MANUAL

OF THE

SOUTHEASTERN FLORA

BEING DESCRIPTIONS OF THE SEED PLANTS GROWING NATURALLY
IN FLORIDA, ALABAMA, MISSISSIPPI, EASTERN LOUISIANA,
TENNESSEE, NORTH CAROLINA, SOUTH CAROLINA
AND GEORGIA

ILLUSTRATED

BY

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CONTENTS

	PAGE
Preface	iv–vii
Introduction	ix–xiii
Key to the Orders	xv–xxii
Descriptive Flora	1–1499
Appendix	1500–1502
Genera and species published in this Flora	1503–1509
Table of Orders and Families	1510–1512
Index	1513–1554

PREFACE

This volume is designed to record and describe the species of native and naturalized flowering plants known by the author to grow naturally in the southeastern United States south of the northern boundaries of North Carolina and Tennessee and east of the Mississippi River. The species are grouped in genera, families, and orders, and are so arranged and described that they may be identified by means of the analytical keys and synopses given under each group, mainly by a study of the morphology of the flowers and the fruits.

The arrangement of the natural plant families is essentially that of Engler and Prantl, Die Natürlichen Pflanzenfamilien, although in a few cases modifications of the sequence there adopted seemed to be desirable. The descriptive matter has been made very short, except in special cases. In order to facilitate the tracing and determination of genera and species, a drawing showing a flower and its gross morphology and a fruit, of the first species under each genus is given. The illustrations are not made to a scale, but the sizes of some of the parts are usually given in the descriptive matter. The drawings were made by Miss Mary E. Eaton, with the exception of those of the grasses, which were made by Mrs. Agnes Chase,[1] and those of *Carex* which were made by Mr. H. Creutzberg, through the interest of Mr. K. K. Mackenzie.

In the matter of the interpretation of species and genera what has seemed to the author a balanced course has been followed—traditional "lumping" and modern "splitting" have not influenced the treatments of the various groups. Complex genera have been divided into more natural groups, both for convenience of study and also in order to make the genera, as far as possible, correspond in rank to the great majority of groups of species now recognized as genera by most present-day botanists. Species have been interpreted in the broader sense; minor variations of species, "varieties" or "subspecies" have not been considered to any great extent. "Subvarieties", "forms", "subforms" have not been considered at all.

The names adopted for species and genera in this volume are those which to the best of the author's knowledge, were first applied to each, accompanied or supported by an adequate description, and in the case of genera by specific references, from the time (1753) when binomial desig-

[1] The drawings for the grasses were made with the understanding that they were to be reduced to 1 inch square, allowance being made for such reduction. Coarseness of the illustrations, if any, is due to the fact that the drawings were not reduced in engraving.

nation of species was definitely introduced into biological nomenclature, unless preoccupied for another species or genus.[2]

During the preparation of this manual, numerous botanists, naturalists, and collectors helped continuously by the contribution of specimens and of information relating to the vegetation and its distribution, in short, doing much to help to make this volume complete.

Botanists as indicated below kindly prepared the text for several plant-families printed in this volume: POACEAE, by Dr. A. S. Hitchcock; POLEMONIACEAE, by Dr. E. T. Wherry; RHINANTHACEAE, by Dr. F. W. Pennell; PINGUICULACEAE, by Dr. J. H. Barnhart; LORANTHACEAE, by Dr. William Trelease. The text for certain genera was prepared by the following botanists: *Iris, Vincetoxicum, Odontostephana, Scutellaria, Laciniaria, Zinnia, Melanthera, Pterophyton, Cosmos, Emilia,* by Mr. E. J. Alexander; *Philadelphus,* by Mr. C. D. Beadle; *Crataegus,* by Mr. Ivar Tidestrom; *Tilia,* by Mr. B. F. Bush; *Physalis, Acanthoxanthium, Xanthium,* by the late Dr. P. A. Rydberg; *Carex, Solidago,* by Mr. K. K. Mackenzie; *Rudbeckia,* by Mr. C. L. Boynton and Mr. C. D. Beadle; *Helianthus,* by Mr. E. E. Watson; *Coreopsis,* by Mr. F. E. Boynton; *Bidens,* by Dr. Karl M. Wiegand. The following genera were revised: *Viola, Aster,* by Mr. E. J. Alexander. Assistance is preparing the text of *Philotria* and of *Trillium* was furnished by Dr. Harold St. John and Mr. Donald C. Peattie, respectively.

Help in many ways was given by my associates on the botanical staff of the Garden. Among those who participated in intensive field-work of the past two decades were Mr. Charles A. Mosier, the late Captain Paul A. Matthaus, and Mr. John B. DeWinkeler. Both the galley and the page proof have been read by Dr. Edgar T. Wherry, who also supplied the provincial distribution of the species, checked many of the geographic ranges, and furnished data as to habitats and soils. The galley proof was read in whole or in part by Mr. Kenneth K. Mackenzie, Dr. N. L. Britton, Dr. Roland M. Harper, Mr. Edward J. Alexander, and Miss Bertha Pickering, while each contributor of generic or family treatments, as indicated in the text, read the proofs of these.

The author is indebted to Dr. John H. Barnhart for advice and information on many botanical and bibliographic questions that arose throughout the years of preparation of the manuscript and the reading

[2] The manuscript of the grasses (POACEAE) was completed several years ago and was held in proof along with other parts of this work. It was therefore impracticable to bring the nomenclature into accord with the rules of nomenclature which Dr. Hitchcock is now following. This statement also applies to the treatment of the figworts (RHINANTHACEAE) by Dr. Pennell, and to the treatments of several other families and genera by others, for which credit is given.

of the proof and to Mr. E. J. Alexander for cooperation in studies on many genera and species.

The completion of the manuscript was made possible, in part, by the cooperation of the Board of Managers of The New York Botanical Garden. The publication was made possible, in part, by the interest of the late Mr. Charles Deering.

The numerous specimens, which the investigations connected with this work have brought to the author during a period of thirty-five years, along with much botanical information, have been incorporated in the herbarium, the museums, and the records of the Garden.

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November 30, 1933

INTRODUCTION

This manual supplants, in part, the Flora of the Southeastern United States published by the author in 1903 (second edition 1913). That volume recorded and described the flowering plants and pteridophyta[3] known at that time to grow naturally in the southern United States east of the one hundredth meridian of longitude. The complexity and magnitude of the flora in this area, resulting from its proximity to the tropics, the intrusion of the northern highlands, and the extension of the Great Plains and the deserts from the west, made it seem desirable to divide the "Flora" into two parts. The result is the present volume and a proposed volume to include the area west of the Mississippi River south of the same degree of latitude and east of the western boundary of Texas. Thus smaller volumes will result, and plants may be traced by the analytical keys with greater ease, since fewer genera and species are usually involved.

The geographic area concerned represents one of the cradles of botany on the American mainland, for on the coasts of the Gulf States early Spanish expeditioners were necessarily, not by choice, brought into close contact with the native vegetation. They left us printed records of the uses made of various plants by the aborigines and by themselves for foods, drinks, medicines, clothing, utensils, and fumitories. Their interest was not wholly utilitarian, for some plants so impressed them, the cacti for example, that they took them back to Europe and grew them there.

About a century after the discovery of America by Columbus, living specimens of plants from the Atlantic coast began to find their way into European botanic gardens. Explorations by plant collectors were soon extended into the highlands and into the Florida peninsula. Later, collectors were sent over from Europe and Americans were commissioned by European patrons of botany to explore for plants. American residents about this time began to publish the results of their studies. Today the works on the flora are numerous.

The first American botanical garden in the northeast developed near Philadelphia, Pennsylvania, in the middle part of the eighteenth century, as a result of the plant-collecting activities of John Bartram. Here many of the plants of the southeast were cultivated. In the second half of that century the first botanical garden in the southeast grew about the home of Thomas Walter on the Santee River north of Charleston, South Carolina. Walter's association with this native flora crystallized into the first manual of the plants of a more or less definite geographic area, under the title Flora Caroliniana, in 1788. Interest in the native plants and in botany increased and reached a culmination about the middle of the last century,

[3] The pteridophyta are omitted from the present work.

in the publication of Chapman's Flora of the Southern United States, in 1860. Then, botanical activity waned in the South. Toward the end of the last century, however, a revival took place in the southeastern states, mainly through the activities of permanent and transient residents, of plant collectors, and of botanists and naturalists who moved into the region to fill professional positions.

In pioneer days with the horse and few trails, the sail-boat and undeveloped water-ways, botanical exploration was restricted to limited areas and progressed slowly, consequently the botanical harvests were often scant. Since the advent of the automobile, the motor-boat, and the construction of a vast network of highways, canals, and improved waterways, largely through virgin country, a vast territory, until recently inaccessible, has been made to yield numerous botanical and horticultural treasures. As a consequence, many additional species and not a few genera of all groups of plants have been recorded for the area under consideration only since the end of the last century.

The area extends over about twelve degrees of latitude. The southern limit lies within less than a hundred miles of the Tropic of Cancer. The northern limit is not very far north, but two mountain ranges, with a multitude of peaks rising to between five and six thousand feet and several to more than six thousand, furnish a cool climate representing a high latitude through altitude. Intermediate altitudes (Piedmont and Appalachian Plateau) supply still other elements for greater variety in the vegetation. As compared with northeastern America there are one-third more species in about one-fifth the area. Three main factors contribute to this condition—*latitude, geology, physiography.*

The ancestors of our present plant-covering were subjected to both major and minor earth disturbances, elevations and depressions and rearrangements of the land-mass. Submergences also destroyed vast areas of coastwise vegetation several times. When the areas emerged from the sea for the last time and the higher lands became more stable, the coastwise areas were populated from both the plant refuges in the highlands and those of continental and insular regions lying to the south. Whether these early floras were more extensive in kinds and density of population than those of today we shall never know. The records of several different floras are preserved in the sedimentary rocks, but they are naturally very incomplete. Large areas of eroded materials of the very old geological formations, often segregated into areas of different kinds of soil, such as sand, clay, marl, loam, in the Coastal Plain and the Piedmont, very definitely contribute to the complexity of the flora. Then, in relatively recent geologic time, came the advance of successive great ice-sheets from the north as far south as New Jersey and Pennsylvania, with accompanying cold, which killed the vegetation before their immediate front, while they

advanced, or drove the more distant plants southward. When the ice receded to the north some plants at the south doubtless succumbed as the temperature rose to a point beyond their endurance more rapidly than they could migrate; while others accommodated themselves to the new conditions, and traveled back to their former, more northern latitudes.

Thus our present plant population shows the results of invasions from the north. On the other hand, peninsular Florida, and in a lesser degree the more northern Gulf Coast, received many elements from the West Indies near at hand, and from northern South America, carried over a narrow ocean area by birds, winds, and currents. The physiographic structure of the area involved furnishes a sliding scale, either from the boreal to the tropical or *vice versa,* so that any plant which gains a foothold in the area might find conditions suitable for its growth and maintenance. The above remarks apply mainly to the eastern part of the area; here we find a very dense plant population, specifically and generically considered. In the western part there are less differences in elevation, and much simpler geologic history; here there is sparser plant-population both in density and variety.

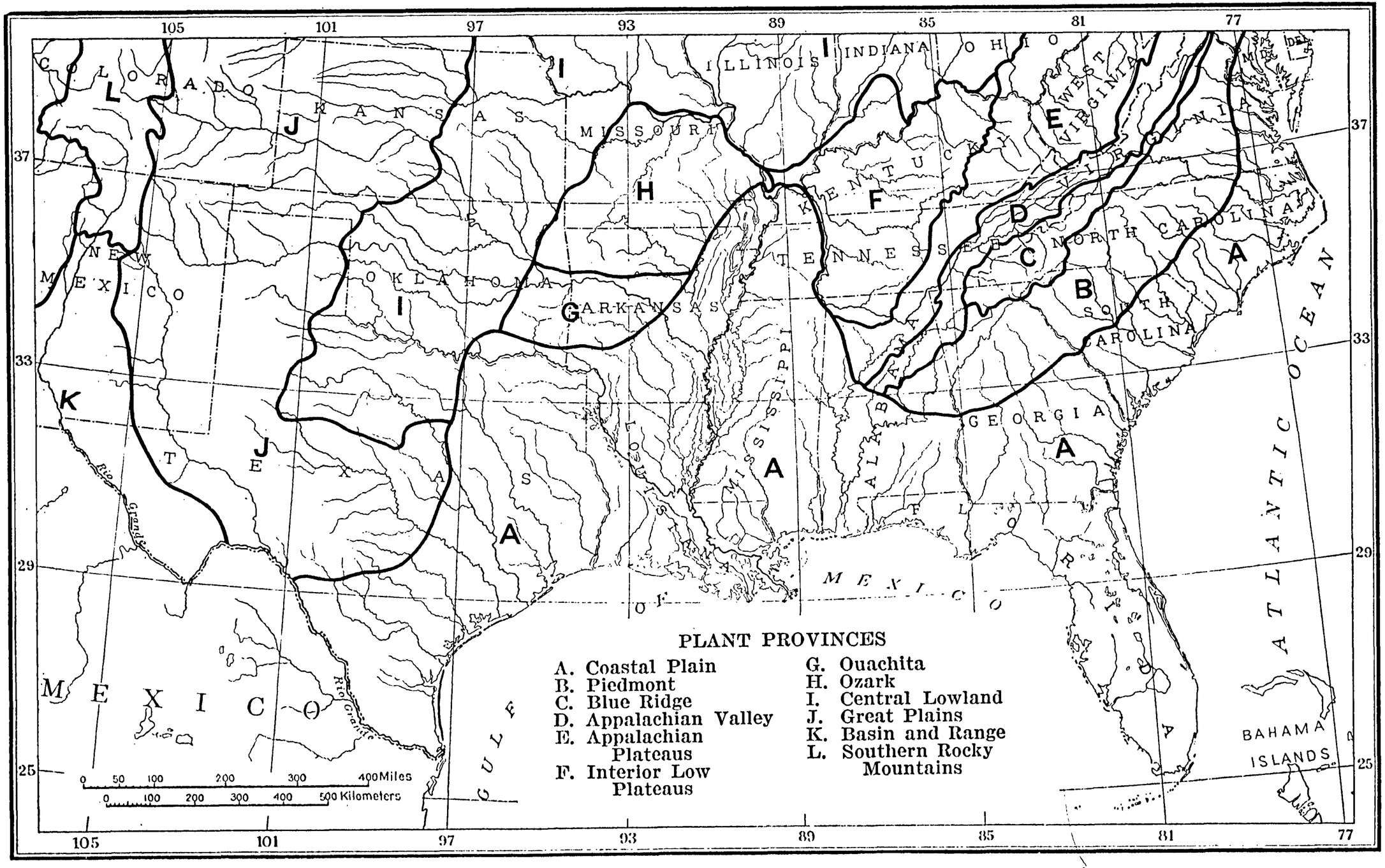
There are many locally peculiar minor plant areas. For example, capes, peninsulas, coastal sand-dunes, river-deltas, river-valleys or watersheds, swamps, marshes, plateaus, mountain-valleys, mountain ranges, and mountain peaks, each harboring peculiar or endemic plants.

The accompanying map shows the territory included in the Southeastern States and the Southcentral States. The Mississippi River divides the area into approximate halves. Both areas are shown for convenience in tracing the geographic distribution of the plants, and to show the relation of the floras of the two areas. These are closely related at the boundary line, for they both naturally merge in the ancient delta of the Mississippi River or the present Coastal Plain part of the Mississippi watershed.

Following the description of each species, and separated by a dash from it (or from synonyms or common names which may be introduced at this point), the habitat, the province, and the geographic range are stated.

Habitat.—Not only are the physical features briefly characterized, but in cases where it seems noteworthy, something is stated as to the chemical nature of the soil, that is whether it is acid, neutral, or alkaline, whether siliceous or calcareous. When the habitat is given as pinelands, the soil may be inferred to be acid, except in southern Florida, where the pinewoods cover limestone rocks and have more or less alkaline soil. Otherwise, where no statement is made as to soil reaction, either no data are available or else the plant appears to be indifferent to this factor.

Provinces.—Each species is here assigned to one or more physiographic provinces. These are used instead of life-zones because the latter do not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COLORADO
KANSAS
MISSOURI
ILLINOIS
INDIANA
OHIO
WEST VIRGINIA
VIRGINIA
KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
NEW MEXICO
OKLAHOMA
ARKANSAS
MISSISSIPPI
ALABAMA
FLORIDA
TEXAS
MEXICO
Rio Grande
GULF OF MEXICO
ATLANTIC OCEAN
BAHAMA ISLANDS
L
J
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0 50 100 200 300 400 Miles
0 100 200 300 400 500 Kilometers
PLANT PROVINCES
A. Coastal Plain
B. Piedmont
C. Blue Ridge
D. Appalachian Valley
E. Appalachian Plateaus
F. Interior Low Plateaus
G. Ouachita
H. Ozark
I. Central Lowland
J. Great Plains
K. Basin and Range
L. Southern Rocky Mountains

really express very well the distributional relations of plants in our region. Thus, in the east Gulf Coastal Plain, where the Lower Austral life-zone should supposedly be represented, there occur many Transition and even Canadian plants which have pushed southward, west of the Appalachian mountains, in some past geological period and have persisted there. Again, in the Blue Ridge, where on ascending a high mountain the theoretical sequence should be Upper Austral—Transition—Canadian—Hudsonian, one finds instead a mixture of Upper Austral and Transition plants on the lower slopes, Canadian plants further up, but then instead of anything more boreal, a mixture of plants characterizing the Upper Austral of the Atlantic Coastal Plain mingled with many Transition shrubs and Canadian trees at the summit. It has accordingly seemed best to refer the plants only to the physiographic provinces in which they have been observed to grow, and to leave the untangling of the complexities of life-zone relations to other writers.

The physiographic province names used have been taken, with minor modifications, from "Physiographic Divisions of the United States."[4] The boundaries of those lying within our limits are indicated on the accompanying sketch map (figure 1), and certain points concerning their positions are here discussed.

Physiographic province	*Discussion*
Coastal Plain	Separated in some cases into "Atlantic" and "Gulf" Coastal Plain, the division between these extending from Macon, Ga., to Gainesville, Fla.
Piedmont	Alabama to New York; between the Coastal Plain and the Blue Ridge and Appalachian provinces.
Appalachian Valley Appalachian Plateau	Often collectively referred to as "Appalachian provinces."
New England	Includes E Canada; often divided into "Upland" and "Coast," the division between these lying roughly 30 miles inland.
Interior Low Plateaus	Northern Alabama to Southern Illinois, Indiana, and Ohio.
Central Lowland	The portion immediately surrounding Lakes Michigan, Huron, and Erie is often separately referred to as the "Great Lakes Lowland."
Great Plains	Texas to North Dakota.
Ozark Plateaus	Northern Arkansas to central Missouri.
Ouachita	Central Arkansas to eastern Oklahoma.
Basin-and-range	Western Texas to California and southern Oregon.

[4] Nevin M. Fenneman, Ann. Assoc. Am. Geogr., 1917, reprinted 1921.

In addition, the following special groupings of provinces are often found convenient:

"Coastal Plain and adj. provinces." Plants thus annotated appear to reach their maximum development on the Coastal Plain, but also occur northward and westward in the Piedmont, Appalachian Valley, Appalachian Plateau, and other provinces which border the Coastal Plain.

"Various provinces, in Coastal Plain only N." These plants are not known to grow in the Coastal Plain within our limits, although they may be abundant in or even typical of that province further northward, as in Va., Md., or N. J.

"Blue Ridge and more N Provinces." In this manner are designated plants which reach their greatest development in regions north (and northwest) of our limits, or in some cases in the Rocky Mountains.

As the states of Florida, Mississippi, and Louisiana lie essentially within the Coastal Plain, plants limited to them have not required special mention of province. Moreover, plants occurring "in salt-marshes along the coast" or "on sand-dunes," are so obviously limited to the Coastal Plain that statement of it has been omitted. It is of course realized that the Coastal Plain is not an ecological unit, being divisible into a considerable number of areas with different soils and other features; however, in a work of the scope of the present volume it is impracticable to go into details in this respect, which must be left for the writers of local floras.

While every effort has been made to have these province-assignments accurate, the data in the literature are often inadequate to decide the exact range of given species, and errors which users of this work may discover will be thankfully received.

Range.—Instead of following the usual plan of beginning range statements at the northeast, we begin at the southeasternmost state within our limits at which the plant is known to occur. When the starting-point lies toward the eastern coast, the final state named is that lying furthest northeast, as "Ga. to La., Minn., and Me." When, however, the start is made far inland, the last state given is the southernmost in which the plant approaches the coast, as "Tenn. to Mo., Mich., N. Y., and Va." The primary reason for this method is that this manual covers southern plants, and users are naturally most interested in the places where the plant occurs in the south, hence it is convenient to have the southern limits come first. There is, however, also a scientific significance to the plan, in that the last great plant migration on this continent, resulting from the climatic change connected with the retreat of the ice-sheets of the final stage of the Glacial Period, consisted in a movement of plants from south to north, of which the range as stated may give a rough picture.

J. K. S.

KEY TO THE ORDERS

Subkingdom **SPERMATOPHYTA**—Seed-Plants

Plants producing flowers and seeds. A seed contains an embryo consisting of a short stem (radicle, caulicle, hypocotyl), one, two, or several rudimentry leaves (cotyledons), and a terminal bud (plumule).

Carpel or pistil represented by a scale on the face of which the ovules are borne, and on which the naked seeds mature. Class 1. GYMNOSPERMAE.

Carpel or pistil with a closed cavity within which the ovules are borne and the seeds mature. Class 2. ANGIOSPERMAE.

1. Gymnospermae

Plants growing by single terminal bud or sometimes with adventitious buds, when with pinnate leaves, circinate in bud.

PAGE

Palm-like or fern-like plants. Leaves in a crown: blades pinnate. Flowers in cones of approximate scales or on less modified leaves. Staminate cone with scales bearing several pollen-sacs. Ovulate cone with two or more ovules on each scale. Seed drupe-like or nut-like. Order CYCADALES. 1

Shrubs or trees. Leaves scale-like, narrow, or needle-like, and often borne in bundles. Flowers mainly monoecious, the cones of spirally imbricate bracts or in *Taxaceae* the ovulate flowers often solitary. Seed borne in a cone of dry or fleshy scales, or partly or wholly naked.—A group developed later and more highly organized than the CYCADALES. Order PINALES. 2

2. Angiospermae

Embryo with a single cotyledon, the early leaves alternate; blades, except in *Smilacaceae*, parallel-veined: stem with a mass of cellular tissue through which woody fibers are scattered: flower with the parts in threes or sixes. Subclass 1. MONOCOTYLEDONES.

Embryo usually with a pair of opposite cotyledones, the early leaves opposite: blade net-veined: stem with central pith, enclosed in layers of wood which is surrounded by bark: flower with the parts in fours or fives. Subclass 2. DICOTYLEDONES.

1. MONOCOTYLEDONES

Perianth rudimentary or degenerate, the members often bristles or mere scales, not corolla-like, or wanting.
- Flowers not in the axils of dry or chaffy bracts (scales or glumes).
  - Perianth of bristles or chaffy scales. Order PANDANALES. 13
  - Perianth fleshy or herbaceous, or wanting.
    - Fruit baccate: endosperm present. Order ARALES. 243
    - Fruit drupaceous: endosperm wanting. Order NAIADALES. 14
- Flowers in the axils or dry or chaffy, usually imbricated, bracts (scales or glumes). Order POALES. 29

Perianth of 2 distinct series, the inner series usually corolloid.
- Gynoecium of distinct carpels. Order ALISMALES. 220
- Gynoecium of united carpels.
  - Endosperm mealy. Order XYRIDALES. 250
  - Endosperm fleshy, horny or cartilaginous.
    - Ovary, and fruit, superior.
      - Herbs, or rarely shrubs or trees, with simple leaves: ovules 2–many in each cavity of the ovary, or solitary only in the case of a few herbs.
        - Inflorescence not a fleshy spadix. Order LILIALES. 273
        - Inflorescence a fleshy spadix subtended by a spathe. Order ARALES. 243
      - Trees or shrubs, with pinnately or palmately compound or lobed leaf-blades: ovules solitary in each cavity of the ovary. Order ARECALES. 236

Ovary, and fruit, wholly inferior or half-inferior.
- Endosperm present and usually copious.
  - Flowers regular: androecium not reduced. Order AMARYLLIDALES. 314
  - Flowers very irregular: androecium much reduced and modified. Order SCITAMINALES. 358
- Endosperm wanting.
  - Flowers regular, monoecious or dioecious: aquatic plants. Order HYDROCHARITALES. 26
  - Flowers irregular, perfect: terrestrial or epiphytic plants. Order ORCHIDALES. 362

2. DICOTYLEDONES

PAGE

Corolla wanting, except in the pistillate flowers of *Juglans* (Juglandaceae).
Calyx wanting, at least in the staminate flowers, except sometimes in *Casuarina* (Casuarinaceae).
Herbs.
Flowers mainly perfect.
Seeds solitary in each carpel or in each cavity of the ovary: endosperm present.
Flowers spicate: styles wanting: stigmas sessile. Order PIPERALES. 399
Flowers axillary: styles present. Callitrichaceae in Order EUPHORBIALES. 804
Seeds numerous in each cavity of the ovary: endosperm wanting. Podostemaceae in Order ROSALES. 584
Flowers monoecious or dioecious. Order EUPHORBIALES. 774
Trees or shrubs: flowers monoecious or dioecious, or polygamous.
Leaves represented by appressed whorled scales: stems or branches loosely jointed. Order CASUARINALES. 402
Leaves not appressed scales: stems or branches not loose jointed.
Fruit 1-seeded: seeds without tufts of hairs.
Ovules 1 or 2 in each cavity of the ovary: flowers not in heads.
Gynoecium 1-carpellary: stigma 1: ovule laterally attached and amphitropous. Order LEITNERIALES. 407
Gynoecium 2-carpellary: stigmas 2: ovule erect and amphitropous or pendulous and anatropous.
Pistillate flowers without a calyx: ovule erect and orthotropous. Order MYRICALES. 408
Pistillate flowers with a calyx: ovule pendulous and anatropous.
Leaf-blades simple.
Fruit a nut or an achene. Corylaceae in Order FAGALES. 415
Fruit a drupe. Oleaceae in Order OLEALES. 1037
Leaf-blades compound: fruit a samara. Oleaceae in Order OLEALES. 1037
Ovules many: flowers aggregated into dense heads. Altingiaceae in Order ROSALES. 601
Fruit many-seeded: seeds each with a tuft of hairs. Order SALICALES. 410
Calyx present at least in the staminate or in the perfect flowers.
Leaves represented by appressed whorled scales: branches loosely jointed. Order CASUARINALES. 402
Leaves not appressed scales: branches not loosely jointed.
Flowers, at least the staminate, in aments, or ament-like spikes.
Leaf-blades simple: ovule pendulous and anatropous.
Pistillate flowers separate at maturity: fruit a nut or an achene. Order FAGALES. 415
Pistillate flowers forming aggregate fruits: fruit drupe-like. Artocarpaceae in Order URTICALES. 437
Leaf-blades pinnately compound: ovule erect and orthotropous. Order JUGLANDALES. 403
Flowers, at least the staminate, not in aments.
Ovary superior.
Gynoecium of 1 or several and distinct carpels: stigma and style solitary.
Carpel solitary.
Style lateral and oblique. Petiveriaceae in Order CHENOPODIALES. 485
Style, axile, erect.
Ovary neither enclosed nor seated in a hypanthium or a calyx-tube.
Flowers not solitary in axils; land plants.
Filaments free and distinct. Urticaceae in Order URTICALES. 431
Filaments adnate to the sepals or to the calyx-tube. Order PROTEALES. 918
Flowers solitary in axils: aquatic plants. Ceratophyllaceae in Order RANALES. 509
Ovary enclosed in or seated in a hypanthium or a calyx-tube.
Stamens borne under the gynoecium. Allioniaceae in Order CHENOPODIALES. 487
Stamens borne on the hypanthium or adnate to the calyx-tube. Order THYMELEALES. 919
Carpels several.
Stamens inserted below the ovary. Families in Order RANALES. 583

PAGE

Stamens inserted on the edge of a cup-shaped hypanthium. Rosaceae in Order ROSALES. 604
Gynoecium of 2 or several united carpels: stigmas or styles 2 or several.
Ovary, by abortion, 1-celled and 1-ovuled.
Leaves with sheathing stipules (ocreae).
Order POLYGONALES. 443
Leaves estipulate, or stipules present if they are not sheathing.
Trees or shrubs.
Anthers opening by slits: ovary not seated in a hypanthium. Ulmaceae in Order URTICALES. 440
Anthers opening by hinged valves: ovary seated in an accrescent hypanthium.
Lauraceae in Order THYMELEALES. 926
Herbs or vines.
Leaves with stipules.
Stipules herbaceous: inflorescence spicate or racemose: leaf-blades palmately veined.
Cannabinaceae in Order URTICALES. 436
Stipules scarious or hyaline: inflorescence cymose: leaf-blades pinnately veined.
Families in Order CHENOPODIALES. 461
Leaves without stipules.
Stigmas entire. Order CHENOPODIALES. 461
Stigmas 2-cleft.
Euphorbiaceae in Order EUPHORBIALES. 775
Ovary several-celled, or with several placentae, several-ovuled.
Stamens hypogynous, inserted under the gynoecium in the perfect flowers, not on a disk in the pistillate flowers.
Herbs.
Flowers perfect.
Ovary several-celled.
Fruit baccate or nut-like, or a circumscissile capsule, the carpels terminal on the receptacle.
Families in Order CHENOPODIALES. 461
Fruit of several carpels, lateral on the receptacle, each carpel circumscissile.
Penthoraceae in Order ROSALES. 589
Ovary 1–2-celled.
Stamens not tetradynamous, 4–8: ovary 1-celled. Order CHENOPODIALES. 461
Stamens tetradynamous: ovary 2-celled.
Brassicaceae in Order PAPAVERALES. 551
Flowers monoecious or dioecious.
Ovules with the raphe towards the axis of the gynoecium.
Euphorbiaceae in Order EUPHORBIALES. 775
Ovules with the raphe away from the axis of the gynoecium.
Buxaceae in Order SAPINDALES. 806
Trees or shrubs.
Gynoecium 5-carpellary, the carpels nearly distinct. Buettneriaceae in Order MALVALES. 861
Gynoecium 2–4-carpellary, the carpels united.
Ovary 4-celled: fleshy maritime shrubs.
Batidaceae in Order CHENOPODIALES. 486
Ovary 2-celled: plants not fleshy.
Oleaceae in Order OLEALES. 1037
Stamens perigynous or epigynous, inserted on the margin of a hypanthium or a disk.
Fruit a samara. Families in Order SAPINDALES. 805
Fruit not a samara.
Fruit drupe-like or berry-like: shrubs or trees.
Order RHAMNALES. 830
Fruit a capsule: herbs. Order ARISTOLOCHIALES. 1279
Ovary inferior.
Flowers not in involucrate heads.
Fruit 3-winged, splitting into 3 nutlets.
Gouania in Order RHAMNALES. 834
Fruit neither 3-winged nor splitting into carpels.
Fruit a berry or a drupe, or nut-like.

PAGE

Calyx deciduous as a lid: stamens numerous.
Calyptranthes in Order MYRTALES. 937
Calyx of valvate or imbricated sepals: stamens few.
Stamens as many as the perianth-members and alternate with them, or fewer.
Herbs, with succulent stems and leaves, or woody below: flowers perfect.
Tetragoniaceae in Order CHENOPODIALES. 490
Trees or shrubs: flowers dioecious.
Nyssaceae in Order AMMIALES. 956
Stamens as many as the perianth-members and opposite them, or twice as many.
Styles present.
Ovules mostly on basal placentae, sometimes pendulous: cotyledons not convolute: tree- or root-parasites. Order SANTALALES. 1247
Ovules not on basal placentae: cotyledons convolute: not parasitic plants.
Families in Order MYRTALES. 925
Styles wanting: stigmas sessile.
Gunneraceae in Order MYRTALES. 953
Fruit a capsule.
Sepals as many as the ovary-cavities or one half as many.
Calyx regular and the sepals half as many as the cavities in the ovary, or irregular. Order ARISTOLOCHIALES. 1279
Calyx regular and the sepals as many as the cavities in the ovary.
Order MYRTALES. 925
Sepals (4–5) at least twice as many as the ovary-cavities (2).
Saxifragaceae in Order ROSALES. 590
Flowers, at least the staminate, in involucrate heads.
Ambrosiaceae in Order CARDUALES. 1297
Corolla present.
Petals distinct, at least at the base.
'Carpels solitary, or several and distinct, or united only at the base.
Stamens at the base of the receptacle, *i.e.*, hypogynous.
Flowers in monoecious heads. Platanaceae in Order ROSALES. 604
Flowers not in monoecious heads.
Plants with relatively firm stems and leaves, not succulent.
Order RANALES. 508
Plants with succulent stems and leaves.
Sedaceae in Order ROSALES. 585
Stamens on the margin of a hypanthium (the hypanthium very small in some Saxifragaceae).
Plants without secreting glands in the bark. Order ROSALES. 583
Plants with secreting glands in the bark.
Surianaceae in Order GERANIALES. 761
Carpels several and united.
Ovary superior.
Stamens inserted at the base of the ovary or receptacle.
Stamens numerous.
Sepals imbricated.
Calyx deciduous. Order PAPAVERALES. 546
Calyx persistent.
Stigmas pinnatifid: insectivorous plants.
Dionaeaceae in Order SARRACENIALES. 580
Stigmas not pinnatifid: plants not insectivorous (except in Sarraceniales).
Styles or stigmas distinct or united, but not discoid.
Leaves glandular or pellucid-punctate.
Placentae axile.
Rutaceae in Order GERANIALES. 756
Placentae parietal.
Canellaceae in Order HYPERICALES. 864
Leaves not glandular.
Placentae parietal: gynoecium with a 1-celled ovary.
Anther-sacs opening lengthwise.
Capparidaceae in Order PAPAVERALES. 575

PAGE

Anther-sacs opening at the top.
Bixaceae in Order HYPERICALES. 864
Placentae axile or central: gynoecium with a 2–several-celled ovary, (or with distinct carpels.)
Theaceae in Order HYPERICALES. 875
Styles or stigmas united into a disk.
Herbs: bog or aquatic plants.
Petals and sepals numerous: leaves with flat blades: aquatic plants.
Nymphaeaceae in Order RANALES. 540
Petals and sepals few: leaves with pitcher-like organs: bog plants.
Sarraceniaceae in Order SARRACENIALES. 580
Shrubs or trees: plants not aquatic.
Clusiaceae in Order HYPERICALES. 865
Sepals valvate.
Stamens with distinct filaments.
Ovary 1-celled: placentae parietal.
Capparidaceae in Order PAPAVERALES. 575
Ovary 2–several-celled: placentae axile or central.
Families in Order MALVALES. 840
Stamens with united filaments. Order MALVALES. 840
Stamens few, not over twice as many as the petals.
Stamens as many as the petals and opposite them.
Anther-sacs opening by hinged valves.
Podophyllaceae in Order RANALES. 543
Anther-sacs opening by slits.
Flowers monoecious.
Euphorbiaceae in Order EUPHORBIALES. 775
Flowers perfect.
Ovules, or seeds, several or many: embryo coiled.
Portulacaceae in Order CHENOPODIALES. 493
Ovules, or seeds, solitary; embryo straight.
Armeriaceae in Order PRIMULALES. 1020
Stamens as many as the petals and alternate with them, or more, sometimes twice as many.
Stamens 6: petals 4: sepals 2 or 4.
Families in Order PAPAVERALES. 546
Stamens, petals and sepals of the same number, or stamens more, usually twice as many as the sepals or petals.
Ovary 1-celled.
Ovules, or seeds, on basal or central placentae.
Herbs. Families in Order CHENOPODIALES. 461
Trees or shrubs.
Stamens with free and distinct filaments.
Tamaricaceae in Order HYPERICALES. 866
Stamens with partially united filaments, and usually adnate to the corolla.
Styracaceae in Order EBENALES. 1036
Ovules, or seeds, on parietal placentae.
Stigmas 2-cleft.
Anther with an inconspicuous connective.
Stigmas not brush-like.
Droseraceae in Order SARRACENIALES. 578
Stigmas brush-like.
Turneraceae in Order HYPERICALES. 877
Anther with the conspicuous connective produced beyond the sacs.
Papayaceae in Order PASSIFLORALES. 894
Stigmas entire.
Stamens with united filaments and no staminodia. Families in Order MALVALES. 840
Stamens with distinct filaments.
Staminodia present.
Parnassiaceae in Order ROSALES. 589
Staminodia wanting.
Families in Order HYPERICALES. 864
Ovary several-celled.
Stamens adnate to the gynoecium.
Asclepiadaceae in Order ASCLEPIADALES. 1064
Stamens not adnate to the gynoecium.
Stamens with wholly or partly united filaments.
Anthers opening lengthwise.
Families in Order GERANIALES. 743
Anthers opening by pores.
Polygalaceae in Order POLYGALALES. 765
Stamens with distinct filaments.

PAGE

Anthers opening by pores.
Families in Order ERICALES. 986
Anthers opening by slits.
Stigmas or styles distinct and cleft, or foliaceous, or united by pairs.
Order EUPHORBIALES. 774
Stigmas or styles all distinct or all united, neither cleft nor foliaceous.
Stamens 2. Oleaceae in Order OLEALES. 1037
Stamens more than 2.
Leaves with compound blades.
Families in Order GERANIALES. 743
Leaves with simple blades.
Ovule solitary in each carpel.
Styles distinct: ovule pendulous. Families in Order GERANIALES. 743
Styles united: ovule erect or ascending.
Limnanthaceae in Order SAPINDALES. 753
Ovules 2 or more in each carpel.
Flowers irregular: stamens united at the top or converging.
Placentae axile.
Balsaminaceae in Order GERANIALES. 753
Placentae parietal.
Violaceae in Order HYPERICALES. 884
Flowers regular: stamens neither united nor converging at the top.
Carpels not circumscissile at maturity.
Placentae parietal.
Cistaceae in Order HYPERICALES. 878
Placentae axile or central.
Styles distinct,
Elatinaceae in Order HYPERICALES. 864
Styles united.
Ovary sessile: filaments filiform.
Tiliaceae in Order MALVALES. 840
Ovary stipitate: filaments fusiform.
Koeberliniaceae in Order GERANIALES. 743
Carpels circumscissile at maturity.
Penthoraceae in Order ROSALES. 589
Stamens inserted on the margin of a disk or hypanthium (perigynous or hypogynous).
Stamens fewer than the sepals or the petals.
Hippocrateaceae in Order SAPINDALES. 820
Stamens as many as the sepals or the petals, or more.
Stamens as many as the petals and opposite them.
Styles and upper part of the ovaries distinct: ovules and seeds many. Saxifragaceae in Order ROSALES. 590
Styles united.
Ovules and seeds numerous.
Moringaceae in Order PAPAVERALES. 578
Ovules and seeds solitary or 2.
Order RHAMNALES. 830

PAGE

Stamens as many as the petals and alternate with them, or more or many.
Styles distinct and separate.
Upper part of the ovaries distinct, at least at maturity.
Saxifragaceae and Iteaceae in Order ROSALES. 590
Upper part of the ovaries united. Order SAPINDALES. 804
Styles united.
Hypanthium flat or obsolete: disk fleshy.
Plants without secreting glands in the bark.
Order SAPINDALES. 804
Plants with secreting glands in the bark.
Families in Order GERANIALES. 743
Hypanthium cup-shaped or campanulate: disk obsolete or inconspicuous. Order MYRTALES. 925
Ovary inferior.
Stamens numerous.
Styles and stigmas united into a disk: water-plants with endogenous stems. Nymphaeaceae in Order RANALES. 540
Styles distinct, or united, but not forming a disk with radiating stigmas: land-plants with exogenous stems.
Styles distinct.
Stamens distinct: stigmas simple: shrubs or trees.
Families in Order ROSALES. 583
Stamens with united filaments: styles branched: herbs.
Order BEGONIALES. 917
Styles united.
Shrubs or trees, not succulents, sometimes woody vines.
Hypanthium not produced beyond the ovary.
Hydrangeaceae in Order ROSALES. 596
Hypanthium produced beyond the ovary.
Families in Order MYRTALES. 925
Herbs, or shrub-like or tree-like succulents.
Order OPUNTIALES. 896
Stamens not more than twice as many as the petals.
Styles wanting: stigmas sessile.
Gunneraceae in Order MYRTALES. 953
Styles present.
Styles distinct.
Ovules several in each cavity of the ovary: fruit a capsule or a fleshy many-seeded berry.
Fruit, if dehiscent, valvate.
Families in Order ROSALES. 508
Fruit circumscissile.
Portulacaceae in Order CHENOPODIALES. 493
Ovules solitary in each cavity of the ovary: fruit a drupe or 2–5 more or less united achenes.
Order AMMIALES. 955
Styles united, or single.
Plants without tendrils.
Ovary enclosed in or surpassed by the hypanthium or adnate to it.
Anther-sacs opening by pores.
Vacciniaceae in Order ERICALES. 1006
Anther-sacs opening by slits.
Ovules solitary in each cavity of the ovary.
Order AMMIALES. 955
Ovules several in each cavity.
Ovary with parietal placentae.
Loasaceae in Order OPUNTIALES. 897
Ovary with central or basal placentae.
Families in Order MYRTALES. 925
Ovary exceeding the hypanthium, the top free.
Hydrangeaceae in Order ROSALES. 596
Plants with tendrils.
Herbs: fruit a pepo: leaf-blades palmately veined.
Cucurbitaceae in Order CAMPANULALES. 1283
Shrubby vines: fruit drupaceous, separating into nutlets: leaf-blades pinnately veined.
Frangulaceae in Order RHAMNALES. 830
Petals more or less united.
Ovary superior.
Stamens free from the corolla.
Gynoecium of a single carpel. Families in Order ROSALES. 508
Gynoecium of several united carpels.
Filaments united.
Stamens diadelphous. Fumariaceae in Order PAPAVERALES. 549
Stamens monadelphous.

PAGE

Anther-sacs opening by slits.
Oxalidaceae in Order GERANIALES. 745
Anther-sacs opening by pores.
Calyx and corolla very irregular.
Order POLYGALALES. 765
Calyx and corolla regular.
Families in Order ERICALES. 986
Filaments distinct.
Styles wanting or very short: stigma sessile.
Aquifoliaceae in Order SAPINDALES. 813
Styles elongated.
Ovary several-celled. Families in Order ERICALES. 981
Ovary 1-celled. Armeriaceae in Order PRIMULALES. 1020
Stamens partially adnate to the corolla.
Stamens as many as the lobes of the corolla and opposite them, or twice as many or more.
Ovary 1-celled.
Placentae central or basal. Order PRIMULALES. 1020
Placentae parietal.
Fouquieriaceae in Order HYPERICALES. 864
Ovary several-celled.
Upper portion of the ovaries distinct.
Sedaceae in Order ROSALES. 585
Upper portion of the ovaries united. Order EBENALES. 1030
Stamens as many as the lobes of the corolla and alternate with them, or fewer.
Corolla not scarious, veiny: fruit various, but not a pyxis.
Gynoecium of 3–6 carpels.
Shrubs or trees: ovules and seeds few.
Aquifoliaceae in Order SAPINDALES. 813
Herbs, or creeping or tufted shrubby plants: ovules and seeds numerous or few in some members of the Polemoniaceae.
Stamens adnate up to the sinuses of the corolla: creeping evergreen under-shrubs.
Diapensiaceae in Order ERICALES. 1018
Stamens adnate to the lower part of the corolla-tube: herbs, undershrubs, or vines.
Families in Order POLEMONIALES. 1078
Gynoecium of 2 carpels.
Carpels distinct, except sometimes at the apex.
Style terminal. Order ASCLEPIADALES. 1057
Style basal. Dichondraceae in Order POLEMONIALES. 1079
Carpels united.
Ovary 1-celled, with central placentae.
Order GENTIANALES. 1044
Ovary 2-celled, or falsely 4-celled, or if 1-celled with parietal placentae.
Stamens 2 and opposite each other, or 3.
Order OLEALES. 1037
Stamens usually 4 or 5, if 2 by reduction not opposite each other.
Leaves with stipules or stipular lines at their bases. Spigeliaceae in Order GENTIANALES. 1044
Leaves with no traces of stipules.
Families in Order POLEMONIALES. 1078
Corolla scarious, veinless: fruit a pyxis. Order PLANTAGINALES. 1244
Ovary inferior.
Stamens with the filaments free from the corolla.
Stamens 10: anther-sacs opening by terminal pores or chinks.
Vacciniaceae in Order ERICALES. 1006
Stamens 5 or fewer: anther-sacs opening by longitudinal slits.
Order CAMPANULALES. 1283
Stamens adnate to the corolla.
Ovary with 2–many fertile cavities and 2–many ovules: calyx unmodified, at least not a pappus.
Plants tendril-bearing.
Cucurbitaceae in Order CAMPANULALES. 1283
Plants not tendril-bearing.
Ovules mostly on basal placentae: plants parasitic.
Order SANTALALES. 1247
Ovules variously borne, but not on a basal placenta: plants not parasitic.
Order RUBIALES. 1251
Ovary with one fertile cavity.
Ovules numerous on a basal placenta.
Primulaceae in Order PRIMULALES. 1020
Ovule solitary, the placentae not basal.
Flowers not in heads, often in head-like spikes or racemes.
Order VALERIANALES. 1276
Flowers in involucrate heads. Order CARDUALES. 1297

DESCRIPTIVE FLORA

SUBKINGDOM **SPERMATOPHYTA** SEED-PLANTS

Plants producing flowers and seeds. A seed contains an embryo consisting of a short stem (radicle, caulicle, or hypocotyl), one, two, or several rudimentary leaves (cotyledons), and a terminal bud (plumule).

CLASS 1. **GYMNOSPERMAE** CONE-PLANTS

Carpel or pistil represented by a scale on the face of which the ovules are borne, and on which the naked seeds mature.

ORDER **CYCADALES** — CYCADAL ORDER

Palm-like or fern-like plants. Leaves in a crown: blades pinnate. Flowers in cones of approximate scales or on less modified leaves. Staminate cone with scales bearing several pollen-sacs. Ovulate cone with two or more ovules on each scale. Seed drupe-like or nut-like.

FAMILY 1. **CYCADACEAE** — SAGO-PALM FAMILY

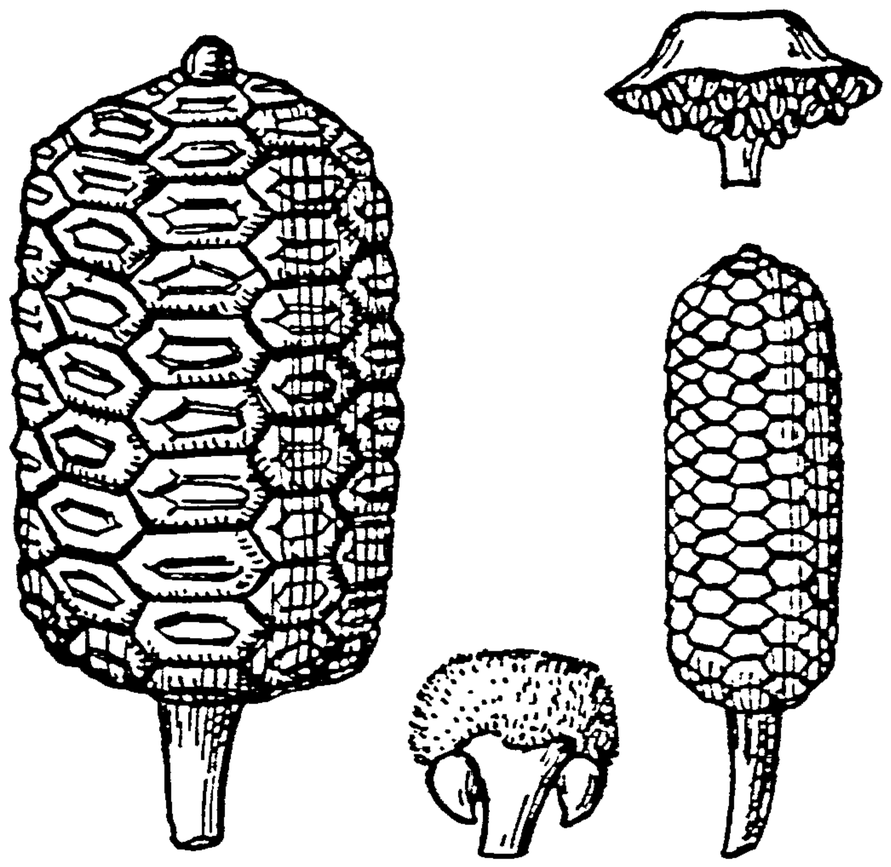
Dioecious plants with subterranean or aërial stems. Leaves clustered: leaflets with 1 or several ribs or veins. Staminate cone deciduous. Ovulate leaf or cone persistent. Seeds exposed on the margins of the ovulate leaf or enclosed in a cone.—The most primitive living seed-plants, even showing some characters of the ferns in their structure. There are about 9 genera and nearly 100 species in tropical and subtropical regions.

1. ZAMIA L. Fern-like plants with erect, simple, or sometimes branched, subterranean, stout, fleshy, farinaceous, stems. Leaves erect or spreading: leaflets jointed to the rachis, with parallel veins. Cones stalked, the staminate one more slender than the ovulate one: scales peltate, spiral. Mature ovulate cone erect.—Represented by four species in Florida, but more abundantly in the West Indies and continental tropical America, where other genera occur as well.—COONTIES. CONTIS. COMPTIES. COMFORTROOTS. FLORIDA-ARROWROOTS. WILD-SAGOS.—The zamias were known to the early Seminoles as *Conti Hateka* which means white-root or white bread-plant.

Blades of the leaflets of a narrow type, 8–20-veined, entire or obscurely toothed at the apex.
- Leaflets close together on the rachis, mostly less than 11 cm. long. — 1. *Z. integrifolia.*
- Leaflets rather distant on the rachis, mostly over 12 cm. long.
  - Blades of the leaflets narrowly linear-attenuate, 10–14-veined, 6 mm. wide or less. — 2. *Z. angustifolia.*
  - Blades of the leaflets broadly linear, 14–20-veined, 10 mm. wide or more. — 3. *Z. silvicola.*

Blades of the leaflets of a broad type, 20–30-veined, evidently callous-toothed at the apex. — 4. *Z. umbrosa.*

1. Z. integrifolia Ait. Leaves 4–9 dm. long; leaflets 8–11 cm. long, the blades linear, 3–7 mm. wide, 8–16-veined, often revolute and very stiff: staminate cone narrowly cylindric, 8–13 cm. long: mature ovulate cone cylindric-ellipsoid, 12–16.5 cm. long: nut-like part of seed ellipsoid, 17–19 mm. long, nearly terete. [*Z. floridana* DC.]—Dry sandy pinelands or rarely coastal dunes, pen. and N Fla., and occasionally lower Keys.—The starchy underground stem of this cycad was the main native source of flour for the Fla. aborigines and for the Seminoles. The phenomenal growth on the Everglade Keys now furnishes "Florida arrowroot" to the whiteman. The stems are frequently branched.



2. Z. angustifolia Jacq. Leaves 1–2 m. long: leaflets 12–20 cm. long, the blades narrowly linear-attenuate, 3–6 mm. wide, 10–14-veined, flat or nearly so, minutely toothed at the apex: inflorescence not seen in Fla. (Bahamian specimens are described as having oblong-cylindric staminate cones 5–7 cm. long and mature ovulate cones 8–9 cm. long.)—Humus, wet hammock islands, between Royal Palm Hammock and Cape Sable, Fla.—(*W. I.*)—The stems are large but simple.

3. Z. silvicola Small. Leaves 1 m. long or less; leaflets 12–17 cm. long, the blades linear, often broadly so, 1–1.5 cm. wide, 14–20-veined, flat, obscurely toothed at the apex: staminate cone cylindric or slightly tapering upward, 8–16 cm. long: mature ovulate cone ellipsoid-cylindric, mostly 9–14 cm. long: nut-like part of seed broadly obovoid, 18–20 mm. long, decidedly flattened, minutely pointed at both ends.—Humus, rich sandy soil, aboriginal village sites, and shell mounds, pen. Fla.—Our most robust zamia, often abundant on the upper western coast, and locally in hammocks to the S. Plants on the shell mounds often have branching stems.

4. Z. umbrosa Small. Leaves mostly less than 0.5 m. long; leaflets 7–11 cm. long, the blades linear-oblanceolate, linear-elliptic, or broadly linear, 8–16 mm. wide, 20–30-veined, flat, callous-toothed at the apex, firm: staminate cone narrowly cylindric, 7–11 cm. long: mature ovulate cone cylindric, 6.5–11 cm. long or rarely longer: nut-like part of seed obovoid, 15–17 mm. long, evidently 3-sided. [*Z. pumila* (Fl. SE. U. S.)]—Hammocks, sand-dunes, and shell mounds, NE Fla.—Primarily a hammock plant and especially abundant on the kitchen-middens and aboriginal village sites of the upper eastern coast. The stems are frequently simple.

Order **PINALES** — Pinal Order

Shrubs or trees. Leaves scale-like, narrow, or needle-like, and often borne in bundles. Flowers mainly monoecious, the cones of spirally imbricate bracts, or in Taxaceae the ovulate flowers often solitary. Seed borne in a cone of dry or fleshy scales, or partly or wholly naked.—A group developed later and more highly organized than the Cycadales.

Ovulate flowers several, with carpellary scales, these sometimes bracted: cone with either dry or fleshy scales.
  Carpellary scales with bracts, not peltate: ovules inverted: buds scaly: wing accompanying the seed a portion of the carpellary scale. Fam. 1. Pinaceae.

Carpellary scales without bracts, mostly peltate, or fleshy: ovules erect: buds naked: wing of the seed, when present, a portion of the testa. — Fam. 2. JUNIPERACEAE.
Ovulate flowers solitary or 2, without carpellary scales: cone drupaceous or baccate. — Fam. 3. TAXACEAE.

FAMILY 1. PINACEAE — PINE FAMILY

Mostly evergreen resin-yielding shrubs or trees, typically conic, with flaky or brittle bark, the buds scaly. Leaves narrow and solitary or needle-like and usually several together, each group with a sheath at the base. Ovulate ament with bracted scales. Ovules inverted. Cone of dry scales. Seeds usually 2 on each scale, often samara-like.—A family of the first economic importance: its members furnish lumber, resinous products, tanning materials, volatile oils. The species fall into a dozen genera of wide geographic distribution.

Leaves several together, the bundle surrounded by a sheath at the base: cones maturing the second year. — Tribe I. PINEAE.
Leaves solitary, without a sheath: cones maturing the first year. — Tribe II. ABIETINEAE.

I. PINEAE

Cone-scales with dorsal, spine-armed appendages: leaves in 2's or 3's. — 1. PINUS.
Cone-scales with terminal unarmed appendages: leaves in 5's. — 2. STROBUS.

II. ABIETINEAE

Cone drooping; bracts shorter than the cone-scales.
  Leaves 4-sided or nearly terete, spreading: anther-sacs opening lengthwise. — 3. PICEA.
  Leaves flat, apparently 2-ranked: anther-sacs opening transversely. — 4. TSUGA.
Cone erect; bracts longer than the cone-scales. — 5. ABIES.

1. PINUS [Tourn.] L. Trees or rarely shrubs. Leaves needle-like, mostly in 2's or 3's and each with 2 fibro-vascular bundles. Staminate aments elongate, at the ends of branches of the preceding year. Ovulate ament globular or slightly elongate. Cone spreading: scales at length woody and spreading, each with a dorsal, usually spine-armed appendage. Seed samara-like.—About 75 species, mostly in the north temperate zone.—Spr.—PINES.—Most of our pines, especially the long-leaved ones, are important timber trees.

Branchlets terminated by plumes of relatively long, curved or recurved leaves: resin-ducts of the leaf contiguous to the fibro-vascular bundle. — I. AUSTRALES.
Branchlets terminated by brushes of relatively short, stiff, straight leaves: resin-ducts of the leaf remote from the fibro-vascular bundle. — II. RIGIDAE.

I. AUSTRALES

Cone elongate, of a conic type and over twice as long as thick when closed, slightly umbonate, the scale-appendages flat or slightly elevated, with recurved or hooked prickles.
  Cone-scales thin-edged, the appendages flattish, the prickles hooked. — 1. *P. australis.*
  Cone-scales thick-edged, the appendages turgid, the prickles slightly recurved. — 2. *P. caribaea.*
Cone short, of an ovoid type and less than twice as long as thick when closed, prominently umbonate, the scale-appendages elevated, often pyramidal, with nearly straight or decurved prickles. — 3. *P. palustris.*

II. RIGIDAE

Scales of the ovulate ament stout, each with a short tip which scarcely equals the body in length.
  Cone over 8 cm. long.
    Cone broadly conic when closed and prominently umbonate; scales thick-edged, the appendages projecting little, if at all, beyond the short spine. — 4. *P. Taeda.*

Cone narrowly conic when closed, and slightly umbonate; scales thin-edged, the appendage projecting far beyond the long spine. — 5. *P. heterophylla.*

Cone less than 8 cm. long.

Cone ovoid or globular-ovoid when closed: leaves 15–25 cm. long, about 2 mm. wide. — 6. *P. serotina.*

Cone narrowly conic when closed: leaves 4–12 cm. long, about 1 mm. wide.

Cone-scales readily opening, each with a slender or minute spine towards the front of the appendage, the spine sometimes deciduous or obsolete.

Cone-scales with minute, deciduous or obsolete spines: scales of the staminate aments erose-toothed at the apex: bark of the trunk relatively close and smooth. — 7. *P. glabra.*

Cone-scales with slender persistent spines: scales of the staminate aments entire: bark of the trunk broken into angular plates. — 8. *P. echinata.*

Cone-scales tardily opening or permanently closed, each with a stout spine at the middle or towards the back of the appendage. — 9. *P. clausa.*

Scales of the ovulate ament slender, each with a subulate tip several times the length of the body.

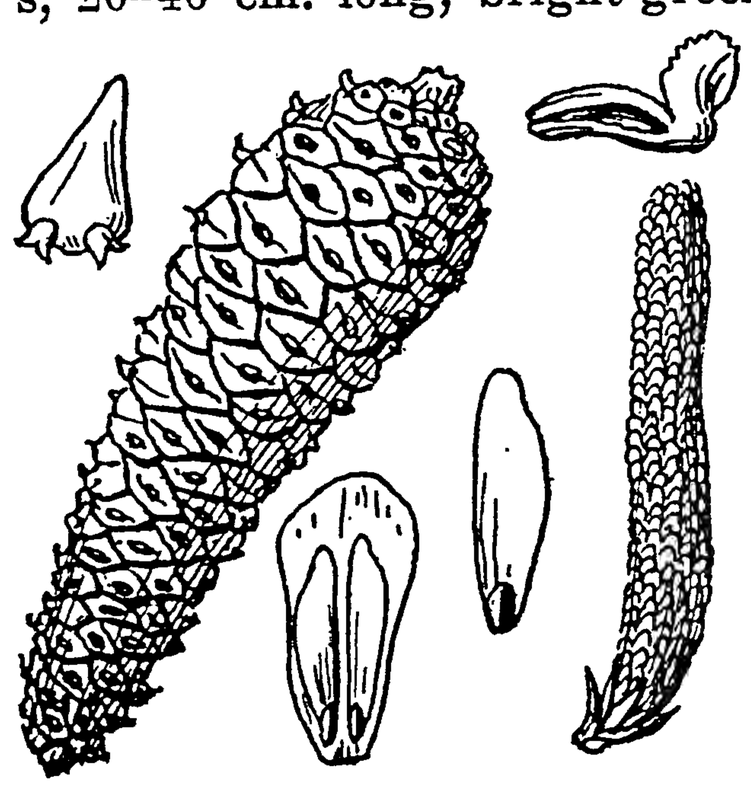
Cone conic when closed, ovoid when open: twigs glaucous. — 10. *P. virginiana.*

Cone ovoid when closed, globose-ovoid or depressed when open: twigs yellow.

Scales of the pistillate ament recurved: appendages of the cone-scales relatively thin; spines slender, more or less recurved. — 11. *P. rigida.*

Scales of the pistillate ament ascending: appendages of the cone-scales very thick; spines stout, more or less incurved. — 12. *P. pungens.*

1. **P. australis** Michx. f. Tree becoming 40 m. tall, irregularly branched above, the bark in large plates: leaves typically in 3's, 20–40 cm. long, bright-green, borne in terminal plumes, on twigs about 1 cm. in diameter: staminate ament 5.5–8 cm. long: cone 16–25 cm. long, ascending when young, narrowly conic when closed, broadly conic when open, each scale-appendage with a recurved spine: seed 12–13 mm. long, the wing 4.5–5 cm. long. [*P. palustris* (Fl. SE. U. S.)]—(LONG-LEAF PINE. LONG-STRAW PINE. YELLOW-PINE. GEORGIA-PINE. SOUTHERN-PINE. PITCH-PINE.)—Sandy soil, usually dry and acid, Coastal Plain and rarely adj. provinces, Fla. to Tex., N Ala., and S Va.—The giant of our pines, as well as the one with the longest leaves and the largest cones. A timber tree of the first importance, and the principal source of rosin and turpentine in the U. S.



2. **P. caribaea** Morelet. Tree usually smaller than *P. australis*: leaves in 2's or 3's, 18–30 cm. long (rarely shorter), bright-green, on twigs about 5 mm. in diameter: staminate ament 2.5–4 cm. long: half mature ovulate ament ascending: cone 8–15 cm. long, recurving when young, cylindric-conic when closed, cylindric or ovoid-cylindric when open: each scale-appendage turgid: seed 4–7 mm. long, the wing 2–2.5 cm. long, or smaller.—(SLASH-PINE. CARIBBEAN-PINE. ROCK-PINE.)—Dry sandy or rocky soil, often calcareous, pen. Fla. and the lower Keys, extending near the coast to Miss. and Ga.—(*W. I.*)—The only pine growing naturally on the Florida Keys.

3. **P. palustris** Mill. Tree becoming 30 m. tall: leaves in 2's or 3's, deep-green: staminate ament 3.5–5 cm. long: half mature ovulate ament recurved: cone 8–12 cm. long, narrowly ovoid when closed, broadly ovoid when open, each scale-appendage very prominent: seed 6–8 mm. long, the wing 2–3 cm. long. [*P.*

Elliottii Engelm.]—(SLASH-PINE. SWAMP–PINE.)—Shallow ponds, swamps, and low grounds, often acid, Coastal Plain, C Fla. to E La. and S. C.—Inhabiting the lower or wet situations within the range of *P. australis*, and thriving under the influence of either salt or fresh water. The cones are about as long as those of the next preceding species, but broader.

4. P. Taeda L. Tree becoming 45 m. tall, the dark bark deeply furrowed, very rough, exfoliating in coarse plates: leaves in 3's, glaucous, 15–28 cm. long: cone 10–13 cm. long, broadly conic when closed, ovoid or conic-cylindric when open, the scale-appendages thick, projecting little, if at all, beyond the small spine: seed 6–7 mm. long, the wing about 2 cm. long.—(LOBLOLLY-PINE. SHORT-LEAF PINE. OLDFIELD-PINE.)—Sandy or clay soil, frequently acid, Coastal Plain and rarely adj. provinces, Fla. to Tex., Ark., Tenn., and S N. J.—After the manner of a weed completely foresting abandoned cultivated lands.

5. P. heterophylla (Ell.) Sudw. Tree becoming 35 m. tall, the pale bark shallowly furrowed: leaves in 2's or 3's, glaucous, 12–25 cm. long, often stouter than in *P. Taeda*: cone 9–14 cm. long, conic when closed, ellipsoid or ovoid-cylindric when open, the scale-appendages thin, projecting beyond the slender spine: seed 5–7 mm. long, the wing 2–2.5 cm. long.—(POND-PINE. SLASH-PINE.)—Sandy swamps, near the coast, Ga. and S. C.—It produces the palest bark and the softest wood of our pines and has the most restricted range.

6. P. serotina Michx. Tree becoming 25 m. tall, with many short irregular branches near the base, the bark flaky: leaves in 3's, glaucous, 15–28 cm. long, crowded; sheath about 12 mm. long: staminate ament 1.5–2 cm. long: cone 4–6 cm. long, ovoid or globular-ovoid when closed, very broad when open, each scale with a thick appendage and a minute spine: seed 3–4 mm. long, the wing 2 cm. long.—(BLACK-PINE. POND-PINE. MARSH-PINE.)—Sandy swamps and shallow ponds, frequently acid, Coastal Plain, Fla. and Ala. to S N. J.—The cones are much shorter and thicker than in its relatives.

7. P. glabra Walt. Tree becoming 40 m. tall, with a relatively smooth grayish bark: leaves in 2's, glaucous, 4–8 cm. long, very slender; sheath 5–8 mm. long: staminate ament about 1 cm. long: cone 3.5–5 cm. long, conic when closed, ovoid when open, each appendage with a minute or almost obsolete spine: seed about 4 mm. long, the wing usually 1.5 cm. long.—(SPRUCE-PINE. CEDAR-PINE. WHITE-PINE. WALTER'S-PINE.)—Hammocks, bluffs and bottoms, Coastal Plain, N Fla. to E La. and S. C.—Readily distinguished by the smooth bark, the very slender leaves, and the small nearly unarmed cones.

8. P. echinata Mill. Tree up to 40 m. tall, the bark splitting into angular plates: leaves in 2's or occasionally in 3's, deep-green, 8–12 cm. long, slender; sheath 10–15 mm. long: cone 3.5–6.5 cm. long, conic when closed, ovoid when open, each appendage with a slender spine: seed 4–5 mm. long, the wing 1.5–2 cm. long. [*P. mitis* Michx.]—(SHORT-LEAF PINE. YELLOW-PINE. FOX-TAIL-PINE.)—Dry sterile and frequently acid soils, various provinces, N Fla. to Tex., SE Kans., Ind., and S N. Y.—This wide-ranging species may be distinguished from its associates by its slender leaves.

9. P. clausa (Engelm.) Vasey. Tree becoming 24 m. tall, the bark relatively smooth: leaves in 2's, deep-green, 4–8 cm. long, very slender; sheath 5–7 mm. long: cone 4.5–6 cm. long, conic when closed, ovoid when open, each scale-appendage with a stout spine near the middle: seed 4 mm. long, the wing about 1.5 cm. long.—(SAND-PINE. SPRUCE-PINE.)—Acid sand-ridges and dunes near the coast, and scrublands, Fla. and adj. Ala.—May be recognized by the numerous slender leaves and the persistent cones which are often slow to open.

10. P. virginiana Mill. Tree becoming 36 m. tall, the bark rough and the branches sinuous, the twigs glaucous: leaves in 2's, deep-green, 4–7 cm. long, rather stout; sheath 5–8 mm. long: cone 5–7 cm. long, narrowly conic when

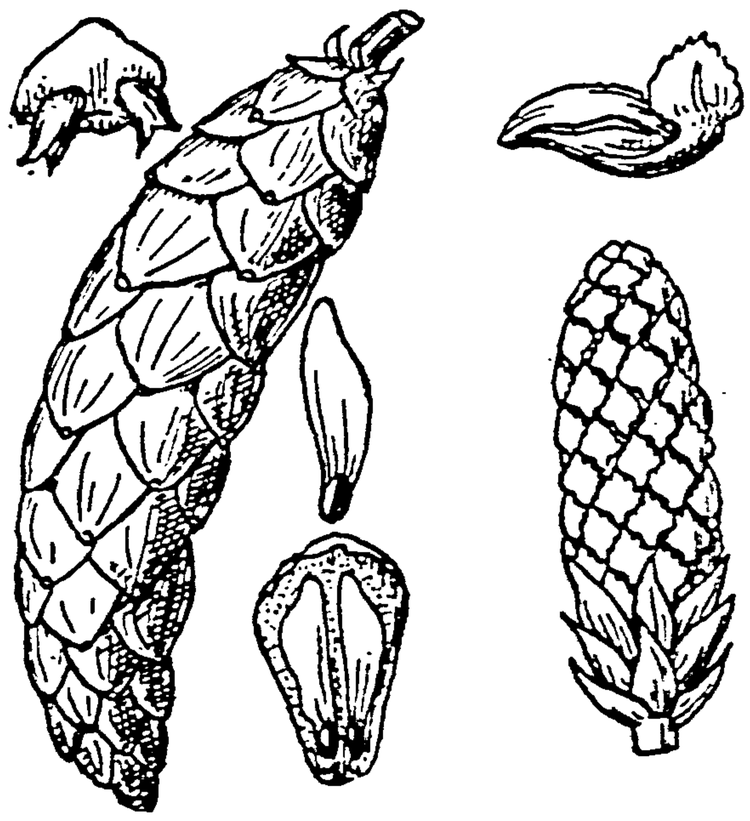
closed, ovoid when open, each scale-appendage with a curved spine: seed 4–5 mm. long, the wing fully 1.5 cm. long. [*P. inops* Ait.]—(SCRUB-PINE. JERSEY-PINE. POVERTY-PINE.)—Dry sterile soils, various provinces, C Ga. to E Miss., S Ind. and S N. Y.—Characterized by its short stubby leaves and medium-sized cones.

11. P. rigida Mill. Tree becoming 25 m. tall, with stiff branches, the bark very rough, the twigs yellow: leaves in 3's, bright-green, 6–12 cm. long, rather stout; sheath 10–15 mm. long: cone 4–7 cm. long, ovoid when closed, globose-ovoid or depressed when open, the scale-appendages relatively thin, each with a recurved spine: seed 4–4.5 mm. long, the wing about 1.5 cm. long.—(PITCH-PINE.)—Sterile and usually acid soils, various provinces, N Ga. to Ont. and N. B.

12. P. pungens Lamb. Tree becoming 18 m. tall, the bark rather smooth, but flaky: leaves in 2's, bright-green, 5–10 cm. long, stout, rigid: cone 8–12 cm. long, very persistent, ovoid when closed, globose-ovoid or depressed when open, the scale-appendages very thick, each with a stout incurved spine: seed 6–7 mm. long, the wing fully 2 cm. long.—(TABLE-MOUNTAIN PINE. TABLE-ROCK PINE. MOUNTAIN-PINE.)—Rocky acid soil and cliffs, Piedmont to Appalachian provinces, N Ga. to Pa. and N. J.—Has stout leaves and very stout cones with prominently armed scales. Cones often persist on the branches for many years.

2. **STROBUS** Opiz. Trees. Leaves needle-like, 5 together, mostly with 1 fibro-vascular bundle each. Staminate aments with involucral bracts at the base. Ovulate ament narrow, stalked. Cone drooping: scales leathery, with neither dorsal appendage nor spine.—A genus represented in eastern North America by the following and in the Pacific States by several other species.

1. S. Strobus (L.) Small. Tree becoming 50 m. tall, with a relatively smooth bark and approximately whorled branches: leaves 5 together, 5–10 cm. long, glaucous, very slender; sheath deciduous or fugacious: cone narrow, slightly tapering when open, 10–20 cm. long, often curved; scales loosely spreading: seed 6–7 mm. long, the wing about 2.5 cm. long. [*Pinus Strobus* L.]—(WHITE-PINE).—Sandy or rocky soil, various provinces, N Ga. to Man. and Newf.—Spr.—The most widely distributed species of the white pines. Its five-fascicled slender leaves and long unarmed cones readily distinguish it from other pines. Once the most important of American timber trees, but greatly depleted by reckless lumbering.

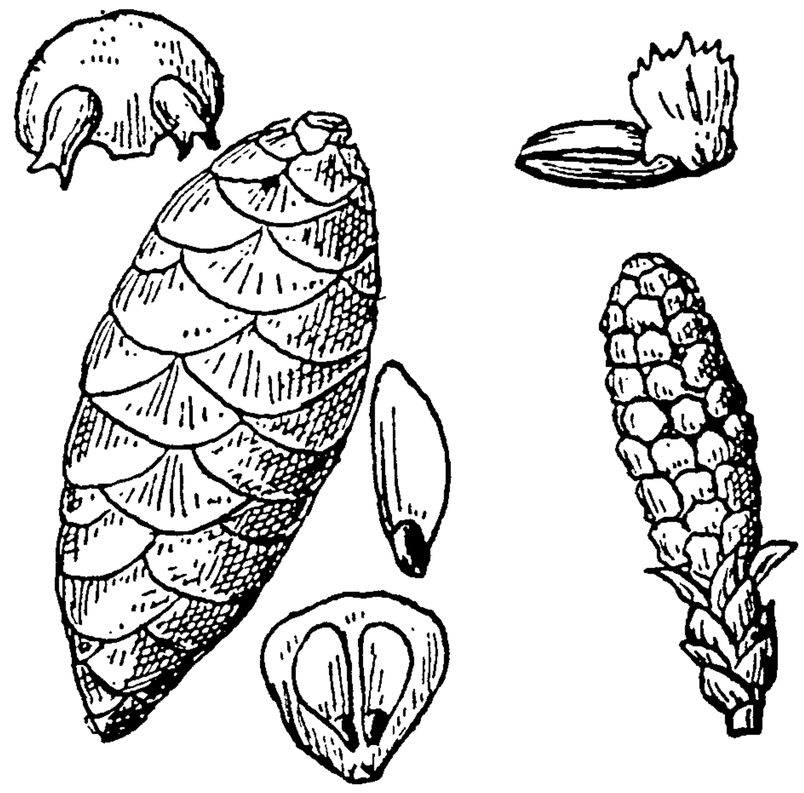


3. **PICEA** Link. Trees. Leaves solitary, ascending or erect, narrow, angled or terete, leaving sterigmata when falling. Pollen-sacs opening lengthwise. Ovulate ament with inconspicuous bracts. Cone drooping.—Spr.—A genus of 14 species of the more northern latitudes, represented in our area only in the higher mountains.—SPRUCES.—Some species are timber trees, and are, also, an important source of paper pulp.

Twigs stout, copiously pubescent: leaves over 1 mm. broad, blunt or mucronate. 1. *P. rubens.*

Twigs slender, glabrate or merely pubescent between the decurrent sterigmata: leaves barely 1 mm. broad, acute. 2. *P. australis.*

1. P. rubens Sargent. Tree often becoming 30 m. tall, the bark rough: twigs stout, stiff, pubescent as are usually the sterigmata: leaves curved, 8–12 mm. long, deep-green: cone ellipsoid or ovoid, 2.5–4 cm. long. [*P. mariana* (Fl. SE. U. S.)]—(RED-SPRUCE. HE-BALSAM. TAMARACK. YEW-PINE.)—Moist or rocky and usually acid soil, Blue Ridge and more northern provinces, N. C. to Sask. and Newf.—Often crowns mountain tops with a pure growth. The black spruce—*P. mariana* (Mill.) Britton—recorded as growing in the N. C. Mts., has glaucous leaves and small persistent cones.



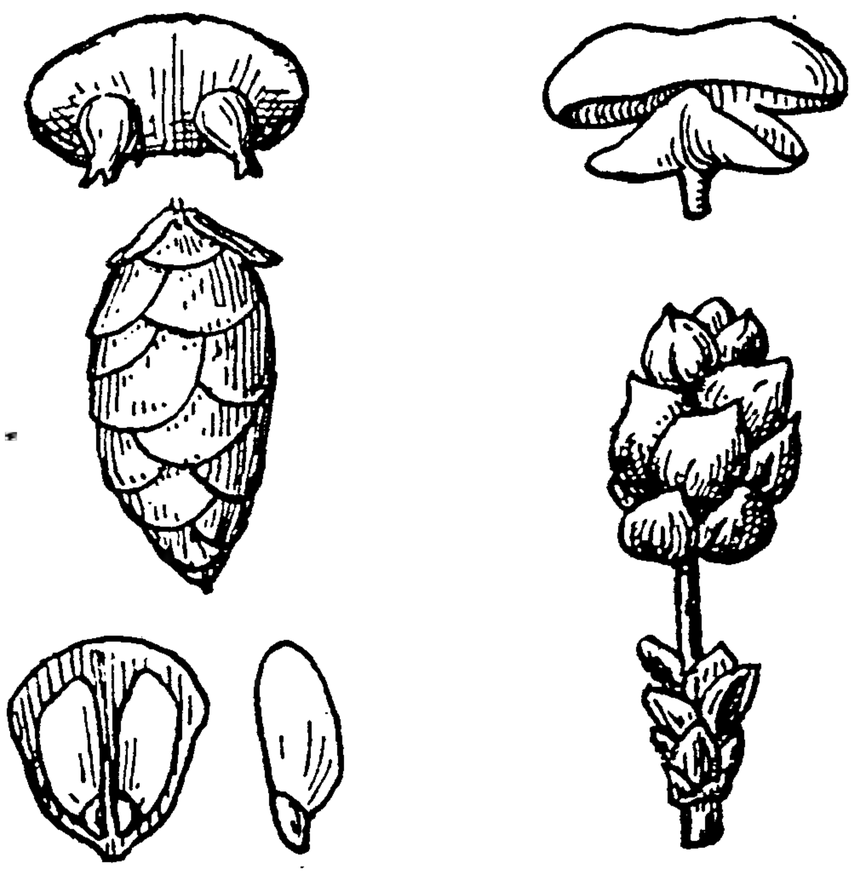
2. P. australis Small. Tree becoming 40 m. tall, the bark relatively smooth: twigs slender, glabrous or merely pubescent in lines between the decurrent glabrous sterigmata: leaves slender, 8–14 mm. long, straight or nearly so, bright-green: cone ellipsoid, oval or ovoid, mostly less than 2.5 cm. long. [*P. alba* (Chapm. Fl.)]—(SOUTHERN-SPRUCE. HE-BALSAM.)—Dry acid slopes, summits, and cliffs, Blue Ridge, N. C. and Va.—Less common than the preceding. Sometimes in forests unmingled with other trees.

4. TSUGA Carr. Trees. Leaves distichously spreading: blades linear, glaucous beneath, not jointed to sterigmata. Pollen-sacs opening transversely. Ovulate ament with inconspicuous bracts. Cone drooping. There are 7 species native of North America and Asia.—HEMLOCKS.—Spr.—Some species are timber trees.

Twigs tomentose with long hairs: cones narrowly ovoid when closed, 1.8–2.3 cm. long: scales nearly erect. 1. *T. canadensis.*

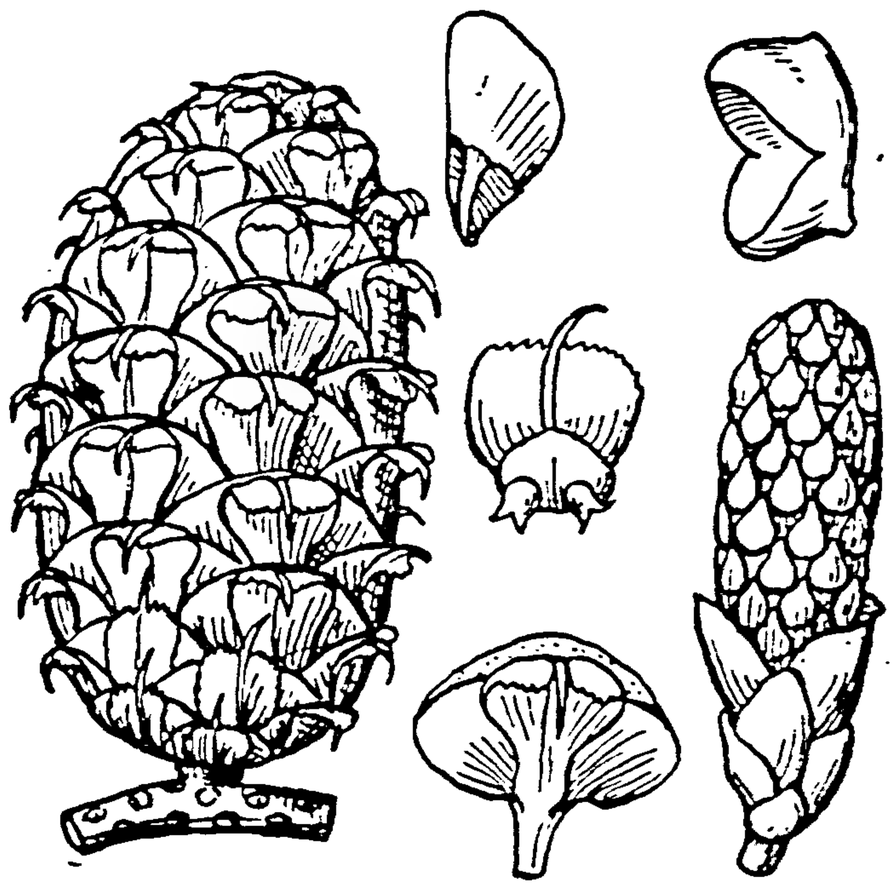
Twigs tomentose with short hairs, or glabrate: cones cylindric-ellipsoid when closed, 3 cm. long: scales spreading at right angles. 2. *T. caroliniana.*

1. T. canadensis (L.) Carr. Tree becoming 30 m. tall, with a scaly-exfoliating bark: leaves loosely spreading, 6–14 mm. long, obtuse at the apex: staminate ament 2 mm. in diameter: cone ellipsoid when open, 18–23 mm. long; scales erect, suborbicular or subcuneate: seed-wing mainly less than 1 cm. long.—(CANADA-HEMLOCK. NORTHERN-HEMLOCK. SPRUCE-PINE.)—Rocky banks, woods, and ravines, various provinces, Ga. and Ala. to Minn. and N. S.—Like *Picea rubens*, this tree is fond of moist places and on slopes often forms extensive forests. It is a graceful tree, with pliable branches, soft foliage, and smooth cones.



2. T. caroliniana Engelm. Tree becoming 25 m. tall, the bark relatively smooth: leaves rigidly spreading, mostly notched at the apex: staminate ament about 3 mm. in diameter: cone ovoid when open, 25–30 mm. long; scales spreading or nearly so: seed-wing ellipsoid, over 1 cm. long.—(CRAG-HEMLOCK. CAROLINA-HEMLOCK.)—Ravines and rocky slopes, frequently acid, Blue Ridge, Ga. to S Va.—A striking tree, but not graceful. The rigid branches are bristly with the spreading leaves and even the cones are bristly on account of the widely divergent scales.

5. **ABIES** [Tourn.] Hill. Trees. Leaves distichously spreading on twigs and branchlets: blades linear, not jointed to sterigmata. Pollen-sacs opening transversely or nearly so. Ovulate ament with conspicuous bracts. Cone erect, cylindric.—A genus characteristic of high latitudes and mountains, with only 2 species in the eastern United States, 8 species in western North America and about a dozen in the Old World.—FIRS.—Some of the western species are valuable timber trees. Canada balsam is an exudation in the blisters on the trunk of *A. balsamea.*



1. **A. Fraseri** (Pursh) Lindl. Tree becoming 25 mm. tall, the bark with balsam-yielding blisters: leaves 1–2 cm. long; blades shining above, glaucous beneath: staminate ament 5–8 mm. long: cone 4–5 cm. long; scales flabellate: bracts exserted, apiculate: seed 4–5 mm. long, the wing about as wide as long.—(SILVER-FIR. BALSAM-FIR. SHE-BALSAM. LASH-HORN. BLISTER-PINE.)—Acid swamps, slopes, and summits, Blue Ridge to Appalachian Plateau, N. C. and Tenn. to W. Va.—Spr.—A related northern species, *A. balsamea,* with included cone-bracts, may occur in NW N. C.

FAMILY 2. JUNIPERACEAE — JUNIPER FAMILY

Mostly evergreen often slightly resiniferous shrubs or trees, with fibrous, shreddy bark, the buds naked. Leaves mainly appressed or sometimes subulate and spreading. Ovulate ament with bractless scales. Ovules erect. Cone of dry, often thick, peltate scales, or baccate or drupaceous. Seed wingless, or winged, the wing a portion of the testa.—About 12 genera, widely distributed. The woods and the products are of great economic importance.

Plants monoecious: cones dry, merely imbricated.
- Leaves long and narrow, not scale-like, spreading: scales of the ovulate cones spirally placed, imbricate. — Tribe I. TAXODIEAE.
- Leaves scale-like, typically appressed and imbricate (sometimes spreading on twigs): scales of the ovulate cones decussately opposite or ternate. — Tribe II. CUPRESSEAE.

Plants mostly dioecious: cone berry-like or drupe-like: scales fleshy, coalescent. — Tribe III. JUNIPEREAE.

I. TAXODIEAE

Trees producing erect "knees" from the root-system: leaves deciduous. — 1. TAXODIUM.

II. CUPRESSEAE

Cones elongate: scales not peltate, the tip apically thickened, often apiculate or hooked below the apex.
- Cones drooping; scales not hooked near the apex: seeds wingless: branchlets in horizontally disposed fronds. — 2. THUJA.
- Cones erect; scales hooked below the apex: seeds winged: branchlets in vertically disposed fronds. — 3. BIOTA.

Cones nearly globular; scales peltate, the conspicuously thickened tops ending in short tips. — 4. CHAMAECYPARIS.

III. JUNIPEREAE

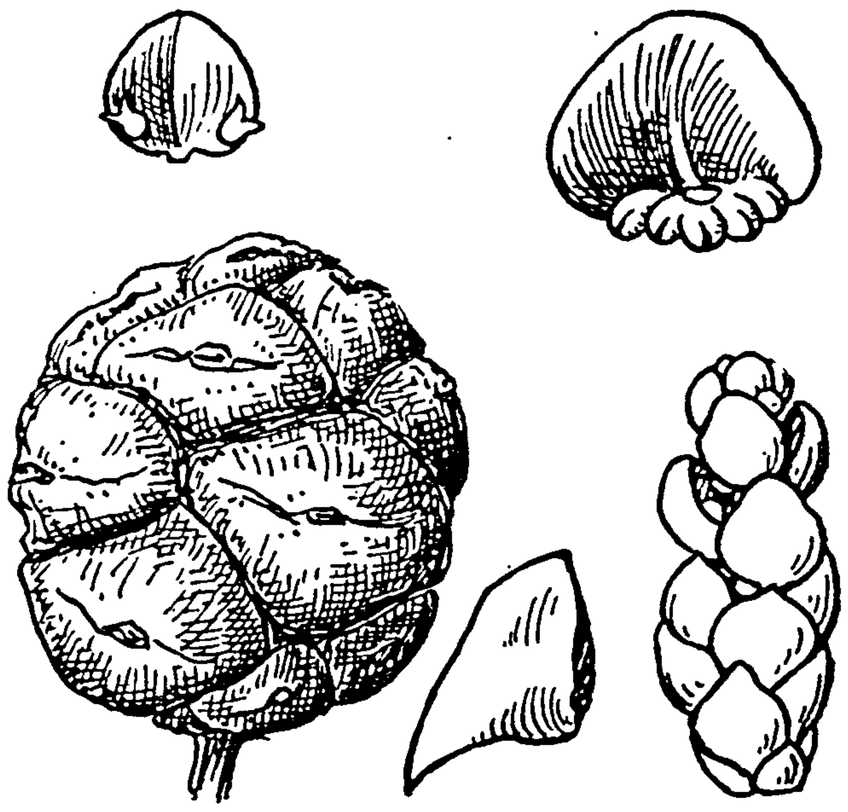
- Leaves subulate and spreading on the mature branches: aments axillary, the pistillate with smaller scales at the top. — 5. JUNIPERUS.
- Leaves scale-like and appressed on the mature branches: aments terminal, the pistillate with larger scales at the top. — 6. SABINA.

1. **TAXODIUM** L. C. Rich. Deciduous-leaved trees, the roots producing erect conic "knees." Leaves often almost 2-ranked: blades narrow. Staminate

aments in panicled spikes or racemes. Ovulate aments with peltate scales. Cone spreading, globular or obovoid, the scales woody, stalked. Seed wingless. —Comprises three species of the southern Atlantic and Gulf seaboard.—Spr.—The wood has exceptionally durable qualities.—CYPRESSES.—Inhabitants of low grounds.

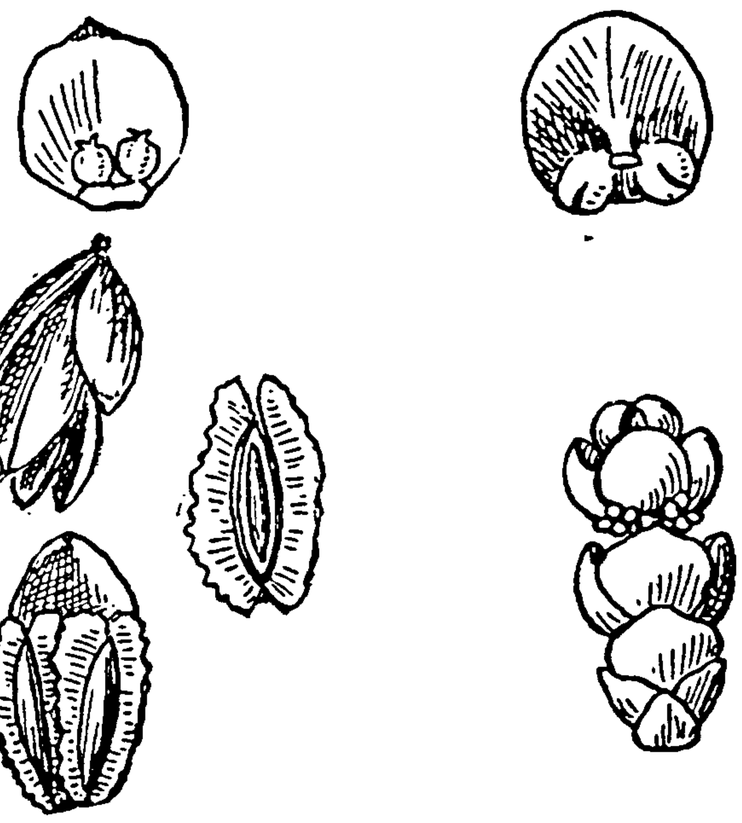
Leaves 2-ranked, widely spreading: branchlets usually horizontal: bark thin, comparatively smooth. 1. *T. distichum.*
Leaves appressed to the erect branchlets: bark thick, strongly furrowed. 2. *T. ascendens.*

1. T. distichum (L.) L. C. Rich. Tree becoming 50 m. tall, the base of trunk conic, narrowly ridged, the bark thin, relatively smooth: leaves 1–1.5 cm. long, often curved: cone globular, about 2.5 cm. in diameter: seed 8–10 mm. long.—(BALD-CYPRESS. RIVER-CYPRESS.)—Swamps, or rarely rocky slopes, often over calcareous subsoil, Coastal Plain and rarely adj. provinces, Fla. to Tex., Mo., Ind. and N. J.; also rare along the Hudson River, N. Y., where perhaps introduced.—The characteristic cypress of river swamps. Often a very large tree with the trunk gradually tapering near the base. It is usually copiously branched.



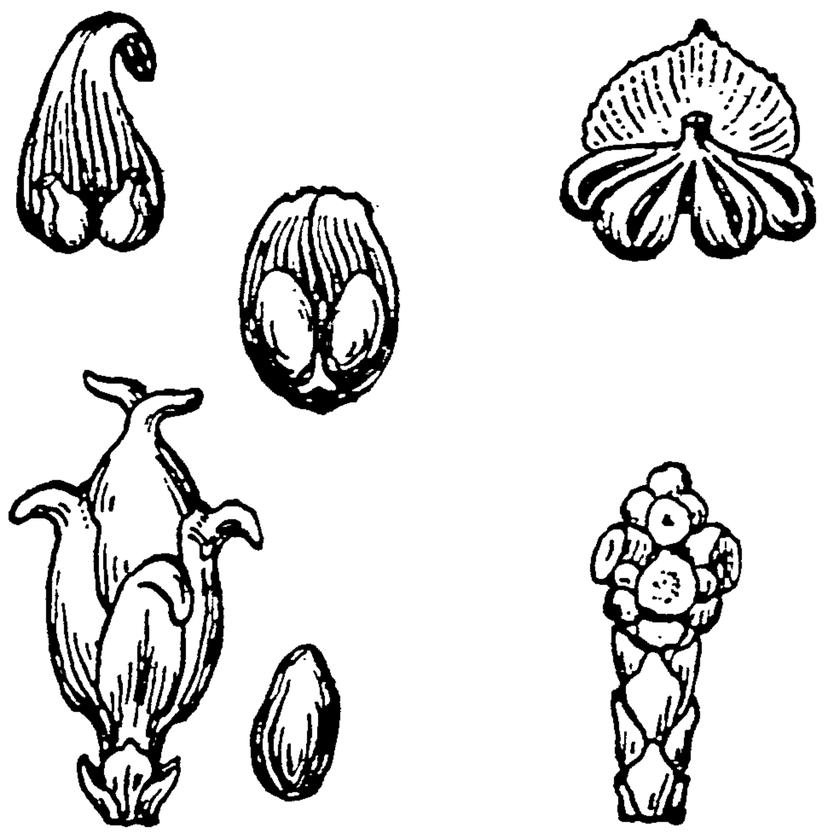
2. T. ascendens Brongn. Tree typically smaller than *T. distichum,* but with very similar inflorescence and fruit, the knees less abundant, the trunk with a conoidal broadly ridged base: leaves incurved; blades 0.5–1 cm. long. [*T. imbricarium* (Nutt.) Harper.]—(POND-CYPRESS.) Pineland ponds, creeks, and small rivers, usually over a clay subsoil, rarely in dry barrens, Coastal Plain, Fla. to La. and Va.—The cypress of ponds and marshy places. It is less branched than the preceding. The bark is rougher than that of *T. distichum,* and as a consequence the trees are sometimes copiously infested with air-plants.

2. THUJA L. Evergreen trees. Leaves scale-like, 4-ranked, often with a gland on the back. Staminate aments solitary. Ovulate ament with imbricate scales. Cone drooping, ellipsoid or ovoid, the scales leathery, lax. Seeds winged on both sides.—About 15 species, native of North America and Asia. Only two species in America, one in the eastern part and one in the western.—ARBORVITAES.



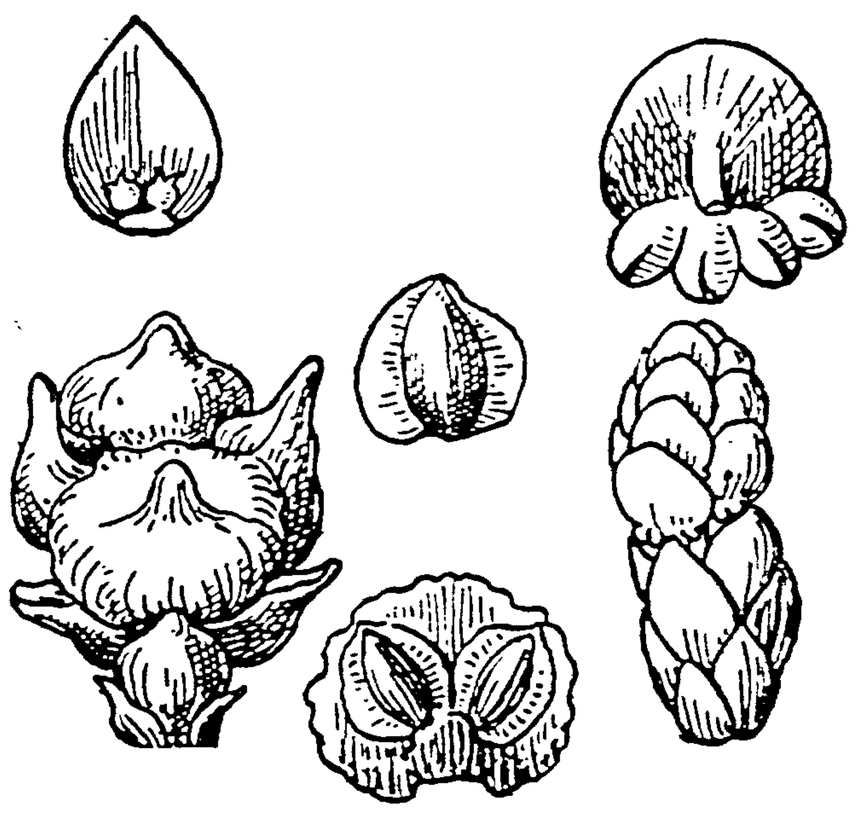
1. T. occidentalis L. Tree up to 18 m. tall, the branchlets in horizontally disposed fronds. Leaves appressed, those of the branches 5–7 mm. long: staminate ament globose: ovulate ament with erect scale-tips: cone 9–13 mm. long; scales obtuse, each apiculate below the apex.—(WHITE-CEDAR. AMERICAN-ARBORVITAE.)—Swamps or rocky banks, usually calcareous, Blue Ridge and more northern provinces, N. C. and Tenn. to Man. and N. B.—Spr.—One of the cool climate plants surviving in our range only in the mountains. It is used in horticulture. The wood has few uses in the industries.

3. BIOTA Endl. Evergreen trees. Branchlets placed in a vertical plane, with both sides alike. Leaves scale-like, 4-ranked, with a gland on the back. Staminate aments solitary. Ovulate aments with fleshy imbricate scales. Cone erect, slightly elongate, the scales leathery, each with a stout hook below the apex. Seeds thick, wingless.— Only one species, native of eastern Asia, and widely cult.— ARBORVITAES.



1. B. orientalis (L.) Endl. Tree 9 m. tall or less, the branches in vertically disposed fronds: leaves appressed, those of the branches 2–4 mm long: staminate ament ellipsoid: ovulate ament with recurved scale-tips: cone erect, mostly 15–25 mm. long; scales hooked below the apex. [*Thuja orientalis* L.]—(CHINESE-ARBORVITAE. ASIATIC-ARBORVITAE.)—Sandy soil, coast of Fla. Nat. of Asia.—All year.—Not extensively naturalized, but persistent about abandoned gardens and occasionally spontaneous.

4. CHAMAECYPARIS Spach. Trees. Leaves scale-like and imbricate, each with a gland on the back, or sometimes subulate on twigs. Staminate aments terminal. Ovulate aments with peltate scales. Cone spreading, globular: scales woody, appendaged. Seeds winged. About 7 species, two in western North America and several in eastern Asia. —CYPRESSES.

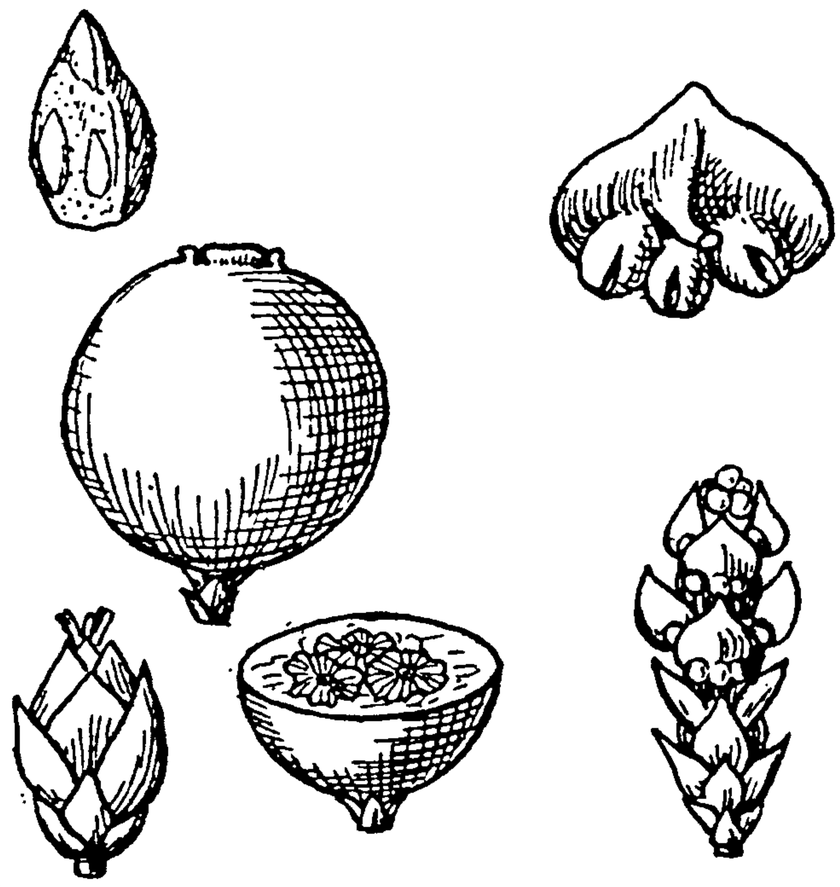


1. C. thyoides (L.) B. S. P. Strong-scented tree becoming 27 m. tall: leaves 1–2 mm. long, appressed, the lateral ones keeled, the vertical merely convex: staminate ament 2–3 mm. long: ovulate ament glaucous, the scales with hyaline appendages: cone globular, 5–7 mm. in diameter: seed narrowly winged. [*C. sphaeroidea* Spach.] — (WHITE-CEDAR.) — Acid swamps, Coastal Plain and rarely adj. provinces, N Fla. to Miss. and Me.—Spr.—A tree somewhat resembling the arborvitae in habit, but with quite different cones. It varies much in its mode of branching. The natural growth is being rapidly depleted by cutting the trees for telephone poles. The wood has many uses in the industries.

5. JUNIPERUS [Tourn.] L. Shrubs or trees. Leaves in 3's, subulate, neither imbricate nor appressed, glandless. Staminate aments axillary. Ovulate ament with ovules alternate with the scales. Cone baccate. Seeds wingless. —Spr.—Consists of ten or fifteen species, mostly in the more northern parts of the northern hemisphere.—JUNIPERS.

A depressed shrub, with creeping branches: leaves abruptly bent at the base, deeply channeled, rather abruptly pointed. 1. *J. sibirica.*
A tree; leaves straight or nearly so, shallowly channeled, gradually acuminate. 2. *J. communis.*

1. J. sibirica Burgsd. Depressed shrub, the radiating branches rarely rising over 5 dm., often matted: leaves stout, mostly 5–8 mm. long, abruptly curved at the base, erect or erect-ascending, abruptly pointed: cone globular, 8–10 mm. in diameter.—(MOUNTAIN-JUNIPER.) — Dry gravelly soil, Blue Ridge and more northern provinces, N. C. to Rocky Mts., Alas., and Lab.—(*Eurasia.*)—Our two species of juniper may be distinguished by habit alone. The present one is always depressed with the branches on the ground and only ascending at the tips.

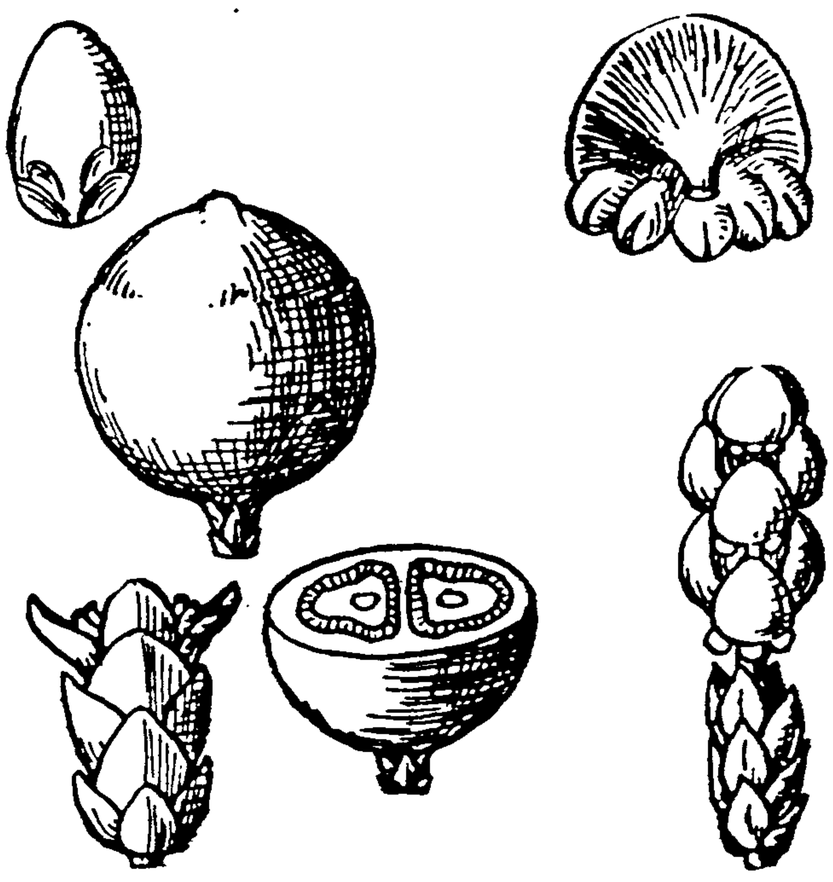


2. J. communis L. Erect tree becoming 8 m. tall: leaves slender, 10–20 mm. long, spreading, gradually narrowed at the apex: cone globular, 6–8 mm. in diameter.—Dry sandy hills, Blue Ridge and more northern provinces, Ga. to N. M. and Can.—(*Eurasia.*)—Rare in our range.

6. SABINA Haller. Shrubs or trees. Leaves scale-like, except sometimes on twigs, appressed, often imbricate, each with a gland in the back. Staminate aments terminal on branchlets. Ovulate ament with ovules opposite the scales. Cone baccate. Seeds wingless.—Spr.—About 25 species, most abundant northward, but ranging southward to the West Indies and Mexico.—CEDARS. SAVINS.

Staminate ament 3–4 mm. long: cone 5–6 mm. long. 1. *S. virginiana.*
Staminate ament 4–5 mm. long: cone 3–4 mm. long. 2. *S. silicicola.*

1. S. virginiana (L.) Antoine. Tree becoming 30 m. tall: scale-like leaves opposite, 4-ranked, 1–4 mm. long, acute: staminate ament 3–4 mm. long: cone sub-globose, 5–6 mm. long, glabrous: seed 3–4 mm. long, smooth. [*Juniperus virginiana* L.]—(RED-CEDAR.)—Dry hills or rarely swamps, nearly throughout N. A., east of the Great Plains.—The foliage is strong scented. The durable heart-wood is used in cabinet work and especially for lead-pencils. The cones are much eaten by birds and the seeds thus widely distributed. This species reaches its maximum development in our region, forming pure forest stands, in the so-called Cedar glades, in the Interior Low Plateau province.



2. S. silicicola Small. Tree similar to *S. virginiana* in habit, but with shorter and rather thicker leaves, the relatively blunt apex closely appressed: staminate ament 4–5 mm. long: cone ovoid or ellipsoid-ovoid, 3–4 mm. long. [*S. barbadensis* (Fl. SE. U. S.)]—(SOUTHERN RED-CEDAR.)—Sand and clay soil, Coastal Plain, Fla. to Tex. and S. C.—(*W. I.*)—With the same qualities and a source of the same products as the preceding. The natural supply has been exhausted through the manufacture of pencil wood.

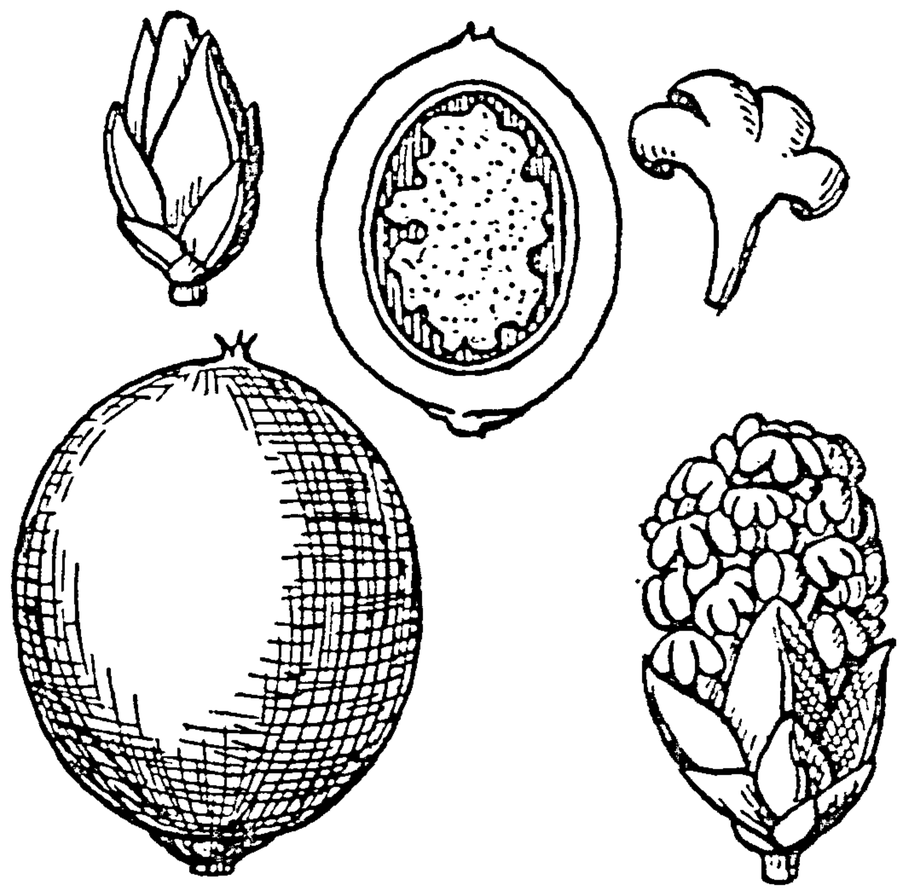
FAMILY 3. **TAXACEAE** — YEW FAMILY

Evergreen shrubs or trees, mostly destitute of resin, the buds scaly. Leaves distichously spreading: blades narrow, entire. Staminate ament

mostly few-flowered, with scaly involucres. Ovulate ament most 1-flowered, the carpellary scale wanting. Cone baccate or drupaceous, wholly or partially enclosed by a pulpy cup-like aril.—About 12 genera, widely distributed. Many kinds are used in ornamental horticulture.

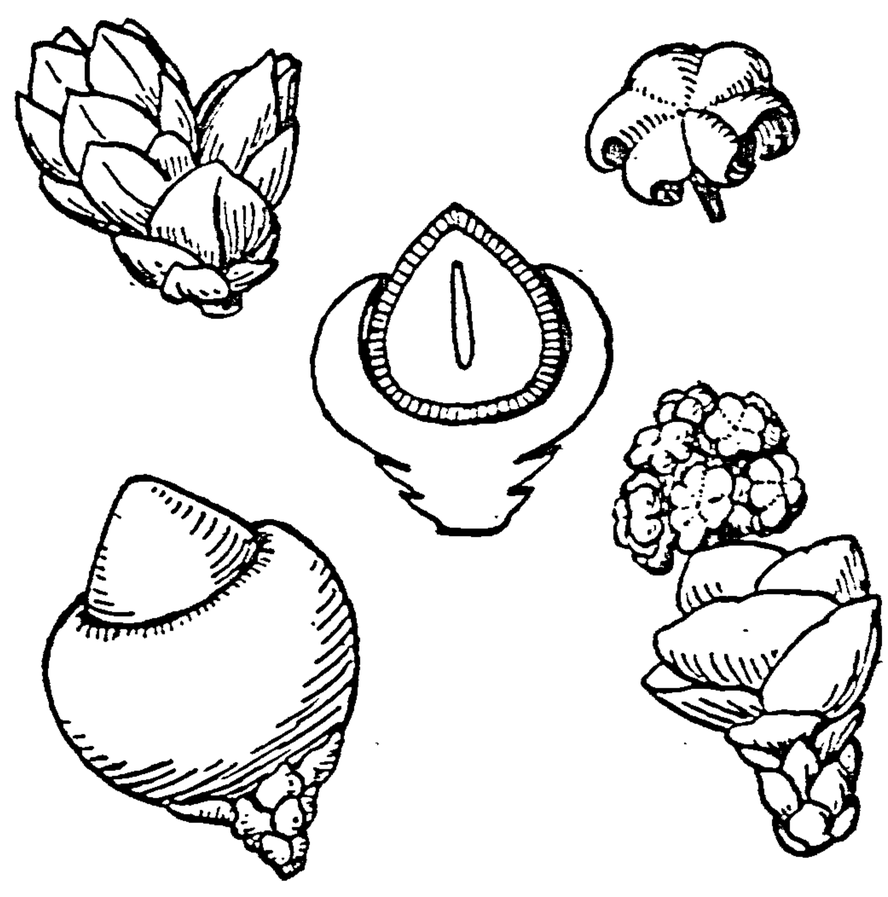
Ovulate flowers usually 2 together: ovule borne in a cup: seed enclosed in the accrescent cup: endosperm channeled: pollen-sacs 4. 1. TUMION.
Ovulate flowers usually solitary: ovule borne in a cup: seed surrounded by the accrescent cup: endosperm even: pollen-sacs more than 4. 2. TAXUS.

1. **TUMION** Raf. Trees. Leaves rigid. Staminate ament with 4 pollen-sacs under each scale. Ovulate ament usually with 2 ovules. Seed baccate, the pericarp fleshy. [*Torreya* Arn.]—Besides the following, there are three other species, one in California and two in eastern Asia.



1. T. taxifolium (Arn.) Greene. Tree becoming 18 m. tall, with a disagreeable odor when bruised: leaf-blades linear, 1.5–3 cm. long, firm-tipped: staminate ament 5–8 mm. long: seed globose-ellipsoid or somewhat obovoid, 3–4 cm. long, glaucous. [*Torreya taxifolia* Arn.]—(STINKING-CEDAR. TORREYA.)—Bluffs and woods along the Apalachicola River, and tributary streams, Fla. and adj. Ga.—Spr.—Limited in distribution, but often plentiful where it grows. The wood is durable, and many of the better specimens have been destroyed for making fence-posts. The seeds are a favorite food of wild rodents. The heartwood is pale-yellow.

2. **TAXUS** [Tourn.] L. Diffuse shrubs, or trees. Leaves leathery. Staminate ament with mostly 6–8 pollen-sacs under each scale. Ovulate ament with 1 ovule each. Seed nut-like, surrounded by the pulpy aril, except the apex.—About 6 species, of wide geographic distribution. A shrubby one occurs in NE N. A. and may extend into NW N. C., and an arboreous kind ranges west of the continental divide. The European species was formerly much used in ecclesiastical ceremonies, and much superstition was associated with the tree.—YEWS.



1. T. floridana Nutt. Tree becoming 6 m. tall, pleasant-scented when bruised: leaf-blades narrowly linear, 1–2 cm. long, sharply apiculate: aril light-red, 6–10 mm. long, the seed ovoid, 5–7 mm. long.—(YEW. FLORIDA-YEW.)—Bluffs and woods along the Apalachicola River, and tributary streams, Fla.—Spr.—Less common than TORREYA. On account of its smaller size, limited distribution and comparative scarcity, it has not been used economically. The heart-wood is light-brown.

Class 2. **ANGIOSPERMAE** Seed-pod Plants

Carpel or pistil with a closed cavity within which the ovules are borne and the seeds mature.

Subclass 1. **MONOCOTYLEDONES** Monocotyls

Stem consisting of a ground-mass of soft tissue in which bundles of wood-cells are irregularly placed. Early leaves alternate. This subclass embraces one-fourth of the living seed-plants.

Order **PANDANALES** — Pandanal Order

Perennial, aquatic or marsh herbs, with elongate rootstocks. Leaves with narrow blades. Flowers in narrow racemes or globular spikes. Perianth of scales or bristles. Androecium of 2–7 stamens. Gynoecium 1- or 2-carpellary. Fruit nut-like.

Racemes cylindric: perianth of bristles. — Fam. 1. Typhaceae.
Spikes (heads) globular: perianth of scales. — Fam. 2. Sparganiaceae.

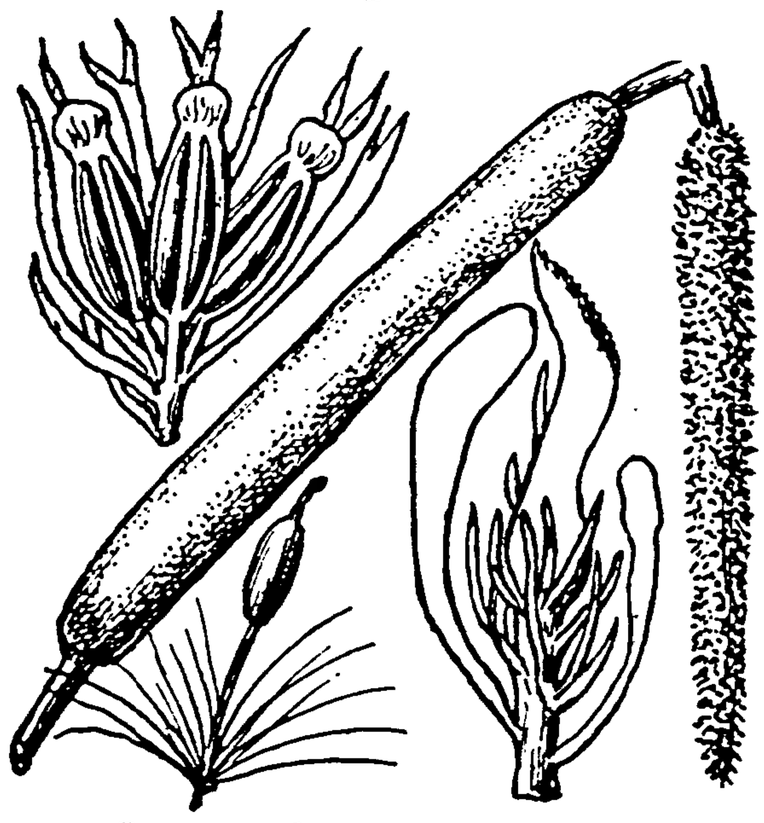
Family 1. **TYPHACEAE** — Cat-tail Family

Plants erect. Raceme spike-like, solitary and terminal, subtended by deciduous bracts, the staminate portion uppermost. Perianth of bristles. Pistil stipitate: stigma narrow, spatulate, elliptic, or rhomboidal.—A family of uncertain relationship. Consists of the following genus.

1. TYPHA [Tourn.] L. Erect herbs with sheathed stems. Leaves erect, with linear blades. Raceme cylindric, the pistillate portion brown.—About 12 species of tropical and temperate regions. Represented in our range by 2 species, widely distributed.—Sum.–fall.—Cat-tails. Reed-maces. Cooper's reeds. Cat-o'-nine-tails.—The rootstocks were an aboriginal food.

Raceme with staminate and pistillate portions usually separate: pollen of simple grains: pedicels of the mature pistillate raceme short, rigid, 1 mm. long or less. — 1. *T. angustifolia.*
Raceme with staminate and pistillate portions usually contiguous: pollen grains in 4's: pedicels of the pistillate raceme bristle-like, 2–3 mm. long. — 2. *T. latifolia.*

1. T. angustifolia L. Stem slender, 1.5–3 m. tall: leaf-blades 5–15 mm. wide: raceme light-brown, the pistillate portion 0.5–2 cm. thick, separated from the staminate: stigma narrow: nutlet terete. [*T. domingensis* Pers.]—Marshes, river-shores, and ditches, nearly throughout N. A., but best developed near the coast.—(*W. I., Mex., C. A., S. A., Eurasia.*)—The leaves are used for making mats and the hairs of the fruits to stuff pillows and mattresses.



2. T. latifolia L. Stem about 1–2.5 m. tall: leaf-blades 10–25 mm. wide: raceme dark-brown or black, the pistillate portion 2.5–3.5 cm. thick, contiguous to the staminate: stigma spatulate or rhomboidal: nutlet furrowed.—Shores of lakes, ponds, and rivers, and marshes, nearly throughout U. S. and Can.—(*Eurasia.*)—Used for the same purposes as the preceding.

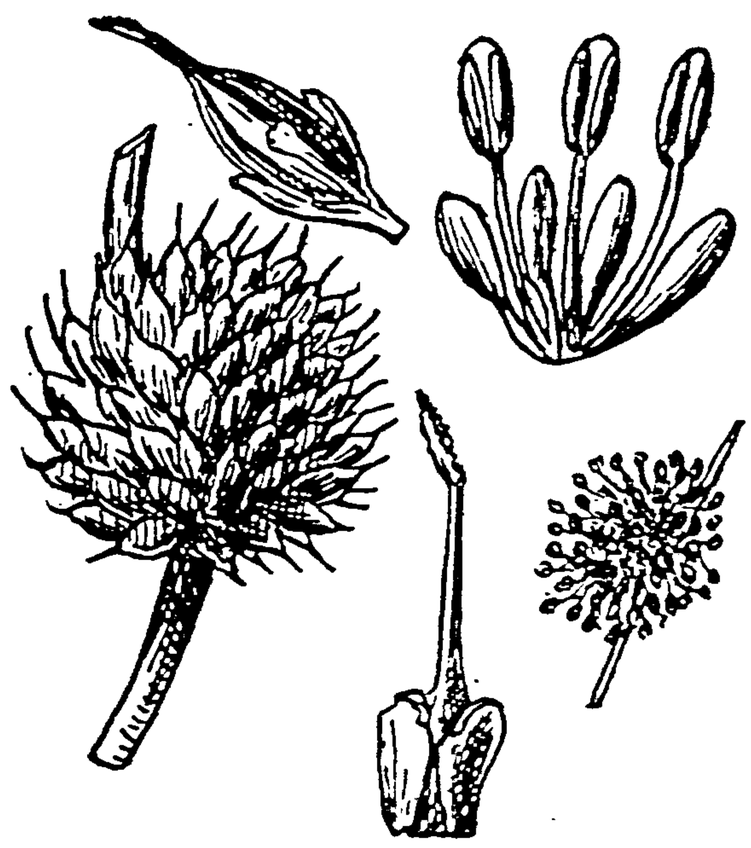
Family 2. **SPARGANIACEAE**—Bur-reed Family

Plants erect, or rarely floating. Spikes globular, borne in racemes or panicles, or spicate, their bracts persistent. Perianth of scales. Pistil sessile: stigma subulate, lanceolate, elliptic, or linear. Fruit an achene. Related to the Typhaceae, but with less modified flower-parts. Comprises the following genus.

1. **SPARGANIUM** [Tourn.] L. Plants growing in low grounds, marshes, or deep water. Stem not sheathed. Leaves erect and triangular-keeled at the base or floating and flat.—About 24 species in temperate and boreal regions.—A dozen species additional to those described below occur elsewhere in North America.—Sum.—Bur-reeds.

Achene fusiform, the body stalked: fruit-producing flowers pedicelled. — 1. *S. americanum.*
Achene obovoid or obpyramidal, sessile: fruit-producing flowers sessile. — 2. *S. eurycarpum.*

1. S. americanum Nutt. Plant 2–8 dm. tall, simple or branched: staminate heads mostly less than 1 cm. thick: fruit-head 1–2 cm. thick: achene-body 6–7 mm. long, narrowed at the apex, stipitate. [*S. simplex* (Chapm. Fl.)]—River-shores, borders of lakes, and ponds, various provinces, Fla. to Okla., Minn., and Newf. Plants with branched inflorescence have been referred to *S. androcladum*.



2. S. eurycarpum Engelm. Plant 8–20 dm. tall: staminate head about 1 cm. thick: fruit-head 2.5 cm. thick: achene-body 7–8 mm. long, rounded or depressed at the apex, sessile.—Marshes, stream-banks, and pools, various provinces, Fla. to Calif., B. C., and Newf.—This is a very vigorous plant. It frequently fills whole ponds and streams, the dense growth of leaves resembling species of iris or of sweet-flag (*Acorus*).

Order **NAIADALES** — Naiadal Order

Perennial aquatic or marsh herbs. Leaves various, sometimes mere phyllodia. Flowers usually symmetric. Perianth wanting or imperfect. Androecium usually of 1–4 stamens. Gynoecium simple or several-carpellary.

Gynoecium of distinct carpels. — Fam. 1. Zannichelliaceae.
Gynoecium of one carpel, or of united carpels.
  Staminate and pistillate flowers borne alternately on a one-sided spadix, laterally attached. — Fam. 2. Zosteraceae.
  Staminate and pistillate flowers borne in the leaf-axils.
    Staminate flower consisting of 2 anthers terminating an elongate pedicel: perianth wanting: stigmas filiform: caulescent plants with entire leaf-blades. — Fam. 3. Cymodoceaceae.
    Staminate flower sessile or nearly so, consisting of an anther surrounded by the perianth: stigmas subulate: caulescent plants with spiny toothed leaf-blades. — Fam. 4. Naiadaceae.

FAMILY 1. ZANNICHELLIACEAE — PONDWEED FAMILY

Aquatic caulescent herbs. Leaves alternate, filiform or with broad entire blades. Flowers perfect or monoecious, in spikes or clusters from a spathe. Androecium of 1 or mostly 2–4 distinct stamens. Gynoecium of several distinct carpels. Fruit a cluster or spike of drupelets.—Five genera and about 80 species, most abundant in temperate regions.

Flowers monoecious, axillary: leaves opposite. Tribe I. ZANNICHELLIEAE.
Flowers perfect, borne in stalked clusters or spikes: leaves alternate. Tribe II. RUPPIEAE.

I. ZANNICHELLIEAE

Submerged herbs, the very slender leaves with membranous stipules. 1. ZANNICHELLIA.

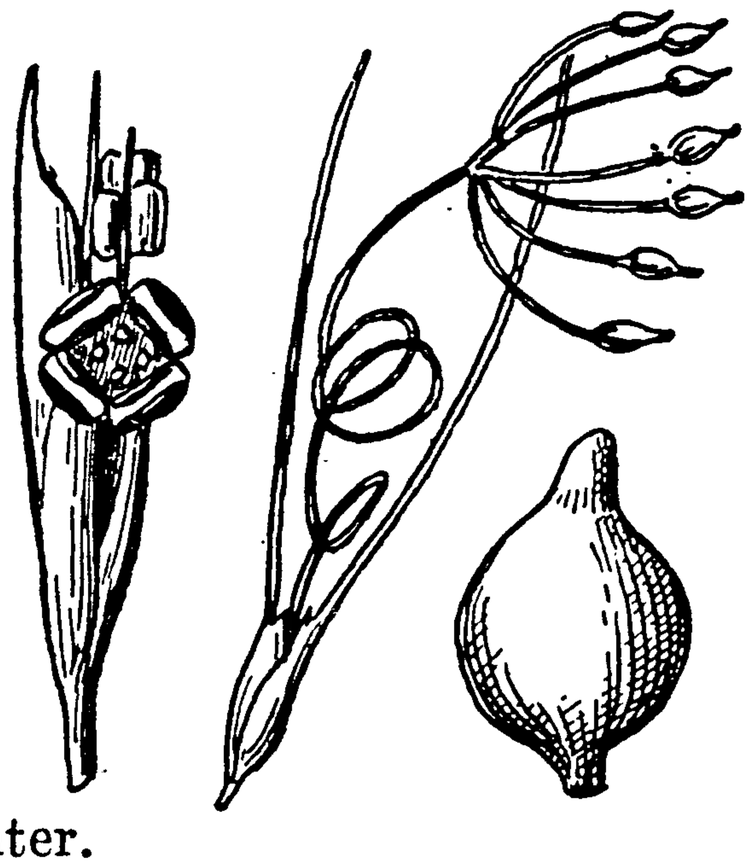
II. RUPPIEAE

Stamens 2 or sometimes solitary, the connective without appendages: drupelet manifestly stipitate. 2. RUPPIA.
Stamens 4, the connective with dilated appendages: drupelet sessile. 3. POTAMOGETON.

1. ZANNICHELLIA [Mich.] L. Delicate herbs of fresh or brackish water. Leaves with narrow blades and inconspicuous bases. Flowers monoecious: staminate with 1 stamen: pistillate with 2–6 carpels together. Drupelets clustered, curved, crested.—Two or three species, widely distributed.

1. Z. palustris L. Stem 2–7 dm. long: leaves 2–7 cm. long, acute: drupelets 2–4, or sometimes 6, together, the body 2–4 mm. long, short stipitate.—(HORNED-PONDWEED.)—Ponds, ditches, and pools, throughout U. S. and S Can.—(*W. I., Mex., C. A., O. W.*)—Spr.–sum.—Often in dense mats just beneath the surface of the water.

2. RUPPIA L. Delicate herbs of salt or brackish water. Leaves with slender blades and conspicuous bases. Flowers perfect. Stamens 2. Carpels 4. Drupelets clustered, oblique, crestless.—Three or four species, very widely distributed.



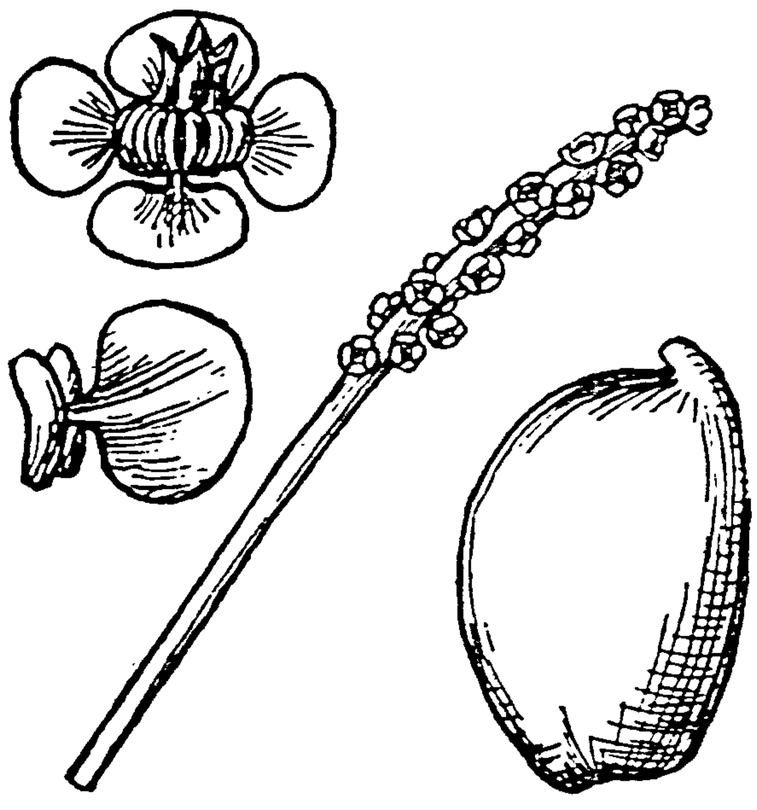
1. R. maritima L. Stem 3–10 dm. long: leaves 2.5–10 cm. long, capillary at the apex: drupelets few, the body ovoid, gibbous at the base, long-stipitate.—(DITCH-GRASS. TASSEL-PONDWEED. SEA-GRASS.)—Shallow water, throughout N. A., except the extreme N.—(*W. I., Mex., C. A., S. A., O. W.*)—Sum.–fall.—Commonly in extensive dense masses just beneath the surface of the water. In the extreme southern Coastal Plain the plant may be found in the winter.

3. POTAMOGETON [Tourn.] L. Herbs growing mostly in fresh water. Leaves various, the submerged and floating mainly different. Flowers perfect, spicate. Stamens 4, with appendaged anthers. Carpels 4. Drupelets 4 together, spicate, sessile.—About 70 species, widely distributed in temperate

regions.—PONDWEEDS. FISHWEEDS.—Both the submerged and the floating kinds often occur in such dense masses that navigation by small boats is seriously impeded. Plants are sometimes collected *en masse* and used as fertilizer. Our plants usually flower in sum.

Stipules axillary, free from the leaf.
  Plant with both submerged and floating leaves.
    Submerged leaves without blades.
      Floating leaves with ovate or oval blades subcordate or rounded at the base: flowering spikes 3–6 cm. long, 5–6 mm. thick. — 1. *P. natans.*
      Floating leaves with narrowly elliptic blades acute at both ends: flowering spikes 1–2 cm. long, 2.5–4 mm. thick. — 2. *P. floridanus.*
    Submerged leaves with normal blades.
      Blades of submerged leaves of 2 forms.
        Blade of the floating leaves cordate at the base: druplet-beak erect. — 3. *P. pulcher.*
        Blade of the floating leaves rounded at the base: drupelet-beak oblique. — 4. *P. amplifolius.*
      Blades of submerged leaves all alike.
        Submerged leaves with linear or nearly linear blades.
          Leaf-blades with coarse cellular reticulation in the middle. — 5. *P. epihydrus.*
          Leaf-blades with inconspicuous cellular reticulation. — 6. *P. heterophyllus.*
        Submerged leaves with lanceolate or oblanceolate blades.
          Leaf-blades distinctly petioled. — 7. *P. fluitans.*
          Leaf-blades sessile or nearly so. — 8. *P. angustifolius.*
  Plant with submerged leaves only.
    Leaf-blades broad.
      Blade short-petioled or nearly sessile. — 9. *P. lucens.*
      Blade clasping the stem. — 10. *P. perfoliatus.*
    Leaf-blades linear or filiform.
      Blade 1-nerved. — 11. *P. Curtissii.*
      Blade 3-nerved.
        Drupelet crested: plants without propagating buds or glands. — 12. *P. foliosus.*
        Drupelet crestless: plants with both propagating buds and glands. — 13. *P. pusillus.*
Stipules adnate to the blades or to the petioles of the submerged leaves.
  Plant with both submerged and floating leaves: drupelet crested. — 14. *P. diversifolius.*
  Plant with submerged leaves only: drupelet crestless. — 15. *P. pectinatus.*

1. P. natans L. Leaves of 2 kinds, the submerged phyllodia, the floating ones with ovate or oval blades 4–9 cm. long, rounded or subcordate at the base: anther notched at the apex: drupelet obovoid, 4–4.5 mm. long, scarcely keeled.—Still water and slow streams, various provinces, Tenn. to Calif., B. C., and N. S.—(*Eurasia.*)



2. P. floridanus Small. Smaller than *P. natans*: floating leaves with narrowly elliptic blades 4–7 cm. long, acute at both ends: anther apiculate at the apex: drupelet smaller than in *P. natans*.—Blackwater River, W Fla.

3. P. pulcher Tuckerm. Leaves of 3 kinds, the lower submerged ones leathery, the blades spatulate to ovate, the upper submerged ones narrower, flimsy, the floating leaves with leathery ovate or orbicular-ovate, cordate blades: drupelet

turgid, 4–4.5 mm. long, 3-keeled.—(HEARTLEAF-PONDWEED.)—Ponds, various provinces, Fla. to Ark., B. C., and Me.

4. P. amplifolius Tuckerm. Leaves of 3 kinds, the lower submerged ones with lanceolate blades acute at each end, the upper submerged ones mostly smaller than the lower ones; blades elliptic to oval, the floating leaves with thick ovate or oval blades rounded at the base: drupelet turgid, 4–5 mm. long, the middle keel prominent.—Streams and ponds, various provinces, Fla. to Ark., Calif., B. C., and N. S.

5. P. epihydrus Raf. Leaves of 2 kinds, the submerged with linear 5-nerved blades, the floating ones with elliptic or obovate blades 3–8 cm. long: drupelet globose-obovoid, 2.5–3 mm. long, the middle keel sharp. [*P. pennsylvanicus* Willd., *P. Nuttallii* Cham. & Schlecht.]—Ponds and streams, various provinces, S. C. to B. C. and Newf.

6. P. heterophyllus Schreb. Leaves of 2 kinds, the submerged narrowed upward, inconspicuously reticulate, the floating ones with oval or elliptic blades 1.5–4 cm. long, abruptly pointed: drupelet 1.5–3 mm. long, indistinctly 3-keeled.—Still or flowing water, throughout U. S. and S Can.—(*W. I., Mex., Eurasia.*)

7. P. fluitans Roth. Leaves of 2 kinds, the submerged long-petioled, with elongate blades, the floating ones with elliptic, sometimes narrowly so, long-petioled blades 4–15 cm. long, usually acute: drupelet 3.5–4 mm. long, the middle keel prominent. [*P. americanus* Cham. & Schlecht., *P. lonchites* Tuckerm.]—Streams and ponds, various provinces, Fla. to Calif., B. C., and N. B.—(*W. I., Mex., O. W.*)

8. P. angustifolius Berch. & Presl. Leaves of 2 kinds, the submerged with blades 5–15 cm. long, the floating ones with elliptic, nearly sessile blades 3–10 cm. long: drupelet 2.5–3.5 mm. long, 3-keeled, abruptly pointed. [*P. Zizii* Roth.]—Lakes and streams, various provinces, Fla. to Tex., Calif., and Me.—(*Mex., C. A., O. W.*)

9. P. lucens L. Leaves of 1 kind, all submerged; blades elliptic or lanceolate, or oval above, 5–20 cm. long, acute or acuminate and often serrulate at the apex, nearly sessile: drupelet 3 mm. long, blunt-tipped.—(CORNSTALK-PONDWEED.)—Ponds, various provinces, Fla. to Tex., Calif., and N. S.—(*W. I., Mex., O. W.*)

10. P. perfoliatus L. Leaves submerged; blades suborbicular to ovate or lanceolate, 2–4 cm. long, usually obtuse and serrulate at the apex, cordate-perfoliate: drupelet 2.5–3 mm. long, obscurely 3-keeled.—Slow rivers and ponds, various provinces, Fla. to Tex., Minn., and Newf.—(*Eu.*)

11. P. Curtissii Morong. Leaves submerged; blades linear-filiform, 1–4 cm. long, 1-ribbed, hair-tipped: drupelet not seen.—Tidal creeks, Blackwater River region, W Fla.

12. P. foliosus Raf. Leaves very many, submerged; blades linear or filiform, 1.5–5 cm. long, 3-ribbed, acute: drupelet 1.5–2 mm. long, the middle keel crest-like. [*P. pauciflorus* Pursh.]—Streams and ponds, various provinces, Fla. to Calif., B. C., and N. B.—(*W. I., Mex.*)

13. P. pusillus L. Leaves numerous, submerged; blades linear or linear-filiform, 2–8 cm. long, 3-ribbed, acute: drupelet 1.5–2 mm. long, the middle keel not crest-like, or obsolete.—Slow streams and ponds, various provinces, Ala. to Calif., B. C., N. S., and N. C.—(*Mex., Eurasia.*)

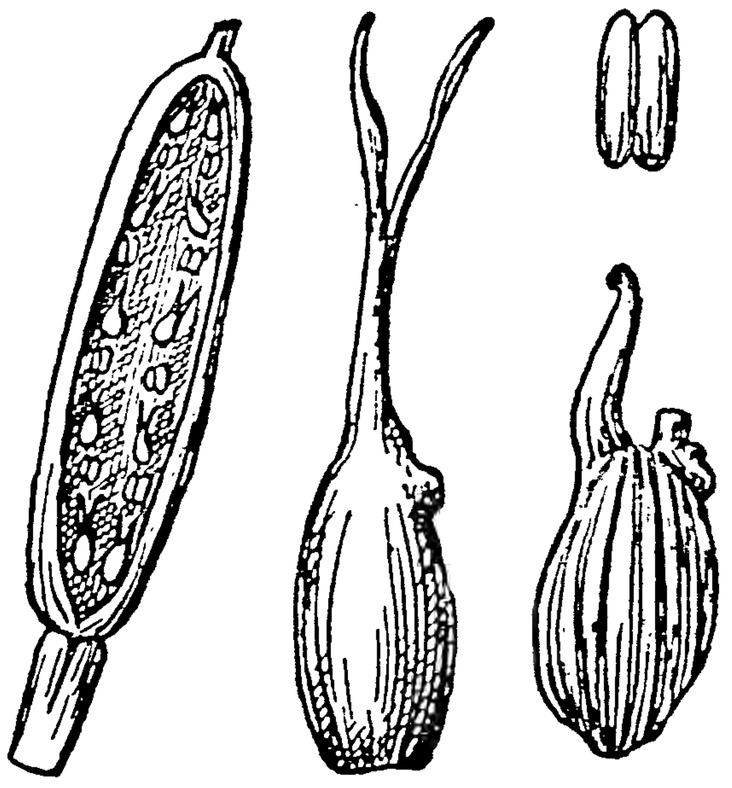
14. P. diversifolius Raf. Leaves of 2 kinds, the submerged linear-setaceous, the floating ones elliptic, oval, or elliptic-lanceolate, 1–2.5 cm. long: drupelet about 1 mm. long, the middle keel crest-like. [*P. hybridus* Michx.]—Ponds and still water, various provinces, Fla. to Tex., Calif., and Me.—(*W. I., Mex.*)

15. P. pectinatus L. Leaves of 1 kind, all submerged, setaceous or filiform, 2–15 cm. long: drupelet 1.5 mm. long, crestless.—Still water or streams, various provinces, Fla. to Tex., Calif., B. C. and Que.—(*W. I., O. W.*)

Family 2. **ZOSTERACEAE** — Eel-grass Family

Marine herbs. Leaves alternate: blades narrow, the base inflated. Flowers monoecious, alternating on a flat spadix; staminate a sessile anther; pistillate an ovary with a style and two capillary stigmas. Fruit utricular.—Consists of 2 genera and about 8 species of wide distribution in coastal regions.

1. ZOSTERA L. Plants submerged or floating. Leaf-blades elongate. Spathe thin-edged.—About 8 species in both the Old World and the New.

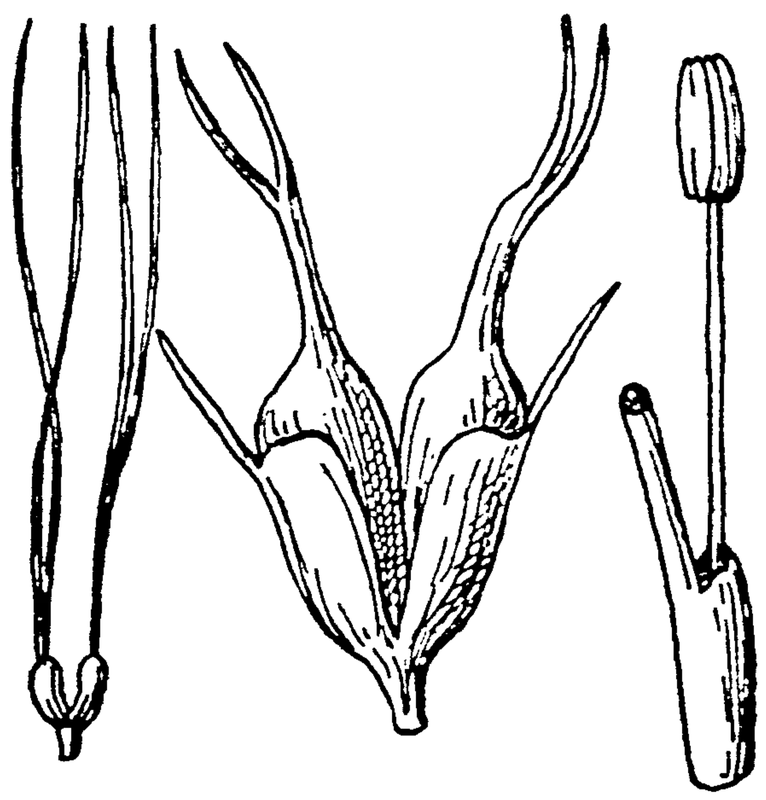


1. Z. marina L. Leaf-blades linear, 3.5–5 mm. wide: spadix 2.5–6.5 cm. long: seed about 20-ribbed.—(Grass-wrack. Eel-grass.)—Streams, bays, and ditches along the coast, Fla. to Newf.; also on Pacif. coast.—(*O. W.*)—It occurs only in salt water.—*Z. minor* has been reported in our region, but imperfect material of the next following species has been mistaken for it.

Family 3. **CYMODOCEACEAE** — Manatee-grass Family

Submerged herbs with jointed rootstocks. Leaves clustered at the nodes or on short branches each with a sheath and a narrow blade. Flowers monoecious or dioecious. Perianth wanting. Androecium a pair of anthers terminating a long stalk. Gynoecium of 2 united carpels, terminating in a style and 2 elongate stigmas, or of 1 carpel. Fruit an oblique nutlet.—Comprises 2 genera and 10 species, widely distributed.

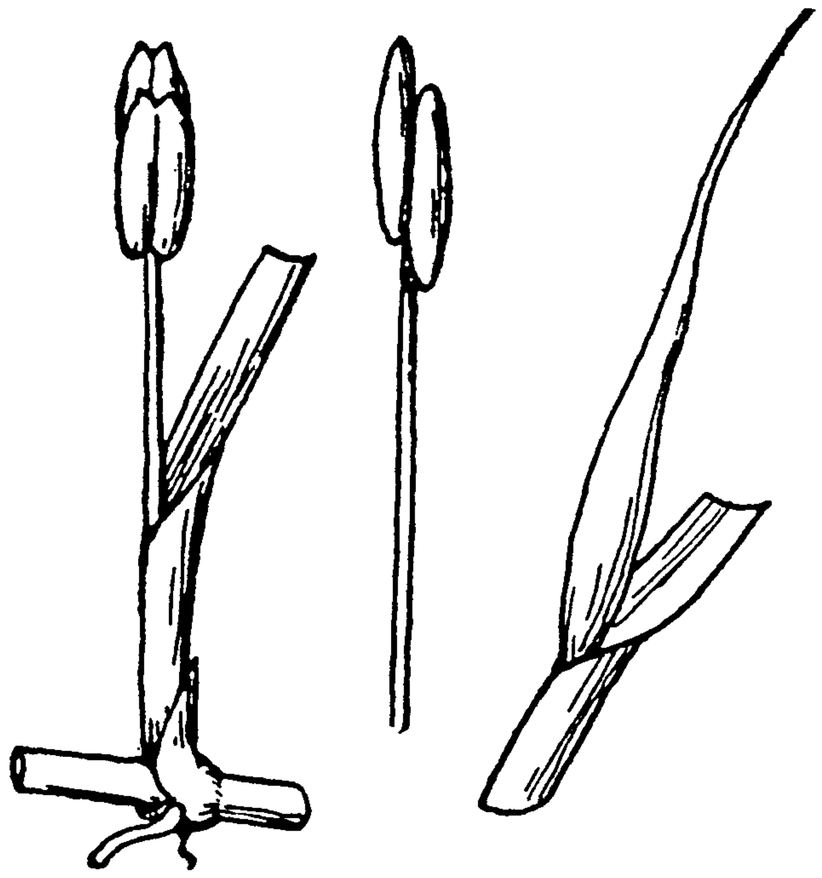
Anthers equally attached to the stalk: stigmas 2: leaf-blade terete or nearly so. 1. Cymodocea.
Anthers unequally attached to the stalk: stigma 1: leaf-blade flat. 2. Halodule.



1. CYMODOCEA Koenig. Rootstock elongate. Leaves terete or half-terete above the sheaths. Flowers hidden in the leaf-sheaths, or the staminate long-exserted.—Seven or eight species, in tropical regions.

1. C. manatorum Aschers. Plant growing on sandy bottoms, the short stems arising from the nodes of the rootstock: leaf-blades narrowly linear, 5–25 cm. long: nutlet 6–7 mm. long, short-stipitate, prominently beaked.—(Manatee-grass.)—Coastal creeks and bays, Fla. to La.—(*W. I.*)—All year. Seldom seen unless dredged up or blown ashore during storms.

2. **HALODULE** Endl. Rootstock elongate. Leaves flat above the sheaths. Flowers borne in the leaf-sheaths or the staminate long-exserted. —Two species, one in the Old World and one in the New.



1. **H. Wrightii** Aschers. Plant growing on sandy bottoms, the short stems arising from the nodes of the rootstock: leaf-blades narrowly linear, 3–40 cm. long: nutlets sessile.—Bays and creeks along the coast, southern Fla., particularly on the Reef.—(*W. I.*)—All year.—Grows alone or in company with *Cymodocea.* Both these plants are commonly associated with the turtle-grass, *Thalassia,* on sandy bottoms.

Family 4. **NAIADACEAE** — Naiad Family

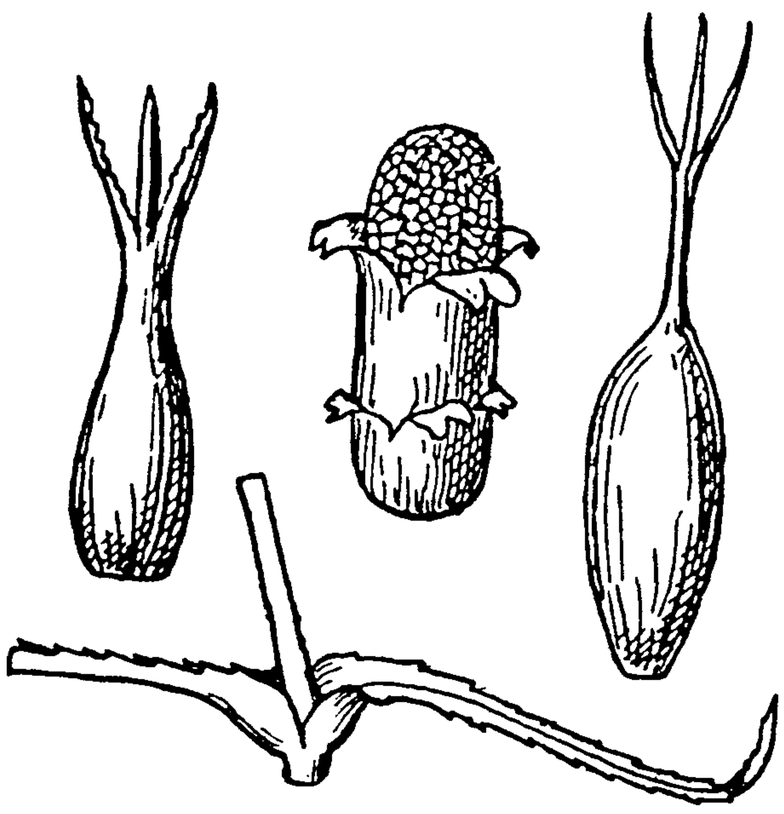
Mostly fresh-water herbs. Leaves mainly opposite: blades mostly toothed, the bases dilated. Flowers dioecious, axillary: staminate, a double perianth and a single stamen: pistillate, a gynoecium consisting of an ovary, a style, and 2 or 3 stigmas. Fruit drupaceous.—Consists of the following genus:

1. **NAIAS** L. Submerged plants with usually much-branched stems. Leaves numerous, the margins prominently or inconspicuously toothed.—About 10 species, collectively almost cosmopolitan.—Naiads.

Flowers monoecious: internodes and lower surfaces of the leaves unarmed.
- Anther 1-celled: seeds shining. — 1. *N. flexilis.*
- Anther 4-celled: seeds reticulated.
  - Leaf-margins with minute subulate teeth. — 2. *N. guadalupensis.*
  - Leaf-margins with prominent triangular teeth. — 3. *N. conferta.*

Florwers dioecious: internodes and lower surfaces of the leaves spiny.
- Leaves about 0.5 mm. wide, with 15–24 marginal teeth: internodes filiform. — 4. *N. gracilis.*
- Leaves about 2 mm. wide, with 6–10 marginal teeth: internodes stout. — 5. *N. marina.*

1. **N. flexilis** (Willd.) Rostk. & Schmidt. Stem slender: leaves more numerous, rather closer together and smaller than in the next following; blade mainly acuminate: drupelet 3–4 mm. long.—Streams and ponds, various provinces, S. C. to Tex., B. C., and Lab.—(*W. I.* ? *Mex.* ? *O. W.*)—Sum.—This and some of the following species are sometimes collected for fertilizer. Dried *en masse* it is occasionally used as a packing material.



2. **N. guadalupensis** (Spreng.) Morong. Stem capillary or filiform: leaves 10–26 mm. long; blade acute: drupelet about 2 mm. long.—Ponds and lakes, various provinces, Fla. to Tex., Ore., and Pa.—(*W. I., Mex., C. A.*)—Sum.–fall.

3. N. conferta A. Br. Similar to *N. flexilis* in habit, but the leaves more slender; blade with prominently sharp-toothed margins.—Tidal creeks, W Fla. —(*W. I.*)—Sum.

4. N. gracilis (Morong) Small. Stem filiform, the internodes slightly armed near the top: leaf-blades slender, acuminate: drupelet mainly less than 4 mm. long.—Creeks and ponds, Fla.—All year.

5. N. marina L. Stem stout, the internodes strongly armed throughout: leaf-blades linear, acute: drupelet mainly over 4 mm. long. [*N. major* All.]—Lakes, rivers, marshes, and salt springs, various provinces, Fla. to Calif., Minn., and N. Y.—(*W. I., Mex., O. W.*)—Sum.

Order **ALISMALES** — Alismal Order

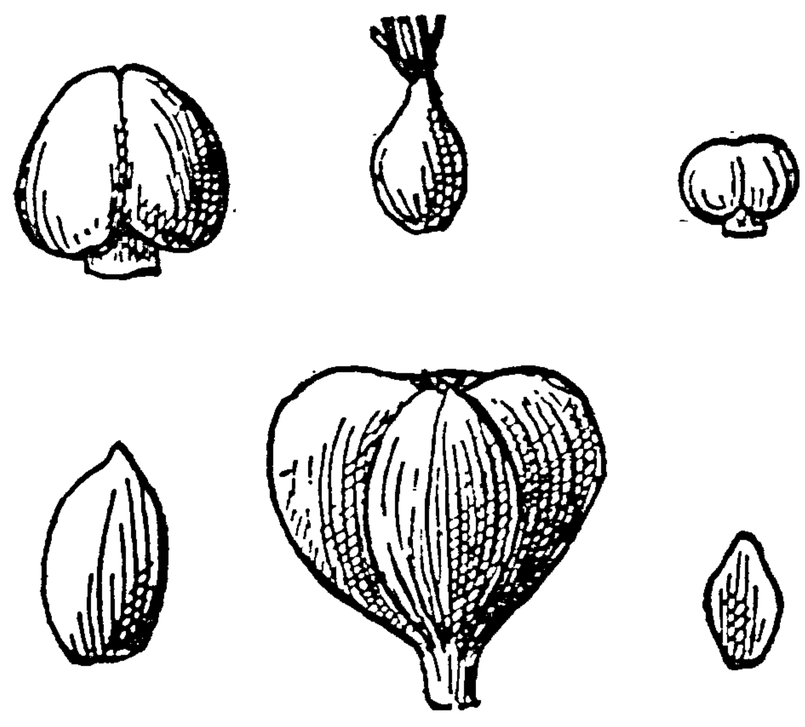
Marsh or aquatic herbs. Leaves alternate, mere phyllodia, or with dilated blades. Flowers regular. Perianth of sepals and usually also of petals. Androecium of 3–6 stamens or more. Gynoecium of 3-many carpels.

Petals nearly similar to the sepals: carpels coherent.	Fam. 1. Scheuchzeriaceae.
Petals very different from the sepals: carpels not coherent.	Fam. 2. Alismaceae.

Family 1. **SCHEUCHZERIACEAE** — Arrow-grass Family

Perennial herbs. Leaves narrow or slender above the dilated bases. Flowers perfect, in spikes or racemes. Perianth herbaceous. Gynoecium 3–6-carpellary. Style wanting or obsolete. Fruit 3–6 turgid carpels.—Four genera and about 10 species of wide geographic distribution.

1. TRIGLOCHIN L. Acaulescent herbs, the perianth inconspicuous.—Nine species, in subarctic and temperate regions. Two species, additional to the following, occupy similar habitats in North America north of our range.



1. T. striata R. & P. Plants glabrous: leaves 2–3 dm. long, attenuate: raceme 2–15 cm. long: sepals ovate or oval, less than 1 mm. long, greenish or light-yellow: fruit 1.5–2 mm. in diameter, each carpel 3–ribbed. [*T. triandra* Michx.]—(Arrow-grass.)—Salt-marshes, river-shores, and edges of lakes, mostly near the coast, Fla. to La. and Md.; also Calif.—(*Mex., S. A.*)—Sum.–fall, or all year S.—Reaches its best development in the coastwide marshes. It is rare in the Florida lake region.

Family 2. **ALISMACEAE** — Water-Plantain Family

Annual or perennial herbs. Leaves basal, the blades flat, often with basal lobes, or mere phyllodia. Flowers perfect, monoecious, or dioecious, whorled. Sepals herbaceous. Petals tender, white or pink. Gynoecium of few to many carpels. Style manifest. Fruit a head of flattened or turgid achenes.—About 14 genera and 75 species, widely distributed in fresh-water swamps and marshes.

Carpels borne in one series: achenes verticillate. I. ALISMEAE.
Carpels borne in several spiral series: achenes capitate. II. SAGITTARIEAE.

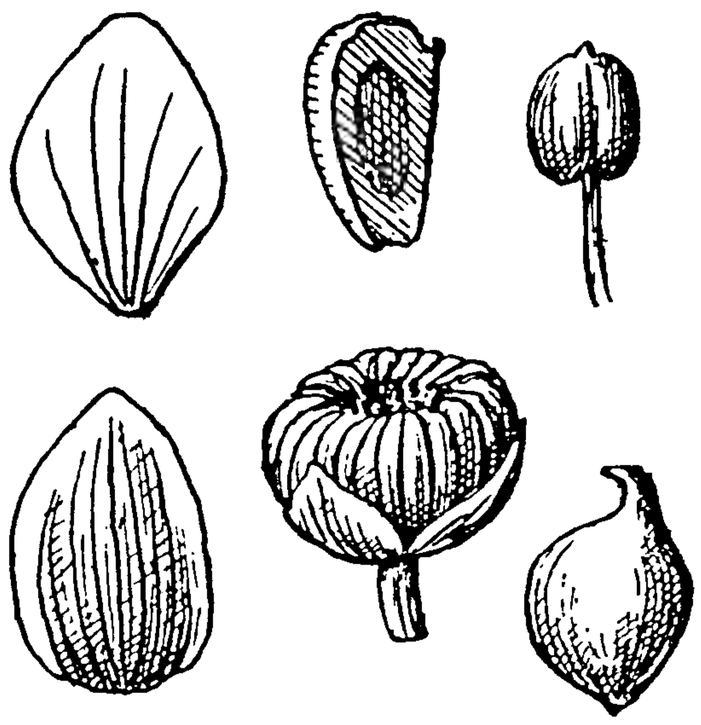
I. ALISMEAE

Flowering stem much branched, the pedicels very slender and wiry. 1. ALISMA.

II. SAGITTARIEAE

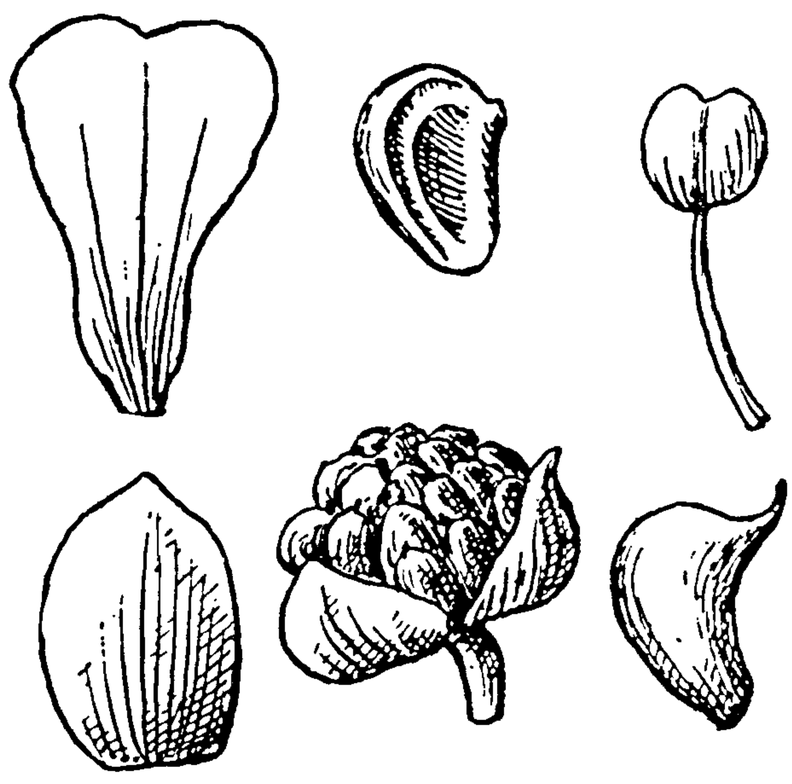
Flowers all perfect.
Style not apical: fruit-head not echinate: achene turgid, beakless or only obscurely beaked. 2. HELANTHIUM.
Style apical: fruit-head echinate: achene flat, prominently beaked. 3. ECHINODORUS.
Flowers polygamous or dioecious, or monoecious—the lower flowers of the inflorescence perfect or pistillate, the upper ones staminate.
Lower flowers of the inflorescence perfect. 4. LOPHOTOCARPUS.
Lower flowers of the inflorescence pistillate. 5. SAGITTARIA.

1. ALISMA L. Leaves without basal lobes. Flowers perfect, in compound panicles. Stamens mostly 6. Achenes in 1 whorl.—About 10 species, mostly in temperate and tropical regions.



1. A. subcordatum Raf. Leaves erect; blade entire, 3–15 cm. long, long-petioled: scape 1–10 dm. tall, the branches, or pedicels, whorled in 3's to 10's: sepals obtuse: petals 1–2 mm. long: fruit-heads depressed, 3.5–4.5 mm. wide: achene 1.5–2 mm. long. [*A. Plantago* (Chapm. Fl.)]—(WATER-PLANTAIN.)—Swamps, ditches, and shallow water, various provinces, Fla. to Tex., Minn., and Mass.—Spr.–fall.

2. HELANTHIUM Engelm. Leaves without basal lobes, the blades narrow. Flowers perfect, borne in racemes. Stamens 6 or 9. Achenes borne in an inconspicuous naked head.—Two species, one in Cuba and the following.

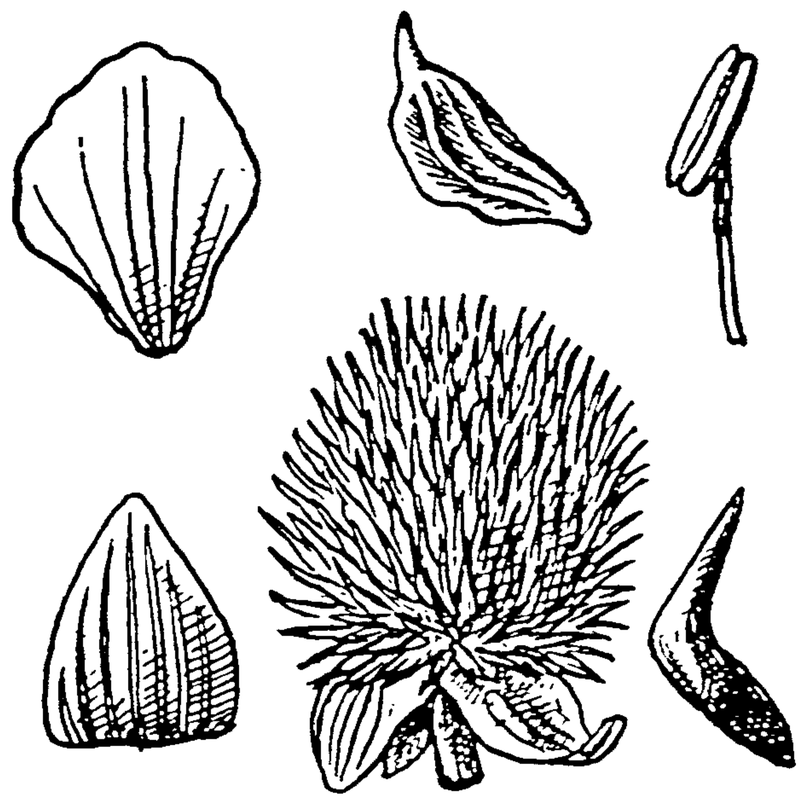


1. H. parvulum (Engelm.) Britton. Leaves lax; blade linear or linear-elliptic, 1–3 cm. long: scape 3–11 cm. tall, with a terminal whorl of 2–8 flowers: petals 1.5–2 mm. long: fruit-head 3–4 mm. thick: achene barely 1 mm. long. [*Echinodorus parvulus* Engelm.]—Muddy places or shallow water, various provinces, Fla. to Tex., Minn., and Mass.—(*W. I., Mex.*)—Spr.–fall.

3. ECHINODORUS L. C. Rich. Leaves with rounded basal lobes. Flowers perfect, in racemes or panicles. Stamens 12–30. Achenes borne in a bristly naked head.—About 15 species, all but the following mostly tropical American.—Spr.–sum.—BUR-HEADS. MUD-BABIES. CREEPING WATER-PLANTAINS.

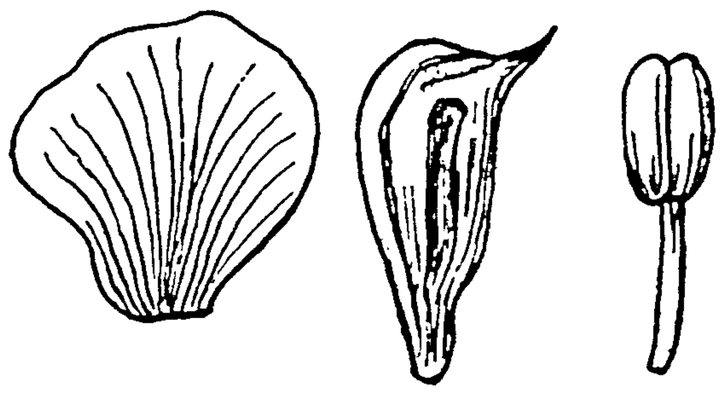
Flowers, and fruit-heads, borne on pliable curved pedicels: style shorter than the ovary: achene-beak about ¼ as long as the body. 1. *E. radicans.*
Flowers, and fruit-heads, borne on stiff spreading pedicels: style longer than the ovary: achene-beak fully ½ as long as the body. 2. *E. cordifolius.*

1. E. radicans (Nutt.) Engelm. Stem creeping near the base: leaf-blades ovate or elliptic, 5–20 cm. long: scape often creeping, the flower-whorls remote: petals about 6 mm. long: fruit-head 7–8 mm. thick: achene 2 mm. long, short-beaked.—Pond-margins and ditches, various provinces, Fla. to Tex., Calif., Kans., and D. C. (*Mex.*)

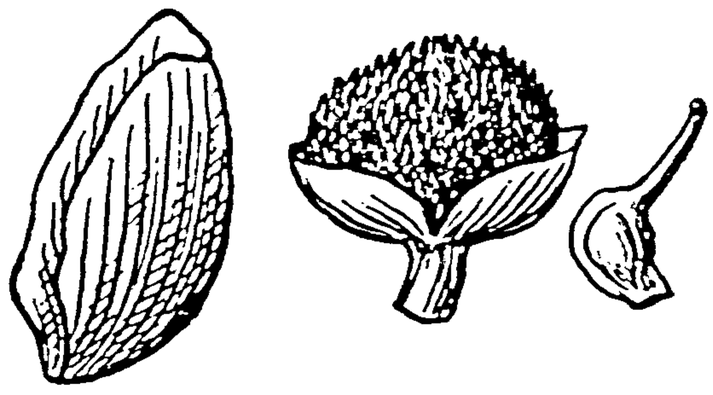


2. E. cordifolius (L.) Griseb. Stem erect or ascending: leaf-blades lanceolate to broadly ovate, 4–20 cm. long: scape 1–5 dm. tall, the flower-whorls less remote than in *E. radicans*: petals 4–6 mm. long: fruit-head 4–6 mm. thick: achenes 2.5–3 mm. long, long-beaked. [*E. rostratus* Engelm.]—Swamps, ditches, and ponds, various provinces, Fla. to Tex., Kans., and Ill.—(*W. I., Mex., C. A.*)

4. LOPHOTOCARPUS T. Durand. Leaves often with basal lobes, but variable. Flowers monoecious, the upper ones staminate. Stamens 9–15. Achenes in a head embraced by the calyx.—About 7 species, besides the following and several that range westward to California, others occur in tropical America.—Sum.–fall.



1. L. calycinus (Engelm.) J. G. Smith. Leaves with petioles 1.5–4 dm. long: scape with 2–6 flower-whorls: achene over 2 mm. long, broad, beaked.—Wet grounds, swamps, and ponds, various provinces, Ala. to N. M., S. Dak., and Del.



5. SAGITTARIA L. Leaves often with basal lobes, sometimes lobeless, or mere phyllodia. Flowers monoecious or dioecious, the upper ones usually staminate. Corolla white. Stamens mainly numerous. Achenes numerous or rarely few, in dense heads.—Comprises about 40 species of wide geographic distribution. Several species produce edible starchy tubers which were extensively used by the aborigines.—Mainly sum.–fall, or all year *S.*—ARROWHEADS. SWAMP-POTATOES.

Sepals of the pistillate flowers ultimately lax or reflexed, not accrescent.
  Fruit-bearing pedicels reflexed or recurved. — I. SUBULATAE.
  Fruit-bearing pedicels ascending.
    Leaf-blades without basal lobes. — II. ANGUSTIFOLIAE.
    Leaf-blades with basal lobes. — III. LATIFOLIAE.
Sepals of the pistillate flowers accrescent and ultimately appressed to the fruit-heads. — IV. MONTEVIDENSES.

SUBULATAE

Filaments glabrous.
  Inflorescence simple, except in robust plants of *S. lorata*: phyllodia obtuse or abruptly pointed.
    Mud-inhabiting plant with short leaves: filaments about as long as the anthers: achene long-beaked. — 1. *S. subulata.*
    Aquatic plants with elongate leaves: achene short-beaked.

Leaves with small floating blades: inflorescence simple: crests of the achene with mere shallow undulations. — 2. *S. stagnorum.*
Leaves elongate ligulate phyllodia: inflorescence sometimes branched: crests of the achene with deep undulations. — 3. *S. lorata.*
Inflorescence branched: phyllodia slenderly attenuate. — 4. *S. filiformis.*
Filaments pubescent. — 5. *S. platyphylla.*

II. Angustifoliae

Pedicels of the pistillate flowers as long as those of the staminate ones, or nearly so.
Filament dilated, relatively short.
Leaf-blade terete or 3-sided, often imperfectly developed.
Anther longer than the filament: achene with several facial wings. — 6. *S. teres.*
Anther shorter than the filament: achene with 3 low facial ridges. — 7. *S. isoetiformis.*
Leaf-blade flat.
Achene oval or broadly elliptic. — 8. *S. cycloptera.*
Achene cuneate:
Beak large, horizontal at the top of the achene-body. — 9. *S. Mohrii.*
Beak minute, borne much below the top of achene-body.
Inflorescence simple: lower bracts ovate, united to the middle: achene with lateral ribs or wings. — 10. *S. graminea.*
Inflorescence widely branched: lower bracts lanceolate, united at the base: achene without lateral ribs or wings. — 11. *S. Chapmanii.*
Filament not dilated, slender.
Bracts and sepals granular-papillose. — 12. *S. falcata.*
Bracts and sepals ribbed.
Achene more or less falcate, gradually beaked, the dorsal wing thick and even. — 13. *S. lancifolia.*
Achene not falcate, abruptly beaked, the dorsal wing usually thin and crested. — 14. *S. angustifolia.*
Pedicels of the pistillate flowers very short or nearly wanting.
Fruit-head not echinate: achene broadly winged and short-beaked: anther broadly elliptic, about as long as the filament. — 15. *S. macrocarpa.*
Fruit-head echinate: achene narrowly winged and long-beaked: anther suborbicular, shorter than the filament. — 16. *S. rigida.*

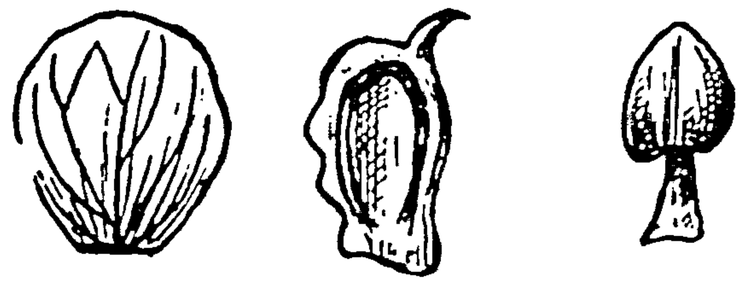
III. Latifoliae

Achene minutely or inconspicuously beaked. — 10. *S. graminea.*
Achene prominently long-beaked:
Beak horizontal or nearly so.
Inflorescence-rachis, pedicels, bracts, and sepals pubescent.
Achene less than 4 mm. long; beak horizontal or declined, narrow, much smaller than the body from which it is differentiated: bracts tomentulose. — 17. *S. pubescens.*
Achene over 4 mm. long; beak horizontal-ascending, broad, larger than the body, with which it is continuous: bracts granular-pubescent. — 18. *S. ornithorhyncha.*
Inflorescence-rachis, pedicels, bracts, and sepals glabrous. — 19. *S. latifolia.*
Beak erect.
Filament pubescent.
Pistillate pedicel very short: sepals and bracts glabrous. — 16. *S. rigida.*
Pistillate pedicel elongate: sepals and bracts pubescent. — 20. *S. viscosa.*
Filament glabrous.
Basal lobes of the leaf-blade acute or acuminate. — 21. *S. longirostra.*
Basal lobes of the leaf-blade rounded. — 22. *S. australis.*

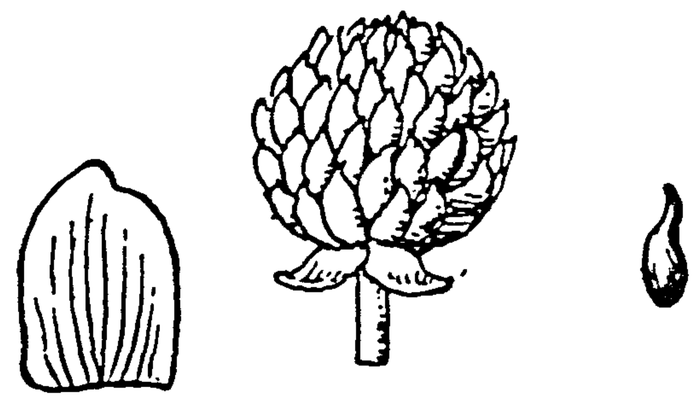
IV. Montevidenses

Robust plant: leaf-blades 1–5 dm. long and wide: scape up to 1 m. tall. — 23. *S. montevidensis.*

1. S. subulata (L.) Buch. Leaves erect; blade linear or linear-lanceolate, 2–3 cm. long, or wanting, the phyllodia slender: scape 5–15 cm. tall, with 1 or 2 flower-whorls: achenes relatively few, about 1.5 mm. long, the beak ascending. [*S. natans pusilla* Chapm.]—Tidal flats and mud, Coastal Plain and New England Coast, Fla. to Ala. and Conn.



2. S. stagnorum Small. Leaves few; blades elliptic to ovate-elliptic 1.5–5 cm. long, the phyllodia linear, wider than the petioles: scape with 1–few flower-whorls: flowers floating: achenes few, about 2 mm. long, the beak mostly erect. [*S. natans* Michx. not Pall.]—Shallow ponds, Coastal Plain, Fla. to Ala. and S. C.



3. S. lorata (Chapm.) Small. Leaves represented by elongate-linear, often rather broad phyllodia which sometimes are up to 250 cm. long, 3–5-ribbed, at least in age: scape about as long as the leaves: flower-whorls usually 4–8: flowers floating: achenes numerous, 2–2.5 mm. long, the beak horizontal.—Streams and springs, Fla. and adj. Coastal Plain of Ala. and Ga.; perhaps N along the coast. The plant of the northern states, sometimes referred here, may represent a different species.—An apparently extremely large form of *S. lorata* in the Wakulla River, Fla., has been named *S. Kurziana* Glück.

4. S. filiformis J. G. Smith. Leaf-blades wanting: scape 6–12 dm. long, with several flower-whorls; only 1 or 2 flowers of the lower whorls pistillate, their pedicels elongate: fruit-head 6–7 mm. thick: achene 1.5 mm. long, about 6-crested, the beak curved up.—Ponds, Coastal Plain, Fla. and Ala.; apparently also in the Carolinas.

5. S. platyphylla (Engelm.) J. G. Smith. Leaf-blades lanceolate, elliptic, or ovate, 5–15 cm. long: scape 2–5 dm. tall, with 3–8 flower whorls, the flowers of 2 or 3 lower whorls pistillate, their pedicels very short: fruit-heads fully 10 mm. thick: achenes 2 mm. long, winged, the beak horizontal.—Ponds and swamps, various provinces, Ala. to Tex., Kans., and Mo.

6. S. teres S. Wats. Leaf-blades narrow and imperfect, or wanting: scape 1.5–4.5 dm. tall, with 1 or rarely 2 or 3 flower-whorls, 1 or 2 flowers of the lower whorl pistillate: fruit-head 8–12 mm. thick: achene 2 mm. long, unevenly crested, the beak nearly erect.—Shallow water, Coastal Plain and New England Coast, S. C. to Mass.

7. S. isoetiformis J. G. Smith. Leaf-blades wanting or imperfect: scape 7–12 dm. tall, usually with 1 flower whorl: fruit-head about 6 mm. thick: achene 1 mm. long, dorsally crested, the beak oblique.—Low grounds and sandy lake-margins, Coastal Plain, Fla. and S Ga.

8. S. cycloptera (J. G. Smith) C. Mohr. Leaf-blades linear or linear-lanceolate, 4–15 cm. long, or wanting: scape 2–8 dm. long, mainly with 3–15 flower-whorls: fruit-head barely 10 mm. thick: achene 1.5 mm. long, the minute beak ascending.—Swamps, Coastal Plain, Fla. to La. and S. C.

9. S. Mohrii J. G. Smith. Leaf-blades linear to lanceolate, 5–15 cm. long, sometimes imperfect: scape 4–9 dm. long, with 6–8 flower-whorls: fruit-head 6–8 mm. thick: achene 2.5–3.5 mm. long, the large beak horizontal.—Ponds, Coastal Plain, Fla. to Miss. and Ga.

10. S. graminea Michx. Leaf-blades linear, lanceolate, or elliptic, 5–15 cm. long, or wanting: scape 1–6 dm. tall, with few or many flower-whorls: fruit-head less than 10 mm. thick: achene 1.5 mm. long, winged, the minute beak horizontal.—Mud and ponds, various provinces, Fla. to Tex., Sask., and Newf.

11. S. Chapmanii (J. G. Smith) C. Mohr. Leaf-blades linear or lanceolate, 15–20 cm. long, or wanting: scape 3–5 dm. long, with often many flower-whorls and paniculate: fruit-head 5 mm. thick: achene 1 mm. long, wingless, the minute beak lateral.—Ponds and marshes, Coastal Plain, Fla., Ala., and Ga.

12. S. falcata Pursh. Leaf-blades narrowly elliptic, sometimes slightly broadest above the middle, or nearly linear, 10–35 cm. long, mainly 3–5 nerved: pedicels of the pistillate flowers relatively short, their bracts of an ovate type: achene about 2 mm. long.—Low grounds and marshes, Coastal Plain, Fla. to Tex. and Del.—(*Mex.*)

13. S. lancifolia L. Leaf-blades elliptic or nearly so to narrowly elliptic-lanceolate, 30–60 cm. long, mainly 5–9-nerved: pedicels of pistillate flowers relatively long, their bracts of a lanceolate type: achene 2.5–3 mm. long.—Swamps, pools, and low river-banks, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)—Very variable in size, but at its best it is the giant of our arrowheads. On the Florida prairies and marshes the leaves and flower-stalks often grow higher than one's head. Used medicinally by the Seminoles in cases of shock following alligator bite.

14. S. angustifolia Lindl. Leaf-blades linear or nearly so, sometimes very narrow, 9–40 cm. long: scape as long as the leaves or longer, usually simple, with several flower-whorls, their bracts of a lanceolate type: fruit-head 1–1.5 cm. thick: achene 2–2.5 mm. long, abruptly narrowed into the minute beak, the dorsal wing usually crested.—Low grounds and swamps, Coastal Plain, Ga. to La.—(*W. I., Mex., C. A., S. A.*)

15. S. macrocarpa J. G. Smith. Leaf-blades linear or linear-lanceolate, 5–7 cm. long: scape 2–4.5 dm. tall, with 3–5 flower-whorls, the flowers of the lowest whorl or the 2 lower whorls pistillate: fruit-head 10–12 mm. thick: achene 3 mm. long, winged, the beak ascending.—Pond-margins and streams, Coastal Plain, S. C. and N. C.

16. S. rigida Pursh. Leaf-blades linear to broadly ovate, individually with basal lobes, 5–20 cm. long: scape weak, 1–8 dm. long, with 5–9 flower-whorls: fruit-head 8–15 mm. thick, sessile or nearly so: achene 3–4 mm. long, winged, the beak ascending.—(STIFF-ARROWHEAD.)—Swamps and running water, various provinces, Tenn. to Nebr., Minn., Que., and N. J.

17. S. pubescens Muhl. Leaf-blades 8–25 cm. long, with the terminal lobe more rounded than in no. 20, puberulent or hirsute: scape 3–6 dm. tall: pedicels of pistillate flowers about as long as the obtuse bracts or slightly longer: sepals not accrescent: fruit-head 8–15 mm. thick: achene 2–3 mm. long, the beak horizontal or somewhat declined.—Meadows, spring-runs, and marshes, Coastal Plain and rarely adj. provinces, Fla. to Ala., Tenn., Pa., and N. J.

18. S. ornithorhyncha Small. Leaf-blades 9–17 cm. long, hastate, the terminal lobe slightly acuminate, the basal lobes as long as the terminal one or nearly so: scape 7–9 dm. tall: pedicels of the pistillate flowers much longer than the acute or acutish bracts: sepals ovate, obtuse: fruit-heads globular, 1.5–2 cm. in diameter: achene resembling a bird, 4–6 mm. long, the beak as long as the achene-body or longer, winged, horizontal-ascending.—Swamps, Coastal Plain, N. C.

19. S. latifolia Willd. Leaf-blades broad, 15–40 cm. long, glabrous, the basal lobes narrower and rather shorter than the terminal one: scape 3–6 dm. tall: pedicels of pistillate flowers much longer than the acute bracts: fruit-head 15–30 mm. thick: achene about 3 mm. long, the beak ascending or recurved. [*S. variabilis* Engelm.]—(ARROWLEAF. DUCK-POTATO. WAPATO.)—Swamps, shallow water, and river-banks, various provinces, Fla. to Calif., B. C., and N. B.—(*Mex., C. A.*)

20. S. viscosa C. Mohr. Leaf-blades 20–35 cm. long, the middle lobe broadly ovate, the basal lobes shorter, acute or acuminate: scape 5–8 dm. tall, with few flower-whorls: bracts obtuse: fruit-heads not seen.—Muddy places and marshes, Coastal Plain, N Fla. and S Ala.

21. S. longirostra (Micheli) J. G. Smith. Leaf-blades 10–25 cm. long, the terminal lobe broadly ovate, the basal lobes as long but narrower: scape 4–8 cm. tall, with few flower-whorls: bracts acuminate: fruit-heads 12–18 mm. thick, short-pedicelled: achene 4 mm. long, with facial wings, the dorsal wing partially crenate, the beak erect.—Pond-margins and streams, Coastal Plain and rarely adj. provinces, Fla. to Ark., Pa., and N. J.

22. S. australis (J. G. Smith) Small. Leaf-blades 8–10 cm. long, the terminal lobe very broad, the basal lobes shorter, obtuse: scape 4–5 dm. tall, with 4–6 flower-whorls: fruit-heads fully 10 mm. thick: achene 3–3.5 mm. long, with facial wings, the dorsal wing undulate, the beak curved over the crest.—Low grounds, Appalachian Plateau, N Ala.

23. S. montevidensis C. & S. Leaf-blades 1–5 dm. long, the basal lobes narrower and shorter than the ovate terminal one: scape very stout, about as tall as the leaves, the pedicels relatively short: fruit-heads 15–30 mm. thick: achene 2–3 mm. long, the slender beak oblique.—(GIANT-ARROWLEAF.)—Low grounds and swamps, Coastal Plain, Fla. to Ala. and N. C.; also Calif. Nat. of S. A.

ORDER **HYDROCHARITALES** — HYDROCHARITAL ORDER

Perennial aquatic herbs, with rootstocks. Leaves usually with blades. Flowers monoecious or dioecious, or rarely perfect, from spathes. Perianth double, or the corolla wanting. Androecium of 1–12 stamens. Gynoecium 3–15-carpellary. Ovary inferior. Fruits capsular or baccate.

Gynoecium 3-carpellary, or rarely 2-, 4- or 5-carpellary: ovary 1-celled, with 3, or rarely with 2, 4 or 5 parietal placentae: stigmas usually 3. — Fam. 1. ELODEACEAE.
Gynoecium 6–9 carpellary: ovary 6–9-celled: stigmas 6–9. — Fam. 2. HYDROCHARITACEAE.

FAMILY 1. **ELODEACEAE** — TAPE-GRASS FAMILY

Plants with leafy stems, or leaves basal, often greatly elongate. Gynoecium 2–5-carpellary, the ovary 1-celled.—Comprises 6 genera and about 24 species, widely distributed in warm regions.

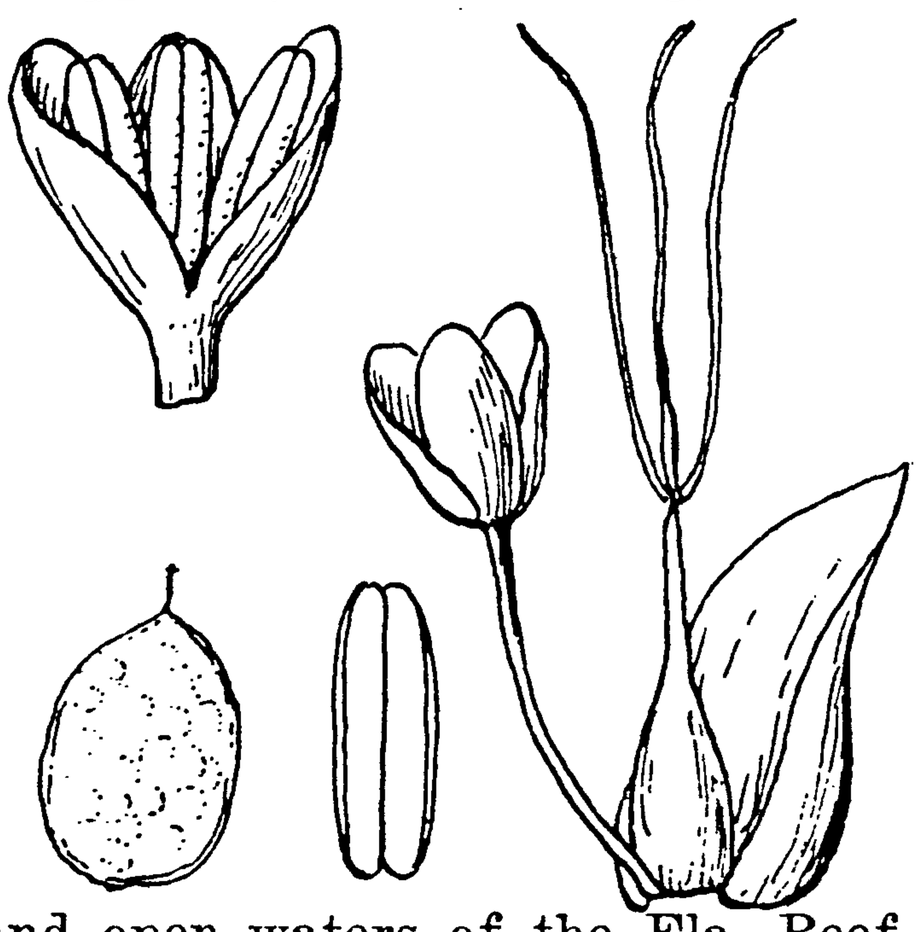
Staminate flower with 1–3 stamens: plant with horizontal rootstocks.
  Leaves opposite on short horizontal stems; blade broad, more or less petioled: stigmas filiform: pollen filiform: marine plant. — 1. HALOPHILA.
  Leaves spiral, but in a basal cluster; blade linear, without a petiole: stigmas short and broad: pollen spheroidal: fresh water plant. — 2. VALLISNERIA.
Staminate flower with 9 stamens: fresh water plant with floating stems and whorled leaves. — 3. PHILOTRIA.

1. HALOPHILA Thouars. Marine submerged herbs, with short branches arising from the rootstock. Leaves opposite or whorled, the lower ones often scale-like. Flowers dioecious or monoecious, the staminate pedicelled, the pistillate sessile in the spathe, flask-shaped. Fruit short, included in the spathe.—About 6 species, mostly circumtropical.—SEA-GRASSES—The plants creep on the sea-bottom, in shallow water, or at considerable depths when

the water is clear. Their habit is somewhat suggestive of marine algae of the genus *Caulerpa;* often found washed ashore after storms.

Leaves 1 or 2 at the tip of the branches; blades evidently serrulate, on filiform petioles: capsule short-beaked. 1. *H. Baillonis.*
Leaves 3–7 at the tips of the branches; blades ciliate or ciliolate and obscurely serrulate, sessile or with stout short petiole-like bases: capsule long-beaked. 2. *H. Engelmannii.*

1. H. Baillonis Aschers. Plant with a thread-like rootstock, the branches short, usually very short or obsolete: leaves opposite, blades oblong, linear-oblong, or spatulate, mostly 1–2.5 mm. long, thin, often minutely pubescent, especially when young, with the lateral veins indistinct or obscure, slender-petioled: capsule ellipsoid or ovoid-ellipsoid, 3–3.5 mm. long.—Sandy or marly bottoms on Reef about the Florida Keys.

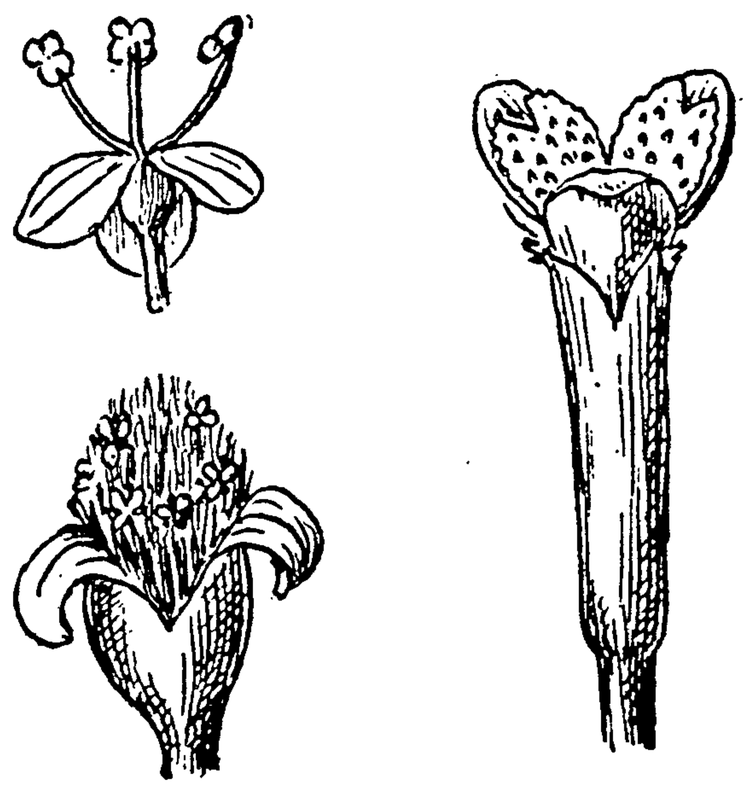


2. H. Engelmannii Aschers. Plant with a cord-like rootstock; the branches stoutish, mostly 2–6 cm. long: leaves mostly whorled at the tips of the stem and branches; blades linear, elliptic, or oblanceolate, 1–3 cm. long, thick, glabrous, sharply serrulate, evidently 3-veined, sessile or with short petiole-like bases: capsule ovoid or globose-ovoid, 2.5–3 mm. long.—Bays and creeks, coast of Fla. and open waters of the Fla. Reef.

2. VALLISNERIA [Mich.] L. Fresh-water herbs. Leaves basal with greatly elongate ribbon-like blades. Flowers dioecious, the staminate numerous, crowded on a spadix; they break away from their short stalks and float on the surface of the water where they shed their pollen about the pistillate flowers which have been raised to the surface by the rapid growth of the pedicels. Pistillate flowers few, each solitary at the end of an elongate spiral scape. Fruit subtended by the spathe.—Two species, both represented in our range, the first one also in the Old World.—EEL-GRASSES. TAPE-GRASSES. WATER-CELERIES.—Plants with their long leaves and pistillate flowers usually partly floating.

Stigmas cleft for less than half their length: sepals of the pistillate flowers 2–3 mm. long. 1. *V. spiralis.*
Stigmas cleft nearly to the base: sepals of the pistillate flowers 5–6 mm. long. 2. *V. americana.*

1. V. spiralis L. Leaf-blades thin, 3–8 mm. wide, usually denticulate, espepecially near the apex: peduncles of the pistillate flowers 3–6 dm. long, spirally twisted at maturity: spathe close-fitting, 1–1.5 cm. long: hypanthium 1–2 cm. long in anthesis: petals minute: capsule slender.—Still and flowing water, various provinces, N. C. to Ind., S. Dak., and N. S.—(*O. W.*)—Sum.–fall.—A wide-spread species, occurring in both the Old World and the New, but barely entering our range from the North.



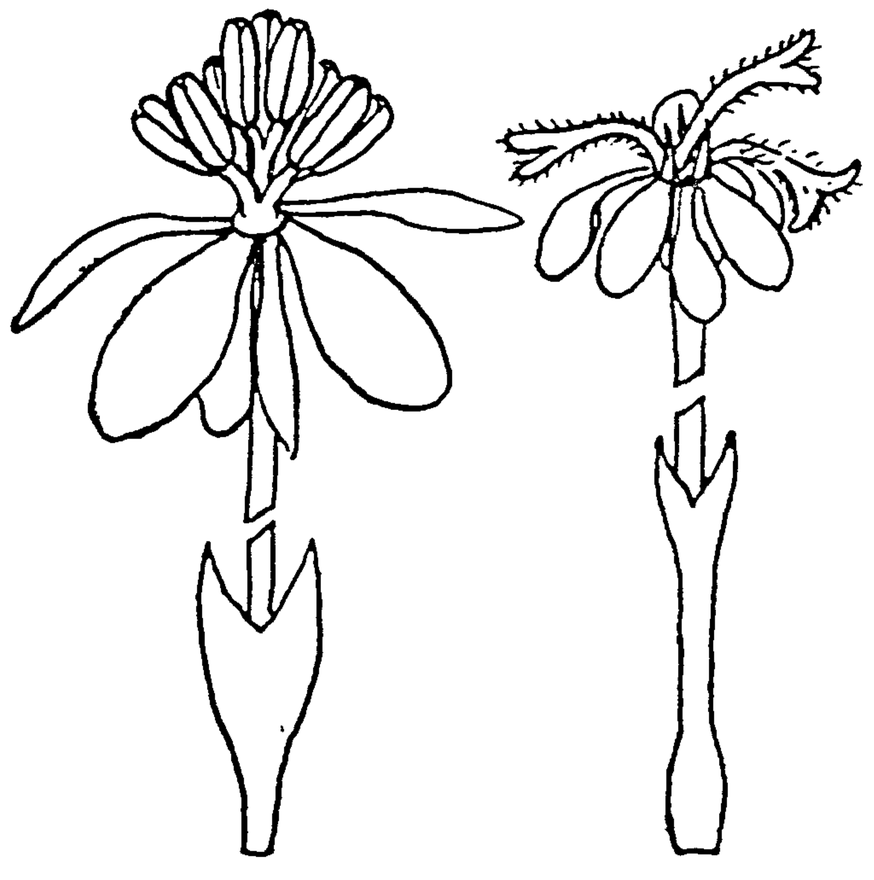
2. V. americana Michx. Leaf-blades thickish, 6–20 mm. wide, often denticulate: peduncles of the pistillate flowers 5–10 dm. long or more, curved at maturity, but

scarcely spiral; spathe loose, 2–2.5 cm. long: hypanthium 2.5–3 cm. long in anthesis: petals less than ½ as long as the sepals: capsule stout, 7–11 cm. long.—Creeks, rivers, and lakes, Coastal Plain, Fla. to La.—All year.—A plant much larger in all its parts than the preceding. Often very luxuriant in growth. Like the preceding species it is a favorite food of ducks, and perhaps of other water birds.

3. **PHILOTRIA** Raf.[1] Fresh-water herbs. Leaves cauline, opposite or whorled. Flowers perfect and with 3 stamens or dioecious or polygamous; the staminate with 9 stamens detach themselves, arise and float on the surface of the water and shed their pollen about the pistillate or perfect flowers or reach the surface by the elongation of their thread-like hypanthia like the pistillate flowers which are raised to the surface on long stalks; the pistillate similar and slender-pedicelled. Fruit enclosed by the spathe. [*Elodea Michx.*]—About 10 species, natives of America; one naturalized in Europe.—Spr.-sum.—WATERWEEDS.—The plants of some species are collected locally and applied to cultivated land as fertilizers.

Staminate spathes not cleft nearly to the base, 1-flowered: petals less than 5 mm. long or wanting: upper leaves in whorls of 3.
  Leaf-blades 1–5 mm. broad: staminate flowers with the 3 central stamens on a stalk exceeding the other 6: pistillate flowers frequent, long-exserted. 1. *P. canadensis.*
  Leaf-blades less than 1 mm. broad: staminate flowers with 9 equal stamens: pistillate flowers unknown. 2. *P. linearis.*
Staminate spathes cleft nearly to the base, several-flowered: petals about 1 cm. long; upper leaves in whorls of 4. 3. *P. densa.*

1. P. canadensis (Michx.) Britton. Stem slender, dichotomously branched lower leaves opposite, with small ovate blades; upper leaves of pistillate plant with elliptic to lanceolate-ovate blades, firm, dark-green, imbricate above; those of staminate plants narrower, even lanceolate-linear, thinner, scarcely imbricate: staminate spathe slender at the base, with an inflated ellipsoid bidentate apex; staminate flower exserted on a thread-like hypanthium: sepals elliptic, 3.5–5 mm. long; petals white, linear: anthers 3 mm. long: pistillate spathe nearly cylindric, bidentate: pistillate flower long exserted; sepals 2.2 mm. long; petals white clawed, spatulate; staminodia 3, acicular: stigmas 3, ligulate, pink, 2-cleft. [*P. Nuttallii* (Fl. SE. U. S.)]—Ponds, springs, and streams, various provinces, N. C. and Ala. to Calif., Wash., and Que.—A related species, *P. angustifolia,* has been reported from Florida in error.



2. P. linearis Rydb. Stem slender: upper leaves with linear, flaccid, pale-green blades, 5–12 mm. long, not imbricate: staminate spathe as in *P. canadensis;* staminate flower exserted on a thread-like hypanthium: sepals oval, 2.5–4 mm. long: petals white, linear, exceeding the sepals or abortive; anthers 2 mm. long.—Swamps, Interior Low Plateaus, along Cumberland River, near Nashville, Tenn.

3. P. densa (Planch.) Small. Stem stout, 2–3 mm. in diameter: leaves very numerous, densely crowded; blades lanceolate to linear-lanceolate, 1.5–2 cm. long, 2–5 mm. broad, acuminate, serrulate: spathe of the staminate flowers

[1] Prepared with the assistance of Harold St. John.

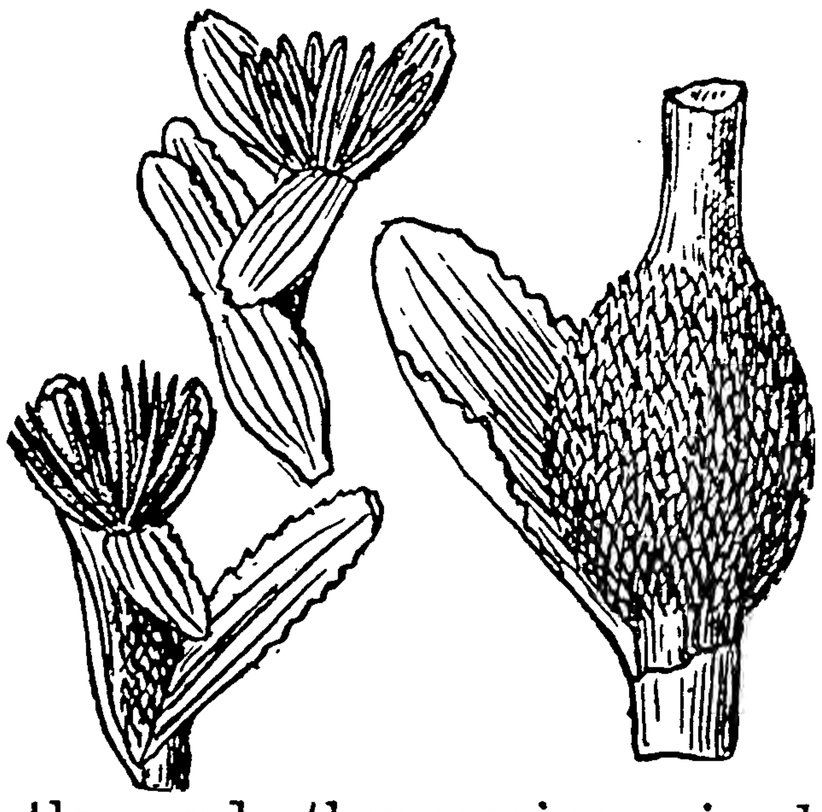
narrowly conic, about 1 cm. long: sepals green, oval to ovate, 3–4 mm. long: petals white, 9–11 mm. long: pistillate flowers not seen.—Lakes, Pinellas pen., Fla.—Perhaps introduced through cultivated plants.—(*S. A.*)

Family 2. **HYDROCHARITACEAE** — Frog's-Bit Family

Plants with leaves in clusters on the rootstocks. Gynoecium 6–9-carpellary, the ovary 6–9-celled.—Comprises 8 genera and about 20 species of temperate and tropical regions.

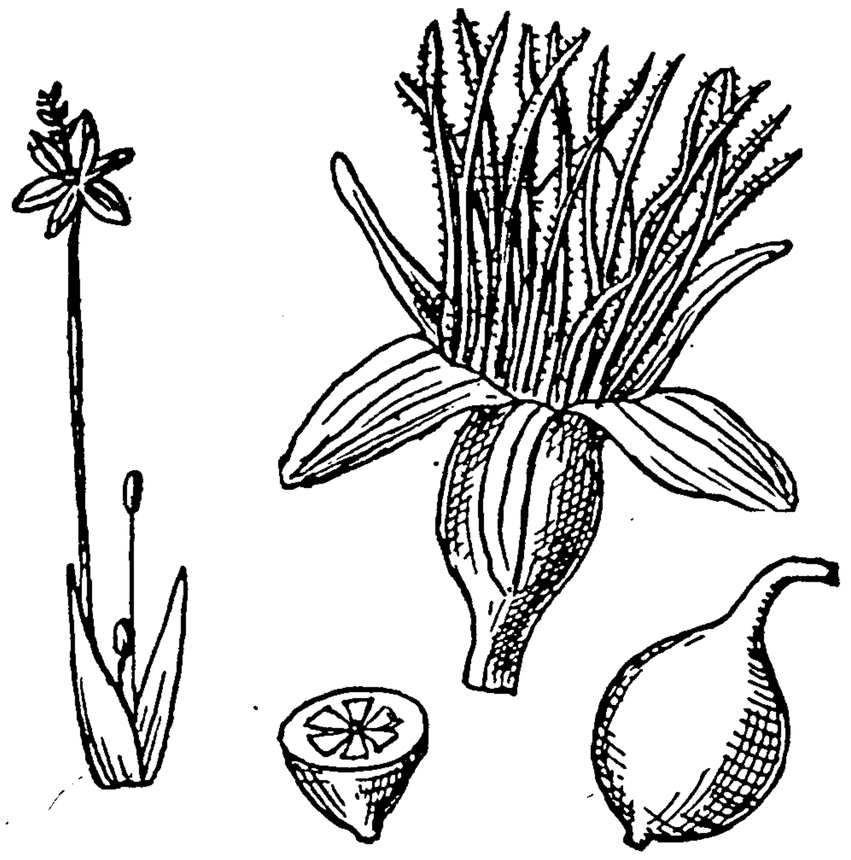
Flowers dioecious: stamens distinct: anther nearly sessile: leaf not differentiated into blade and petiole. 1. Thalassia.
Flowers monoecious: stamens with united filaments: leaf differentiated into blade and petiole. 2. Limnobium.

1. THALASSIA Banks. Marine herbs. Leaves mere strap-like blades. Flowers dioecious. Fruit rugose or nearly echinate.—Two species, circumtropical.



1. T. testudinum Koenig & Sims. Leaves 2–5 together; blade linear, 5–30 cm. long: fruit echinate-pubescent, erect.—(Turtle-grass. Sea-weed.)—Bays and coasts, pen. Fla. and Florida Reef.—(*W. I., S. A.*)—All year.—Occurs mainly in vast submarine fields, often forming a dense turf. The leaves are washed ashore in vast quantities and are gathered as "sea weed" for fertilizer. Only during quiet weather, and consequent clear water, can one get an adequate view of these submarine fields which are favorite rendezvous for various kinds of fish, turtles, and other marine animals.

2. LIMNOBIUM L. C. Rich. Fresh-water herbs. Leaves with dilated blades terminating petioles. Flowers monoecious. Fruit smooth. Three or four species, American.



1. L. Spongia (Bosc.) L. C. Rich. Leaves several together; blade ovate to suborbicular or reniform, 2–5 cm. broad: fruit glabrous, nodding.—(Frog's-bit.)—Shallow water and mud, various provinces, Fla. to Tex., Mo., Ont., and N. J.—Sum.–fall.—The plants are very variable in size, and the leaves vary in shape and have short or long petioles. In marshes as the water dries up, the frog's-bit grows rapidly and often covers acres of these low lands with a bright green carpet.

Order **POALES** — Poal Order

Mostly perennial caulescent or acaulescent plants, known as grasses and sedges. Stems sometimes conspicuously jointed. Leaves alternate, mostly sheathing at the base: blades usually narrow and elongate, entire or nearly so. Flowers variously disposed in a simple or compound inflorescence, perfect or rarely monoecious or dioecious, incomplete, inconspicuous, borne in the axils of chaffy bracts or scales (glumes). Fruit a caryopsis (grain) or an achene, or rarely a nut, or baccate.

Leaves 2-ranked, their sheath-margins usually not united: stem mostly hollow: fruit a grain (caryopsis). Fam. 1. POACEAE.
Leaves 3-ranked, their sheath-margins united: stem solid: fruit an achene. Fam. 2. CYPERACEAE.

FAMILY 1. POACEAE — GRASS FAMILY[1]

Herbs or rarely woody plants, with often hollow stems (*culms*) closed at the nodes, and 2-ranked parallel-veined leaves, these consisting of 2 parts, a lower (the *sheath*), enveloping the culm, its margins overlapping or sometimes grown together, an upper (the *blade*), usually flat, while between the two on the inside, a membranaceous hyaline or hairy appendage (the *ligule*). Flowers perfect (rarely unisexual), small, with no distinct perianth, arranged in spikelets consisting of a shortened axis (*rachilla*) and 2 to many 2-ranked bracts, the lowest 2 being empty (the *glumes*, rarely 1 or both of these obsolete), the 1 or more succeeding ones (*lemmas*) bearing in their axils a single flower, and, between the flower and the rachilla, a second 2-nerved bract (the *palea*). Stamens 1 to 6, usually 3, with very delicate filaments and 2-celled anthers. Pistil 1, with a 1-celled 1-ovuled ovary, 2 (rarely 1 or 3) styles, and usually plumose stigmas. Fruit a caryopsis (grain) with starchy endosperm and a small embryo at the base on the side opposite the hilum.—The perianth is usually represented by 2 (rarely 3) small hyaline scales (the *lodicules*) at the base of the flower inside the lemma and palea. The lemma, palea, and inclosed flower constitute the *floret*. The spikelets are almost always aggregated in an inflorescence at the ends of the main stems or branches. The grain or caryopsis (the single seed and the adherent pericarp) may be free, as in wheat, or permanently inclosed in the lemma and palea as in the oat. Rarely the seed is free from the pericarp, as in species of *Sporobolus* and *Eleusine*. The stems of bamboos are woody as are also those of a few genera, such as *Olyra* and *Lasiacis*, belonging to other tribes. The culms are solid in our species of the tribes Tripsaceae and Andropogoneae. The margins of the sheaths are grown together in species of *Bromus*, *Festuca*, *Melica*, *Panicularia*, and others. The parts of the spikelet may be modified in various ways. The first, and more rarely also the second, glume may be wanting. The lemmas may contain no flower, or even no palea, or may be reduced or rudimentary. The palea is rarely wanting in perfect florets as in species of *Agrostis*.—Comprises about 500 genera and 7,000 species very widely distributed in latitude, altitude, and habitat. The so-called cereals are of great economic importance.

Spikelets with 1 perfect terminal floret (disregarding those of the staminate and neuter spikelets) and a sterile or staminate floret below, usually represented by a sterile lemma only, one glume sometimes, both glumes rarely, wanting: articulation below the spikelets either in the pedicel, in the rachis, or at the base of a cluster of spikelets, the spikelets falling entire, singly, in groups, or together with joints of the rachis: spikelets, or at least the fruits, more or less dorsally compressed (except in some genera of Nazieae). (SUBFAMILY PANICATAE.)
  Glumes indurate: fertile lemma and palea hyaline or membranaceous, the sterile lemma (when present) like the fertile one in texture.
    Spikelets unisexual, the pistillate below, the staminate above, on the same inflorescence, or in separate inflorescences. Tribe I. TRIPSACEAE.
    Spikelets perfect, staminate or neuter ones sometimes also present.
      Spikelets in pairs; one sessile and perfect, the other pedicelled and usually staminate or neutral (the pedicellate one sometimes obsolete, or rarely both pedicellate): lemmas hyaline. Tribe II. ANDROPOGONEAE.

[1] Contributed by Albert Spear Hitchcock.

- Spikelets in groups of 2–5, the groups falling entire from the continuous axis: lemmas membranous. — Tribe III. NAZIEAE.
- Glumes membranaceous: fertile lemma and palea indurate, at least firmer than the glumes: sterile lemma like the glumes in texture. — Tribe IV. PANICEAE.
- Spikelets 1- to many-flowered, the reduced florets, if any, above the perfect florets (except in Phalarideae: sterile lemmas below as well as above in *Campulosus* and *Uniola*): articulation usually above the glumes: spikelets usually more or less laterally compressed. (SUBFAMILY POATAE.)
  - Plants woody, the stem perennial: spikelets several-flowered. — Tribe XIII. BAMBUSEAE.
  - Plants herbaceous, the stem annual.
    - Spikelets with 2 staminate, neuter or rudimentary lemmas unlike and below the fertile lemma: no sterile or rudimentary florets above. — Tribe VII. PHALARIDEAE.
- Spikelets without sterile lemmas below the perfect floret (or these rarely present and like the fertile ones.)
  - Spikelets unisexual, articulate below the glumes, 1-flowered, terete or nearly so. — Tribe VI. ZIZANIEAE.
  - Spikelets perfect (rarely unisexual but then not as above), usually articulate above the glume.
    - Spikelets articulate below the glumes, 1-flowered, very flat, the lemma and palea about equal, both keeled; glumes small or wanting. — Tribe V. ORYZEAE.
    - Spikelets articulate above the glumes (rarely below, but the glumes, at least one, then well developed).
      - Spikelets sessile on a usually continuous rachis (short-pedicellate in *Leptochloa*: the rachis disarticulating in *Hordeum*): articulation above the glumes except in *Spartina*.
        - Spikelets on opposite sides of the rachis: spike terminal, single. — Tribe XII. HORDEAE.
        - Spikelets on one side of the rachis: spikes usually more than 1, digitate or racemose. — Tribe X. CHLORIDEAE.
      - Spikelets pedicellate in open or contracted, sometimes spike-like, panicles.
        - Spikelets 1-flowered. — Tribe VIII. AGROSTIDEAE.
        - Spikelets 2- to many-flowered.
          - Glumes as long as the lowest floret, usually as long as the spikelet: lemmas awned from the back (awnless in *Koeleria* and *Sphenopholis*). — Tribe IX. AVENEAE.
          - Glumes shorter than the first floret: lemmas awnless or awned from the tip or from a bifid apex. — Tribe XI. FESTUCEAE.

Tribe I. TRIPSACEAE

Fruiting spikelets not enclosed in a hard bead-like involucre.

- Staminate and pistillate spikelets in the same inflorescence, the former comprising the upper part of the spike and the latter the lower. — 1. TRIPSACUM.
- Staminate and pistillate spikelets in separate inflorescences, the former in racemes borne in terminal panicles, the latter in spikes subtended by and enclosed by large bracts.
  - Pistillate spikes separate, the rachis articulate: fruits enclosed. — 2. EUCHLAENA.
  - Pistillate spikes united into a thick receptacle-like axis (cob): fruits exposed. — 3. ZEA.

Fruiting spikelets enclosed in a hard bead-like involucre formed from the indurate sheath of the subtending bract. — 4. COIX.

Tribe II. ANDROPOGONEAE

Spikelets all perfect, surrounded by copious soft hairs.
Rachis continuous, the spikelets falling: spikelets of the pair unequally pedicellate.
Racemes in a narrow spike-like panicle: spikelets awnless. — 5. IMPERATA.
Racemes in an open, usually flabellate, panicle: spikelets awned. — 6. MISCANTHUS.
Rachis breaking up into joints at maturity with the spikelets attached: one spikelet sessile, the other pedicellate.
Spikelets awnless. — 7. SACCHARUM.
Spikelets awned. — 8. ERIANTHUS.
Spikelets unlike, the sessile perfect, the pedicellate sterile.
Pedicel thickened, appressed to the thickened rachis-joint (at least parallel to it) or adnate to it: spikelets awnless, appressed to the joint.
Rachis-joint and pedicel adnate, forming a short flat joint, this sunken in the open side of the globose first glume of the sessile spikelet: sterile spikelet conspicuous. — 10. RYTILIX.
Rachis-joint and pedicel distinct, the sessile spikelet appressed to them, its first glume lanceolate.
Racemes subcylindric: rachis-joints and pedicels glabrous, much thicker at the summit, the spikelets sunken in the hollow below: sterile spikelet rudimentary. — 9. MANISURIS.
Racemes flat: rachis-joints and pedicels woolly, not much thicker at the summit: sterile spikelet staminate or neuter. — 11. ELYONURUS.
Pedicel not thickened (if slightly so the spikelets awned), neither appressed nor adnate to the rachis-joint, this usually slender: spikelets usually awned.
Fertile spikelet with a hairy-pointed callus, formed of the attached supporting rachis-joint or pedicel: awns strong.
Racemes reduced to a single joint, long-peduncled, in a simple open panicle. — 15. RHAPHIS.
Racemes of several to many joints, single. — 16. HETEROPOGON.
Fertile spikelet without a callus, the rachis disarticulating immediately below the spikelet: awns slender, sometimes wanting.
Racemes of several to many joints, solitary, digitate, or aggregate. — 12. ANDROPOGON.
Racemes reduced to 1 or few joints: these mostly peduncled in a subsimple or compound panicle.
Pedicellate spikelets staminate. — 13. HOLCUS.
Pedicellate spikelets wanting, the pedicel only present. — 14. SORGHASTRUM.

Tribe III. NAZIEAE

Annuals with flat leaf-blades and spikes of bur-like spikelets. — 17. NAZIA.

Tribe IV. PANICEAE

Spikelets monoecious: leaf-blades petioled. — 38. OLYRA.
Spikelets all perfect.
Spikelets of 2 kinds, aerial and subterranean. — 37. AMPHICARPON.
Spikelets all of one kind.
Spikelets sunken in the cavities of the flattened corky rachis. — 36. STENOTAPHRUM.
Spikelets not sunken in the rachis.
Spikelets subtended or surrounded by 1 to many bristles, these distinct or more or less connate, forming an involucre.
Bristles persistent, the spikelets deciduous. — 33. CHAETOCHLOA.
Bristles falling with the spikelets at maturity.
Bristles not united at base, slender, often plumose. — 34. PENNISETUM.
Bristles united into a bur-like involucre, the bristles retrorsely barbed. — 35. CENCHRUS.

- Spikelets not subtended by bristles.
  - Glumes or sterile lemma awned. (Awn short, concealed in the silky hairs of the spikelet in *Tricholaena*: awn reduced to a point in *Echinochloa colonum*.)
    - Inflorescence paniculate: spikelets silky. — 32. TRICHOLAENA.
    - Inflorescence of unilateral simple or somewhat compound racemes along a common axis: spikelets smooth or hispid, not silky.
      - Leaf-blades lanceolate, broad and thin: glumes 2-lobed, awned from between the lobes. — 30. OPLISMENUS.
      - Leaf-blades long and narrow: glumes awned from the tip. — 31. ECHINOCHLOA.
  - Glumes and sterile lemma awnless.
    - Fruit cartilaginous-indurate, flexible, usually dark-colored, the lemma with more or less prominent white hyaline margins, these not inrolled.
      - Spikelets in racemes, covered with long silky hairs, the racemes panicled. — 19. VALOTA.
      - Spikelets glabrous or variously pubescent, but not long-silky.
        - Spikelets in slender racemes more or less digitate. — 20. SYNTHERISMA.
        - Spikelets in panicles.
          - Fertile lemma boat-shaped: panicles narrow. — 18. ANTHAENANTIA.
          - Fertile lemma convex: panicles diffuse. — 21. LEPTOLOMA.
    - Fruit chartaceous-indurate, rigid.
      - Spikelets placed with the back of the fruit turned away from the rachis of the racemes, usually single (not in pairs).
        - First glume and the rachilla-joint forming a swollen ring-like callus below the spikelet. — 22. ERIOCHLOA.
        - First glume present or wanting, not forming a ring-like callus below the spikelet.
          - First glume present: racemes racemose along the main axis. — 23. BRACHIARIA.
          - First glume wanting: racemes digitate or subdigitate. — 24. AXONOPUS.
      - Spikelets placed with the back of the fruit turned toward the rachis of the spike-like racemes, or pedicellate in panicles.
        - Fruit long-acuminate: both glumes wanting. — 25. REIMAROCHLOA.
        - Fruit not long-acuminate: at least one glume present.
          - First glume typically wanting: spikelets plano-convex, sub-sessile in spike-like racemes. — 26. PASPALUM.
          - First glume present: spikelets usually in panicles.
            - Second glume inflated-saccate, this and the sterile lemma much exceeding the stipitate fruit. — 29. SACCIOLEPIS.
            - Second glume not inflated-saccate.
              - Stems woody: plants bamboo-like: fruit with a tuft of down at the apex. — 28. LASIACIS.
              - Stems herbaceous: no tuft of down at the apex of the fruit. — 27. PANICUM.

Tribe V. ORYZEAE

- Glumes minute: lemma often awned. — 39. ORYZA.
- Glumes wanting: lemma awnless. — 40. HOMALOCENCHRUS.

Tribe VI. ZIZANIEAE

Stem slender, low: staminate and pistillate spikelets borne in separate inflorescences.
  Inflorescence a few-flowered spike: plants not stoloniferous. — 41. HYDROCHLOA.
  Inflorescence a panicle: plants stoloniferous. — 42. LUZIOLA.
Stem robust, tall: staminate and pistillate spikelets borne in the same panicle.
  Spikelets in pairs, the larger one sessile and pistillate, the smaller staminate and pedicellate. — 45. PHARUS.
  Spikelets not paired.
    Plant annual: pistillate spikelets on the ascending upper branches, the staminate on the spreading lower branches of the panicle. — 44. ZIZANIA.
    Plant perennial: pistillate spikelets at the ends, the staminate below on the same branches of the panicle. — 43. ZIZANIOPSIS.

Tribe VII. PHALARIDEAE

Sterile florets reduced to small awnless scale-like lemmas: spikelets much compressed laterally. — 46. PHALARIS.
Sterile florets consisting of awned hairy empty lemmas exceeding the fertile floret: spikelets terete. — 47. ANTHOXANTHUM.

Tribe VIII. AGROSTIDEAE

Rachilla articulate below the glumes, these falling with the spikelet.
  Glumes long-awned. — 55. POLYPOGON.
  Glumes awnless.
    Rachilla not prolonged behind the palea: panicle dense and spike-like: glumes united toward the base, ciliate on the keel. — 53. ALOPECURUS.
    Rachilla prolonged behind the palea: panicle narrow or open, not dense: glumes not united, not ciliate on the keel.
      Panicle narrow; lemma with a slender bent twisted awn from the bifid apex. — 56. LIMNODEA.
      Panicle open and drooping: lemma with a minute straight awn just below the entire apex. — 57. CINNA.
Rachilla articulate above the glumes.
  Fruit indurate, terete, awned, the nerves obscure: callus well-developed, oblique, bearded.
    Awn trifid, the lateral divisions sometimes short, rarely obsolete (when obsolete no line of demarcation between awn and lemma as in the next). — 48. ARISTIDA.
    Awn simple, a line of demarcation between the awn and the lemma. — 49. STIPA.
  Fruit thin, or firm, but scarcely indurate, if firm the nerves prominent or evident: callus not well-developed.
    Glumes longer than the lemma.
      Glumes compressed-carinate, abruptly mucronate, stiffly ciliate on the keels: panicle dense, cylindric or ellipsoid. — 52. PHLEUM.
      Glumes not compressed-carinate, not ciliate.
        Florets bearing a tuft of hairs at the base from the short callus, the hairs at least half as long as the lemma. — 59. CALAMAGROSTIS.
        Florets without hairs at the base or the hairs very short. — 58. AGROSTIS.
    Glumes not longer than the lemma, usually shorter (the awn-tips longer in *Muhlenbergia racemosa*).
      Lemma awned from the tip or mucronate, 3–5-nerved.
        Rachilla prolonged behind the palea: floret stipitate. — 51. BRACHYELYTRUM.
        Rachilla not prolonged: floret not stipitate. — 50. MUHLENBERGIA.
Lemma awnless or awned from the back.
  Callus bearded: lemma and palea chartaceous, awnless.
    Panicles spike-like: rachilla prolonged. — 60. AMMOPHILA.
    Panicles open: rachilla not prolonged. — 61. CALAMOVILFA.
  Callus not bearded. — 54. SPOROBOLUS.

Tribe IX. AVENEAE

Spikelets falling entire: first glume much smaller than the second.	
Florets alike, perfect.	66. SPHENOPHOLIS.
Florets unlike, the lower perfect, awnless, the upper staminate and bearing a hooked awn.	62. NOTHOLCUS.
Spikelets not falling entire, the glume persistent.	
Florets 2, the lower staminate, awned; the upper perfect, awnless.	69. ARRHENATHERUM.
Florets 2 or more, all alike except the reduced upper ones.	
Awn arising from between the teeth of a bifid apex, flattened, twisted.	70. DANTHONIA.
Awn dorsal, not flattened: lemma often bifid at apex.	
Spikelets large, the glumes over 1.5 cm. long.	68. AVENA.
Spikelets less than 1 cm. long.	
Lemmas keeled: awn arising from above the middle.	
Lemmas bidentate: perennial.	65. TRISETUM.
Lemmas entire: annual.	67. KŒLERIA.
Lemmas convex: awn from below the middle.	
Rachilla prolonged behind the upper floret: lemmas truncate and erose-dentate.	63. AIRA.
Rachilla not prolonged: lemmas tapering into 2 slender teeth.	64. ASPRIS.

Tribe X. CHLORIDEAE

Spikelets with more than 1 perfect floret.	
Spikes numerous, slender, racemose on an elongate axis.	79. LEPTOCHLOA.
Spikes few, digitate or nearly so.	
Rachis of spike extending beyond the spikelets.	78. DACTYLOCTENIUM.
Rachis not prolonged.	77. ELEUSINE.
Spikelets with only 1 perfect floret, often with additional imperfect florets above.	
Spikelets without additional modified florets, the rachilla sometimes prolonged.	
Rachilla articulate below the glumes, the spikelets falling entire.	72. SPARTINA.
Rachilla articulate above the glumes.	
Spikes digitate: rachilla prolonged.	71. CAPRIOLA.
Spikes racemose along the main axis: rachilla not prolonged.	
Spikelets with one or more modified florets above the perfect one.	
Spikelets with 2 sterile florets below the perfect one: second glume bearing a squarrose spine on the back: spike single, recurved.	73. CAMPULOSUS.
Spikelets with no sterile florets below the perfect one: second glume without a squarrose spine: spikes usually several.	
Spikes digitate or nearly so.	74. CHLORIS.
Spikes racemose along the main axis.	
Spikelets distant, appressed: spikes slender, elongate.	75. GYMNOPOGON.
Spikelets contiguous or crowded, not appressed: spikes usually short, relatively stout.	76. BOUTELOUA.

Tribe XI. FESTUCEAE

Tall stout reeds with large plume-like panicles: lemmas or rachilla with long silky hairs as long as the lemmas.	
Lemmas hairy: rachilla naked.	81. ARUNDO.
Lemmas naked: rachilla hairy.	82. PHRAGMITES.
Low or rather tall stems, rarely over 1.5 m. tall.	
Plant dioecious, perennial: lemmas glabrous: grasses of salt or alkaline soil.	
Plant low and creeping: spikelets obscure, scarcely differentiated from the short crowded rigid leaves.	80. MONANTHOCHLOË.
Plant erect from creeping rootstocks: spikelets in a narrow simple exserted panicle.	89. DISTICHLIS.
Plant not dioecious (except in a few species of *Poa* with villous lemmas and in an annual species of *Eragrostis*).	

Lemmas 3-nerved, the nerves prominent, often hairy.
Lemmas pubescent on the nerves or callus: mid-nerve usually exserted as an awn or mucro.
Palea long-ciliate on the upper half. 84. TRIPLASIS.
Palea sometimes villous, but not long-ciliate on the upper half. 83. TRIODIA.
Lemmas not pubescent on the nerves or callus (the internerves sometimes sparsely pubescent), awnless.
Lemmas chartaceous: grain large and beaked, at maturity forcing the lemma and palea open. 87. DIARINA.
Lemmas membranaceous, if firm the grain neither large nor beaked. 85. ERAGROSTIS.
Lemmas 5- to many-nerved, the nerves sometimes obscure.
Spikelets with 1 to 4 empty lemmas below the fertile florets: nerves obscure: lemmas firm. 88. UNIOLA.
Spikelets with no empty lemmas below the fertile florets: nerves usually prominent: lemmas membranaceous (firm in a few species of *Bromus* and *Festuca*).
Lemmas keeled on the back.
Spikelets strongly compressed, crowded in 1-sided clusters at the ends of the stiff naked panicle-branches. 90. DACTYLIS.
Spikelets not strongly compressed, not crowded in 1-sided clusters.
Lemmas awned from a minutely bifid apex (awnless or nearly so in *B. unioloides*): spikelets large. 95. BROMUS.
Lemmas awnless: spikelets small. 91. POA.
Lemmas rounded on the back (slightly keeled toward the summit in *Festuca* and *Brōmus*).
Glumes papery: lemmas firm, strongly nerved, scarious-margined: upper florets sterile, often reduced to a club-shaped rudiment enfolded by the broad upper lemmas: spikelets tawny or purplish. 86. MELICA.
Glumes not papery: upper florets not unlike the others.
Nerves of the lemma prominent, parallel, not converging at the summit or but slightly so: lemmas awnless, mostly obtuse. 92. PANICULARIA.
Nerves of the lemma converging at the summit: lemmas awned or pointed.
Florets minute: spikelets many-flowered, in small rigid panicles. 94. SCLEROPOA.
Florets 4 mm. or more long: spikelets few to several flowered, not in rigid panicles.
Lemmas entire, awned from the tip or pointed. 93. FESTUCA.
Lemmas awned or awn-tipped from a minutely bifid apex. 95. BROMUS.

Tribe XII. HORDEAE

Spikelets solitary at each node of the rachis.
Spikelets placed edgewise to the rachis: glume 1 except in the terminal spikelet. 96. LOLIUM.
Spikelets placed flatwise to the rachis. 97. AGROPYRON.
Spikelets more than 1 at each node of the rachis.
Spikelets 3 at each node of the rachis, 1-flowered, the lateral pair pedicelled, usually reduced to awns. 98. HORDEUM.
Spikelets 2 at each node of the rachis, 2- to 6-flowered, all alike.
Glumes usually equalling the florets: spikelets appressed or ascending. 99. ELYMUS.
Glumes wanting or reduced to 2 short bristles: spikelets horizontally spreading at maturity: spikes very loose. 100. HYSTRIX.

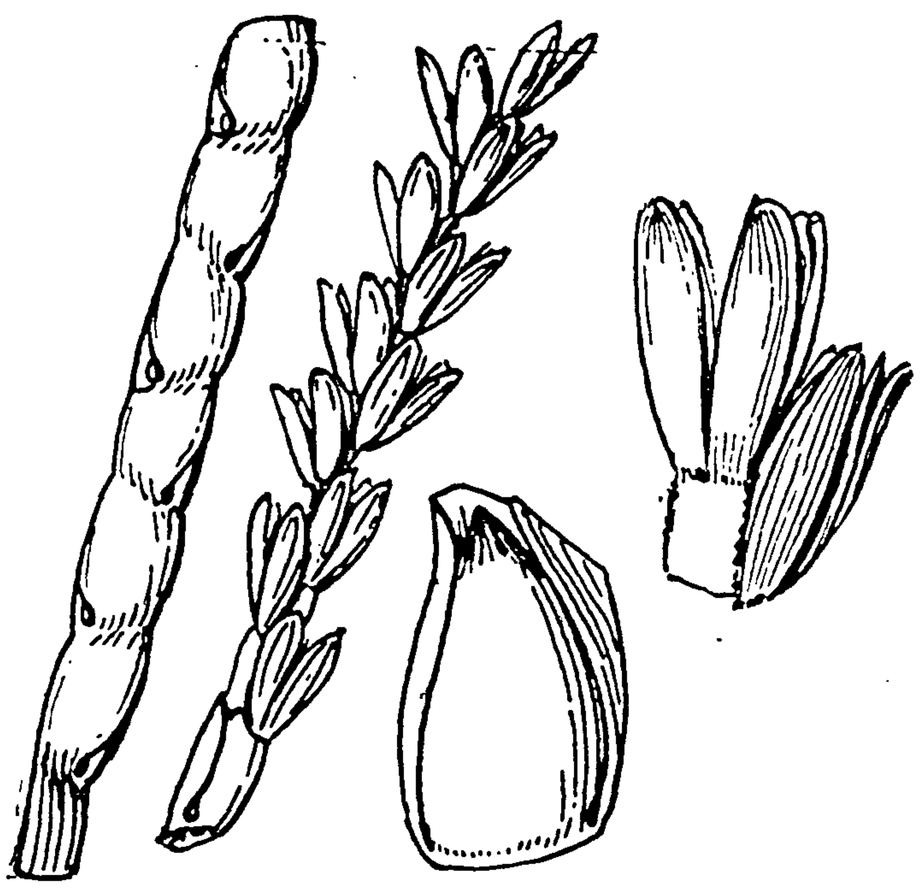
Tribe XIII. BAMBUSEAE

Gregarious woody grasses with usually branching stems. 101. ARUNDINARIA.

1. TRIPSACUM L. Robust perennials, with monoecious terminal and axillary inflorescences, of 1, 2, or 3 spikes, the pistillate below, breaking up into bony seed-like joints, the staminate above on the same rachis, deciduous as a whole. Staminate spikelets 2-flowered, in pairs on a continuous rachis, one sessile, the other sessile or pedicellate. Pistillate spikelets single at each joint of the thick, hard, articulate lower part of the same rachis, sunken in hollows in the joints, consisting of one perfect floret and a sterile lemma; first glume coriaceous, nearly enfolding the spikelet, fitting into and closing the hollow of the rachis: second glume similar to the first but smaller, enfolding the remainder of the spikelet: sterile and fertile lemmas and palea hyaline.—About 7 species in temperate and tropical America.—GAMA-GRASSES.

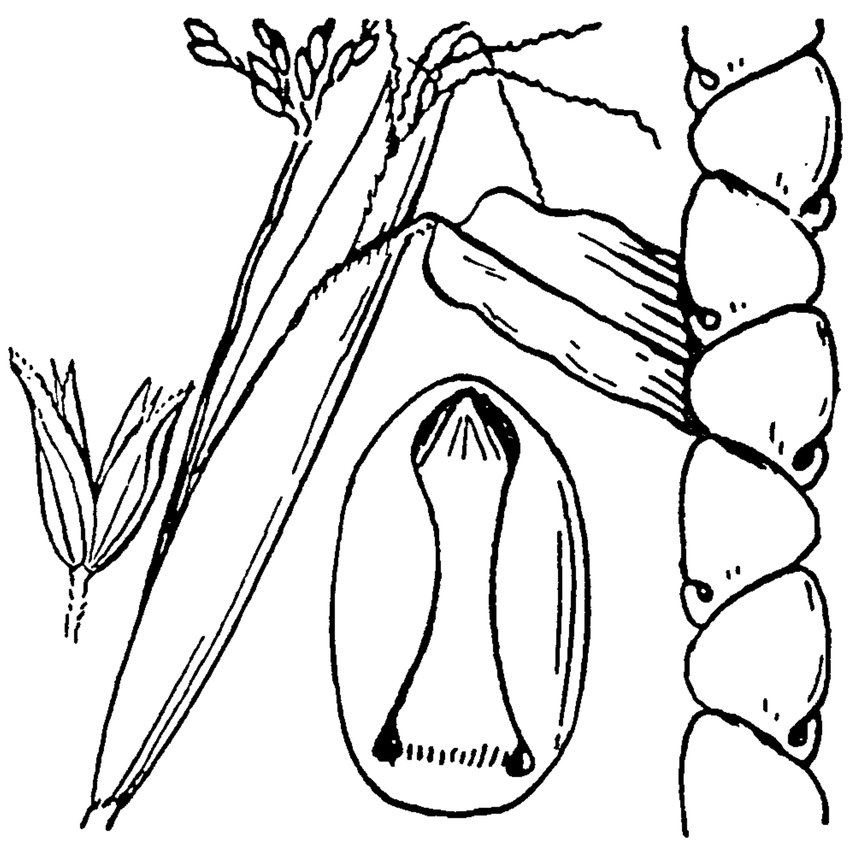
Leaf-blades 1–2 cm. wide, flat: plant 1–2 m. tall. 1. *T. dactyloides.*
Leaf-blades 1–3 mm. wide, more or less involute: plant less than 1 m. tall. 2. *T. floridanum.*

1. T. dactyloides L. Plant commonly 2–4 m. tall: leaf-blades more or less auricled at the base: rachis of the pistillate spike 5–6 mm. in diameter: terminal spikes usually 2–3 together, the contiguous sides flattened, those from the axils usually single, cylindric, the long purple stigmas showy during anthesis.—Moist soil, riverbanks, pond-margins, and hammocks, various provinces, Fla. to E Tex., Nebr., and R. I.—(*W. I., Mex., S. A.*)—Sum.–fall, or all year S.—Used for forage when abundant.



2. T. floridanum Porter. Smaller than *T. dactyloides* in all ways, commonly less than 1 m. tall: leaf-blades not auricled at the base: rachis of the pistillate spike 3–4 mm. in diameter.—Low rocky pinelands, Everglade Keys, and adj. Everglades, pen. Fla. and Florida Keys.—All year.

2. EUCHLAENA Schrad. Tall monoecious annuals or perennials, with broad leaf-blades and long sheaths. Staminate spikelets 2-flowered, in pairs, unequally pedicellate, on a simple rachis: racemes several, in a terminal corymbiform panicle. Pistillate spikelets single on opposite sides and sunken in cavities in the hardened joints of an obliquely articulate rachis, the indurate first glume covering the cavity, the spikes 2-several together, enclosed in the leaf-sheaths.—Three species, natives of Mex.

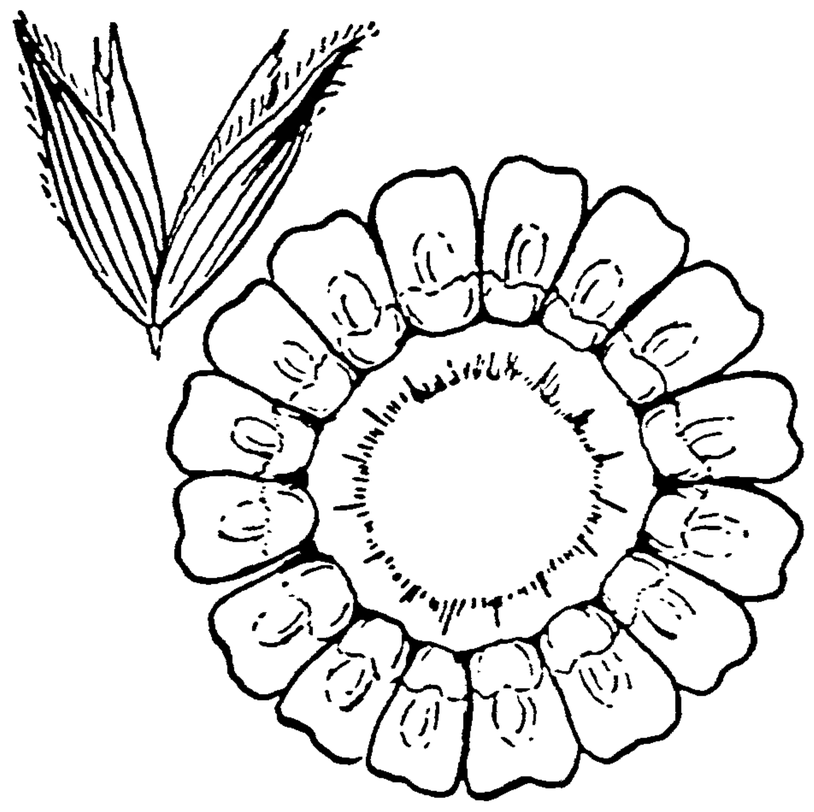


1. E. mexicana Schrad. Stem up to 5 m. tall: leaf-blades elongate-lanceolate, 1 m. long or less, up to 8 cm. wide: staminate racemes mostly 10–15 cm. long, the spikelets about 8 mm. long: pistillate enclosed in trapezoid joints: spikelets about 7 mm. long.—(TEOSINTE.)—Waste places and cultivated grounds, Fla. Nat. of Mex.

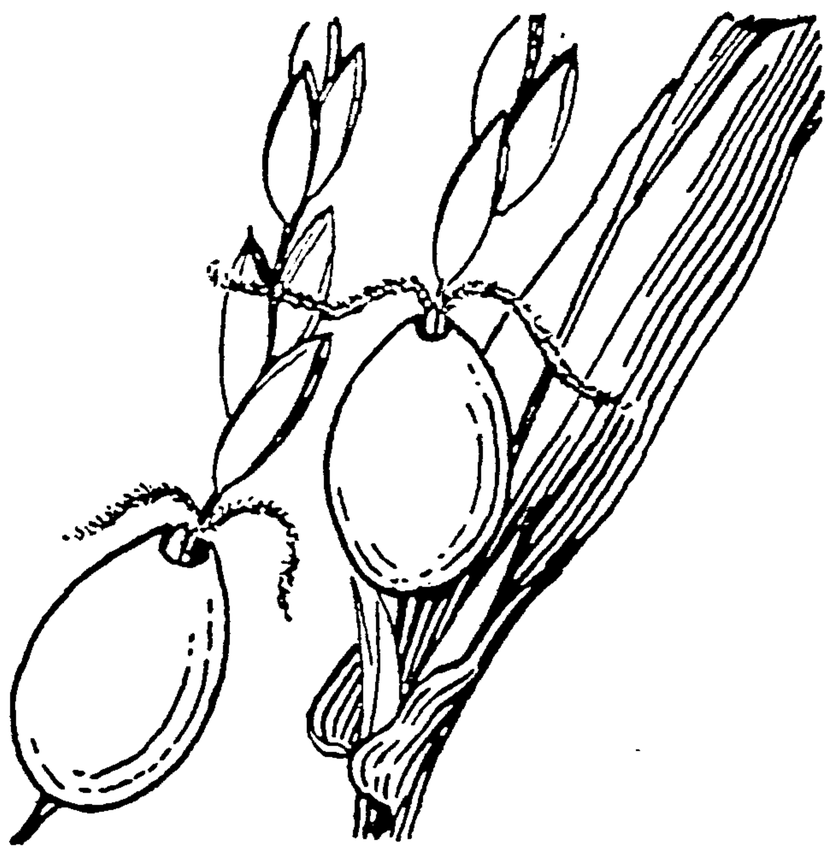
—Sum.–fall.—Plants rarely flower, and mature fruits only in S Fla. Grown for forage and for soil improvement.

3. ZEA L. A tall annual grass, with broad, conspicuously distichous blades, monoecious inflorescences, staminate flowers in spike-like racemes, these numerous, forming large spreading panicles (tassels) terminating the stems. Pistillate inflorescence in the axils of the leaves, the spikelets in 8 to 16 or even as many as 30 rows on a thickened, almost woody axis (cob), the whole enclosed in numerous large foliaceous bracts (husks), the long styles (silk) protruding from the tops as a silky mass of threads. Spikelets unisexual; staminate spikelets 2-flowered, in pairs, on one side of a continuous rachis, one nearly sessile, the other pedicellate: glumes membranaceous, acute: lemma and palea hyaline: pistillate spikelets sessile, in pairs, consisting of one fertile floret and one sterile floret, the latter sometimes developed as a second fertile floret: glumes broad, rounded or emarginate at apex: style very long and slender, stigmatic along both sides well toward the base.—Consists of the following species, known only in cultivation or as an escape, and in many varieties.

1. Z. Mays L. Stem up to 4 m. tall, stout, leafy: leaf-blades linear-lanceolate, elongate, fully 10 cm. wide, or less: staminate panicle erect, 20–30 cm. long, with spreading or drooping branches: pistillate panicle ultimately protruding from the leaf-sheaths, the grains white or variously colored.—(CORN. INDIAN-CORN. MAIZE.)—Roadsides, fields, and waste-places, locally throughout our range. Nat. of trop. Am.—Sum.–fall.—Extensively cultivated in many varieties in America from prehistoric times. Corn is one of the important economic plants of the world.

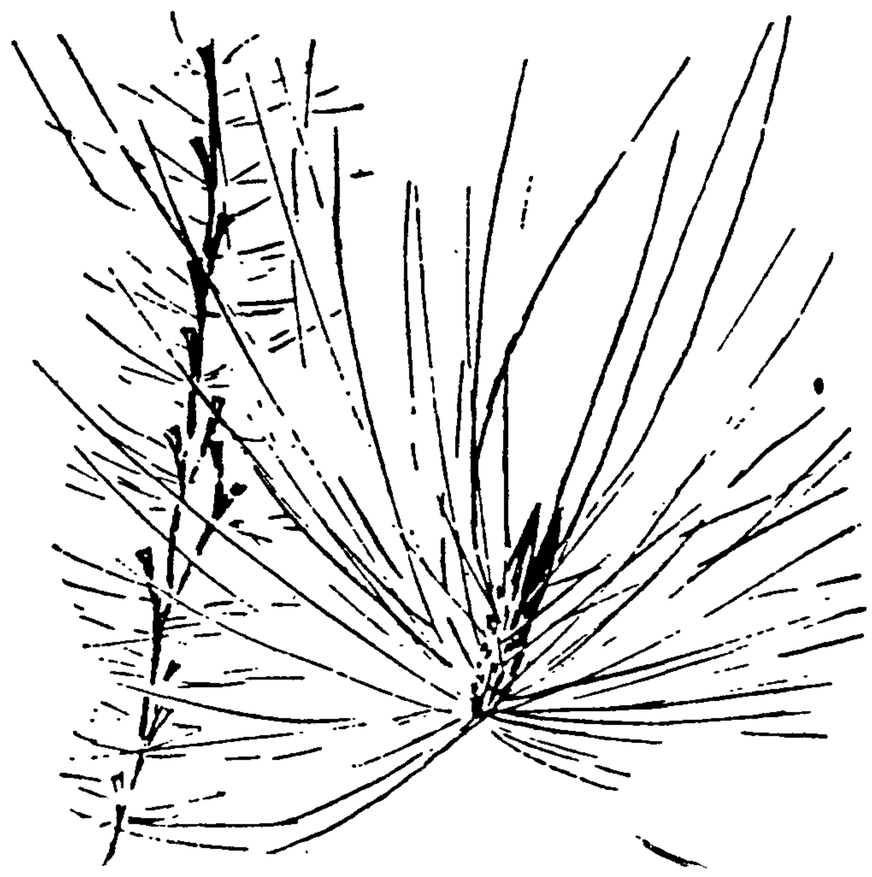


4. COIX L. Diffuse monoecious annuals, with narrow elongate leaf-blades. Inflorescence compound, each branch bearing a bead-like involucre enclosing 1 pistillate and 2 sterile spikelets, and a short staminate raceme on a slender peduncle protruding from an orifice at the summit of the involucre. Grain enclosed in the hard bead-like involucre.—Four species, natives of Asia; the following now widely distributed in the tropics.



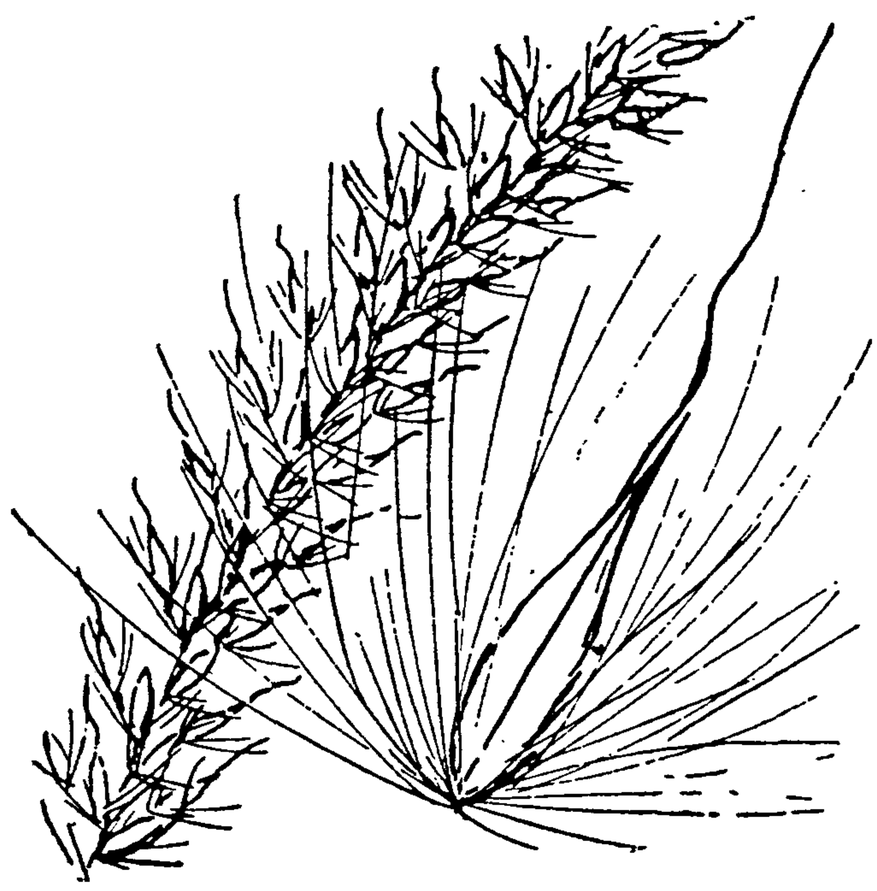
1. C. Lachryma-Jobi L. Stem 0.5–1.5 m. tall, much-branched: leaf-blades elongate, linear-lanceolate, 4 cm. wide or less: spikelets and spikes terminating fascicles of branches from the leaf-axils: involucres globular or ovoid, mostly about 1 cm. long, white or bluish, shining.—(TEAR-GRASS. JOB'S-TEARS. CHRIST'S-TEARS.)—Widely cult. and locally escaped, cult. grounds and roadsides, Coastal Plain, Fla. to Tex. Nat. of E Ind.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall.—Employed medicinally, while the hard mature involucres are used as beads.

5. **IMPERATA** Cyr. Slender erect perennials with terminal narrow woolly panicles. Spikelets all alike, awnless, in pairs, unequally pedicellate on a slender continuous rachis, surrounded by long silky hairs: glumes about equal, membranaceous: sterile lemma, fertile lemma, and palea thin and hyaline.—Five species, in nearly all tropical and subtropical regions.



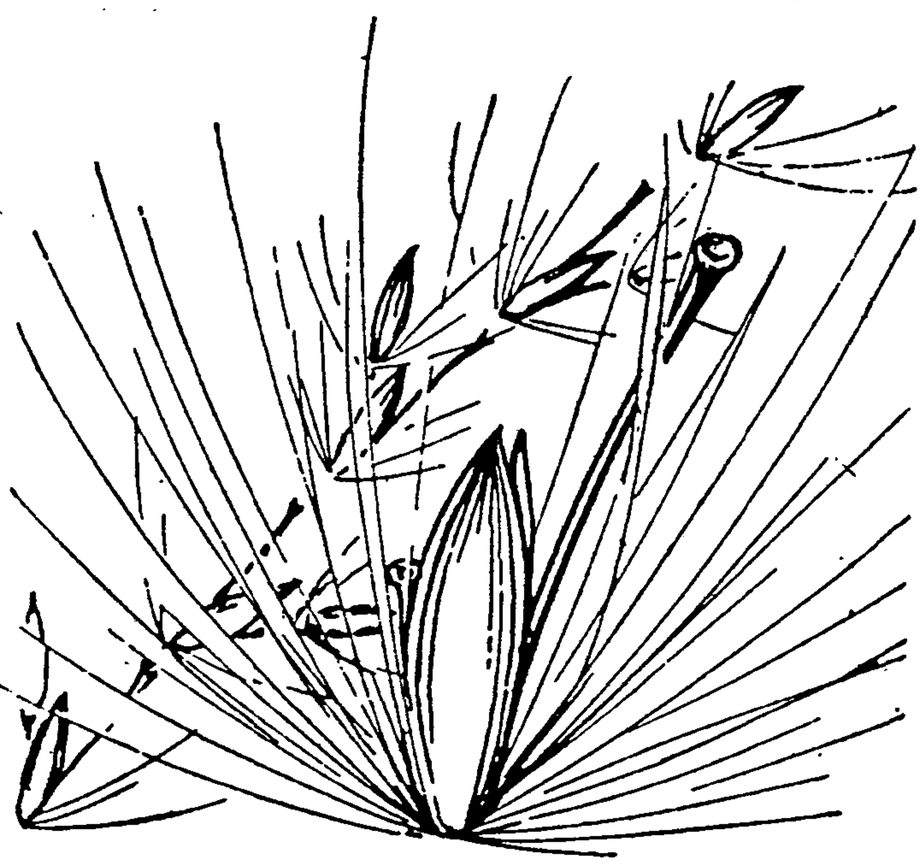
1. I. brasiliensis Trin. Stem 0.5–1 m. tall, from scaly rootstocks: leaf-blades mostly basal, 3–8 mm. wide, the stem-blades short, the uppermost leaf reduced to a nearly bladeless sheath: panicle pale, usually not over 10 cm. long.—(BRAZILIAN BLADY-GRASS. SILVER-PLUME.)—Pinelands, prairies, sand-dunes and Everglades, S pen. Fla.—(*W. I., Mex., C. A., S. A.*)—All year.—Conspicuous on account of the erect narrow silvery plume-like inflorescence. The plants are often tufted.

6. **MISCANTHUS** Anderss. Robust perennials with usually flat leaf-blades and terminal panicles of aggregate slender racemes. Spikelets all perfect, in pairs, unequally pedicellate along a continuous rachis: glumes membranous: lemma hyaline, 2-toothed, with a slender, somewhat geniculate and flexuous awn.—Six species, natives of Asia.



1. M. sinensis Anderss. Stems 1–2 m. tall: leaf-blades 80 cm. long or less, 1–1.5 cm. wide: panicle 20–40 cm. long, flabellate: spikelets 4.5–5 mm. long, yellowish-brown, shining, encircled at the base with white or purplish hairs equalling or exceeding the spikelet, the awns 8–10 mm. long, twisted at the base.—(EULALIA.)—Waste-places and roadsides, various provinces, Fla. to Miss. and Mass. Escaped from cult. Nat. of E Asia.—Spr.–fall.—Frequently cultivated for ornament. Sometimes with variegated leaves.

7. **SACCHARUM** L. Tall perennials with many-jointed stems, flat leaf-blades, and usually large loose silky terminal panicles. Spikelets in pairs, one sessile, the other pedicellate, both perfect, awnless, in slender racemes, the rachis disarticulating. Glumes acute, membranous, or indurate at base: lemmas hyaline, the fertile sometimes wanting.—Twelve species, most abundant in the tropical regions of the Old World.



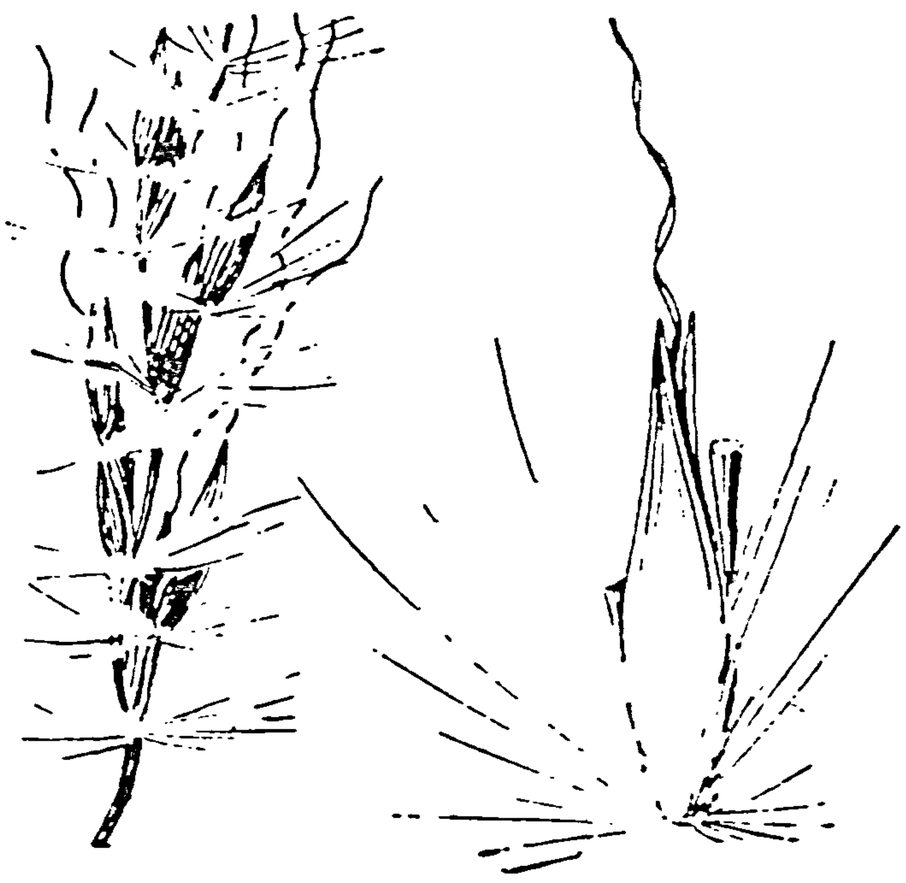
1. S. officinarum L. Stem tall and leafy, sometimes several meters high, usually decumbent and rooting at the base: leaf-blades often over 1 m. long, 6 cm. wide or less: panicle plume-like, mostly 60 cm. long or more, loose.—(SUGAR-CANE.)—Old fields

and cult. grounds, Coastal Plain, Gulf States. Often persisting after cult. Nat. of trop. Asia.—Spr.–fall.—Cultivated in many varieties as sugar-cane, the main source of sugar. Sometimes used for forage. Matures its fruit in Fla.

8. **ERIANTHUS** Michx. Reed-like perennials, with flat leaf-blades and terminal oblong usually dense silky panicles. Spikelets all alike, in pairs along a slender axis, 1 sessile, the other pedicellate, the rachis disarticulating below the spikelets, the rachis-joint and pedicel falling attached to the sessile-spikelet: glumes coriaceous, equal, usually copiously clothed, at least at the base, with long silky spreading hairs: sterile and fertile lemmas hyaline, the latter bearing a slender awn: palea small, hyaline.—About 20 species, natives of nearly all tropical and temperate regions.—WOOLLY BEARD-GRASSES. PLUME-GRASSES.—Some species are cultivated for ornament, but the plants are too coarse for forage.

Spikelets with a tuft of hairs at base.
  Awn flat, spirally coiled at base, the upper portion more or less bent and flexuous or loosely spiral.
    Basal hairs about as long as the brownish spikelets: panicle not conspicuously hairy, the main axis and branches visible: stems usually glabrous below panicle. 1. *E. contortus.*
    Basal hairs copious, about twice as long as the yellowish spikelets: panicle conspicuously woolly, the hairs hiding the main axis and branches: stems villous below panicle. 2. *E. divaricatus.*
  Awn terete, or at base flattened, not coiled, the upper portion usually straight, sometimes flexuous.
    Basal hairs rather sparse, shorter than the spikelet. 3. *E. brevibarbis.*
    Basal hairs copious, longer than the spikelet. 4. *E. saccharoides.*
Spikelets naked, or nearly so, at base. 5. *E. strictus.*

1. E. contortus Ell. Stem 1–2 m. tall, glabrous or sometimes sparsely appressed-pilose below the panicle, the nodes glabrous or pubescent with erect deciduous hairs: panicle 15–30 cm. long, narrow, the branches ascending but not closely appressed: spikelets 6–8 mm. long, brownish, glabrous on the back, the rachis-joints and pedicels villous, the awn about 2 cm. long. [*E. Smallii* Nash]—Moist pinelands, thickets, and dry slopes, Coastal Plain, Fla. to E Tex., Okla., and Md.



2. E. divaricatus (L.) A. Hitchc. Stem 1.5–3 m. tall, appressed-villous below the panicle, the nodes usually appressed-hirsute: panicle 20–30 cm. long, tawny or purplish: spikelets 5–6 mm. long, pale, sparsely villous, shorter than the copious basal hairs, the awns 1–1.5 cm. long. [*E. alopecuroides* Ell.]—Damp woods, thickets, rocky hills, and borders of fields, Coastal Plain and occasionally more northern provinces, Fla. to E Tex. and S N. J.

3. E. brevibarbis Michx. Stem 1–2 m. tall, glabrous, the nodes glabrous or appressed-hirsute: panicle 20–30 cm. long, brown or purplish, the branches ascending, not conspicuously woolly: spikelets 6–7 mm. long, brown.—Moist soil, low thickets and about ponds, Coastal Plain, Fla. to La. and Del.

4. E. saccharoides Michx. Stem 1–3 m. tall, appressed-villous below the panicle, the nodes hispid with appressed-deciduous hairs: panicle oblong or ovoid, tawny or purplish, 10–40 cm. long, rather compact (*E. compactus*) or somewhat open: spikelets 5–7 mm. long, sparsely long-villous on the upper part. [*E. laxus* Nash *E. compactus* Nash *E. Tracyi* Nash]—Moist soil,

swamps, wet hammocks, and marshes, Coastal Plain, Fla. to E Tex. and N. J.—(*W. I.*)

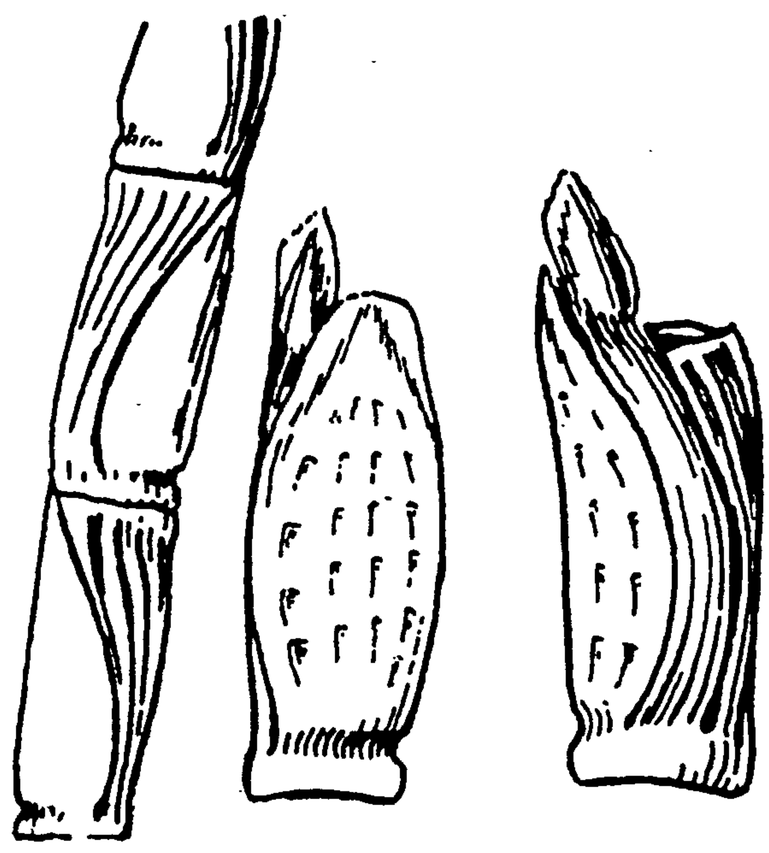
5. E. strictus Baldw. Stem 1–2 m. tall, glabrous, the nodes hirsute with stiff erect deciduous hairs: panicle 20–40 cm. long, strict, the branches closely appressed: spikelets about 8 mm. long, scabrous, the awn straight, about 1.5 cm. long.—Moist soil, marshes, low thickets and beds of streams, Coastal Plain and rarely adj. provinces, Fla. to Tex., S Mo., Tenn., and S. C.

9. MANISURIS L. Slender rather tall perennials or annuals with usually numerous smooth cylindric or flattened spikes or racemes, single on the stem and branches. Spikelets awnless in pairs at the nodes of a thickened articulate rachis, one sessile and fertile, the other pedicellate and sterile, the pedicel thickened and appressed to the rachis, the sessile spikelet fitting closely against the rachis, forming a cylindric or subcylindric raceme: glumes obtuse, the first coriaceous, fitting over the hollow containing the spikelet, the second less coriaceous than the first; sterile and fertile lemmas and palea hyaline: pedicellate spikelet reduced, often rudimentary. [*Röttboellia* L. f.]—About 20 species, natives of the warm temperate and tropical regions of both hemispheres. Of little economic importance.

Plant perennial.
- Leaf-sheath not compressed-keeled: first glume more or less pitted. — 1. *M. campestris*
- Leaf-sheath compressed-keeled: first glume tessellated or wrinkled, rarely smooth.
  - First glume tessellated, the depressions rectangular. — 2. *M. tessellata.*
  - First glume wrinkled, tubercled, or smooth.
    - Glume bearing prominent transverse wrinkles. — 3. *M. rugosa.*
    - Glume bearing a few low tubercles or smooth. — 4. *M. tuberculosa.*

Plant annual. — 5. *M. exaltata.*

1. M. campestris (Nutt.) A. Hitchc. Stem 0.3–1 tall, erect, rather slender, producing short rootstocks: leaf-blades 1–2 mm. wide: raceme 5–15 cm. long, slightly curved: first glume 4–5 mm. long, pitted along the obscure nerves. [*R. campestris* Nutt *R. cylindrica* Chapm. *M. cylindrica* Kuntze]—Pinelands and prairies, Coastal Plain, Fla. to E Tex., S Mo., and S. C.



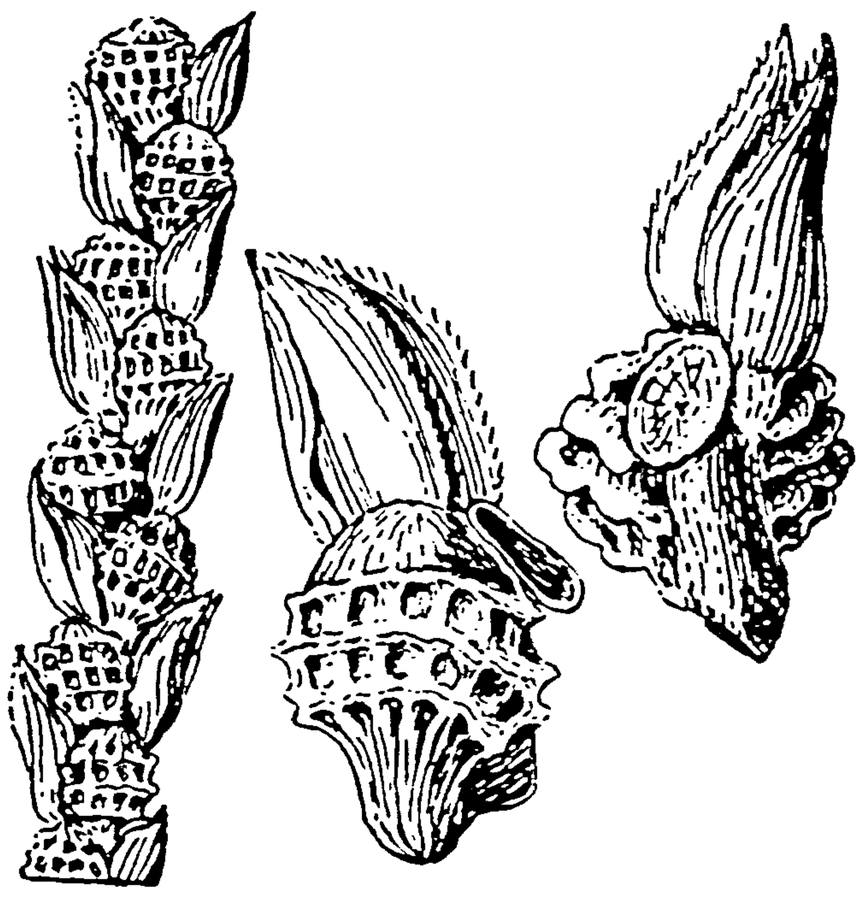
2. M. tessellata (Steud.) Scribn. Stem 0.8–1.2 m. tall, rather stout: raceme 5–12 cm. long; spikelets about 4 mm. long. [*R. corrugata* Chapm.]—Moist pinelands, Coastal Plain, Fla. to La. and Ala.

3. M. rugosa (Nutt.) Kuntze. Stem 0.7–1.2 m. tall: raceme 5–8 cm. long: first glume with prominent transverse ridges. [*M. Chapmani* Nash *R. rugosa* Nutt.]—Wet pinelands, Coastal Plain, Fla. to E Tex. and S N. J.

4. M. tuberculosa Nash. Similar to *M. rugosa*; but the first glume with a few short ridges or low tubercles, these sometimes obscure or wanting, the glume then smooth and shining.—Lake shores and about ponds, pen. Fla.

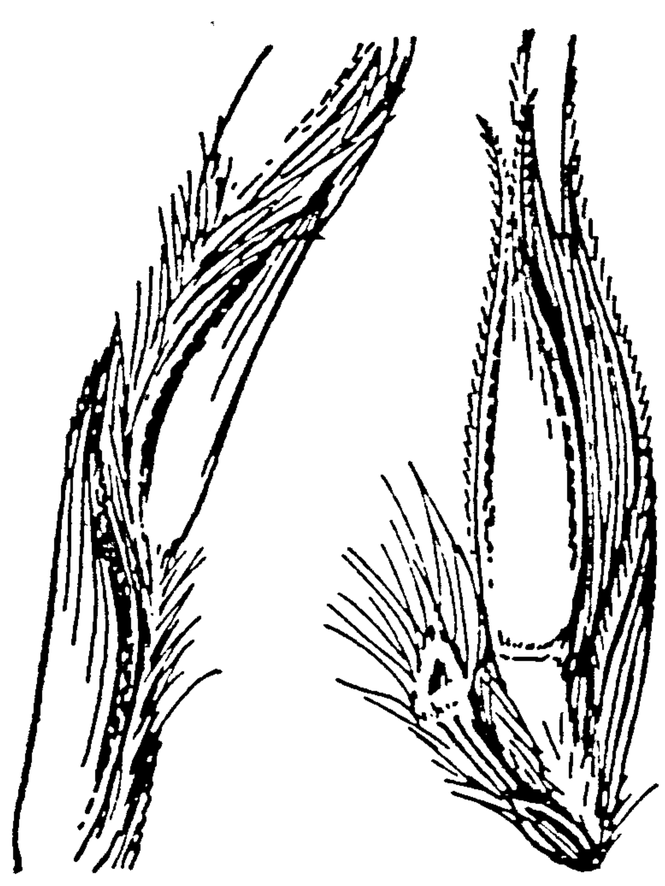
5. M. exaltata (L. f.) Kuntze. Stem stout, 1 m. tall or more, branching: leaf-sheaths hispid; leaf-blades elongate, 1–2.5 cm. wide: racemes numerous, more or less included at base, dwindling at the summit and bearing abortive spikelets only: first glume of sessile spikelet smooth.—Moist soil, S Fla. Nat. of S Asia. (*W. I.*)

10. RYTILIX Raf. Much branched erect annuals with flat leaf-blades, the numerous racemes single and more or less enclosed in the sheathing bract, these somewhat clustered in the axils of the leaves. Spikelets awnless, in pairs, the rachis-joint and pedicel grown together, the two clasped between the edges of the globose alveolate first glume of the sessile spikelet: pedicellate spikelet conspicuous, staminate. [*Hackelochloa* Kuntze] —Consists of the following species only:



1. R. granularis (L.) Skeels. Stem as much as 1 m. tall: leaf-sheaths papillose-hispid: raceme 1–2 cm. long. [*Manisuris granularis* Sw. *Hackelochloa granularis* Kuntze]—Pinelands, prairies, and waste grounds, various provinces, Fla. and Ga. to Ariz. Nat. of E I.—(*W. I., Mex., C. A., S. A., O. W.*)—A weed in many countries.

11. ELYONURUS Humb. & Bonpl. Erect moderately tall perennials with solitary spike-like racemes. Spikelets awnless, in pairs along a somewhat tardily disarticulating rachis, the joints and pedicels thickened and parallel, the sessile spikelets appressed to the concave side, the pedicellate spikelet staminate, similar to the sessile one, the pairs falling with a joint of the rachis: first glume firm, somewhat coriaceous, with a line of balsam glands on the marginal nerves, the apex acute or acuminate, bifid: second glume similar to the first: sterile and fertile lemmas hyaline: palea obsolete.—About 15 species, circumtropical.—Important grazing grasses in tropical America.



1. E. tripsacoides Humb. & Bonpl. Stem 0.6–1.2 m. tall: leaf-blades flat or involute, 2–4 mm. wide, slightly pilose on the upper surface below: raceme 7–12 cm. long: sessile spikelet 6–8 mm. long.—Hammocks, pinelands, prairies, and open grassy slopes, Coastal Plain, Fla. to Tex. and Ga.—(*Mex.,C. A., S. A.*)

12. ANDROPOGON [Royen] L. Mostly slender perennials (in our range), with solid sometimes tufted stems, the spikelets arranged in racemes, these single, in pairs, or in 3's or 4's, the common peduncle usually enclosed by a spathe-like sheath, these sheaths often numerous, forming a compound inflorescence, usually narrow, but sometimes in dense subcorymbose masses. Spikelets in pairs at each node of an articulate rachis, one sessile and perfect, the other pedicellate and staminate, neuter or reduced to the pedicel, the rachis and pedicels of sterile spikelet often villous, sometimes conspicuously so: glumes of fertile spikelet coriaceous, narrow, the first rounded, flat, or concave on the back, several-nerved, the median nerve weak or wanting: sterile lemma hyaline: fertile lemma hyaline, narrow, entire or bifid, usually bearing a bent and twisted

awn: palea hyaline, small or wanting: pedicellate spikelet sometimes staminate and about as large as the sessile spikelet, sometimes reduced or wanting, only the pedicel present. [*Schizachyrium* Nees]—About 150 species widely distributed in temperate and tropical regions.—BROOM-GRASSES. BEARD-GRASSES. SAGE-GRASSES. SAND-GRASSES. BUNCH-GRASSES.—Some species are important forage grasses.

Racemes single, from bract-like sheaths.—(*Schizachyrium.*) I. SCOPARII.
Racemes more than one from the spathe or several in a panicle on a naked peduncle.—(*Andropogon.*) II. FURCATI.

I. SCOPARII

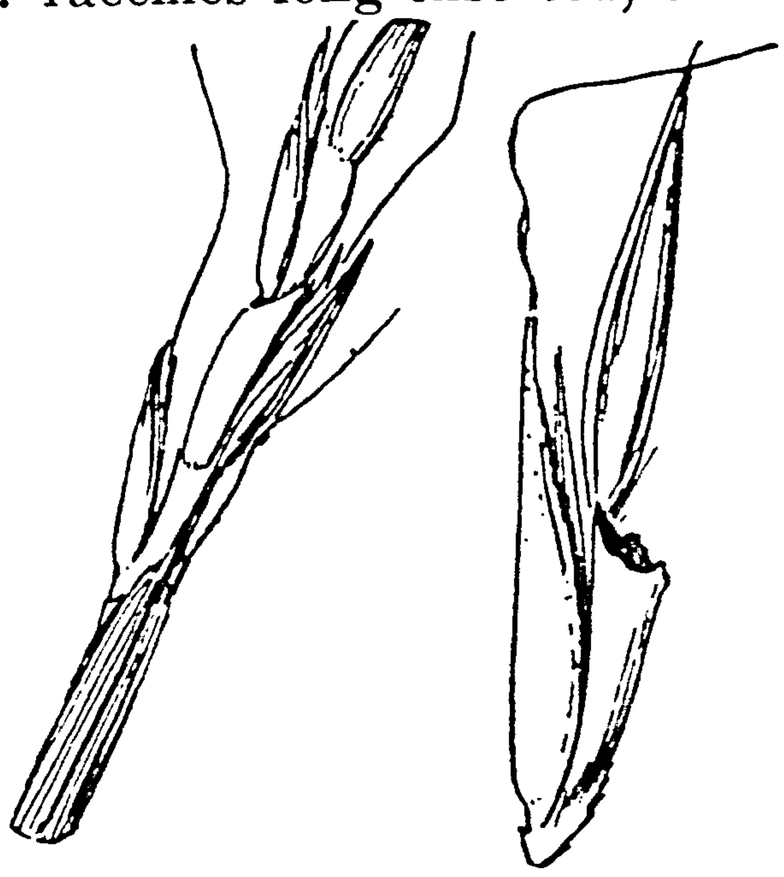
Leaf-blade flat or folded, not terete.
  First glume of sessile spikelet glabrous.
    Internodes of rachis glabrous or ciliate at base and near apex only.
      Sessile spikelet 4 mm. long: leaf-blades scarcely 1 mm. wide. 1. *A. tener.*
      Sessile spikelet about 6 mm. long: leaf-blades mostly 2–4 mm. wide. 2. *A. semiberbis.*
    Internodes of rachis and sterile pedicel villous from base to apex.
      Rootstock present.
        Sessile spikelet about 1 cm. long.
          Glume of pedicellate spikelet 1-awned. 3. *A. maritimus.*
          Glume of pedicellate spikelet 3-awned. 4. *A. littoralis.*
        Sessile spikelet 6 mm. long. 5. *A. stolonifer.*
      Rootstock wanting. 6. *A. scoparius.*
  First glume of sessile spikelet villous. 7. *A. hirtiflorus.*
Leaf-blade slender, terete, the upper surface a mere groove. 8. *A. gracilis.*

II. FURCATI

Pedicellate spikelet staminate, similar to the sessile spikelet. 9. *A. provincialis.*
Pedicellate spikelet reduced to 1 or 2 glumes.
  Racemes in pairs, the spathes aggregate in a flabellate inflorescence. 10. *A. glomeratus.*
  Racemes 2–4, the spathes not aggregate (somewhat aggregate in *A. capillipes*).
    Peduncle of the 2 (sometimes 3 or 4) racemes less than 1 cm. long, (2 cm. in *A. Tracyi*) enclosed in the spathe.
      Silky hairs of the spike dense, concealing the rachis and sterile pedicels.
        Peduncles in each spathe about 5 mm. long. 11. *A. longiberbis.*
        Peduncles in each spathe about 2 cm. long. 11a. *A. Tracyi.*
      Silky hairs of the spike comparatively sparse, not concealing the rachis and sterile pedicels.
        Plant green, more or less pilose on the leaf-sheaths or blades. 12. *A. virginicus.*
        Plant glabrous, often glaucous.
          Ligule truncate, concealed within the folded blade. 13. *A. capillipes.*
          Ligule acutish, protruding from the folded blade. 14. *A. perangustatus.*
    Peduncle of the 2–4 racemes more than 1 cm. long, often long-exserted from the spathe.
      Racemes in pairs, usually not over 15 mm. long: branches bearing the spathes numerous and slender. 15. *A. brachystachys.*
      Racemes more than 15 mm. long.
        Sheaths, especially the upper, long and inflated, more or less aggregate: rachis very slender and flexuous, the internodes 2–3 mm. long. 16. *A. Elliottii.*
        Sheaths not conspicuously inflated (or occasionally so in *A. campyloracheus*).
          Rachis conspicuously slender and flexuous, the internodes 7–10 mm. long. 17. *A. campyloracheus.*
          Rachis not conspicuously slender: racemes densely silky.
            Racemes in 4's: plant stout, the sheaths usually woolly. 18. *A. Mohrii.*
            Racemes in pairs.
              First glume of sessile spikelet 2-nerved between the keels: hairs

on rachis and sterile pedicels not concealing spikelets. — 19. *A. Cabanisii.*
First glume of sessile spikelet nerveless between the keels.
Awn twisted into a column at base. (see *A. Tracyi*)
Stamen 1 : spikelets 4–5 mm. long, with brownish hairs about as long, not concealing the spikelets : awn rather short. — 20. *A. arctatus.*
Stamens 3 : spikelets 5–7 mm. long, with silvery white hairs as long or longer, concealing the spikelets : awn 15–20 mm. long. — 21. *A. ternarius.*
Awn not twisted into a column at base : plant stout, much-branched : spikelets 3 mm. long. — 22. *A. floridanus.*

1. A. tener (Nees) Kunth. Stem slender, 0.6–1 m. tall, sometimes reclining or decumbent: leaf-blades scarcely 1 mm. wide: racemes long-exserted, slender, glabrous, 2–6 cm. long: first glume of sessile spikelet about 3 mm. long, the awn 7–10 mm. long. [*S. tenerum* Nees]—Dry pinelands, woods, and prairies, Coastal Plain, Fla. to La. and Tex.—(*W. I., Mex., C. A., S. A.*)



2. A. semiberbis (Nees) Kunth. Stem glabrous, erect, 0.6–1.2 m. tall: leaf-blades glabrous, 2–4 mm. wide: racemes erect, 5–8 cm. long, the rachis straight, the joints short-hispid at base with erect hairs: sessile spikelet about 6 mm. long, acuminate, the awn 10–15 mm. long: sterile pedicel ciliate on one margin from below the middle. [*S. semiberbe* Nees]—Pinelands, pen. Fla.—(*W. I., S. A.*)

3. A. maritimus Chapm. Stem decumbent at base, often glaucous, 0.4–0.6 m. long: leaf-sheaths compressed and keeled: racemes 3–5 cm. long, the rachis slender and becoming flexuous, the hairs about 5 mm. long: sessile spikelet 8–10 mm. long, glabrous, the awn about 1 cm. long: sterile spikelet staminate, nearly as large as the fertile. [*S. maritimum* Nash]—Coastal sands, W Fla. and Miss.

4. A. littoralis Nash. Resembling *A. maritimus*: sterile spikelet a single glume about 5 mm. long, the 3 nerves extending into cusps or awns, the central distinct, the lateral usually minute, sometimes wanting. [*S. littorale* Bickn. *S. triaristatum* Nash]—Sand-dunes and beaches, Coastal Plain, Fla. to Tex., N. Y., and N. J.

5. A. stolonifer (Nash) A. Hitchc. Stem 0.6–1 m. tall, often glaucous: leaf-sheaths glabrous: racemes 3–4 cm. long, the rachis slender and flexuous, the hairs about 3 mm. long: sterile spikelet about 3 mm. long. [*S. stoloniferum* Nash]—Pinelands, prairies, hammocks, and scrublands, Coastal Plain, Fla., and Ga.—Differs from *A. scoparius* in having rootstocks. Forms rarely have villous leaf-sheaths.

6. A. scoparius Michx. Stem 0.5–1.5 m. tall, sometimes glaucous: leaf-sheaths glabrous or sometimes villous: racemes 3–6 cm. long, the rachis slender and flexuous: sessile spikelet 6–7 mm. long, scabrous, the awn 8–15 mm. long. [*S. scoparium* Nash *S. villosissimum* Nash *S. acuminatum* Nash]—(LITTLE BLUE-STEM. BROOM-SEDGE.)—Pinelands, prairies, open woods, hillsides, and dry fields, various provinces, Fla. to Ariz., Alb., and N. B.

7. A. hirtiflorus (Nees) Kunth. Stem 0.6–1.2 m. tall, often glaucous: leaf-blades 2–4 mm. wide, smooth: racemes 6–10 cm. long, the base included in the somewhat inflated upper sheath, the rachis straight, the joints tapering below: sessile spikelet about 6 mm. long, the awn geniculate and twisted, about 1 cm. long: pedicellate spikelet reduced to a glume 2–4 mm. long, the pedicel thick, villous. [*A. oligostachyus* Chapm. *A. feensis* Fourn. *S. oligostachyum* Nash]—Pinelands, various provinces, Fla., Ga., and Ariz. (*W. I., Mex., S. A.*)

8. A. gracilis Spreng. Stem slender, tufted, glabrous, 0.2–0.6 m. tall: racemes 2–4 cm. long, silvery white, long-exserted, the rachis slender, very villous: sessile spikelet about 5 mm. long, the awn geniculate and twisted, 1–2 cm. long: pedicellate spikelet reduced to an awned or awnless glume, the pedicel very villous. [*S. gracile* Nash]—Rocky pinelands, S Fla.—(*W. I.*)

9. A. provincialis Lam. Glabrous or more or less villous and often glaucous: stem 1–2 m. tall: racemes 2–4, rarely more, on each peduncle, long-exserted, 5–10 cm. long, the peduncles terminal and axillary: rachis straight, the joints pilose at base and along one or both margins: sessile spikelet 7–10 mm. long, the first glume slightly sulcate, scabrous, the awn geniculate and tightly twisted below, 1–2 cm. long: sterile pedicel sparingly short-villous, the hairs whitish. [*A. furcatus* Muhl. *A. tennesseensis* Scribn.]—(BLUE-STEM.)—Dry soil, open woods, pinelands, and old fields, various provinces, Fla. to Tex., Ariz., and Me.

10. A. glomeratus (Walt.) B. S. P. Glabrous and often glaucous the leaf-sheaths sometimes villous: stem 0.5–1.5 m. tall: racemes 1–3 cm. long, as long as or a little longer than the somewhat inflated spathe and protruding from its side, the common peduncle within the spathe, and the stem just below the spathe villous, the rachis slender and flexuous, long-villous: sessile spikelet 3–4 mm. long, the awn straight, 1–1.5 cm. long: sterile spikelet reduced to a subulate glume or wanting, the pedicel slender, long-villous. [*A. macrourus* Michx. *A. corymbosus* Nash *A. tenuispatheus* Nash]—Low moist grounds, swamps, marshes, and wet pinelands, Coastal Plain and occasionally adj. provinces, Fla. to Tex. and Mass.—(*W. I., Mex., C. A.*)

11. A. longiberbis Hack. Stem slender, 0.5–1 m. tall: racemes in pairs, 2–3 cm. long, the spathe 3–5 cm. long, enclosing the base of the racemes: sessile spikelets about 3 mm. long, the awn slender and straight, 10–15 mm. long. —Dry pinelands, pen. Fla.—**A. Tracyi** Nash, differs from *A. longiberbis* in the longer peduncles (about 2 cm.) of the racemes in each spathe: leaf-sheaths glabrous.—Pinewoods, Fla. to La.

12. A. virginicus L. Stem virgate, 0.5–1 m. tall: lower sheaths compressed, equitant: ligule strongly ciliate: spathes scattered along the upper half or two-thirds of the plant: racemes 2–4 from each spathe, 2–3 cm. long, the bases enclosed in the spathe, this usually a little longer than the racemes: rachis very slender, flexuous: sessile spikelet about 3 mm. long, the awn 1–2 cm. long. [*A. tetrastachys* Ell. *A. vaginatus* Ell. *A. macrourus viridis* Chapm.]—(BROOM-SEDGE.)—Dry grounds, pinelands, open woods, old fields, and beach sands, various provinces, Fla. to Tex., Mo., and Mass.; also in S Calif.—(*W. I., Mex.*)

13. A. capillipes Nash. Differs from *A. virginicus* in being glabrous and glaucous, especially the strongly compressed innovations, in having more flexuous peduncles and often a more compact inflorescence: ligule entire or minutely ciliate. [*A. glaucopsis* Nash]—Moist pinelands, Coastal Plain, Fla. to Miss. and N. C.

14. A. perangustatus Nash. Plant green or slightly glaucous: stem slender, 0.3–0.6 m. tall: sheaths not equitant: leaf-blades very narrow, the blades of the innovations tightly folded, almost filiform, the ligule 1–1.5 mm. long, firm,

glabrous. [*A. virginicus stenophyllus* Hack.]—Wet pinelands, Fla.—The leaf-blades of the innovations are often solid, the upper surface being obliterated.

15. A. brachystachys Chapm. Stem 1–1.5 m. tall: spathes in a long inflorescence, not usually inflated, the peduncles of the spathes slender, often flexuous: racemes in pairs, usually about 1 cm. long, the common peduncle sometimes exserted from the spathe: sessile spikelet about 3 mm. long, the awn less than 1 cm. long, sometimes wanting.—Moist pinelands, Fla.

16. A. Elliottii Chapm. Stem 0.3–0.8 m. tall: leaf-sheaths more or less villous, the upper inflated and aggregate: racemes in pairs, 3–4 cm. long, some of the pedicels exserted from the appressed spathe and from the sheaths, others more or less included in the inflated upper sheaths: sessile spikelet 4–5 mm. long, the awn 10–15 mm. long, geniculate and twisted.—Pinelands, prairies, rocky hills, open dry grounds, and old fields, Coastal Plain and occasionally adj. provinces, Fla. to E Tex., S Mo., and Pa.—(*Mex.*)—The inflated ferruginous sheaths are conspicuous in winter.—*A. gracilior* (Hack.) Nash is a slender form with sometimes scarcely inflated upper sheaths. [*A. subtenuis* Nash]—Fla. to Miss.

17. A. campyloracheus Nash. Stem 0.4–0.8 m. tall: racemes mostly in pairs, sometimes in 3's or 4's, 5–10 cm. long, the terminal peduncle long-exserted: rachis slender and very flexuous, the internodes much longer than the sessile spikelet, this 3–4 mm. long, the awn as much as 2 cm. long.—Dry pinelands, Coastal Plain, Fla. to La.

18. A. Mohrii Hack. Stem stout, 0.8–1.2 m. tall: leaves villous, especially at summit of sheath: racemes in 4's, 2–4 cm. long, protruding from the side of inflated spathes and about as long as these: rachis scarcely flexuous: sessile spikelet 4–5 mm. long, longer than the internodes of the rachis, the awn 1.5–2 cm. long.—Wet pinelands and beach sands, Coastal Plain, Ga. to La. and N. C.

19. A. Cabanisii Hack. Stem stout, 0.6–1 m. tall: racemes 4–7 cm. long, tawny, rather stout, scattered along the upper part of the plant: sessile spikelet 6–7 mm. long, the first glume firm, broadly lanceolate, the awn about 1 cm. long.—Dry pinelands, pen. Fla.

20. A. arctatus Chapm. Stem 1–1.5 m. tall: racemes 3–5 cm. long, tawny: sessile spikelet 4–5 mm. long, the awn 1–1.5 cm. long.—Low pinelands, Fla.

21. A. ternarius Michx. Stem 0.8–1.2 m. tall: racemes 3–5 cm. long, silvery white, rather stout. [*A. argyraeus* Schult. *A. mississippiensis* Scribn. & Ball *A. Scribnerianus* Nash]—Dry sandy soil, often in pinelands or open woods, Coastal Plain and rarely Blue Ridge, Fla. to E Tex., Okla., and Del.

22. A. floridanus Scribn. Stem 1–1.5 m. tall: racemes 2–4 cm. long, slender, the spathes long-exserted on capillary peduncles, numerous in a large loose inflorescence. [*A. Bakeri* Scribn. & Ball]—Low pinelands, pen. Fla.

Arthraxon ciliaris cryptatheris Hack. A weak-stemmed, laxly branching annual, with ascending flowering branches, bearing thin cordate-lanceolate blades, the inflorescence of several slender racemes in a cluster, occurs in lawns and old fields, various provinces from Fla. to Ark. and Penn. Nat. of Asia.

13. HOLCUS L. Tall or moderately tall annuals or perennials, with flat leaf-blades and terminal panicles. Spikelets in pairs, the pedicellate spikelet well-developed, usually staminate: racemes reduced to 1–5 joints, these disarticulating tardily, the racemes in a large open or contracted panicle.—About 10 species widely distributed in tropical and warm temperate regions.

Plants perennial with stout creeping rootstocks. 1. *H. halepensis.*
Plants annual. 2. *H. Sorghum.*

1. H. halepensis L. Stem 0.5–1.5 m. tall, arising from a stout creeping root-stock: panicle oblong or pyramidal, 15–50 cm. long, the branches sometimes finally drooping: sessile spikelet 4.5–5.5 mm. long, plump, more or less pubescent, the awn, if present, 1–1.5 cm. long, deciduous. [*Sorghum halepense* Pers. *Andropogon halepensis* Brot.]—(JOHNSON-GRASS. EVERGREEN-MILLET. EGYPTIAN-MILLET.)—Fields and waste-places, various provinces, Fla. to Tex., Calif., Kans., and Mass. Nat. of Afr.—(*W. I., Mex., C. A., S. A.*)—Sometimes a troublesome weed. This and the following species sometimes produce hydrocyanic acid in sufficient abundance to poison grazing animals.

2. H. Sorghum L. Annual with stouter stems and broader leaf-blades. The cultivated sorghum or sorgo sometimes persists in fields and waste-places, locally throughout our range. Nat. of E. I.—(*W. I., Mex., C. A., S. A.*)—This grass has been cultivated from prehistoric times in many varieties for food and forage—SORGO, KAFIR, MILO, SHALLU, KAOLIANG, DURRA, BROOM-CORN, EGYPTIAN-CORN, CHICKEN-CORN, JERUSALEM-CORN, FETERITA—and for its sweet juice which is made into sirup.

14. SORGHASTRUM Nash. Erect rather tall perennials, with narrow flat leaf-blades and narrow terminal panicles. Spikelets in pairs, one nearly terete, sessile and fertile, the other wanting, only the hairy pedicel present: glumes coriaceous, brown or yellowish, hirsute: sterile and fertile lemmas hyaline, the latter bearing a well-developed bent and twisted awn: racemes reduced to 1 to few joints.—About 12 species, natives of tropical and temperate regions.—INDIAN-GRASSES. INDIAN-REEDS.

Awn usually 15 mm. or less long, once bent: spikelets yellowish: panicle rather dense. 1. *S. nutans.*

Awn 20 to 30 mm. long, twice bent, twisted below the second bend.

Spikelets chestnut-brown, the ultimate branchlets villous only at the very tip: panicle loose, not unilateral. 2. *S. Elliottii.*

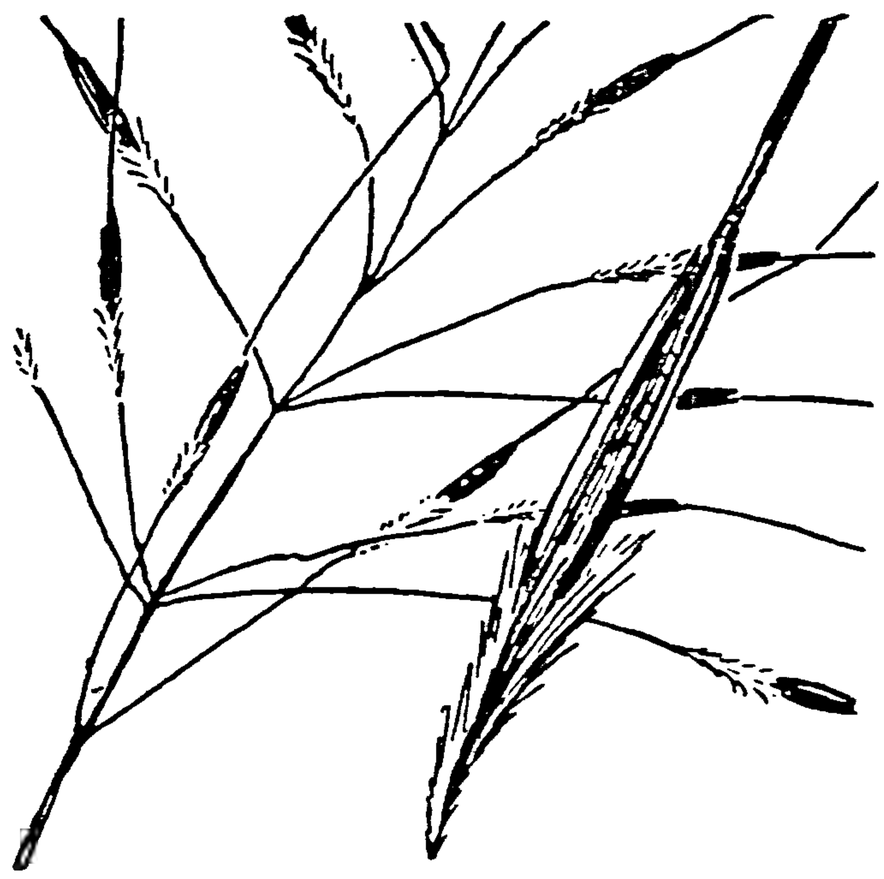
Spikelets yellowish-brown, the upper portion of the ultimate branchlets with long ascending hairs: panicles rather dense, distinctly unilateral. 3. *S. secundum.*

1. S. nutans (L.) Nash. Stem 1–2.5 m. tall: panicle oblong, yellowish or bronze, 20–50 cm. long, rather compact, the branchlets not flexuous: spikelets 6–8 mm. long, the awn geniculate and twisted. [*Sorghum avenaceum* Chapm. *S. nutans* A. Gray]—(WOOD-GRASS.)—Dry soil, various provinces, Fla. to Tex., Ariz., N. D., and Me.—(*Mex.*)

2. S. Elliottii (Mohr) Nash. Stem 1–1.5 m. tall: panicle 15–30 cm. long, loose, the pedicels flexuous or drooping: spikelets 6–7 mm. long. [*S. Linnaeanum* Nash]—Dry soil, woods, slopes, and bluffs, Coastal Plain and rarely adj. provinces, Fla. to E Tex., Tenn., and Md.

3. **S. secundum** (Ell.) Nash. Stem 1–2 m. tall: panicle 20–40 cm. long: spikelets 6–8 mm. long. [*Sorghum secundum* Chapm.]—Pinelands, Coastal Plain, Fla. to Tex., and S. C.

15. RHAPHIS Lour. Our species annual, with open panicles, the three spikelets (reduced racemes) borne at the ends of long slender naked branches. Spikelets in 3's, one sessile and perfect, the other two pedicellate and sterile, or sometimes a pair below, one fertile and one sterile: fertile spikelets terete, the glumes coriaceous: sterile and fertile lemmas hyaline, the latter long-awned.—Twenty species, widely distributed in tropical regions.



1. **R. pauciflora** (Chapm.) Nash. Stem 0.5–1 m. tall: panicle very open, the branches 2–5 cm. long: spikelets about 8 mm. long, the peduncle disjointing obliquely leaving a long sharp densely pubescent callus below: awn stout, 10–14 cm. long, geniculate, twisted below. [*Sorghum pauciflorum* Chapm.]—Pinelands and old fields, pen. Fla.—(*Cuba.*)

16. HETEROPOGON Pers. Annuals or perennials, often robust with flat leaf-blades and solitary terminal racemes: rachis slender, the lower part, bearing the pairs of staminate spikelets, continuous, the remainder disarticulating obliquely at the base of each joint, the joint forming a sharp-barbed callus below the fertile spikelet, the pedicellate spikelet readily falling, its pedicel remaining, obscured in the hairs of the callus. Spikelets in pairs, one sessile, the other pedicellate, both of the lower few to several pairs staminate or neuter, the remainder of the sessile spikelets perfect, terete, long-awned, the pedicellate spikelets, like the lower, staminate, flat, conspicuous: glumes of the fertile spikelet equal, coriaceous, the first brown-hirsute, infolding the second: lemmas hyaline, the fertile one bearing a strong bent and twisted brown awn: palea wanting: glumes of the staminate spikelet membranaceous, the first green, faintly many-nerved, unsymmetrical, one submarginal keel rather broadly winged, the other wingless, the margins inflexed, the second glume narrower, symmetrical.—Six species, most abundant in the Old World. Our species is annual.

1. **H. melanocarpus** (Ell.) Benth. Stem 1–2 m. tall, branched: raceme 3–6 cm. long: sessile spikelet 5–6 mm. long, the awn 10–15 cm. long: pedicellate spikelet 1.5–2 cm. long, acuminate, the first glume with a row of oil glands. [*H. acuminatus* Trin.]—Fields and open grounds, Coastal Plain, Fla., Ala., and Ga.; also in Ariz.—(*Mex., C. A., S. A.*)

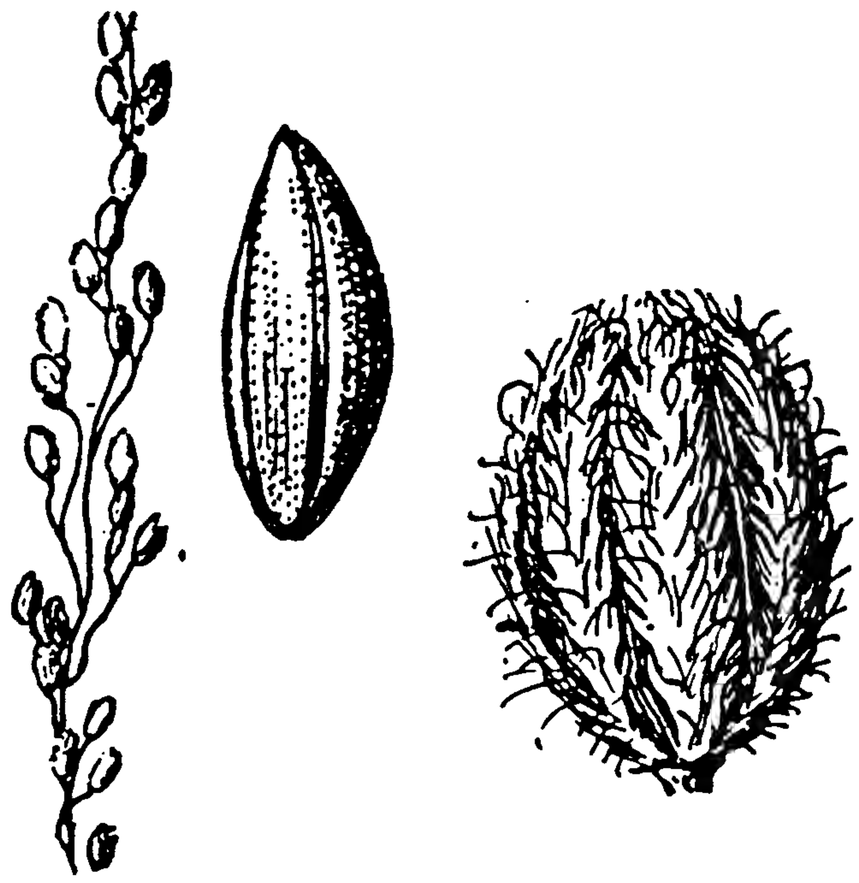
17. NAZIA Adans. Low annuals with flat leaf-blades and terminal spikes, the bur-like clusters of spikelets rather closely arranged along a slender axis.

Spikelets in groups of 2–5, the groups falling entire, the spikelets sessile on a short zigzag axis, the upper 1–3 reduced and sterile, the lower perfect, 1-flowered: first glume small and thin, or wanting: second glume of the two lower spikelets 3-nerved, and with a row of prickles on each side of each nerve: lemma and palea thin.—Three species, natives of the tropics, and more widely naturalized.

1. **N. racemosa** (L.) Kuntze. Stem usually branching at the base and decumbent, 30 cm. long or less: leaf-blades ciliate, mostly less than 5 cm. long: spike 8 cm. long or less: spikelets 4–4.5 mm. long, the acuminate apex projecting beyond the spines, the cluster pedicelled. — (PRICKLE-GRASS.) — Waste places, especially ballast, coast region of N. C., and at more northern seaports; also in Tex. and Ariz. Nat. of Eu.

18. ANTHAENANTIA Beauv. Erect perennials, with short creeping rootstocks, narrow, firm flat leaf-blades, the uppermost much reduced, and narrow panicles, the slender branches ascending or appressed. Spikelets obovoid, villous: first glume wanting: second glume and sterile lemma subequal, broad, 5-nerved, the sterile lemma with a small palea and sometimes a staminate flower: fertile lemma cartilaginous, boat-shaped, 3-nerved, subacute, chestnut-brown, as long as the glume, the pale margins very narrow.—Two species, natives of the S United States.

Leaf-blades erect, or spreading at the apex, linear, folded at base: panicle usually purple. 1. *A. rufa.*
Leaf-blades ascending or spreading (on the average shorter and broader than in *A. rufa*), tapering to the apex, rounded at base: panicle usually pale. 2. *A. villosa.*

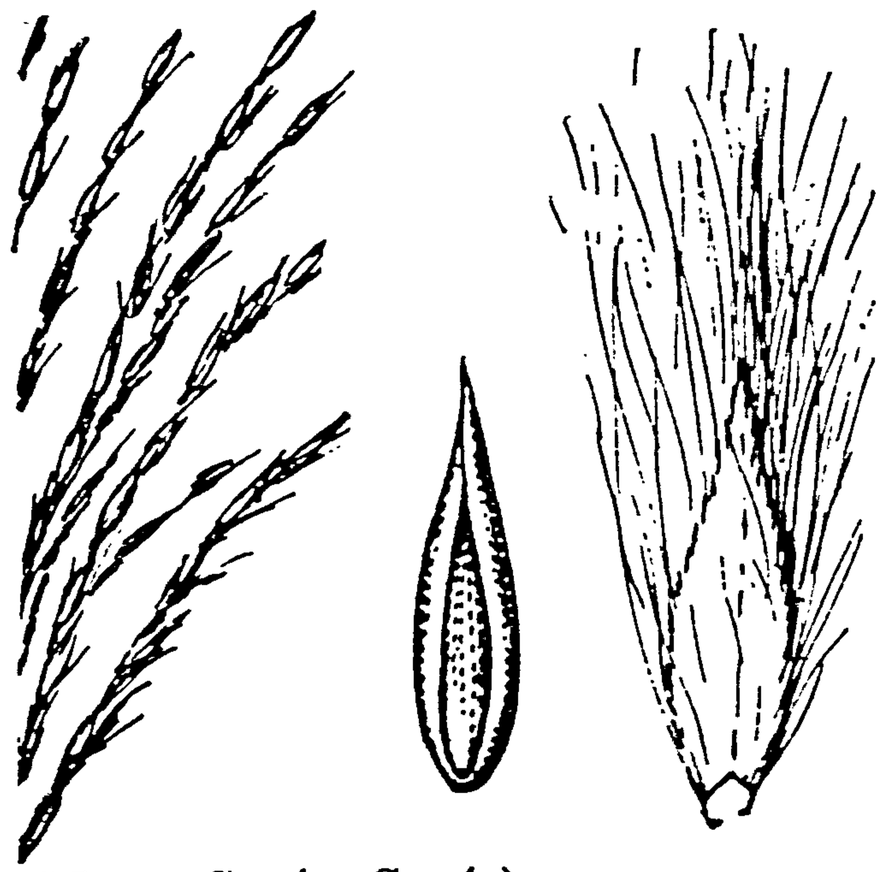


1. **A. rufa** (Ell.) Schult. Stem slender, erect; 0.6–1.2 m. tall: lower sheaths crowded, keeled, often purplish; leaf-blades mostly 20–50 cm. long, 2–4 mm. wide: panicle 8–15 cm. long, 1.5–3 cm. wide, brownish at maturity, the slender erect branches spikelet-bearing throughout; spikelets 3–4 mm. long, the copious pubescence in stripes down the middle of the internerves.—Moist pinelands, Coastal Plain, Fla. to Tex. and N. C.

2. **A. villosa** (Michx.) Beauv. Differs from *A. rufa* in the short lower sheaths, shorter, wider leaf-blades and paler, more open panicle.—Dry pinelands, Coastal Plain, Fla. to E Tex. and N. C.

19. VALOTA Adans. Perennials from knotty pubescent crowns, the slender racemes erect or nearly so, aggregated along the upper part of the main

axis, forming a white or tawny silky panicle. Spikelets lanceolate, in pairs, short-pedicelled in 2 rows along one side of a narrow rachis: first glume minute, glabrous: second glume and sterile lemma about as long as the fruit, 3–5-nerved, copiously silky: fertile lemma cartilaginous, lanceolate, acuminate, brown, the flat white hyaline margins broad.—About 12 species, in temperate and tropical America.



1. V. insularis (L.) Chase. Stem 1–1.5 m. tall, rather stout: leaf-blades as much as 30 cm. long and 1.5 cm. wide: panicle 15–30 cm. long, more or less nodding. [*Trichachne insularis* Nees *Panicum leucophaeum* H.B.K.] —(SILKY-GRASS.)—Moist soil and waste-places, Coastal Plain, Fla. and S Tex.—(*W. I., Mex., C. A., S. A.*)

20. SYNTHERISMA Walt. Erect or prostrate annuals or perennials, the slender racemes digitate or aggregate on a short axis. Spikelets in 2's or 3's, subsessile or short-pedicelled, alternate in 2 rows on one side of a 3-angled rachis, lanceolate or elliptic: first glume minute or wanting: second glume equalling the sterile lemma or shorter: fertile lemma cartilaginous, the hyaline margins pale. [*Digitaria* Haller]—About 60 species, in tropical and temperate regions. —FINGER-GRASSES. CRAB-GRASSES.—Some species are pernicious weeds.

Rachis of raceme winged, or flat-margined: creeping annuals. — I. SANGUINALIA.
Rachis of raceme wingless, triangular: plants not creeping, annual or perennial. — II. FILIFORMIA.

I. SANGUINALIA

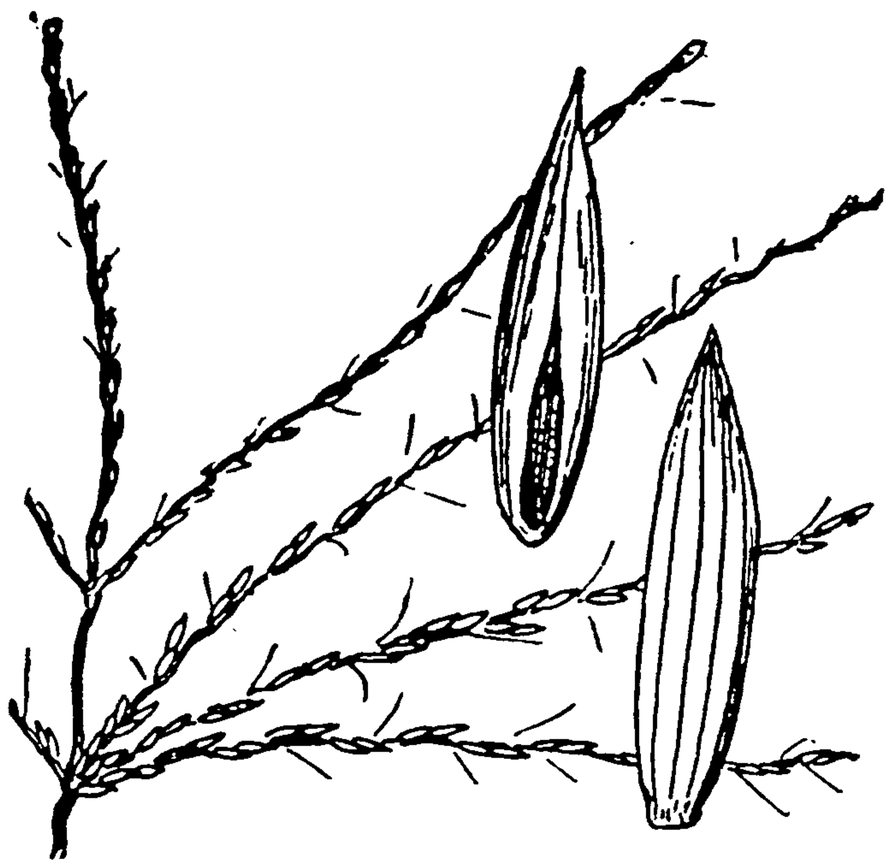
Rachis bearing scattered long, fine hairs (these rarely wanting): spikelets narrow, acuminate, nearly glabrous. — 1. *S. digitatum.*
Rachis not bearing hairs.
  Leaf-sheaths glabrous: fertile lemma brown.
    Spikelets 2 mm. long. — 2. *S. Ischaemum.*
    Spikelets 1.7 mm. long. — 3. *S. floridanum.*
  Leaf-sheaths hispid or villous: fertile lemma pale.
    Spikelets 1.5 mm. long: pedicels terete, glabrous. — 4. *S. serotinum.*
    Spikelets 2.5–3.5 mm. long: pedicels angled, scabrous.
      Second glume much smaller than the spikelets; first glume present. — 5. *S. sanguinale.*
      Second glume equalling the spikelets; first glume obsolete. — 6. *S. Simpsoni.*

II. FILIFORMIA

Fertile lemma pale or gray: plant perennial. — 7. *S. pauciflorum.*
Fertile lemma dark-brown: plant erect or at least not rooting at decumbent base, annual or sometimes apparently perennial.
  Second glume and sterile lemma glabrous. — 8. *S. gracillimum.*
  Second glume and sterile lemma glandular-pubescent.
    Spikelets about 1.5 mm. long.
      Leaf-blades folded or involute, flexuous. — 9. *S. paniceum.*
      Leaf-blades flat. — 10. *S. filiforme.*
    Spikelets 2–3 mm. long. — 11. *S. villosum.*

1. S. digitatum (Sw.) A. Hitchc. Plant decumbent and spreading, with the aspect of *S. sanguinale*: stem as much as 60 cm. long or rarely 100 cm.: leaf-sheaths papillose-hirsute: racemes slender, mostly 5–10, aggregate, spreading, 5–10 cm. long: spikelets about 2 mm. long: first glume minute; second

glume half as long as the spikelet, both sparingly appressed-pubescent: fruit slightly shorter than the sterile lemma, pale. [*S. setosum* Nash]—Waste-places, Coastal Plain, C and S Fla. and Ala.—(*W. I., Mex., C. A., S. A.*)



2. S. Ischaemum (Schreb.) Nash. Plant decumbent and spreading or at first erect: stem usually less than 50 cm. tall: leaf-sheaths smooth: racemes 2–6, rarely more, mostly 4–7 cm. long: spikelets about 2 mm. long, usually purplish: first glume wanting: second glume and sterile lemma equal, glandular-pubescent, as long as the dark fruit. [*S. humifusum* Rydb. *Panicum glabrum* Gaud.]—Waste-places, various provinces, S. C. to Ark., S. D., and Me.; occasional westward. Nat. of Eu.—(*W. I.*)

3. S. floridanum A. Hitchc. Differs from *S. Ischaemum* in the smaller spikelets (1.7 mm. long, 0.6 mm. wide) and the less pubescent second glume and sterile lemma, the hairs not being glandular.—Sandy pinelands, Hernando Co., Fla.

4. S. serotinum Walt. Plant creeping, sometimes forming extensive mats: flowering stem usually not more than 30 cm. tall: leaves crowded on the creeping stems, the sheaths villous, the blade 1–2 cm. long, 3–5 mm. wide: racemes usually 3–5, slender, often arcuate, usually 3–6 cm. long: spikelets pale, crowded: first glume wanting: second glume about one-third as long as the sterile lemma, both pubescent. [*Panicum serotinum* Michx.]—Pasture and waste-places, Coastal Plain, Fla. to La. and N. C.—(*W. I.*)

5. S. sanguinale (L.) Dulac. Plant decumbent and spreading, often purplish: stem rooting at the lower nodes, as much as 1 m. long: leaf-sheaths papillose-pilose: racemes several to many, 3–15 cm. long, digitate at the summit of the stems and usually one or more whorls a short distance below: spikelets usually about 3 mm. long: first glume minute, triangular, glabrous: second glume about half as long as the sterile lemma, both appressed-pilose, the hairs becoming spreading, or the sterile lemma glabrous. [*Panicum sanguinale* L. *S. fimbriatum* Nash *S. marginatum* Nash *S. barbatum* Nash]—(CRAB-GRASS.)—Fields, pastures, and waste-places, throughout E U. S.—(*W. I., Mex., C. A., S. A., O. W.*)

6. S. Simpsoni (Vasey) Nash. Stem creeping and rooting at the lower nodes, as much as 1–1.5 m. long: leaf-sheaths papillose-pilose, those of the innovations compressed and keeled: racemes 4–8, ascending, pale, 8–12 cm. long: spikelets about 3 mm. long: second glume and sterile lemma finely nerved, as long as the fertile lemma.—Sandy fields, Fla.—(*Cuba.*)

7. S. pauciflorum A. Hitchc. Plant perennial: stem erect or somewhat decumbent at base, 0.5–1 m. tall, very slender: leaf-sheaths and blades grayish-villous: racemes 2–3, ascending or erect, 5–11 cm. long, the filiform rachis naked for 1–5 cm. at base: spikelets rather distant, elliptic, about 3.2 mm. long, glabrous: first glume minute, with a hyaline erose margin: second glume and sterile lemma finely nerved, as long as the grayish fertile lemma.—Pinelands, S Fla.

8. S. gracillimum (Scribn.) Nash. Stem 0.5–1 m. tall: leaf-sheaths appressed-pilose: blades long and narrow, 1–2 mm. wide, often involute: racemes 2–several, slender, ascending or erect, 10–30 cm. long: spikelets about 2 mm. long,

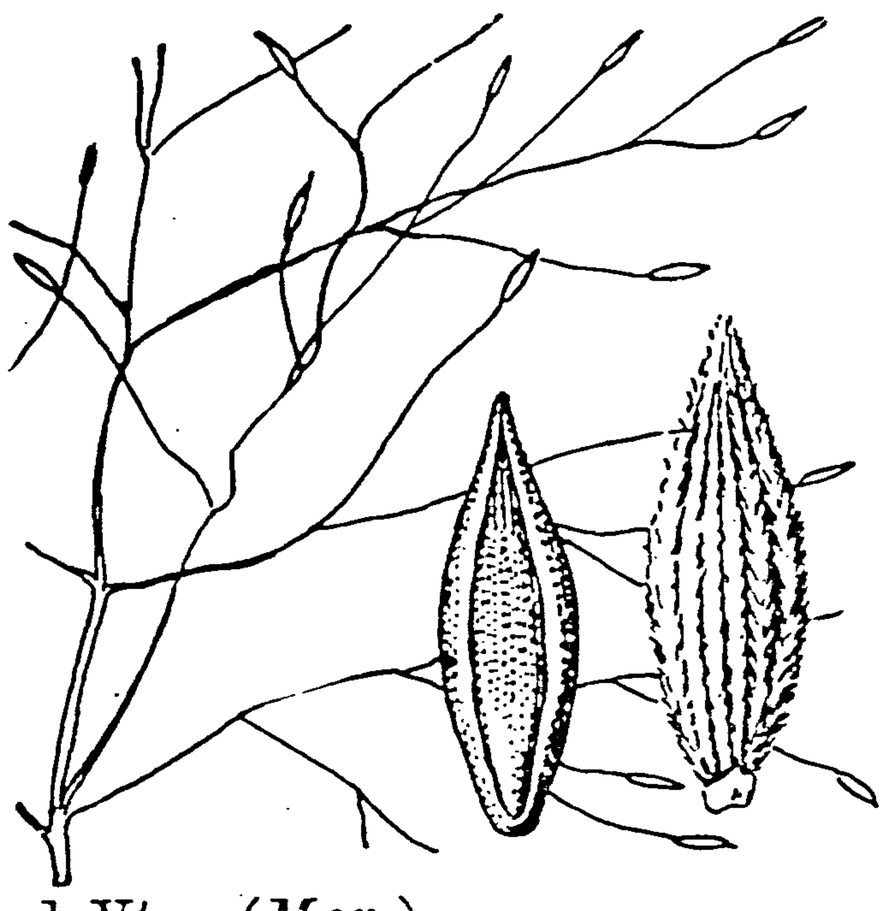
often in 3's, the longer pedicels as much as 5 mm. long: first glume wanting: second glume half to three-fourths as long as the sterile lemma. [*S. Bakeri* Nash]—Dry pinelands, Fla.

9. S. paniceum (Sw.) Nash. Stems commonly in dense tufts, 0.3–1 m. tall: leaf-sheaths appressed-pubescent or glabrous: blades about 1 mm. wide, slender, often folded or involute, the older ones usually flexuous: racemes mostly 1–3, erect, 5–20 cm., commonly 10–15 cm. long.—Moist soil, pinelands or open grounds, S Fla.—(*W. I.*)

10. S. filiforme (L.) Nash. Stems usually in small tufts, rarely as much as 0.6 m. tall: leaf-sheaths pilose: blades usually less than 10 cm. long: racemes 1–5, erect or ascending, usually not over 10 cm. long: spikelets rather crowded: first glume wanting: second glume somewhat shorter than the sterile lemma, both densely pubescent with crisp glandular-tipped whitish hairs: fertile lemma somewhat acuminate. [*Panicum filiforme* L.]—Sandy fields and open grounds, Coastal Plain and adj. provinces, Fla. to Tex., Kans., and Mass. Nat. of Eu.—(*W. I., Mex.*)

11. S. villosum Walt. Differs from *S. filiforme* in being taller (as much as 1–1.5 m.) and apparently perennial, the leaf-blades longer, the racemes more numerous (5–7) and longer (as much as 25 cm.), and in the larger spikelets (2–3 mm.).—*S. leucocoma* Nash is a form with few racemes and silky spikelets.—Sandy fields and woods, Coastal Plain, Fla. to E Tex., Okla., Ill., and S Va.—(*W. I., Mex.*)

21. LEPTOLOMA Chase. Branching perennials with brittle culms, felty pubescent at base, flat blades and open or diffuse panicles, these breaking away at maturity, becoming tumble-weeds. Spikelets lanceolate, on slender pedicels: first glume minute or obsolete: second glume 3-nerved, nearly as long as the 5–7-nerved sterile lemma, a stripe of appressed silky hairs down the internerves and margins of each: fertile lemma cartilaginous, elliptic, acute, brown, the delicate hyaline margins enclosing the palea.—Four species, Australian, except the following.



1. L. cognatum (Schult.) Chase. Stem decumbent at base, 20–50 cm. long: leaf-blades mostly less than 10 cm. long: panicle 10–20 cm. long, becoming nearly as wide: spikelets about 3 mm. long, borne singly at the ends of capillary branchlets. [*Panicum cognatum* Schult. *P. autumnale* Bosc.]—(WITCH-GRASS.)—Sandy open grounds, various provinces, Fla. to Tex., Ariz., Kans., and Vt.—(*Mex.*)

22. ERIOCHLOA H. B. K. Annuals or perennials with terminal panicles consisting of several to many spreading or appressed racemes, usually rather closely arranged along the main axis. Spikelets more or less pubescent, solitary or sometimes in pairs, short-pedicelled or subsessile in 2 rows on one side of a narrow, usually hairy rachis, the pedicels often clothed with long stiff hairs, the back of the fertile lemma turned from the rachis: lower rachilla-joint thickened, forming a more or less ring-like callus below the second glume, the first glume reduced to a minute sheath adnate to it: second glume and

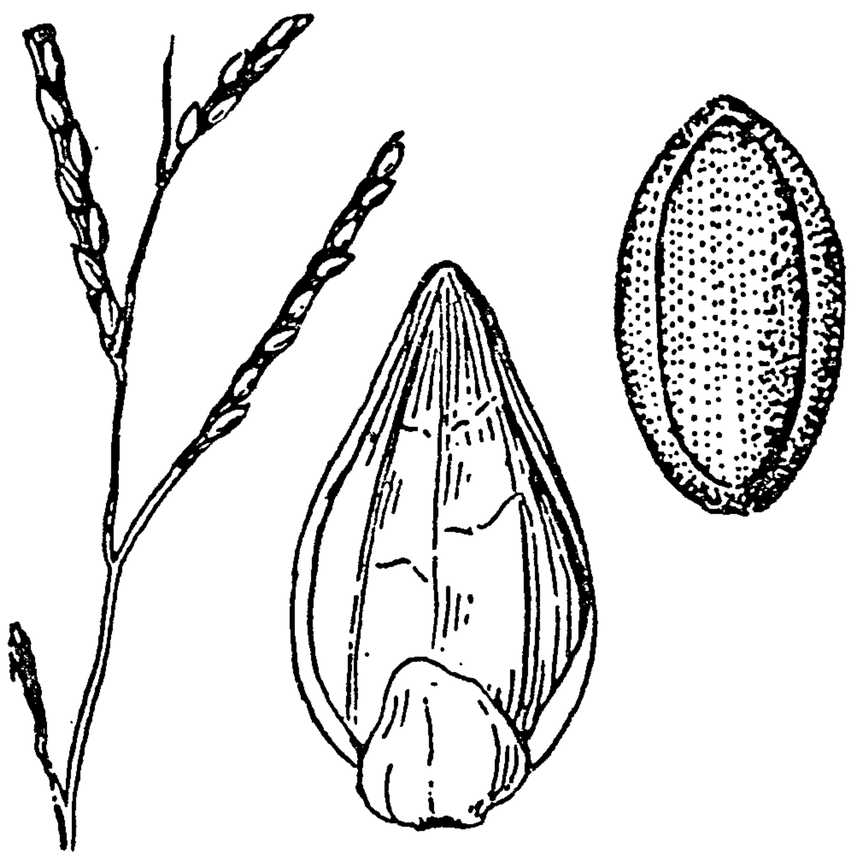
sterile lemma about equal, acute or acuminate, the lemma usually enclosing a hyaline palea or sometimes a staminate flower: fertile lemma indurate, minutely papillose-rugose, mucronate or awned, the margins slightly inrolled.—Fifteen species, in the warmer regions, but mostly American.

1. E. Michauxii (Roem. & Schult.) A. Hitchc. Plant perennial: stem erect, single, puberulent about the nodes, 70–150 cm. tall: leaf-blades usually 20–40 cm. long, (very narrow, and with few racemes and empty sterile lemma in *E. Michauxii Simpsoni*): racemes ascending or spreading: spikelets about 5 mm. long. [*E. mollis* Michx. *E. longifolia* Vasey *E. mollis longifolia* Chapm.]—Wet soil, Coastal Plain, Fla. and S Ga.

23. BRACHIARIA (Trin.) Griseb. Annuals or perennials, with terminal inflorescence of several racemes along a common axis: spikelets dorsally compressed, solitary, rarely in pairs, subsessile, in two rows on one side of a 3-angled, sometimes narrowly winged rachis, the first glume turned toward the axis; first glume short or nearly as long as the spikelets: second glume and sterile lemma about equal, 5- to 7-nerved, the lemma enclosing a hyaline palea and sometimes a staminate flower: fertile lemma indurate, usually papillose-rugose, the margins inrolled, the apex rarely mucronate or bearing a short awn. —Fifteen species, in the warmer regions of both hemispheres.

Anastomosing veins of spikelet prominent. 1. *B. extensa.*
Anastomosing veins of spikelet obscure or wanting. 2. *B. plantaginea.*

1. B. extensa Chase. Plant annual, nearly glabrous throughout: stem branching, decumbent and rooting at base, 40–60 cm. long: leaf-blades flat, mostly not over 10 cm. long, 8–12 mm. wide: spikes 2–5, spreading, 3–7 cm. long, distant on the axis: spikelets about 4 mm. long, the second glume and sterile lemma pointed beyond the turgid fruit. [*B. platyphylla* Nash]—Moist fields, Coastal Plain, Fla., La., and Tex.—(*W. I., S. A.*)



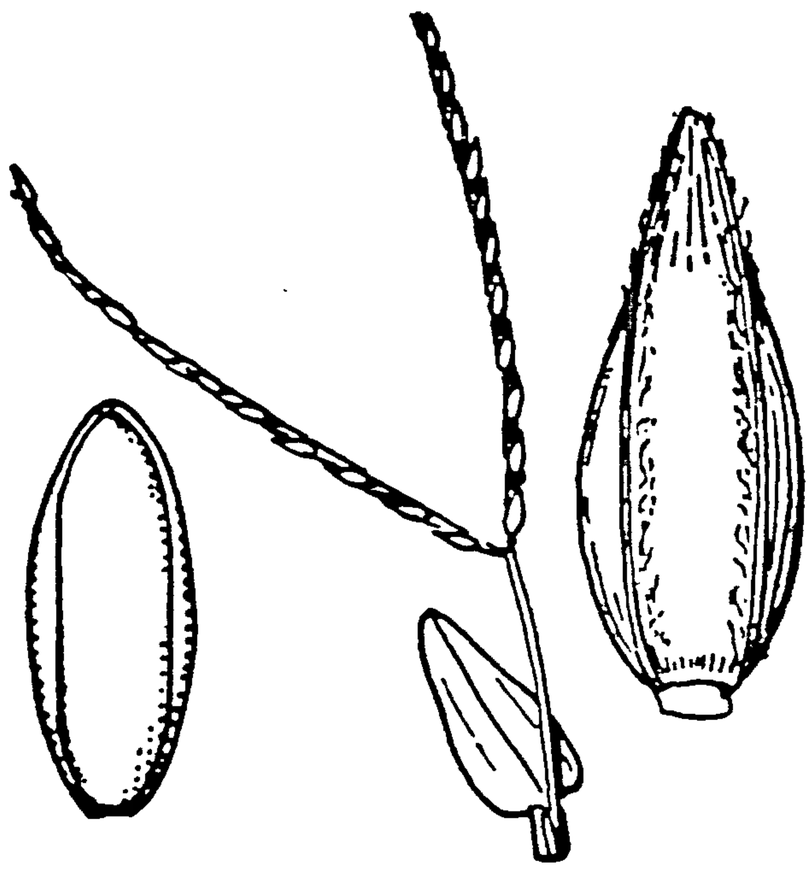
2. B. plantaginea (Link) A. Hitchc. Differs from *B. extensa* in having the anastomosing veins of the spikelet obscure or wanting and the second glume and sterile lemma not pointed beyond the fruit.—Open moist ground, various provinces, Ga. to Pa. and N. J.—(*Mex., S. A.*)

24. AXONOPUS Beauv. Our species stoloniferous or tufted glabrous perennials, with usually flat abruptly rounded or somewhat pointed leaf-blades, and 2–4 slender spike-like digitate racemes. Spikelets depressed biconvex, not turgid, oblong, usually obtuse, solitary, sessile and alternate in 2 rows on one side of a 3-angled rachis, the back of the fertile lemma turned from the axis: first glume wanting: second glume and sterile lemma equal, the former without

a palea: fertile lemma indurate, oblong-elliptic, obtuse, the margins of the lemma slightly inrolled.—About 30 species, mostly natives of tropical America.

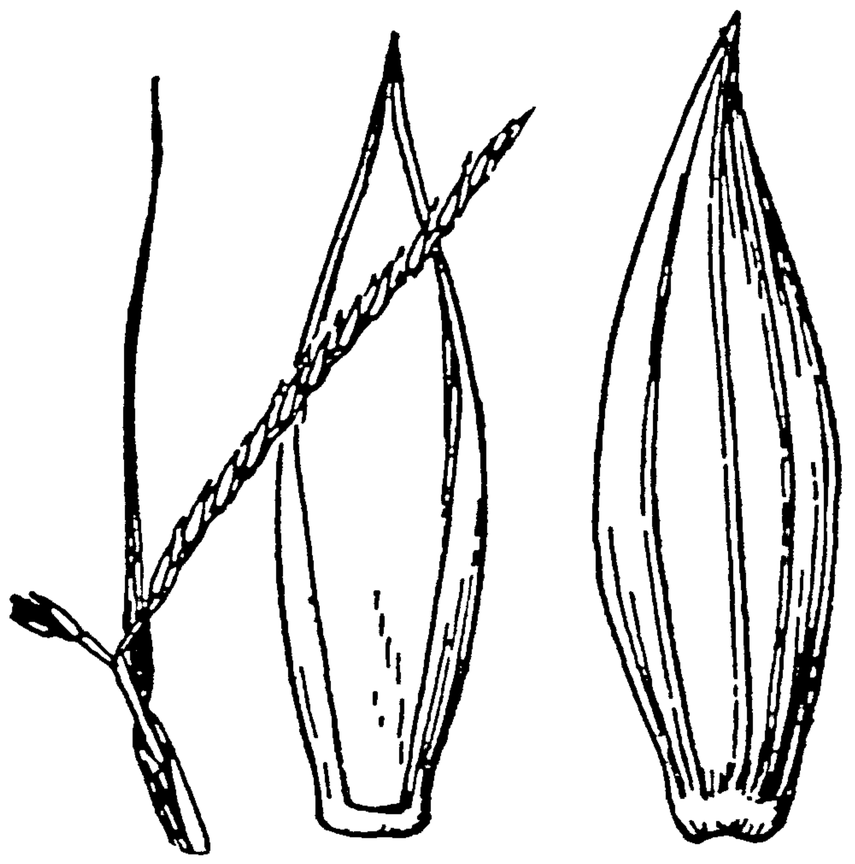
Spikelets 2–2.5 mm. long, obscurely silky pubescent: midnerve suppressed. 1. *A. compressus.*
Spikelets more than 4 mm. long, glabrous: midnerve evident. 2. *A. furcatus.*

1. **A. compressus** (Sw.) Beauv. Tufted, often producing long leafy stolons with short broad obtuse leaf-blades: flowering stem 20–40 cm. tall: leaf-sheaths compressed: racemes mostly 2 or 3, spreading, 3–10 cm. long, long-exserted on slender peduncles, terminal and axillary: spikelets 2–2.5 mm. long. [*Anastrophus compressus* Schlecht. *A. platycaulis* Nash *Paspalum platycaule* Poir.]—(CARPET-GRASS.)—Moist open ground, Coastal Plain, Fla. to E Tex., Ark., and N. C.—(*W. I., Mex., C. A., S. A.*)



2. **A. furcatus** (Flügge) A. Hitchc. Plant usually larger than *A. compressus,* the stems few in a tuft, extensively stoloniferous: racemes 2, 5–15 cm. long: second glume and sterile lemma conspicuously pointed beyond the fruit: foliage rarely pubescent. [*Anastrophus paspaloides* Nash *Paspalum furcatum* Flügge]—Moist pinelands and open grounds, Coastal Plain, Fla. to Tex. and Va.

25. **REIMAROCHLOA** A. Hitchc. Spreading or stoloniferous perennials with flat leaf-blades and slender subdigitate racemes, stiffly spreading or reflexed at maturity. Spikelets strongly dorsally compressed, lanceolate, acuminate, rather distant, subsessile and alternate in two rows along one side of a narrow, flattened rachis, the back of the fertile lemma turned toward it: both glumes wanting, or the second sometimes present in the terminal spikelet: sterile lemma about equalling the fruit, the sterile palea obsolete: fertile lemma scarcely indurate, faintly nerved, acuminate, the margins inrolled at the base only, the palea free nearly half its length.—Four species, natives of tropical America.



1. **R. oligostachya** (Munro) A. Hitchc. Plant glabrous: stem compressed, 40–80 cm. long: racemes 1–4, 5–7 cm. long: spikelets about 5 mm. long. [*Reimaria oligostachya* Munro]—In water or wet soil, Fla.—(*Cuba.*)

26. **PASPALUM** L. Mostly perennials, with 1 to many spike-like racemes, these single or paired at the summit of the stem or racemosely arranged along the main axis. Spikelets plano-convex, usually obtuse, subsessile, solitary or in pairs, in two rows on one side of a narrow or dilated rachis, the back of the fertile lemma toward it: first glume usually wanting: second glume and sterile lemma commonly about equal: fertile lemma usually obtuse, chartaceous-

indurate, the margins inrolled.—Over 300 species, widely distributed in the warmer parts of both hemispheres.

Rachis with broad green membranous wings. (Subgenus CERESIA.) — I. DISSECTA.
Rachis not winged or very narrowly so.
  Racemes in pairs at the summit of the stem, rarely a third one below, divaricate at maturity: spikelets solitary.
    Spikelets narrowly ovate, 3–4.5 mm. long. — II. DISTICHA.
    Spikelets nearly circular, 1.5 mm. long. — III. CONJUGATA.
  Racemes 1-many, racemose on the axis, not in pairs at the summit.
    Fruit pale.
      Spikelets not over 2 mm. long (except in no. 6): slender leafless flowering branches borne in the upper sheaths (except in nos. 7–10). — IV. SETACEA.
      Spikelets over 2 mm. long: branches, if any, leafy.
        First glume usually present on one of each pair of spikelets, sometimes on both: plants producing scaly rhizomes. — V. BIFIDA.
        First glume wanting.
          Spikelets glabrous: leaf-blades flat or folded, 5–12 mm. wide. — VI. LAEVIA.
          Spikelets with a silky fringe around the margin, in pairs — VII. DILATATA.
    Fruit dark brown at maturity — VIII. PLICATULA.

I. DISSECTA

Racemes not more than 6, usually 3 or 4: spikelets broadly ovate: rachis not extending beyond the uppermost spikelet. — 1. *P. dissectum.*
Racemes numerous: spikelets about half as broad as long: rachis extending as a point beyond the spikelet. — 2. *P. repens.*

II. DISTICHA

Sterile lemma wrinkled in the internerves: spikelets glabrous, flattened. — 3. *P. vaginatum.*
Sterile lemma not wrinkled: second glume pubescent. — 4. *P. distichum.*

III. CONJUGATA

Plant stoloniferous; widely creeping. — 5. *P. conjugatum.*

IV. SETACEA

First glume present in at least one of each pair of spikelets: spikelets obovate, appressed-pubescent, 2–2.5 mm. or more long. — 6. *P. Langei.*
First glume wanting: spikelets not over 2 mm. long.
  Racemes 3–9, scarcely longer than the corresponding internode of the axis: leaf-sheath with an erect pointed auricle on each side at the summit: axillary racemes rarely present.
    Spikelets about 1.3 mm. long, obovate, blunt, crowded, glandular-pubescent. — 7. *P. Blodgettii.*
    Spikelets 1.5–2 mm. long, elliptic.
      Racemes 2–3 cm. long, relatively thick. — 8. *P. caespitosum.*
      Racemes 5–10 cm. long, slender. — 9. *P. laxum.*
  Racemes 1 or 2, rarely 3, 2 or 3 times longer than the axis internodes: leaf-sheaths not auricled (rarely so in *P. ciliatifolium*): stems slender.
    Spikelets not over 1.8 mm. long (if as much as 1.8 mm., leaf-blades either pubescent on the surface or clustered at the base). — 10. *P. longepedunculatum.*
    Spikelets 1.6–1.8 mm. long, oval: leaf-blades conspicuously villous, usually 3–10 mm. wide. — 11. *P. debile.*
    Spikelets about 1.5 mm. long, orbicular: leaf-blades short-pilose, usually not over 4 mm. wide. — 12. *P. setaceum.*
Spikelets 2 mm. long (or less in *P. ciliatifolium*).
  Leaf-blades linear, rarely over 4 mm. wide, firm, glabrous. — 13. *P. rigidifolium.*
  Leaf-blades lanceolate to linear, if the latter pubescent on both surfaces.

Leaf-blades glabrous or with occasional cilia, 8–16 mm. wide.
Leaf-blades firm, tapering from the subcordate base to summit: plants rather stout. 14. *P. propinquum.*
Leaf-blades thin, tapering toward base and summit: sheaths glabrous or margin ciliate: spikelets 1.8–2 mm. long. 15. *P. ciliatifolium.*
Leaf-blades pubescent on one or both surfaces.
Leaf-blades on both surfaces sparsely pilose with long hairs, rather thin. 16. *P. pubescens.*
Leaf-blades densely pubescent on both surfaces. 17. *P. supinum.*

V. Bifida

Racemes solitary or rarely 2: spikelets subsessile, crowded. 18. *P. monostachyum.*
Racemes 2–5: spikelets long-pedicellate, loose. 19. *P. bifidum.*

VI. Laevia

Plant erect or ascending, not stoloniferous nor with leafy branches: spikelets blunt, mostly solitary.
Spikelets more or less flattened.
Spikelets ⅓–½ as thick as broad: glume and sterile lemma firm.
Spikelets rarely over 2.8 mm. long, longer than broad, more than ⅓ as thick: panicle much exceeding the blades.
Leaf-sheaths glabrous or ciliate only. 20. *P. laeve.*
Leaf-sheaths and blades pilose. 21. *P. longipilum.*
Spikelets 3–3.2 mm. long, circular, not more than ⅓ as thick: leaf-blades equalling the base of the panicle or overtopping it. 22. *P. circulare.*
Spikelets flattened, not more than ¼ as thick as broad, closely imbricate, often in pairs: glume and sterile lemma thin, the cells visible: short scaly rootstocks present.
Plant glabrous or nearly so: spikelets 2.2–2.8 mm. long. 23. *P. praecox.*
Plant villous: spikelets 2.7–3.4 mm. long. 24. *P. lentiferum.*
Spikelets turgidly plano-convex: glume and sterile lemma firm.
Leaves clustered toward the base of the stem; rarely over 15 cm. long, the upper half of the stem appearing naked: stems less than 1 m. tall, usually 75 cm. or less, mostly ascending. 25. *P. difforme.*
Leaves scattered along the stem; some of the blades, at least, 20 cm. long, commonly much longer: stems usually 1–2 m. tall, erect.
Glume and sterile lemma not inflated and wrinkled, commonly rusty-tinged: racemes usually long and widely spreading at maturity: leaf-blades flat, 1.2–2.3 cm. wide, the base wider than the sheath. 26. *P. giganteum.*
Glume and sterile lemma slightly inflated and wrinkled, not rusty-tinged: racemes erect or ascending: leaf-blades firm, commonly folded, the base not wider than the sheath, rarely as wide. 27. *P. floridanum.*
Plant decumbent at base, rooting at the nodes, or stoloniferous (occasional plants in dry situations erect from the base), producing leafy branches: rachis about 2 mm. wide: spikelets in pairs, acute or subacute. (See also no. 26.)
Spikelets depressed plano-convex, not over 1.5 mm. wide; leaf-sheaths keeled: blades rarely over 5 mm. wide, usually folded at base: racemes ascending or erect. 28. *P. lividum.*
Spikelets turgidly plano-convex, 2 mm. or more wide: leaf-sheaths not keeled: blades more than 7 mm. wide (usually 10 mm. or more), flat. 29. *P. pubiflorum.*

VII. Dilatata

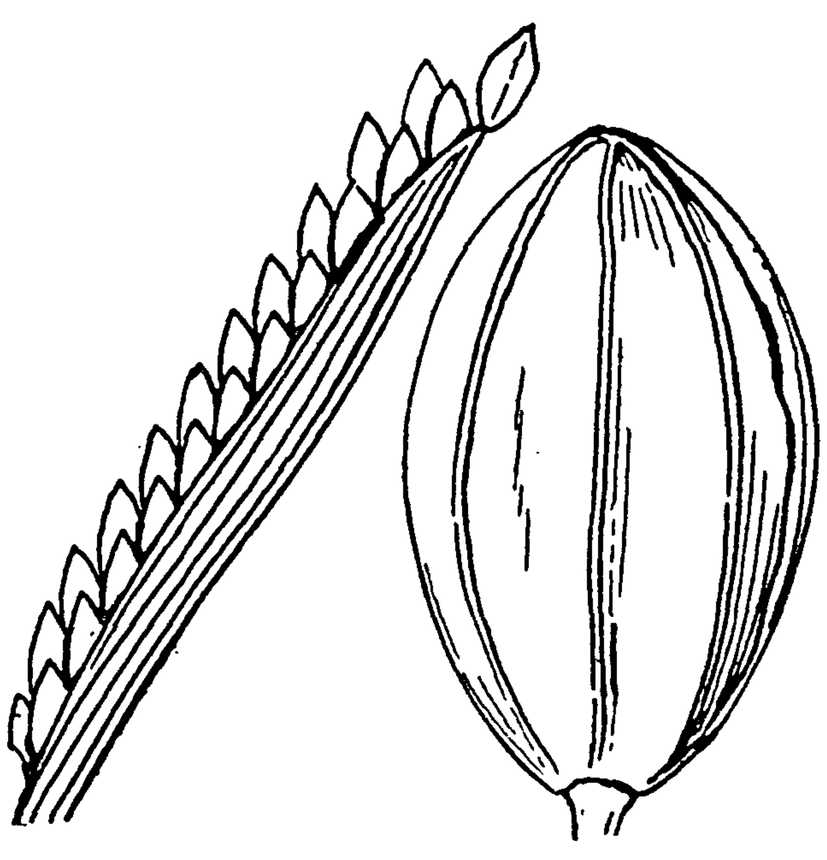
Panicle virgate, the usually numerous racemes suberect: spikelets scarcely over 2 mm. long. 30. *P. Urvillei.*

Panicle lax, the few to several racemes more or less spreading: spikelets about 3.5 mm. long. 31. *P. dilatatum.*

VIII. PLICATULA

Spikelets about 2 mm. long, nearly as broad, glabrous: rachis 1.5–2 mm. wide: plant annual. 32. *P. Boscianum.*
Spikelets 3 mm. long: rachis 1 mm. or less wide: plant perennial 33. *P. plicatulum.*

1. P. dissectum L. Glabrous creeping subaquatic perennial: stem 20–60 cm. long: leaf-blades 3–6 cm. long, 4–5 mm. wide: racemes usually erect, 2–3 cm. long, the rachis 2–3 mm. wide: spikelets 2 mm. long, obovate, pale, glabrous. [*P. membranaceum* Walt. *P. Walterianum* Schult.]—Muddy banks, ditches, wet sandy places, and in shallow water, Coastal Plain and rarely adj. provinces, Fla. to Tex., Mo., and Del.—(*W. I.*)



2. P. repens Berg. Aquatic perennial with submerged stems as much as 200 cm. long, and numerous floating branches with inflated sheaths: leaf-blades 10–20 cm. long, 12–15 mm. wide: racemes ascending, spreading or recurved, rather lax, 3–5 cm. long, the rachis about 1.5 mm. wide: spikelets 1.4–2 mm. long, elliptic. [*P. mucronatum* Muhl. *P. fluitans* Kunth]—Ponds, marshes, and streams, Coastal Plain, Fla. to Tex., Ill., and S. C.—(*W. I., Mex.*)

3. P. vaginatum Swartz. Stem producing creeping rootstocks and also stolons 100 cm. or more long, the flowering shoots 8–60 cm. tall: leaf-sheaths inflated; blades 3–8 mm. wide: racemes usually 2, at first erect, finally spreading or reflexed: spikelets 3–4.5 mm. long, acute, pale. [*P. reimarioides* Chapm.]—(SALT JOINT-GRASS.)—Seacoasts and brackish marshes, Coastal Plain, Fla. to Tex. and N. C.—(*W. I., Mex., C. A., S. A.*)

4. P. distichum L. Resembling *P. vaginatum*: leaf-sheaths usually less inflated and papery: spikelets less flattened, first glume often present on some of the spikelets.—(JOINT-GRASS.)—Ditches, fresh or brackish marshes and prairies, Coastal Plain and Basin and Range, Fla. to Tex., Calif., Okla., and N. J.—(*W. I., Mex., C. A., S. A.*)

5. P. conjugatum Berg. Perennial, extensively creeping: stems compressed: flowering-branches as much as 100 cm. tall: leaf-blades flat, thin, about 1 cm. wide: racemes widely divaricate, usually arcuate, slender, 10–12 cm. long: spikelets 1.5 mm. long, flat on both sides, pale-yellow, silky-pubescent around the margin.—Moist ground, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)

6. P. Langei (Fourn.) Nash. Stem 70–110 cm. tall: leaf-sheaths glabrous or sometimes hirsute, ciliate; blades flat, as much as 1.5 cm. wide: racemes 2 or 3, 7–9 cm. long: spikelets obovate, 2.5–2.8 mm. long. [*Dimorphostachys ciliifera* Nash]—Moist woods and thickets, Fla. to Tex.—(*W. I.*)

7. P. Blodgettii Chapm. Stem erect, as much as 100 cm. tall: leaf-sheaths glabrous or the lower appressed villous; blades 2–15 mm. wide, glabrous, often ciliate: racemes 3–15, spreading or ascending. [*P. gracillimum* Nash]—Pinelands and hammocks, Everglade Keys, and adj. Everglades, Fla. and Florida Keys.—(*W. I.*)

8. P. caespitosum Flügge. Stem 30–60 cm. tall: leaf-sheaths glabrous; blades 3–7 mm. wide, glabrous, flat, usually subinvolute in drying, narrowed at both ends: racemes 2–6: spikelets sparsely appressed-pubescent.—Pinelands, Everglades, and hammocks, S pen. Fla. and the Keys.—(*W. I.*)

9. P. laxum Lam. Stem 60–100 cm. tall: leaf-sheaths glabrous, a few long white hairs at the mouth: blades folded or involute: racemes few to several, mostly arcuate-divaricate: spikelets crowded, 1.8–2 mm. long, pubescent or rarely glabrous. [*P. elatum* (Fl. SE. U. S.)]—Rocky hammocks, Key West, Fla.—(*W. I.*)

10. P. longepedunculatum Le Conte. Stem spreading, 25–80 cm. tall: leaf-sheaths glabrous, ciliate: blades 4–10 mm. wide, the margin ciliate: racemes 1 or 2, 2–8 cm. long, slender, usually curved: spikelets 1.5 mm. long. [*P. kentuckyense* Nash]—Pinelands, fields, and woods, Coastal Plain and rarely adj. provinces, Fla. to Miss. and Ky.

11. P. debile Michx. Stem 40–100 cm. tall: leaf-sheaths villous; blades 3–10 mm. wide: racemes usually single, 7–11 cm. long: spikelets glandular-pubescent. [*P. villosissimum* Nash]—Pinelands and fields, Coastal Plain, Fla. to Tex. and N. Y.

12. P. setaceum Michx. Stem 20–70 cm. tall: leaf-sheaths villous; blades linear, 2.5–5 mm. wide: racemes usually single: spikelets glabrous or sparsely glandular-pubescent.—Meadows, fields, pinelands, and woods, various provinces, Fla. to Tex. and N. Y.

13. P. rigidifolium Nash. Stem erect, 30–80 cm. tall: lower leaf-sheaths villous; blades erect or ascending: racemes usually single, 6–13 cm. tall: spikelets about 2 mm. long, glabrous or pubescent.—Pinelands, Coastal Plain, Fla. to Tex.—(*W. I.*)

14. P. propinquum Nash. Stem 50–100 cm. tall: leaf-sheaths glabrous; blades glabrous or sparingly ciliate, 7–20 mm. wide: racemes 1–3, 6–12 cm. long: spikelets glabrous, about 2 mm. long.—Hammocks, moist banks, and thickets, sandy soil, Coastal Plain, Fla. to Tex.

15. P. ciliatifolium Michx. Stem 40–80 cm. tall: leaf-blades 6–15 mm. wide: racemes 1 or 2, 5–11 cm. long: spikelets glabrous or pubescent. [*P. blepharophyllum* Nash *P. Chapmanii* Nash *P. Eggertii* Nash *P. epile* Nash *P. latifolium* Le Conte]—Fields, pinelands, hammocks, open woods, and swamps, Coastal Plain and adj. provinces, Fla. to Tex. and N. J.—(*W. I.*)

16. P. pubescens Muhl. Stem 40–80 cm. tall, usually pilose below the racemes: leaf-blades linear: racemes usually single, 6–12 cm. long: spikelets about 2 mm. long, glabrous. [*P. Muhlenbergii* Nash]—Fields, acid swamps, and marshes, Coastal Plain and rarely adj. provinces, Fla. to Tex. and Vt.

17. P. supinum Bosc. Stem 20–60 cm. tall: leaf-blades 10–20 mm. wide: racemes usually 2 or 3, 4–10 cm. long: spikelets about 2 mm. long, glandular-pubescent, or sometimes glabrous. [*P. dasyphyllum* Ell.]—Sandy soil, pinelands, fields, banks, and swamps, Coastal Plain, Fla. to La., Tenn., and N. C.

18. P. monostachyum Vasey. Glabrous: stem strict, 60–120 cm. tall: leaf-blades elongate, terete: racemes mostly 10–30 cm. long: spikelets 3 mm. long. [*P. solitarium* Nash]—Wet soil, prairies and marshes, Coastal Plain, S Fla. and Tex.

19. **P. bifidum** (Bertol.) Nash. Stem erect, 70–130 cm. tall: leaf-sheaths mostly papillose-hirsute; blades 5–10 mm. wide, glabrous beneath, hirsute above toward the base: racemes 2–5, 7–15 cm. long, erect; the rachis very slender, flexuous: spikelets turgid, 3.5–4 mm. long. [*P. racemulosum* Nutt.]—Dry pinelands, sandy woods, shaded banks, and thickets, Coastal Plain, Fla. to Tex. and S. C.

20. **P. laeve** Michx. Stem erect or ascending, glabrous, 40–100 cm. tall: leaf-blades glabrous, or sparsely pilose on the upper surface: racemes 2–5, usually 3 or 4, 3–10 cm. long, spreading or ascending: spikelets 2.5–3 mm. long. [*P. angustifolium* Le Conte *P. australe* Nash]—Fields, woods, swamps, and meadows, various provinces, Fla. to Tex. and N. J.

21. **P. longipilum** Nash. Resembling *P. laeve*: leaf-blades pilose on both surfaces or nearly glabrous beneath: racemes 2–6, rather lax and spreading. [*P. plenipilum* Nash *P. praelongum* Nash]—Moist sandy soil, pinelands, woods, and marshes, Coastal Plain, Fla. to Tex., Tenn., and N. Y.

22. **P. circulare** Nash. Stem 30–60 cm. tall: leaf-sheaths sparsely pilose or the upper glabrous; blades 5–10 mm. wide, usually more or less pilose: racemes 2–4, 5–10 cm. long, mostly suberect or the lower spreading.—Fields, marshes, meadows, prairies, and sandy woods, Coastal Plain and occasionally adj. provinces, N. C. to Tex., Kans., and Conn.

23. **P. praecox** Walt. Stem 50–100 cm. tall, producing short scaly rootstocks: leaf-sheaths glabrous or the lower pilose; blades 3–7 mm. wide, glabrous, or somewhat pilose on upper surface toward the base: racemes 2–8 (usually 4–6), 2–7 cm. long, ascending.—Wet pinelands, marshes, and ponds, Coastal Plain, Fla. to Tex. and N. C.

24. **P. lentiferum** Lam. Resembling *P. praecox*, but commonly more robust, the leaf-sheaths and blades often conspicuously pilose: racemes 2–9, usually 4 or 5, 3–10 cm. long. [*P. Curtisianum* Steud. *P. glaberrimum* Nash *P. tardum* Nash *P. Kearneyi* Nash *P. amplum* Nash]—Moist pinelands, wet woods, and marshes, Coastal Plain, Fla. to Tex. and N. C.

25. **P. difforme** LeConte. Stem 35–75 cm. tall: leaf-sheaths pilose on keel and margin or glabrous; blades usually pilose on the upper surface at least at base: racemes 2 or 3, 3.5–8 cm. long: spikelets mostly in pairs, 3.5–4 mm. long, oval.—Low grounds and rich woods, Coastal Plain, Fla. to La., and Ga.

26. **P. giganteum** Baldw. Stem mostly solitary, 150–200 cm. tall, with short scaly rootstocks: leaf-sheaths glabrous or pilose: racemes usually 3 or 4, 10–20 cm. long: spikelets 3–3.8 mm. long, oval or obovate, glabrous. [*P. longicilium* Nash.]—Moist sandy soil or clay, pinelands, marshes, and ditches, Coastal Plain, Fla. to Miss.

27. **P. floridanum** Michx. Stem 100–150 cm. tall, with short scaly rootstocks (more robust and taller: foliage glabrous or nearly so: racemes averaging longer, in *P. floridanum glabratum.* [*P. altissimum* Le Conte], Fla. to Tex., Kan., Md., and N. J.): leaf-sheaths commonly villous; blades 4–10 mm. wide, usually villous at least above: racemes mostly 2–4, 4–12 cm. long: spikelets 3.6–4 mm. long, oval, glabrous.—Low sandy soil, pinelands, prairies, swamps, and fields, Coastal Plain and rarely adj. provinces, Fla. to Tex., Mo., and Va.

28. **P. lividum** Trin. Stem 60–100 cm. tall: leaf-sheaths usually glabrous; blades 3–6 mm. wide, sometimes pubescent on the upper surface: racemes

usually 4–7, often flexuous, 1.5–5 cm. long.—Wet ground, Coastal Plain, Fla. to Tex.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)

29. **P. pubiflorum** Rupr. Stem 40–100 cm. tall, rather stout: leaf-sheaths glabrous or the lower hirsute; blades 10–15 mm. wide, glabrous: racemes usually 3–5, 5–10 cm. long: spikelets about 3 mm. long, softly pubescent (stems often taller: spikelets glabrous in *P. pubiflorum glabrum.* [*P. laeviglumis* Scribn.], Woods, various provinces, Kans., Ind., and N. C.), broadly obovate. [*P. Hallii* Vasey & Scribn. *P. geminum* Nash]—Moist soil, Coastal Plain, La. to Tex.—(*Mex.*)

30. **P. Urvillei** Steud. Stems in large clumps, 100–150 cm. tall: lower leaf-sheaths densely papillose-hirsute, purplish; blades 8–12 mm. wide: racemes 10–20, 8–12 cm. long. [*P. Vaseyanum* Scribn.]—(VASEY-GRASS.)—Fields, low grounds, prairies, and roadsides, Coastal Plain, Fla. to Tex. and S. C.—(*C. A.*, *S. A.*)

31. **P. dilatatum** Poir. Stem 50–170 cm. tall: leaf-sheaths glabrous; blades 3–12 mm. wide: racemes 3–8, 5–10 cm. long.—(DALLIS-GRASS.)—Moist soil, stream-banks, marshes, and waste-places, various provinces, Fla. to Tex., Tenn., and N. J.—(*W. I.*, *C. A.*, *S. A.*)

32. **P. Boscianum** Flügge. Annual, glabrous as a whole, stems ascending from a decumbent rooting base, 50–120 cm. long: leaf-sheaths purplish, the lowermost hirsute; blades 3–10 mm. wide: racemes 2–9 cm. long: spikelets mostly in pairs 2–2.3 mm. long, obovate. [*P. purpurascens* Ell.]—Moist soil, swamps, cult. grounds, and hillsides, Coastal Plain, Fla. to Miss. and Pa.—(*W. I.*)—*P. scrobiculatum* (Fl. SE. U. S.)is a depauperate plant with solitary spikelets.

33. **P. plicatulum** Michx. Stem 50–100 cm. tall: leaf-sheaths keeled, glabrous or rarely hirsute, the lower crowded: blades mostly folded at base, rather firm, 3–10 mm. wide: racemes usually 3–10 (2–19), 2–10 cm. long, usually arcuate-spreading: spikelets drying brown, the sterile lemma wrinkled just inside the margin.—Moist soil, pinelands, woods, and prairies, Coastal Plain, Fla. to Tex. and Ga.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)

27. **PANICUM** L. Annuals or perennials various in habit. Spikelets in open or compact panicles, rarely in racemes: glumes 2, usually very unequal, the first often minute, the second typically equalling the sterile lemma, the latter enclosing a thin palea and sometimes a staminate flower: fertile lemma chartaceous-indurate, typically obtuse, the nerves obsolete, the margins inrolled over a palea of the same texture.—Five hundred species, in the warmer parts of both hemispheres.—Sum.–fall, or all year S.—PANIC-GRASSES. WITCH-GRASSES.

Axis of branchlets extending beyond the base of the uppermost spikelet as a point or bristle 1–6 mm. long: perennials: fruit transversely rugose.	I. DISTANTIFLORA.
Axis of branchlets not extending into a bristle. (In *Panicum geminatum* and *P. paludivagum* the somewhat flattened axis pointed but not bristle-form.)	
Basal leaves similar to stem-leaves, not forming a winter rosette: spikelets all fertile.	
Fruit transversely rugose.	
Plant annual: leaf-sheaths rather wide, flat: spikelets more or less reticulate-veined.	III. FASCICULATA.
Plant perennial: spikelets glabrous.	
Inflorescence consisting of several spike-like racemes along a main axis.	II. GEMINATA.
Inflorescence an open panicle.	VI. MAXIMA.
Fruit not transversely rugose.	
First glume truncate or triangular-tipped, not more than one fourth the length of the nar-	

row, acute or acuminate, glabrous spikelet: plants annual. — IV. DICHOTOMIFLORA.

First glume not truncate (except in *P. repens*).

Plant annual.

Spikelets glabrous, pointed: leaf-sheaths papillose-hispid; leaves hirsute. — V. CAPILLARIA.

Spikelets warty: leaves glabrous. — XI. VERRUCOSA.

Plant perennial.

Spikelets short-pediceled along one side of the main branches of the panicle forming narrow or spike-like racemes, sometimes somewhat aggregate toward the ends of branches (see also VIII. Tenera).

First glume nearly equalling the sterile lemma. — XXIX. GYMNOCARPA.

First glume much shorter than the sterile lemma.

Panicle long (15–30 cm.), very narrow, the branches erect or nearly so; fruit rather thin and soft, the palea scarcely enclosed. — XXVIII. HEMITOMA.

Panicle usually open (at least not long and narrow), the main branches spreading: fruit indurate, the palea enclosed: plants commonly producing axillary panicles.

Sterile palea not enlarged at maturity. — IX. AGROSTOIDEA.

Sterile palea enlarged at maturity, forcing open the spikelet. — X. LAXA.

Spikelets in open or sometimes in contracted or congested panicles, but the main branches not in narrow or spike-like racemes: stems simple.

Panicle narrow and few-flowered: stems erect and wiry: leaf-blades drying involute. — VIII. TENERA.

Panicle open or contracted, several- to many-flowered: stems stout or rigid. — VII. VIRGATA.

Basal leaves usually distinctly different from those of the stem, forming a winter rosette: stems at first simple, the spikelets of the primary panicle not perfecting seed, later usually becoming much-branched, the small secondary panicles with cleistogamous, fruitful spikelets: panicles open, the branchlets usually flexuous: perennials.

Leaf-blades elongate, not more than 5 mm. wide, 20 times as long as wide: autumnal phase branching from the base only. — XII. DEPAUPERATA.

Leaf-blades not elongate (or if so more than 5 mm. wide and autumnal phase not branching from the base).

Plant branching from the base, finally forming rosettes or cushions, the foliage soft and lax: leaf-blades prominently ciliate (except in *P. laxiflorum*). — XIII. LAXIFLORA.

Plant branching from the stem-nodes or rarely remaining simple.

Leaf-blades long, stiff: autumnal phase bushy-branched above.

Spikelets turgid, attenuate at base, mostly pustulose-pubescent: leaf-blades conspicuously striate, tapering from base to apex. — XIV. ANGUSTIFOLIA.

Spikelets scarcely turgid, not attenuate at base: leaf-blades tapering to both ends. — XV. BICKNELLIANA

Leaf-blades not long and stiff (somewhat so in *P. oligosanthes*, *P. malacon*, *P. Commonsianum*, and *P. equilaterale*): autumnal phase usually not bushy-branched.

Spikelets turgid, blunt, strongly nerved (not strongly turgid in *P. oligosanthes*): leaf-blades rarely as much as 1.5 cm. wide (sometimes 2 cm. in *P. Ravenelii*).

Leaf-sheaths glabrous or minutely puberulent: spikelets 1.5–2.5 mm. long, asymmetrically pyriform, strongly nerved: stems wiry. — XXIII. LANCEARIA.

Leaf-sheaths, or some of them, papillose-hispid: spikelets 3–4 mm. long. XXIV. OLIGOSANTHIA.
Spikelets not turgid, blunt, nor strongly nerved (see, however, *P. roanokense* and *P. caerulescens*).
Ligule of conspicuous hairs, usually 3–5 mm. long: spikelets pubescent.
Leaf-sheaths glabrous or only the lowermost somewhat pubescent. XVIII. SPRETA.
Leaf-sheaths strongly pubescent. XIX. LANUGINOSA.
Ligule obsolete or nearly so (manifest in *P. tsugetorum* and *P. curtifolium*).
Spikelets spheric at maturity: leaf-blades glabrous, firm, cordate, with a fine white margin: plants sparingly branching: panicle-branches with viscid spots. XXI. SPHAEROCARPA.
Spikelets usually obovate or elliptic.
Leaf-blades of the mid-stem elongate, less than 1.5 cm. wide: stems usually tall: spikelets pointed, abruptly so in the velvety *P. scoparium*. XXV. SCOPARIA.
Leaf-blades of the mid-stem not elongate (somewhat so in *P. equilaterale*).
Blades cordate, 1–3 cm. wide (5–12 mm. in *P. Ashei*): spikelets pubescent.
Spikelets 2.5–3 mm. long: leaf-sheaths glabrous or minutely puberulent. XXVI. COMMUTATA.
Spikelets 3–5 mm. long (sometimes but 2.7 mm. long in the hispid-sheathed *P. clandestinum*). XXVII. LATIFOLIA.
Blades not cordate (somewhat in *P. annulum*), less than 1 cm. wide.
Sheaths crisp- or appressed-pubescent: blades firm: spikelets pubescent. XX. COLUMBIANA.
Sheaths glabrous (sparsely pilose in *P. curtifolium* and the lower ones velvety in *P. mattamuskeetense* and often in *P. annulum*).
Vernal stems delicate (sometimes scarcely so in *P. albomarginatum* and *P. tenue*): spikelets 1.5 mm. long or less (1.6–1.7 mm. in *P. tenue*). XXII. ENSIFOLIA.
Vernal stems slender but not delicate, rarely less than 40 cm. high: spikelets 2–2.9 mm. long (1.5 mm. in *P. microcarpon* and *P. caerulescens*).
Lower internodes short, upper elongate, producing a nearly naked stem, leafy at base: spikelets narrowly ovate, 2.7–2.9 mm. long. XVI. NUDICAULIA.
Lower internodes not short: vernal stems about evenly leafy throughout: spikelets elliptic or obovate, not more than 2.5 mm. long. XVII. DICHOTOMA.

I. DISTANTIFLORA

Plant slender, erect, with narrow erect or appressed racemes. 1. *P. Chapmani.*

II. GEMINATA

Nodes bearded: leaf-sheath villous. — 2. *P. barbinode.*
Nodes glabrous: plants glabrous throughout.
  Spikelets 3 mm. long: glumes and sterile lemma papery. — 3. *P. paludivagum.*
  Spikelets not over 2.4 mm. long: glumes and sterile lemma not papery. — 4. *P. geminatum.*

III. FASCICULATA

Spikelets 2–4 mm. long.
  Spikelets strongly reticulate-veined, 2–3 mm. long: glabrous. — 5. *P. fasciculatum.*
  Spikelets scarcely reticulate-veined or only near apex.
    Spikelets not over 2 mm. long, glabrous. — 6. *P. reptans.*
    Spikelets over 3 mm. long, pubescent. — 7. *P. adspersum.*
Spikelets 5–6 mm. long. — 8. *P. texanum.*

IV. DICHOTOMIFLORA

Leaf-sheaths papillose-hispid. — 9. *P. bartowense.*
Leaf-sheaths glabrous. — 10. *P. dichotomiflorum.*

V. CAPILLARIA

Panicles drooping: spikelets 4.5–5 mm. long. — 11. *P. miliaceum.*
Panicles erect: spikelets less than 3.5 mm. long.
  Panicles more than half the length of the entire plant.
    Panicles narrow, usually less than half as broad as long. — 12. *P. flexile.*
    Panicles as broad as long. — 13. *P. capillare.*
  Panicles not more than one-third the entire height of the plant.
    Stem stout: leaf-blades about 1 cm. wide: spikelets turgid. — 14. *P. Gattingeri.*
    Stem slender: leaf-blades not over 6 mm. wide: spikelets not turgid. — 15. *P. philadelphicum.*

VI. MAXIMA

Plant large, rather coarse, with ample panicles. — 16. *P. maximum.*

VII. VIRGATA

Spikelets not over 2.5 mm. long, first glume less than half the length of the spikelet.
  Panicles loosely flowered: first glume truncate, about one-fifth the length of the spikelet. — 17. *P. repens.*
  Panicle rather densely flowered: first glume triangular, about one-third the length of the spikelet. — 18. *P. Gouini.*
Spikelets 3–7 mm. long (sometimes less than 3 mm. in *P. virgatum cubense*): first glume more than half the length of the spikelet.
  Panicles elongate, strongly contracted: seacoast plants.
    Stem rarely 1 m. high, solitary from the nodes of the horizontal rootstock. — 19. *P. amarum.*
    Stem 1–2 m. high, in dense tufts. — 20. *P. amarulum.*
  Panicles diffuse or only slightly contracted: plants sometimes of salt marshes but not littoral. — 21. *P. virgatum.*

VIII. TENERA

Plant slender, stiffly erect, with narrow strict panicles. — 22. *P. tenerum.*

IX. AGROSTOIDEA

Rootstock present: stem but little compressed: spikelets set obliquely on their appressed pedicels.
  Panicles open: spikelets 3.4–3.8 mm. long (shorter in exceptional specimens). — 23. *P. anceps.*
  Panicles more or less contracted: spikelets not over 2.8 mm. long. — 24. *P. rhizomatum.*
Rootstock wanting: stem strongly compressed: leaf-sheaths keeled: spikelets not obliquely disposed.
  Ligules ciliate: basal leaves half as long as the stem or more: panicle rather open, much exceeding the upper leaves.

Spikelets not over 2.7 mm., usually 2.5 mm. long, the first glume less than half that length: ligules 2–3 mm. long. — 25. *P. longifolium.*
Spikelets 3–3.5 mm. long: first glume two-thirds to three-fourths that length: ligule less than 1 mm. long. — 26. *P. Combsii.*
Ligules erose or lacerate, not ciliate: basal leaves in short tufts, the upper usually nearly equalling the terminal rather dense panicle.
Fruit stipitate: spikelets 2.5–2.8 mm. long, conspicuously secund. — 27. *P. stipitatum.*
Fruit not stipitate: spikelets not conspicuously secund.
Spikelets 1.8–2 mm., in occasional specimens 2.2 mm. long: panicle-branches ascending or spreading. — 28. *P. agrostoides.*
Spikelets about 2.5 mm. long: panicle-branches erect or nearly so. — 29. *P. condensum.*

X. Laxa

Plant erect or partly decumbent, with lax panicles and small gaping spikelets. — 30. *P. hians.*

XI. Verrucosa

Plant weak, often with reclining stems, the mature panicle diffuse, with filiform branches and scattered spikelets. — 31. *P. verrucosum.*

XII. Depauperata

Spikelets about 3.5 mm. long, beaked. — 32. *P. depauperatum.*
Spikelets 3 mm. long or less. — 33. *P. linearifolium.*

XIII. Laxiflora

Leaf-sheaths retrorsely pilose: spikelets papillose-pilose.
Leaf-blades glabrous or nearly so on the surface and margin: spikelets 2.2 mm. long. — 34. *P. laxiflorum.*
Leaf-blades ciliate and more or less pilose on the surface: spikelets 2 mm. long. — 35. *P. xalapense.*
Leaf-sheaths not retrorsely pilose: spikelets pubescent or glabrous.
Spikelets pubescent, about 2 mm. long. — 36. *P. ciliatum.*
Spikelets glabrous.
Leaf-blades glabrous on the surface. — 37. *P. polycaulon.*
Leaf-blades pilose on the surface. — 38. *P. strigosum.*

XIV. Angustifolia

Nodes bearded: plant grayish-villous: autumnal leaf-blades flat.
Spikelets 2 mm. long. — 39. *P. chrysopsidifolium.*
Spikelets 2.5–2.8 mm. long. — 40. *P. consanguineum.*
Nodes not bearded: plant villous only at base, or nearly glabrous: autumnal leaf-blades involute or flat.
Autumnal leaf-blades flat: lower panicle-branches spreading or deflexed. — 41. *P. angustifolium.*
Autumnal leaf-blades involute: lower panicle-branches more or less ascending.
Spikelets 3.3–3.5 mm. long, pointed. — 42. *P. fusiforme.*
Spikelets less than 3 mm. long, not pointed, or obscurely so.
Plant glabrous or nearly so: autumnal stems erect.
Spikelets subsecund along the suberect panicle-branches. — 43. *P. neuranthum.*
Spikelets not subsecund: panicle loose and open. — 44. *P. ovinum.*
Plant pubescent, at least on the lower half.
Spikelets about 2.4 mm., rarely only 2.1 mm. long: vernal leaf-blades 7–12 cm. long; autumnal blades not falcate. — 45. *P. arenicoloides.*
Spikelets not over 2 mm. long: vernal leaf-blades 4–6 cm. long; autumnal blades much crowded, falcate. — 46. *P. aciculare.*

XV. BICKNELLIANA

Plant with tufted stems and open panicles with few spikelets. — 47. *P. Bicknellii.*

XVI. NUDICAULIA

Plant with erect or partly decumbent stems, the panicles with spreading branches. — 48. *P. nudicaule.*

XVII. DICHOTOMA

Nodes, at least the lower, bearded.
- Spikelets 1.5–1.6 mm. long, glabrous (occasional individuals with pubescent spikelets). — 49. *P. microcarpon.*
- Spikelets 2 mm. or more long.
  - Spikelets glabrous, 2 mm. long: autumnal form top-heavy-reclining. — 60. *P. barbulatum.*
  - Spikelets pubescent.
    - Leaf-blades all velvety: autumnal form sparingly branched. — 50. *P. annulum.*
    - Leaf-blades glabrous, or only the lower pubescent or velvety: autumnal form freely branching.
      - Spikelets 2 mm. long: autumnal form profusely branching. — 51. *P. nitidum.*
      - Spikelets 2.2 mm. or more long: autumnal form less profusely branching.
        - Lower leaf-sheaths and all nodes pubescent. — 52. *P. mattamuskeetense.*
        - Leaf-sheaths and upper nodes glabrous. — 53. *P. Clutei.*

Nodes not bearded (lower nodes pubescent in *P. barbulatum*).
- Spikelets pubescent.
  - Stems erect, never becoming vine-like. — 53. *P. Clutei.*
  - Stems soon prostrate, vine-like: branches divaricate.
    - Plants bright-green; stems lax: spikelets not over 2.1 mm. long. — 54. *P. lucidum.*
    - Plants grayish-green; stems stiff: spikelets 2.5 mm. long. — 55. *P. sphagnicola.*
- Spikelets glabrous.
  - Stem soon prostrate.
    - Plant bright-green; stems lax: spikelets not over 2.1 mm. long. — 54. *P. lucidum.*
    - Plant grayish-green; stems stiff: spikelets 2.5 mm. long. — 55. *P. sphagnicola.*

Stem erect, or the autumnal form topheavy, never prostrate.
- Spikelets not over 1.6 mm. long: panicles narrow: plants glaucous bluish-green. — 56. *P. caerulescens.*
- Spikelets 2 mm. or more long: panicles open.
  - Leaf-blades erect, firm: spikelets turgid, strongly nerved: plants grayish olive-green. — 57. *P. roanokense.*
  - Leaf-blades spreading: spikelets not turgid.
    - Spikelets 2.2 mm. or more long, pointed: sheaths bearing pale glandular spots. — 58. *P. yadkinense.*
    - Spikelets not over 2 mm. long, not pointed.
      - Autumnal form erect, branched like a little tree: primary leaf-blades rarely over 5 mm. wide: second glume shorter than fruit and sterile lemma. — 59. *P. dichotomum.*
      - Autumnal form topheavy-reclining: primary leaf-blades 6–10 mm. wide: second glume equalling fruit and sterile lemma. — 60. *P. barbulatum.*

XVIII. SPRETA

Panicle narrow, one-fourth to one-third as wide as long. — 61. *P. spretum.*

Panicle open, two-thirds as wide as long, or more.
- Spikelets 1.5 mm. long. — 62. *P. Lindheimeri.*
- Spikelets 1.3 mm. long or less.
  - Stem and leaf-sheaths glabrous. — 63. *P. longiligulatum.*

Stem and leaf-sheaths appressed-pubescent.
Spikelets 1.2–1.3 mm. long. — 64. *P. leucothrix.*
Spikelets not over 1 mm. long. — 65. *P. Wrightianum.*

XIX. Lanuginosa

Spikelets not over 2 mm. long.
Plant grayish, velvety-pubescent.
Spikelets 1.4–1.5 mm. long: autumnal leaf-blades involute-pointed (see also *P. albemarlense*). — 66. *P. auburne.*
Spikelets 1.8–2 mm. long: autumnal leaf- blades flat.
Plant dark-green or olive-green when dry: spikelets 1.9–2 mm. long. — 67. *P. Thurowii.*
Plant light-green or yellow-green when dry. — 68. *P. lanuginosum.*
Plant pubescent, often villous, but not velvety.
Vernal leaf-blades glabrous or nearly so on the upper surface, firm in texture. — 69. *P. tennesseense.*
Vernal leaf-blades pubescent on upper surface, sometimes pilose near base and margins only.
Spikelets 1.3–1.5 mm. long: vernal leaf-blades long-pilose on upper surface.
Autumnal form widely decumbent-spreading, forming a mat: vernal stems soon geniculate-spreading: plants olivaceous. — 70. *P. albemarlense.*
Autumnal form erect or leaning, never forming a mat: plants yellowish-green. — 71. *P. meridionale.*
Spikelets 1.6–2 mm. long: vernal leaf-blades pilose or pubescent. — 72. *P. Huachucae.*
Spikelets 2.2 mm. or more long: plants conspicuously pilose.
Spikelets 2.2–2.4 mm. long.
Pubescence on stems and leaf-sheaths horizontally spreading: autumnal form freely branching. — 73. *P. villosissimum.*
Pubescence on stems and leaf-blades appressed or ascending: autumnal form rather sparingly branching. — 74. *P. pseudopubescens.*
Spikelets 2.7–2.9 mm. long. — 75. *P. ovale.*

XX. Columbiana

Spikelets 2–3.2 mm. long, mostly elliptic.
Winter leaf-blades 5–10 cm. long: spikelets 2 mm. long: plants blue-green. — 76. *P. wilmingtonense.*
Winter leaf-blades 1–3 cm. long.
Spikelets 3.2 mm. long: first glume conspicuously distant. — 77. *P. malacon.*
Spikelets not over 2.5 mm. long: first glume not distant.
Spikelets about 2.4 mm. (2.2–2.4 mm.) long: panicle open; branches stiffly spreading. — 78. *P. Commonsianum.*
Spikelets 2–2.1 mm. long: panicle rather dense; branches ascending. — 79. *P. Addisonii.*
Spikelets not over 1.9 mm. long, obovate, turgid. — 80. *P. tsugetorum.*
Spikelets about 1.9 mm. long. — 80a. *P. columbianum.*
Spikelets about 1.5 mm. long.

XXI. Sphaerocarpa

Stem spreading: leaf-blades obscurely nerved: panicle nearly as broad as long. — 81. *P. sphaerocarpon.*
Stem erect or ascending: leaf-blades rather strongly nerved: panicle never more than two-thirds as broad as long, usually less.
Spikelets 1.5–1.6 mm. long: leaf-blades lanceolate, the upper not reduced. — 82. *P. polyanthes.*
Spikelets 1–1.2 mm. long: leaf-blades tapering from base to apex, the upper much smaller than the lower. — 83. *P. erectifolium.*

XXII. Ensifolia

Ligule about 1 mm. long: sheaths or some of them sparsely spreading-pilose. — 84. *P. curtifolium.*
Ligules obsolete or nearly so: pubescence if present not spreading.
Leaf-blades prominently white-margined, firm: spikelets densely puberulent.

Leaf-blades puberulent beneath, often above: sheaths and sometimes lower internodes ascending pubescent. — 85. *P. tenue.*
Leaf-blades glabrous: sheaths glabrous or minutely ciliate only.
Uppermost leaf-blades much reduced: stems branching from lower nodes only, the branches repeatedly branching. — 86. *P. albomarginatum.*
Uppermost leaf-blades about as long as the others: stems bearing short branches from the upper and middle nodes. — 87. *P. trifolium.*
Leaf-blades not white-margined or very obscurely so (or if white margin is evident spikelets only 1.1 mm. long): spikelets glabrous or puberulent.
Stem branching only at base: plants soft, light green. — 88. *P. vernale.*
Stem branching at the nodes: plant firm or at least not soft.
Spikelets glabrous.
Spikelets 1.1–1.2 mm. long: leaf-blades rarely as much as 5 cm. long. — 89. *P. chamaelonche.*
Spikelets 1.2–1.5 mm. long.
Leaf-blades elongate, at least some of them 8–10 cm. long. — 90. *P. glabrifolium.*
Leaf-blades not over 3 cm. long. — 91. *P. ensifolium.*
Spikelets puberulent.
Spikelets 1.1 mm. long: winter leaf-blades bluish-green, not glossy. — 92. *P. concinnius.*
Spikelets 1.3–1.5 mm. long.
Leaf-blades involute, falcate, with long stiff hairs on margin near base: plants stiff and wiry. — 93. *P. breve.*
Leaf-blades not involute, or at tip only, not falcate: plants bright-green: winter leaf-blades conspicuous, glossy green. — 94. *P. flavovirens.*

XXIII. Lancearia

Spikelets 1.5–1.6 mm. long. — 95. *P. portoricense.*
Spikelets 2 mm. or more long.
Leaf-blades, or some of them, at least 8 mm. wide, glabrous on the upper surface: fruit papillose-roughened. — 96. *P. Webberianum.*
Leaf-blades not over 6 mm. wide (or if wider, puberulent on the upper surface): fruit smooth and shining.
Spikelets 2.4–2.6 mm. long: leaf-blades narrowed toward the base. — 97. *P. patentifolium.*
Spikelets not over 2.1 mm. long.
Leaf-blades firm, glabrous above: stem stiffly ascending. — 98. *P. lancearium.*
Leaf-blades lax, softly puberulent on both surfaces: stem decumbent. — 99. *P. patulum.*

XXIV. Oligosanthia

Nodes bearded: blades velvety-pubescent beneath.
Plants lax, soft-velvety throughout: spikelets not over 3 mm. long. — 100. *P. malacophyllum.*
Plants stiff, pubescence harsh: spikelets about 4 mm. long. — 101. *P. Ravenelii.*
Nodes not bearded: leaf-blades not velvety.
Spikelets narrowly obovate, subacute: plants olivaceous, appressed-pubescent. — 102. *P. oligosanthes.*
Spikelets broadly obovate, turgid, blunt: plants green, pubescence, if any, not appressed. — 103. *P. Scribnerianum.*

XXV. Scoparia

Pubescence soft-villous or velvety: spikelets abruptly pointed. — 104. *P. scoparium.*
Pubescence when present not velvety.
Spikelets elliptic: fruit about 2.5 mm. long. — 105. *P. aculeatum.*
Spikelets ovate, that is, broadest below the middle: fruit 2 mm. long or less.

Leaf-sheaths or some of them hispid, rarely glabrous: autumnal phase with crowded branchlets. — 106. *P. scabriusculum.*
Leaf-sheaths glabrous: autumnal phase sparingly branching. — 107. *P. cryptanthum.*

XXVI. COMMUTATA

Plant glaucous, glabrous: basal leaf-blades conspicuously ciliate: vernal stems usually solitary. — 108. *P. mutabile.*
Plant not glaucous.
Leaf-blades linear: first glume about half as long as the spikelet. — 109. *P. equilaterale.*
Leaf-blades lanceolate.
Stems crisp-puberulent: leaf-blades usually rigid, symmetrical, rarely over 10 mm. wide: spikelets about 2.5 mm. long. — 110. *P. Ashei.*
Stems glabrous or softly puberulent: leaf-blades firm or lax: spikelets 2.7–3.2 mm. long.
Stems erect, or autumnal form leaning: leaf-blades symmetric, broadly cordate. — 111. *P. commutatum.*
Stems decumbent: leaf-blades usually unsymmetric and falcate, narrowed to the scarcely cordate base. — 112. *P. Joorii.*

XXVII. LATIFOLIA

Leaf-sheaths, at least the lower and those of the branches, strongly papillose-hispid. — 113. *P. clandestinum.*
Leaf-sheaths glabrous or softly villous.
Nodes glabrous: spikelets 3.4–3.7 mm. long. — 114. *P. latifolium.*
Nodes bearded: spikelets 4–4.5 mm. long. — 115. *P. Boscii.*

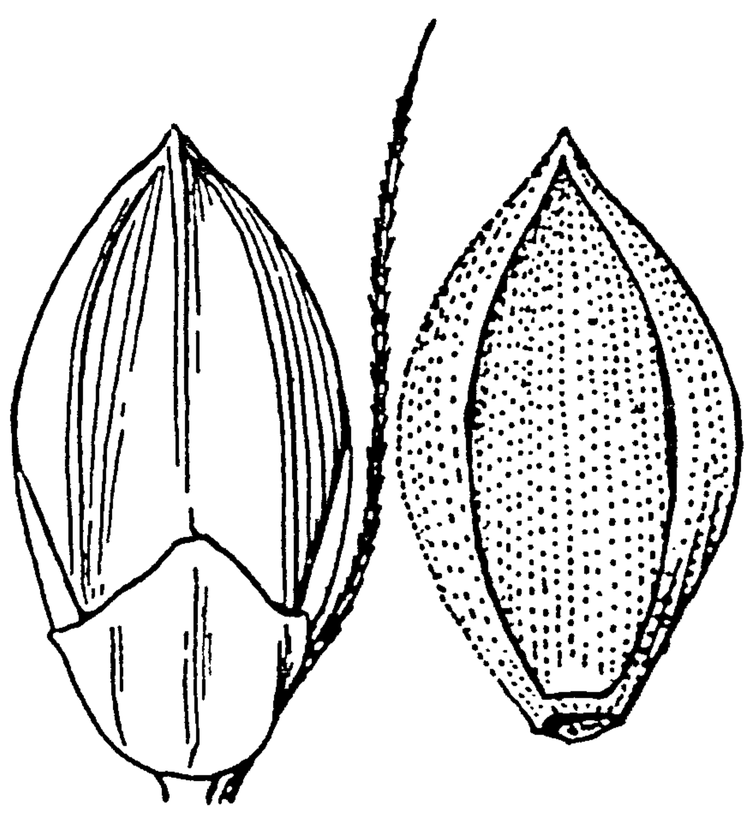
XXVIII. HEMITOMA

Plant vigorous, extensively rooting, with erect narrow, often elongate, panicles and acute spikelets. — 116. *P. hemitomon.*

XXIX. GYMNOCARPA

Plant stout, extensively creeping, with spreading panicles and long narrowly pointed spikelets. — 117. *P. gymnocarpon.*

1. P. Chapmani Vasey. Stem ascending or spreading, 40–100 cm. tall: leaf-blades erect, 2–5 mm. wide: panicle elongate, as much as 30 cm. long, the branches remote, appressed. —Rocky pinelands, shell-mounds and cleared hammock land, S pen. Fla. and the Keys.—(*Bah.*)



2. P. barbinode Trin. Stem erect from a long decumbent rooting stoloniferous base, 200–600 cm. long: leaf-sheaths villous, or glabrous toward the summit, densely pubescent on the collar: blades 10–15 mm. wide, glabrous: panicle 12–20 cm. long, the rather distant subracemose densely flowered branches ascending or spreading: spikelets 3 mm. long. [*P. molle* (Fl. SE. U. S.]—Hammocks, fields, and waste-places, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A., O. W.*)

3. P. paludivagum H. & C. Stem elongate, as much as 200 cm. long, the base creeping, rooting at the nodes: panicle 25–35 cm. long; racemes 12–15, erect, the lower distant, 3 cm. long.—In fresh water, Coastal Plain, Fla. and Tex.—(*Mex., C. A., S. A.*)

4. P. geminatum Forsk. Stem 25–80 cm. tall, spreading from a somewhat decumbent base: panicle 12–30 cm. long, the racemes 12–18, erect, the lower 2.5–3 cm. long. [*P. paspaloides* (Fl. SE. U. S.)]—(WATER-GRASS.)—Moist ground, ponds and prairies, Coastal Plain, S Fla. and Tex.—(*W. I., Mex., C. A., S. A., O. W.*)—Plant cespitose.

5. P. fasciculatum Swartz. Stem erect or spreading from a decumbent base, 30–100 cm. tall: leaf-sheaths glabrous or papillose-hispid: blades 6–20 mm. wide, glabrous: panicle 5–15 cm. long, the branches racemose along the main axis, solitary or clustered, 5–10 cm. long, spreading, the spikelets short-pedicelled (panicles smaller and more compact, the branches appressed: leaf-blades narrower, pubescent: spikelets 2.5–3 mm. long, in *P. fasciculatum reticulatum.* Tex. to Ariz.; introd. into S. C.—(*Mex., C. A., S. A.*)): spikelets mostly brownish, usually 2–2.5 mm. long, glabrous. [*P. fuscum* Swartz]—Hammocks, fields, and waste-places, S Fla. and S Tex.—(*W. I., Mex., C. A., S. A.*)

6. P. reptans L. Stem prostrate or decumbent at base, rooting at the lower nodes, the ascending portion 10–30 cm. tall: leaves glabrous, the blades ciliate at base: panicle 2–6 cm. long, the 3–12 spike-like branches ascending or spreading: first glume truncate, about one-sixth the length of the spikelet. [*P. prostratum* Lam.]—Fields and moist open ground, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)

7. P. adspersum Trin. Stem ascending or spreading from a decumbent base, 30–100 cm. tall: leaf-blades 6–20 cm. wide: panicle 6–15 cm. long, the few ascending spike-like racemes 3–10 cm. long: spikelets pale, 3.5–4 mm. long, abruptly acuminate, more or less hispid.—Moist open ground, Fla.—(*W. I.*)—A robust form is *P. keyense* Mez.

8. P. texanum Buckl. Stem stout, 50–150 cm. tall, branching at base and lower nodes, pubescent below nodes and panicle: leaf-sheaths and blades softly pubescent: panicle 8–20 cm. long, 1–3 cm. wide, the axis densely pubescent: spikelets fusiform, pointed, pilose. Prairies and open ground, Coastal Plain, Tex. and Okla., introd. in Ariz., and eastward to Fla. and N. C.—(*Mex.*)

9. P. bartowense Scribn. & Merr. Stem erect, as much as 200 cm. tall: leaf-blades 15–40 cm. long, 5–13 mm. wide: glabrous or nearly so: panicle large, loosely spreading, 15–60 cm. long: spikelets short-pediceled, appressed, about 2.5 mm. long.—(WITCH-GRASS.)—Low grounds, marshes, and prairies, Fla.—(*W. I.*)

10. P. dichotomiflorum Michx. Stem much-branched, ascending from a geniculate base, usually 50–100 cm. tall, sometimes as much as 2 m., the plant usually glabrous throughout: leaf-blades 3–20 mm. wide: panicles terminal and axillary, 10–40 cm. long: spikelets short-pediceled along the main branches, usually 2.5 mm. long. [*P. proliferum* (Fl. SE. U. S.)]—Low grounds, fields, roadsides, and waste-places, various provinces, Fla. to Tex., Calif., Nebr., and Me.—(*W. I.*)

11. P. miliaceum L. Stem as much as 100 cm. tall, rather stout: leaf-blades mostly pilose, as much as 30 cm. long and 2 cm. wide: panicle 10–30 cm. long, usually rather compact, the numerous branches narrowly ascending, spikelet-bearing toward the summit.—Roadsides, waste-places, and cult. grounds, occasional throughout the U. S., rare S—Cult. as PROSO. HOG-MILLET. BROOM-CORN MILLET. Nat. of Eu.—(*Mex.*)

12. P. flexile (Gatt.) Scribn. Stem erect, 20–70 cm. tall, slender, branching at base: leaf-blades erect, glabrous to sparsely hispid, 2–6 mm. wide: spikelets 3–3.5 mm. long, acuminate.—Sandy damp soil, various provinces, Fla. to Tex., S. D., and Ont.

13. P. capillare L. Stem erect or ascending, simple or sparingly branched, 20–80 cm. tall: leaf-blades 5–15 mm. wide, hispid: panicle large, diffuse, at maturity breaking away as a tumble-weed: spikelets 2–2.5 mm. long.—(WITCH-

GRASS.)—Woods, fields, marshes, prairies, and waste-places, various provinces, Fla. to Tex., Mont., and Me.—*Panicum Bergii* Arech., differing from *P. capillare* in being perennial, in having involute leaf-blades, the axils of the panicle strongly pilose, and the lower branches in verticils, has been found on ballast at Mobile, Ala., and Galveston, Tex.

14. P. Gattingeri Nash. Stem soon decumbent-spreading, rooting at the lower nodes, as much as 100 cm. long: leaf-blades 6–10 mm. wide, more or less hispid: panicles numerous, terminal and axillary, the former 10–15 cm. long, the latter smaller.—Open ground, dry hills, woods, cult. grounds, and waste-places, various provinces, N. C. and Tenn. to Minn and N. Y.

15. P. philadelphicum Bernh. Stem mostly erect, 15–20 cm. tall, usually zigzag at the slender base: leaf-blades 2–6 mm. wide, sparingly hirsute: panicle ovoid, few-flowered, the spikelets usually in twos at the ends of the branchlets.—Dry open ground, hillsides, barrens, and roadsides, various provinces, Ga. to Okla., Wis., and Me.

16. P. maximum Jacq. Stem erect, 100–250 cm. tall, from a creeping root-stock: leaf-sheaths papillose-hirsute to glabrous: ligules 4–6 mm. long: blades elongate, 1–3.5 cm. wide: panicle 20–50 cm. long, about one-third as wide, the branches ascending, the lower in whorls, pilose in the axils: spikelets about 3 mm. long.—(GUINEA-GRASS.)—Cult. grounds, roadsides, and ditches, Coastal Plain, Fla. Nat. of Afr.—(*W. I., Mex., C. A., S. A., O. W.*)

17. P. repens L. Stem rigid, 30–80 cm. tall, from an extensively creeping root-stock: leaf-blades 2–5 mm. wide: panicle 7–12 cm. long, the branches ascending: spikelets pale, about 2.5 mm. long.—Sea beaches, sand-dunes, and sandy soil, Coastal Plain, Ala. to La. Nat. of O. W.—(*W. I., C. A., S. A.*)

18. P. Gouini Fourn. Resembling *P. repens*, usually lower: panicle smaller, narrower, more densely flowered, commonly purple: spikelets 2–2.4 mm. long. [*P. halophilum* Nash]—Sea beaches, Ala. and Miss.—(*Mex.*)

19. P. amarum Ell. Plant glaucous and glabrous throughout: stem solitary from a stout extensively creeping rootstock, 30–100 cm. tall: panicle not over 3 cm. wide, few-flowered, the branches appressed: spikelets 5–6.5 mm. long, acuminate, strongly nerved. [*P. amaroides* Scribn. & Merr.]—Beaches and dunes, Coastal Plain and New England Coast, Ga. to Miss. and Conn.

20. P. amarulum H. & C. Resembling *P. amarum*, but grows in large bunches, 100–200 cm. tall: panicles 5–10 cm. wide, nodding: spikelets 4.5–5.5 mm. long. [*P. amarum* (Fl. SE. U. S.)]—(BEACH-GRASS.)—Beaches and dunes, Coastal Plain, Fla. to La. and Va.—(*W. I.*)

21. P. virgatum L. Plant erect, with stout scaly rootstocks, glabrous throughout, or upper surface of leaf-blades pilose, 100–200 cm. tall (more slender, the panicle narrower: spikelets 2.8–3.2 mm. long, first glume about half the length of the spikelet, acute only, in *P. virgatum cubense*. [*P. virgatum breviramosum* Nash]—Sandy moist woods, Coastal Plain, Fla. to Miss. and Conn. (*W. I.*)): panicles 15–50 cm. long, open or diffuse: spikelets 3.5–5 mm. long, acuminate.—Prairies, pinelands, marshes, hammocks, and salt marshes, various provinces, Fla. to Ariz., Wyo., and Me.—(*Mex., C. A., S. A.*)

22. P. tenerum Beyr. Plant slender in small tufts from a knotted crown, 40–90 cm. tall: leaf-blades erect, firm, 2–4 mm. wide: panicle 3–8 cm. long, about 5 mm. wide: spikelets about 2.5 mm. long. [*P. stenodes* (Fl. SE. U. S.)]—Wet pinelands, ponds, and prairies, Coastal Plain, Fla. to Tex. and N. C.—(*W. I.*)

23. P. anceps Michx. Stem erect, rather stout, 50–100 cm. tall: leaf-sheaths glabrous to papillose-pilose: blades 20–50 cm. long, 4–12 mm. wide, pilose above toward the base: panicle 15–40 cm. long, the remote branches somewhat spreading: spikelets somewhat curved, set obliquely on the pedicels. [*P. rostratum* Muhl.]—Moist sandy soil, stream-banks, meadows, and pinelands, various provinces, Fla. to Tex., Kans., and N. J.

24. P. rhizomatum H. & C. Resembling *P. anceps*, the stem more slender: rootstocks more numerous: leaves shorter, somewhat crowded at the base, the sheaths villous.—Moist sandy woods, pinelands and swamps, Coastal Plain, Fla. to Tex. and Va.

25. P. longifolium Torr. Plant in dense tufts, 35–80 cm. tall, usually surrounded by basal leaves: leaf-sheaths usually glabrous, sometimes villous toward the summit: blades 2–5 mm. wide: panicle 10–25 cm. long: spikelets about 2.5 mm. long: first glume not over half the length of the spikelet. [*P. pseudanceps* Nash]—Moist acid sandy soil and low pinelands, Coastal Plain and New England Coast, Fla. to Tex. and R. I.

26. P. Combsii Scribn. & Ball. Resembling *P. longifolium*, but usually glabrous, the leaf-blades shorter: lateral panicles seldom developed: spikelets 3–3.5 mm. long, the first glume two-thirds to three fourths as long as the spikelet.—Wet woods, low pinelands, and cypress-ponds, Coastal Plain, Fla. to La. and Ga.

27. P. stipitatum Nash. Resembling *P. agrostoides*, often purple-tinged throughout, the stem strongly compressed: panicles usually several to a stem, 10–20 cm. long, rather narrow.—Moist soil, and stream-banks, various provinces, S. C. to Tex., Mo., and Conn.

28. P. agrostoides Spreng. Plant 50–100 cm. tall, with a dense clump of stems from a short caudex, with numerous shoots of short leaves at the base: stems compressed: panicle 10–30 cm. long, the stiff branches ascending or spreading: spikelets about 2 mm. long.—Wet meadows, ponds, swamps and marshes, various provinces, Fla. to Tex., Kans., and Me.

29. P. condensum Nash. Resembles *P. agrostoides*, usually rather taller: panicle 10–25 cm. long, rarely over 5 cm. wide, rather compact: spikelets 2.2–2.5 mm. long, turgid, the tips slightly spreading.—Wet places, marshes, swamps and ditches, Coastal Plain and rarely adj. provinces, Fla. to Tex. and Pa. —(*W. I.*)

30. P. hians Ell. Stem slender, erect or geniculate and rooting at the lower nodes, 20–60 cm. long: leaf-blades 1–5 mm. wide: panicle 5–20 cm. long, usually loose and open, the primary branches few, slender, distant, spreading to drooping, the spikelets towards the ends: spikelets about 2.3 mm. long, rather strongly nerved, glabrous. [*Steinchisma hians* Nash]—Damp soil, low woods, stream-banks, pools, and ditches, Coastal Plain and adj. provinces, Fla. to N. M. and N. C.

31. P. verrucosum Muhl. Plant bright-green, lax, soon decumbent, widely spreading, and divaricate-branched, as much as 150 cm. long: leaf-blades thin, lax, 4–10 mm. wide: panicle 5–30 cm. long, diffuse, the mostly solitary branches bearing a few short-pedicelled spikelets mostly in 2's toward the ends.—Wet shady places, acid swamps, ditches, and woods, Coastal Plain and New England Coast, Fla. to Tex. and Mass., and Great Lake Lowlands, N Ind.

32. P. depauperatum Muhl. Stem 20–40 cm. tall, erect and rather stiff: leaf-sheaths glabrous or pilose: blades linear, 6–15 cm. long, 2–5 mm. wide, often involute in drying: panicle 4–8 cm. long, the rather strict remote branches ascending: spikelets glabrous or sparsely pubescent. Autumnal phase similar,

but with reduced secondary panicles more or less concealed among the basal leaves.—Open sterile woods, fields, and rocky slopes, various provinces, Ga. to Tex., Minn., and Me.

33. P. linearifolium Scribn. Stem 20–45 cm. tall, not stiff: leaf-sheaths papillose-pilose: blades 10–35 cm. long, 2–4 mm. wide: panicle 5–10 cm. long. Autumnal phase with small panicles among the basal leaves.—Dry woods, hillsides, fields and thickets, various provinces, Ga. to Tex., Minn. and Me.

34. P. laxiflorum Lam. Stem slender, 20–60 cm. tall, erect, or geniculate at base: leaf-blades 10–18 cm. long, 7–12 mm. wide: panicle 8–12 cm. long, lax, few-flowered, the branches flexuous, spreading, the lower often deflexed. Autumnal phase much-branched at base, forming a soft spreading mat, with small secondary panicles intermixed. [*P. pyriforme* Nash] Rich woods, Coastal Plain, Fla., Ga., and Ala.

35. P. xalapense H. B. K. Resembling *P. laxiflorum;* differing in the pilose and ciliate leaf-blades and somewhat smaller (2 mm.) spikelets (with ovoid more compact panicles and somewhat smaller spikelets, about 1.7 mm. long, in *P. xalapense strictirameum.* S. C. to La.) [*P. laxiflorum* (Fl. SE. U. S.)] Open woods, pinelands, hammocks, and rocky fields, various provinces, Fla. to Tex., Mo., and Md. (*W. I., Mex.*)

36. P. ciliatum Ell. Stem 5–30 cm. tall, erect or spreading: leaf-blades 3–6 cm. long, 3–8 mm. wide, conspicuously ciliate: panicle 3–4 cm. long, the axis pilose. Autumnal phase a soft flat mat. Low pinelands, Coastal Plain, Fla. to La. and N. C.

37. P. polycaulon Nash. Resembling *P. ciliatum*: panicle larger, the axis sparsely pilose: spikelets about 1.5 mm. long, rarely as much as 2 mm. long. Low pinelands, and prairies, Coastal Plain, Fla. to Miss. (*W. I.*)

38. P. strigosum Muhl. Resembling *P. ciliatum*: panicle-axis and branches pilose: spikelets 1.3–1.5 mm. long. Sandy woods and pinelands, Coastal Plain, Fla. to La., Tenn., and Va. (*W. I., Mex.*)

39. P. chrysopsidifolium Nash. Stems ascending or spreading, 30–45 cm. tall: leaf-blades 5–10 cm. long, 3–5 mm. wide, conspicuously pointed, villous on both surfaces: panicles 4–6 cm. long, the flexuous branches ascending or spreading: spikelets villous. Autumnal phase forming mats, the blades 1–3 cm. long, 1.5 mm. wide, papery.—Sandy pinelands and woods, Coastal Plain, Fla. to La.—(*W. I.*)

40. P. consanguineum Kunth. Stem ascending or spreading, 20–55 cm. tall, densely felty-villous below: leaf-blades erect, 7–11 cm. long, 5–8 mm. wide: panicles 4–8 cm. long, the lower branches narrowly ascending. Autumnal phase spreading or decumbent, the numerous branches somewhat flabellately fascicled, the blades 3–4 cm. long, 2–3 mm. wide.—Sandy pinelands and meadows, Coastal Plain, Fla. to Tex. and Va.

41. P. angustifolium Ell. Stem erect, 30–55 cm. tall, the lowermost internodes gray crisp-villous, the upper glabrous: panicle 4–12 cm. long: spikelets 2.5–2.8 mm. long, papillose-villous. Autumnal phase stiffly ascending or somewhat topheavy-reclining, not mat-like: blades very numerous.—Sandy woods and pinelands, Coastal Plain and adj. provinces, Fla. to Tex. and Pa.

42. P. fusiforme A. Hitchc. Vernal phase similar to that of *P. angustifolium*: stem 30–70 cm. tall: lower leaf-blades softly pubescent beneath:

panicle long-exserted. Autumnal phase erect or reclining, forming dense bushy clusters 30–60 cm. tall.—Sandy pinelands and prairies, Coastal Plain, Fla. to Miss. and Ga.—(*W. I.*)

43. P. neuranthum Griseb. Stem stiff, 30–60 cm.: leaf-blades erect or ascending, 3–5 mm. wide: panicles 5–9 cm. long: spikelets 2 mm. long, finely papillose-pubescent. Autumnal phase slender.—Prairies, open woods and pinelands, Coastal Plain, Fla. to Miss.—(*W. I.*)

44. P. ovinum Scribn. & Smith. Stem erect, 30–50 cm. tall: leaf-blades erect or ascending, the lowermost as much as 1 cm. wide: panicle 5–9 cm. long, three-fourths as wide: spikelets slightly over 2 mm. long, minutely papillose-pubescent. Autumnal leaf-blades not much reduced.—Dry or moist grounds, woods and pinelands, Coastal Plain, Miss. to Tex. and Ark.—(*Mex.*)

45. P. arenicoloides Ashe. Stem mostly erect, 30–50 cm. tall: leaf-blades 3–4 mm. wide: panicle 4–6 cm. long: spikelets papillose-pubescent. Autumnal phase bushy-branched, erect or topheavy.—Sandy pinelands, sand-dunes, and woods, Coastal Plain, Fla. to Tex. and N. C.—(*W. I., C. A.*)

46. P. aciculare Desv. Stem ascending, 20–50 cm. tall: leaf-blades stiff, spreading or ascending, narrowed to an involute point, 2–5 mm. wide: panicle open, 3–7 cm. long, the flexuous branches spreading. Autumnal phase bushy-branched, 10–30 cm. long, spreading and forming dense cushions, the blades 1–3 cm. long. [*P. arenicola* Ashe]—Sandy woods and pinelands, Coastal Plain, Fla. to Tex., Okla., and N. J.—(*W. I.*)

47. P. Bicknellii Nash. Stem erect, 30–50 cm. tall, glabrous, or puberulent toward base: nodes sparsely bearded or glabrous: leaf-sheaths glabrous or nearly so: blades stiffly ascending, 8–15 cm. long, 3–8 mm. wide, the uppermost usually longest: panicle ovoid, 5–8 cm. long, the branches ascending: spikelets 2.3–2.8 mm. long, sparsely pubescent, rarely glabrous. Autumnal phase erect, branching from middle nodes, forming a loose bushy crown of stiffly ascending blades. [*P. nemopanthum* Ashe]—Dry sterile or acid woods and hillsides, various provinces N of Coastal Plain, Ga. to Mo. and Conn.

48. P. nudicaule Vasey. Stem erect from a spreading base, 40–60 cm. tall, glabrous: panicle long-exserted, 4–7 cm. long.—Swamps, Coastal Plain, W Fla. and S Ala.

49. P. microcarpon Muhl. Stem erect, or geniculate at base, usually 60–100 cm. tall: leaf-sheaths glabrous or the lowermost pubescent: blades 8–15 mm. wide: panicle 8–12 cm. long, the branches ascending. Autumnal phase repeatedly branching from all the nodes, reclining from the weight of the dense mass: leaf-blades and panicles reduced. [*P. barbulatum* (Fl. SE. U. S.)]—Wet woods, marshy places, swamps, hillsides, and thickets, various provinces, Fla. to Tex., Mo., and Mass.

50. P. annulum Ashe. Stem usually purplish, 35–60 cm. tall: leaf-sheaths velvety or the upper nearly glabrous: blades 7–13 mm. wide: panicle 6–8 cm. long: spikelets 2 mm. long. Autumnal phase erect, bearing a few erect branches at the upper nodes.—Dry woods, Piedmont and rarely inner margin of Coastal Plain, Ga. to Miss. and N. J.

51. P. nitidum Lam. Stem erect, 30–60 cm. tall, sometimes taller: leaf-sheaths glabrous, or the lower pubescent, mottled or glandular: blades 5–10 mm. wide, glabrous: panicle 5–8 cm. long, the axis and the ascending branches viscid-spotted. Autumnal phase erect or reclining from the weight of the

foliage, the branchlets forming large clusters from the nodes: reduced blades numerous, 1–3 cm. long, 1–3 mm. wide, flat or soon involute.—Low moist ground, pinelands, prairies, and hammocks, Coastal Plain, Fla. to Tex. and Va.—(*W. I.*)

52. **P. mattamuskeetense** Ashe. Stem erect, usually purplish, 40–100 cm. tall: leaf-blades 8–12 cm. long, 8–12 mm. wide, glabrous or velvety: panicle 8–10 cm. long, the flexuous branches spreading: spikelets about 2.5 mm. long. Autumnal phase erect or decumbent, branching rather sparingly from the middle nodes.—Low moist grounds, Coastal Plain, N. C. to N. Y.

53. **P. Clutei** Nash. Resembling *P. mattamuskeetense*, but more nearly glabrous, only the lowermost nodes, leaf-sheaths and blades velvety: spikelets slightly smaller.—Moist acid soils, Coastal Plain and New England Coast, N. C. to Mass.

54. **P. lucidum** Ashe. Plant glabrous, at first erect and resembling those of *P. dichotomum*, the weak stem soon decumbent: spikelets 2 mm. long, glabrous or rarely pubescent. Autumnal phase repeatedly branching, forming large clumps or mats of slender, weak vine-like stems, the branches elongate and divergent, not fascicled.—Wet woods, prairies, and sphagnum bogs, Coastal Plain and New England Coast, Fla. to Tex. and Mass., and Great Lake Lowland, N Ind.—(*W. I.*)

55. **P. sphagnicola** Nash. Plant glabrous: stem slender, erect or reclining, 50–100 cm. tall: spikelets 2.5 mm. long, glabrous or puberulent toward the apex. Autumnal phase decumbent or finally prostrate-spreading, divaricately branched from all the nodes.—Edges of cypress swamps and in sphagnum bogs, Coastal Plain, Fla. and Ga.

56. **P. caerulescens** Hack. Plant glabrous: stem slender, 50–75 cm. tall: leaf-blades 5–8 cm. long, 4–7 mm. wide, usually purplish-beneath: panicle 3–7 cm. long: spikelets turgid, strongly nerved.—Marshes, prairies, and swampy woods, Coastal Plain, Fla. to Miss. and N. J.—(*W. I.*)

57. **P. roanokense** Ashe. Resembles *P. caerulescens*: stem 50–100 cm. tall: panicle more spreading: spikelets turgid, strongly nerved, purple-tinged at base. [*P. curtivaginum* Ashe]—Open swampy woods, Coastal Plain, Fla. to Tex. and Va.—(*W. I.*)

58. **P. yadkinense** Ashe. Plant glabrous, in a small tuft: stems erect and as much as 100 cm. tall: leaf-blades 8–11 mm. wide: panicle 10–12 cm. long: spikelets about 2.5 mm. long, the second glume and sterile lemma pointed beyond the fruit. Autumnal phase erect or leaning, loosely branched from the middle nodes.—Moist woods and swamps, Coastal Plain and rarely adj. provinces, Ga. to La., Ill., and Pa.—(*Mex.*)

59. **P. dichotomum** L. Plant glabrous: stem erect from a knotted crown, 30–50 cm. tall: leaf-blades spreading, 5–11 cm. long, 4–6 mm. wide: panicle 4–9 cm. long: spikelets 2 mm. long, glabrous, rarely pubescent.—Dry sterile woods, various provinces, Fla. to Tex., Mich., and N. B.

60. **P. barbulatum** Michx. Resembling *P. dichotomum*: differs in having pubescent lower nodes and in the diffusely branched autumnal phase, forming large reclining bunches, the slender branches recurved, the numerous flat leaf-blades horizontally spreading.—Sterile woods, pinelands, and fields, various provinces, Ga. to Tex., Mich., and Mass.

61. P. spretum Schult. Plant glabrous: stem erect, 30–90 cm. tall: panicle 8–12 cm. long, the branches ascending or appressed: spikelets about 1.5 mm. long, pubescent or rarely glabrous. Autumnal phase reclining, the branches in short fascicles at the nodes, the blades much reduced. [*P. octonodum* J. G. Smith *P. paucipilum* Nash *P. nitidum* (Fl. SE. U. S.)]—Wet acid soil and low pinelands, Coastal Plain and New England Coast, Fla. to Tex. and Me., and Great Lake Lowland, N Ind.

62. P. Lindheimeri Nash. Stem stiffly ascending or spreading, 30–100 cm. tall: nodes swollen: leaf-sheaths glabrous or the lower pubescent: blades 5–10 cm. long, 6–8 mm. wide, usually glabrous. Autumnal phase usually stiffly spreading or radiate-prostrate, the internodes elongate, with tufts of short appressed branches at the nodes, the blades reduced, involute-pointed, often conspicuously ciliate at base.—Dry woods, open grounds, and prairies, various provinces, Fla. to N. M., Calif., Minn., and Me.

63. P. longiligulatum Nash. Stem relatively stout, 30–70 cm. tall: nodes swollen: leaf-blades rather firm and thick, 4–8 cm. long, 4–8 mm. wide, glabrous above, puberulent beneath: panicle 3–8 cm. long: spikelets 1.1–1.2 mm. long, pubescent. Autumnal phase reclining, the branchlets crowded on spreading branches, the blades reduced and subinvolute.—Low pinelands, swamps, and ponds, Coastal Plain, Fla. to La. and N. C.

64. P. leucothrix Nash. Stem erect or ascending, 25–45 cm. tall, appressed papillose-pilose: leaf-blades rather firm, 3–7 cm. long, 3–7 mm. wide, glabrous above, puberulent beneath: panicle 3–8 cm. long. Autumnal phase with appressed fascicled branches: the blades not much reduced. [*P. parvispiculum* Nash]—Low pinelands and cypress swamps, often in acid peat, Coastal Plain, Fla. to La. and N. J.—(*W. I.*)

65. P. Wrightianum Scribn. Stem weak and slender, ascending from a decumbent base, 15–40 cm. tall, minutely pubescent: leaf-blades 2–4 cm. long, 3–5 mm. wide, glabrous or puberulent beneath, minutely pilose above: panicle 3–6 cm. long. Autumnal phase decumbent spreading, somewhat bushy-branched.—Moist soil, swamps, ponds, and cypress-heads, Coastal Plain and New England Coast, Fla. to Tex. and Mass.—(*W. I.*)

66. P. auburne Ashe. Stem 20–50 cm. tall, geniculate, widely spreading, densely papillose, silky-villous below, velvety with copious silky hairs intermixed above: leaf-sheaths villous: blades 3–7 cm. long, 3–5 mm. wide: panicle 3–5 cm. long. Autumnal phase diffusely branched, prostrate spreading, forming large mats, the branches curved upward at the ends.—Sandy woods, Coastal Plain, Fla. to La., Ark., and N. Y.—Plants tufted.

67. P. Thurowii Scribn. & Smith. Stem erect, 35–70 cm. tall, the nodes bearded: leaf-blades rather stiff, 7–12 cm. long, 6–10 mm. wide, velvety beneath: panicle 7–11 cm. long. Autumnal phase erect, bearing at the middle nodes a few appressed fascicled branches.—Prairies and dry open woods, Coastal Plain, Ala. to Tex.

68. P. lanuginosum Ell. Stem 40–70 cm. tall, spreading, the nodes villous, usually with a glabrous ring below: panicle 6–12 cm. long, the axis pubescent, the lower branches often drooping. Autumnal phase widely spreading or decumbent, freely branching. [*P. ciliosum* Nash]—Moist sandy woods, thickets and pinelands, mostly near the coast, Coastal Plain, Fla. to Tex. and N. J.

69. P. tennesseense Ashe. Plant somewhat bluish-green: stem erect or stiffly spreading, 25–60 cm. tall: leaf-sheaths spreading-pubescent: blades with a

thin white cartilaginous margin, ascending or erect, 5–8 mm. long, the lower surface appressed-pubescent: panicle 4–7 cm. long: spikelets about 1.6 mm. long. Autumnal phase widely spreading, with numerous fascicled branches, often forming prostrate mats.—Open moist ground, woods, and barrens, various provinces, Ga. to Ariz., Minn., and Me.—(*Mex.*)

70. P. albemarlense Ashe. Plant grayish-villous: stem 25–45 cm. tall: leaf-blades puberulent as well as long-villous on the upper surface: panicle 3–5 cm. long, the axis puberulent: spikelets 1.4 mm. long. Autumnal phase freely branching.—Low sandy woods and dunes, Coastal Plain and New England Coast N. C. to Minn. and Mass. and Great Lake Lowland, N Ind.

71. P. meridionale Ashe. Stem very slender, 15–40 cm. tall: panicle 1.5–4 cm. long, the axis appressed-pubescent: spikelets about 1.3 mm. long. Autumnal phase erect or nearly so, not bushy. [*P. filiculme* Ashe]—Sandy soil, sterile woods, and bogs, various provinces, Ga. to Wis. and R. I.

72. P. Huachucae Ashe. Stem stiffly upright, light-olivaceous, copiously papillose-pubescent, 20–60 cm. tall, the nodes bearded: (taller and more slender, brighter-green and less densely pubescent: leaf-blades lax, thin, spreading, the upper surface sparsely short-pilose, or with copious long hairs near the base, the lower surface pubescent and with a satiny luster in *P. Huachucae silvicola.* [*P. lanuginosum* (Fl. SE. U. S.)]—Fla. to Tex., Nebr., and Me.): leaf-sheaths pubescent: blades firm, stiffly erect or ascending, the upper surface copiously short-pilose, the lower densely pubescent: panicle 4–6 cm. long, the axis pilose: spikelets about 1.7 mm. long. Autumnal phase stiffly erect or ascending, the branches fascicled. [*P. unciphyllum* (Fl. SE. U. S.)]—Prairies and open grounds, various provinces, N. C. to Calif., S. D., and Me.

73. P. villosissimum Nash. Stem 25–45 cm. tall, erect or ascending: panicle 4–8 cm. long, the branches rather stiffly ascending or spreading: spikelets about 2.2 mm. long. Autumnal phase finally prostrate, forming a mat, the leaf-blades not much reduced. [*P. atlanticum* Nash *P. xanthospermum* Scribn. & Mohr]—Dry sandy or sterile soil, woods, and pinelands, various provinces, Fla. to Tex., Minn., and Mass.—(*C. A.*)

74. P. pseudopubescens Nash. Resembling *P. villosissimum*: leaf-blades glabrous on upper surface along center or all over: spikelets about 2.3 mm. long. Autumnal phase stiffly spreading.—Sandy woods and pinelands, Coastal Plain and adj. provinces, Fla. to Miss., Ill., and Conn.—(*Mex.*)

75. P. ovale Ell. Stem 20–50 cm. tall, relatively stout, the lower portion and the leaf-sheaths long-pilose with ascending or appressed hairs: blades nearly glabrous on upper surface: panicle 5–9 cm. long. Autumnal phase spreading-decumbent, the stiff stems rather loosely branching, the winter blades very firm, conspicuously ciliate. [*P. ciliiferum* Nash]—Dry sandy woods and pinelands, Coastal Plain, Fla. to Tex. and N. C.—Plant densely tufted.

76. P. wilmingtonense Ashe. Stem 20–40 cm. tall, pilose with soft ascending hairs, the nodes pilose: leaf-sheaths villous like the stems: blades rather stiff, ascending, 4–9 cm. long, glabrous on the upper surface, softly pubescent to nearly glabrous beneath: panicle 5–8 cm. long. Autumnal phase spreading, the branches crowded, the reduced blades involute-pointed.—Sandy woods, Coastal Plain, Ala. to N. C.

77. P. malacon Nash. Stem erect or stiffly spreading, 30–50 cm. tall, pubescent with ascending hairs like the leaf-sheaths: blades stiffly ascending, 4–12 cm. long, 3–5 mm. wide, sharply acuminate, puberulent or glabrous above,

often villous on the margin: panicle 4–7 cm. long, the few branches stiffly ascending, the spikelets on long stiff pedicels. Autumnal phase decumbent-spreading, the branches appressed. [*P. strictifolium* Nash]—Dry pinelands and scrublands, Fla.

78. **P. Commonsianum** Ashe. Plant olivaceous: stem 20–50 cm. tall, stiffly ascending or spreading, appressed-strigose or appressed-pilose: leaf-blades firm, stiffly ascending, glabrous above, strigose or glabrous beneath: panicle 4–8 cm. long. Autumnal phase spreading or prostrate, forming mats.—Sandy woods and pinelands, Coastal Plain and New England Coast, Fla. to Conn.

79. **P. Addisonii** Nash. Resembling *P. Commonsianum*: usually less than 40 cm. tall: leaf-sheaths sparsely ascending-pilose: blades glabrous above, pubescent or glabrous beneath: panicle 2–6 cm. long. Autumnal phase spreading, freely branching, the branches appressed.—Sandy barrens, often acid, Coastal Plain and New England Coast, S. C. to Ind. and Mass.

80. **P. tsugetorum** Nash. Plants rather pale bluish-green: stem 30–50 cm. high, ascending, sometimes geniculate at base, densely appressed-pubescent: ligules 1–1.5 mm. long: leaf-blades 4–7 cm. long, 4–7 mm. wide, glabrous above, appressed-puberulent beneath: spikelets about 1.8 mm. long. Autumnal phase decumbent-spreading, branched, the branches appressed.—Acid sandy woods, various provinces, Va. to Tenn., Ill., and Me.

80a. **P. columbianum** Scribn. Differs from *P. tsugetorum* in being smaller, more slender, with the stiffer culms densely crisp-puberulent, and smaller spikelets (about 1.5 mm. long).—Sandy woods, various provinces, N. C. to Me.

81. **P. sphaerocarpon** Ell. Plant light-green: stem 20–55 cm. tall, radiate-spreading (ascending: ligules 0.3–1 mm. long in *P. sphaerocarpon inflatum*.—Tex. to N. C.): leaf-sheaths glabrous, ciliate: ligules obsolete: blades thick and firm, rough above, smooth beneath: panicle long-exserted, 5–10 cm. long: spikelets 1.6–1.8 mm. long, puberulent. Autumnal phase prostrate-spreading, the branches mostly simple.—Sandy soil, acid woods, thickets, and prairies, various provinces, Fla. to Tex., Kans., and Vt.—(*Mex., C. A., S. A.*)

82. **P. polyanthes** Schult. Plant glabrous or nearly so: stem erect, 30–90 cm. tall: leaf-blades 12–23 cm. long, 15–25 mm. wide: panicle 8–25 cm. long. Autumnal phase erect, sparsely branched.—Damp ground, woods, thickets, stream-banks, and prairies, various provinces, Ga. to Tex., Okla., and N. J.

83. **P. erectifolium** Nash. Stem erect, 30–70 cm. tall: panicle 6–12 cm. long. Autumnal phase erect, little-branched.—Moist pinelands, prairies and cypress-ponds, Coastal Plain, Fla. to La. and N. C.—(*W. I.*)

84. **P. curtifolium** Nash. Stem weak, slender, 10–30 cm. tall, angled, the nodes sparsely bearded: leaf-blades spreading or reflexed, 1.5–3 cm. long, 2–5 mm. wide, thin and soft: panicle 2–3 cm. long: spikelets 1.4 mm. long, glabrous or minutely pubescent. Autumnal phase weakly spreading, the ultimate branches in small fascicles. [*P. Earlei* Nash]—Boggy soil, Coastal Plain and adj. provinces, Fla. to Ala., Tenn., and S. C.

85. **P. tenue** Muhl. Stem 20–55 cm. tall, glabrous or the lower part sparsely appressed-pubescent: leaf-sheaths sparsely appressed-pilose or the upper glabrous: panicle 3–5 cm. long: spikelets 1.6 mm. long, puberulent. Autumnal phase erect or leaning, branching from the middle nodes.—Moist sandy woods, Coastal Plain, Fla. to N. C.

86. **P. albomarginatum** Nash. Stem 15–40 cm. tall: leaf-blades thick and firm, with a thick cartilaginous margin: panicle 3–6 cm. long: spikelets about 1.5

mm. long, puberulent. Autumnal phase spreading, repeatedly branching from the base.—Low sandy soil, pinelands, and prairies, Coastal Plain, Fla. to La. and Va.—(*W. I., C. A.*)

87. P. trifolium Nash. Resembling *P. albomarginatum*: stem more slender, leaves less conspicuously crowded at the base, blades less thick and firm. Autumnal phase sparingly branching from the middle and upper nodes.—Low woods, pinelands, and prairies, Coastal Plain, Fla. to La., Tenn., and N. J.

88. P. vernale H. & C. Stem 15–30 cm. tall, very slender, glabrous: leaves clustered at the base, the blades thin, soft, 2–7 cm. long, 3–5 mm. wide: panicles 1.5–3 cm. long: spikelets 1.5 mm. long, pubescent. Autumnal phase forming soft mats.—Moist places, Coastal Plain, Fla. to Miss.

89. P. chamaelonche Trin. Stem 10–20 cm. tall, glabrous. Autumnal phase freely branching from the base and lower nodes. [*P. Baldwinii* Nutt.]—Open sandy soil, pinelands, old fields, and hammocks, Coastal Plain, Fla. to Miss. and N. C.—(*W. I.*)

90. P. glabrifolium Nash. Resembling *P. chamaelonche*: stem as much as 50 cm. tall. Autumnal phase freely branching from the middle and upper nodes. —Low sandy pinelands, pen. Fla.

91. P. ensifolium Baldw. Stem 20–40 cm. tall, slender, glabrous: panicle 1.5–4 cm. long: spikelets glabrous or puberulent. Autumnal phase spreading or reclining, sparingly branching. [*P. Cuthbertii* Ashe *P. glabrissimum* Ashe]—Wet places, woods, and pinelands, often in acid soil, Coastal Plain, Ga. to Miss. and N. J.

92. P. concinnius H. & C. Stem very slender, 12–50 cm. tall, glabrous, puberulent at the nodes: panicle 3–6 cm. long. Autumnal phase radiate-spreading, sparingly branched. [*P. gracilicaule* Nash]—Moist, sandy soil, Piedmont and Appalachian Valley, Ga. and Ala.

93. P. breve H. & C. Stem erect, 5–15 cm. tall: panicle 1.5–4 cm. long: spikelets about 1.3 mm. long. Autumnal phase spreading, freely branching from the upper and middle nodes.—Low sandy or rocky pinelands, pen. Fla.

94. P. flavovirens Nash. Stem slender, ascending or spreading, 15–30 cm. tall, the lower leaves somewhat crowded: blades 2–5 cm. long, 3–4 mm. wide: spikelets about 1.4 mm. long. Autumnal phase spreading, branching from the lower and middle nodes.—Moist shady soil, Coastal Plain, Fla. to Miss. and N. C.

95. P. portoricense Desv. Stem 15–30 cm. tall: leaf-blades 2–5 cm. long, 3–6 mm. wide, firm, glabrous to puberulent: panicle 2–4 cm. long: spikelets puberulent. Autumnal phase ascending from a decumbent base, repeatedly branching.—Sandy pinelands, Coastal Plain, Fla. to Tex. and N. C.—(*W. I.*)

96. P. Webberianum Nash. Stem 20–50 cm. tall, rather stout: leaf-blades 3–9 cm. long, 4–12 mm. wide: panicle 4–10 cm. long: spikelets 2.3–2.5 mm. long, glabrous or puberulent. Autumnal phase spreading or decumbent, flabellately branched.—Low pinelands, prairies, and fields, Coastal Plain, Fla. to N. C.

97. P. patentifolium Nash. Stem 25–55 cm. tall: leaf-blades stiffly spreading, 2.5–8 cm. long: panicle 3–7 cm. long: spikelets puberulent or nearly glabrous. Autumnal phase decumbent or spreading, branched from the middle and upper nodes.—Dry sand, prairies, pinelands, and hammocks, Coastal Plain, Fla. to Miss. and Ga.

98. P. lancearium Trin. Stem 20–50 cm. tall: leaf-blades 2–6 cm. long, 3–7 mm. wide, puberulent or nearly glabrous beneath, strongly ciliate towards base: panicle 3–6 cm. long: spikelets puberulent or glabrous. Autumnal phase geniculate-spreading, branching from the middle nodes. [*P. Nashianum* Scribn.]—Low sandy woods, prairies, and pinelands, Coastal Plain and rarely Blue Ridge, Fla. to Miss. and Va.—(*W. I., C. A.*)

99. P. patulum (Scribn. & Merr.) A. Hitchc. Resembling *P. lancearium*, but more lax. Autumnal phase more freely branching, often forming large mats. —Low moist woods, pinelands and 'hammocks, Coastal Plain, Fla. to La. and Va.

100. P. malacophyllum Nash. Stem slender, 25–70 cm. long, geniculate, ascending or spreading: ligules 1–1.5 mm. long: leaf-blades 6–12 mm. wide: panicle 3–7 cm. long: spikelets papillose-pilose. Autumnal phase spreading, freely branching from the upper and middle nodes.—Sandy woods, various provinces N of Coastal Plain, Tex. to Okla. and Tenn.

101. P. Ravenelii Scribn. & Merr. Stem erect, 30–70 cm. tall: ligules 3–4 mm. long: leaf-blades 1–2 cm. wide, glabrous on upper surface: panicle 7–12 cm. long: spikelets sparsely papillose-pubescent. Autumnal phase spreading, the branches numerous at the summit.—Sandy woods, pinelands, and marshes, various provinces, Fla. to Tex., Mo., and Del.

102. P. oligosanthes Schult. Stem erect, 35–80 cm. tall: ligules 1–2 mm. long: leaf-blades stiffly spreading or ascending, 5–8 mm. wide, glabrous on upper surface: panicle 6–12 cm. long: spikelets 3.5–4 mm. long, sparsely hirsute. Autumnal phase topheavy-prostrate, the short branches aggregate at the summit.—Sandy moist woods, dunes, and bottoms, Coastal Plain, Fla. to Tex., Okla., and N. J., and Great Lake Lowland, N Ind.

103. P. Scribnerianum Nash. Stem erect, rather stiff, 20–50 cm. tall: ligules about 1 mm. long: leaf-blades 6–12 mm. wide, glabrous on the upper surface: panicle 4–8 cm. long: spikelets sparsely pubescent to nearly glabrous. Autumnal phase much-branched at summit, the blades not greatly reduced.—Dry prairies, sandy soil, woods, prairies, barrens, and fields, various provinces, Tenn. to Ariz., Wash., Ont., Me., and Md.

104. P. scoparium Lam. Stem 80–130 cm. tall, stout, erect or ascending, usually geniculate at base, the nodes villous with reflexed hairs, a glabrous viscid ring below: leaf-sheaths glabrous and viscid on the back toward the summit: leaf-blades 10–18 mm. wide, long-acuminate: panicle 8–15 cm. long: spikelets turgid, about 2.5 mm. long, papillose-pubescent. Autumnal phase leaning or spreading, freely branching, the ultimate branches in fascicles at the nodes. [*P. pubescens* Lam.]—Wet soil, prairies, swamps, woods, and thickets, Coastal Plain and adj. provinces, Fla. to Tex., Okla., and Mass.—(*W. I.*)

105. P. aculeatum H. & C. Stems in large clumps, 70–100 cm. tall, harshly pubescent below: leaf-sheaths papillose-hispid with stiff, sharp hairs: blades firm, 12–20 cm. long, 9–13 mm. wide, involute-pointed: panicle 8–12 cm. long: spikelets 3 mm. long, minutely pubescent. Autumnal phase branching from the middle nodes.—Swampy woods, Coastal Plain, N. C. to Long Id., N. Y.

106. P. scabriusculum Ell. Stem 1–1.5 m. tall, scabrous at least below the nodes, sometimes puberulent: leaf-blades 15–25 cm. long, 9–12 mm. wide, glabrous or scabrous, often pubescent beneath: panicle 10–20 cm. long: spikelets 2.3–2.6 mm. long, glabrous or obscurely puberulent, the second glume and sterile lemma much larger than the fruit. Autumnal phase erect, branching from the middle and upper nodes, finally bearing fascicled branchlets and forming dense oblong masses along the upper part of the primary stem.—

Moist ground, wet acid woods, and pinelands, Coastal Plain, Fla. to Tex. and N. J.

107. P. cryptanthum Ashe. Stem erect, 80–100 cm. tall, glabrous except the usually bearded nodes: leaf-blades 7–9 mm. wide, glabrous: panicle 6–10 cm. long: spikelets 2.2–2.4 mm. long, glabrous or sparsely pilose, the second glume and sterile lemma pointed beyond the fruit. Autumnal phase erect, sparingly branched at the middle and upper nodes.—Low swampy ground, Coastal Plain, Fla. to Tex. and N. J.

108. P. mutabile Scribn. & Smith. Stem erect, 30–70 cm. tall: leaf-blades horizontally spreading, 6–15 cm. long, 8–20 mm. wide: panicle 7–15 cm. long: spikelets about 3 mm. long. Autumnal phase erect or reclining, sparingly branched from the middle and upper nodes.—Sandy pinelands, dunes, and hammocks, Coastal Plain and rarely Blue Ridge, Fla. to Miss. and Va.

109. P. equilaterale Scribn. Stem stiffly erect, 25–70 cm. tall: leaf-blades firm, widely spreading, 6–17 cm. long, 6–14 mm. wide, very scabrous, often ciliate at base: panicle 5–10 cm. long: spikelets 3.2 mm. long. Autumnal phase erect or leaning, branching from the upper and middle nodes. [*P. epilifolium* Nash]—Pinelands, hammocks, and dunes, Coastal Plain, Fla. to S. C.

110. P. Ashei Pearson. Stem usually purplish, erect, 25–50 cm. tall: leaf-sheaths puberulent: blades 4–8 cm. long, 5–10 mm. wide: panicle 5–8 cm. long. Autumnal phase divergently branching from the middle and upper nodes.—Dry sterile woods, rocky places, and sand hills, various provinces, Fla. to Miss., Mich., and Mass.

111. P. commutatum Schult. Stem 40–75 cm. tall: leaf-sheaths glabrous or puberulent between the nerves: blades 5–12 cm. long, 12–25 mm. wide, glabrous, or puberulent beneath: panicle 6–12 cm. long: spikelets 2.6–3.2 mm. long. Autumnal phase erect or leaning, branching from the middle nodes, the blades not much reduced. [*P. ovale* (Fl. SE. U. S.)]—Woods, copses, stream-banks, and hammocks, various provinces, Fla. to Tex., Ill., and Mass.

112. P. Joorii Vasey. Stem 20–55 cm. tall, spreading or ascending from a decumbent base, at least the lower part purple: panicle 5–9 cm. long: spikelets 3 mm. long. Autumnal phase widely spreading, bearing more or less divaricate branches from all the nodes, the ultimate branchlets in dense fascicles. [*P. manatense* Nash]—Low woods, hammocks, and cypress-swamps, Coastal Plain, Fla. to Tex. and Va.—(*W. I., Mex.*)

113. P. clandestinum L. Stems in dense clumps, 70–150 cm. tall: leaf-blades 10–20 cm. long, 1.2–3 cm. wide, cordate-clasping: panicle 8–15 cm. long: spikelets 2.7–3 mm. long, sparsely pubescent. Autumnal phase erect or leaning, sparingly branched, the swollen bristly sheaths overlapping on the shortened branchlets inclosing wholly or partially the secondary panicles.—Moist ground, woods and thickets, various provinces, Fla. to Tex., Kans., and Me.

114. P. latifolium L. Stem erect, 45–100 cm. tall: leaf-blades 8–18 cm. long, 1.5–4 cm. wide, cordate-clasping, usually ciliate at base, otherwise glabrous: panicle 7–15 cm. long: spikelets sparsely pubescent. Autumnal phase branching from the middle nodes, the branches crowded and spreading. [*P. macrocarpon* Le Conte]—Rocky or sandy woods, various provinces N of Coastal Plain, N. C. to Kan., Minn., and Me.

115. P. Boscii Poir. Stem 40–70 cm. tall, erect or ascending, glabrous or minutely puberulent: leaf-sheaths glabrous or nearly so (downy-villous, the blades velvety beneath in *P. Boscii molle* = *P. pubifolium* Nash—Fla. to La., Ark., and Conn.): blades 7–12 cm. long, 1.5–3 cm. wide: spikelets papillose-

pubescent. Autumnal phase more freely branched than in *P. latifolium*, sometimes topheavy-reclining. [*P. Porterianum* Nash]—Woods, bottoms, and hillsides, various provinces, Fla. to Tex., Okla., and Mass.

116. P. hemitomon Schult. Plant aquatic or semiaquatic, with extensively creeping rootstocks, often producing numerous sterile shoots with densely hirsute sheaths and strigose blades: stem 50–150 cm. tall, glabrous: leaf-blades ascending or spreading, 10–25 cm. long, 7–15 mm. wide, scabrous on upper surface, glabrous beneath: panicle 15–30 cm. long, the branches solitary or 2 or 3 in a fascicle, 2–10 cm. long: spikelets about 2.5 mm. long, lanceolate, acute, glabrous. [*P. digitarioides* Carpenter]—(MAIDEN-CANE.)—Stream-banks, ditches, ponds, and lakes, often in the water, Coastal Plain, Fla. to Tex. and N. J.

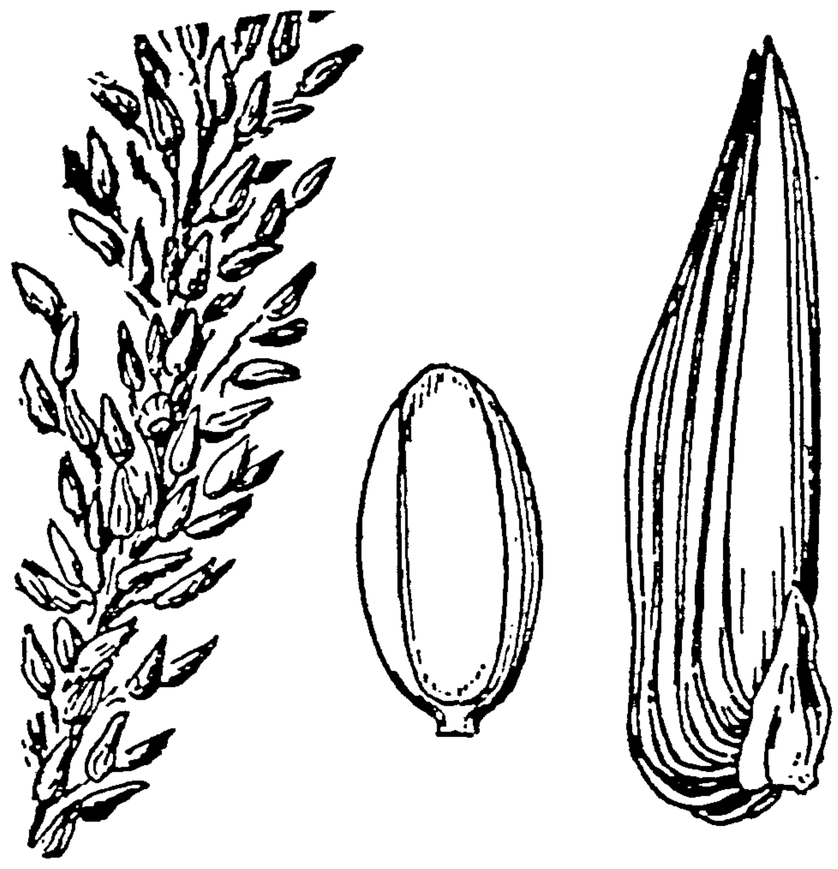
117. P. gymnocarpon Ell. Plant perennial, with a succulent decumbent or creeping base as much as 2 m. long: stem erect or ascending, 60–100 cm. tall, the nodes often dark-colored: leaf-blades linear-lanceolate, 20–35 cm. long, 15–25 mm. wide, flat, cordate: panicle 20–40 cm. long, with several solitary or fascicled racemes along the main axis, these 8–12 cm. long: spikelets short-pedicelled, appressed, 6–7 mm. long, glabrous, the glumes acuminate. [*Phanopyrum gymnocarpon* Nash]—Ditches, ponds, and muddy banks, Coastal Plain, Fla. to Tex. and Ga.

28. LASIACIS A. Hitchc. Large branching perennials, with woody culms often straggling several feet high into shrubs or trees, the leaf-blades firm, flat, usually lanceolate and narrowed into a petiole, the spikelets in an open panicle. Spikelets subglobose, glabrous, placed obliquely on their pedicels; first glume somewhat inflated-ventricose, usually not over one-third the length of the spikelet, several nerved; second glume and sterile lemma about equal, broad, abruptly apiculate, papery-chartaceous, shining, many-nerved, the lemma enclosing a membranaceous palea and sometimes a staminate flower; fertile lemma white, bony-indurate, obovoid, obtuse, this and the palea bearing at the apex in a slight crateriform depression a tuft of woolly hairs, the palea concave below, gibbous above, the apex often free at maturity.—Twenty species, natives of tropical America.

1. L. divaricata (L.) A. Hitchc. Plant glabrous throughout except the margin of the sheaths: stem branching, shrubby or elongate, straggling over bushes or up into trees, or vine-like, 2–4 m., the main stem strong, as much as 6 mm. in diameter, the main branches often fascicled, the vigorous sterile secondary shoots often strongly divaricate or zigzag: leaf-blades narrowly lanceolate, 5–12 cm. long, 5–15 mm. wide, on vigorous shoots much larger: panicle ovate, 5–20 cm. long: spikelets about 4 mm. long, commonly black at maturity. [*Panicum divaricatum* L. *P. latifolium* (Fl. SE. U. S.)]—(SMALL-CANE. WILD-BAMBOO.)—Hammocks, S Fla. —(*W. I., Mex., C. A., S. A.*)

29. SACCIOLEPIS Nash. Perennials of wet soil; stems usually branching, with elongate spike-like panicles. Spikelets oblong-conic; first glume minute: second glume broad, inflated-saccate, strongly many-nerved; sterile lemma

narrower, flat, fewer-nerved, its palea nearly as long, often subtending a staminate flower: fertile lemma much smaller, stipitate, elliptic, chartaceous-indurate, the margins inrolled, the palea not enclosed at the summit.—Twelve species, except the following confined to the tropics of both hemispheres.



1. S. striata (L.) Nash. Plant glabrous, often decumbent and rooting at base: stem finally branched, as much as 1–2 m. long: leaf-sheaths more or less papillose-hirsute: blades lanceolate, 4–20 cm. long, long-acuminate: panicle rather loose, 6–30 cm. long: spikelets about 4 mm. long. [*Panicum gibbum* Ell. *S. gibba* Nash]—Marshes, ditches, prairies, and ponds, Coastal Plain, Fla. to E Tex., Okla., and N. J. —(*W. I.*)

30. **OPLISMENUS** Beauv. Freely branching, creeping perennials, with slender erect flowering shoots, flat, thin, lanceolate or ovate leaf-blades, and several 1-sided thickish spikes rather distant on a main axis. Spikelets terete or somewhat laterally compressed, subsessile, solitary or in pairs in 2 rows, crowded or somewhat distant on one side of a narrow scabrous or hairy rachis: glumes about equal, emarginate or 2-lobed, awned from between the lobes; sterile lemma exceeding the glumes and fruit, notched or entire, mucronate or short-awned, inclosing a hyaline palea: fertile lemma elliptic, acute, convex or boat-shaped, the firm margins clasping the palea, not inrolled.—Ten species, except the following, confined to the tropics of both hemispheres.

1. O. setarius (Lam.) Roem. & Schult. Flowering stem 20–30 cm. tall: leaf-blades 1–3 cm. long, lanceolate, conspicuously undulate-margined: racemes 3–5, distant, 1–3 cm. long, the rachis usually 2–5 mm. long, sometimes 1 cm. long: the spikelets appearing to be in clusters on the rather strict axis. —(WOOD-GRASSES.)—Moist woods, swamps, hammocks, and shady banks, Coastal Plain, Fla. to Tex. and N. C.—(*W. I., Mex., C. A., S. A.*)

31. **ECHINOCHLOA** Beauv. Our species coarse, often succulent, annuals, with compressed leaf-sheaths, no ligule, linear flat blades and rather compact panicles composed of short densely flowered racemes along a main axis. Spikelets plano-convex, often stiffly hispid, subsessile, solitary or in irregular clusters on one side of the panicle-branches; first glume not over half the length of the spikelet; second glume and sterile lemma equal, pointed, mucronate, or the glume short-awned and the lemma long-awned, sometimes conspicuously so, inclosing a membranaceous palea and sometimes a staminate flower; fertile lemma acuminate-pointed, the margins inrolled below, flat above, the apex of

the palea not inclosed.—Ten species, natives of the tropical and temperate regions of both hemispheres.

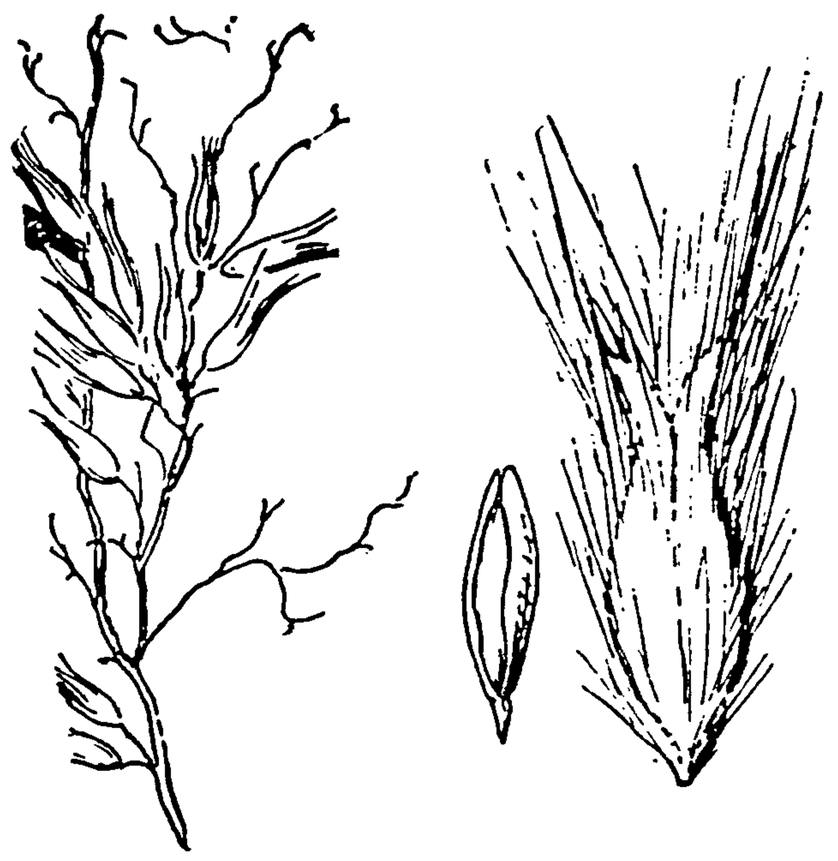
Spikelets mostly in pairs, evenly imbricate in 3 or 4 rows on one side of the rachis, abruptly pointed. 1. *E. colona.*
Spikelets irregularly crowded in the spike-like scarcely 1-sided branches.
  Leaf-sheaths smooth.
    Sterile floret neuter. 2. *E. Crus-galli.*
    Sterile floret staminate. 3. *E. paludigena.*
  Leaf-sheaths, at least the lower ones, hispid or scabrous: panicle a nodding dense mass of long-awned spikelets. 4. *E. Walteri.*

1. E. colona (L.) Link. Stem compressed, branching at the more or less decumbent base, as much as 80 cm. tall: leaf-blades about 5 mm. wide, sometimes barred with purplish-brown: racemes usually 5–10, ascending, distant nearly their own length on the strict axis: spikelets about 3 mm. long. [*Panicum colonum* L.] — (JUNGLE-RICE.) — Fields, waste-places, ditches, and moist open grounds, various provinces, Fla. to S Calif., Mo., and N. J.—(*W. I., Mex., C. A., S. A.*)

2. E. Crus-galli (L.) Beauv. Stem usually spreading and much branched at base, as much as 100 cm. tall, rather stout and succulent: leaf-blades 15–60 cm. long, 1–2 cm. wide: panicle pale or often purple: awns mostly not over 1 cm. long, rarely 3 cm. [*Panicum Crus-galli* L.] — (BARNYARD-GRASS.)—Waste-places, fields, and moist ground, throughout the U. S. and S Can.—(*Eu., W. I., Mex., C. A., S. A.*)—An exotic form, *E. Crus-galli edulis,* has panicle rather compact, 10–20 cm. long, the thick branches often slightly incurved: spikelets, excluding awn, about 3 mm. long, the awn usually not over 2 mm. long.—(JAPANESE BARNYARD-MILLET. BILLION-DOLLAR-GRASS.)—Waste-places, various provinces, Ala. to Tex. and Conn.—(*E. I.*)—Occasionally cult. for forage.

3. E. paludigena Wiegand. Stems mostly solitary, erect, 1 to 1.5 m. tall: panicles narrow, 20–30 cm. long: racemes ascending, mostly simple: sterile floret staminate.—Ditches, marshes, and wet places, often in shallow water, pen. Fla.

4. E. Walteri (Pursh) Heller. Stem 1–2 m. tall: ligule none: awns 2–4 cm. long.—Wet banks, marshes, and ponds, various provinces, Fla. to Tex., Wis., and Mass.—(*W. I., Mex.*)—Exceptional specimens have glabrous or scabrous sheaths, *E. longiaristata* Nash.



32. TRICHOLAENA Schrad. Perennials with rather open panicles of silky spikelets. Spikelets on short capillary pedicels; first glume minute, villous; second glume and sterile lemma equal, raised on a stipe above the first glume, short-awned from a notched apex, thickly beset, except towards the apex, with long silky hairs, the palea of the sterile lemma well developed; fertile lemma shorter than the spikelet, cartilaginous, boat-shaped, obtuse, the margins thin, not inrolled.—Fifteen species, natives of Africa.

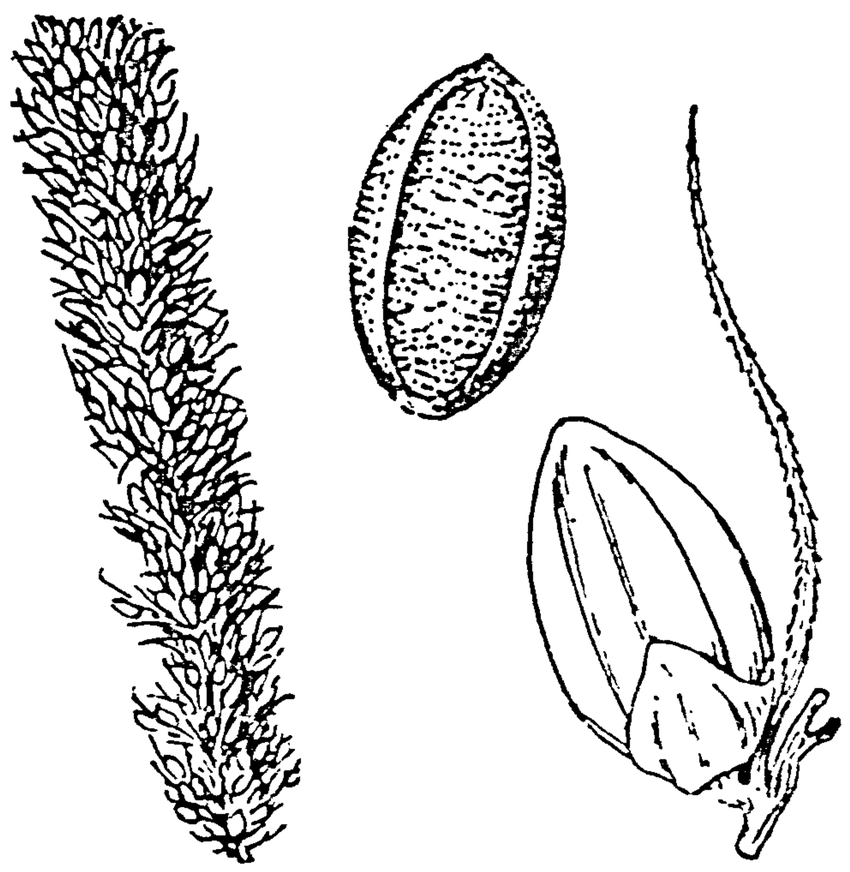
1. T. rosea Nees. A short-lived perennial: stem slender, about 1 m. tall, the base often decumbent; leaf-sheaths sparsely papillose-hirsute: blades flat, 2–5 mm. wide: panicles rosy purple, 10–15 cm. long, the branches slender, ascending: spikelets about 5 mm. long, the capillary pedicels flexuous or recurved.—(NATAL-GRASS.)—Prairies, pinelands, old fields, and roadsides, Fla. Nat. of Afr.—(*W. I., Mex., C. A., S. A.*)—Formerly cult. for hay, now very abundant in sandy fields, groves, and pinelands, and on roadsides. Seeds readily and spreads rapidly.

33. **CHAETOCHLOA** Scribn. Annuals or perennials, with narrow bristly terminal panicles, these dense and spike-like or somewhat loose and open. Spikelets subtended by 1 to several bristles (sterile branchlets), deciduous, falling free from the bristles; first glume broad, usually less than half the length of the spikelet, 3- to 5-nerved; second glume and sterile lemma equal, or the former shorter, several-nerved; fertile lemma coriaceous-indurate, smooth or rugose. [*Setaria* Beauv., not Achar.]—Sixty-five species, most abundant in the tropical and warm-temperate parts of both hemispheres.—FOXTAIL-GRASSES. BRISTLY FOXTAIL-GRASSES. PIGEON-GRASSES.

Plant annual.
- Bristles retrorsely scabrous. — 1. *C. verticillata.*
- Bristles antrorsely scabrous.
  - Bristles 5–12 at the base of each spikelet: panicle cylindric, yellow. — 2. *C. lutescens.*
  - Bristles 1–3 at the base of each spikelet.
    - Second glume distinctly shorter than the spikelet.
      - Leaf-blades pilose. — 3. *C. hispida.*
      - Leaf-blades scabrous but not pilose. — 4. *C. corrugata.*
    - Second glume about as long as the spikelet (a little shorter sometimes in *C. italica*).
      - Fertile lemma smooth and shining: plant robust, the panicle usually 2–5 cm. in diameter. — 5. *C. magna.*
      - Fertile lemma more or less roughened or wrinkled.
        - Fruit disarticulating above the sterile lemma: panicle usually large and robust, often lobed (smaller forms often purple). — 6. *C. italica.*
        - Fruit not disarticulating, the spikelets falling entire. — 7. *C. viridis.*

Plant perennial.
- Bristles 8–12 at the base of each spikelet. — 8. *C. geniculata.*
- Bristles 1–3 at the base of each spikelet. — 9. *C. macrosperma.*

1. C. verticillata (L.) Scribn. Stem 0.3–0.6 m. tall: leaf-blades flat, 7–18 cm. long, 6–12 mm. wide, scabrous on both surfaces: panicle 5–10 cm. long, compact or somewhat loose and lobed toward base: spikelets 2–2.5 mm. long, the bristles flexuous, 3–6 mm. long. [*S. verticillata* Beauv.]—Cult. grounds and waste-places, E U. S. and SE Can. Nat. of Eu.—Rare in the S States.—(*W. I., Mex., C. A.*)



2. C. lutescens (Weigel) Stuntz. Stem as much as 1 m. tall, often branched and decumbent at base: leaf-blades linear-lanceolate, often glaucous, twisted in a half spiral: panicle 10 cm. long, seldom more than 1 cm. thick, not narrowed above: bristles 3–8 mm. long, yellow: spikelets about 3 mm. long: first glume one-half, the second two-thirds as long as the striate undulate-rugose fertile lemma. [*C. glauca* (Fl. SE. U. S.)]—(YELLOW-FOXTAIL. PIGEON-GRASS.)—Fields, waste-places, roadsides, and woods, various provinces, U. S. and S Can. Nat. of Eu.—(*W. I., Mex.*)

3. C. hispida Scribn. & Merr. Stem as much as 1 m. tall, decumbent at base: leaf-sheaths sparsely appressed-pilose: blades 4–6 mm. wide: panicle 10–15 cm. long, the axis villous: spikelets about 2 mm. long.—Shell mounds, Marco Island, S Fla.—(*Cuba.*)

4. C. corrugata (Ell.) Scribn. Stem as much as 1 m. tall, usually spreading and decumbent at base: leaf-blades 3–6 mm. wide: panicles 5–15 cm. long, 5–10 mm. in diameter, exclusive of the bristles, the rachis villous: spikelets about 2 mm. long, the bristles 5–15 mm. long: fertile lemma undulate-rugose. [*S. corrugata* Schult.]—Fields and sandy soil, Coastal Plain, Fla. to La. and N. C.—(*W. I.*)

5. C. magna (Griseb.) Scribn. Stem stout, erect, as much as 4 m. tall: leaf-sheaths keeled, glabrous or scabrous: blades as much as 3 cm. wide, scabrous: panicles as much as 40 cm. long, interrupted below, the secondary panicles smaller, sometimes not over 5 cm. long: spikelets about 2 mm. long, the bristles 8–11 mm. long, ascending, tawny. [*S. magna* Griseb.]—Marshes, swamps, and ditches, Coastal Plain, Fla. to Tex. and N. J.—(*W. I., C. A.*)

6. C. italica (L.) Scribn. Stem as much as 1–2 m. tall: leaf-blades as much as 3 cm. wide: panicle as much as 20 cm. long. Cult. for forage. Escaped in fields and waste places, such specimens usually much reduced, the panicles often purple. [*S. italica* Beauv.]—(COMMON-MILLET. HUNGARIAN-GRASS.)—Cult. grounds, roadsides, waste-places, and woods, various provinces, Fla. to Tex., Calif., Minn., and Que. Nat. of Eurasia.

7. C. viridis (L.) Scribn. Stem usually less than 0.6 m. tall: leaf-blades not twisted (as in *C. lutescens*): panicle green, tapering at summit, as much as 10 cm. long: spikelets 2 mm. long, the bristles 7–12 mm. long: second glume and sterile lemma equal, covering the striate faintly wrinkled fertile lemma. [*S. viridis* Beauv.]—(GREEN-FOXTAIL.)—Fields and waste-places throughout U. S. and S Can. Nat. of Eu.—(*W. I., Mex., C. A.*)—**Chaetochloa ambigua,** found on ballast at Mobile, Ala., differs from *C. viridis* in the scabrous, not villous axis of the panicle; the spikelets resemble those of *C. verticillata.*

8. C. geniculata (Lam.) Millsp. & Chase. Stem compressed, as much as 1 m. tall, usually tufted and decumbent at base, from short knotty rootstocks: leaf-sheaths glabrous: blades attenuate at apex, often with long hairs on upper surface near base: panicle cylindric, dense, not tapering at either end, 2–10 cm. long, 7–8 mm. in diameter, exclusive of bristles, the rachis pubescent: spikelets 2–3 mm. long, the bristles horizontally spreading, as much as 10 mm. long or sometimes scarcely longer than the spikelets, yellow or purplish: first glume one-third as long as the spikelet: second glume half to two-thirds as long as the spikelet: fertile lemma finely transversely rugose. [*C. imberbis* Scribn. *C. versicolor* Bickn. *C. occidentalis* Nash *C. purpurascens* Scribn. & Merr. *S. imberbis* Roem. & Schult. *S. laevigata* Chapm. *S. perennis* Hall]—Pinelands, prairies, hillsides, swamps, and roadsides, various provinces, Fla. to S Calif. and Conn.—(*W. I., Mex., C. A., S. A.*)

9. C. macrosperma Scribn. & Merr. Stem stout, 0.6–1.2 m. tall: leaf-sheaths glabrous, compressed, the margins ciliate: blades 10–30 cm. long, 10–20 mm. wide: panicles as much as 30 cm. long and 5 cm. wide, tapering toward the apex: bristles 1.5–3 cm. long: fertile lemma finely transversely undulate-wrinkled.—Hammocks, shell-mounds, and swamps, Fla.—(*W. I.*)

C. barbata (Lam.) H. & C., a weak-stemmed annual, with plaited blades, 1–3 cm. wide, tapering at each end, and narrow panicles of numerous pale racemes, has been collected at Miami, Fla. Introd. from trop. Asia.—(*W. I., S. A.*)

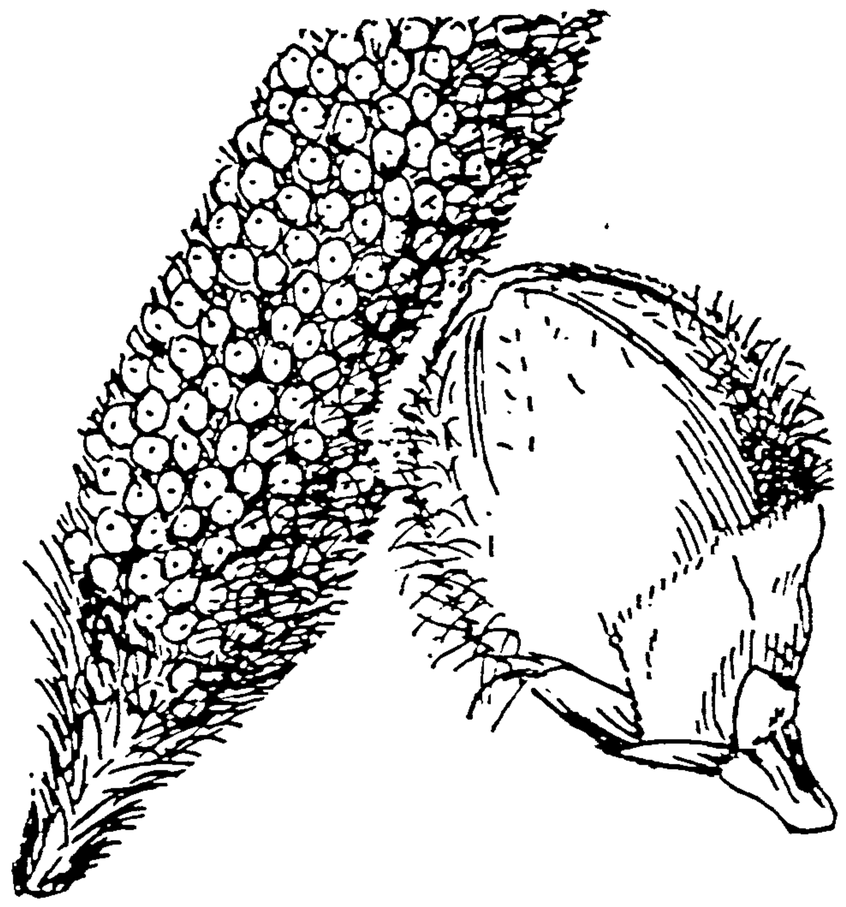
C. rariflora (Mikan) H. & C., a perennial with flat blades mostly more than 5 mm. wide, pale narrow rather loosely branched panicles, tapering to a slender

summit, [*C. caudata* Scribn.], has been collected on ballast at Mobile, Ala. Nat. of S. A.—(*W. I., Mex., S. A.*)

34. **PENNISETUM** L. C. Rich. Annuals or perennials, often branched, with dense spike-like terminal panicles. Spikelets solitary or in groups of 2 or 3 surrounded by an involucre of slender bristles, these not united except at the very base, often plumose, falling attached to the spikelets; glumes shorter than the sterile and fertile lemmas; fertile lemma chartaceous, smooth, the margin thin, enclosing the palea.—Fifty species, natives of the tropical regions.

Bristles, at maturity, not exceeding the spikelets, the large caryopsis bursting through the lemma and palea. 1. *P. glaucum.*
Bristles much exceeding the spikelets, the caryopsis remaining within the lemma and palea. 2. *P. setosum.*

1. P. glaucum (L.) R. Br. Stout annual, 1–3 m. tall, or even more: leaf-blades as much as 40 cm. long and 4 cm. wide: panicle glaucous, dense, spike-like, cylindric, 10–30 cm. long, 1–1.5 cm. in diameter. [*Penicillaria spicata* Willd.]—(PEARL-MILLET.)—Cult. grounds and roadsides, various provinces, Gulf States to Md. Nat. of Afr.—Cult. for forage.



2. P. setosum (Swartz) L. C. Rich. Stem 1–1.5 m. tall: leaf-blades 5–10 mm. wide: panicle 10–15 cm. long, tapering above, usually purple: outer bristles about as long as spikelets, scabrous, inner bristles longer, densely silky-plumose on lower part, one longer than the others: spikelets about 3 mm. long.—Sandy soil, S Fla.—(*W. I., Mex., C. A., S. A.*)

35. **CENCHRUS** L. Low branching annuals or perennials, with flat blades and terminal spikes of readily deciduous burs. Spikelets solitary or few together, surrounded and enclosed by a spiny bur composed of several coalescing bristles (sterile branchlets), the bur subglobular, the peduncle short and thick, articulate at base, falling with the spikelets enclosed, the spines in ours retrorsely barbed.—Twenty-five species, in warm regions generally, most abundant in America.—SAND-BURS. BUR-GRASSES. SAND-SPURS. COCK-SPURS.

Involucral lobes united below: stem compressed, branched, the branches usually decumbent and spreading. I. TRIBULOIDES.
Involucral lobes united at the base only: stem terete. II. MYOSUROIDES.

I. TRIBULOIDES

Involucre with a ring of slender bristles at base.
  Burs excluding bristles not over 4 mm. wide, numerous, crowded in a long spike; lobes of the involucre interlocking. 1. *C. viridis.*
  Burs excluding bristles 5–7 mm. wide, not densely crowded; lobes of the involucre erect. 2. *C. echinatus.*
Involucre with flattened spreading spines, no ring of slender bristles at base.
  Burs tapering at base, ovate: stems rather slender and wiry, ascending or erect, 30–60 cm. tall: plants perennial.

Burs pubescent: spines relatively few, usually 2–4 mm. long.	3. *C. incertus.*
Burs glabrous: spines numerous, 4–6 mm. long.	4. *C. gracillimus.*
Burs globose, rounded at base, the spines numerous: stems spreading: plants annual.	
Burs 7–8 mm. wide, finely pubescent.	5. *C. pauciflorus.*
Burs 10–15 mm. wide, densely woolly: inflorescence usually included at base in the inflated sheaths.	6. *C. tribuloides.*
II. MYOSUROIDES	
A stout glaucous woody perennial.	7. *C. myosuroides.*

1. C. viridis Spreng. Stem erect or spreading, 30–50 cm. tall: leaf-blades lax, 6–12 mm. wide: spike about 10 cm. long.—Hammocks, fields, and waste-places, S Fla.—(*W. I., Mex., C. A., S. A.*)

2. C. echinatus L. Stem 30–50 cm. long: blades flat and thin, 5–10 mm. wide: spike usually 5–7 cm. long.—(HEDGEHOG-GRASS.)—Pinelands, hammocks, coastal sand-dunes, fields, and waste-places, Coastal Plain and adj. provinces, Fla. to N. Mex. and S. C.—(*W. I., Mex., C. A., S. A.*)

3. C. incertus M. A. Curtis. Leaf-blades commonly folded, 2–5 mm. wide: spike 3–6 cm. long: burs rather crowded: spines broad at base.—Sandy soil, pinelands, woods, and dunes, Coastal Plain, Fla. to Tex. and N. C.

4. C. gracillimus Nash. In dense clumps: leaf-blades folded, stiffly flexuous, usually 2–3 mm. wide: spike often long-exserted, 3–5 cm. long: burs usually few, the spines slender.—Sandy soil, pinelands and coastal dunes, Fla. and Ala.—(*W. I.*)

5. C. pauciflorus Benth. Stem 20–60 cm. long: leaf-blades 2–7 mm. wide: spike 3–8 cm. long: burs usually 6–12, sometimes more, the spines 3–4 mm. long. [*C. tribuloides* (Fl. SE. U. S.)]—Sandy soil, roadsides, cult. grounds, pinelands and coastal dunes, various provinces, Fla. to Calif. and Me.—(*W. I., Mex., C. A., S. A.*)

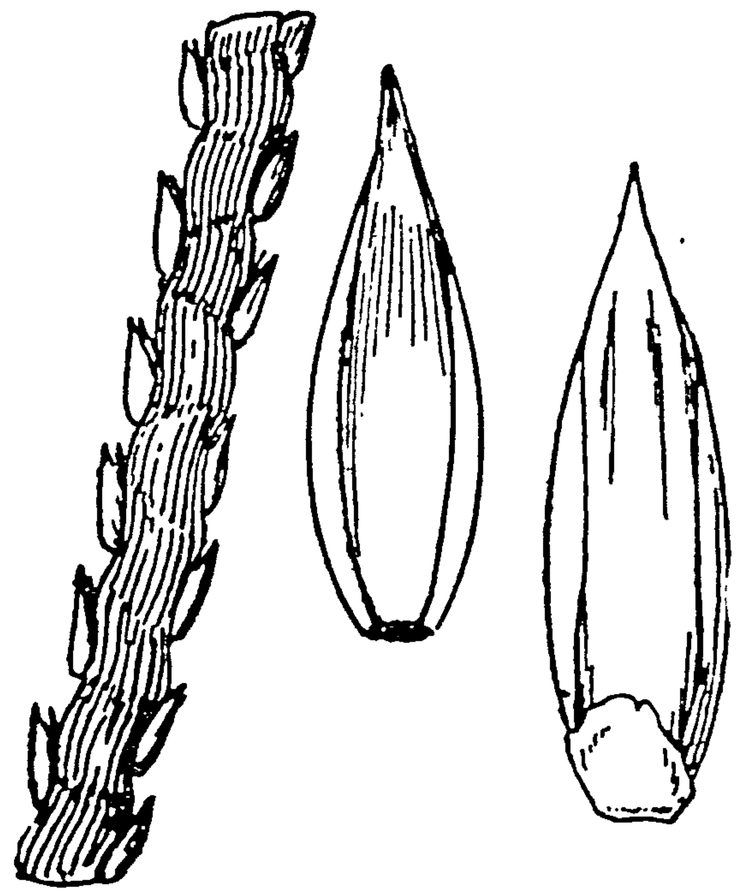
6. C. tribuloides L. Resembles *C. pauciflorus*: plant more robust, the trailing stems as much as 1 m. long. [*C. macrocephalus* Scribn.]—Sandy beaches, Coastal Plain, Fla. to La. and Long Id., N. Y.—(*W. I., Mex., C. A., S. A.*)

7. C. myosuroides H. B. K. Stem erect, often decumbent at base, branching, 1–1.5 m. tall: spike 5–20 cm. long: burs narrow, numerous, contiguous: spikelets about 5 mm. long. [*Cenchropsis myosuroides* Nash]—Sandy soil, cult. grounds, and beaches, Coastal Plain, Fla. to La. and Tex.—(*W. I., Mex., C. A., S. A.*)

C. catharticus Del., a spreading annual with stems up to 1 m. long, its burs 4–6 mm. long, 2-flowered, the lobes united at the base only, the flat erect inner lobes densely ciliate, has been collected on ballast at Mobile, Ala.

36. **STENOTAPHRUM** Trin. Creeping stoloniferous perennials, with short flowering stems, rather broad and short obtuse leaf-blades, and terminal and axillary racemes. Spikelets imbedded in one side of an enlarged and flattened articulate rachis: first glume small: second glume and sterile lemma

about equal, the latter with a palea or staminate flower: fertile lemma chartaceous.—Five species, except the following, on the islands of the Pacific Ocean.



1. S. secundatum (Walt.) Kuntze. Stem compressed, the flowering shoots 10–30 cm. tall: leaf-blades usually less than 15 cm. long, 4–10 mm. wide: racemes 5–10 cm. long. [*S. americanum* Schrank]—(ST. AUGUSTINE-GRASS. RUNNING CRAB-GRASS.)—Moist loamy or sandy soil, mostly on or near beaches, Coastal Plain, Fla. to Tex. and S. C.—(*W. I., Mex., C. A., S. A., O. W.*)—Commonly cult. for lawns in Gulf States, particularly in Fla.

37. AMPHICARPON Kunth. Erect annuals or perennials, with stiff flat blades and narrow terminal panicles. Spikelets of two kinds on the same plant, one in a terminal panicle, perfect but not fruitful, the other cleistogamous on slender leafless subterranean branches from the base of the stem, sometimes also from the lower nodes: first glume of the aerial spikelets variable in size, sometimes obsolete: second glume and sterile lemma about equal; lemma and palea indurate, the margins of the lemma thin and flat: fruiting spikelets much larger, first glume wanting: second glume and sterile lemma strongly nerved, subrigid, exceeded at maturity by the turgid elliptic acuminate fruit with strongly indurate lemma and palea, the margins of the lemma thin and flat: stamens with small anthers on short filaments.—Two species, confined to the eastern United States.

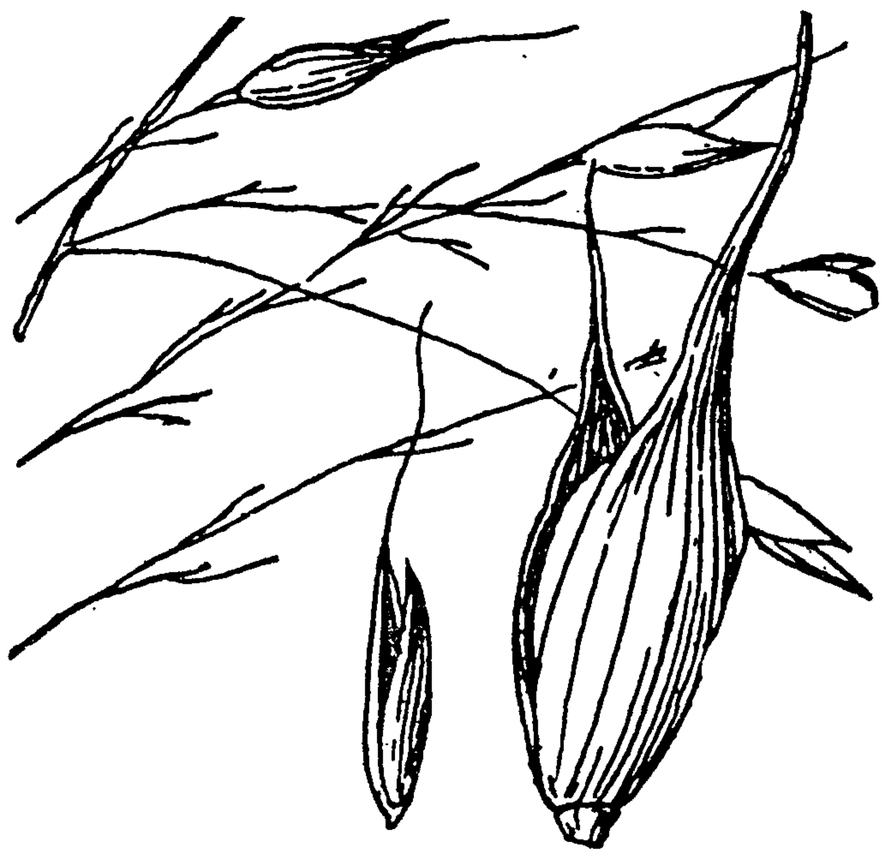
Blades conspicuously hirsute.	1. *A. Amphicarpon.*
Blades glabrous or nearly so.	2. *A. floridanum.*

1. A. Amphicarpon (Pursh.) Nash. Annual: stem erect, 30–80 cm. tall, the leaves crowded toward the base: leaf-blades erect, 10–15 cm. long, 5–15 mm. wide, sharp-pointed: panicle narrow, 3–20 cm. long: spikelets elliptic, 4–5 mm. long: subterranean spikelets 7–8 mm. long, plump. [*A. Purshii* Kunth]—Sandy pinelands, Coastal Plain, Ga. to N. J. (Ga., according to Chapman.)

2. A. floridanum Chapm. Perennial: stem usually decumbent at base, 30–100 cm. tall, the leaves scattered along the stem; blades firm, white-margined when dry, mostly less than 10 cm. long, 5–10 mm. wide: panicles long-exserted, narrow, few-flowered: spikelets narrowly lanceolate, 6–7 mm. long: subterranean spikelets 6–9 mm.—Low pinelands, Coastal Plain, Fla. to S. C.

38. OLYRA L. Tall monoecious perennials, with broad flat leaf-blades which are contracted into a petiole-like base, and terminal or axillary panicles.

Staminate spikelets arranged along the panicle-branches below the summit: lemma usually awned; palea as long as the lemma. Pistillate spikelets terminating the main branches of the panicle, much larger than the staminate: first glume wanting, second glume and lemma awned, membranous, the fertile lemma chartaceous-bony-indurate in fruit.—Twenty species, mostly natives of tropical America.



1. **O. latifolia** L. A tall woody-stemmed branching perennial, with oblong to broadly lanceolate leaf-blades as much as 5 cm. wide, and oblong somewhat open panicles, 10–15 cm. long, the branches stiffly ascending or spreading, bearing one large pistillate spikelet at the summit and several spikelets along the side.—Region of Tampa Bay, Fla.—(*W. I., Mex., C. A., S. A.*)—The occurrence of this species, at least at the present time, in Florida is doubtful.

39. **ORYZA** L. Swamp annuals or perennials, often tall, with flat leaf-blades and spikelets in open panicles. Spikelets 1-flowered, laterally compressed-flattened; glumes 2, much shorter than the lemma, narrow: lemma rigid, keeled, 3-nerved, sometimes awned: palea similar to the lemma, narrower, keeled but with no midnerve on the back, 2-nerved close to the margins.—Seven species, mostly of the Old World tropics.

1. **O. sativa** L. Stem erect, 50–100 cm. tall: panicles 10–30 cm. long, the branches erect below drooping above: spikelets 8–10 mm. long, oblong, hispid, awned or awnless.—(RICE.)—Wet places, cult. and sometimes escaped, though scarcely permanently established, on the Coastal Plain, Fla. to Tex. and Va. Nat. of trop. Asia.—(*W. I., Mex., C. A., S. A.*)

40. **HOMALOCENCHRUS** Meig. Perennials, usually with creeping rootstocks, flat scabrous leaf-blades and usually open panicles, the spikelets nearly sessile along one side of the branchlets. Spikelets 1-flowered, strongly compressed laterally: glumes wanting: lemma chartaceous, broad, oblong, boat-shaped, usually 5–nerved, the lateral pair of nerves close to the margins, these and the keel often hispid-ciliate, the intermediate nerves sometimes faint: palea as long as the lemma, much narrower, usually 3-nerved, the keel usually hispid-ciliate, the lateral nerves close to the margins, closely held by the margins of the lemma: stamens 6 or fewer. [*Leersia* Sw.]—Ten species, of tropical and temperate regions.—CUT-GRASSES.

Spikelets broadly oval, 3–4 mm. wide. 1. *H. lenticularis.*
Spikelets elliptic, not over 1.5 mm. wide.
  Panicle narrow, the branches ascending. 2. *H. hexandrus.*

Panicle open, the branches slender, spreading.
Spikelets glabrous, about 2 mm. long: stems tufted, erect: rootstocks wanting. 3. *H. monandrus.*
Spikelets hispidulous: stems decumbent at base: rootstocks present.
Lower branches of panicle single at the node. 4. *H. virginicus.*
Lower branches of panicle more than one at the node. 5. *H. oryzoides.*

1. H. lenticularis (Michx.) Kuntze. Stem about 100 cm. tall, with rather stout rootstocks: leaf-sheaths somewhat retrorsely scabrous: blades very scabrous, 5–20 mm. wide: panicle 10–20 cm. long, the few branches spreading, spikelet-bearing towards the ends. [*L. lenticularis* Michx.]—Marshes, swamps, and wet woods, various provinces, Fla. to Tex., Minn., and S. C.

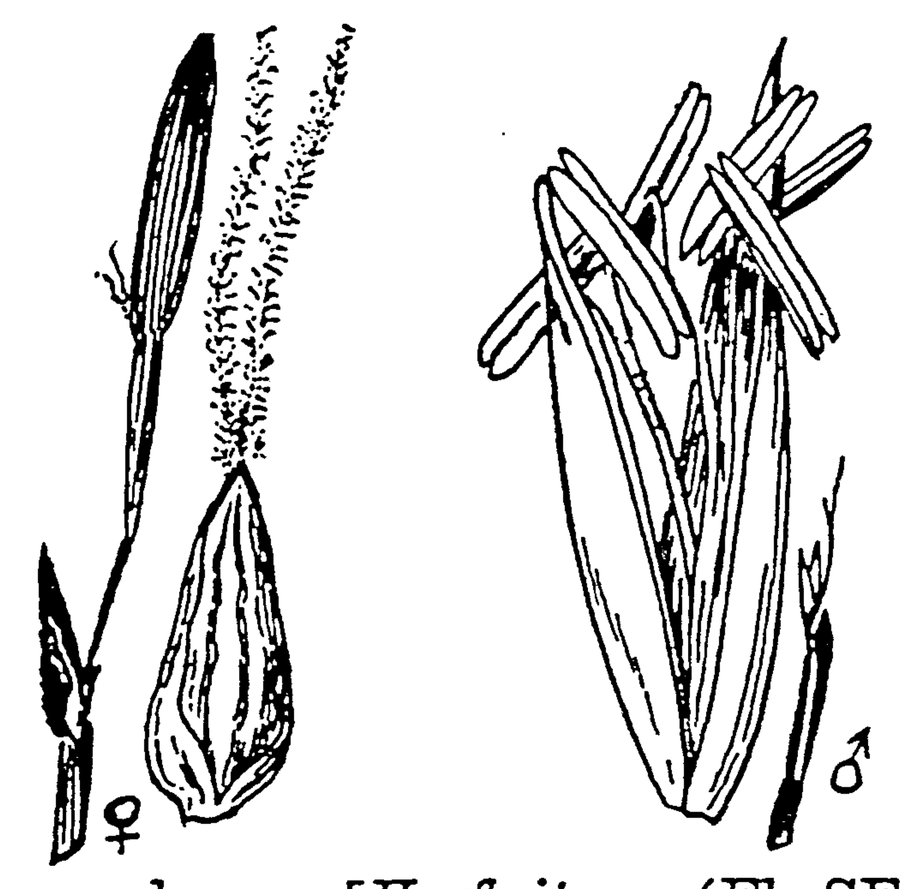
2. H. hexandrus (L.) Kuntze. Stem slender, 50–150 cm. long, often long-decumbent and rooting at the base, with slender scaly rootstocks: leaf-blades mostly erect, usually not over 5 mm. wide: panicle mostly less than 10 cm. long, often purplish: spikelets about 5 mm. long, 1.5 mm. wide. [*L. hexandra* Swartz]—Marshes, lakes, and ponds, often in rather deep water, Coastal Plain, Fla. to Tex. and N. C.—(*W. I., Mex., C. A., S. A., O. W.*)

3. H. monandrus (Sw.) Kuntze. Stem tufted, slender, erect, 50–100 cm. tall: leaf-blades erect, slender, 2–5 mm. wide, narrowed towards the base: panicle 5–15 cm. long, the capillary branches solitary, naked below: spikelets 1 mm. wide. [*L. monandra* Sw.]—Rocky woods and fields, Coastal Plain, Fla. to E Tex.—(*W. I., S. A.*)

4. H. virginicus (Willd.) Britton. Stem 50–100 cm. long, erect from an often straggling or decumbent base with densely imbricate-scaly rootstocks: leaf-blades thin, rather short, mostly 5–10 mm. wide: panicle 5–20 cm. long: spikelets 3–4 mm. long, 1–1.5 mm. wide. [*L. virginica* Willd.]—(WHITE-GRASS.)—Moist woods, meadows, stream-banks and low pinelands, various provinces, Fla. to Tex., Minn., and Mass.

5. H. oryzoides (L.) Poll. Stem 100–150 cm. tall, with slender, loosely scaly rootstocks: leaf-sheaths retrorsely scabrous: blades very rough, 5–10 mm. wide: panicle 10–20 cm. long: spikelets about 5 mm. long, 1.5 mm. wide. [*L. oryzoides* Sw.]—Marshes and wet places, often in zones around ponds, various provinces, Fla. to Tex., S Calif., Wash., and Newf.—(*Eurasia.*)

41. HYDROCHLOA Beauv. A slender branching monoecious aquatic, probably perennial, the leaves floating: staminate flowers in a small few-flowered terminal raceme: pistillate flowers in few-flowered racemes in the axils of the leaves. Spikelets 1-flowered: staminate spikelets with a thin 7-nerved lemma, 2-nerved palea, and 6 stamens, the glumes wanting: pistillate spiketlets with a thin 3-nerved second glume and 5-nerved lemma, the first glume and palea wanting, the stigmas long and slender.—Represented only by the following species.



1. H. caroliniensis Beauv. Leaf-blades 1–5 cm. long, 1–5 mm. wide: staminate spikelets 4–5 mm. long: pistillate spikelets about 2–5 mm. long. [*H. fluitans* (Fl. SE.

U. S.)]—In water, lakes, ponds, and river-shores, Coastal Plain, Fla. to La. and Md.

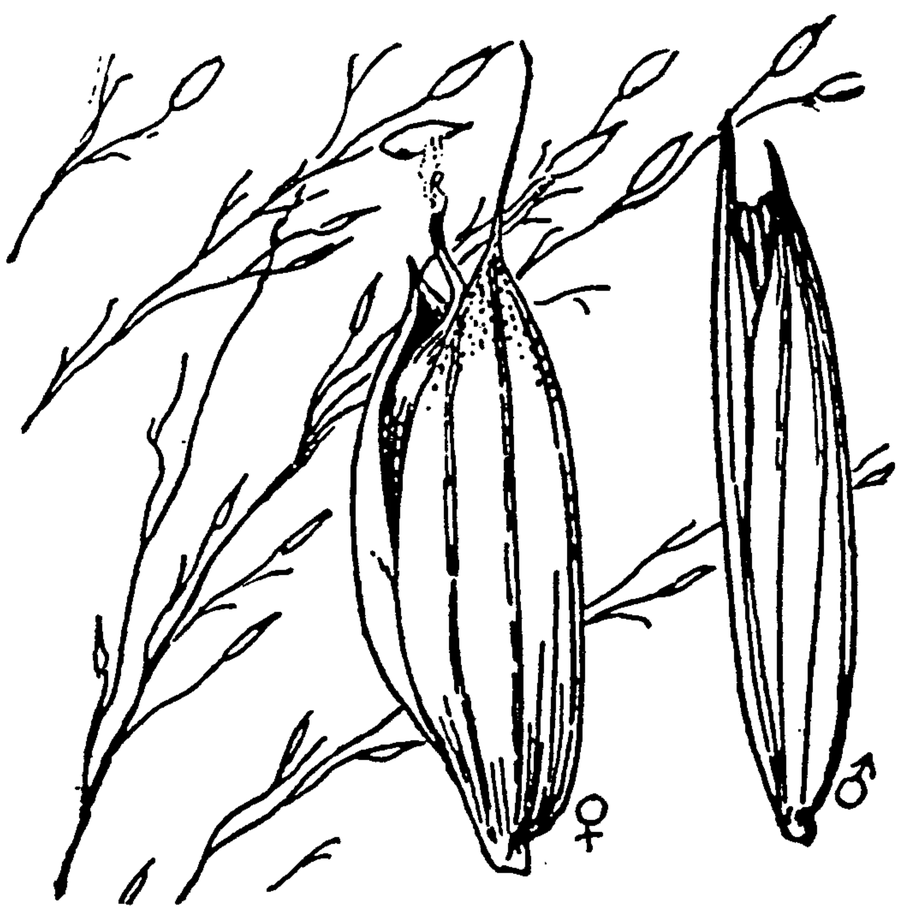
42. **LUZIOLA** Juss. Creeping low or delicate monoecious perennials, with narrow flat blades and terminal and axillary panicles. Spikelets 1-flowered, the staminate and pistillate flowers in separate panicles: first glume and palea wanting: second glume and lemma about equal, thin, several- to many-nerved, lanceolate or oblong: stamens several: stigmas long, plumose. Grain free, globose, smooth.—Six species, mostly in tropical America.

Pistillate spikelets ovoid, about 2 mm. long: staminate and pistillate inflorescences on the same shoot. 1. *L. peruviana.*
Pistillate spikelets oblong-lanceolate, 4 mm. long: staminate and pistillate inflorescence on different shoots. 2. *L. bahiensis.*

1. L. peruviana J. G. Gmel. Stem tufted, decumbent or stoloniferous: blades not so narrow at base as in *L. bahiensis*: panicles 3–6 cm. long, the staminate branches ascending, the pistillate spreading and flexuous.—Ditches and wet places, Coastal Plain, Fla. to La.—(*W. I., Mex., C. A., S. A.*)

2. L. bahiensis (Steud.) A. Hitchc. Tufted, sending out long slender stolons: leaf-blades acuminate, gradually narrowed to the base, narrower than the sheath, 5–20 cm. long, 2–4 mm. wide: panicle shorter than the leaves, the lower branches finally spreading or deflexed. [*L. alabamensis* Chapm.]—In water or mud, lagoons and stream-banks, Coastal Plain, Ala. and Miss.

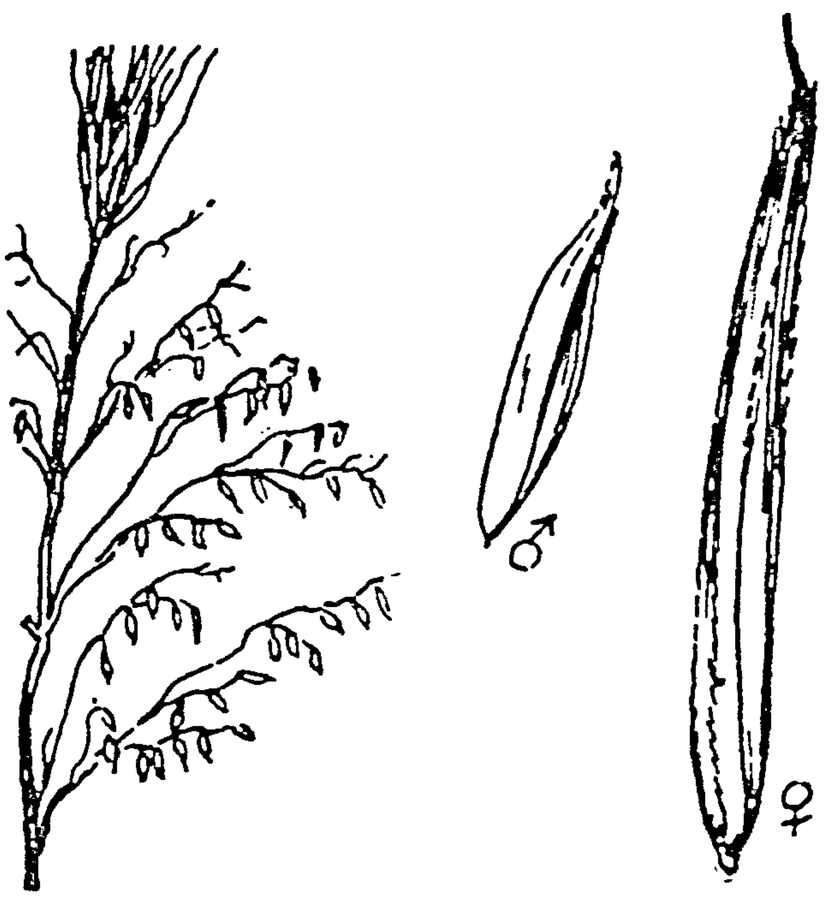
43. **ZIZANIOPSIS** Doell. & Aschers. Robust monoecious marsh perennials, with stout creeping rootstocks, flat leaf-blades and large open panicles. Spikelets 1-flowered, the 2 kinds on the same branches of the panicle, the staminate below: first glume wanting: second glume 7-nerved, awn-pointed in the pistillate spikelets: lemma 3-nerved: palea wanting: stamens 6: styles rather long, united: caryopsis obovate, free, coriaceous, smooth and shining, beaked with the persistent style.—Three species, the following, and two in South America.



1. Z. miliacea (Michx.) Doell. & Aschers. Stem as much as 4 m. tall, the rootstocks covered with large overlapping scales: leaf-blades as much as 1 m. long and 3 cm. wide, the midrib thick and pithy, the margins very scabrous: panicle as much as 60 cm. long: spikelets 5-8 mm. long. [*Zizania miliacea* Michx.]—(WATER-MILLET.)—Marshes, swamps, and moist hammocks, Coastal Plain, Fla. to Tex., Okla. and Va.

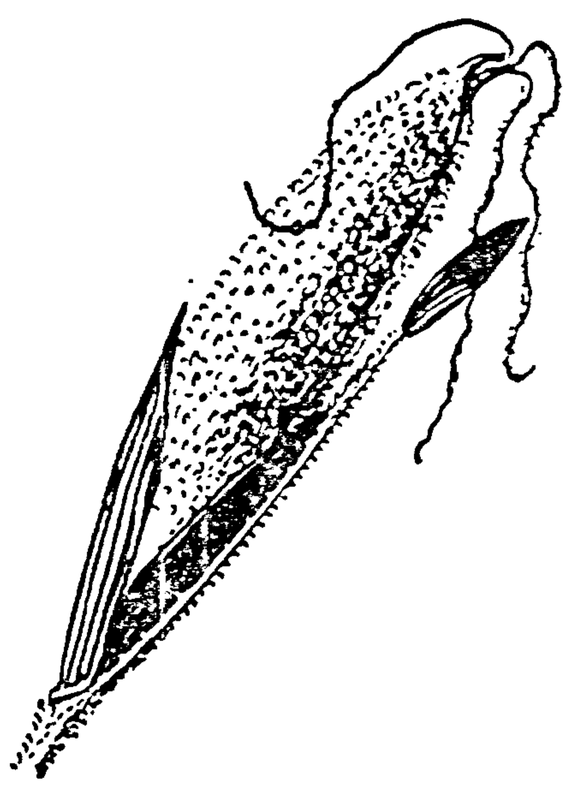
44. **ZIZANIA** [Gronov.] L. Tall monoecious aquatic annuals; ours with flat blades, and large terminal panicles, the staminate spikelets pendulous on the

lower spreading branches, early deciduous, the pistillate erect on the appressed upper branches, tardily deciduous. Spikelets 1-flowered; first glume of staminate spikelet wanting, the second 5-nerved, membranaceous, linear-acuminate or awn-pointed; lemma about as long as the glume, 3-nerved; palea wanting; stamens 6: pistillate spikelet terete, angled at maturity; glumes wanting: lemma chartaceous, 3-nerved, tapering into a long slender awn; palea 2-nerved, closely clasped by the lemma. Grain cylindric, as much as 2 cm. long.—Three species, one in Asia, two in North America.



1. Z. aquatica L. Stem succulent, stout, as much as 3 m. tall: leaf-blades as much as 1 m. long and 4 cm. wide: panicle 20–30 cm. long.—(INDIAN RICE. WILD-RICE.)—Marshes, fresh or brackish water, various provinces, Fla. to Tex., N. D., and Vt.

45. **PHARUS** L. Monoecious perennials, with ample panicles and large oblique long-petiolate feather-veined leaf-blades with numerous veinlets, the petioles twisted, reversing the leaf. Spikelets in pairs on the stiff fragile branches of the panicle; pistillate, subsessile; the staminate much smaller, pedicellate. Glumes in the staminate spikelets membranous, somewhat broadened, the first a little shorter, the second longer than the lemma, enclosing a flower but no palea: in the pistillate spikelets the glumes membranous, many-nerved, subequal, the lemma longer than the glumes, narrow, at length subindurate, clothed at least toward the beaked apex, with uncinate hairs, nearly closed by the involute margins, enfolding a 2-toothed membranous palea.—Five species, natives of tropical America.



1. P. parvifolius Nash. Stem creeping and rooting at base, 50–100 cm. long: leaf-blades oblanceolate-elliptic, acuminate, narrowed into a petiole 1–3 cm. long, the middle ones 12–15 cm. long, about 4 cm. wide: spikelets 8–10 mm. long: fruit pubescent all over, about twice as long as the glumes.—Rocky hammocks, N pen. Fla.—(*W. I., Mex., C. A.*)—*P. latifolius,* a tropical American species, formerly credited to the flora of Florida, does not occur in our range.

46. **PHALARIS** L. Erect annuals or perennials, with flat blades. Spikelets laterally compressed, with one terminal perfect floret and 2 lateral sterile lemmas, articulate above the glumes, arranged in usually dense spike-like panicles; glumes equal, boat-shaped, often winged on the keel; sterile lemmas reduced to 2 small scales (rarely only one): fertile lemma coriaceous, shorter than the glumes, enclosing the faintly 2-nerved palea.—Twenty species, natives of temperate Europe and America.—CANARY-GRASSES.

Plant perennial, with stout creeping rootstocks: panicles contracted but somewhat lobed or interrupted. 1. *P. arundinacea.*
Plant annual: panicles ovoid to linear, dense.
Glumes broadly winged: panicle ovoid. 2. *P. canariensis.*
Glumes wingless or nearly so: panicles oblong to linear. 3. *P. caroliniana.*

1. P. arundinacea L. Stem erect, usually 100–150 cm. tall: panicle in anthesis rather open, 10–20 cm. long, pale: spikelets lanceolate, about 5 mm. long.—(REED CANARY-GRASS.)—Wet soil, swamps, and stream-banks, various provinces, N. C. and Ky. to Kan., Ariz., B. C., and N. S.

2. P. canariensis L. Stem usually less than 50 cm. tall: panicles 2–3 cm. long: spikelets broadly obovate, 5–6 mm. long: glumes white with green veins, the keel entire: fertile lemma brown. (CANARY-GRASS.)—Waste-places, various provinces, Fla. to Ariz., Wash., and N. S. Nat of Eu.—Rare within our limits. (*W. I., Mex.*)

3. P. caroliniana Walt. Stem 30–100 cm. tall: panicle ellipsoid to linear, 1–6 cm. long: spikelets 5–6 mm. long, rather abruptly narrowed to an acute apex, the keel scabrous and narrowly winged above from below the middle, the lateral nerves about midway between keel and margin: fertile lemma ovate, acute, densely villous, about 4 mm. long. [*P. intermedia* Bosc.]—Moist soil, coastal sands, borders of woods, prairies, and roadsides, Coastal Plain and southwestern provinces, Fla. to Tex., S Calif., Mo., and Md.—(*Mex.*)

47. ANTHOXANTHUM L. Sweet-smelling annuals or perennials, with flat blades and spike-like panicles. Spikelets with 1 terminal perfect floret and 2 lateral sterile lemmas, articulate above the glumes; glumes unequal, acute or mucronate; sterile lemmas shorter than the glumes, empty, awned from the back; fertile lemma shorter than the sterile ones, awnless; palea 1-nerved, rounded on the back, enclosed in the lemma.—Four species, of Europe and Asia.

1. A. odoratum L. Perennial, the plant very fragrant in drying: stems tufted, 30–60 cm. tall: panicle 3–8 cm. long, tapering above: spikelets brownish green, 8–10 mm. long, the sterile lemmas and fruit golden-brown.—(SWEET-VERNAL GRASS.)—Meadows, pastures, woods, roadsides, and waste-places, nearly throughout N. A., less common southward. Nat. of Eu.—(*W. I.*)—**A. aristatum** Boiss., a native of Europe, differing in being annual, has been found in Fla. and Miss.; it also occurs in the NE States.

Torresia odorata (L.) A. Hitchc., representing an allied genus in which the lower florets are staminate, is recorded by Chapman from Statesville, N. C. Stems 30–60 cm. long: spikelets bronze-brown, 3-flowered, the terminal floret perfect, the 2 lateral staminate. [*Savastana odorata* Scribn. *Hierochloa borealis* Roem. & Schult.]—(VANILLA-GRASS. HOLY-GRASS.)—Moist grounds, N. J. to Colo., B. C., and Newf.

48. **ARISTIDA** L. Mostly low or moderately tall annuals or perennials, with narrow often convolute leaf-blades and narrow or sometimes open panicles. Spikelets 1-flowered, the rachilla articulate obliquely above the glumes; glumes narrow, acute, acuminate or awn-tipped; lemma indurate, narrow, terete, convolute, with a pointed usually minutely bearded callus at base, terminating above in a usually trifid awn.—One hundred and fifty species, of the warmer parts of the world.—NEEDLE-GRASSES. POVERTY-GRASSES. WIRE-GRASSES.

Lemma articulate with the column of the awns: awns nearly equal. — I. TUBERCULOSAE.
Lemma not articulate.
Lateral awns minute (less than 1 mm.) or wanting. — II. TERNIPIDES.
Lateral awns usually well developed (reduced in *A. dichotoma*.
Central awn coiled at base: plants annual. — III. DICHOTOMAE.
Central awn not spirally coiled (sometimes all the awns loosely contorted in the lower part).
Plants annual. — IV. OLIGANTHAE.
Plants perennial.
Panicle open, the branches spreading, naked at base. — V. DIVARICATAE.
Panicle narrow, the branches ascending or appressed. — VI. STRICTAE.

I. TUBERCULOSAE

Tufted annual with involute leaf-blades: panicles with the numerous long bristle-like awns spreading in all directions. — 1. *A. tuberculosa.*

II. TERNIPIDES

Tufted erect perennial with wiry stems, long leaf-blades and open panicles nearly half the length of the plant. — 2. *A. ternipes.*

III. DICHOTOMAE

Glumes about equal, mostly 5–7 mm. long; straight portion of the central awn about 5 mm. long; lateral awns short, scarcely 2 mm. long, erect. — 3. *A. dichotoma.*
Glumes unequal, the second longer, 10–15 mm. long; straight portion of the central awn about 10 mm. long. — 4. *A. Curtissii.*

IV. OLIGANTHAE

Central awn horizontally spreading or reflexed, much longer than the lateral.
Central awn 15–30 mm. long, with a semi-circular or S-shaped bend at base. — 5. *A. ramosissima.*
Central awn about 10 mm. long, merely spreading or reflexed. — 6. *A. longespica.*
Central awn ascending (or spreading in *A. intermedia*), about as long as the others.
Glumes 20–30 mm. long; awns 4–7 cm. long. — 7. *A. oligantha.*
Glumes not over 10 mm. long; awns not over 2.5 cm. long. — 8. *A. intermedia.*

V. DIVARICATAE

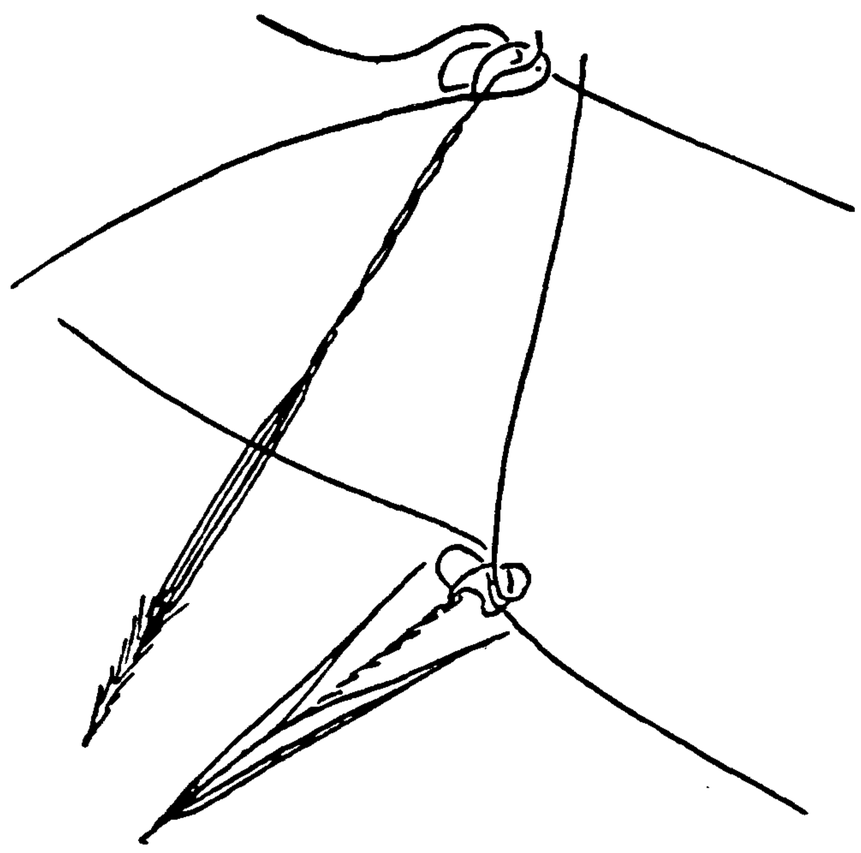
Erect stiff perennial with long leaves and large open few-flowered panicles with spreading branches. — 9. *A. patula.*

VI. STRICTAE

Neck of fruit 1.5–3 cm. long, slender, twisted: panicle congested. — 10. *A. spiciformis.*
Neck of fruit sometimes twisted but not long and slender.
Sheaths more or less lanose. — 11. *A. lanosa.*
Sheaths not lanose.
First glume ½ to ⅔ as long as second. — 12. *A. gyrans.*
First glume nearly as long as the second or longer.
Leaf-blades closely involute, densely villous on upper surface near base. — 13. *A. stricta.*
Leaf-blades flat or loosely involute, not densely villous at base.
Central awn horizontally spreading or reflexed by a semicircular bend.

Lateral awns erect.
  Glumes 6 mm. long. 14. *A. virgata.*
  Glumes 12 mm. long. 15. *A. palustris.*
Lateral awns spreading or reflexed.
  Glumes 6–7 mm. long; spikelets mostly in pairs. 16. *A. simpliciflora.*
  Glumes 10 mm. long; spikelets solitary. 17. *A. Mohrii.*
Central awn with no semicircular bend; all awns spirally contorted at base.
First glume longer than the second: fruit sparsely pubescent on the short (0.5 mm. long) callus. 18. *A. purpurascens.*
First glume slightly shorter than the second: fruit strongly pubescent on the slender (1 mm. long) callus.
Panicle slender, the branches short, rather distant, few-flowered. 19. *A. tenuispica.*
Panicle rather stout, the branches as much as 10 cm. long, rather densely many-flowered. 20. *A. condensata.*

1. A. tuberculosa Nutt. Stem 20–50 cm. tall: panicle 10–20 cm. long: glumes equal, 2 cm. long, awned: lemma 15 mm. long, the neck about 1 cm. long, the awns 3–5 cm. long.—Sandy soil, pinelands, sand-dunes, and gravelly fields, near the coast, Coastal Plain, New England Coast, and Great Lake Lowland, Ga. to Miss., Minn., and Mass.—(*Mex.*)



2. A. ternipes Cav. Stem 60–100 cm. tall: panicle 15–30 cm. long, the short branches ascending: glumes about equal, 8 mm. long: lemma about as long as the glumes, gradually tapering into an awn, 15–20 mm. long. [*Streptachne floridana* Chapm. *Ortachne floridana* Nash]—Hammocks, Key West, Fla.; also in N. M. and Ariz.—(*W. I., Mex., C. A., S. A.*)

3. A. dichotoma Michx. Stem slender, much branched at base, 20–60 cm. tall: panicle narrow, 5–7 cm. long, the branches short, appressed, bearing 1 or 2 spikelets: lemma about as long as second glume.—Dry open grounds, roadsides, barrens, woods, and fields, various provinces, Fla. to Tex., Kans., and Me.

4. A. Curtissii (A. Gray) Nash. Resembles *A. dichotoma*: second glume 10–12 mm. long, the first shorter: lemma shorter than the second glume, the lateral awns just about reaching its summit: straight portion of central awn about 10 mm. long.—Sterile open grounds, various provinces, Fla. to Okla., Wyo., and Md.

5. A. ramosissima Engelm. Stem spreading, 30–60 cm. tall: panicle usually reduced to a raceme 5–10 cm. long: spikelets ascending on short pedicels: glumes unequal, the second longer, about 2 cm. long: lateral awns short or minute.—Sterile open grounds and sandy places, various provinces, La. to Okla., Ia., Ind., and Tenn.

6. A. longespica Poir. Stem slender, 15–50 cm. tall: panicle narrow and strict, the branches short and appressed, bearing 1 or 2 spikelets, the lower branches distant: glumes nearly equal, about 6 mm. long, about as long as the lemma: central awn 8–15 mm. long, the lateral 2–6 mm. long. [*A. gracilis* Ell.]—Sterile open ground, roadsides, fields, and dry banks, various provinces, Fla. to Tex., Mo., and N. H.

7. A. oligantha Michx. Stem 30–60 cm. tall: panicle few-flowered, nearly simple, the pedicels or branchlets short: glumes somewhat unequal, awned: lemma 3-nerved, 2 cm. long, narrowed into a short beak, the three awns diver-

gent, finally horizontally spreading or reflexed, somewhat spirally curved at base.—Dry sterile soil, various provinces, Fla. to Tex., S. D., and Mass.; also Ore. and Calif.

8. **A. intermedia** Scribn. & Ball. Resembles *A. longespica*: stem slender, 30–80 cm. tall: panicle 20–40 cm. long: glumes 7–9 mm. long: awns all spreading, the central 18–22 mm. long, the lateral 14–17 mm. long.—Dry soil, especially sandy bottom lands, Coastal Plain and Central Lowland, Miss. to Tex., Nebr., and Ind.

9. **A. patula** Chapm. Stem erect, 100–150 cm. tall: leaf-blades smooth, flat, as much as 60 cm. long, 2–3 mm. wide: panicle as much as 60 cm. long, the branches naked below: central awn 2–3 cm. long.—Pinelands and coastal dunes, pen. Fla.

10. **A. spiciformis** Ell. Stem stiffly erect, 40–100 cm. tall: panicle dense and spike-like, 10–20 cm. long: glumes unequal, the first about half as long as the second, the second about 1 cm. long, both long-awned: lemma about 5 mm. long: awns curved at base, spreading, 2–3 cm. long.—Moist pinelands and scrublands, Coastal Plain, Fla. to Tex. and S. C.—(*W. I.*)

11. **A. lanosa** Muhl. Stem erect, rather stout, 80–140 cm. tall: leaves mostly near the base of the plant: blades flat, 2–7 mm. wide: panicle narrow, 40–60 cm. long, the branches distant, ascending, 8–12 cm. long, villous at the axils: glumes unequal, acuminate or short-awned, the first longer than the second, about 15 mm. long: lemma about 1 cm. long, the central awn recurved-spreading, 1.5–2.4 cm. long, the lateral shorter, erect or ascending. [*A. lanata* Poir.] —Dry sandy soil, woods, thickets, and roadsides, Coastal Plain and rarely adj. provinces, Fla. to Tex., Okla., and N. J.

12. **A. gyrans** Chapm. Stem slender, erect, 30–60 cm. tall: leaf-blades 1 mm. wide or less: panicle slender, 10–25 cm. long, the short branches distant, appressed, bearing 1 or 2 spikelets: lemma fusiform, the body 4–5 mm. long, the slender bearded callus 1.5 mm. long, the pale neck about 1 mm. long: awns about 1 cm. long, about equally spreading.—Pinelands, Coastal Plain, Fla. and Ga.

13. **A. stricta** Michx. Stems tufted, erect, wiry, 50–100 cm. tall: leaf-blades slender, firm: panicle strict, 10–30 cm. long, the short branches appressed: glumes somewhat unequal, the second longer, about 1 cm. long: lemma about 7–9 mm. long, minutely hispidulous toward the tip: awns 10–15 mm. long.—(WIRE-GRASS.)—Sandy pinelands and scrublands, Coastal Plain, Fla. to Miss. and N. C.

14. **A. virgata** Trin. Stem slender, 50–80 cm. tall: leaf-blades flat, 1–2 mm. wide, becoming involute toward the tip: panicle slender, the spikelets appressed, distant: glumes about 7 mm. long; lemma flattish: central awn 15–20 mm. long, horizontally spreading, the lateral awns more slender, erect, ⅔ as long as the central. [*A. Chapmaniana* Nash]—Dry pinelands and scrublands, Coastal Plain, Fla. to Miss. and N. J.

15. **A. palustris** (Chapm.) Vasey. Stem erect, stout, 100–150 cm. tall: leaf-blades 2–3 mm. wide: panicle strict, 20–40 cm. long, the branches appressed, the lower 2–4 cm. long: glumes about 1 cm. long: lemma about 8 mm. long, smooth: central awn spreading, 2–3 cm. long, the lateral erect or ascending.—Low pinelands and shallow ponds, Coastal Plain, Fla. to E Tex. and N. C.

16. **A. simpliciflora** Chapm. Stem slender, erect, 30–60 cm. tall: leaf-blades flat, 1 mm. wide: panicle slender, 10–20 cm. long, few-flowered, the spikelets mostly in pairs, unequally pedicelled: glumes 6–7 mm. long, awn-tipped: lemma a little shorter than the glumes: central awn reflexed by a semicircular bend, 1.5 cm. long, the lateral horizontally spreading, a little shorter than the central. —Moist pine woods, W Fla. and Miss.

17. A. Mohrii Nash. Resembles *A. virgata*: inflorescence reduced to a raceme, the spikelets short-pedicelled and distant along the main axis: glumes 10–11 mm. long, glabrous: lemma terete; lateral awns about as long as the central, spreading or reflexed.—Dry sandy pine ridges and woods, Coastal Plain, Ala.

18. A. purpurascens Poir. Stems erect, mostly in small tufts, rather slender, 30–100 cm. tall: leaf-blades flat, or becoming loosely involute, 1–2 mm. wide: panicle strict, 15–30 cm. long, rather dense, or interrupted: first glume about 1 cm. long: lemma about 7 mm. long, smooth: awns 15–25 mm. long, the central spreading, the lateral often somewhat shorter, erect or spreading.—Sandy woods, thickets, prairies, fields and coastal sands, various provinces, Fla. to Tex., Wis., and Mass.—(*W. I.*)

19. A. tenuispica A. Hitchc. Stem slender, 60–100 cm. tall: leaf-blades flat, 1–2 mm. wide, with scattered long hairs on the upper surface: panicle slender, the branches appressed, somewhat distant, few-flowered: glumes equal, about 8 mm. long: lemma 7 mm. long: awns equal, 12–15 mm. long, spreading or reflexed, somewhat contorted at base.—Low pine woods, pen. Fla.

20. A. condensata Chapm. Stem erect, rather stout, 50–100 cm. tall: leaf-blades 2–3 mm. wide: panicle compound, 15–30 cm. long, the branches ascending, many-flowered, as much as 10 cm. long: glumes about 8 mm. long: lemma a little shorter than the glumes, smooth: awns spreading, often somewhat curved at base, 10–15 mm. long.—Dry sandy woods, pinelands, sandhills and coastal sands, Coastal Plain, Fla., Ala. and Ga.

49. STIPA L. Perennials, usually tufted and erect, with narrow leaf-blades. Spikelets 1-flowered, articulate above the glumes, the articulation oblique, leaving a bearded sharp-pointed callus at the base of the floret; glumes membranaceous, often papery, acute, acuminate, or even aristate, long and narrow; lemma narrow, terete, firm or indurate, strongly convolute, terminating in a usually bent and twisted prominent persistent awn; palea enclosed in the convolute lemma.—One hundred species, of temperate regions generally.—SPEAR-GRASSES. PORCUPINE-GRASSES. FEATHER-GRASSES. DEVILS' DARNING-NEEDLES.

Glumes purple below: first glume 5-nerved.	1. *S. avenaceoides.*
Glumes pale: first glume 3-nerved.	2. *S. avenacea.*

1. S. avenaceoides Nash. Stem 70–140 cm. tall, naked above: leaf-blades 1 mm. wide, flat or involute: panicle 10–25 cm. long, the few branches capillary, ascending, bearing 1 or 2 spikelets: glumes 15–20 mm. long, acuminate: lemma about 1.5 cm. long, the long callus brown-bearded; awn 7–10 cm. long.—Dry pinelands, Fla.

2. S. avenacea L. Stem 50–100 cm. tall: leaf-blades 1 mm. wide, flat or involute: panicle 10–20 cm. long, the capillary nodding branches bearing 1 or 2 spikelets: glumes about 1 cm. long, abruptly acute or acuminate: lemma brown, scabrous above, 8–10 mm. long, the callus brown-felty, the neck very short, ciliate: awn 4–7 cm. long.—

(BLACK OAT-GRASS.)—Rocky or sandy woods, thickets and old fields, various provinces, Fla. to Tex., Mich. and Mass.

50. MUHLENBERGIA Schreb. Low or moderately tall perennials, the stems simple to much branched, the inflorescence a narrow or open panicle. Spikelets 1-flowered: glumes usually shorter than the lemma, obtuse to acuminate or awned, the first sometimes small, rarely obsolete; lemma membranaceous, 3- to 5-nerved, with a very short usually minutely pilose callus, the acute apex sometimes extending into a straight or flexuous awn, or mucronate only.—Eighty species, mostly in Mexico and the SW United States.—HAIR-GRASSES.

Plant producing creeping scaly rootstocks: glumes at least half as long as the floret. — I. TENUIFLORAE.
Plant without creeping scaly rootstocks, but base sometimes decumbent and rooting.
  Panicle more or less contracted, not diffuse: stems branched: leaf-blades flat. — II. SCHREBERIANAE.
  Panicle diffuse, the branches capillary: stems simple: leaf-blades involute. — III. EXPANSAE.

I. TENUIFLORAE

Stem erect, ultimately somewhat branched above: leaf-blades divaricate: glumes broad and thin, shorter than the body of the lemma: panicles slender, loosely flowered.
  Spikelets 1.5–2 mm. long: lemmas awnless or short-awned. — 1. *M. sobolifera.*
  Spikelets 3–4 mm. long: lemmas long-awned. — 2. *M. tenuiflora.*
Stem much-branched, soon spreading: leaf-blades ascending or erect: glumes narrow, acuminate, about as long as the body of the lemma.
  Stem glabrous below the nodes. — 3. *M. mexicana.*
  Stem minutely pubescent below the nodes.
    Lemma long-awned. — 4. *M. umbrosa.*
    Lemma mucronate or short-awned. — 5. *M. foliosa.*

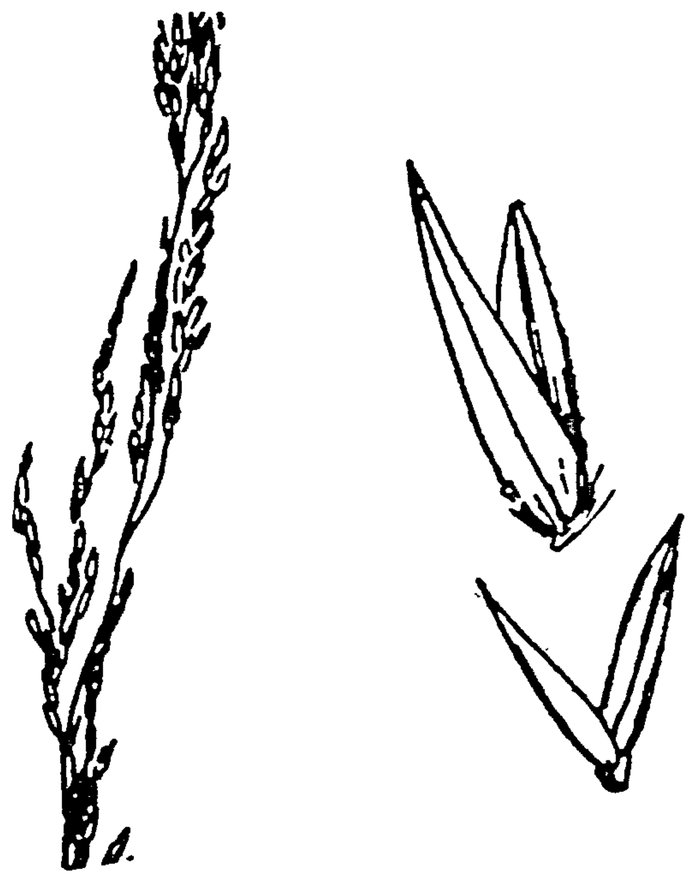
II. SCHREBERIANAE

Plant with weak stem and branches: leaf-blades flat, mostly 2–3 mm. wide. — 6. *M. Schreberi.*

III. EXPANSAE

Awn shorter than the lemma, sometimes wanting: glumes half to ⅔ as long as the lemma. — 7. *M. expansa.*
Awn longer than the lemma; glumes, excluding awns, less than half as long as the lemma. — 8. *M. capillaris.*

1. M. sobolifera (Muhl.) Trin. Stem glabrous, slender, 30–80 cm. tall: leaf-blades as much as 15 cm. long, 3–7 mm. wide: panicle 5–15 cm. long: glumes about half as long as the acuminate or short-awned lemma.—Rocky woods, various provinces, Tenn. to Tex., Wis., N. H., and Va.



2. M. tenuiflora (Willd.) B. S. P. Stem 60–100 cm. tall: leaf-blades 6–18 cm. long, mostly 8 mm. wide or more: panicle 10–25 cm. long: glumes abruptly acuminate, half to ⅔ as long as the floret: awn of lemma 5–10 mm. long. [*M. Willdenovii* Trin.]—Rocky woods and dry hillsides, various provinces, Tenn. to Ark., Wis., and Vt.

3. M. mexicana (L.) Trin. Stem 50–100 cm. long, sprawling: panicle 5–15 cm. long, the branches appressed (spreading at anthesis), spike-like: spikelets 2.5–3 mm. long.—Moist places, rich woods, and prairies, various provinces, N. C. to Tex., N. D., and N. B.

3a. Muhlenbergia racemosa (Michx.) B. S. P. [*M. glomerata* Trin.] has been reported from Statesville, N. C. (Chapm. Fl.). Its panicle is dense and the glumes aristate, exceeding the awnless lemma.

4. M. umbrosa Scribn. Stem 30–100 cm. tall: panicle 5–15 cm. long, narrow, the branches appressed or ascending: glumes 2.5–3 mm. long, awn-pointed: awn of lemma 5–15 mm. long. [*M. sylvatica* Torr.]—Moist woods, various provinces, N. C. to Tex., Minn., and N. B.

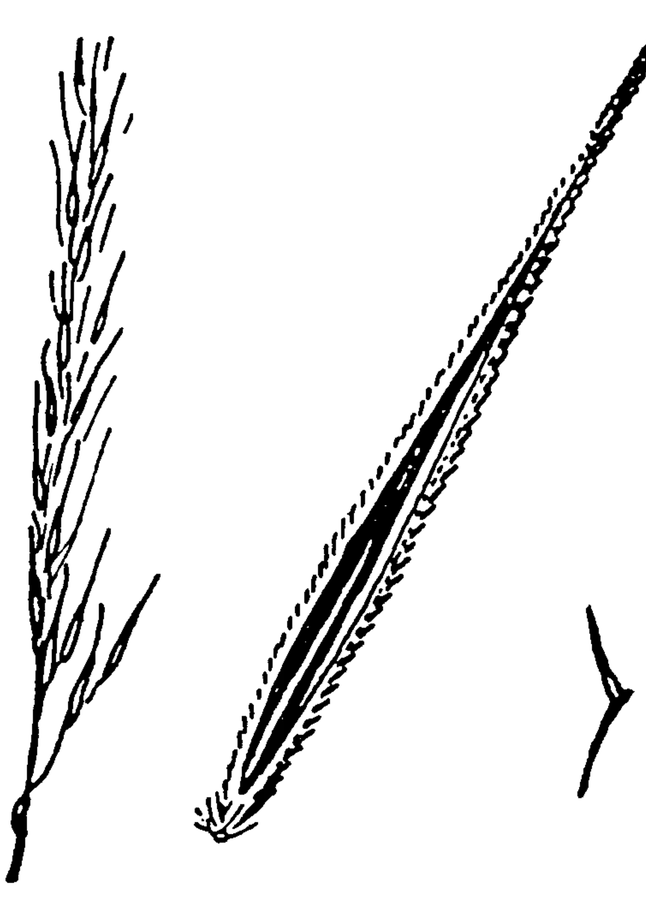
5. M. foliosa Trin. Stem erect, 30–100 cm. tall: panicle slender, exserted, 5–15 cm. long: spikelets 3–4 mm. long.—Swamps, various provinces, N. C. to Ariz., Mont., and Me.

6. M. Schreberi Gmel. Stem decumbent or prostrate, slender and wiry, diffusely branched: leaf-blades mostly 1–3 mm. wide: panicle 5–20 cm. long, slender, rather lax: glumes minute, the first often wanting: lemma about 2 mm. long, the awn 1–4 mm. long. [*M. diffusa* Willd.]—(NIMBLE-WILL.)—Low ground, moist woods, thickets, and cult. grounds, various provinces, Fla. to Tex., Nebr., and N. H.—(*Mex.*)

7. M. expansa (DC.) Trin. Stems tufted, erect, 60–100 cm. tall: leaf-blades flat, 2–3 mm. wide, becoming involute: panicle 20–40 cm. long, about half as wide, oblong, the branches ascending: lemma 4–5 mm. long, the glumes acuminate, half to ⅔ as long, the awn usually minute. [*M. trichopodes* Chapm. *M. caespitosa* Chapm. *M. Reverchoni* (Fl. SE. U.S.).]—Pinelands, Coastal Plain, Fla. to La. and N. C.

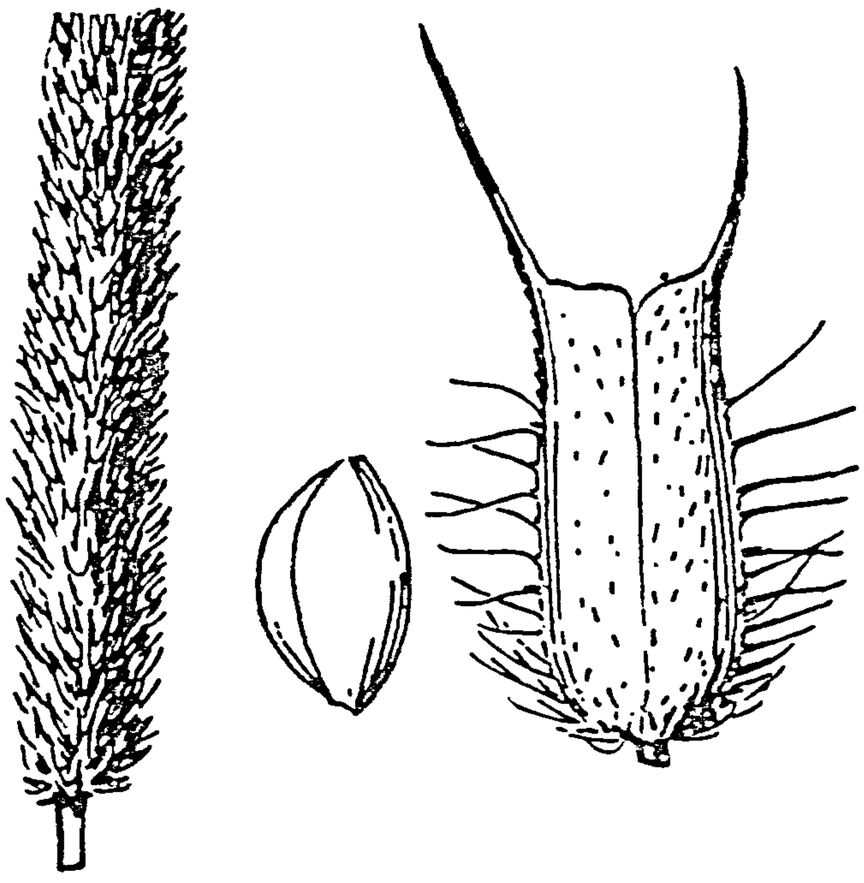
8. M. capillaris (Lam.) Trin. Resembles *M. expansa*, but stems not so tall: panicles more diffuse, broader, the capillary branches somewhat flexuous and implicate: glumes shorter (long-awned in *M. capillaris filipes*): awn of lemma 5–15 mm. long.—(HAIR-GRASS.)—Dry pinelands, prairies, meadows, and stream-banks Coastal Plain and adj. provinces, Fla. to Tex., Okla., and Mass.—(*W. I.*)—Grows in large tufts.

51. BRACHYELYTRUM Beauv. Erect slender perennials, with short knotty rootstocks, flat blades and narrow rather few-flowered panicles. Spikelets 1-flowered: rachilla prolonged behind the palea as a slender naked bristle; glumes very short, unequal, the first often obsolete, the second sometimes awned; lemma firm, narrow, 5-nerved, with an oblique callus, the apex terminating in a long straight awn.—One species.



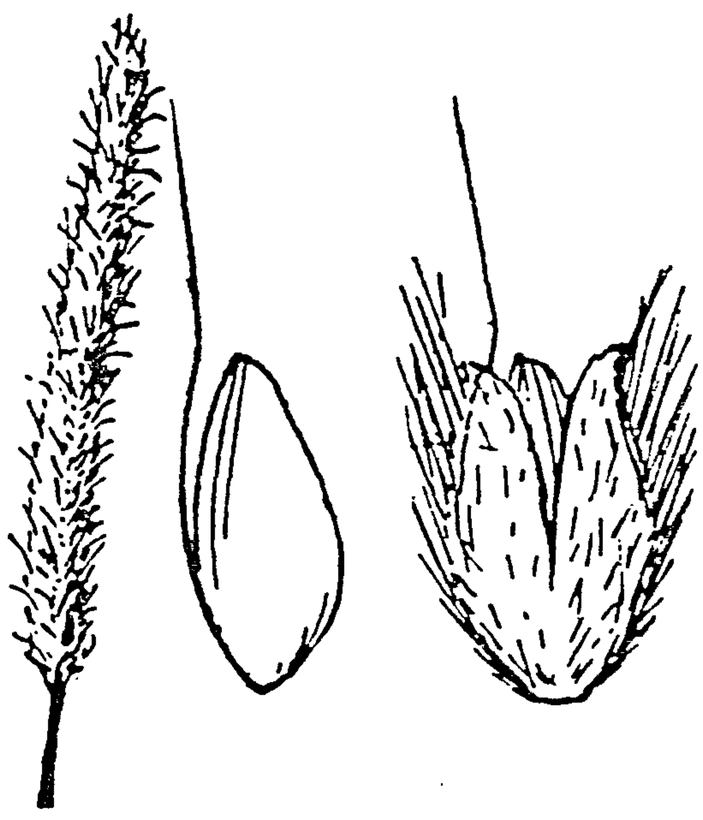
1. B. erectum (Schreb.) Beauv. Stem 50–100 cm. tall: leaf-sheaths sparsely retrorse-hispid: blades 10–20 cm. long, 1–2 cm. wide: panicle 10–20 cm. long: spikelets 1 cm. long: awn 1–2 cm. long. [*Muhlenbergia erecta* Schreb. *Dilepyrum erectum* Farwell]—Rocky woods, various provinces, Ga. to Okla., Minn., and Newf.

52. **PHLEUM** L. Annuals or perennials, with erect stems, flat leaf-blades and a dense cylindric spike-like panicle. Spikelets 1-flowered, laterally compressed: glumes equal, membranaceous, keeled, abruptly mucronate or awned; lemma shorter than the glumes, hyaline, broadly truncate, 3- to 5-nerved; palea narrow, nearly as long as the lemma.—Ten species, in the temperate regions of both hemispheres.



1. P. pratense L. Stem erect, 40–100 cm. tall, the base swollen: panicle 5–10 cm. long: glumes about 3 mm. long, the awn 1–2 mm. long.—(TIMOTHY.)—Meadows, cult. grounds, and waste-places, cult. and escaped, nearly throughout N. A. Nat. of Eu.—(*W. I., S. A.*)

53. **ALOPECURUS** L. Low or moderately tall perennials or rarely annuals, with flat blades and soft dense spike-like panicles. Spikelets 1-flowered, articulate below the glumes, falling entire, strongly compressed laterally: glumes equal, awnless, usually united at base, ciliate on the keel; lemma 5-nerved, obtuse, connate at base, bearing a delicate awn from below the middle, this included or exserted 2 or 3 times the length of the spikelet; palea wanting.—Twenty-five species, in the temperate regions of the Northern Hemisphere.—FOXTAIL-GRASSES.



1. A. ramosus Poir. Annual; stems tufted, much branched at the base, 20–50 cm. tall: panicle 2–5 cm. long, slender, pale; glumes about 2 mm. long, long-ciliate on the keel; lemma about as long as the glumes, the awn bent, the exserted portion as long again as the glumes: anthers about 0.5 mm. long. [*A. geniculatus* (Chapm. Fl.) (Fl. SE. U. S.)].—Moist places, meadows, and cult. grounds, various provinces, Fla. to Tex., Calif., Alberta, and N. J.

1a. A. myosuroides Huds. has broader panicles than *A. ramosus*: glumes 4–5 mm. long. [*A. agrestis* L.].—(MEADOW FOXTAIL.)—Waste-places, Atlantic and Gulf coasts.—Nat. of *Eurasia*.

54. **SPOROBOLUS** R. Br. Annuals or perennials, with small spikelets in open or contracted panicles. Spikelets 1-flowered: glumes awnless, usually unequal, the second often as long as the spikelet: lemma membranaceous, awnless: palea usually prominent and as long as the lemma or longer: seed free from the pericarp.—Ninety-five species, most abundant in the warmer parts of America.—DROPSEEDS. RUSH-GRASSES.

Plant annual. — I. VAGINAEFLORI.
Plant perennial.
  Creeping rootstock present. — II. VIRGINICI.
  Creeping rootstock wanting: plant tufted.
    Glumes nearly equal, much shorter than the lemma. — III. INDICI.
    Glumes unequal, the second as long as the floret or a little shorter.
      Second glume shorter than the floret: panicles narrow, the branches appressed. — IV. ASPERI.
      Second glume as long as the floret.
        Spikelets 1.5–2 mm. long, pale.
          Panicles narrow or pyramidal. — V. ARGUTI.
          Panicles open above, included below. — VI. CRYPTANDRI.
        Spikelets 3 mm. long or more, purplish or bronze. — VII. GRACILES.

I. VAGINAEFLORI

Lemma pubescent. — 1. *S. vaginaeflorus.*
Lemma glabrous. — 2. *S. neglectus.*

II. VIRGINICI

Panicle narrow or spike-like: leaf-blades involute-pointed.
  Second glume shorter than the floret: rootstock short and simple. — 3. *S. macrus.*
  Second glume as long as the floret or longer: rootstock long and branching. — 4. *S. virginicus.*
Panicle open: leaf-blades conduplicate, rather lax. — 5. *S. Torreyanus.*

III. INDICI

Tufted perennials with tall virgate stems, rather long leaves, and slender elongate panicles. — 6. *S. Berteroanus.*

IV. ASPERI

Lemma sparsely pilose. — 7. *S. clandestinus.*
Lemma glabrous. — 8. *S. asper.*

V. ARGUTI

Panicle-branches, especially the lower, whorled. — 9. *S. argutus.*
Panicle-branches not whorled. — 10. *S. domingensis.*

VI. CRYPTANDRI

Tufted perennial; sheaths conspicuously pilose at the throat. — 11. *S. cryptandrus.*

VII. GRACILES

Panicle-branches in whorls. — 12. *S. gracilis.*
Panicle-branches not in whorls.
  Leaf-blades narrowly involute. — 13. *S. teretifolius.*
  Leaf-blades flat.
    Pedicels appressed to the branches: leaf-blades about 1 mm. wide. — 14. *S. Curtissii.*
    Pedicels spreading: leaf-blades 2–4 mm. wide. — 15. *S. floridanus.*

1. S. vaginaeflorus (Torr.) Wood. Stem slender, erect, spreading or prostrate, 20–60 cm. tall: leaf-blades 1–2 mm. wide, those of the stem usually less than 5 cm. long: panicle 2–4 cm. long, partially enclosed in the inflated sheaths, or the terminal exserted: spikelets about 4 mm. long: glumes acuminate, about equal: lemma about as long as the glumes, minutely appressed-pubescent: palea acuminate, longer than the lemma. [*S. vaginaeflorus minor* Scribn.]—Sterile open ground, pastures, fields, barrens, and waste-places, various provinces, Ga. to Tex., Ariz., Minn., and Me.

2. S. neglectus Nash. Differs from *S. vaginaeflorus* chiefly in the smaller spikelets and glabrous lemma: glumes broader proportionately, about 2 mm. long: lemma more turgid, acutish, glabrous, about 2 mm. long; palea about as long as the lemma.—Dry open ground and sandy fields, various provinces, Tenn. to Tex., N. D., and Que.

3. S. macrus (Trin.) A. Hitchc. Stem 40–70 cm. tall: rootstocks numerous: leaf-blades 2–3 mm. wide, flat at base: panicle narrow, partially included in the uppermost sheath, the branches appressed, 2–3 cm. long: spikelets glabrous, about 4 mm. long: glumes somewhat unequal, slightly shorter than the nearly equal lemma and palea.—Wet pinelands, Coastal Plain, Miss. and La.

4. S. virginicus (L.) Kunth. Stem 15–50 cm. tall: leaf-sheaths overlapping: blades firm, flat or becoming involute, conspicuously distichous on the sterile shoots: panicle exserted, dense and spike-like, 3–10 cm. long: spikelets about 3 mm. long; glumes somewhat unequal, the second as long as the lemma or longer.—Sandy beaches, Coastal Plain, Fla. to Tex. and N. C.—(*W. I., Mex., C. A., S. A.*)—A robust form, *S. littoralis* (Lam.) Kunth, with culms as much as 100 cm. tall, and panicles as much as 15 cm. long, is found in S. Fla.

5. S. Torreyanus (Roem. & Schult.) Nash. Stem erect, from a short rootstock: leaf-blades flat, rather lax: panicle narrow, open, the branches ascending. [*S. compressus* (Torr.) Kunth]—Acid bogs in pinelands, Coastal Plain, Ga. to N. J.

6. S. Berteroanus (Trin.) H. & C. Stem erect, virgate, 40–100 cm. tall: leaves mostly basal, the blades flat below, as much as 5 mm. wide, tapering to a long involute point: panicle 10–40 cm. long, dense, the branches appressed, usually interrupted below: spikelets about 2 mm. long: glumes broad, obtuse, the second about half as long as the lemma, the first a little shorter. [*S. angustus* Buckl.]—(BULL-GRASS. SMUT-GRASS, the inflorescence often affected by a black fungus.)—Waste-places, hammocks, pinelands, prairies, and cult. grounds, Coastal Plain and rarely Blue Ridge, Fla. to Tex., and Va.—(*W. I., Mex., C. A., S. A.*)—**S. indicus** (L.) R. Br. has been collected on ballast at Mobile. Differs from *S. Berteroanus* in having slender, secund, loosely ascending panicle-branches and slender lax leaf-blades: glumes nearly equal, about 3 mm. long.—(*W. I., Mex., C. A., S. A.*)

7. S. clandestinus (Spreng.) A. Hitchc. Stem erect, 60–120 cm. tall: leaf-blades attenuate in slender involute points: panicle 5–15 cm. long, usually more or less enclosed in the sheaths: glumes 3–5 mm. long: lemma 6–7 mm. long, acuminate, exceeded by the acuminate or subulate-pointed palea. [*S. canovirens* Nash]—Sandy soil, prairies, sand-hills, woods, and uplands, various provinces, Fla. to Tex., Kans., and Conn.

8. S. asper (Michx.) Kunth. Stem erect, rather stout, 50–150 cm. tall: leaf-blades usually glabrous except near the base: panicle 10–20 cm. long, often more or less enclosed in the sheaths: first glume about half as long as the spikelet, the second a little shorter than the spikelet: lemma slightly exceeding the palea, all obtusish. [*S. longifolius* Wood *S. compositus* Merr.]—Dry soil, often on prairies, various provinces, Miss. to Tex., N. D., and Me.—**Sporobolus Drummondii** (Trin.) Vasey, differing from *S. asper* in being less robust, the panicles less dense and more attenuate, the branches slender and ascending: spikelets somewhat smaller, is not considered specifically distinct from *S. asper*. It occurs in Miss. and Tex.

9. S. argutus (Nees) Kunth. Stems tufted, usually geniculate at base, sometimes prostrate, 20–40 cm. long: leaf-blades mostly less than 10 cm. long, flat: panicle pyramidal, 2–10 cm. long.—Open, especially alkaline, soil, various provinces, W La. to Ariz. and Kans.; also hammocks, and cult. grounds, S Fla.—(*W. I., Mex., C. A., S. A.*)

10. S. domingensis (Trin.) Kunth. Stem erect, 30–50 cm. tall: leaves mostly basal, the blades flat, 2–4 mm. wide, involute-pointed: panicle contracted, oblong-pyramidal or spike-like, 5–15 cm. long.—Rocky or sandy soil and dunes, on or near the coast, S Fla.—(*W. I., Mex.*)

11. S. cryptandrus (Torr.) A. Gray. Stems erect, tufted, 30–100 cm. tall: leaf-blades flat, tapering to a fine point: panicles terminal and axillary, included at base in upper sheath, sometimes entirely included, the well-developed terminal panicles open, as much as 25 cm. long: spikelets crowded along the upper part of the main branches, 2–25 mm. long.—Sandy open ground, various provinces, N. C. to Tex., Ariz., Wash., and Me.

12. S. gracilis (Trin.) Merr. Plant tufted, with numerous long basal leaves: stem erect, slender, 30–60 cm. tall: leaf-blades mostly less than 1 mm. wide: panicle narrowly pyramidal, 10–18 cm. long, 2–3 cm. wide, purple. [*S. juncea* Kunth *S. ejuncidus* Nash]—Pinelands and sandy woods, Coastal Plain, Fla. to Tex. and N. C.

13. S. teretifolius Harper. Plant tufted, with numerous long basal leaves: stem 50–60 cm. tall: leaf-blades firm, glabrous, filiform, channeled, flexuous, villous above the ligule: panicle oblong-pyramidal, 20 cm. long, about 8 cm. wide.—Moist pinelands, Coastal Plain, Ga.

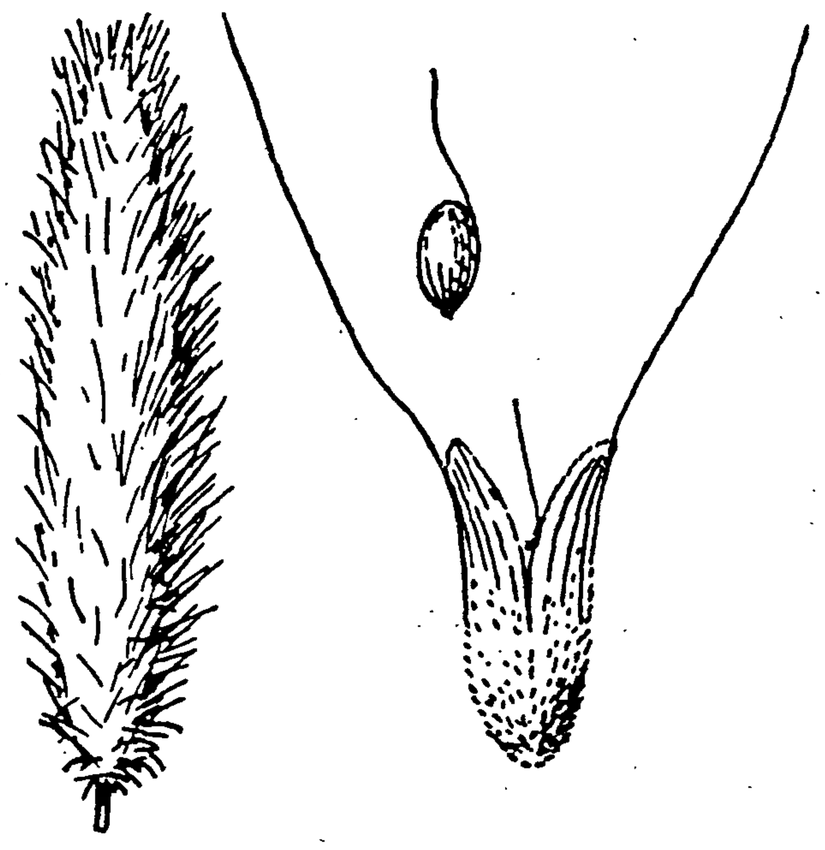
14. S. Curtissii (Vasey) Small. Stem slender, erect, 30–60 cm. tall: leaf-blades 0.5–1.5 mm. wide: panicle 15–20 cm. long, the branches rather stiffly ascending.—Moist pinelands, Coastal Plain, Fla. to N. C.

15. S. floridanus Chapm. Stem rather stout, 50–100 cm. tall: panicle 15–40 cm. long, mostly 5–10 cm. wide.—Moist pinelands, Coastal Plain, Fla. and Ga.

55. **POLYPOGON** Desf. Annuals or perennials, usually decumbent, with flat blades and dense soft-bristly spike-like panicles. Spikelets 1-flowered, the pedicel disarticulating a short distance below the glumes, leaving a short-pointed callus attached; glumes equal, entire or 2-lobed, awned from the tip or from between the lobes, the awn slender, straight; lemma much shorter than the glumes, hyaline, usually bearing a slender straight awn shorter than the awns of the glumes.—Ten species, most abundant in the Eastern Hemisphere. —BEARD-GRASSES.

Plant annual: awns 6–10 mm. long.
  Glumes slightly lobed, the lobes not ciliate. 1. *P. monspeliensis.*
  Glumes prominently lobed, the lobes ciliate-fringed. 2. *P. maritimus.*
Plant perennial: awns 1–3 mm. long. 3. *P. lutosus.*

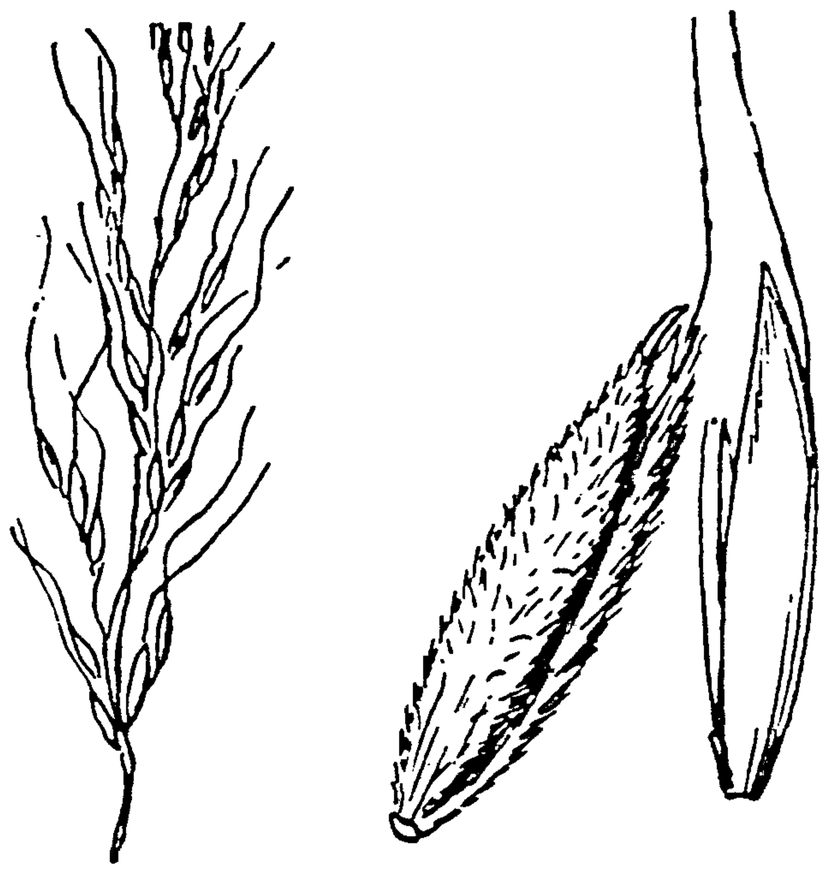
1. P. monspeliensis (L.) Desf. Stem usually 20–30 cm. tall, sometimes taller: leaf-sheaths glabrous: panicle pale, dense and silky, usually 2–10 cm. long: spikelets about 2 mm. long, the awns as much as 10 mm. long.—Moist waste-places, various provinces, N. C. to Tex. and Me.; also on Pacific Coast. Nat. of Eu.—(*Mex., S. A.*)



2. P. maritimus Willd. Stem 20–30 cm. tall: leaf-blades usually less than 5 cm. long, 2 to 4 mm. wide: panicle cylindric, scarcely lobed, 5 cm. long, or less, 1 cm. thick: glumes 3 mm. long, villous, the awn as much as 7 mm. long.—Roadsides and fields, Tybee Island, Ga. Nat. of Eu.

3. P. lutosus (Poir.) A. Hitchc. Stem 10–50 cm. tall: leaf-sheaths scabrous: panicle as much as 10 cm. long, somewhat lobed: spikelet 2–3 mm. long. [*P. littoralis* J. E. Smith]—Wet places, fields, and roadsides, various provinces, La. to Calif. and Wash. Nat. of Eu.—(*Mex., S. A.*)

56. **LIMNODEA** L. H. Dewey. A slender annual, with flat blades and narrow loose panicles. Spikelets 1-flowered, articulate with the pedicel below the glumes, the rachilla prolonged behind the palea as a short slender bristle; glumes equal, firm; lemma membranaceous, smooth, nerveless, 2-toothed at apex, bearing from between the teeth a slender bent awn, twisted at base; palea a little shorter than the lemma.—One species.



1. **L. arkansana** (Nutt.) L. H. Dewey. Stem tufted, 20–40 cm. tall: leaf-blades more or less pubescent on both surfaces: panicle 5–15 cm. long: spikelets 3.5–4 mm. long, the glumes hispidulous or hirsute: awn 8–10 mm. long. [*Thurberia arkansana* Benth.]—Dry soil, prairies, river-banks, and sand-dunes, Coastal Plain, Fla. to Tex. and Okla.

57. **CINNA** L. Tall perennials, with flat blades and large drooping panicles. Spikelets 1-flowered, articulate below the glumes, falling entire, the rachilla produced behind the palea as a minute bristle; glumes subequal, 1–3-nerved; lemma similar to the glumes, nearly as long, 3-nerved, bearing a minute short straight awn just below the tip: palea apparently 1-nerved.—Three species, natives of North America.—REED-GRASSES.

Spikelets 5 mm. long: panicle rather compact, the branches ascending. 1. *C. arundinacea.*
Spikelets 4 mm. long: panicle loose, the branches flexuous, drooping. 2. *C. latifolia.*

1. **C. arundinacea** L. Stem 60–150 cm. tall: leaf-blades as much as 1.5 cm. wide, scabrous: panicle 15–30 cm. long, somewhat glaucous: glumes somewhat unequal, acute, the second 3-nerved; lemma usually just a little shorter than the first glume; palea 1-nerved.—Moist woods, swamps, hillsides, and meadows, various provinces, Ga. to Tex., S. D., and Me.

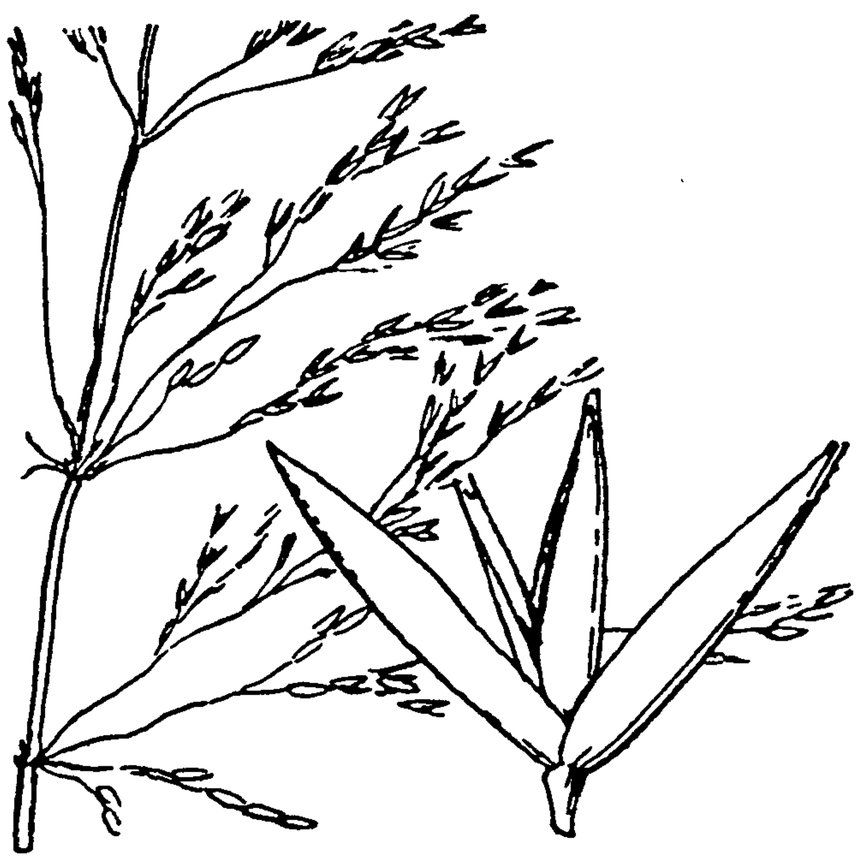
2. **C. latifolia** (Trev.) Griseb. Stem 60–120 cm. tall: leaf-blades 10–14 mm. wide: panicle 15–30 cm. long, bright-green, "awn of lemma sometimes as much as 1 mm. long; palea 2 nerved, the nerves close together." [*C. arundinacea pendula* A. Gray]—Moist woods, stream-banks, and swamps, Blue Ridge and more northern provinces, N. C. to Colo., Alas., Ont., and Newf.—(*Eu.*)

58. **AGROSTIS** L. Slender, tall or low, perennials (one of our species annual), with glabrous stems, flat or sometimes involute, scabrous blades and open or contracted panicles of small spikelets. Spikelets 1-flowered, the rachilla not prolonged; glumes equal or nearly so, acute or acuminate, carinate, usually scabrous on the keel and sometimes on the back; lemma obtuse, usually shorter than the glumes and thinner in texture, awnless or dorsally

awned, sometimes minutely hairy at base; palea usually shorter than the lemma, small and nerveless or obsolete or rarely well-developed and 2-nerved.—One hundred species, natives of temperate and cool regions.—BENT-GRASSES

Palea evident, 2-nerved.
  Branches of panicle unequal, some short and floriferous from base: ligule 2-5 mm. long. 1. *A. alba.*
  Branches of panicle all naked at base: ligule about 1 mm. long. 2. *A. tenuis.*
Palea wanting, or minute and nerveless.
  Lemma bearing a delicate awn about 5 mm. long: annual. 3. *A. Elliottiana.*
  Lemma awnless or short-awned: perennial.
    Lemma with a bent, exserted awn: stems tufted.
      Spikelets 2 mm. long. 4. *A. canina.*
      Spikelets 2.5–3 mm. long. 5. *A. borealis.*
    Lemma awnless: panicle-branches capillary.
      Panicle very diffuse, with very scabrous primary branches, these branching above the middle, the spikelets clustered toward the ends of the smaller branchlets. 6. *A. hiemalis.*
      Panicle open but not conspicuously diffuse, the branches forking at or below the middle. 7. *A. perennans.*

1. A. alba L. Stem erect, 20–100 cm. tall, producing short rootstocks and sometimes stolons: ligule 2–5 mm. long: panicle 5–30 cm. long, the lower branches in whorls, some floriferous from base, some naked at base: glumes acute, 2–3 mm. long: lemma ⅔–¾ as long as glumes: palea ½–⅔ as long as the lemma. —(RED-TOP.)—Fields, meadows, and waste-places, nearly throughout cult. N. A. Nat. of Eurasia.



2. A. tenuis Sibth. Stem slender, usually 20–40 cm. tall: ligule short and truncate: panicle 5–10 cm. long, open, the branches few and spreading, naked at base. [*A. vulgaris* With.] — (RHODE-ISLAND BENT.)—Meadows, various provinces, Tenn. to Me. Nat. of Eu.

3. A. Elliottiana Schult. Stem very slender, 10–40 cm. tall: panicle diffuse, the slender branches spreading, scabrous, floriferous toward the ends: glumes 1.5 mm. long: lemma 1 mm. long. [*A. arachnoides* Ell.]—Open dry places, woods, and prairies, various provinces, Ga. and N. C. to Tex., Kans., and Ind.

4. A. canina L. Stem 30–50 cm. tall: panicle open, 5–10 cm. long, the branches spreading.—Meadows and waste-places, various provinces, Tenn. to Me. Nat. of Eurasia.

5. A. borealis Hartm. Stem 20–40 cm. tall: leaves mostly basal: panicle 5–15 cm. long, open, usually purple, the branches spreading, naked below, nearly smooth. [*A. rubra* (Fl. SE. U. S.)]—Rocky places, Blue Ridge and more northern provinces, N. C. to Alas. and Lab.

6. A. hiemalis (Walt.) B. S. P. Stem erect, slender, tufted, 20–40 cm. tall, sometimes as much as 80 cm.: leaves mostly basal, the blades short and very narrow or almost setaceous: panicle often more than half the height of the plant: glumes 1.5–2 mm. long. [*A. scabra* Willd.]—(HAIR-GRASS.)—Open grounds, nearly throughout N. A.—The mature panicle breaks away as a tumble-weed.

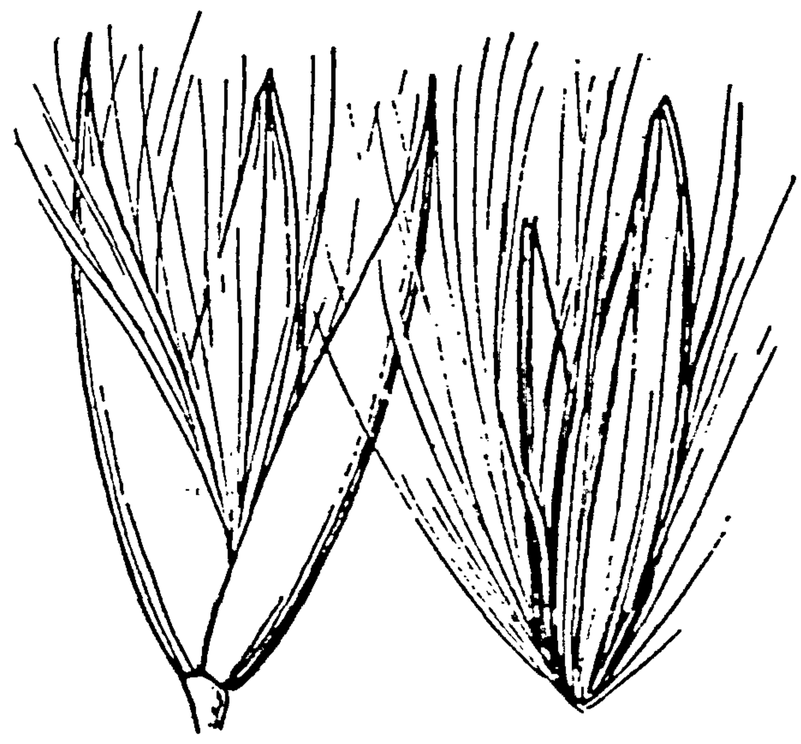
7. A. perennans (Walt.) Tuckerm. Stem erect or decumbent at base, 30–100 cm. tall, in the shade often weak and lax (more slender and taller, with

spikelets crowded toward the ends of the branches in *A. perennans elata.* [*A. altissima* (Fl. SE. U. S.) not *Cornucopiae altissima* Walt.]—Acid marshes, Coastal Plain, Ala. to Miss. and N. J.): leaves scattered along the stem: panicles 10–30 cm. long, ellipsoid, the delicate branches ascending or spreading, branching at or below the middle. [*A. novae-angliae* Tuckerm. *A. Scribneriana* Nash]—Open woods, old fields, meadows, and moist soil, various provinces, Fla. to Tex., Minn., and Me.—(*W. I., Mex., C. A., S. A.*)

59. **CALAMAGROSTIS** Adans. Moderately tall or robust erect perennials, with small spikelets in open or narrow sometimes spike-like panicles. Spikelets 1-flowered, the rachilla prolonged behind the palea as a short hairy bristle; glumes about equal, acute or acuminate; lemma shorter than the glumes, usually more delicate, with a tuft of hairs at base, these usually copious, awned from the back, usually below the middle, the awn (in our species) delicate and straight: palea shorter than the lemma.—One hundred species, natives of temperate and cool regions.—REED BENT-GRASSES.

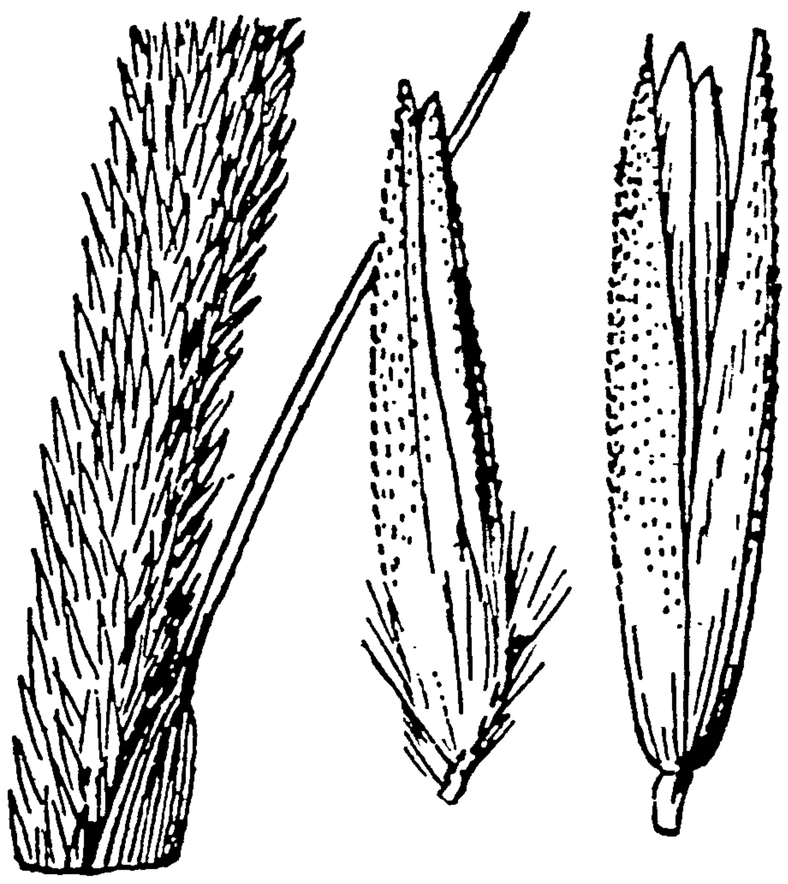
Panicle rather open, usually nodding: spikelets 3–4 mm. long. 1. *C. canadensis.*
Panicle contracted, strict: spikelets 6–7 mm. long. 2. *C. cinnoides.*

1. C. canadensis (Michx.) Beauv. Stem 60–120 cm. tall: panicle 10–20 cm. long: callus-hairs copious, about as long as the lemma: awn delicate, straight, attached just below the middle and extending to or slightly beyond its tip.—(BLUE-JOINT GRASS.)—Marshes, swamps, stream-banks, and wet places, Blue Ridge, N. C., and various provinces, N. J. to Calif., B. C., Ont., N. S., and Newf.



2. C. cinnoides (Muhl.) Barton. Stem 1–1.5 m. tall: panicle 10–15 cm. long, tapering at summit: callus-hairs about half as long as the lemma: awn attached about ¼ below the tip; rachilla about 1 mm. long, glabrous below, long-villous above. [*C. Nuttalliana* Steud.]—Wet places, acid swamps, marshes, and damp wooded slopes, various provinces, Ala. to Me.

60. **AMMOPHILA** Host. A coarse erect perennial with stout creeping rootstocks, long tough involute blades, and a pale dense spike-like panicle. Spikelets 1-flowered, the rachilla produced beyond the palea as a short bristle, hairy above; glumes about equal, chartaceous; lemma similar to the glumes, about as long, slightly emarginate, mucronate between the teeth, the callus bearing short hairs; palea nearly as long as the lemma.—Two species, of the Northern Hemisphere.

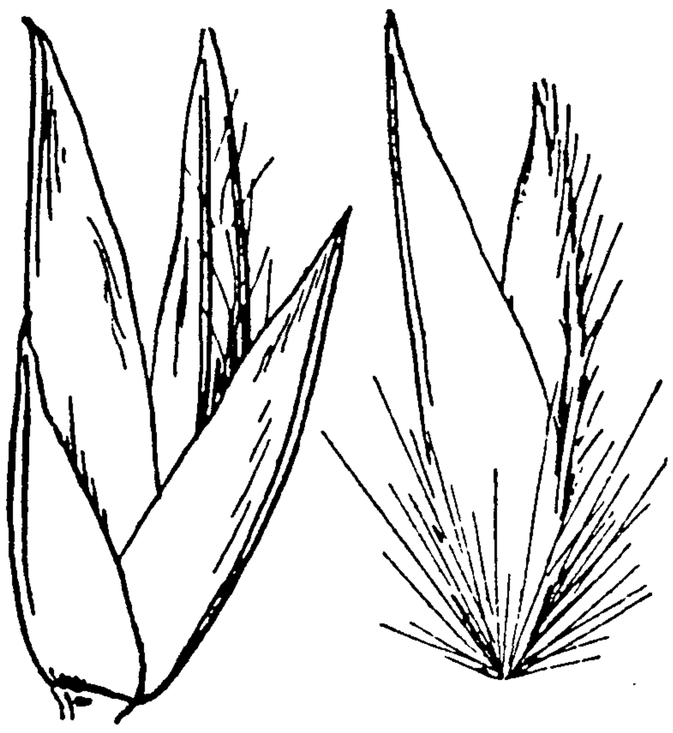


1. A. breviligulata Fernald. Stem 50–100 cm. tall: leaf-blades nearly equalling the panicle, the upper surface turned downward: panicle 10–40 cm. long: spikelets flattened, about 1 cm. long. [*A. arenaria* (Fl. SE. U. S.)]—(BEACH-GRASS. SEA-SAND REED. SEA-MAT WEED.)—Sandy beaches and dunes, Coastal Plain and New England Coast, N. C. to Newf.; also Great Lake Lowland, Ind. to Wis. and Mich.

61. CALAMOVILFA Scribn. Rigid usually tall perennials with narrow or open panicles, some species with creeping root-stocks. Spikelets 1-flowered, the rachilla not prolonged behind the palea; glumes unequal, acute, chartaceous, awnless; lemma a little longer than the second glume, chartaceous, awnless, smooth or pubescent, the callus bearded; palea about as long as the lemma.—Four species, natives of the United States and Canada.—SAND-GRASSES. REED-GRASSES.

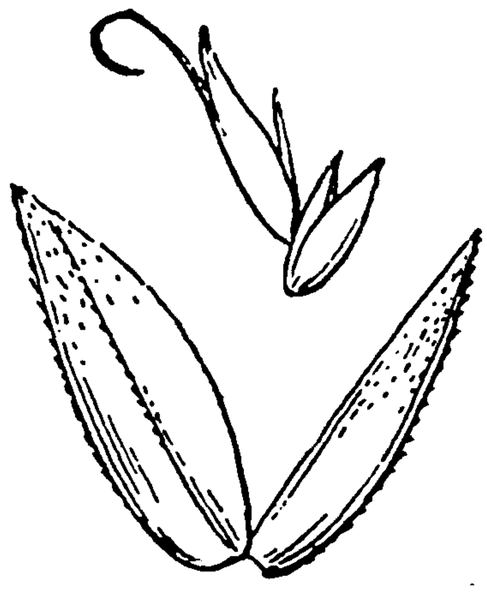
Panicle long and narrow, the branches appressed. 1. *C. Curtissii.*
Panicle open, the branches spreading. 2. *C. brevipilis.*

1. C. Curtissii (Vasey) Scribn. Stem 80–120 cm. tall: leaf-blades 2–3 mm. wide: panicle 15–30 cm. long, narrow, somewhat loose, the branches ascending or appressed. [*Calamagrostis Curtissii* Vasey]—Sandy pinelands, E pen. Fla.



2. C. brevipilis (Torr.) Scribn. Stem 60–120 cm. tall, tufted: panicle purplish, 10–20 cm. long, pyramidal, rather open, the branches glabrous, naked below.—Acid sandy swamps, Coastal Plain, N. C. to N. J.

62. NOTHOLCUS Nash. Perennials with flat blades and contracted panicles. Spikelets 2-flowered, the pedicel articulate below the glumes, the rachilla curved and somewhat elongate below the first floret, not prolonged above the second floret; glumes about equal, longer than the 2 florets; first floret perfect, the lemma awnless; second floret staminate, the lemma bearing on the back a short hooked awn.—Eight species, natives of Europe and Africa.

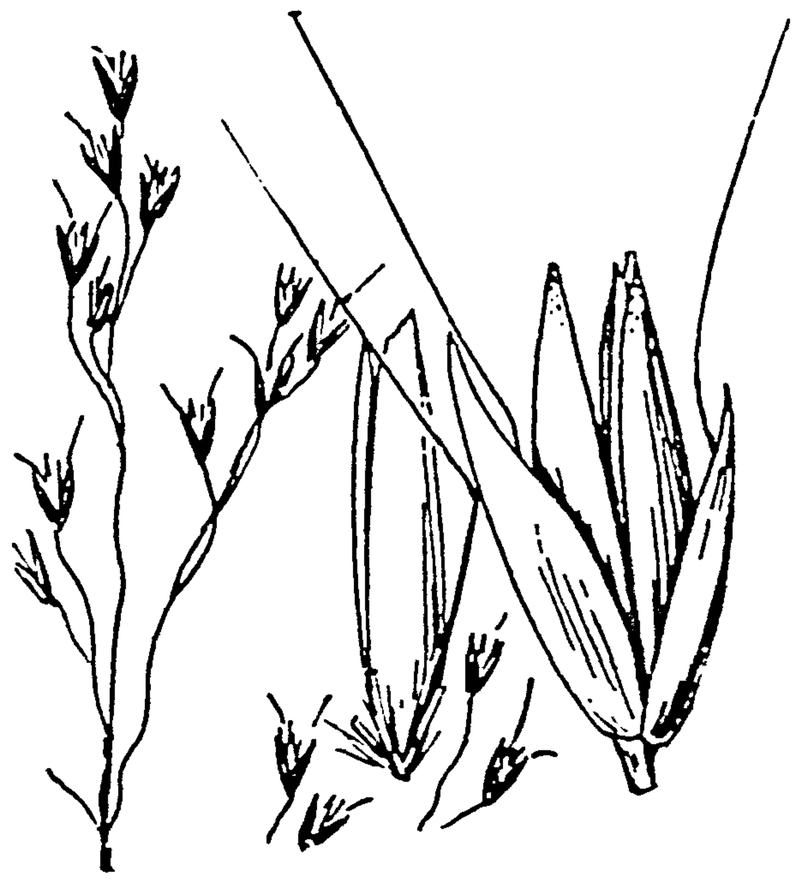


1. N. lanatus (L.) Nash. Stem 30–60 cm. tall: leaf-sheaths and blades pale, velvety-pubescent, the latter 5–10 mm. wide: panicle pale-purplish, 5–10 cm. long: spikelets 4 mm. long: glumes hairy. [*Holcus lanatus* L.]—(VELVET-GRASS.)—Moist meadows, fields, woods, and waste-places, various provinces, S. C. to La., Ill., and N. S.; also on the Pacific Coast. Nat. of Eu.

63. AIRA L. Low or rather tall perennials with shining pale or purplish spikelets in open panicles: spikelets 2-flowered, articulate above the glumes, the hairy rachilla prolonged behind the upper floret as a stripe, this sometimes bearing a reduced floret; glumes about equal, acute or acutish, membranaceous; lemmas thin, truncate and 2–4-toothed at the summit, bearing a slender awn from or below the middle, the awn straight, bent, or twisted, sometimes absent from the lower floret. [*Deschampsia* Beauv.]—Thirty-five species, in cool and temperate regions generally.—HAIR-GRASSES.

Awn twisted below at maturity, bent, exserted: leaf-blades filiform, lax. 1. *A. flexuosa.*
Awn not twisted, straight, not much exserted: leaf-blades 1.5–3 mm. wide, flat or folded, firm. 2. *A. caespitosa.*

1. A. flexuosa L. Stems tufted slender, 30–80 cm. tall: leaves chiefly basal, the blades 5–20 cm. long, the sheaths scabrous: panicle 5–12 cm. long, open; spikelets 4–5 mm. long, purplish: glume acute: awn 5–7 mm. long, attached near the base, geniculate, twisted. [*D. flexuosa* Trin.] —Dry woods or rocky banks, meadows, and dry fields, Blue Ridge, N. C. to Tenn., and various provinces, Va. to Wis. and Newf.—(*Eu.*)

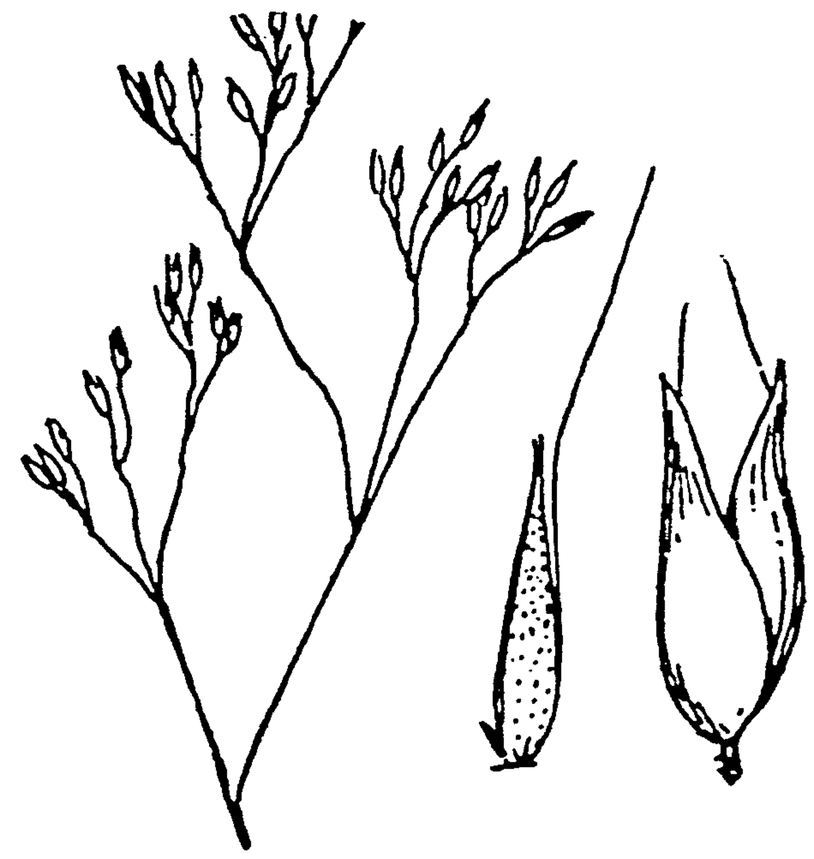


2. A. caespitosa L. Stems tufted, 60–120 cm. tall: panicle 10–20 cm. long: spikelets about 4 mm. long, pale: awn only a little longer than the lemma, straight, articulate at the base, deciduous. [*D. caespitosa* Beauv.] — Moist places, meadows, and swamps, Blue Ridge and more northern provinces, N. C. (?) to Alas., Ont., and Newf.—(*Eu.*)—The former definite inclusion of this species in our range may have been an error.

64. ASPRIS Adans. Annuals with pale shining spikelets in narrow or open panicles. Spikelets 2-flowered, articulate above the glumes, the rachilla not prolonged: glumes about equal, acute, membranaceous, or subscarious:.lemmas firm, rounded on the back, tapering into 2 slender teeth, bearing on the back below the middle a slender geniculate twisted usually exserted awn, this rarely wanting in the lower floret or reduced, the callus with a very short tuft of hairs.—Nine species, natives of Europe.—HAIR-GRASSES. WIND-GRASSES.

Lower floret awned, the awn as long as that of the upper floret. 1. *A. caryophyllea.*
Lower floret awnless or nearly so. 2. *A. capillaris.*

1. A. caryophyllea (L.) Nash. Stem delicate, less than 20 cm. tall: panicle open, about ⅓ the height of the plant, the capillary branches spreading: spikelets clustered toward the ends of the branches, 3 mm. long: teeth of lemma setaceous.—(SILVERY HAIR-GRASS.)—Waste-places, fields, woods, and roadsides, various provinces, Fla. to La., Ohio, and Mass.; also on the Pacific Coast. Nat. of Eu.



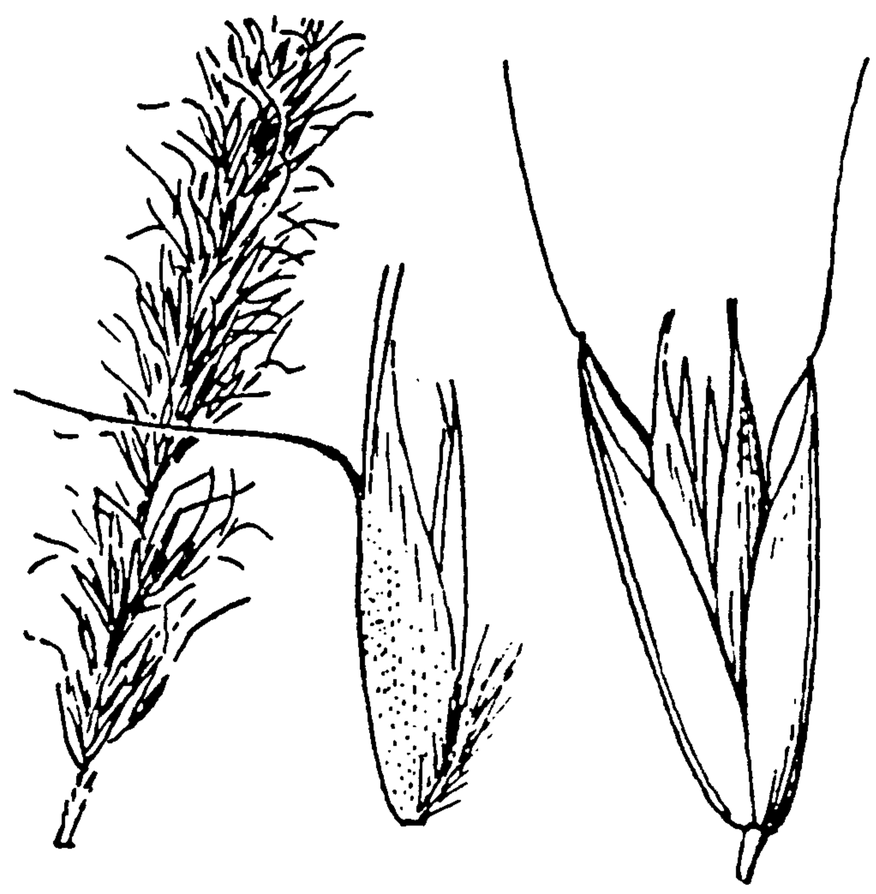
2. A. capillaris (Host.) A. Hitchc. Similar to *A. caryophyllea*: spikelets scattered at the ends of the branches, 2.5 mm. long: lemma of lower floret with short teeth, of the upper floret with setaceous teeth.—Waste-places, various provinces, Fla. to La., Calif., N. J., and Md. Nat. of Eu.

65. TRISETUM Pers. Tufted perennials with flat blades and open or usually contracted or spike-like panicles. Spikelets 2-flowered, sometimes 3- to 5-flowered, the rachilla prolonged behind the upper floret, usually villous; glumes somewhat unequal, acute, awnless, the second usually longer than the

first floret; lemmas usually short-bearded at the base, 2 cleft at the apex, the teeth often awned, and with a bent and exserted awn from the back below the cleft apex.—Sixty-five species, in the Arctic and temperate regions of both hemispheres.—FALSE-OATS. WILD OAT-GRASSES. SWAMP OAT-GRASSES.

Panicle dense, spike-like, sometimes interrupted below. 1. *T. spicatum.*
Panicle narrow but loose.
  Awn twisted below: both florets long-awned; rachilla articulate above the glumes. 2. *T. flavescens.*
  Awn not twisted: lower floret awnless or with a short straight awn: pedicel articulate below the glumes. 3. *T. pennsylvanicum.*

1. T. spicatum (L.) Richt. Stem 15–50 cm. tall: leaves more or less puberulent: panicle 3–10 cm. long: spikelets 5–6 mm. long, the rachilla articulate above the glumes: awn 4–5 mm. long, exserted, divergent. [*T. molle* Kunth *T. subspicatum* Beauv.]—Mtn. summits and slopes, Blue Ridge and more northern provinces, N. C. to Alas., Ont., and Lab.—(*W. I., Mex., C. A., S. A.*)



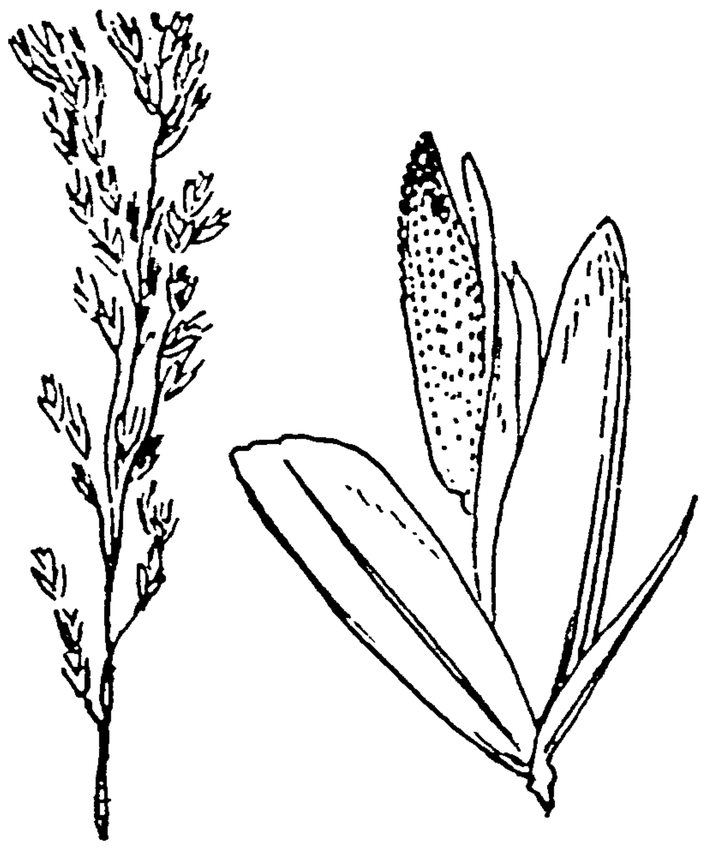
2. T. flavescens (L.) Roem. & Schult. Stem 40–100 cm. tall: leaf-sheaths pubescent: blades 2–6 mm. wide: panicle 5–15 cm. long: spikelets 3–4-flowered: lemmas 5–6 mm. long.—Occasional in waste-places; reported from Miss. Nat. of Eu.

3. T. pennsylvanicum (L.) B. S. P. Stem 30–100 cm. tall: leaf-sheaths glabrous or the lower pubescent: panicle 10–20 cm. long: awn 4–5 mm. long. [*Sphenopholis palustris* Scribn. *T. palustre* Torr. *T. ludovicianum* Vasey]—Marshes, swamps, and springy places, various provinces, Fla. to La., and Mass.

66. **SPHENOPHOLIS** Scribn. Erect perennials with usually flat blades and narrow panicles of shining spikelets. Spikelets 2- or 3-flowered, the rachilla articulate below the glumes and between the florets, produced beyond the upper floret as a slender bristle; glumes unlike in shape, the first narrow, acute, 1-nerved, the second broadly obovate, 3- to 5-nerved, somewhat coriaceous; lemmas firm, scarcely nerved, awnless or rarely short-awned, the first a little shorter or a little longer than the second glume. [*Eatonia* Endl. Not Raf.]—Four species, natives of the United States, Mexico, and the West Indies.

Leaf-blades about 1 mm. wide, elongate, flat or involute. 1. *S. filiformis.*
Leaf-blades flat, more than 1 mm. wide, not much elongate.
  Panicle narrow, densely flowered: glumes equal in length, about 2 mm. long, the second much broadened above, 1 mm. wide as folded. 2. *S. obtusata.*
  Panicle lax, the branches more or less spreading: glumes unequal, the second longer, widened above, 0.5–0.75 mm. wide as folded.
    Lemmas smooth: panicle-branches approximate. 3. *S. pallens.*
    Lemmas, especially the second, scabrous: panicle-branches rather distant. 4. *S. nitida.*

1. S. filiformis (Chapm.) Scribn. Stem densely tufted, 30–60 cm. tall: panicle 5–15 cm. long, slender, often nodding: spikelets about 4 mm. long. [*E. filiformis* Vasey]—Dry soil, Coastal Plain, Fla. to Tex., Tenn., and N. C.



2. S. obtusata (Michx.) Scribn. Stem 30–100 cm. tall: leaf-sheaths glabrous or pubescent: panicle 6–18 cm. long, often glomerate: spikelets 2.5–3 mm. long. [*E. obtusata* A. Gray *E. pubescens* Scribn. & Merr., the pubescent form.]—Dry soil, various provinces, Fla. to Tex. and Me.—(*W. I., Mex.*)

3. S. pallens (Spreng.) Scribn. Stem 30–100 cm. tall: leaf-sheaths glabrous or pubescent: panicle 8–20 cm. long, nodding: spikelets 3–4 mm. long: lemmas lanceolate, acute, glabrous, sometimes awned below the apex. [*E. pennsylvanica* A. Gray *E. longiflora* Beal]—Damp or rocky woods, various provinces, Fla. to Ariz., Wis., and Me.—**S. aristata** (Scribn. & Merr.) Heller [*Eatonia aristata* Scribn. & Merr. *Trisetum aristatum* Nash] resembles *S. pallens:* lemmas scabrous as in *S. nitida,* the second awned. S. C. Probably a hybrid.

4. S. nitida (Spreng.) Scribn. Resembles *S. pallens*: stem more slender and usually not so tall: leaves pubescent or glabrous: panicle looser, the branches more widely spreading in flower: first glume proportionately wider. [*E. nitida* Nash *E. Dudleyi* Vasey *E. glabra* Nash, the glabrous form.]—Dry woods, various provinces, Fla. to Tex., N. D., and Mass.

67. KOELERIA Pers. Slender low or rather tall annuals or perennials with narrow blades and spike-like panicles. Spikelets 2- to 4-flowered, the rachilla prolonged beyond the perfect florets as a slender bristle or bearing a reduced or sterile floret: glumes about equal in length, unequal in shape, the lower narrow and sometimes shorter, 1-nerved, the upper somewhat broader above the middle, wider than the lower, 3- to 5-nerved; lemmas somewhat scarious and shining, the lowermost a little longer than the glume, obscurely 5-nerved, acute or short-awned.—Twenty species, in the temperate regions of both hemispheres.—JUNE-GRASSES.

1. K. phleoides (Vill.) Pers. Annual with short oblong panicles and short-awned lemmas.—Pensacola, Fla. and Ala. Nat. of Eu.

68. AVENA [Tourn.] L. Low or moderately tall annuals or perennials with narrow or open usually rather few-flowered panicles of large spikelets. Spikelets 2- to several-flowered, the rachilla bearded, articulate above the glumes and between the florets; glumes about equal, membranaceous or papery, several-nerved, longer than the lower floret, usually exceed-

ing the upper floret: lemmas indurate except toward the summit, 5- to 9-nerved, bidentate, bearing a dorsal bent and twisted awn (this straight or reduced in *A. sativa*).—Fifty-five species, in temperate regions, most abundant in the Old World.—OATS.

1. A. sativa L. Annual: stem 50–100 cm. tall: leaf-blades flat, 5–10 mm. wide: panicle nodding, 15–40 cm. long, the branches spreading or ascending: spikelets usually 2-flowered: glumes 2–2.5 cm. long: lemmas glabrous, the awn usually straight, often wanting.—(OAT.)—Escaped from cult., fields, roadsides, woods, and waste-places, nearly throughout N. A. Nat. of Eurasia.—(*W. I., Mex.*)

69. ARRHENATHERUM Beauv. Rather tall perennials, with flat leaf-blades and rather dense panicles. Spikelets 2-flowered, the lower floret staminate, the upper perfect, the rachilla produced beyond the florets as a slender bristle; glumes rather broad and papery, the first 1-nerved, the second a little longer than the first, about as long as the spikelet, 3-nerved; lemmas 5-nerved, hairy on the callus, the lower bearing near the base a twisted, geniculate, exserted awn, the upper bearing a short straight slender awn just below the tip.—Six species, in the temperate parts of Eurasia.

1. A. elatius (L.) Mert. & Koch. Stem 100–150 cm. tall (with tubers or corms in a short chain at the base of the stem in *A. elatius tuberosum.* Ala. to Va. Nat. of Eu.): leaf-blades 5–10 mm. wide: panicle pale and shiny, sometimes purplish, 15–30 cm. long, narrow, the short branches verticillate: spikelets 7–8 mm. long. [*A. avenaceum* Beauv.]—(TALL OAT-GRASS.)—Meadows, fields, roadsides, and waste-places, escaped from cult., various provinces, Ga. to La. and N. C. Nat. of Eu.

70. DANTHONIA Lam. Tufted low or moderately tall perennials, with few-flowered open or contracted panicles of rather large spikelets, and, besides, solitary or few cleistogamous spikelets of 1 or 2 florets at the base of the lower leaf-sheaths. Spikelets several-flowered, the rachilla readily disarticulating above the glumes and between the florets; glumes about equal, broad and papery, acuminate, mostly exceeding the uppermost floret; lemmas rounded on the back, obscurely several-nerved, the apex bifid, the lobes acute, often aristate, a stout awn arising from between the lobes, the awn flat, twisted, geniculate, exserted.—One hundred species, in the temperate parts of both hemispheres, most abundant in southern Africa.—WILD OAT-GRASSES.

Leaf-sheaths villous: lemmas densely long-villous all over. 1. *D. sericea.*
Leaf-sheaths glabrous or sparsely pilose: lemmas villous on the margins, glabrous or sparsely pilose on the back.
  Glumes about 1.5 cm. long: lemmas glabrous on the back. 2. *D. epilis.*
  Glumes 7–10 mm. long: lemmas sparsely pilose on the back.
    Stem terete: teeth of lemma triangular, acute, or acuminate, not aristate. 3. *D. spicata.*
    Stem compressed: teeth of lemma aristate. 4. *D. compressa.*

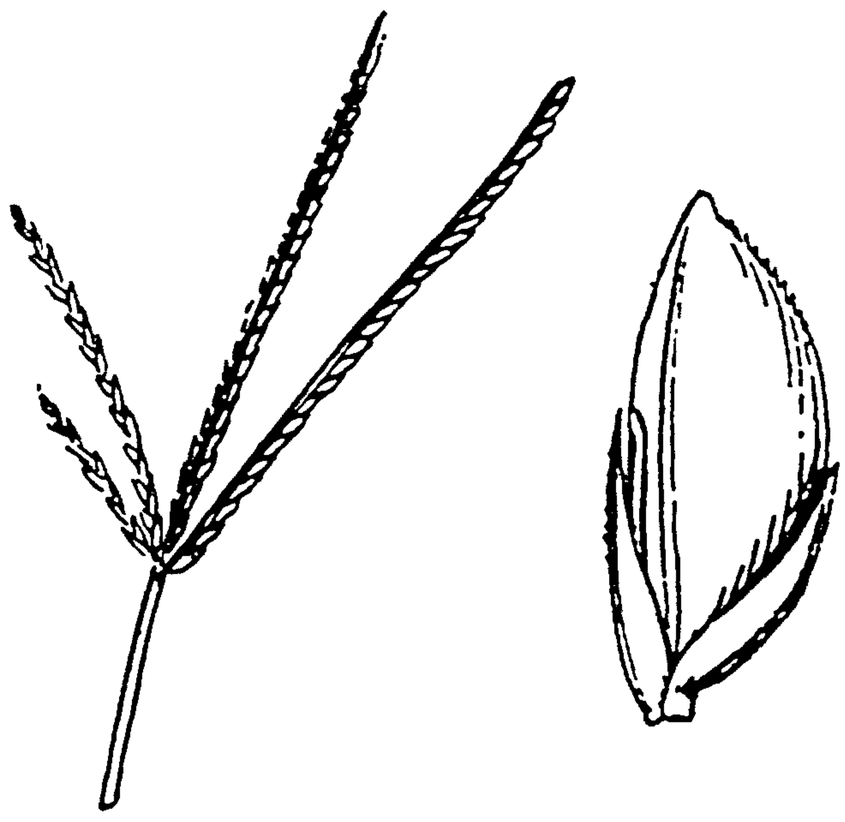
1. D. sericea Nutt. Stem 50–100 cm. tall: panicle 6–10 cm. long, rather loose, the branches ascending or spreading: teeth of lemma 2–3 mm. long, the dorsal awn 12–15 mm. long.—Sandy soil, dry acid woods, and pinelands, various provinces, W Fla. to La., Tenn., and Mass.

2. D. epilis Scribn. Resembles *D. sericea,* usually not so tall: panicles smaller: lemma glabrous except at the base and on the margins below the middle.—Acid bogs and wet sandy soil, Coastal Plain, Ga. to N. J., rare. Probably only a variety of *D. sericea.*

3. D. spicata (L.) Beauv. Stem 20–70 cm. tall: leaves usually in a basal tuft, the blades short and curly: panicle few-flowered, the few short branches erect.—Dry and sterile soil, woods, pastures, clearings, and sand-hills, various provinces, Fla. to Tex., N. M., Wash., and Me.

4. D. compressa Austin. Stem 40–90 cm. tall: leaf-blades elongate, 2–3 mm. wide: teeth of lemma 2 mm. long or more.—Dry woods, various provinces, N. C. to Tenn. and Me.

71. CAPRIOLA Adans. Perennial, usually low grasses with extensively creeping stolons and rootstocks, short blades and several slender spikes digitate at the summit of the upright flowering stems. Spikelets 1-flowered, awnless, sessile in 2 rows along one side of a slender continuous rachis, the rachilla prolonged behind the palea, sometimes bearing a minute bract; glumes narrow, acuminate, 1-nerved, about equal, shorter than the floret; lemma strongly compressed, pubescent on the keel, firm in texture, 3-nerved, the lateral nerves close to the margins.—Six species, of the warmer regions, the following widely distributed.



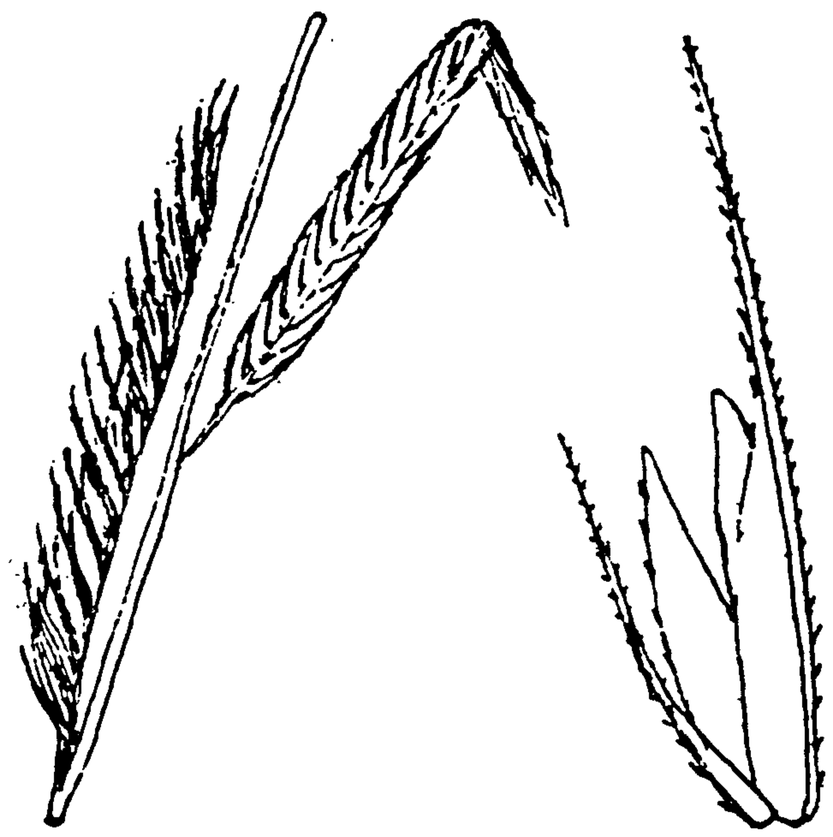
1. C. Dactylon (L.) Kuntze. Stem flattened, wiry, 10–30 cm. tall: spikes usually 4–5, slender, 2–5 cm. long: spikelets imbricate, 2 mm. long. [*Cynodon Dactylon* Pers.]—(BERMUDA-GRASS. SCUTCH-GRASS.)—Fields and waste-places, various provinces, Fla. to Tex., Calif., Ore., and Mass. Nat. of Eu. (*W. I., Mex., C. A., S. A.*)—A more robust form is found along the seacoast of Fla.

72. SPARTINA Schreb. Stout erect, often tall perennials with usually extensively creeping firm, scaly rootstocks, long tough blades, and 2 to many appressed or sometimes spreading spikes racemose on the main axis. Spikelets 1-flowered, the rachilla articulate below the glumes, not produced beyond the floret, much flattened laterally, sessile and usually closely imbricate in 2 rows on one side of a continuous rachis: glumes keeled, 1-nerved, acute or short-awned, the first shorter, the second often exceeding the lemma; lemma firm, keeled, the lateral nerves obscure, narrowed to a rather obtuse point; palea

2-nerved, keeled and flattened, the keel between or at one side of the nerves.—Fourteen species, most of them North American.—MARSH-GRASSES. CORD-GRASSES.

Leaf-blades more than 5 mm., usually more than 8 mm. wide, flat (more or less rolled in drying) : plants robust, often tall and reed-like.
  First glume as long as the floret, slender-acuminate, the second with an awn about 7 mm. long : spikes somewhat distant. 1. *S. Michauxiana.*
  First glume shorter than the floret, acute, the second acute or mucronate, but not slender-awned : spikes approximate.
    Spikes numerous, ascending, forming a thick panicle. 2. *S. cynosuroides.*
    Spikes few to several, remote, erect or nearly so. 3. S. *alterniflora.*
Leaf-blades less than 5 mm. broad, involute or soon becoming so : plants rather slender.
Spikes appressed, forming a dense cylindrical inflorescence. 4. *S. spartinae.*
Spikes spreading or appressed, but not closely approximate and dense.
  Creeping rootstocks wanting : plant in a dense hard clump with tall stems (1–2 m.) and long slender involute leaf-blades as much as 2 m. long. 5. *S. Bakeri.*
  Creeping rootstocks present : plant more slender and with shorter blades. 6. *S. patens.*

1. S. Michauxiana A. Hitchc. Stem 1–2 m. tall: leaf-blades 60–120 cm. long, as much as 15 mm. wide, tapering to a very slender point: spikes 5–20, appressed or ascending, mostly 4–8 cm. long: glumes serrulate-hispid on the keel, the first acuminate, equalling the floret, the second longer than the floret, tapering into an awn 7 mm. long: lemma 7–9 mm. long. [*S. cynosuroides* (Fl. SE. U. S.)]—(SLOUGH-GRASS.)—Marshes, river-banks, swamps, and wet prairies, various provinces, N. C. to N. M., Wash., N. S., and N. J..



2. S. cynosuroides (L.) Roth. Stem 1–3 m. tall, as much as 2 cm. thick at base: leaf-blades 1–2.5 cm. wide: spikes 20–50, dark colored, crowded, usually ascending: glumes acuminate, the first about half as long as the lemma, the second longer than the lemma. [*S. polystachya* Willd.]—(SALT REED-GRASS.)—Salt and brackish marshes, Coastal Plain and New England Coast, Fla. to La. and Me.

3. S. alterniflora Loisel. Stem rather lush, 1–2 m. tall, leafy: leaf-blades 1–1.5 cm. wide: spikes appressed, 5–15 cm. long: spikelets 10–14 mm. long, remote along the rachis, barely overlapping: glumes and lemma sparingly pilose, the first glume ⅔ as long as the second, the lemma 8–10 mm. long (spikelets imbricate, the lemma glabrous in *S. alterniflora glabra* [*S. stricta* (Fl. SE. U. S.) *S. glabra* Muhl.]—Salt-marshes, Coastal Plain and New England Coast, Fla. to Tex. and Me.

4. S. spartinae (Trin.) Merr. Stem 0.3–1 m. tall, in dense hard clumps, the rootstocks wanting: panicles 10–20 cm. long, strict: spikes numerous, mostly 2–3 cm. long: spikelets about 7 mm. long. [*S. junciformis* Engelm. & Gray]—Sandy marshes, cypress-ponds, and alluvial flats, Coastal Plain, Fla. to Tex.—(*Mex.*)

5. S. Bakeri Merr. Stems in dense tufts: spikes few, 3–6 cm. long, appressed: first glume about 3 mm. long: second glume about 1 cm. long, acuminate: lemma about 6 mm. long, glabrous except the scabrous keel.—Fresh water marshes, prairies, and borders of lakes, Coastal Plain, Fla. and Ga.

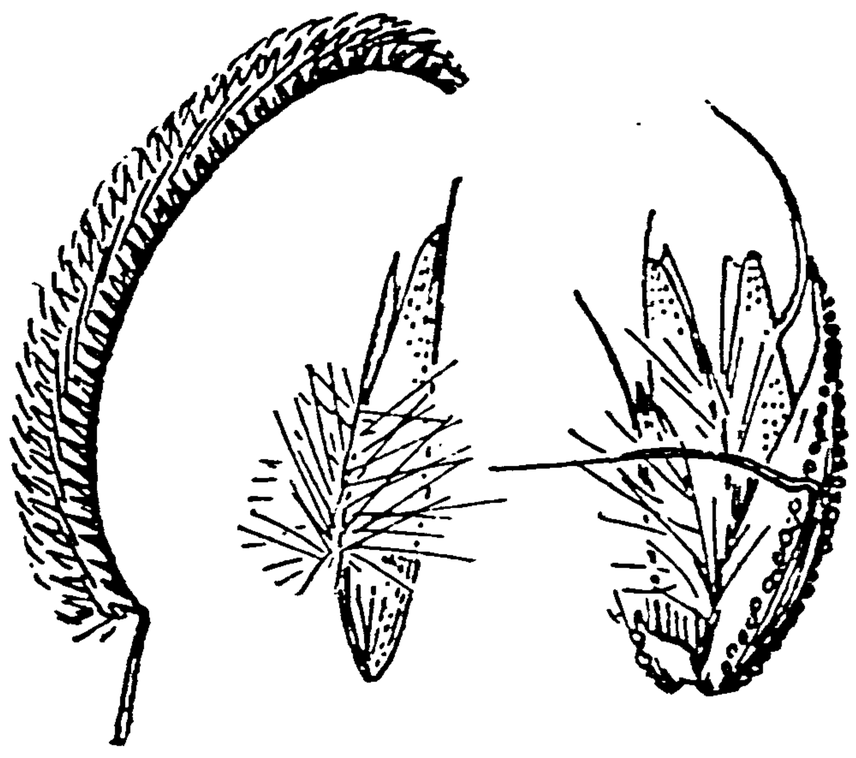
6. S. patens (Ait.) Muhl. Stem 0.3–0.9 m. tall, rarely taller: spikes mostly 4–6, ascending, 2–5 cm. long: spikelets 7–10 mm. long. [*S. juncea* Willd.]—(SALT-GRASS. SALT MARSH-GRASS.)—Salt marshes, along the coast, Fla. to Tex. and Newf.—(*W. I.*)

73. CAMPULOSUS Desv. Erect slender, rather tall perennials with solitary curved spikes. Spikelets several-flowered but with only one perfect floret, sessile and closely imbricate on one side of a continuous rachis, the rachilla disarticulating above the glumes; first glume small, hyaline, 1-nerved, the second as long as the lemma, firm, 3- to 4-nerved, bearing on the back a strong divergent awn: lemmas rather papery, 3-nerved, villous on the lateral nerves and callus, bearing a short straight awn on the back just below the apex, the first and second lemmas empty, the third enclosing a perfect flower, the upper 1 to 3 empty and successively smaller. [*Ctenium* Panz.]—Twelve species, of the warmer regions; mostly American.—TOOTHACHE-GRASSES.

Plant forming dense tussocks: second glume with a row of prominent glands on each side of the mid-nerve: awn stout, at maturity horizontal or nearly so: ligule about 1 mm. long. 1. *C. aromaticus*

Plants with slender scaly rootstocks: second glume glandless or with obscure glands: awn rather slender, not horizontally spreading: ligule 2–3 mm. long. 2. *C. floridanus.*

1. C. aromaticus (Walt.) Trin. Stem 1–1.5 m. tall: old leaf-sheaths persistent and fibrillose at the base of the stem; leaf-blades flat or involute, stiff: spike 5–15 cm. long: spikelets 5–7 mm. long. [*Ctenium americanum* Spreng.]—Damp pinelands and swamps, Coastal Plain and rarely adj. provinces, Fla. to La. and Va.—Rootstock pungent.



2. C. floridanus A. Hitchc. Differs from the preceding in having a creeping rootstock: stem erect, 0.6–1 m. tall: leaf-blades firm, mostly becoming involute, attenuate at the apex, glabrous, 10–15 cm. long, 1–3 mm. wide: spike 8–15 cm. long, often twisted; second glume glandless or the glands obscure. [*C. chapadensis* (Fl. SE. U. S.)]—Pinelands, Fla.

74. CHLORIS Swartz. Tufted perennials or annuals with flat blades and 2- to several often showy and feathery spikes aggregated at the summit of the stems. Spikelets with 1 perfect floret, sessile in 2 rows along one side of a continuous rachis, the rachilla produced beyond the perfect floret and bearing 1 to several reduced florets consisting of empty lemmas, these often truncate and, if more than one, the smaller ones enclosed in the lower, forming a usually club-shaped rudiment; glumes somewhat unequal, the first shorter, narrow, acute: lemma keeled, usually broad, 1- to 5-nerved, often villous on the callus, and on the keel or marginal nerves, awned from between the short teeth of a bifid apex, the awn slender, sometimes obsolete: sterile lemmas awned or awnless. [*Eustachys* Desv.]—Sixty species, in the warmer regions of both hemispheres.—BRANCHING-FOXTAILS. FINGER-GRASSES.

Lemma awnless or with an inconspicuous awn, dark-brown; leaf-sheaths much compressed; blades abruptly rounded at the tip.—EUSTACHYS. I. PETRAEAE.

Lemma distinctly awned, pale.—CHLORIS. II. VIRGATAE.

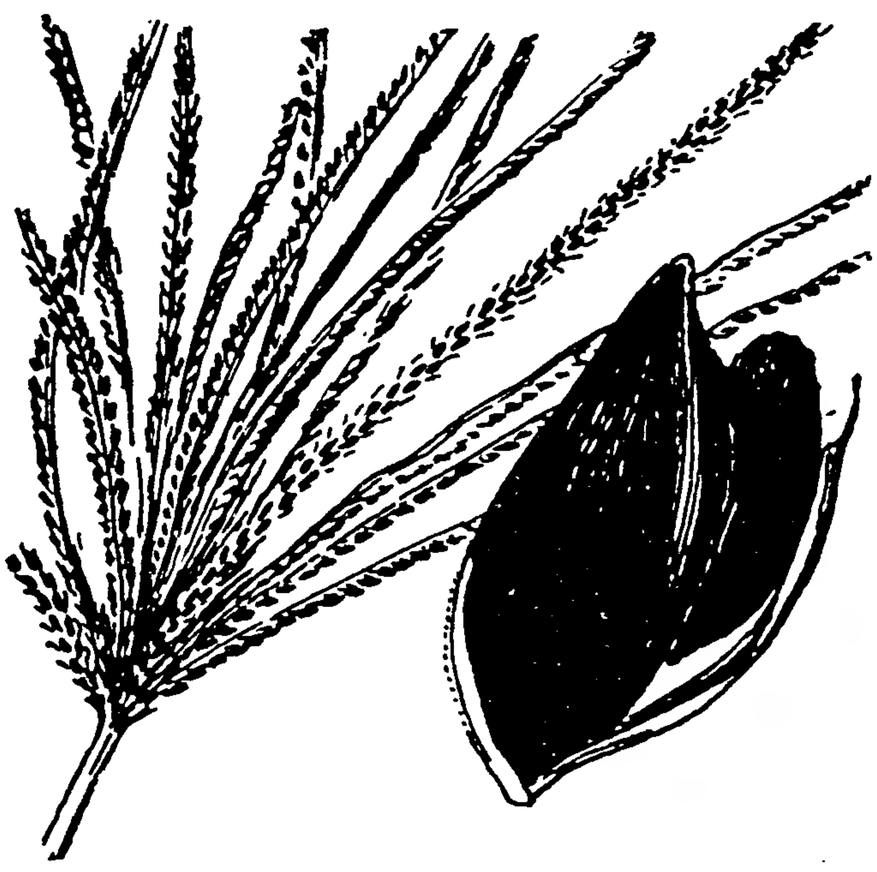
I. PETRAEAE

Spikes numerous (10–25) : second glume truncate, not notched. 1. *C. glauca.*
Spikes rarely more than 6.
  Spikelets 2 mm. long : second glume mucronate from a notched apex. 2. *C. petraea.*
  Spikelets 3 mm. long.
    Spikes 1 or 2, rarely 3. 3. *C. floridana.*
    Spikes 4 to 6, rarely more. 4. *C. neglecta.*

II. VIRGATAE

Rudiment narrow : awns about 8 mm. long. 5. *C. Prieuri.*
Rudiment truncate, broadened above : awns 3–5 mm. long.
  Plants strongly stoloniferous : lemmas pilose on nerves. 6. *C. Gayana.*
  Plants without stolons : lemmas strongly ciliate-villous. 7. *C. polydactyla.*

1. C. glauca (Chapm.) Vasey. Stem stout, 50–150 cm. tall, one or more nodes with opposite, spreading leaf-sheaths: leaf-blades as much as 1.5 cm. wide: spikes 5–15 cm. long: spikelets about 2 mm. long. [*E. glauca* Chapm.]—Brackish marshes, prairies, and cypress swamps, Fla. to N. C.



2. C. petraea Swartz. Stem 30–100 cm. tall: leaf-sheaths often paired: leaf-blades 4–10 mm. wide: spikes mostly 4–6, suberect, 4–10 cm. long. [*E. petraea* Desv.]—Dry soil, hammocks, pinelands, and prairies, Coastal Plain, Fla. to Tex. and N. C.—(*W. I., Mex., C. A., S. A.*)

3. C. floridana (Chapm.) Vasey. Stem 40–100 cm. tall: leaf-sheaths not paired: leaf-blades 4–8 mm. wide: spikes erect, 5–10 cm. long. [*E. floridana* Chapm.]—Dry sandy soil, woods, and old fields, Coastal Plain, N Fla. and Ga.

4. C. neglecta Nash. Similar to *C. floridana,* usually taller and stouter: leaf-sheaths commonly paired: spikes more numerous, usually longer. [*E. neglecta* Nash]—Open sandy woods and swamps, Fla.

5. C. Prieuri Kunth. Perennial with stems 30–60 cm. tall: leaf-blades 2–3 mm. wide: spikes 2–8, erect, 5–8 cm. long: fertile lemma 2.5 mm. long, ciliate near summit: rudiment narrow, bearing 3 or 4 awns.—Waste grounds, Mobile, Ala., and Wilmington, N. C. Nat. of Africa.

6. C. Gayana Kunth. Plant producing stout stolons a meter or more long: stem tufted, 100–150 cm. tall: leaf-blades 3–5 mm. wide: spikes mostly 12–15, straight, ascending or erect, 6–8 cm. long, inconspicuously pilose.—(RHODES GRASS.)—Fields and roadsides, various provinces, Fla. to Miss., Tex., and S Calif. Nat. of Afr.

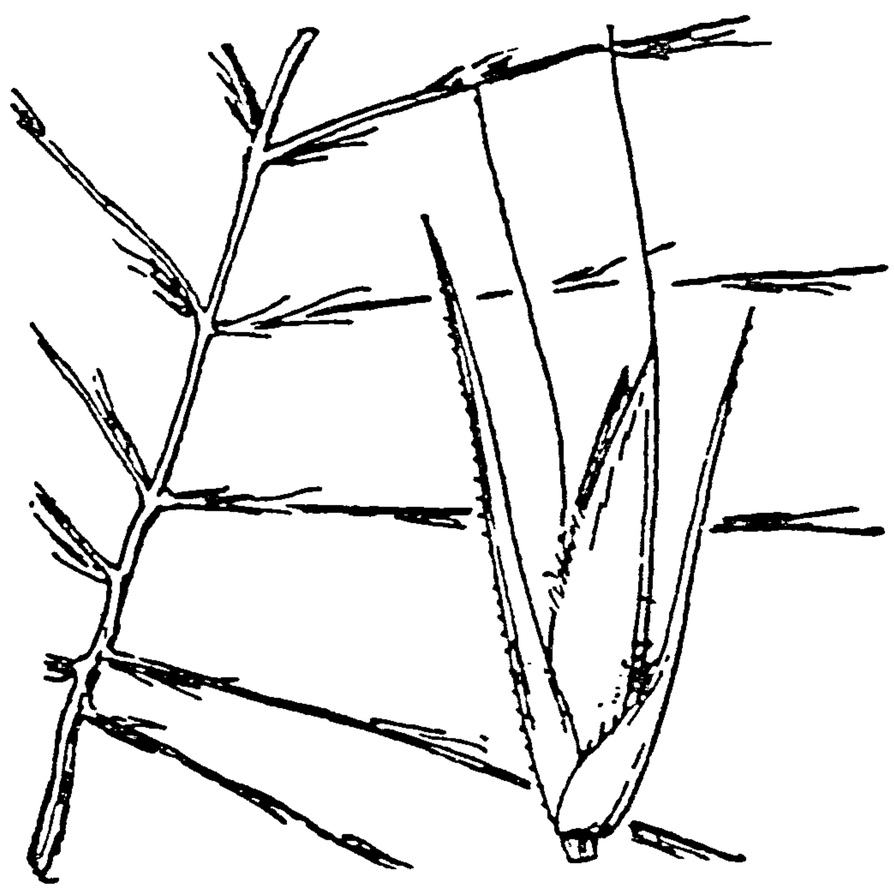
7. C. polydactyla (L.) Swartz. Perennial: stem 50–100 cm. tall: leaf-blades as much as 1 cm. wide: spikes several to many, flexuous, tawny, mostly 8–12 cm. long. [*C. barbata* Nash]—Open sandy soil, S Fla.—(*W. I., S. A.*)

75. GYMNOPOGON Beauv. Rigid perennials with short flat stiff blades, numerous stiff slender divergent spikes loosely scattered along the upper part of the stem, often deflexed at maturity. Spikes 1 or rarely 2–4-flowered, nearly sessile, appressed and usually remote in 2 rows, along 1 side of a slender con-

tinuous rachis, the rachilla prolonged behind the 1 or more fertile florets bearing a rudiment of a floret, this sometimes bearing 1 or 2 slender awns; glumes narrow, acuminate, 1-nerved, usually longer than the floret; lemmas narrow, 3-nerved, the lateral nerves near the margin, the apex minutely bifid, bearing between the teeth a slender awn, or rarely awnless.—Ten species, mostly American.—BEARD-GRASSES.

Awn longer than the lemma: spikes floriferous from base. 1. *G. ambiguus.*
Awn shorter than the lemma or none.
  Spikes spreading or reflexed, naked for 1 to several cm. at base: leaf-blades spreading: spikelets 2-flowered. 2. *G. brevifolius.*
  Spikes ascending, approximate, floriferous from base: leaf-blades ascending: spikelets 3-flowered (2–4-flowered), the florets zigzag. 3. *G. Chapmanianus.*

1. **G. ambiguus** (Michx.) B. S. P. Stem 30–60 cm. tall: leaf-blades 5–10 mm. wide: spike 10–20 cm. long: glumes 4–6 mm. long: awn 4–6 mm. long. [*G. racemosus* Beauv.]—Dry soil, woods, pinelands, and hillsides, Coastal Plain and adj. provinces, Fla. to Tex., Kans., and N. J.



2. **G. brevifolius** Trin. Resembles *G. ambiguus*: stem more slender: leaf-blades narrower and shorter: spikes floriferous usually only on the upper half or third.—Dry grounds, Coastal Plain, Fla. to La. and N. J.

3. **G. Chapmanianus** A. Hitchc. Stem 30–40 cm. tall, stout: leaf-blades 5–6 cm. long, about 5 mm. wide: branches of panicle relatively stout.—Sandy pinelands, Fla.

76. **BOUTELOUA** Lag. Low or rather tall perennials or annuals, with 2 to many spikes, or sometimes solitary, racemose on a common axis, the spikelets few to many in each spike, pectinate or more loosely arranged and appressed, the rachis of the spike usually produced beyond the insertion of the spikelets. Spikelets 1-flowered, with the rudiments of 1 or more florets above, sessile in 2 rows along one side of the rachis: glumes unequal, 1-nerved, acuminate or short-awned, the first shorter and narrower: lemma as long as the second glume or a little longer, 3-nerved, the nerves extending into short or often rather long awns, the internerves usually extending into teeth; palea sometimes 2-awned; rudiment various, usually 3-awned, a second rudimentary floret sometimes present. [*Triathera* Desv. *Atheropogon* Muhl. *Polyodon* H. B. K.]—Thirty-eight species, mostly North American.—MESQUITE-GRASSES. GRAMA-GRASSES.

Spikes falling from the axis entire: spikelets not pectinately arranged.—ATHEROPOGON. 1. *B. curtipendula.*
Spikes persistent, the florets falling, more than twice as long as wide: spikelets pectinately arranged.—BOUTELOUA. 2. *B. hirsuta.*

1. **B. curtipendula** (Michx.) Torr. Stem erect, 50–80 cm. tall: inflorescence 15–25 cm. long, mostly 1-sided: spikes 1–2 cm. long, the peduncles recurved:

spikelets 5–8: first glume 4–5 mm., the second 7 mm. long: rudiment 3-awned, the awns 3–6 mm. long, the lateral ones sometimes obsolete. [*A. curtipendulus* Fourn.]—Hills, plains, barrens, prairies, and rocky slopes, various provinces, S. C. to Calif., Mont., and Conn.—(*Mex.*, *C. A.*, *S. A.*)

2. B. hirsuta Lag. Stem erect, 20–50 cm. tall: leaf-blades about 3 mm. wide, sparsely papillose-pilose: spikes 1–4, usually 2, 2.5–3.5 cm. long, the rachis projecting 5–8 mm.; spikelets about 6 mm. long: second glume tuberculate-pilose.—(BLACK-GRAMA.)—Rocky hills, various provinces, Tex. to Calif., Mont., and Ill.; also in pinelands, pen. Fla.—(*Mex.*)

77. ELEUSINE Gaertn. Annuals, with 2 to several rather stout spikes digitate at the summit of the culms, sometimes with 1 or 2 a short distance below, rarely with a single terminal spike. Spikelets few- to several-flowered, compressed, sessile and closely imbricate in 2 rows along one side of a rather broad rachis, the latter not prolonged beyond the spikelets; glumes unequal, rather broad, acute, 1-nerved, shorter than the first lemma; lemmas acute, with 3 strong green nerves close together forming a keel, the uppermost somewhat reduced.—Six species, natives of the warmer parts of the Eastern Hemisphere.

1. E. indica (L.) Gaertn. Glabrous stem decumbent or prostrate, flattened, usually 10–40 cm. long: spikes 2.5–8 cm. long: spikelets 3-5-flowered, about 5 mm. long: seed roughened by fine ridges, loosely enclosed in the pericarp.—(WIRE-GRASS. YARD-GRASS. DOG-GRASS. CRAB-GRASS. CROW-FOOT.)—Roadsides, cult. grounds, yards and waste-places, various provinces, Fla. to Tex., Calif., Kans., and Mass. Nat. of E. I.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)

1a. **Eleusine tristachya** Lam. Glabrous, tufted, the stems geniculate, mostly not more than 25 cm. long: spikes 2 or 3, thick, 1.5–3 cm. long, often 1 cm. wide: spikelets 5–9-flowered, 6–8 mm. long.—Ballast at Mobile, Ala., also in N. J. and Ore.—(*S. A.*, *Africa.*)

78. DACTYLOCTENIUM Willd. Annuals or perennials with flat blades and 2 to several short thick spikes digitate at the summit of the culms. Spikelets 3- to 5-flowered, compressed, sessile, closely imbricate in 2 rows along one side of the rather narrow flat rachis, the end projecting in a point beyond the spikelets; glumes somewhat unequal, broad, 1-nerved, the first persistent upon the rachis, the second mucronate or short-awned below the tip, deciduous;

lemmas firm, broad, keeled, acuminate or short-awned, 3-nerved, the lateral nerves indistinct, the upper floret reduced; palea about as long as the lemma; seed subglobose, ridged or wrinkled, enclosed in a thin, early disappearing pericarp.—Three species, natives of Eurasia.

1. D. aegyptium (L.) Richt. Glabrous annual: stem spreading or prostrate, often rooting at the nodes: spikes 1.5–5 cm. long: glumes scabrous on the keel, the second with a short awn: lemmas cuspidate. [*D. aegyptiacum* Willd. *Eleusine aegyptiaca* Pers.] — (EGYPTIAN-GRASS. CROWFOOT-GRASS.)—Waste-places, roadsides, and cult. grounds, various provinces, Fla. to Ariz., Ill., and Me. Nat. of Eu.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)

79 **LEPTOCHLOA** Beauv. Annuals or perennials with flat blades and numerous racemes, racemose along a common axis forming a panicle. Spikelets 2- to several-flowered, sessile or short-pedicelled, approximate or somewhat distant along one side of a slender rachis; glumes unequal or nearly equal, usually shorter than the first lemma, awnless or mucronate, 1-nerved: lemma obtuse or acute, sometimes 2-toothed and mucronate or short-awned from between the teeth, 3-nerved, the nerves sometimes pubescent. [*Diplachne* Beauv.]—Twenty species, in the warmer parts of both hemispheres.—FEATHER-GRASSES. SALT-GRASSES.

Plant perennial.	
Lemmas broad, notched at apex, the lateral nerves glabrous.	1. *L. dubia.*
Lemmas acute or awned, the lateral nerves pubescent.	
Lemmas awnless or only lowest with short awns: plants smooth, glaucous.	2. *L. virgata.*
Lemmas awned, the awn as long as or longer than the body: leaf-sheaths and blades sparsely pilose, not glaucous.	3. *L. domingensis.*
Plant annual.	
Sheaths papillose-pilose: spikelets minute.	4. *L. filiformis.*
Sheaths smooth or scabrous, not pilose.	
Lemmas awned.	5. *L. fascicularis.*
Lemmas awnless or mucronate only.	6. *L. floribunda.*

1. L. dubia (H. B. K.) Nees. Stem erect, 30–100 cm. tall: leaf-blades as much as 5 mm. wide: racemes several, ascending, 5–15 cm. long, scattered: spikelets 5–10 mm. long, 5-8-flowered, rarely only 2-flowered: lemmas broad, obtuse or emarginate, sometimes mucronate between the lobes. [*D. dubia* Benth.]—(SPRANGLE.)—Plains, hills, and rocky woods, various provinces, Fla.; Tex. to Ariz.—(*Mex.*, *S. A.*)

2. L. virgata (L.) Beauv. Stem wiry, erect, slender, 50–100 cm. tall: leaf-blades flat, 5–10 mm. wide: racemes 10–15 cm. long, ascending, lax: spikelets 3.5–4 mm. long: lemmas 2–2.5 mm. long.—Sandy soil, cult. grounds, and roadsides, Coastal Plain, S Fla. and S Tex.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)

3. L. domingensis (Jacq.) Trin. Resembles *L. virgata*: commonly stouter: racemes shorter, usually more numerous, more closely flowered. [*D. domingensis* Chapm.]—Sandy soil, S Fla.—(*W. I., Mex., C. A., S. A.*)

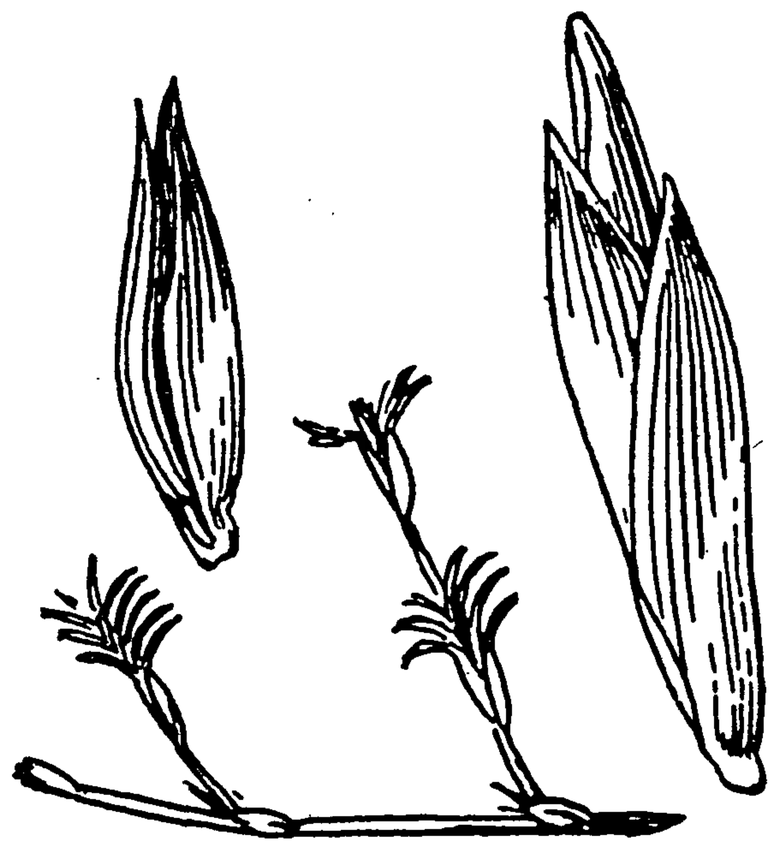
4. L. filiformis (Lam.) Beauv. Stem 40–80 cm. tall, sometimes depauperate: racemes 20–40, ascending or spreading, very slender, lax, 5–10 cm. long: spikelets about 3 mm. long, 3–4-flowered: lemmas awnless. [*L. mucronata* Kunth. *L. attenuata* Nash]—Fields, sandy bottoms and rocky hills, various provinces, Fla. to Tex., Calif., Ill., and Mass.—(*W. I., Mex., C. A., S. A.*)

5. L. fascicularis (Lam.) A. Gray. Plant smooth: stem erect, spreading or prostrate, 20–100 cm. long: leaf-blades 3–5 mm. wide, usually involute: panicles as much as 25 cm. long, the base included in the upper sheath, the racemes 8–12 cm. long, at first ascending, finally spreading: spikelets 6–12-flowered: lemmas 4–5 mm. long, the nerves pubescent below, the awn sometimes as long as the lemma. [*D. fascicularis* Beauv. *D. acuminata* Nash *D. procumbens* Nash]—Brackish soil along the coast, and moist places in the interior, various provinces, Fla. to Tex., Calif., S. D., and N. H.

6. L. floribunda Doell. Stem 60–100 cm. tall: leaf-blades lax, elongate, 5–10 mm. wide, scaberulous: panicles oblong, rather compact, 10–20 cm. long, the numerous racemes ascending, 4–6 cm. long: spikelets 4–5 mm. long, 5–7-flowered: lemmas 3 mm. long. [*D. Halei* Nash]—Marshes, Coastal Plain and adj. provinces, S Miss. to Tex., and S Ind., probably introduced.—(*S. A.*)

6a. Leptochloa uninervia (Presl) Hitchc. & Chase. Annual, densely tufted: stems ascending to suberect, 50–100 cm. tall: leaf-blades narrow, subinvolute: panicle purplish-leadcolor, 15–30 cm. long, the numerous spikes stiffly ascending: spikelets 5–7 cm. long, 6–9-flowered, the lemmas obtuse, minutely mucronate.—Introduced in Miss. It is an annual with numerous spikes and obtuse awnless lemmas. La. to Cal. (*Mex., C. A., S. A.*)

80. MONANTHOCHLOË Engelm. A creeping wiry dioecious perennial, with clustered short subulate leaves, the spikelets at the ends of the short branches only a little exceeding the leaves. Spikelets 3- to 5-flowered, the rachilla disarticulating tardily in pistillate spikelets; glumes wanting: lemmas rounded on the back, convolute, narrowed above, several-nerved, those of the pistillate spikelet like the leaves: palea narrow, in the pistillate spikelets convolute around the pistil, the rudimentary uppermost floret enclosed between the keels of the floret next below.—Two species, both American.



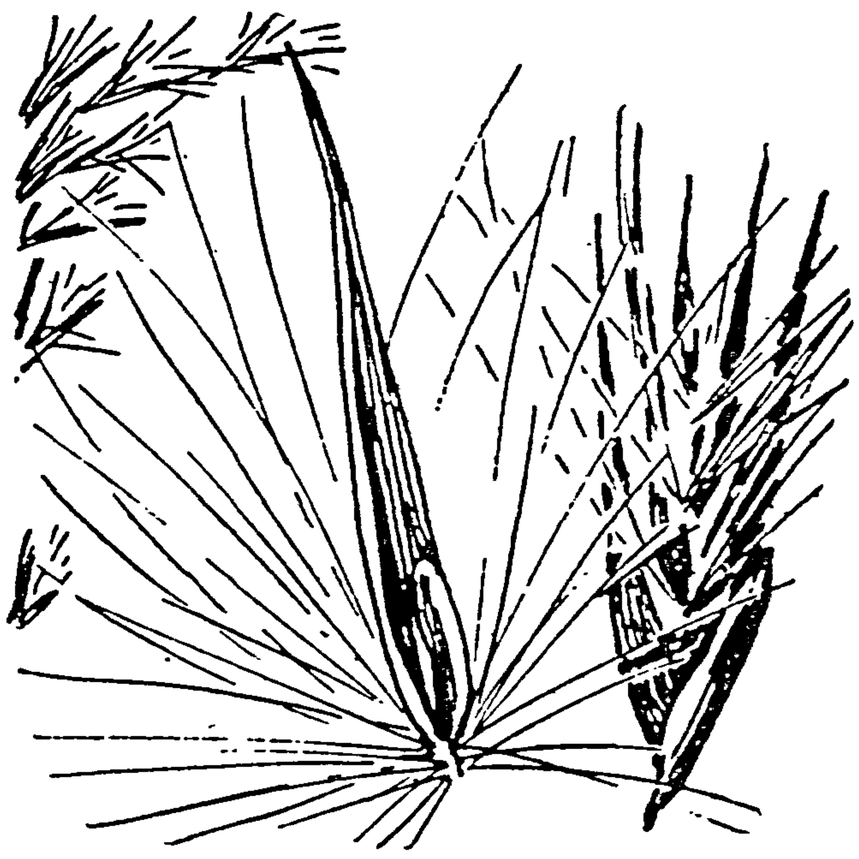
1. M. littoralis Engelm. Branches 10–20 cm. tall: leaf-blades squarrose, rigid, 3–8 mm. long.—(KEY-GRASS.)—Rocky or muddy saline shores, S Fla., S Tex., and S Calif.—(*W. I., Mex., S. A.*)

81. ARUNDO L. Tall perennial reeds with broad linear blades and large plume-like terminal panicles. Spikelets several-flowered, the rachilla glabrous, articulate above the glumes and between the florets; glumes somewhat unequal, membranaceous, 3-nerved, narrow, tapering into a slender point,

about as long as the spikelet: lemmas thin, 3-nerved, densely long-pilose, gradually narrowed at the summit, the nerves ending in slender teeth, the middle one longer, extending into a straight awn, the florets successively smaller, the summits of all about equal.—Six species, natives of the warmer parts of the Old World.

1. A. Donax L. Stem as much as 6 m. tall, branching, the rootstocks thick, rough and knotty: leaf-blades as much as 7 cm. wide, those on the branches much smaller: panicle 30–60 cm. long: spikelets about 12 mm. long. — (GIANT-REED.) — Low grounds and wet places, various provinces, Fla. to Tex., Calif., and Va. Nat. of Eu.—(*W. I., Mex., C. A., S. A.*)

82. PHRAGMITES Adans. Perennial reeds with broad linear flat blades and large terminal panicles. Spikelets several-flowered, the rachilla clothed with long silky hairs, disarticulating above the glumes and at base of each joint between the florets, the lowest floret staminate or neuter: glumes 3-nerved or the upper 5-nerved, lanceolate, acute, the upper shorter than the florets, the lower about half as long as the upper: lemmas narrow, long-acuminate, glabrous, 3-nerved, the florets successively smaller, the summits of all about equal: palea much shorter than the lemma.—Three species, the following cosmopolitan.



1. P. Phragmites (L.) Karst. Stem as much as 4 m. tall, from long creeping rootstocks, these sometimes appearing above the ground as leafy stolons as much as 10 m. long: leaf-blades as much as 5 cm. wide: panicle 15–40 cm. long: spikelets 12–14 mm. long. [*P. communis* Trin.]—(COMMON-REED.)—Marshes, swamps, and wet places, various provinces, nearly throughout U. S. and S Can.—(*W. I., Mex., C. A., S. A., O. W.*)—**Neyraudia arundinacea** (L.) Heuw. has escaped in a few places in S Fla. It is a large reed resembling *Phragmites;* sheaths woolly at the throat: panicle 30 to 50 cm. long: spikelets 4–8-flowered, 6–8 mm. long; lemmas long-villous on the margin, with 2 short setaceous tips with an awn between. Nat. of Madagascar and S. Asia. Cult. for ornament.

83. TRIODIA R. Br. Erect tufted perennials, rarely stoloniferous, the leaf-blades usually flat, the inflorescence an open or contracted panicle. Spikelets several-flowered, the rachilla disarticulating above the glumes and between the florets: glumes membranaceous, often thin, subequal, the first sometimes narrower, 1-nerved or the second rarely 3- to 5-nerved, acute or acuminate: lemmas broad, rounded on the back, the apex from minutely emarginate or toothed to deeply and obtusely lobed, 3-nerved, the midnerve excurrent between the lobes as a minute point, the lateral nerves near the margin often

excurrent as minute points, all the nerves pubescent below, the lateral ones sometimes conspicuously so throughout: palea broad, the nerves near the margin, sometimes villous. [*Erioneuron* Nash *Rhombolytrum* Link]—Thirty species, natives of temperate regions.—SAND-GRASSES.

Pedicels more than 1 mm. long, often longer than the spikelet.
  Lateral nerves of the lemma excurrent.
    Panicle open with the branches spreading or ascending, naked below. 1. *T. flava.*
    Panicle narrow, contracted or spike-like, the branches appressed. 2. *T. Drummondii.*
  Lateral nerves of the lemma disappearing at the margin, not excurrent: lemma about 2 mm. long. 3. *T. eragrostoides.*
Pedicels less than 1 mm. long.
  Panicle open. 4. *T. Elliottii.*
  Panicle dense, elongate. 5. *T. stricta.*

1. T. flava (L.) A. Hitchc. Stem 100–200 cm. tall, very smooth, viscid along the upper part and in the panicles: panicle 20–45 cm. long, the branches spreading or drooping (smaller, the branches stiffly ascending in *T. flava Chapmani.* Fla. to Mex., Mo., and S. C.): spikelets purple, rarely pale, 7–8 mm. long, 5–8-flowered: lemmas 3–4 mm. long, minutely emarginate, the nerves pubescent below, excurrent. [*Triodia cuprea* Jacq. *Tridens seslerioides* Nash]—(TALL RED-TOP.)—Dry fields, open woods, roadsides, and waste-places, various provinces, Fla. to Tex., Nebr. and N. H.

2. T. Drummondii Scribn. & Kearn. Stem 100–150 cm. tall: panicle 15–20 cm. long, the branches appressed naked below: spikelets rather loosely few-flowered: glumes about 5 mm. long: lemmas about 5 mm. long, minutely cleft, pilose on the lower half of the nerves, all the nerves excurrent as mucros.—Pinelands and open grounds, Coastal Plain, Fla. to La. and S. C.

3. T. eragrostoides Vasey & Scribn. Stems tufted, slender, 60–100 cm. tall: panicle as much as 40 cm. long, the branches distant, spreading or drooping, as much as 15 cm. long: spikelets oblong: lemmas emarginate, the nerves minutely pilose below, the midnerve excurrent. [*Tridens eragrostoides* Nash]—Dry grounds, Coastal Plain, S Fla. and Tex.—(*W. I., Mex.*)

4. T. Elliottii Bush. Stem 60–120 cm. tall: panicle 10–20 cm. long, the branches ascending: spikelets along the main branches of the panicle: lemmas 4–5 mm. long, prominently villous on the lower half of the nerves, emarginate, obtuse, all the nerves slightly excurrent. [*Tridens Langloisii* Nash *T. ambiguus* Schult. *Triodia ambigua* Vasey]—Low pinelands, Coastal Plain, Fla. to Tex. and S. C.

5. T. stricta (Nutt.) Benth. Stem strict, rather stout, 1–1.5 m. tall: leaf-blades elongate, flat or loosely involute, 3–8 mm. wide: panicle dense, more or less interrupted below, narrowed above, 10–20 cm. long: spikelets 4–6-flowered, about 5 mm. long.—Low moist ground and low woods, various provinces, Ala. to Tex., Kan., and Mo.

84. **TRIPLASIS** Beauv. Slender tutted annuals or perennials, with short blades, short open few-flowered purple panicles, narrow cleistogamous panicles in the swollen leaf-sheaths, those in the lower leaves reduced to single 1-flowered

spikelets. Spikelets few-flowered, the florets remote, the rachilla slender, disarticulating above the glumes and between the florets; glumes subequal, 1-nerved, acute; lemmas narrow, 3-nerved, 2-lobed, the nerves parallel, villous, the lateral pair near the margin, the midnerve excurrent as an awn as long as the lobes or longer: palea shorter than the lemma, the keels densely long-ciliate on the upper half.—Three species, natives of the United States.—SAND-GRASSES.

Lobes of lemma subulate-pointed: awn longer than the body: perennial. 1. *T. americana.*
Lobes of lemma not subulate-pointed: annuals.
  Awn about 3 mm. long: lobes of lemma narrow. 2. *T. intermedia.*
  Awn scarcely exceeding the rounded, broad, lobes of lemma. 3. *T. purpurea.*

1. T. americana Beauv. Stem spreading, 30–70 cm. tall: panicle 2–5 cm. long, the branches bearing usually only 1–3 spikelets about 1 cm. long: glumes about 5 mm. long, narrow, acuminate: lemmas cleft to the middle or below, about 5 mm. long, the flat awn densely pubescent below, scabrous above.—Sandy soil, pinelands and sandy ridges, Coastal Plain, Fla. to Miss. and N. C.

2. T. intermedia Nash. Stem decumbent-spreading, 30–60 cm. long: panicle as in *T. americana:* lemmas about 4 mm. long, the lobes about 1 mm. long, acute but not subulate, the awn exceeding the lobes.—Sandy soil, Fla. to Tex. and S. C.

3. T. purpurea (Walt.) Chapm. Stem spreading or ascending, 30–80 cm. long: panicle 3–7 cm. long, the few stiff branches finally divergent: spikelets 5–8 mm. long: lemmas about 3 mm. long, cleft at the summit, the obtuse lobes less than 1 mm. long. [*T. sparsiflora* Chapm.]—(SAND-GRASS.)—Sandy soil, Coastal Plain and New England Coast, Fla. to Tex. and N. H., and Great Lake Lowland, Minn. to Mich.

85. ERAGROSTIS Beauv. Annuals or perennials of various habit, the inflorescence an open or contracted panicle. Spikelets few-many-flowered, the florets usually closely imbricate, the rachilla disarticulating above the glumes and between the florets, or continuous, the lemmas deciduous, the paleas persistent; glumes somewhat unequal, shorter than the first lemma, acute or acuminate, 1-nerved, or the second rarely 3-nerved: lemmas acute or acuminate, keeled or rounded on the back, 3-nerved, the nerves usually prominent; keels of the palea sometimes ciliate.—One hundred species, in temperate and tropical regions generally.—LOVE-GRASSES. SKUNK-GRASSES. MEADOW-GRASSES.

Plant perennial.
  Spikelets 2.5–4 mm. wide.
    Panicle narrow: florets sharp-pointed. I. SECUNDIFLORAE.
    Panicle wide, open: florets acute or acuminate but not sharp-pointed. II. REFRACTAE.
  Spikelets 1.5 mm. wide. III. BAHIENSES.
Plant annual.
  Stem low, stoloniferous and creeping. IV. HYPNOIDES.
  Stem erect, or decumbent at base, but not stoloniferous.
    Palea conspicuously ciliate: panicle narrow. V. CILIARES.
    Palea not conspicuously ciliate.
      Spikelets nearly sessile, mostly more than 20-flowered, somewhat clustered along the main axis or along the short spreading branches. VI. SIMPLICES.

Spikelets pedicelled, few–many-flowered, not clustered.
Panicle contracted, the numerous branches appressed: spikelets minute, tawny or stramineous. VII. GLOMERATAE.
Panicle open, the branches spreading. VIII. PILOSAE.

I. SECUNDIFLORAE

Plant more or less tufted, the stem with a very short branching base, the spikelets in contracted or open panicles. 1. *E. secundiflora.*

II. REFRACTAE

Panicle conspicuously purple, many-flowered, closely flowered toward the usually included base. 2. *E. spectabilis.*
Panicle plumbeous, tawny or brownish (sometimes purplish in *E. hirsuta*), rather loosely few-flowered in proportion to size.
Branches, branchlets, and pedicels capillary, stiff, fragile, not flexuous: spikelets usually more than 10-flowered, distinctly flattened.
Lateral spikelets short-pedicelled, appressed: axils of panicle-branches bearded. 3. *E. refracta.*
Lateral spikelets on slender spreading pedicels: axils usually not bearded. 4. *E. Elliottii.*
Branches, branchlets, and pedicels flexuous: spikelets flat or turgid, less than 10-flowered.
Leaf-blades strongly papillose-villous. 5. *E. trichocolea.*
Leaf-blades not villous.
Stems mostly less than 50 cm. tall: sheaths glabrous, except on margins: blades folded or involute, short. 6. *E. lugens.*
Stems mostly more than 50 cm. tall: sheaths hirsute: blades flat, elongate. 7. *E. hirsuta.*

III. BAHIENSES

Plant with a stout tufted base, narrow erect leaves, and numerous spikelets in a narrow panicle. 8. *E. bahiensis.*

IV. HYPNOIDES

Plant extensively branching and creeping, forming a carpet, the spikelets borne in numerous open or compact small panicles. 9. *E. hypnoides.*

V. CILIARES

Lemmas 1 mm. long: hairs on palea 0.5 mm. long. 10. *E. ciliaris.*
Lemmas 0.7 mm. long: hairs on palea 0.2–0.3 mm. long. 11. *E. amabilis.*

VI. SIMPLICES

Plant low, in dense tufts, very leafy at the base, the short panicle-branches spreading or reflexed, the spikelets relatively large. 12. *E. simplex.*

VII. GLOMERATAE

Plant tall, more or less branched at the base, with flat leaf-blades and plume-like panicles with numerous minute spikelets. 13. *E. glomerata.*

VIII. PILOSAE

Spikelets mostly not over 5-flowered.
Plant erect, branched from the base: panicle diffuse, pale or green: pedicels mostly over 5 mm. long. 14. *E. capillaris.*
Plant decumbent or spreading, branched above the base: panicle oblong, the branchlets rather crowded, usually purple: pedicels usually less than 5 mm. long. 15. *E. Frankii.*
Spikelets mostly more than 5-flowered.
Spikelets ovate to oblong, many-flowered, more than 3 mm. wide, the florets closely imbricate.
Florets nearly horizontal, not glandular. 16. *E. unioloides.*
Florets ascending: lemmas glandular on the keel. 17. *E. cilianensis.*
Spikelets oblong or linear, not over 2 mm. wide, the florets relatively distant.
Spikelets 1 mm. wide: branches of panicle more or less flexuous. 18. *E. pilosa.*
Spikelets 1.5 mm. wide or more: axils of panicle-branches usually not pilose.

Spikelets appressed along the spreading branchlets, 1.5 mm. wide.	19. *E. pectinacea.*
Spikelets not appressed; pedicels spreading or ascending.	
Margins of leaf-blades and sometimes other portions of the plant beset with glandular depressions.	20. *E. Eragrostis.*
Margins of leaf-blades not glandular.	
Lemmas 1.5 mm. long; stems 10 to 20 cm. tall, spreading or decumbent at base.	21. *E. teprosanthos.*
Lemmas about 2 mm. long; stems 30 to 50 cm. long, erect.	22. *E. limbata.*

1. **E. secundiflora** Presl. Stem as much as 80 cm. tall: panicle purplish, 5–15 cm. long, the short branches ascending or appressed: spikelets oblong, many-flowered: lemmas 3–5 mm. long, pointed. [*E. oxylepis* Torr.]—Sandy soil, mostly on plains, various provinces, Ala. to S Calif. and Kan.—(*Mex.*)

2. **E. spectabilis** (Pursh.) Steud. Plants in dense stiff clumps: stem erect or ascending, 30–80 cm. tall: leaf-sheaths glabrous or pilose, densely pilose at the throat: panicle usually more than half the entire height of stem, the branches pilose in the axils, the whole finally breaking away as a tumble-weed: spikelets 5–15 flowered.—Open sandy places, old fields, and roadsides, various provinces, Fla. to Tex., Ariz., Minn., and Me.—(*Mex.*)

3. **E. refracta** (Muhl.) Scribn. Stem erect, 30–90 cm. tall: leaf-sheaths glabrous, sparingly villous at the throat: blades 2–4 mm. wide: panicle 20–50 cm. long, the branches remote: spikelets 6–25-flowered, 6–12 mm. long: lemmas acuminate. [*E. campestris refracta* Chapm. *E. campestris* Trin.]—Sandy ground, low pinelands, river-banks, and swamps, Coastal Plain, Fla. to Tex. and Del.

4. **E. Elliottii** S. Wats. Resembles *E. refracta*: spikelets linear, as much as 2 cm. long, the pedicel 5–15 mm. long.—Sandy pinelands, and prairies, Coastal Plain, Fla. to Tex. and N. C.—(*W. I., Mex.*)—**E. acuta** A. Hitchc. differs in the spikelets which are 8–12 mm. long, and the acuminate lemmas 3 mm. long.—S pen. Fla.

5. **E. trichocolea** Hack. & Arech. Stem erect or geniculate at base, 20–40 cm. tall: leaves villous, or the sheath glabrate, the blades 2–3 mm. wide: panicle comprising one-third to one-half the length of the plant, nearly as broad as long, the branches stiffly spreading, pilose in the axils: spikelets 3–5 mm. long, 3–6-flowered: lemmas about 2 mm. long. [*E. floridana* A. Hitchc. *E. lugens* (Fl. SE. U. S.)]—Pinelands, pen. Fla.—(*S. A.*)

6. **E. lugens** Nees. Stem erect, 30–70 cm. tall: leaf-sheaths glabrous or sparsely pilose, prominently pilose at the throat: blades flat or loosely involute: panicle one-third to half the entire height of the plant, the branches rather stiffly spreading or ascending: spikelets oblong, 3–6 mm. long, 3–7-flowered, the pedicels as long as the spikelet or longer, flexuous: glumes acute, about 1.5 mm. long: lemmas 2 mm. long.—Dry grounds, La. to Calif. Nat. in Coastal Plain of Ga. and Ala.—(*Mex., C. A., S. A.*)

7. **E. hirsuta** (Michx.) Nees. Stem erect, 60–120 cm. tall: panicle diffuse, as much as 80 cm. long, the branches finally widely spreading, as much as 25 cm. long, sparingly pilose in the axils: lemmas about 2 mm. long.—Dry fields and open woods, Coastal Plain, Fla. to Tex., Mo., and S Va.

8. E. bahiensis Steud. Stem ascending, 30–50 cm. tall: panicle 7–12 cm. long, the branches as much as 5 cm. long, appressed: spikelets linear, 1 cm. long, many-flowered: lemmas about 2 mm. long, acute.—On ballast, Pensacola, Fla., and Mobile, Ala., and in La. Nat. of S. A.

9. E. hypnoides (Lam.) B. S. P. Stem much-branched, prostrate-spreading, rooting at the nodes, the flower-bearing branches erect or ascending, 5–12 cm. tall: leaf-blades 1–4 cm. long: panicle nearly simple, rather compact, usually not over 5 cm. long: spikelets pale, linear, 10–35-flowered, 5–15 mm. long: lemmas acuminate, keeled.—Moist sandy places, river-banks, ponds, lakes, and wet sandy slopes, various provinces, Fla. to Tex., N. D., and Vt.; Wash. to Calif.—(*W. I., Mex., C. A., S. A.*)

10. E. ciliaris (L.) Link. Stem erect or spreading, as much as 50 cm. tall: panicle as much as 15 cm. long, compact and spikelike or sometimes rather open: spikelets 5–15-flowered, 3–4 mm. long.—Sandy roadsides and waste-places, Coastal Plain, Fla. to Tex. and N. J.—(*W. I., Mex., C. A., S. A.*)

11. E. amabilis (L.) Wight & Arn. Stem erect or spreading, as much as 40 cm. tall: panicle as much as 10 cm. long: spikelets 4–8-flowered, 1–2 mm long. [*E. plumosa* Link]—Waste-places, cult. grounds, and roadsides, Fla., Tex. and Ga.—(*W. I., Mex., C. A., S. A.*)

12. E. simplex Scribn. Stem erect or spreading, as much as 50 cm. tall: panicle narrow, with a few distant branches, the lower finally reflexed: spikelets linear: lemmas 1.5 mm. long.—Waste-places, roadsides, and fields, Coastal Plain, Fla. and Ga.

13. E. glomerata (Walt.) L. H. Dewey. Stem erect, 25–80 cm. tall: panicle pale, as much as 50 cm. long, the slender crowded branches as much as 10 cm. long: spikelets 5–10-flowered: lemmas about 1 mm. long, hyaline, the caryopsis visible through them. [*E. conferta* Trin.]—Damp places, sloughs, and ponds, Coastal Plain, Fla. to Tex. and S. C.—(*W. I., Mex., C. A., S. A.*)

14. E. capillaris (L.) Nees. Stem slender, erect, 15–60 cm. tall or more: panicle more than half the entire height of the plant, oblong-ovoid, the capillary branches spreading: spikelets 2–3 mm. long, on long divergent pedicels: lemmas about 1.5 mm. long.—(LACE-GRASS.)—Dry sandy soil, fields, woods, river-banks, and prairies, various provinces, Ga. to Tex., Ia., and Me.

15. E. Frankii (Fisch. Mey. & Lall.) Steud. Stem 15–40 cm. tall: leaf-sheaths glabrous: panicle less than half the entire height of plant, the short branches spreading: spikelets 2–3 mm. long on mostly appressed pedicels: lemmas scarcely over 1 mm. long.—Low ground, woods, river-banks, fields, and barrens, various provinces, Fla. to Miss., Minn., and N. H.

16. E. unioloides (Retz.) Nees. Stem 30–50 cm. tall: panicle oblong, 5–15 cm. long: spikelets 5–10 mm. long, 3–4 mm. wide: florets 2 mm. long, falling entire from the continuous rachilla.—Roadsides, Coastal Plain, N Fla. and Ga. Nat. of Asia.

17. E. cilianensis (All.) Link. Stem erect or spreading, 20–80 cm. tall: panicle greenish or plumbeous, 5–15 cm. long, rather densely flowered: spikelets 5–15 mm. long, 10–40-flowered: lemmas about 2.5 mm. long, the lateral nerves prominent. [*E. major* Host. *E. megastachya* Link]—Waste places, fields, and roadsides, U. S. and SE Can. Nat. of Eu.—(*W. I., Mex., C. A., S. A.*)

18. E. pilosa (L.) Beauv. Stem erect or spreading, 20–60 cm. tall: panicle oblong-elliptic, 5–20 cm. long, the lower branches usually verticillate, pilose in the axils: spikelets linear, mostly 4–6 mm. long, 5–10-flowered: first glume 0.5

mm. long, the second 1 mm. long: lemmas about 1.3 mm. long, 0.3 mm. wide: caryopsis 0.5–0.7 mm. long.—Waste-places and roadsides, various provinces, Fla. to Tex. and Me. Nat. of Eu.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)

19. **E. pectinacea** (Michx.) Nees. Resembles *E. pilosa*: axils of panicle-branches glabrous or the lower sparingly pilose: spikelets 1.5 mm. wide: first glume 1 mm. long, the second 1.5 mm. long: lemma 1.7 mm. long, 0.5 mm. wide, the lateral nerves more prominent: caryopsis 1 mm. long, light brown, faintly alveolate. [*E. Purshii* Schrad.]—Fields, waste-places, and moist open grounds, various provinces, Fla. to Tex., Calif., Wash., and Me.—(*Mex.*)

20. **E. Eragrostis** (L.) Beauv. Resembles *E. cilianensis*: stem mostly decumbent at base, 10–30 cm. tall: panicle mostly less than 10 cm. long, rather compactly flowered, the branches and pedicels divergent: spikelets about 2 mm. wide. [*E. minor* Host.]—Waste-places, infrequent in widely separated localities throughout U. S. Nat. of Eu.—(*W. I.*)

21. **E. tephrosanthos** Schult. Stem spreading or decumbent at base, usually lax, as much as 30 cm. long: panicle mostly less than 10 cm. long, the branches ascending or spreading, the lower mostly less than 4 cm. long.—Waste-places, Coastal Plain, Fla. to Tex.—(*W. I.*, *C. A.*, *S. A.*)

22. **E. limbata** Fourn. Stem mostly erect, 30–50 cm. tall: panicle erect, open, 10–30 cm. long, the branches, branchlets, and pedicels ascending, flexuous, glabrous in the axils, the pedicels mostly 2–3 times as long as the spikelets.—Open moist ground, Sanibel Island, Fla.; various provinces, W Tex. to S Calif. (*Mex.*, *C. A.*, *S. A.*)

86. **MELICA** L. Rather tall perennials, with closed sheaths, flat blades, narrow or sometimes open, usually simple panicles. Spikelets 2- to several-flowered, the rachilla disarticulating above the glumes and between the florets, prolonged beyond the perfect florets and bearing at the apex 2 or 3 gradually smaller empty lemmas, convolute together or the upper enclosed in the lower: glumes somewhat unequal, thin, often papery, scarious-margined, obtuse or acute, sometimes nearly as long as the lower floret, 3- to 5-nerved, the nerves usually prominent: lemmas convex, several-nerved, membranaceous or rather firm, scarious-margined, sometimes conspicuously so, awnless in ours.—Sixty species, in the cooler parts of both hemispheres.—MELIC-GRASSES. HONEY-GRASSES.

1. **M. mutica** Walt. Stem as much as 1 m. tall: leaf-sheaths scabrous: blades 2–10 mm. wide: panicle 10–25 cm. long, few-flowered: spikelets 7–10 mm. long, nodding.—Dry woods, river-banks, and pond-borders, various provinces, rarely Coastal Plain, Fla. to Tex., Ia. and Md.

87. **DIARINA** Raf. Slender perennials with rootstocks, broadly linear, flat blades, long-tapering below, and narrow, few-flowered panicles. Spikelets few-flowered, the rachilla disarticulating above the glumes and between the

florets; glumes unequal, acute, shorter than the lemmas, the first 1-nerved, the second 3- to 5-nerved; lemmas chartaceous, pointed, 3-nerved, the nerves converging in the point, the upper floret reduced; palea chartaceous, obtuse, at maturity the lemma and palea widely spread by the large turgid beaked caryopsis with hard shining pericarp.—Two species, the following, and one in Asia.

1. D. festucoides Raf. Stem erect, 60–100 cm. tall: leaves nearly as long as the stem, 1–2 cm. wide: panicle nearly simple, 10–25 cm. long: spikelets 10–15 mm. long, the pedicels short. [*Diarrhena americana* Beauv. *Korycarpus. diandrus* Kuntze]—Rich woods, Interior Low Plateaus and Central Lowland, Tenn. to Tex., S. D., and Ohio.

88. UNIOLA L. Rather tall erect perennials with flat or sometimes involute blades and narrow or open panicles of compressed sometimes very broad flat spikelets. Spikelets 3- to many-flowered, the lower 1 to 4 lemmas empty, the rachilla disarticulating above the glumes and between the florets; glumes compressed-keeled, rigid, usually narrow, nerved, acute or acuminate, or rarely mucronate; lemmas compressed, sometimes conspicuously flattened, chartaceous, many-nerved, the nerves sometimes obscure, usually acute or acuminate, the empty ones at the base usually successively smaller, the uppermost reduced; palea rigid, sometimes bowed-out on the winged keels.—Nine species, North American.—SPIKE-GRASSES. SPANGLE-GRASSES.

Panicle drooping.
  Leaf-blades broad, flat. I. LATIFOLIAE.
  Leaf-blades narrow, involute. II. PANICULATAE.
Panicle erect, contracted or somewhat open. III. LAXAE.

I. LATIFOLIAE

Slender wood-grass with flat blades and very flat many-flowered green spikelets. 1. *U. latifolia.*

II. PANICULATAE

Stout dune-grass with a heavy rather dense panicle and many-flowered stramineous spikelets. 2. *U. paniculata.*

III. LAXAE

Spikelets not over 7 mm. wide: leaf-blades and panicles elongate.
  Collar and usually sheaths densely pubescent. 3. *U. longifolia.*
  Collar and sheaths glabrous. 4. *U. laxa.*
Spikelets 1 cm. or more wide: leaf-blades not elongate.
  Panicle not over 10 cm. long: spikelets crowded. 5. *U. ornithorhyncha.*
  Panicle usually 10–20 cm. long: spikelets not crowded. 6. *U. nitida.*

1. U. latifolia Michx. Stem 60–150 cm. tall, leaf-blades commonly 15 mm. wide: panicle 10–25 cm. long, drooping, the slender branches bearing a few broad flat spikelets as much as 3 cm. long: lemmas 9–12 mm. long.—Shaded slopes and stream-banks, various provinces, Fla. to Tex., Kans., and Mass.

2. U. paniculata L. Stems in dense clumps, stout, 100–150 cm. tall: leaf-blades involute in drying, firm: panicle 20–30 cm. long: spikelets 1–2 cm. long, 8–15-flowered: lemmas 8–10 mm. long.—(SEA-OAT. BEACH-GRASS.)—Beach sands and dunes, Coastal Plain, Fla. to Tex. and Va.—(*W. I., Mex., C. A., S. A.*)

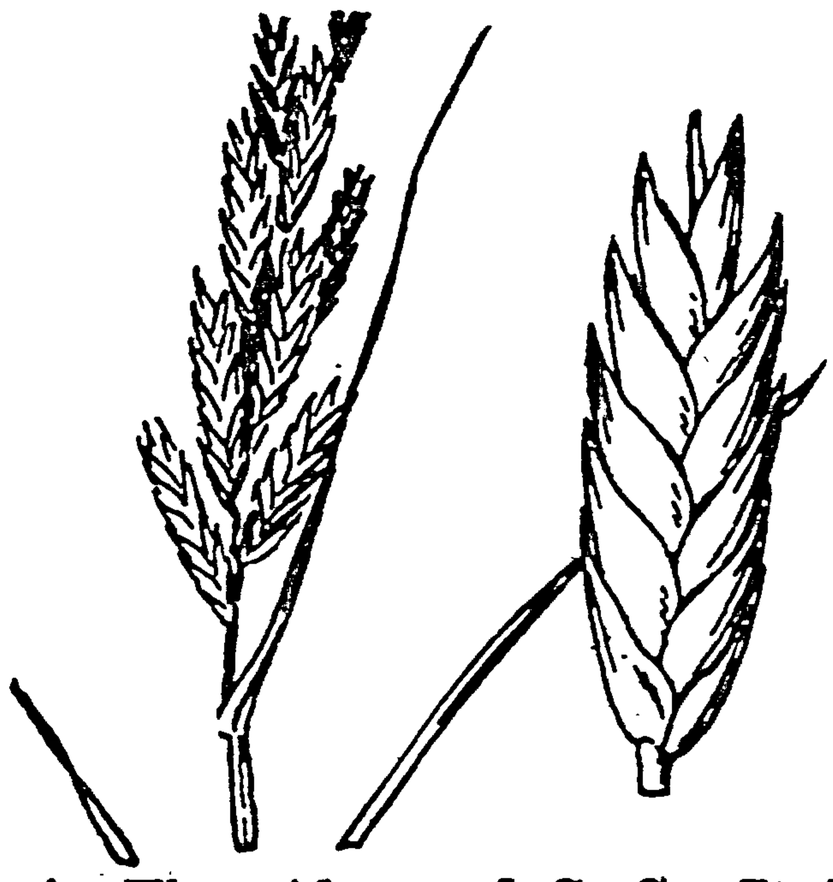
3. U. longifolia Scribn. Stems in clumps, 80–120 cm. tall: leaf-blades flat, 6–12 mm. wide: panicle 20–40 cm. long, the branches mostly distant, short and appressed, or the lower ascending: spikelets 3–4-flowered, 6 mm. long: lemmas 5 mm. long.—Dry sandy soil, woods, pinelands, and hammocks, Coastal Plain and adj. provinces, Fla. to Tex., Okla., and Va.

4. U. laxa (L.) B. S. P. Stem 60–120 cm. tall: leaf-blades 3–7 mm. wide: panicle 15–40 cm. long, the slender branches erect: spikelets 3–6-flowered, 5–7 mm. long. [*U. gracilis* Michx.]—Sandy soil, woods, swamps, low meadows and hammocks, Coastal Plain and occasionally adj. provinces, Fla. to Tex., Okla., and Long Id., N. Y. Plants in clumps.

5. U. ornithoryncha Steud. Stem 100–150 cm. tall, slender, from short slender rootstocks: leaf-blades 4–7 mm. wide, rarely over 15 cm. long: panicle 4–8 cm. long: spikelets 8–10 mm. long.—Low woods, Coastal Plain, Ala. to La.

6. U. nitida Baldw. Stem 50–150 cm. tall, from a slender rootstock: panicle 10–15 cm. long, the branches spreading or ascending: spikelets 1–1.5 cm. long.—Low woods and stream-banks, Coastal Plain, Fla. and S. C.

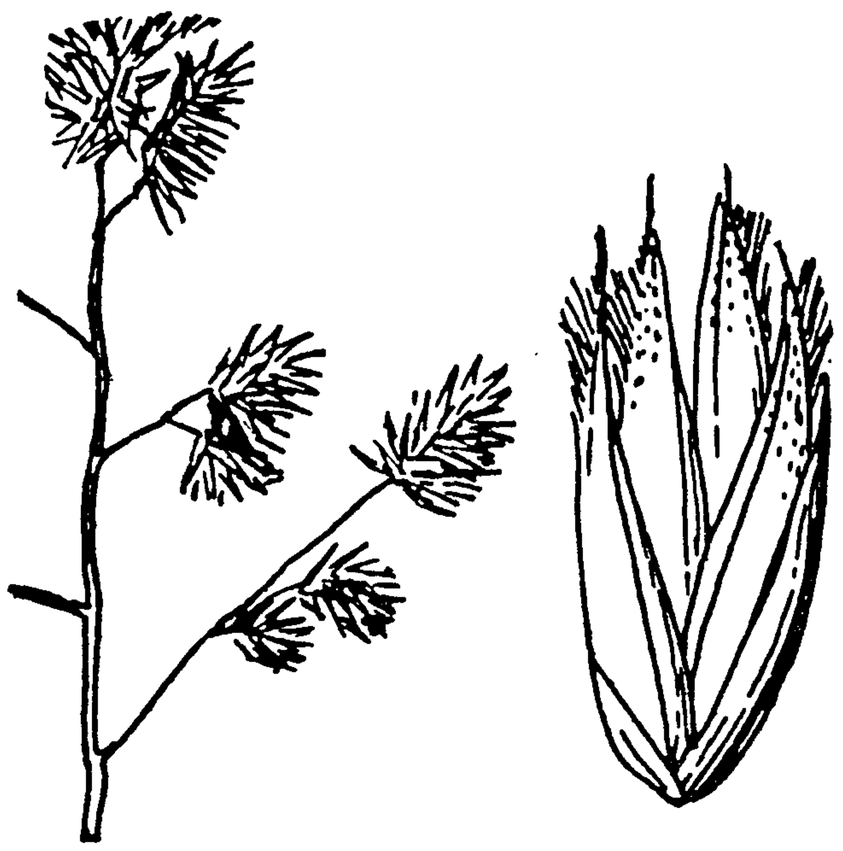
89. DISTICHLIS Raf. Low dioecious perennials with extensively creeping scaly rootstocks, erect, rather rigid stems, and short dense rather few-flowered panicles: spikelets several- to many-flowered, the rachilla of the pistillate spikelets disarticulating above the glumes and between the florets; glumes unequal, broad, acute, keeled, mostly 3-nerved, the lateral nerves sometimes faint: lemmas closely imbricate, firm, the pistillate coriaceous, the margins bowed out near base, acute or acutish, 3-nerved, with several intermediate nerves or striations: palea as long as the lemma or shorter, the pistillate coriaceous.—Six species, mostly American.—SALT-GRASSES. SPIKE-GRASSES. ALKALI-GRASSES.



1. D. spicata (L.) Greene. Stem erect, 15–60 cm. tall: leaf-sheaths overlapping, the blades usually conspicuously distichous, rigidly ascending: panicle 2–6 cm. long: spikelets 8–18 mm. long. [*D. maritima* Raf.]—(MARSH SPIKE-GRASS.)—Salt-marshes along the coast, and alkaline soil in the interior, nearly throughout U. S.—(*W. I., Mex., C. A., S. A.*)—*Briza minor* L. has been introd. in Fla., Ala., and S. C. It is

an annual, with erect pyramidal panicles, triangular several-flowered spikelets, 3 mm. long, on curved pedicels; also Va., Ark., Cal., Ore.—Nat. of Eu.

90. **DACTYLIS** L. An erect perennial with flat blades. Spikelets few-flowered, compressed, finally disarticulating above the glumes and between the florets, nearly sessile in dense 1-sided fascicles, these borne at the ends of the few panicle-branches: glumes unequal, carinate, acute, hispid-ciliate on the keel; lemmas compressed-keeled, mucronate, 5-nerved, ciliate on the keel.—Two species, native of Eurasia.



1. **D. glomerata** L. Stems in large often coarse tufts, 60–120 cm. tall: leaf-sheaths scabrous: panicle 8–15 cm. long, the few stiff branches widely spreading in anthesis, erect in fruit.—(ORCHARD-GRASS.)—Waste-places, fields, and orchards, ranging from the Piedmont of Ala. northward throughout the cooler parts of the U. S. Nat. of Eu.

91. **POA** L. Annuals or usually perennials, low or rather tall, with spikelets in open or contracted panicles, the narrow linear blades ending in a navicular point. Spikelets 2- several-flowered, the rachilla disarticulating above the glumes and between the florets, the uppermost floret reduced or rudimentary; glumes acute, keeled, somewhat unequal, the first 1-nerved, the second usually 3-nerved: lemmas somewhat keeled, acute or acutish, awnless, membranaceous, often somewhat scarious at the tip, 5-nerved, the nerves somewhat pubescent.—Two hundred species, in cool and temperate regions generally.—BLUE-GRASSES. SPEAR-GRASSES.

Plant annual, low, usually less than 25 cm. tall.	I. ANNUAE.
Plant perennial, taller.	
Creeping rootstock present.	II. PRATENSES.
Creeping rootstock wanting.	III. TRIVIALES.

I. ANNUAE

Florets with cottony hairs at base: lemmas distinctly 3-nerved, the intermediate nerves obscure.	1. *P. Chapmaniana.*
Florets not cottony at base: lemmas 5-nerved, the intermediate nerves distinct.	2. *P. annua.*

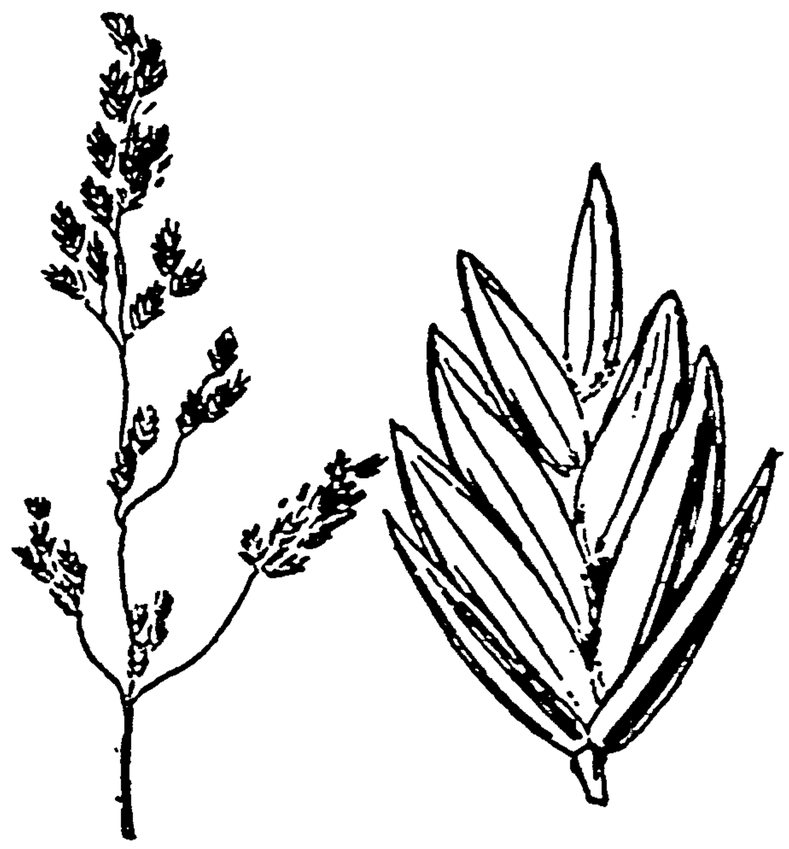
II. PRATENSES

Stem distinctly flattened, wiry: plant blue green.	3. *P. compressa.*
Stem terete or nearly so.	
Plant dioecious: panicle silvery.	4. *P. arachnifera.*
Plant with perfect spikelets: panicle not silvery.	
Leaves about as long as the stem; panicle few-flowered, the slender branches spikelet-bearing near the ends.	5. *P. cuspidata.*
Leaves shorter than the stems: panicles pyramidal, the spikelets rather crowded.	6. *P. pratensis.*

III. TRIVIALES

Leaf-sheaths scabrous: panicle pale.	7. *P. trivialis.*
Leaf-sheaths smooth.	
Lemmas not cottony at the base, pubescent below between the nerves.	8. *P. autumnalis.*
Lemmas cottony at the base.	
Panicle-branches spikelet-bearing from about the middle.	9. *P. sylvestris.*
Panicle-branches bearing a few spikelets near the ends.	
Marginal nerves glabrous.	10. *P. alsodes.*
Marginal nerves pubescent.	11. *P. Wolfii.*

1. **P. Chapmaniana** Scribn. Plants yellowish-green: stem mostly erect: nerves of lemma pubescent. [*P. cristata* (Chapm. Fl.)]—Dry open grounds, prairies and roadsides, Coastal Plain and adj. provinces, Fla. to Tex., Ia., and Ind.



2. **P. annua** L. Plants bright glossy-green: stem usually spreading: panicle pyramidal, 3–8 cm. long: spikelets 3–6-flowered, about 4 mm. long: nerves of lemma pubescent below.—(SIX WEEK'S GRASS. LOW SPEAR-GRASS.)—Open grounds, throughout N. A. Nat. of Eu.—(*W. I., Mex., C. A., S. A.*)

3. **P. compressa** L. Stem wiry, 20–60 cm. tall, geniculate at base: panicle narrow, 2–8 cm. long: spikelets crowded, 4–6 mm. long, 3–6-flowered; lemmas obscurely nerved, sparingly cottony at base, the nerves pubescent below.—(CANADA BLUE-GRASS.)—Dry sterile soils, from Ga. and Okla. northward, nearly throughout N. A. Nat. of Eu.—(*W. I.*)

4. **P. arachnifera** Torr. Stem 30–80 cm. tall: panicle 5–15 cm. long: spikelets several-flowered: lemmas 4–5 mm. long, the pistillate woolly on the nerves and copiously cottony at base.—[*P. glabrescens* Nash, the staminate form.]—Dry grounds, pinelands, prairies, and cult. grounds, Coastal Plain, Tex. and Okla. Naturalized from Fla. to Miss. and S. C.

5. **P. cuspidata** Nutt. Stem 30–50 cm. tall: panicle 7–12 cm. long: spikelets 3–4-flowered: lemmas cottony at base, the nerves sparingly pubescent below, sometimes the lemma villous all over. [*P. brachyphylla* Schult. *P. brevifolia* Muhl.]—Rocky woods and stream-banks, various provinces N of Coastal Plain, Ga. to Ky. and N. J.

6. **P. pratensis** L. Stem up to 100 cm. tall: panicle pyramidal, 5–20 cm. long: spikelets 4–5 mm. long, 3–5-flowered: lemmas 3 mm. long, cottony at base, the nerves pubescent.—(KENTUCKY BLUE-GRASS. JUNE-GRASS.)—Open grounds and woods, nearly throughout N. A. (*Eurasia.*)—(*W. I.*)

7. **P. trivialis** L. Stem erect from a decumbent base, up to 100 cm. long, scabrous below the panicle: panicle 6–15 cm. long: spikelets 2–3-flowered, 3 mm. long: lemma strongly nerved, cottony at base, pubescent on keel only.—(ROUGH-STALKED MEADOW GRASS.)—Moist meadows, various provinces N of Coastal Plain, La. to S. D., Va., and Que. Nat. of Eu.

8. **P. autumnalis** Muhl. Stem 30–100 cm. tall: leaf-blades 2–3 mm. wide: panicle 8–20 cm. long: spikelets 4–6-flowered, about 6 mm. long. [*P. flexuosa* Muhl.]—Woods and swamps, various provinces, Fla. to Tex., Ill., and N. J.

9. **P. sylvestris** A. Gray. Stem 30–100 cm. tall: panicle 10–20 cm. long, rather narrow, the lower branches whorled, often reflexed: spikelets 2–4-flowered, 2.5–4 mm. long: lemmas 2.5 mm. long, pubescent on the keel: glumes widely spreading at maturity.—Rich woods and stream-banks, various provinces, N Fla. to Tex., Wis., and N. Y.

10. **P. alsodes** A. Gray. Stem 20–60 cm. tall: leaf-blades 2–5 mm. wide: panicle 10–20 cm. long, the branches in 3's or 4's: spikelets 2–3-flowered, about 5 mm. long: lemmas faintly nerved, villous on the keel below.—Wooded slopes, Blue Ridge and more northern provinces, N. C. and Tenn. to Minn. and Que.

11. P. Wolfii Scribn. Stem slender, 50–100 cm. tall: leaves mostly basal, the blades 1–2 mm. wide: panicle 8–15 cm. long: spikelets 2–4-flowered, 5–6 mm. long: lemmas strongly nerved, the keel and marginal nerves pubescent.—Woods, various provinces, Tenn. (?), Ill. to Minn.—Specimens from Tenn. seem to be lacking.

92. PANICULARIA Heister. Usually tall aquatic or marsh perennials, with flat blades, closed or partly closed sheaths, and open or contracted panicles. Spikelets few- to many-flowered, subterete or slightly compressed, the rachilla disarticulating above the glumes and between the florets; glumes unequal, short, obtuse or acute, usually scarious, mostly 1-nerved; lemmas broad, convex on the back, firm, usually obtuse, awnless, scarious at apex, 5- to 9-nerved, the nerves parallel, usually prominent. [*Glyceria* R. Br.]—Thirty-five species, in the temperate regions of both hemispheres.—MANNA-GRASSES. MEADOW-GRASSES. FOWL MEADOW-GRASSES.

Spikelets narrow, mostly linear, usually more than 1 cm. long. I. ACUTIFLORAE.
Spikelets ovoid or oblong, usually not over 0.5 cm. long. II. OBTUSAE.

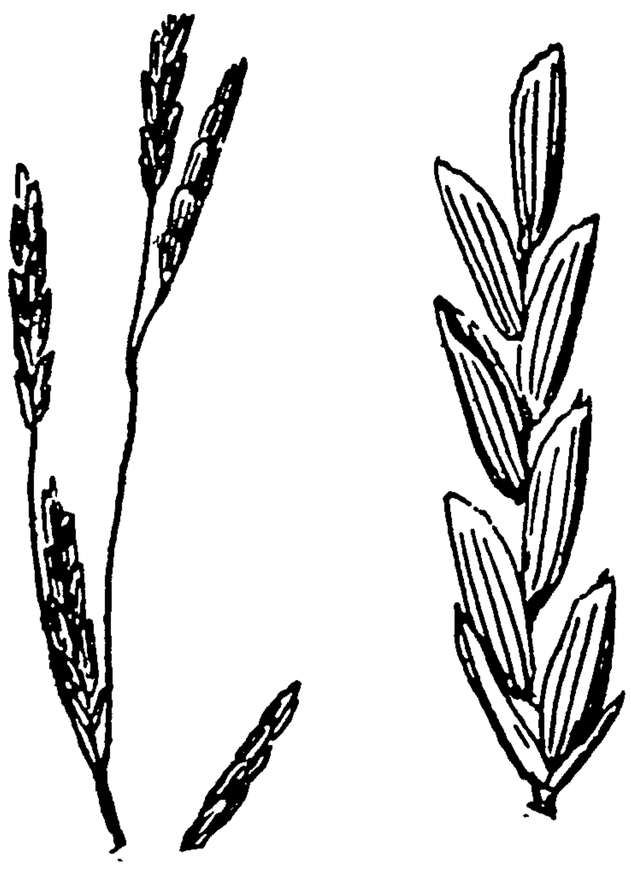
I. ACUTIFLORAE

Lemmas obtuse, about as long as the palea. 1. *P. septentrionalis.*
Lemmas acute, much exceeded by the palea. 2. *P. acutiflora.*

II. OBTUSAE

Panicle contracted, narrow.
  Lemmas about 3 mm. long: panicle oblong, dense, usually not over 10 cm. long. 3. *P. obtusa.*
  Lemmas about 2 mm. long: panicle linear, 15–30 cm. long, loose. 4. *P. melicaria.*
Panicle open, lax.
  Glumes short, rounded, the first about 1 mm. long or less: lemmas about 2 mm. long. 5. *P. striata.*
  Glumes oblong, the first 1.5–2 mm. long: lemmas about 3 mm. long.
    Spikelets elliptic, pointed, pale: plant weak or lax, usually creeping and rooting at the base: panicles usually not over 15 cm. long, few-flowered. 6. *P. pallida.*
    Spikelets oblong, purple: plant upright, stout: panicle many-flowered. 7. *P. grandis.*

1. P. septentrionalis (A. Hitchc.) Bicknell. Stem 1–1.5 m. tall: panicle 5–6 cm. long, the short branches ascending or spreading: spikelets 1.5–2 cm. long: lemmas 4–4.5 mm. long, faintly 7-nerved, scabrous on and between the nerves. [*P. fluitans* (Fl. SE. U. S.)]—(SWEET-GRASS. FLOTE-GRASS.)—Shallow water, various provinces, S. C. to Tex., Minn., and Mass.



2. P. acutiflora (Torr.) Kuntze. Stem weak, slender, as much as 100 cm. long: panicle nearly simple, 15–35 cm. long, the branches mostly appressed: spikelets 5–12-flowered, 2–4 cm. long: lemmas 6–8 mm. long, scabrous. [*G. acutiflora* Torr.]—Shallow water, various provinces, Tenn. to Ohio, Ind., and N. H.

3. P. obtusa (Muhl.) Kuntze. Stem stout, erect, 30–120 cm. tall: panicle 6–18 cm. long: spikelets 3–7-flowered, 5–6 mm. long. [*G. obtusa* Trin.]—Bogs and marshes, often in acid soil, Coastal Plain and adj. provinces, N. C. to N. B.

4. P. melicaria (Michx.) A. Hitchc. Stem erect from a creeping rootstock, 60–100 cm. tall: panicle nodding at the summit: spikelets appressed, 3–4-flowered, about 4 mm. long. [*P. elongata* Kuntze *G. elongata* Trin. *G. Torreyi* A. Hitchc.]—Wet woods, Blue Ridge and more northern provinces, N. C. and Tenn. to Minn. and Que.

5. P. striata (Lam.) A. Hitchc. Forming dense tussocks: stem erect, 30–100 cm. tall: leaf-blades elongate: panicle nodding, 10–20 cm. long, the branches drooping, naked below: spikelets 3–7-flowered, 3–4 mm. long: lemmas prominently 7-nerved. [*Poa striata* Lam. *G. nervata* Trin. *P. nervata* Kuntze *G. striata* A. Hitchc.]—Moist ground, various provinces, Fla. to Tex., Wash., Ont., and Newf.—(*Mex.*)

6. P. pallida (Torr.) Kuntze. Stem often reclining, up to 100 cm. long: spikelets loosely 4–9-flowered, 6–7 mm. long: lemmas 7-nerved, scabrous. [*G. pallida* Trin.]—Shallow water, various provinces, Tenn. to Mo. and N. S.—Plants resemble those of some species of *Poa*.

7. P. grandis (S. Wats.) Nash. Stem 100–150 cm. tall: leaf-blades 5–15 mm. wide: panicle 20–40 cm. long, loose and open: spikelets 4–7-flowered, 5–6 mm. long: lemmas 7-nerved. [*P. americana* MacM. *G. grandis* S. Wats.]—Wet places, various provinces, Tenn. to Alas., Ont., and N. B.

93. FESTUCA L. Low or rather tall annuals or perennials of various habit, the spikelets in narrow or open panicles. Spikelets few- to several-flowered, the rachilla disarticulating above the glumes and between the florets: glumes narrow, acute, unequal, the first sometimes very small: lemmas rounded on the back, membranaceous or somewhat indurate, 5-nerved, the nerves often obscure, acute or rarely obtuse, awned from the tip or rarely from a minutely bifid apex.—One hundred species, in temperate and cool regions.—FESCUE-GRASSES. FESCUES.

Plant annual: stamen usually 1. I. OCTOFLORAE.
Plant perennial: stamens 3.
  Leaf-blades very narrow, involute. II. RUBRAE.
  Leaf-blades flat. III. OBTUSAE.

I. OCTOFLORAE

Awn less than twice as long as the lemma: spikelets closely 5–13-flowered, glabrous or scabrous. 1. *F. octoflora.*
Awn more than twice as long as the lemma: spikelets loosely 4–6-flowered.
  Lemmas scabrous above: first glume less than half as long as the second. 2. *F. Myuros.*
  Lemmas pubescent: first glume ½–¾ as long as the second. 3. *F. sciurea.*

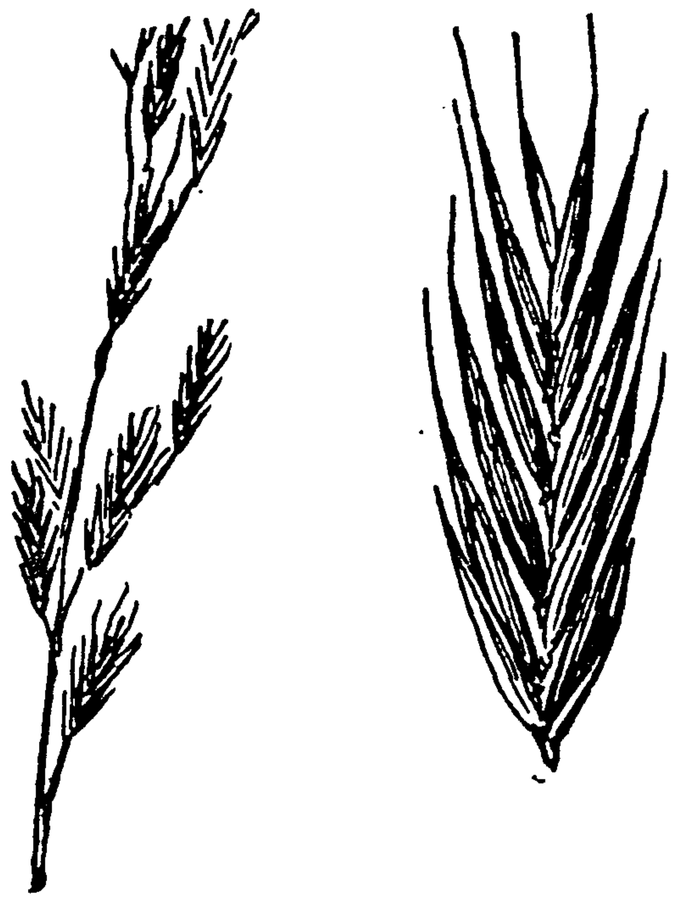
II. RUBRAE

Plant decumbent at base: stems solitary or clustered, the leaves often numerous: panicle with erect or appressed branches. 4. *F. rubra.*

III. OBTUSAE

Spikelets oblong to linear, about 1 cm. long: panicles narrow, the branches appressed at maturity. 5. *F. elatior.*
Spikelets ovate or oval, mostly less than 5 mm. long: panicles open, the branches spreading, naked below.
  Spikelets at the end of long slender branches of a very open panicle. 6. *F. obtusa.*
  Spikelets somewhat aggregate along the upper half of the short branches of the less open nodding panicle. 7. *F. Shortii.*

1. **F. octoflora** Walt. Stem erect, 5–40 cm. tall: panicle narrow, erect, 3–12 cm. long, often reduced to a raceme: spikelets 5–12 mm. long: lemmas 4–5 mm. long, the awn 1–7 mm. long. [*F. tenella* Willd. *F. parviflora* Ell.]—Dry sterile soil, various provinces, Fla. to Tex., Calif., B. C., and Que.—(*Mex.*)



2. **F. Myuros** L. Stem erect or decumbent at base, 20–60 cm. tall: panicle 7–20 cm. long, narrow: spikelets 8–11 mm. long: glumes very unequal, the first 1–1.5 mm. long.—Dry fields and waste-places, various provinces, Ga. to La. and Mass. Nat. of Eu.—(*W. I., Mex.*)

3. **F. sciurea** Nutt. Similar to *F. Myuros*: spikelets 4–5 mm. long: first glume 2 mm. long.—Sandy grounds, Coastal Plain and adj. provinces, Fla. to Tex., Okla., and Va.

4. **F. rubra** L. Stem solitary, sometimes a few stems together, 30–80 cm. tall: leaves glabrous: panicles 5–20 cm. long, usually contracted, the branches erect: spikelets 4-6-flowered, 7–8 mm. long: lemmas 5–7 mm. long, the awn usually about half as long.—Brackish meadows along the coast, N. C. to Lab.; on the Pacific Coast; also cult. and escaped, various provinces, Ga. to Tenn. and Md.—(*Eurasia.*)

4a. **F. ovina** L. and some of its allies are occasionally introduced with grass seed, but they do not appear to persist. They resemble *F. rubra* but are erect and closely tufted.—*F. ovina* L. (SHEEP'S FESCUE) has capillary short firm blades, the awn of the lemma 1 mm. or more long.—*F. capillata* Lam. has slender flexuous capillary blades, the lemmas awnless or nearly so.—*F. duriuscula* L. (HARD FESCUE) has firm blades about 1 mm. wide.

5. **F. elatior** L. Stem 50–120 cm. tall: leaf-blades 4–8 mm. wide: panicle 10–20 cm. long, the branches spreading in flower, appressed in fruit, spikelet-bearing nearly to base: spikelets 9–11 mm. long: lemmas acute, awnless, rarely short-awned.—Meadows and waste-places, from Ala. to La. northward nearly throughout U. S. and S Can. Cult. as meadow grass. Nat. of Eu.

6. **F. obtusa** Spreng. Stem solitary or few, 40–120 cm. tall: panicle diffuse, drooping, 10–20 cm. long, the branches loosely spikelet-bearing near the ends: spikelets 3-5-flowered, 5–7 mm. long. [*F. nutans* Spreng.]—Moist woods, various provinces, Fla. to Tex., N. D., and N. S.

7. **F. Shortii** Kunth. Resembles *F. obtusa*: panicle more compact, the few shorter branches spikelet-bearing from about the middle, the spikelets crowded.—Wet prairies, various provinces, Fla. to Tex., Ia. and Pa.

94. **SCLEROPOA** Griseb. Low annual. Spikelets spiral-flowered, linear, somewhat compressed, the rachilla disarticulating above the glumes and between the florets: glumes unequal, short, acutish, strongly nerved, the first 1-nerved, the second 3-nerved: lemmas convex, nearly terete, glabrous, obscurely

5-nerved, obtuse, awnless, slightly scarious at the tip. Resembling *Festuca*. — One species, native of Eu.

1. S. rigida (L.) Griseb. Stems erect or spreading, 10–20 cm. tall, glabrous or minutely puberulent: leaf-blades flat, 1–2 mm. wide: panicles narrow, condensed, 5–10 cm. long, the branches short, floriferous to base, these and the thick pedicels somewhat divaricately spreading in anthesis: spikelets 4–10-flowered, 5–8 mm. long: glumes about 2 mm. long, lemmas about 2.5 mm. long. [*Diplachne rigida* Munro]—(PRICKLY FESCUE.)—Waste-places, introduced with ballast, Apalachicola, Fla. and Mobile, Ala.; also S Miss.

95. BROMUS L. Low or rather tall annuals or perennials, with closed sheaths, flat blades and open or contracted panicles of large spikelets. Spikelets several- to many-flowered, the rachilla disarticulating above the glumes and between the florets; glumes unequal, acute, the first 1- to 3-nerved, the second usually 3- to 5-nerved; lemmas convex on the back or keeled, 5- to 9-nerved, 2-toothed at the apex, awnless or usually awned from between the teeth; palea usually shorter than the lemma.—One hundred species, in temperate regions generally.—BROME-GRASSES. CHEATS. CHESSES.

Spikelets strongly flattened, the lemmas distinctly compressed-keeled: lemmas acuminate, mucronate, the awn usually not more than 2 mm. long: plant annual. — I. UNIOLOIDES.
Spikelets usually not flattened: lemmas not compressed-keeled.
  Plant perennial. — II. CILIATI.
  Plant annual.
    Glumes rather broad: lemmas broadly elliptic. — III. RACEMOSI.
    Glumes narrow: lemmas narrow and gradually acuminate. — IV. STERILES.

I. UNIOLOIDES

Plant rather stout, with tufted, usually decumbent stems, and pubescent leaf-sheaths. — 1. *B. unioloides.*

II. CILIATI

Lemmas awnless or nearly so: panicle-branches suberect. — 2. *B. inermis.*
Lemmas long-awned: panicle-branches drooping.
  Lemmas glabrous. — 3. *B. laeviglumis.*
  Lemmas pubescent or scabrous. — 4. *B. purgans.*

III. RACEMOSI

Leaf-sheaths glabrous. — 5. *B. secalinus.*
Leaf-sheaths pubescent. — 6. *B. commutatus.*

IV. STERILES

Awns about 1.5 mm. long: lemmas pubescent. — 7. *B. tectorum.*
Awns 2–3 cm. long: lemmas scabrous-puberulent. — 8. *B. sterilis.*

1. B. unioloides H. B. K. Stem rather stout, 30–100 cm. tall: panicle 15–50 cm. long, usually narrow, the branches appressed, sometimes wider with spreading branches: spikelets 2–3.5 cm. long, 7–11-flowered: first glume, 5-nerved, 7–10 mm. long, the second 7-nerved, 10–13 mm. long: lemmas subcoriaceous,

glabrous or scabrous, 13–16 mm. long.—Waste-places, roadsides, and prairies, various provinces, Fla. to Tex., Calif., and Tenn. —(*Mex., C. A., S. A.*)—Cult. as RESCUE GRASS.

2. **B. inermis** Leyss. Perennial with a creeping rootstock: spikelets linear, purplish, the lemmas awnless or nearly so, glabrous.—(BROME-GRASS.)—Cult., and rarely found in waste-places within our range. Nat. of Eu. —**B. erectus** Huds. has been found in Ala. It differs from *B. inermis* in having no rootstocks; also N. Y. to Wash. and Me.

3. **B. laeviglumis** (Scribn.) A. Hitchc. Stem up to 100 cm. tall: leaf-sheaths glabrous or pilose: panicle open, 15–20 cm. long: spikelets, 1.5–2 cm. long: lemmas about 1 cm. long, the awn about half as long. [*B. ciliatus laeviglumis* Scribn.]—Moist woods, Blue Ridge and more northern provinces, N. C. to N. D. and Me.

4. **B. purgans** L. Stem 70–140 cm. tall: leaf-sheaths sparsely retrorsely pilose: blades as much as 1.5 cm. wide: panicle 15–25 cm. long, the branches bearing a few spikelets near the ends: spikelets 2–2.5 cm. long, 7–10-flowered: lemmas 10–12 mm. long, densely pubescent all over, the awn 4–6 mm. long.—Dry woods, various provinces, Fla. to Tex., Mont., and Vt.

4a. **Bromus ciliatus** L. has been found in Tenn. It differs from *B. purgans* in the lemmas pubescent at margin, glabrous on back; also W. Va., to Cal. and northward.

5. **B. secalinus** L. Stem 40–100 cm. tall: panicle open, 5–15 cm. long, the branches drooping: spikelet 5–15-flowered, glabrous: lemmas 8–11 mm. long, plump at maturity, the margins inrolled, the awn mostly less than 5 mm. long.—(CHESS. CHEAT.)—Fields and waste-places, nearly throughout U. S. and S Can. Nat. of Eu.

6. **B. commutatus** Schrad. Similar to *B. secalinus*, but the leaf-sheaths pubescent: lemmas slightly longer, at maturity less plump, the margins not inrolled. [*B. racemosus commutatus* Hook.]—Waste-places, from S. C., Tenn., and Tex. northward, nearly throughout U. S. and S Can. Nat. of Eu.

6a. **Bromus japonicus** Thunb. has been found in N. C. and Ky. It differs from *B. commutatus* in the slender flexuous branches of the panicle and the divergent awn; also Vt. to Calif. and Wash.—(*Eurasia.*)

7. **B. tectorum** L. Stem 30–60 cm. tall: leaves softly pubescent: panicle rather dense, drooping, 6–15 cm. long: spikelets 13–20 mm. long, nodding.—Waste-places, various provinces, Miss. and Tenn. to Wash. and Me.; Pacific Coast. Nat. of Eu.

8. **B. sterilis** L. Leaves minutely puberulent: panicle 10–20 cm. long, broad, lax, drooping, the slender branchlets usually bearing one spikelet: spikelets 2.5–3.5 cm. long, drooping.—Waste-places, various provinces, N. C. to Ala., Ill., and Mass. Nat. of Eu.—(*W. I.*)

96. **LOLIUM** L. Annuals or perennials, with flat blades and simple terminal flat spikes. Spikelets several-flowered, solitary, sessile, placed edgewise to the continuous rachis, one edge fitting to the alternate concavities, the rachilla disarticulating above the glumes and between the florets; first glume wanting (except on the terminal spikelet), the second outward, strongly 3–5-nerved:

lemmas rounded on the back, 5- to 7-nerved.—Eight species, natives of Eurasia. —RYE-GRASSES. DARNELS.

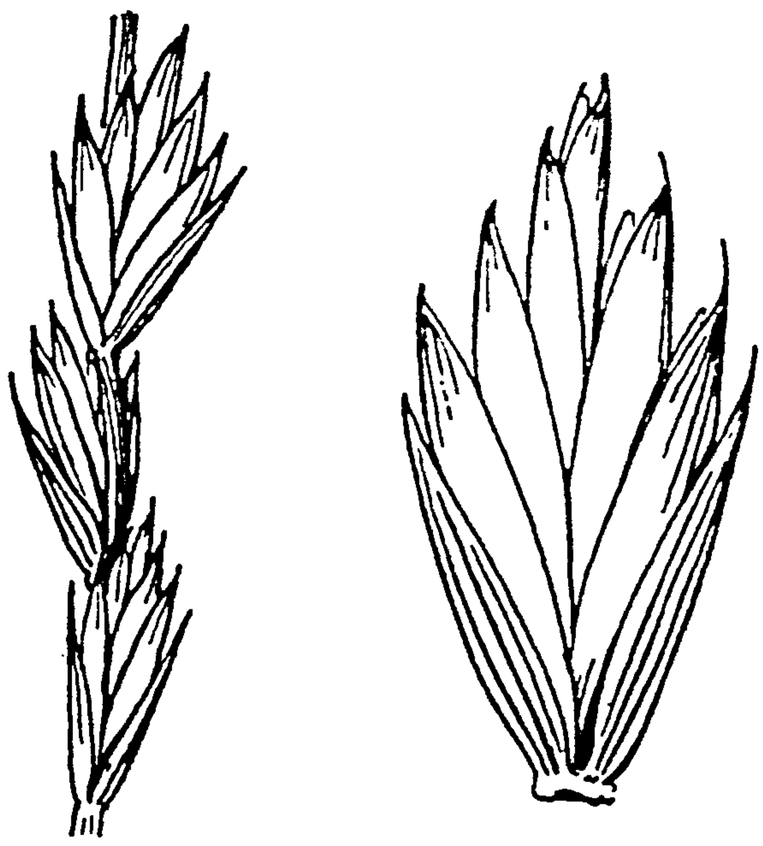
Glume equalling the uppermost floret: plant annual. 1. *L. temulentum.*
Glume shorter than the spikelet: plants perennial.
  Lemmas awned. 2. *L. multiflorum.*
  Lemmas awnless or nearly so. 3. *L. perenne.*

1. L. temulentum L. Stem 60–120 cm. tall: spike 10–30 cm. long: spikelets 5–7-flowered: lemma awned or awnless, plump.—(POISON-DARNEL.)—Waste-places, various provinces, Ga. to Tex., Kan., and N. B. Nat. of Eu.

2. L. multiflorum Lam. Stem 30–60 cm. tall: spike 20–30 cm. long: spikelets 10–20-flowered: lemmas 7–8 mm. long, at least the upper awned. [*L. italicum* A. Br.]—(ITALIAN RYE-GRASS.)—Meadows and waste-places, nearly throughout U. S.; infrequent southward. Nat. of Eu.

3. L. perenne L. Resembles *L. multiflorum*: spike more slender: spikelets 8–10-flowered: lemmas 5–6 mm. long.—(ENGLISH RYE-GRASS. PERENNIAL RYE-GRASS.)—Meadows and waste-places, cult. as a meadow grass, northern states; infrequent southward, but locally naturalized. Nat. of Eu.

97. AGROPYRON Gaertn. Our species perennials, with erect culms, erect spikes, and creeping rootstocks. Spikelets several-flowered, solitary, sessile, placed flatwise at each joint of a continuous rachis; glumes equal, firm, several-nerved, usually shorter than the first lemma, acute or awned: lemmas convex on the back, rather firm, 5–7-nerved, usually acute or awned from the apex: palea shorter than the lemma.—Sixty species, natives of temperate regions generally.—WHEAT-GRASSES. QUITCH-GRASSES. QUICK-GRASSES.

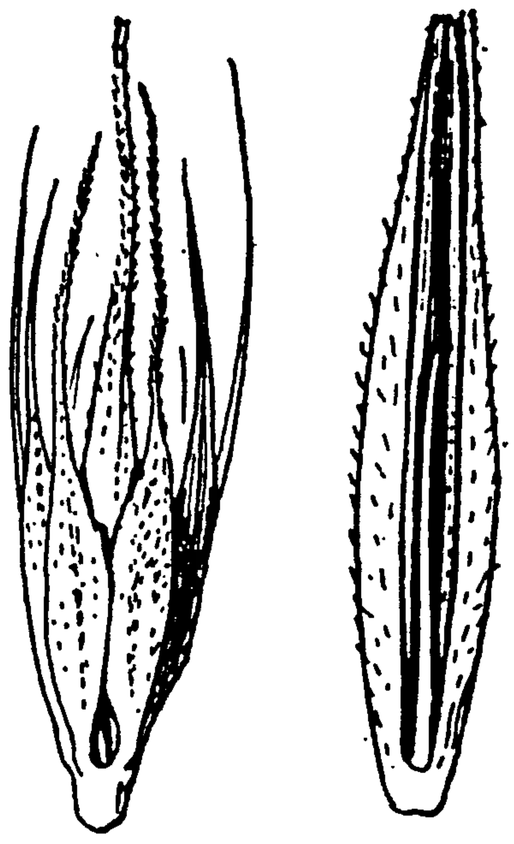


1. A. repens (L.) Beauv. Plant green or glaucous: spikelets about 5-flowered, 1–1.5 cm. long: glumes 8–10 mm. long, strongly nerved: lemmas about 1 cm. long, usually with an awn about 5 mm. long.—(QUACK GRASS.)—Fields and waste-places, from N. C. northward almost throughout the N U. S. Nat. of Eu.—(*Mex.*)

98. HORDEUM [Tourn.] L. Low or rather tall annuals or perennials with flat blades and dense terminal cylindrical or bristly-bushy spikes. Spikelets 1-flowered, 3 together at each node of the articulate rachis, the middle one sessile, the others short-pedicelled, the rachilla disarticulating above the glumes and, in the central spikelet, prolonged behind the palea as a bristle, this sometimes bearing a rudimentary floret: lateral spikelets reduced, imperfect; glumes narrow, often subulate and awned, rigid, standing in front of the spikelet; lemmas rounded on the back, 5-nerved, usually obscurely so, tapering into a usually long awn.—Twenty species, natives of the temperate region of both hemispheres.—BARLEY-GRASSES. DWARF-BARLEYS.

Glumes not ciliate.
  Glumes of fertile spikelet dilated above the base: plant annual. 1. *H. pusillum.*
  Glumes not dilated, all awn-like: plant perennial. 2. *H. nodosum.*
Glumes, or some of them, ciliate: plant annual. 3. *H. murinum.*

1. H. pusillum Nutt. Stem 10–40 cm. tall: spike narrow, erect, 2–7 cm. long: first glume of each lateral spikelet and both glumes of central spikelet dilated above the base.—Open grounds, various provinces, Fla. to Calif., Wash., Ohio, to Me., and D. C.—(*Mex.*)



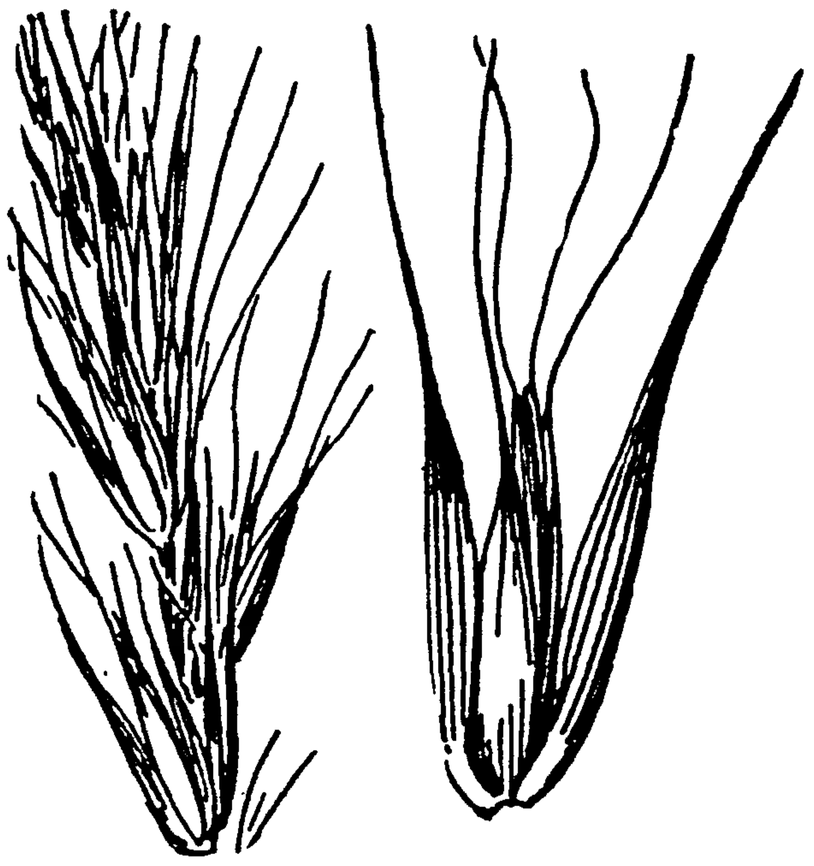
2. H. nodosum L. Plant larger than *H. pusillum*, the stems tufted, commonly 30–60 cm. tall: spike 8–10 mm. wide, bristly.—(MEADOW-BARLEY.)—Open ground, Calif. to Alas. and Mont. Introduced in Coastal Plain, in Miss., and in Piedmont northward.

3. H. murinum L. Stem bushy-branched, spreading: spikes 5–7 cm. long, often partly inclosed in the uppermost inflated sheath: glumes of the central spikelet narrowly spindle-form, 3-nerved, long-ciliate on both margins, the nerves scabrous: awns 2–3 cm. long.—Fields, waste-places, and open ground, various provinces, Ala. to Mass.; also W U. S. Nat. of Eu.

99. ELYMUS L. Erect usually rather tall perennials, with flat blades and terminal spikes. Spikelets 2- to 6-flowered, sessile in pairs (rarely in 3's), on a continuous rachis, the rachilla disarticulating above the glumes and between the florets; glumes equal, usually rigid, sometimes indurate below, narrow, sometimes subulate, 1- to several-nerved, acute to aristate, somewhat asymmetric and placed in front of the spikelet: lemmas rounded on the back or nearly terete, obscurely 5-nerved, acute or usually awned from the tip.—Twenty-five species, in the temperate regions of the Northern Hemisphere.—WILD-RYES. LYME-GRASSES. BUFFALO-RYES.

Glumes narrowly lanceolate, more or less indurate at base. 1. *E. virginicus.*
Glumes very narrow with about 2 strong nerves.
  Leaf-blades pubescent. 2. *E. striatus.*
  Leaf-blades glabrous. 3. *E. riparius.*

1. E. virginicus L. Stem 60–100 cm. tall: spike erect, often included at base in the upper leaf-sheath: spikelets glabrous, erect: glumes rigid, broadened and bowed out above the terete yellowish indurate base, narrowed into an awn 1–2 cm. long: lemmas awned, the awn mostly 1–2 cm. long.—(TERRELL-GRASS.)—Moist woods, various provinces, Fla. to Tex., Mont., and Newf.—Various subspecies have been described: *E. virginicus hirsutiglumis*, with villous hirsute lemmas and glumes, within the range of the species; *E. virginicus australis* with narrow glumes which, like the lemmas, are villous-hirsute and with long awns, Ga. to Tex. and Mass.; *E. virginicus glabriflorus*, with glabrous spikelets, Fla. to Tex., Nebr., and Md.

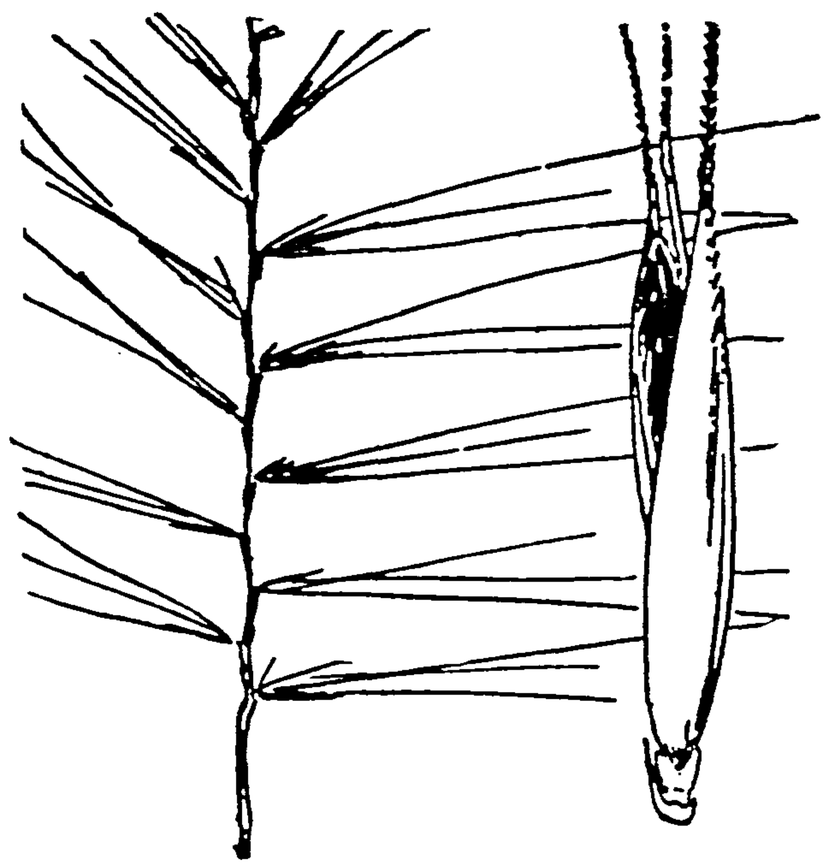


2. E. striatus Willd. Stem slender, 50–100 cm. tall: leaf-blades 6–10 mm. wide, villous

on the upper surface: sheaths villous: spike pale, 5–10 cm. long, nodding, long-exserted: spikelets 1–2-flowered, somewhat spreading: glumes 1.5–3 cm. long, villous: lemmas about 6 mm. long, hirsute, the awns 2–3 cm. long (glumes and lemmas glabrous in *E. striatus arkansansus*, various provinces, Tenn. to Tex. and Wyo.)—(BLUE-JOINT.)—Rocky woods, various provinces, N. C. to Tex., Wyo., and Vt.

3. **E. riparius** Wiegand. Stem rather slender, 90–150 cm. tall; leaf-sheaths glabrous: blades thin, flat, scabrous, 5–15 mm. wide; spike somewhat nodding, 7–20 cm. long: glumes narrow, somewhat indurate but not bowed-out at base: lemmas minutely hispidulous, the awn straight, mostly 2–3 cm. long—River banks and low ground, various provinces, N Fla. to Ky., Ind., and Que.

100. **HYSTRIX** Moench. Erect perennials with flat leaf-blades and loosely flowered bristly spikes. Spikelets 2- to 4-flowered, sessile, 1 to 3 at each node of a continuous flattened rachis, horizontally spreading at maturity: glumes reduced to short awns, the first usually obsolete, both often wanting in the upper spikelets: lemmas convex, rigid, tapering into long awns, 5-nerved, the nerves obscure except toward the tip: palea about as long as the body of the lemma.—Four species, of temperate regions, but widely scattered.



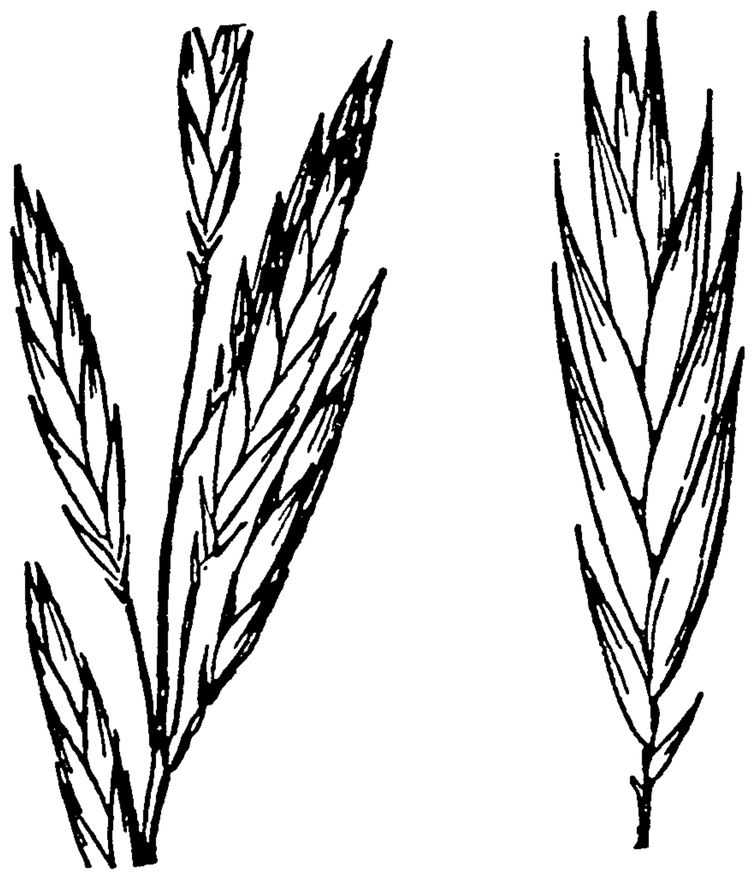
1. **H. Hystrix** (L.) Millsp. Stem 60–120 cm. tall: leaf-sheaths glabrous or scabrous; blades mostly 7–15 mm. wide: spike 8–15 cm. long, the internodes of the rachis 5–10 mm. long: spikelets 1–1.5 cm. long: lemmas glabrous, the awns 1–4 cm. long, straight or rarely curved. [*Asprella Hystrix* Willd.]—(BOTTLEBRUSH-GRASS. BOTTLERUSH.)—Moist woods, various provinces, rarely Coastal Plain, N. C. to Okla., Minn., and N. B.—The inflorescence resembles a commercial bottle-brush.

101. **ARUNDINARIA** Michx. Gregarious shrubs or tall reeds, with woody perennial branching stems, flat leaf-blades with petioles articulate with the sheaths, and loose racemes or panicles. Spikelets few- to many-flowered, large, compressed, the rachilla disarticulating above the glumes and between the florets: glumes unequal, shorter than the lemmas, the first sometimes wanting: lemmas acute or acuminate, mucronate, faintly many-nerved: palea about as long as the lemma, prominently 2-keeled.—Twenty-five species, all except the following, in the tropics of both hemispheres.—CANES.

Inflorescence borne on short leafless radical shoots of the year.	1. *A. tecta.*
Inflorescence borne on leafy branches of the old canes.	2. *A. macrosperma.*

1. **A. tecta** (Walt.) Muhl. Stem 1–4 m. tall: leaf-blades 8–20 cm. long: panicle of few aggregate spikelets on slender shoots with rather loose sheaths, the blades obsolete or nearly so: spikelets 2.5–4 cm. long, 5–10-flowered.—(SMALL-CANE. REED. SWITCH-CANE.)—Sour swamps and bogs, Coastal Plain and occasionally Appalachian provinces, Fla. to La. and Md.—Stems in col-

onies that sometimes flower several seasons in succession. Leaves usually rough, drooping.



2. A. gigantea (Walt.) Chapm. Stem as much as 10 m. tall and 7 cm. thick at base: leaf-blades 20–50 cm. long: panicle of few simple unequal racemes: spikelets 3–5 cm. long, 5–15-flowered. [*A. macrosperma* Michx.]—(LARGE-CANE. GIANT-CANE.)—Alluvial situations, Coastal Plain, Fla. to Tex., Okla., Ky., and Va.—Stems arborescent, forming "cane-brakes." Plants flower at irregular and indefinite periods. They resemble bamboo. Stock browse on the young leaves and seeds. Young shoots are used as a pot herb. Stems of the large cane are used for fishing-poles, mats, baskets, and a variety of other purposes. Leaves usually smooth, ascending.

FAMILY 2. **CYPERACEAE** — SEDGE FAMILY

Grass-like or rush-like caulescent or scapose herbs, when perennial usually with scaly or tuber-bearing rootstocks. Stems or scapes (culms) mostly solid, angular, terete, or flattened. Leaves 3-ranked, with closed sheaths and narrow blades, sometimes mere scales. Flowers perfect, or monoecious or dioecious, borne in spikelets, usually solitary in the axils of each scale (bract, glume), the spikelets solitary or variously clustered, the scales 2-ranked or spirally imbricate, sometimes partly changed into leaves. Perianth hypogynous, consisting of bristles or scales, or wanting. Androecium of 1–3 stamens, or rarely of more. Gynoecium of 2 or 3 united carpels. Ovary 1-celled. Styles united. Stigmas 2 or 3. Ovules solitary, anatropous. Fruit a lenticular or 3-angled achene.—About 75 genera and 3,200 species, of wide geographic distribution, but of little economic importance.

Spikelets with perfect flowers, or some flowers with abortive androecium or gynoecium.
  Scales of the spikelet enclosing 1 or 2 bractlets. Tribe I. HEMICARPHEAE.
  Scales of the spikelet not enclosing bractlets.
    Spikelets many-flowered, sometimes few-flowered, with the lowest scale, or rarely several of the lower scales, flowerless. II. SCIRPEAE.
    Spikelets 1- or 2-flowered, or rarely several-flowered, with 2–several of the lower scales empty. III. RYNCHOSPOREAE.
Spikelets with monoecious or dioecious flowers.
  Pistillate flower subtended by a flat scale: achene exposed. IV. SCLERIEAE.
  Pistillate flower, and achene, enclosed in a utricle (perigynium). V. CARICEAE.

I. HEMICARPHEAE

Flower enclosed in 2 bractlets, one of them anterior, the other posterior. 1. LIPOCARPHA.
Flower subtended by a single minute posterior bractlet. 2. HEMICARPHA.

II. SCIRPEAE

Scales of the spikelets conduplicate, often keeled, 2-ranked, the spikelets mostly flattened.
  Flowers with barbed perianth-bristles. 3. DULICHIUM.
  Flowers without perianth-bristles.
    Achene smooth: style-base not swollen.
      Spikelets with 2–many perfect flowers: achene enclosed in a single scale. 4. CYPERUS.
      Spikelets with 1 perfect flower: achene enclosed in a pair of scales. 5. KYLLINGA.
    Achene warty: style-base swollen. 6. ABILDGAARDIA.

Scales of the spikelets merely concave, spirally imbricate.
Base of the style manifestly swollen, persistent as a tubercle on the achene, or deciduous in *Websteria*.
Perianth-(bristles) wanting.
Achene not surmounted by a tubercle: dilated style-base truncate. 7. FIMBRISTYLIS.
Achene surmounted by a tubercle: dilated style-base not truncate. 8. STENOPHYLLUS.
Perianth-(bristles) present.
Scapose herbs: spikelet solitary, several–many-flowered: achene tubercled: anthers ellipsoid to linear, not conspicuously elongate. 9. ELEOCHARIS.
Caulescent herbs: spikelets umbellate, 1-flowered: achene not tubercled: anthers linear-filiform, greatly elongate. 10. WEBSTERIA.
Base of the style not at all, or only slightly, thickened, deciduous.
Perianth of short or elongate bristles, or obsolete or wanting.
Perianth-bristles numerous, greatly elongate, silky. 11. ERIOPHORUM.
Perianth-bristles 1–8, short, stiff, or wanting. 12. SCIRPUS.
Perianth of 3 sessile or stipitate scales, usually alternating with as many barbed bristles. 13. FUIRENA.

III. RYNCHOSPOREAE

Stigmas 2: achene lenticular.
Spikelets in a dense head subtended by a leafy involucre. 14. DICHROMENA.
Spikelets not in dense involucrate heads.
Spikelets several-flowered: perianth none. 15. PSILOCARYA.
Spikelets 1–2-flowered, or rarely few-flowered: perianth present, the bristles sometimes deciduous or obsolete. 16. RYNCHOSPORA.
Stigmas 3: achene 3-angled.
Perianth wanting: spikelets short and stout: achene dark.
Inflorescence paniculate: spikelets straight: achene of an ovoid type. 17. MARISCUS.
Inflorescence capitate: spikelets curved: achene ellipsoid, similar at both ends. 18. REMIREA.
Perianth present: spikelets slender: achene white. 19. SCHOENUS.

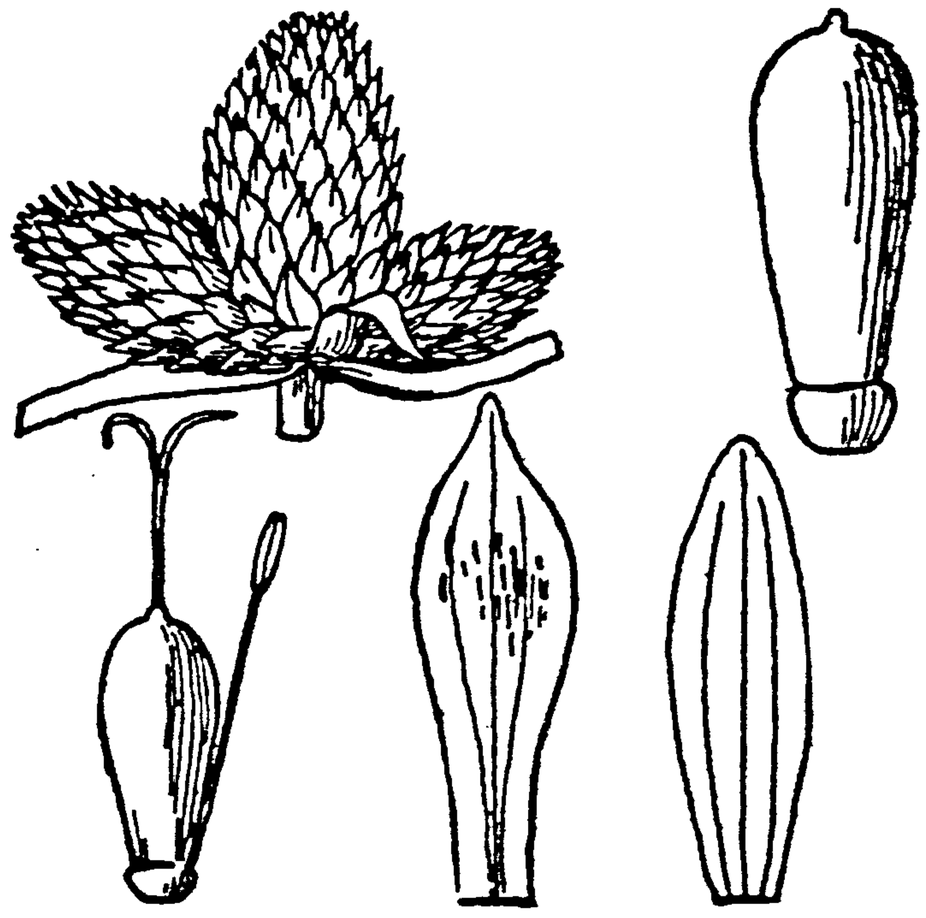
IV. SCLERIEAE

Spikes few-flowered: perianth-bristles wanting: achene bony or crustaceous, with a disk at the base. 20. SCLERIA.

V. CARICEAE

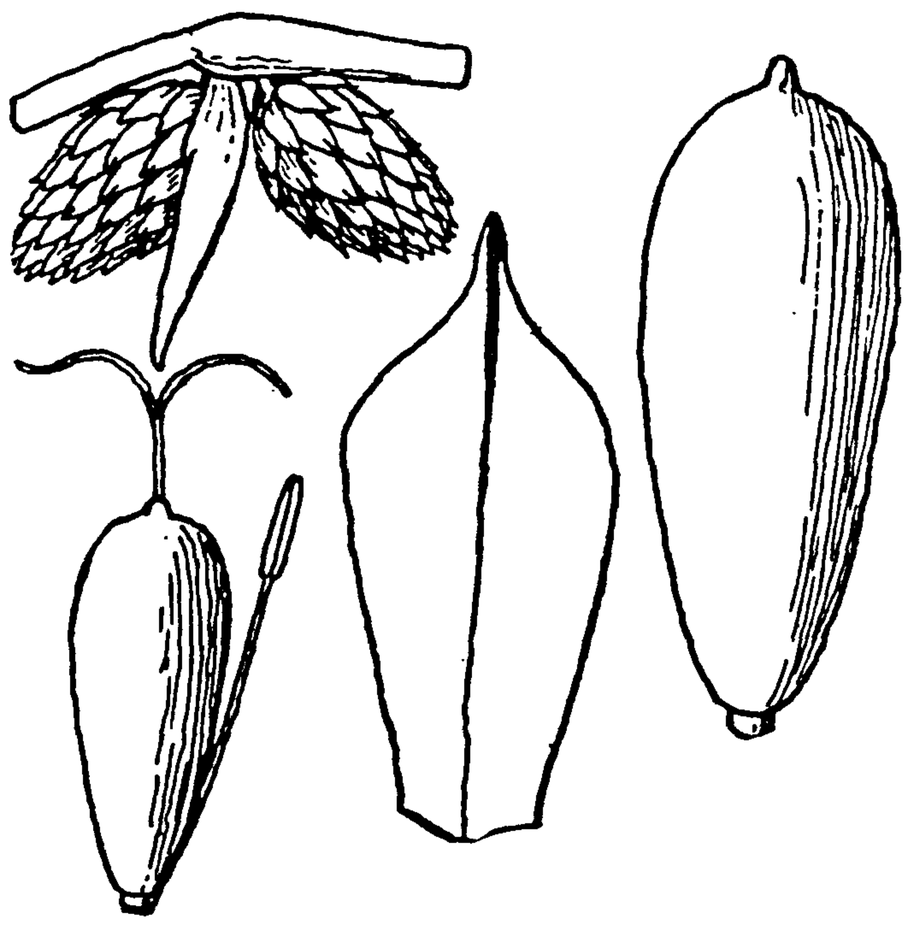
Plant with more than one leaf, each leaf with a sheath, a ligule, and a midrib. 21. CAREX.
Plant with one leaf, the leaf without sheath, ligule, or midrib. 22. CYMOPHYLLUS.

1. LIPOCARPHA R. Br. Annual low tufted herbs. Leaf-blades very narrow. Spikelets many-flowered, few in a terminal involucrate head. Scales firm, spirally imbricate, each subtending a pair of bractlets which enclose a flower, or several of the lower ones empty. Flowers perfect. Perianth wanting. Stamens 1 or 2. Style deciduous, not enlarged at the base. Stigmas 2 or 3. Achene flattened or 3-angled.—About 15 species, widely distributed.



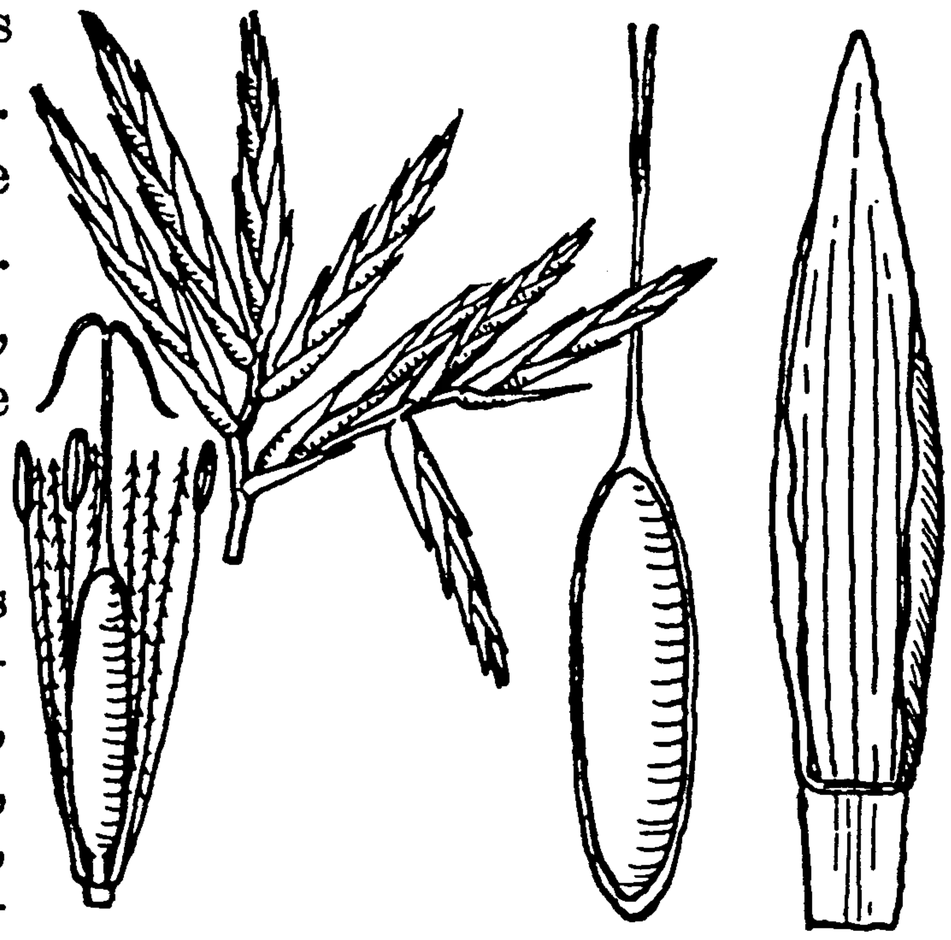
1. **L. maculata** (Michx.) Torr. Plant glabrous: leaf-blades narrowly linear, 1–2 mm. wide, involute: scape flattened, taller than the leaves: involucral bracts 2–4, narrowed above the dilated leaves: spikelets ovoid or ellipsoid, 4–7 mm. long; scales rhombic-cuneate, scarcely 2 mm. long, white-margined, or with reddish-brown spots: exterior bractlet hyaline, few-veined: achene pale, ellipsoid-obovoid, nearly 1 mm. long.—Moist and springy places, Coastal Plain, Fla. to Ala. and Va. Adv. N.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.

2. **HEMICARPHA** Nees & Arn. Annual low or dwarf caulescent herbs. Leaf-blades very narrow or slender. Spikelets many-flowered, solitary or few together in an involucrate head, one involucral bract much exceeding the spikelets. Scales firm, spirally imbricate, each subtending a minute posterior bractlet and a flower. Flowers perfect. Perianth wanting. Stamens 1 or 2. Style deciduous, not swollen at the base. Stigmas 2. Achene flattened or nearly terete.—About 5 species, natives of warm regions. Besides the following, 2 other species occur in the western U. S.—Sum.–fall.



1. **H. micrantha** (Vahl) Pax. Plant 2–10 cm. tall, or rarely more, often tufted or in mats: stem very slender, glabrous: leaf-blades setaceous, smooth: spikelets solitary or 2 or 3 together, ovoid, 2–4 mm. long, not bristly: scales cuneate or cuneate-obovate, about 1 mm. long, abruptly pointed: bractlets fully 0.5 mm. long, delicately veined: achene subcylindric or ellipsoid-ovoid, about 0.7 mm. long, mucronulate, light-brown.—Moist soil and pond-margins, various provinces, Fla. to Tex., Wash., Ont., and N. H.—(*W. I., Mex., C. A., S. A.*)

3. **DULICHIUM** L. C. Rich . Perennial tall caulescent herbs, the stems hollow, copiously leafy. Leaf-blades short, very short or wanting on the lower sheaths. Spikelets several-flowered, 2-ranked on axillary peduncles, flat. Scales 2-ranked, conduplicate, decurrent as a wing on the lower joint. Flowers perfect. Perianth of 6–9 retrorsely barbed elongate bristles. Stamens 3. Style not swollen. Stigmas 2. Achene flattened, narrow, beaked with the persistent style-base—One species.



1. **D. arundinaceum** (L.) Britton. Plants gregarious, the stem up to 1 m. tall: leaf-blades spreading or ascending, flat, linear, 2–8 cm. long: spikelets narrowly linear, spreading, 1–2.5 cm. long: scales appressed, lanceolate, fully twice as long as the rachis-joints: achene linear-ellipsoid, 3–3.5 mm. long, slightly stipitate, each with a setaceous beak.—(SHEATHED-GALINGALE.)—Swamps, springy places, and pond-margins, various provinces, Fla. to Tex., Wash., Ont., and N. S.—Sum.–fall.

4. **CYPERUS** [Tourn.] L. Annual or perennial scapose herbs. Leaves basal, with elongate narrow blades or rarely mere sheaths. Scapes simple (in our species) with a terminal involucre of one or several bracts which subtend the simple or compound inflorescence. Inflorescence-branches, when present, sheathed at the base, usually very unequal. Spikelets few—many-flowered, flat or nearly terete, borne in clusters, heads, spikes, or panicles: scales 2-ranked, deciduous, or persistent and falling away with the rachis which dis-

articulates above the lower pair of scales or with each joint of the rachis when it breaks up into 1-fruited sections, the internodes of the rachis often winged. Flowers perfect. Perianth wanting. Stamens 1–3. Style deciduous. Stigmas 2 or 3. Achene lenticular or 3-angled.—About 600 species, widely distributed in warm regions.—Sum.–fall, or all year S.— GALINGALES. SWEET-RUSHES.— The tuberous-thickened rootstocks of some species are used as food.

Stigmas 2: achene of a lenticular type.
  Achene laterally flattened. (Subgenus **I. Pycreus.**)
    Achene much shorter than the subtending scale. — I. FLAVESCENTES.
    Achene about as long as the subtending scale. — II. SABULOSI.
  Achene dorsally flattened. (Subgenus **II. Juncellus.**) — III. LAEVIGATI.
Stigmas 3: achene of a triquetrous type.
  Spikelets persistent on the spike-rachis. (Subgenus **III. Eucyperus.**)
    Wings of the spikelet-rachis, if any, very narrow.
      Plant annual.
        Scales of the spikelets awn-tipped. — IV. CUSPIDATI.
        Scales of the spikelets obtuse, acute, or merely acuminate.
          Achene much shorter than the subtending scale. — V. COMPRESSI.
          Achene as long as the subtending scale or longer. — VI. IRIAE.
      Plant perennial.
        Scales of the spikelets appressed, contiguous, the rachis-internodes very short.
          Stamens 3: leaves viscid. — VII. ELEGANTES.
          Stamen 1: leaves not viscid. — VIII. VIRENTES.
        Scales of the spikelets not appressed, distant, the rachis-internodes ½ as long as the scales or more. — IX. DISTANTES.
    Wings of the spikelet-rachis prominent, often very broad, persistent or deciduous.
      Rachis-wings persistent: plant perennial.
        Scapes not nodose, 3-angled.
          Leaves reduced to sheathing scales at the base of the scape.
            Inflorescence subtended by an involucre of 2 short erect or ascending bracts: spikelets narrow, dull. — X. HASPAN.
            Inflorescence subtended by an involucre of numerous elongate spreading and drooping bracts: spikelets broad, shining. — XI. ALTERNIFOLII.
          Leaves with elongate-linear blades. — XII. ESCULENTI.
        Scapes nodose, nearly terete. — XIII. ARTICULATI.
      Rachis-wings deciduous as interior scales: plant annual. — XIV. ERYTHRORHIZI.
  Spikelets deciduous above the lower pair of scales, or breaking up into 1-fruited sections.
    Spikelets deciduous above the lower pair of scales. (Subgenus **IV. Mariscella.**)
      Achene thrice as long as thick or more.
        Spikelets decidedly flattened. — XV. STRIGOSI.
        Spikelets only slightly flattened or nearly terete or angled, very narrow. — XVI. PRAELONGATI.
      Achene less than thrice as long as thick. — XVII. TETRAGONI.
    Spikelets breaking up into 1-fruited sections. (Subgenus **V. Torulinium.**) — XVIII. SPECIOSI.

I. FLAVESCENTES

Achene orbicular-obovoid or suborbicular, the superficial cells oblong. — 1. *C. flavescens.*
Achene ellipsoid, obovoid, or linear, the superficial cells quadrate.
  Scales of the spikelets obtuse, acute, or mucronulate.
    Achene obovoid, usually broadly so.
      Stamens 2: stigmas much exserted beyond the scale. — 2. *C. diandrus.*
      Stamens 3: stigmas included, or only slightly exserted. — 3. *C. rivularis.*
    Achene linear, ellipsoid, oval, or narrowly obovoid.
      Scales of the spikelets obtuse. — 4. *C. densus.*

Scales of the spikelets mucronulate.
Achene nearly 1.5 mm. long: scales about 3 mm. long. — 5. *C. filicinus.*
Achene about 1 mm. long: scales 2 mm. long or less.
Spikelets in stiff clusters, spreading.
Spikelets 1.5–2 mm. wide: achene much over ½ as long as the scale. — 6. *C. microdontus.*
Spikelets 1 mm. wide or less: achene slightly over ½ as long as the scale. — 7. *C. paniculatus.*
Spikelets in soft plume-like, often dense, clusters, erect or ascending. — 8. *C. odoratus.*
Scales of the spikelets prominently short-pointed beyond the scarious margin. — 9. *C. pumilus.*

II. Sabulosi

Achene less than 1.5 mm. long, about equalling the subtending scale. — 10. *C. sabulosus.*

III. Laevigati

Spikelets few, in a cluster, appearing lateral on the scape: one involucral bract elongate and erect: anther slender-tipped, 1 mm. long. — 11. *C. laevigatus.*
Spikelets numerous, in a terminal erect head: several involucral bracts elongate and spreading: anther blunt, less than 1 mm. long. — 12. *C. Careyi.*

IV. Cuspidati

Scale-body acute or rounded at the base of the awn: achene cuneate-obovoid. — 13. *C. inflexus.*
Scale-body notched at the base of the awn: achene obovoid. — 14. *C. cuspidatus.*

V. Compressi

Spikelets in stiff clusters: achene less than ½ as long as the scale. — 15. *C. compressus.*

VI. Iriae

Spikelets in plume-like clusters: achene as long as the subtending scale. — 16. *C. Iria.*

VII. Elegantes

Spikelets crowded; scales with ciliate-serrulate keels. — 17. *C. elegans.*

VIII. Virentes

Young spikelets long and narrow; scales persistent. — 18. *C. ochraceus.*
Young spikelets short and broad; scales deciduous.
Achene linear or narrowly ellipsoid, over 1 mm. long.
Achene narrowly ellipsoid: spikelet-scales about 2.5 mm. long. — 19. *C. virens.*
Achene linear: spikelet-scales about 2 mm. long. — 20. *C. pseudovegetus.*
Achene oval or broadly ellipsoid, less than 1 mm. long. — 21. *C. surinamensis.*

IX. Distantes

Spikelets in irregular spikes, very slender. — 22. *C. distans.*

X. Haspan

Spikelets linear to linear-lanceolate, about 1 mm. wide: involucral bracts 2, erect or ascending. — 23. *C. Haspan.*

XI. Alternifolii

Spikelets ovate to elliptic, 2–2.5 mm. wide: involucral bracts numerous, spreading and drooping. — 24. *C. alternifolius.*

XII. Esculenti

Scales of the spikelets with lax or spreading prominently mucronate tips. — 25. *C. dentatus.*
Scales of the spikelets with erect, obtuse, acute, or obscurely mucronulate tips.
Achene ⅓ as long as the scale or less: scales blunt, hooded at the apex. — 26. *C. Le Contei.*
Achene nearly ½ as long as the scale or more: scales acute, blunt, or mucronulate, not hooded at the apex.
Spikelets of wholly or partly reddish-brown or purple-brown scales. — 27. *C. rotundus.*
Spikelets of stramineous or yellowish-brown scales.

Spikelet-scales less than 3 mm. long. 28. *C. esculentus.*
Spikelet-scales 3 mm. long or more. 29. *C. lutescens.*

XIII. Articulati

Tall gregarious perennial, the leaves mostly represented by basal sheaths: spikes umbel-like. 30. *C. articulatus.*

XIV. Erythrorhizi

Spikelets many-flowered, mostly over 5 mm. long: spikes mainly ellipsoid. 31. *C. erythrorhizos.*
Spikelets few-flowered, mostly less than 5 mm. long: spikes mainly cylindric. 32. *C. Halei.*

XV. Strigosi

Spike-rachis very short, the spike thus globose. 33. *C. Martindalei.*
Spike-rachis elongate, the spike thus longer than wide.
  Achene over ½ as long as the subtending scale. 34. *C. litoreus.*
  Achene less than ½ as long as the subtending scale.
    Scales of the spikelets appressed: anthers less than 0.5 mm. long. 35. *C. strigosus.*
    Scales of the spikelets lax: anthers over 0.5 mm. long. 36. *C. stenolepis.*

XVI. Praelongati

Spikelets loosely spicate or paniculate, or capitate.
  Spikelets in several or many spikes or panicles.
    Achene 1.5–2 mm. long, less than ½ as long as the scale: rachis-wings very narrow. 37. *C. praelongatus.*
    Achene 2.5–3 mm. long, fully ½ as long as the scale: rachis-wings broad. 38. *C. refractus.*
  Spikelets capitate, the head solitary. 39. *C. floridanus.*
Spikelets crowded, sometimes densely so, in globose, cylindric, or obovoid spikes.
  Spikelets reflexed or deflexed, the spikes broadest at the top or above the middle.
    Scape rough-pubescent, at least above.
      Inflorescence-rays rough: lower spikelets deflexed. 40. *C. retrofractus.*
      Inflorescence-rays smooth: lower spikelets reflexed-spreading. 41. *C. dipsaciformis.*
    Scape smooth and glabrous. 42. *C. hystricinus.*
Spikelets spreading in all directions, only the basal ones reflexed.
  Spikes ovoid or ellipsoid to cylindric, or narrowed near the base.
    Spikes large, 2 cm. thick or more. 43. *C. lancastriensis.*
    Spikes small, less than 1.5 cm. thick.
      Spikes narrowly obovoid or cylindric-obovoid, the basal spikelets only reflexed. 44. *C. retrorsus.*
      Spikes ellipsoid to cylindric.
        Spikelets 4.5 mm. long or less.
          Spikelets 1–2-flowered: rachis-wings broad.
            Spikes ellipsoid, sometimes narrowly so, simple: spikelets 3–4 mm. long, green. 45. *C. Torreyi.*
            Spikes cylindric, the larger ones, at least, compound: spikelets 2.5–3 mm. long, stramineous. 46. *C. Deeringianus.*
          Spikelets 3–4-flowered: rachis-wings very narrow. 47. *C. Pollardi.*
        Spikelets 5 mm. long or more.
          Spikes stramineous: scales 1.5–2 mm. long, lax. 48. *C. Winkleri.*
          Spikes green: scales 2.5–3 mm. long, closely appressed. 49. *C. Plankii.*
  Spikes globose. 50. *C. ovularis.*

XVII. Tetragoni

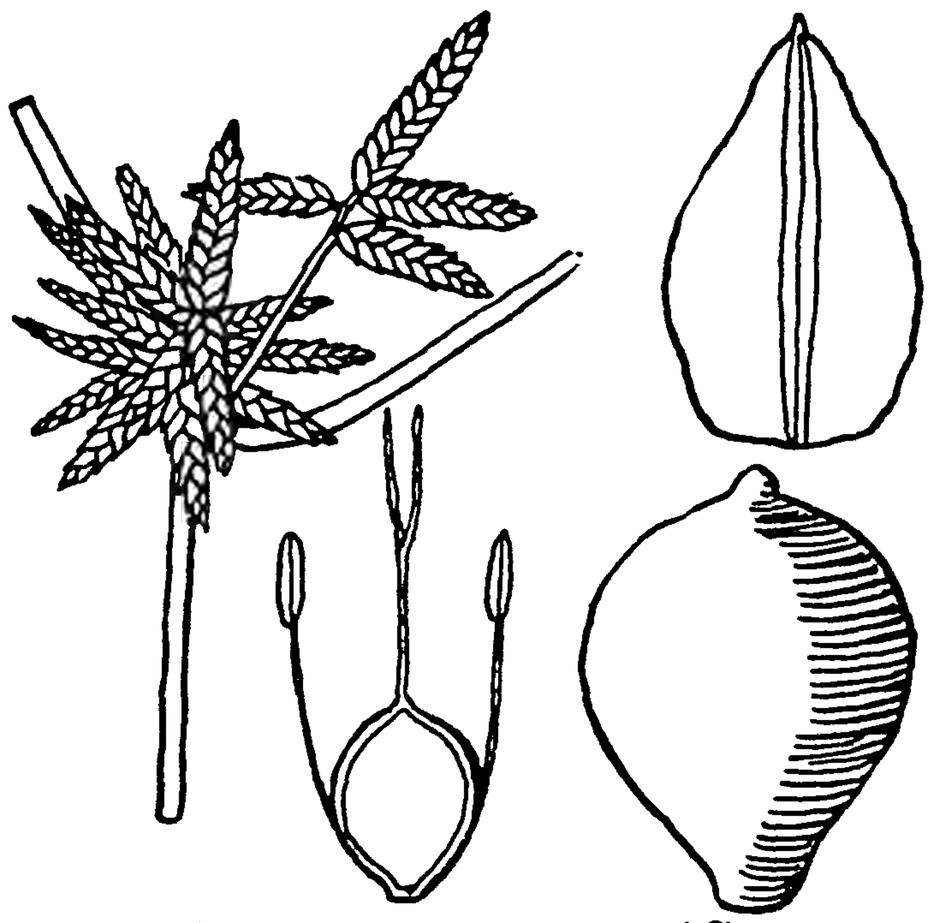
Spikelets few-flowered, bearing 1–4 achenes; scales appressed.
  Spikes dense, the spikelets usually crowded together.
    Spikes umbellate, oval, ellipsoid, globose, or depressed: spikelets subulate.
      Spikes simple, or sometimes with a small cluster at the base.
        Spikes ellipsoid or oval. 51. *C. Nashii.*

Spikes globose or depressed, or globose-ovoid. 52. *C. globulosus.*
Spikes paniculately branched, compound. 53. *C. ligularis.*
Spikes capitate, cylindric: spikelets ellipsoid or ellipsoid-ovoid. 54. *C. cayennensis.*
Spikes lax or stiff, the spikelets loosely spreading.
Spikelets slender, linear-subulate to subulate, 4–8 times as long as wide.
Spikelets contiguous on the rachis; scales over 3 mm. long. 55. *C. hermaphroditus.*
Spikelets separated on the rachis; scales less than 3 mm. long. 56. *C. dissitiflorus.*
Spikelets stout, linear-elliptic to elliptic, 2–3 times as long as wide. 57. *C. tetragonus.*
Spikelets several to many-flowered, bearing 8–12 achenes: scales not appressed.
Spikelets green or yellowish-green.
Spikelets less than 2 mm. wide: achene ellipsoid, about 0.5 mm. wide. 58. *C. multiflorus.*
Spikelets 2–3 mm. wide: achene obovoid, about 1 mm. wide. 59. *C. filiculmis.*
Spikelets chestnut-colored, pale or dark.
Rachis-wings obsolete or very narrow.
Inflorescence branched: spikelet-rachis slender. 60. *C. Blodgettii.*
Inflorescence a single sessile head: spikelet-rachis stout. 61. *C. fuligineus.*
Rachis-wings broad, partly enveloping the achene. 62. *C. brunneus.*

XVIII. Speciosi

Scales of the spikelets distant, the successive scales on either side remote from the bases of those above them: achene linear-ellipsoid. 63. *C. Engelmannii.*
Scales of the spikelets manifestly imbricate: achene broader.
Achene ellipsoid, narrowly obovoid, or ellipsoid-obovoid, inequilateral.
Spikes yellowish or grayish-brown; scales firm: achene obovoid, sometimes narrowly so. 64. *C. ferax.*
Spikes dull-brown; scales thin: achene ellipsoid or ellipsoid-obovoid. 65. *C. speciosus.*
Achene broadly obovoid or obpyramidal, equilateral. 66. *C. longispicatus.*

1. C. flavescens L. Plant annual, tufted, up to 4 dm. tall, yellowish-green: spikelets clustered, linear, 8–18 mm. long, straw-colored: scales ovate, about 2 mm. long, obtuse or obtusish, appressed: achene orbicular-obovoid, or suborbicular, 1 mm. long, about ½ as long as the scale, black.—Low and marshy places, various provinces, Fla. to Tex., Mich., and N. Y.—(*W. I., Mex., C. A., O. W.*)



2. C. diandrus Torr. Plant annual, tufted, up to 4 dm. tall, deep-green: spikelets clustered, elliptic-ovate or linear-elliptic, 8–18 mm. long, dull: scales thin, ovate, about 3 mm. long, brown-margined and more or less brown-spotted, obtuse, loosely appressed: stigmas conspicuously exserted from the scales: achene obovoid, often broadly so, fully 1 mm. long, about ½ as long as the scale, brown or gray.—(Cypress-grass.)—Low grounds, swamps, and marshes, various provinces, Ala. to Nebr., Ont., and N. B.

3. C. rivularis Kunth. Similar to *C. diandrus* in habit: spikelets clustered, ovate, elliptic, or broadly linear, 8–20 mm. long, somewhat shining: scales firm, ovate or rhombic-ovate, about 3 mm. long, with broad brown margins or brown, or rarely pale, obtuse, appressed: stigmas slightly exserted: achene broadly obovoid, fully 1 mm. long, about ½ as long as the scale, brown.—Wet soil or low ground, chiefly along streams or ponds, various provinces, N. C. to Ark., Nebr., Ont., and Me.

4. **C. densus** Link. Plant annual, sparingly tufted, up to 7 dm. tall, bright-green: spikelets clustered, sometimes densely so, linear to lanceolate, 5–9 mm. long, straw-colored or yellowish-green: scales thinnish, ovate, about 2 mm. long, obtuse, appressed, sometimes loosely so: achene oval or ellipsoid-obovate, about 1 mm. long, ½ as long as the scale, brown.—Ditches and moist ground, or sometimes epiphytic, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)

5. **C. filicinus** Vahl. Plant annual, tufted, up to 3 dm. tall, yellowish-green: spikelets rather loosely clustered, linear to linear-lanceolate, 9–30 mm. long, mainly yellowish-brown: scales firm, ovate or somewhat rhombic, about 3 mm. long, mucronulate, loosely appressed: achene obovate or narrowly obovate, nearly 1.5 mm. long, obtuse or truncate at the apex, light-brown, ½ as long as the scale or nearly so.—The plant of the Southern States has narrower spikelets and narrower achenes. [*C. Nuttallii* Eddy]—Salty and brackish marshes, and low grounds, Coastal Plain and New England Coast, Fla. to Miss. and Me.—(*W. I.*)

6. **C. microdontus** Torr. Plant annual, tufted, up to 7 dm. tall, yellowish-green: spikelets clustered, linear, often narrowly so, 6–18 mm. long, yellowish-brown: scales thin, ovate, about 1.5 mm. long or rarely nearly 2 mm. long, obtuse, notched, or abruptly pointed, rather loosely appressed: achene ellipsoid, about 1 mm. long, mucronulate, grayish, fully ½ as long as the scale.—Moist to wet ground, Coastal Plain and adj. provinces, Fla. to Tex. and N. J.

7. **C. paniculatus** Rottb. Plant annual, tufted, up to 6 dm. tall, bright-green: spikelets clustered, narrowly linear to narrowly linear-lanceolate, 6–18 mm. long, pale chestnut-brown: scales rather firm, elliptic to ovate, 1.5–2 mm. long, or rarely longer, mucronulate: achene ellipsoid-obovate, about 1 mm. long, mucronulate, about ½ as long as the scale, grayish. [*C. Gatesii* Torr.]—Low grounds and springy places, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and Va.—(*W. I., Mex., C. A., S. A.*)

8. **C. odoratus** L. Plant annual, tufted, up to 9 dm. tall, pale-green: spikelets crowded, linear-lanceolate to narrowly linear, 6–20 mm. long, gray-brown or straw-colored: scales ovate, 1.5–2 mm. long, mucronulate, appressed: achene ellipsoid or nearly so, often contracted at the base, about 1 mm. long, rounded at the apex, over ½ as long as the scale, grayish. [*C. polystachys* Rottb.]—Ditches and low grounds, Coastal Plain, Fla. to Tex.—(*W. I., Mex., S. A., O. W.*)

9. **C. pumilus** L. Plant annual, densely tufted, up to 3 dm. tall, pale-green: spikelets crowded, sometimes loosely so, linear, 4–9 mm. long, silvery-gray: scales ovate, 1.5 mm. long, prominently short-pointed, appressed: achene obovate, about 0.5 mm. long, truncate and mucronulate at the apex, less than ½ as long as the scale.—Sandy, often wet soil, Coastal Plain, Fla. and Ala.—(*W. I., O. W.*)

10. **C. sabulosus** Mart. & Schrad. Plant annual, sometimes tufted, up to 10 dm. tall, often yellowish-green: spikelets densely clustered, linear, 8–20 mm. long, yellowish-brown: scales oval or suborbicular, about 1.5 mm. long, truncate at the apex, appressed: achene obovate, nearly 1.5 mm. long, mucronate, black, as long as the scale or nearly so. [*C. flavicomus* Vahl]—Moist to wet sandy soil, Coastal Plain, Fla. to Tex. and Va.

11. **C. laevigatus** L. Plant perennial, tufted or gregarious, up to 4 dm. tall, light-green: bracts of the involucre very unequal, one only conspicuous and elongate, erect or nearly so: spikelets crowded, usually in a single head, oblong-ovate to elliptic or linear, 6–15 mm. long, chestnut, or merely variegated with chestnut: scales deltoid-ovate, nearly 2 mm. long, obtuse or acutish, appressed:

achene oval to oval-ovoid or somewhat obovate, less than 1.5 mm. long, or rarely larger, fully ½ as long as the scale.—Sandy, often moist, soil, Coastal Plain, S. C. and N. C. Introduced in Calif.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*, *O. W.*)

12. C. Careyi Britton. Plant annual, tufted, up to 1 dm. tall, pale-green: bracts of the involucre elongate, mostly 1–2.5 mm. wide: spikelets crowded in a head, ovate-elliptic to elliptic, 3–4 mm. long, silvery or whitish: scales ovate, 2–2.5 mm. long, abruptly pointed, appressed: achene ellipsoid or obovoid-ellipsoid.—Sandy soil, M Fla.

13. C. inflexus Muhl. Plant annual, tufted, up to 1.5 dm. tall, bright-green, fragrant: spikelets densely crowded, linear-elliptic or elliptic, 3–9 mm. long, light-brown: scales less than 2 mm. long, rather lax, the subulate awn much shorter than the striate body: achene cuneate-obovoid, about 1 mm. long, abruptly short-beaked, brown, less than ½ as long as the scale.—Damp to wet sandy soil, rocks, and shores, various provinces, Fla. to Tex., Calif., B. C., Sask., and N. B.—(*Mex.*)

14. C. cuspidatus H. B. K. Plant annual, tufted, up to 1.5 dm. tall, bright-green, licorice-scented: spikelets loosely capitate, linear, 5–12 mm. long, often curved, light-chestnut: scales about 2 mm. long, lax, the subulate awn nearly or quite as long as the body: achene obovoid, about 0.5 mm. long, dark-brown, minutely beaked, less than ½ as long as the scale. [*C. squarrosus* (Fl. SE. U. S.)]—Sandy fields and pinelands, Coastal Plain, Fla. to Tex. and Ga. Introduced in Calif.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)

15. C. compressus L. Plant annual, tufted, up to 3.5 dm. tall, with the scapes sometimes reclining, light-green: spikelets loosely capitate, but stiff, narrowly lanceolate or narrowly elliptic to linear, 7–25 mm. long, mainly greenish, often shining: scales ovate to ovate-lanceolate, 3–3.5 mm. long, somewhat acuminate, appressed: achene obovoid, fully 1 mm. long, rounded at the apex, dull-brown, less than ½ as long as the scale.—Sandy roadsides, pinelands, and fields, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Pa.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*, *O. W.*)

16. C. Iria L. Plant annual, up to 6 dm. tall, sometimes tufted, bright-green: spikelets in plume-like clusters, elliptic, mostly 5–10 mm. long, about 2 mm. wide, yellowish or brownish: scales thin, obovate or nearly orbicular, 1–1.5 mm. long, mucronulate: achene elliptic-obovoid, 1–1.5 mm. long, abruptly pointed, as long as the scale or longer.—Swamps and cult. grounds, especially about rice-fields, Coastal Plain and adj. provinces, Fla. to Tex. and N. C.; also S N. Y.—Nat. of Asia.

17. C. elegans L. Plant perennial, tufted, up to 7 dm. tall, pale-green: spikelets densely crowded, linear-elliptic, 6–12 mm. long, light tan-colored or pale-green: scales rhombic-ovate, 2.5–3 mm. long, scabrous on the back, acute, loosely appressed: achene obpyramidal (or obovoid), fully 1.5 mm. long, gray, short-beaked, about ½ as long as the scale.—Sandy soil or marl, Key West and Big Pine Key, Fla.; also in Tex. and N. M.—(*W. I.*, *Mex.*, *C. A.*)

18. C. ochraceus Vahl. Plant perennial, up to 12 dm. tall, bright- or yellowish-green, the scapes smooth: spikelets densely clustered, linear-elliptic to linear-lanceolate, 5–12 mm. long, 2–3 mm. wide, yellowish: scales ovate, 2–2.5 mm. long, obtuse: achene fully 1 mm. long, the body ovoid, contracted at both ends, over ½ as long as the scale.—Moist slopes, swamps, and ponds, Coastal Plain, Fla. to Tex.—(*W. I.*, *Mex.*, *C. A.*)

19. C. virens Michx. Plant perennial, up to 15 dm. tall, often tufted, pale-green: spikelets crowded in rather large clusters, ovate to elliptic-ovate, rela-

tively narrower in age, 6–14 mm. long, 3–4 mm. wide, pale-green: scales elliptic-lanceolate, about 2.5 mm. long, obtuse or acutish, nearly straight: achene narrowly ellipsoid, about 1.5 mm. long, short-stipitate and short-beaked, straight, fully ½ as long as the scale.—Damp soil, low grounds, and swamps, Coastal Plain, Fla. to Tex. and N. C.; also in Calif.—(*W. I., Mex., C. A.*)—Specimens occur with nodose leaves and smooth.

20. **C. pseudovegetus** Steud. Plant perennial, up to 13 dm. tall, sometimes tufted, pale-green: spikelets crowded in rather small clusters, ovate to orbicular, relatively narrower in age, 4–6 mm. long, 4–5 mm. wide, light-green: scales lanceolate, about 2 mm. long, acute or acutish, strongly curved: achene linear, fully 1 mm. long, slender-stipitate and slender-beaked, often curved, over ½ as long as the scale.—Wet places, swamps, low woods, and ditches, Coastal Plain and adj. provinces, Fla. to Tex., Kans., and N. J.—(*W. I.*)

21. **C. surinamensis** Rottb. Plant perennial, up to 12 dm. tall, solitary or tufted, pale-green, the scape rough above: spikelets clustered in rather small dense heads, ovate, narrower and elongate in age, 5–12 mm. long, 2–2.5 mm. wide, yellow or yellowish: scales ovate, about 1.5 mm. long, acute or acutish, straight: achene ellipsoid, less than 1 mm. long, short-stipitate and short-beaked, straight, about ½ as long as the scale.—Moist grounds, swamps, roadsides, and ditches, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)

22. **C. distans** L. Plant perennial, up to 15 dm. tall, commonly gregarious, light-green: spikelets in lax irregular spikes, linear-filiform, very slender, 9–25 mm. long, less than 1 mm. wide, chestnut-colored: scales elliptic, about 2 mm. long, obtuse or truncate at the apex, loosely imbricate at maturity: achene ellipsoid or ellipsoid-obovoid, about 1.5 mm. long, acute, somewhat shorter than the scale.—Banks, wet woods, and swamps, Coastal Plain and adjacent Piedmont, Ga. to N. C.—(*W. I., Mex., C. A., S. A., O. W.*)

23. **C. Haspan** L. Plant perennial, up to 11 dm. tall, tufted or gregarious, the scape smooth: spikelets few together in usually numerous lax spikes, on stiff stalks, linear to linear-lanceolate, 6–12 mm. long, about 1 mm. wide, mostly reddish-brown: scales elliptic, elliptic-lanceolate, or ovate, about 1.5 mm. long, often mucronulate, loosely appressed: achene pale, the body oval, suborbicular, or broadly obovate, about 0.5 mm. long, mucronulate, about ½ as long as the scale.—Wet pinelands, swamps, and ponds, Coastal Plain and adj. provinces, Fla. to Tex. and Va.—(*W. I., Mex., C. A., S. A., O. W.*)

24. **C. alternifolius** L. Plant perennial, up to 20 dm. tall, often tufted, bright-green, the leaves represented by basal sheaths: spikelets rather numerous in head-like spikes which terminate slender curved or drooping stalks, ovate to elliptic, or rarely narrower, 4–9 mm. long, 2–2.5 mm. wide, pale: scales ovate or ovate-lanceolate, about 2 mm. long, acute or acutish, ascending or spreading: achene brown, the body obovoid or oval, over 0.5 mm. long, mucronulate, about ⅓ as long as the scale.—(UMBRELLA-SEDGE. UMBRELLA-PLANT.)—Swamps, pen. Fla. Nat. of Africa.—(*W. I.*)—Frequently cultivated as an ornamental plant.

25. **C. dentatus** Torr. Plant perennial, 2–5 dm. tall, somewhat tufted, bright-green: spikelets in rather lax clusters, linear to linear-lanceolate, 9–12 mm. long, 2–2.5 mm. wide or wider, reddish-brown: scales ovate to ovate-lanceolate, about 2.5 mm. long, mucronate, the tip not appressed: achene obovoid or globose-obovoid, less than 1 mm. long, mucronate, short-stipitate, about ⅓ as long as the scale.—Sandy, often acid swamps and river shores, various provinces, S. C. to Ind., N. Y., and Me. Introd. in Ala.

26. **C. LeContei** Torr. Plant perennial, up to 4 dm. tall, solitary or gregarious, yellowish-green: spikelets in lax clusters, lanceolate to linear, 10–30

mm. long, 3–4 mm. wide, yellow: scales ovate, 3 mm. long or less, blunt, hooded at the apex, the tips appressed: achene ovoid or oval, 1 mm. long or less, mucronulate, nearly sessile, less than ½ as long as the scale. [*C. dentatus multiradiatus* Torr.]—Pinelands, sand-dunes, low grounds, and pond-margins, Coastal Plain, Fla. to La.

27. C. rotundus L. Plant perennial by tuberous rootstocks, 2–6 dm. tall, gregarious, deep-green: spikelets in lax clusters, linear, often narrowly so, 8–30 mm. long, 2–3 mm. wide, mainly purple-brown: scales ovate to elliptic-ovate, acute or blunt, the tips appressed: achene obovoid, 1–1.5 mm. long, mucronate, about ½ as long as the scale.—(NUT-GRASS. COCO-GRASS.)—Sandy fields, lawns, and roadsides, Coastal Plain, Fla. to Tex. and Va. Nat. of the trop.—(*W. I., Mex., C. A., S. A., O. W.*)—Often becomes a troublesome weed through spreading by tuberiferous rootstocks, which are edible.

28. C. esculentus L. Plant perennial by tuber-bearing rootstocks, up to 1 m. tall, tufted or gregarious, bright-green: spikelets in lax spikes or panicles, lanceolate to linear-lanceolate or linear, 9–15 mm. long, or rarely longer, 2–3 mm. wide, stramineous or yellowish-brown: scales ovate to elliptic-ovate, 2–3 mm. long acutish, the tip rather long: achene obovoid or ellipsoid, nearly 1.5–2 mm. long, mucronate, somewhat shorter than the scale. [*C. phymatoides* Muhl.]—(CHUFA. EARTH-ALMOND. YELLOW NUT-GRASS.)—Low grounds, moist fields, river-banks, roadsides, and ditches, various provinces, Fla. to Tex., Minn., and N. B.; also W N. A.—(*W. I., Mex. ,C. A., O. W.*)—Sometimes a troublesome weed. Cultivated for hogs, on account of the tuberiferous rootstocks which are edible.

29. C. lutescens Torr. & Hook. Plant perennial by elongate, often tuber-bearing, rootstocks, gregarious, mostly 3–9 dm. tall, bright-green: spikelets in lax spikes or panicles, narrowly linear, often curved, 20–40 mm. long or sometimes shorter, 1.5–2.5 mm. wide, stramineous: scales ovate, 3–3.5 mm. long, rounded at the apex or abruptly pointed, the tips becoming lax: achene ellipsoid-obovoid, nearly 2 mm. long, mucronate, about ½ as long as the scale.—Dry sandy soil and swamps, Coastal Plain, Fla. to Tex.—(*Mex., C. A., S. A.*)

30. C. articulatus L. Plant perennial, up to 20 dm. tall, gregarious, the nearly terete scape smooth, the leaves mostly represented by basal sheaths: bracts of the involucre very short: spikelets in lax umbel-like spikes, narrowly linear, 20–50 mm. long, or sometimes shorter, mostly 1–2 mm. wide, stramineous: scales mainly ovate, 3–4 mm. long, acutish or blunt, appressed or becoming lax: achene ellipsoid to cuneate-ellipsoid, 1.5 mm. long or nearly so, mucronate, about ½ as long as the scale.—Calcareous swamps, ponds, lakes, and creeks, Coastal Plain, Fla. to Tex. and S. C.—(*W. I., Mex., C. A., S. A., O. W.*)

31. C. erythrorhizos Muhl. Plant annual, 1–5 dm. tall, solitary or gregarious, the scape rough-angled above: bracts of the involucre elongate: spikelets in dense spikes or panicles, linear, 6–25 mm. long, 1–1.5 mm. wide, chestnut-brown: scales ovate, or sometimes elliptic-lanceolate, about 1.5 mm. long, obtuse or abruptly pointed, the tips scarcely lax: achene obovoid, nearly 1 mm. long, slightly mucronate, fully ½ as long as the scale.—Swamps, river-banks, and wet soil, various provinces, Fla. to Tex., Calif., Minn., Ont., and Mass.

32. C. Halei Torr. Plant annual, up to 1 m. tall, tufted or gregarious, bright-green: spikelets crowded in cylindric spikes, linear, 3–5 mm. long, about 1 mm. wide, brown: scales broadly elliptic or obovate, 1–1.5 mm. long, mucronulate, the tips becoming somewhat lax: achene obovoid, about 1 mm. long, as long as the scale or nearly so.—River banks and swamps, Coastal Plain, Fla. to La., and perhaps in the Miss. Valley.

33. C. Martindalei Britton. Plant perennial, 2–7 dm. tall, tufted, bright-green: spikelets crowded in capitate spikes, linear or nearly so, 6–10 mm. long, 2–3 mm. wide, yellowish-green: scales thick, broadly elliptic or elliptic-ovate, 2.5–3 mm. long, notched, mucronulate, or eroded at the apex, loosely imbricate: achene ellipsoid, 2–2.5 mm. long, abruptly pointed, somewhat shorter than the scale.—Pinelands, sand-hills, and dry woods, Coastal Plain, Fla. to La. and S. C.

34. C. litoreus (Clarke) Britton. Plant perennial, up to 5 dm. tall, sparingly tufted, light-green: spikelets in dense capitate spikes, narrowly linear, 9–12 mm. long, greenish: scales thin, ovate to elliptic-ovate, 2.5–3 mm. long or smaller, mucronate, loosely imbricate: achene linear-ellipsoid, about 1.5 mm. long, minutely pointed, fully ½ as long as the scale.—Hammocks, Long Key, Fla.

35. C. strigosus L. Plant perennial, 1–9 dm. tall, gregarious or somewhat tufted, bright-green: spikelets in rather dense spikes or panicles, linear, 7–19 mm. long, about 1.5 mm. wide, stramineous: scales elliptic-lanceolate, 4–5 mm. long, mucronate, usually appressed: achene linear-ellipsoid, about 2 mm. long, abruptly pointed at the apex, constricted at the base, about ⅓ as long as the scale or more.—Meadows, swamps, fields, and waste-places, various provinces, Fla. to Tex., Minn., Ont., and Me.—Often very persistent on account of the tuberiferous rootstocks. Several forms differing in size and habit have been given names.

36. C. stenolepis Torr. Plant perennial, up to 12 dm. tall, often gregarious, bright-green: spikelets in rather dense spikes or panicles, linear, 9–20 mm. long, mostly 1.5–2.5 mm. wide. stramineous: scales linear to linear-lanceolate, 4–5 mm. long, somewhat lax at maturity: achene narrowly ellipsoid or linear-ellipsoid, about 2 mm. long, abruptly pointed at the apex, constricted at the base, less than ½ as long as the scale.—Swamps and low grounds, Coastal Plain, Fla. to Tex. and N. C.

37. C. praelongatus Steud. Plant perennial, up to 1 m. tall, sometimes tufted, bright-green: spikelets in rather lax spikes or panicles, linear-subulate or nearly subulate, 8–14 mm. long, 1 mm. wide or less, green or somewhat stramineous: scales lanceolate, 4–5 mm. long, mucronate, closely imbricate: achene ellipsoid or nearly so, 1.5–2 mm. long, abruptly pointed, less than ½ as long as the scale.—Low grounds, Coastal Plain and adj. provinces, Miss. to Tex. and Tenn.—(*Mex.*)

38. C. refractus Engelm. Plant perennial, 2–9 dm. tall, solitary or gregarious, bright-green: spikelets in lax spikes or panicles, very narrowly linear or subulate, 9–30 mm. long, fully 1 mm. wide or less, yellowish-green; scales oblong-lanceolate to linear, 6–7 mm. long, obtuse, closely appressed: achene linear, 2.5–3 mm. long, abruptly pointed at the apex, constricted at the base, fully ½ as long as the scale.—Dry woods, fields, river-banks, and swamps, Coastal Plain and rarely more N provinces, Fla. to Tex., Mo., and N. J.

39. C. floridanus Britton. Plant perennial, 1–7 dm. tall, tufted, bright-green: bracts of the involucre smooth, involute: spikelets in capitate sessile spikes, linear-subulate, 6–10 mm. long, 1 mm. wide or less, chestnut-brown: scales broadly elliptic to ovate-elliptic, about 2 mm. long, blunt, closely imbricate: achene ellipsoid or nearly so, about 1.5 mm. long, abruptly pointed, nearly as long as the scale.—Sandy soil, Everglade Keys, pen. Fla. and Florida Keys.—(*W. I.*)

40. C. retrofractus (L.) Torr. Plant perennial, up to 1 m. tall, solitary or gregarious, grayish-green: bracts of the involucre smooth or nearly so, often as long as the inflorescence, pubescent: spikelets crowded in turbinate or obovate turbinate spikes, subulate, 5–7 mm. long, less than 1 mm. wide, green-

ish or drab: scales mostly 4 or 5, various, the lower ones short and broad, the upper long and narrow, closely appressed: achene linear, 2.5–3 mm. long, abruptly pointed at the apex, constricted at the base, over ½ as long as the scale.—Sandy and rocky soil, and dry woods, Coastal Plain and occasionally more N provinces, Fla. to Tex., Mo., and N. J.

41. **C. dipsaciformis** Fernald. Plant perennial, 2–8 dm. tall, the scape rough, at least above: bracts of the involucre shorter than the inflorescence, or longer, often sparingly pubescent: spikelets rather crowded in obovate or cylindric-obovate spikes, subulate, 5–11 mm. long, yellowish or brownish: scales mostly 4–6, various, the lower ones short and broad, the upper long and narrow: achene linear, about 3 mm. long, abruptly pointed at the apex, slightly constricted at the base, fully ½ as long as the scale.—Dry, often acid, sandy soil, and woods, Coastal Plain and adj. provinces, Ga. to Ky. and N. J.

42. **C. hystricinus** Fernald. Plant perennial, 3–8 dm. tall, the scape smooth: bracts of the involucre smooth: spikes oval or obovoid, 1.5–3 cm. long: spikelets subulate, 4–10 mm. long, becoming golden-brown, the lower ones reflexed: scales few, subulate or linear-subulate, 3–5 mm. long, or shorter at the base of the spikelet, acute: achene linear, 2–2.5 mm. long, abruptly pointed at the apex, somewhat constricted at the base, much shorter than the scales.—Dry sandy soil and pinelands, Coastal Plain, Ga. to Tex., Ark., and N. J.

43. **C. lancastriensis** Porter. Plant perennial, up to 8 dm. tall, tufted or gregarious, bright-green: spikes oval or nearly so, 1–2.5 cm. long, not very dense: spikelets linear-subulate, 8–10 mm. long, 2–4-flowered, pale-green: scales few, oblong to oblong-lanceolate, 4–5 mm. long, acute or acutish, appressed: achene linear-ellipsoid, 2–2.5 mm. long or rarely larger, abruptly pointed, about ½ as long as the scale or more.—Fields and river-banks, various provinces, Ga. to Ark., Pa., and N. J.

44. **C. retrorsus** Chapm. Plant perennial, 2–7 dm. tall, the scapes smooth: spikes narrowly obovoid or cylindric-obovoid, 1–1.5 mm. long, dense, sometimes compound: spikelets subulate, 2–3 mm. long, the lower one becoming reflexed: scales few, oblong, 2–3 mm. long, closely appressed: achene broadly ellipsoid, less than 2 mm. long, abruptly pointed, somewhat shorter than the scale.—Sandy soil, pinelands, and cult. grounds, Coastal Plain, Fla. to Miss. and Ga.

45. **C. Torreyi** Britton. Plant perennial, 1–5 dm. tall, often sparingly tufted: spikes ellipsoid, often narrowly so, 1.5 cm. long or less, dense: spikelets linear-subulate, 3–4 mm. long, 1 mm. wide or less, 1–2-flowered, green: scales few, ovate, 2.5–3 mm. long, often notched and mucronulate at the apex, appressed: achene ellipsoid, fully 1.5 mm. long, abruptly pointed at the apex, constricted at the base, fully ½ as long as the scale. [*C. cylindricus* (Ell.) Britton.]—Sandy, often acid, soil, low grounds, and pond margins, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and S N. Y.—(*W. I.*)

46. **C. Deeringianus** Britton & Small. Plant perennial, 4–12 dm. tall, yellowish-green: spikes cylindric, 1–3 cm. long, very dense, the main ones usually compound: spikelets subulate, 3–4 mm. long, fully 0.5 mm. wide, 1–2-flowered, yellowish: scales usually 3, ovate, 2–2.5 mm. long, mucronulate, appressed: achene narrowly ellipsoid, less than 1.5 mm. long, abruptly pointed at the apex, somewhat constricted at the base, about ⅔ as long as the scale. [*C. cylindrostachys* (Fl. SE. U. S.)]—Pinelands, prairies, swamps, hammocks, and marshes, Coastal Plain, Fla. to Miss. and Ga.

47. **C. Pollardi** Britton. Plant perennial, up to 13 dm. tall, bright-green: spikes cylindric to ellipsoid, 1–2 cm. long, dense: spikelets linear, 3–4.5 mm. long, 1–1.5 mm. wide, green: scales few, elliptic to ovate-elliptic, 2–2.5 mm.

long, often abruptly pointed, rather lax: achene linear-ellipsoid, about 1.5 mm. long, abruptly pointed, over ½ as long as the scale.—Pinelands, hammocks, swamps, and salt-marshes, Fla.—(*W. I.*)

48. C. Winkleri Britton & Small. Plant perennial, tall, often tufted, light-green: spikes ellipsoid, 1–1.5 cm. long, dense: spikelets linear-subulate, 5–6 mm. long, mostly 5–6-flowered, stramineous: scales mostly 6 or 7, ovate, 1.5–2 mm. long, mucronulate: achene narrowly ellipsoid, slightly over 1 mm. long, abruptly pointed, about ⅔ as long as the scale.—Humbuggus prairie, Dade Co., Fla.

49. C. Plankii Britton. Plant perennial, stouter than *C. Torreyi*, bright-green: spikes cylindric or ellipsoid-cylindric, 1.5–2 cm. long, very dense: spikelets subulate, 5–7 mm. long, mostly 4- or 5-flowered, sometimes fewer-flowered, green: scales few, ovate, 2.5–3 mm. long, abruptly pointed: achene ellipsoid or linear-ellipsoid, about 1.5 mm. long, abruptly pointed, fully ½ as long as the scale—Low grounds, Coastal Plain and adj. provinces, Miss. to Tex. and Okla.

50. C. ovularis (Michx.) Torr. Plant perennial, 1–8 dm. tall, often tufted, the scape smooth: spikelets compactly crowded in globular capitate spikes, linear or elliptic, 3–7 mm. long, greenish: scales ovate to ovate-lanceolate or lanceolate, the upper ones 3–5 mm. long (7–11 mm. long and spikes larger in *C. ovularis robustus*), appressed: achene linear-ellipsoid or ellipsoid-obovoid, 2–2.5 mm. long, or rarely smaller, abruptly pointed, fully ½ as long as the scale.—Dry fields, woods, and hillsides, various provinces, Fla. to Tex., Kans., Ill., and N. Y.

51. C. Nashii Britton. Plant perennial, up to 11 dm. tall, bright-green: spikes ellipsoid to oval, 1 cm. long or less, dense, often compound: spikelets subulate, 2–3 mm. long, less than 1 mm. wide, green or yellowish-green: scales few, elliptic-ovate, 2.5–3 mm. long, often notched at the broad apex, appressed: achene ellipsoid-linear or ellipsoid, about 2 mm. long, somewhat shorter than the scale.—Pinelands and sandy soil, pen. Fla.

52. C. globulosus Aubl. Plant perennial, 1–6 dm. tall, often gregarious or tufted, bright-green: spikelets in rather compact capitate spikes, linear-subulate, 4–8 mm. long, fully 1 mm. wide, scarcely flattened, green: scales few, ovate-lanceolate, mostly 3–4 mm. long, acute, appressed: achene ellipsoid-obovoid or ellipsoid, about 1.5 mm. long, abruptly pointed at the apex, constricted at the base, fully ½ as long as the scale. [*C. echinatus* (Ell.) Wood.]—Pinelands, woods, and sandy soil, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Va.—(*W. I.*)—The related *C. Grayi* Torr. of northern regions has been recorded from the Southern States, but apparently erroneously.

53. C. ligularis L. Plant perennial, up to 13 dm. tall, sometimes clustered, glaucous: spikes cylindric or ellipsoid, mostly 1–2.5 cm. long, dense, sometimes crowded: spikelets elliptic or ovate-elliptic, 3–6 mm. long, 1.5–2 mm. wide, gray to green: scales ovate to oval, 2–2.5 mm. long, obtuse or mucronulate: achene ellipsoid or obovoid, 1.5 mm. long or nearly so, acute, fully ½ as long as the scale.—Swamps, hammocks, and sandy places, Fla. and coast of Ala.—(*W. I., Mex., C. A., S. A., O. W.*)

54. C. cayennensis (L.) Britton. Plant perennial, up to 7 dm. tall, often tufted, bright-green: spikes cylindric, mostly 1–2.5 cm. long, dense, sessile or nearly so and clustered in the involucre: spikelets ellipsoid or ellipsoid-ovoid, 3–5 mm. long, yellowish or light-chestnut: scales ovate to elliptic, 2–3.5 mm. long, mucronate, appressed: achene obovoid, about 2 mm. long, mucronulate, fully ½ as long as the scale.—Fields, ditches, swamps, and waste-places, Mississippi River delta, La. and Coastal Plain, Tex.—(*W. I., Mex., C. A., S. A.*)—A plant collected at St. Augustine in 1876 by A. P. Garber has the spikes capitate as in this species; but the spikelets are very slender and the achene is linear-ellipsoid.

55. C. hermaphroditus (Jacq.) Britton. Plant perennial, up to 8 dm. tall, often sparingly tufted, bright-green: spikes stiff, ellipsoid to cylindric: spikelets linear-subulate, 5–9 mm. long, less than 1 mm. wide, green or yellowish: scales mainly elliptic, fully 3–4 mm. long, rounded or acutish, appressed: achene ellipsoid, 1.5–2 mm. long, mucronulate, fully ½ as long as the scale.—Wet stream-banks and swamps, Coastal Plain, Ala.—(*W. I., Mex., C. A., S. A.*)

56. C. dissitiflorus Torr. Plant perennial, up to 9 dm. tall, sometimes sparingly tufted, bright-green: spikelets linear-subulate, 5–8 mm. long, 1–1.5 mm. wide, chestnut-colored: scales ovate to elliptic, 2.5–3 mm. long, rounded or abruptly pointed at the apex, closely imbricate: achene ellipsoid or slightly broadened upward, 1.5 mm. long, abruptly pointed, fully ½ as long as the scale.—Sandy soil and waste-places, Coastal Plain, Fla. to Tex.

57. C. tetragonus Ell. Plant perennial, 2–11 dm. tall, often solitary: spikes cylindric, 1–4 cm. long, not dense: spikelets linear-elliptic to elliptic, 3–6 mm. long, 1.5–2 mm. wide, chestnut-colored: scales oblong to ovate, 2.5–3.5 mm. long, blunt or mucronate, loosely appressed: achene ellipsoid, sometimes broadly so, 2 mm. long or nearly so, often slightly curved, much shorter than the scale.—Dry sandy soil, swamps, and hammocks, Coastal Plain, Fla. to Tex. and N. C.

58. C. multiflorus (Britton) Small. Plant perennial, 2–7 dm. tall, tufted or gregarious, bright-green: spikelets crowded in short often depressed capitate spikes, linear, mostly 10–25 mm. long, fully 1.5 mm. wide, flat, green: scales numerous, ovate to elliptic-ovate, the lower ones 2–2.5 mm. long, the upper 3–4 mm. long, obscurely mucronulate, lax, the tip, at least, somewhat spreading: achene ellipsoid, somewhat inequilateral, fully 1.5–2 mm. long, abruptly pointed at the apex, constricted at the base, the lower ones nearly as long as the scale, the upper fully ½ as long.—Sandy soil, Coastal Plain, Fla. to Tex.—(*W. I.*)

59. C. filiculmis Vahl. Plant perennial, 1–6 dm. tall, the scapes sometimes reclining: spikes capitate, all sessile in the involucre or some slender-stalked: spikelets linear, 9–21 mm. long, 2–3 mm. wide, 8–16-flowered, (4–8-flowered and spikelets 3–8 mm. long in *C. filiculmis macilentus*), yellowish-green or pale-green: scales ovate or elliptic, 3–3.5 mm. long, often mucronulate, loosely appressed: achene obovoid, about 2 mm. long, abruptly pointed, fully ½ as long as the scale.—Dry sterile, gravelly soil, and fields, various provinces, Fla. to Tex., Minn., Ont., and N. H.—(*Mex.*)

60. C. Blodgettii Torr. Plant perennial, 1–3 dm. tall, tufted, bright-green: spikes capitate, all sessile in the involucre, or several slender-stalked: spikelets elliptic to linear-elliptic, 6–8 mm. long, 1.5–2 mm. wide, chestnut-colored: scales oval or ovate, mostly 2–2.5 mm. long, obtuse or slightly mucronulate, rather loosely appressed: achene ellipsoid or slightly obovoid, 1–1.5 mm. long, abruptly pointed, much over ½ as long as the scale.—Rocky soil in hammocks, Upper Matecumbe Key and Key West, Fla.

61. C. fuligineus Chapm. Plant perennial, 1–4 dm. tall, tufted, the leaf-sheaths blackish: spikes capitate, sessile in the involucre, 1–1.5 cm. in diameter: spikelets linear or linear-elliptic, 4–11 cm. long, 1.5–2 mm. wide, dark-brown: scales oval or ovate, about 2 mm. long, rounded or mucronulate, appressed: achene ellipsoid-obovoid or broadly ellipsoid, 1–1.5 mm. long, abruptly pointed, fully ½ as long as the scale.—Rocky soil in hammocks, Key West, Fla.—(*W. I.*)

62. C. brunneus Sw. Plant perennial, 1.5–12 dm. tall, solitary or clustered, the scapes stout: spikes in a sessile terminal head or on unequal stalks, rather lax: spikelets linear or linear-lanceolate, 9–17 mm. long, 2–3 mm. wide, chestnut-

colored: scales oval, ovate, or elliptic, 3–4 mm. long, mucronate, rather loosely appressed: achene obovoid, ellipsoid-obovoid, or ellipsoid, about 1.5 mm. long, abruptly pointed, fully ½ as long as the scale. [*C. Ottonis* Boeckl.]—Wet and dry sand, sea-beaches, and hammocks, Fla.—(*W. I., Mex., C. A., S. A.*)

63. **C. Engelmannii** Steud. Plant annual, 1–7.5 dm. tall, often tufted, bright-green: spikes lax, mostly clustered at the ends of short stalks: spikelets narrowly linear to linear-subulate, 9–25 mm. long, less than 1 mm. wide, often curved, greenish-brown: scales elliptic to ovate-elliptic, 2–2.5 mm. long, blunt or mucronulate, loosely appressed: achene linear-ellipsoid, about 2 mm. long, often slightly curved, acute, somewhat shorter than the scale.—Low grounds and swamps, various provinces N of Coastal Plain, W Tenn. (?) to W Ark., Wis., Ont., Mass., and N N. Y.; adv. in Ala.

64. **C. ferax** L. C. Rich. Plant annual, up to 9 dm. tall, tufted or gregarious, bright-green: spikes rather crowded at the ends of slender stalks: spikelets narrowly linear, 8–20 mm. long or rarely longer, 1–1.5 mm. wide, yellowish or grayish-brown: scales ovate to ovate-elliptic, 2–3.5 mm. long, obtuse or acutish, appressed: achene obovoid, sometimes narrowly so, about 1.5 mm. long, abruptly pointed, about ½ as long as the scale.—Swamps, banks, sand-dunes, and low grounds, various provinces, Fla. to Tex., Minn., Ont., and Mass.; also on the Pacific Coast.—(*W. I., Mex., C. A., S. A., O. W.*)

65. **C. speciosus** Vahl. Plant annual, 1–4.5 dm. tall, usually tufted, bright-green: spikes mostly clustered at the ends of the slender stalks: spikelets narrowly linear, 8–18 mm. long or rarely longer, 1 mm. wide or less, straight or nearly so, brownish or yellowish-brown: scales ovate or elliptic-ovate, 2–2.5 mm. long, mostly obtuse, rather loosely appressed: achene ellipsoid or ellipsoid-obovoid, 1.5–2 mm. long, abruptly pointed, fully ½ as long as the scale.—Low grounds, swamps, ditches, and banks, various provinces, Fla. to Tex., S. Dak., and Mass.; also on the Pacif. slope.—(*W. I., Mex.*)

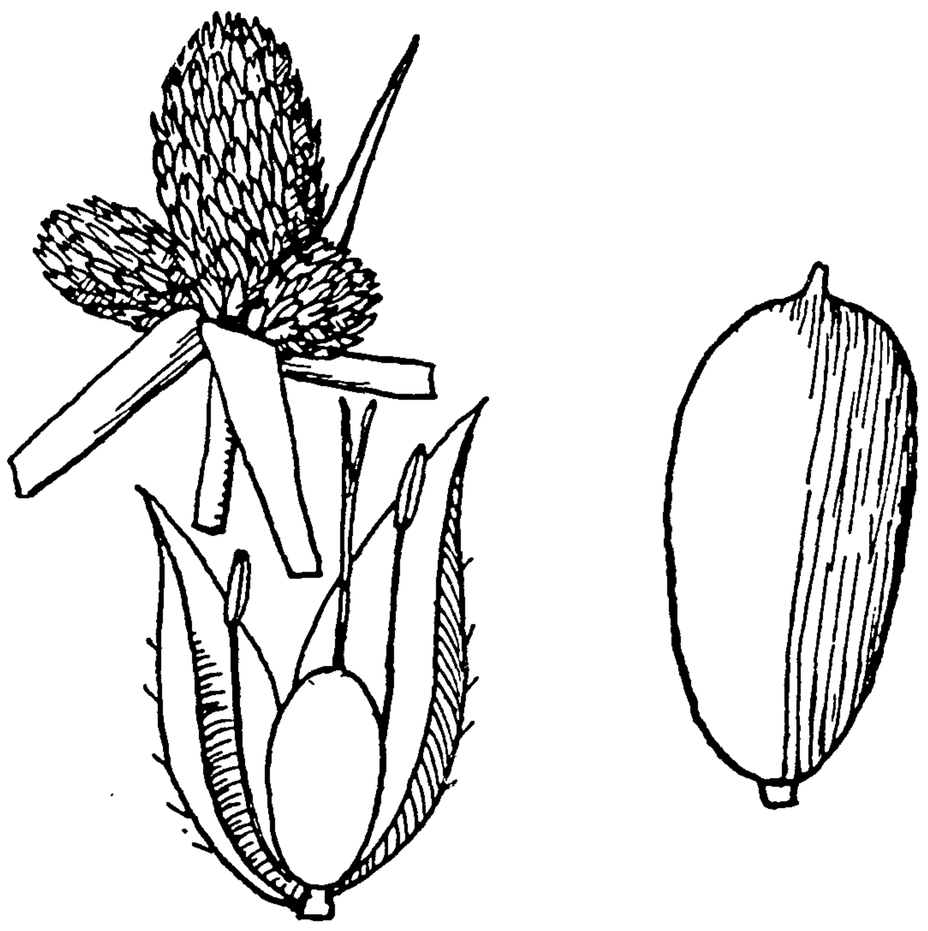
66. **C. longispicatus** Norton. Plant perennial, up to 20 dm. tall, gregarious, bright-green: spikes mostly clustered at the ends of the slender stalks, spikelets narrowly linear, 20–40 mm. long, or rarely shorter, 1.5–2 mm. wide, yellowish-brown: scales thick, ovate, 2.5–3 mm. long, mostly mucronulate, appressed: achene broadly obovoid or obpyramidal, less than 1.5 mm. long, abruptly pointed, about ½ as long as the scale.—Low grounds, swamps, and pond-margins, various provinces, Fla. to Tex. and Calif.—(*Mex.*)

5. **KYLLINGA** Rottb. Annual or perennial scapose, often tufted, herbs. Leaf-blades very narrow. Spikelets several or many in an involucrate head, the involucre of 3 or more elongate bracts. Scales mostly 3- or 4-ranked, the 2 lower empty, the middle one fructiferous, the upper empty or staminate. Perianth wanting. Stamens 1–3. Style not enlarged, deciduous. Stigmas mostly 2. Achene lenticular.—About 45 species, natives of warm regions.—Sum.–fall, or all year S.

Larger scales of the spikelets with ciliate or scabrous keels, sharp- or firm-pointed.	
Achene body of an ellipsoid type: plants annual.	1. *K. pumila.*
Achene-body of an obovate type: plants perennial.	2. *K. brevifolia.*
Larger scales of the spikelets with smooth keels, blunt or merely acutish.	3. *K. odorata.*

1. **K. pumila** Michx. Annual, densely tufted, the scapes 0.5–4 dm. long, erect or reclining: leaf-blades mostly less than 2 mm. wide: bracts of the involucre

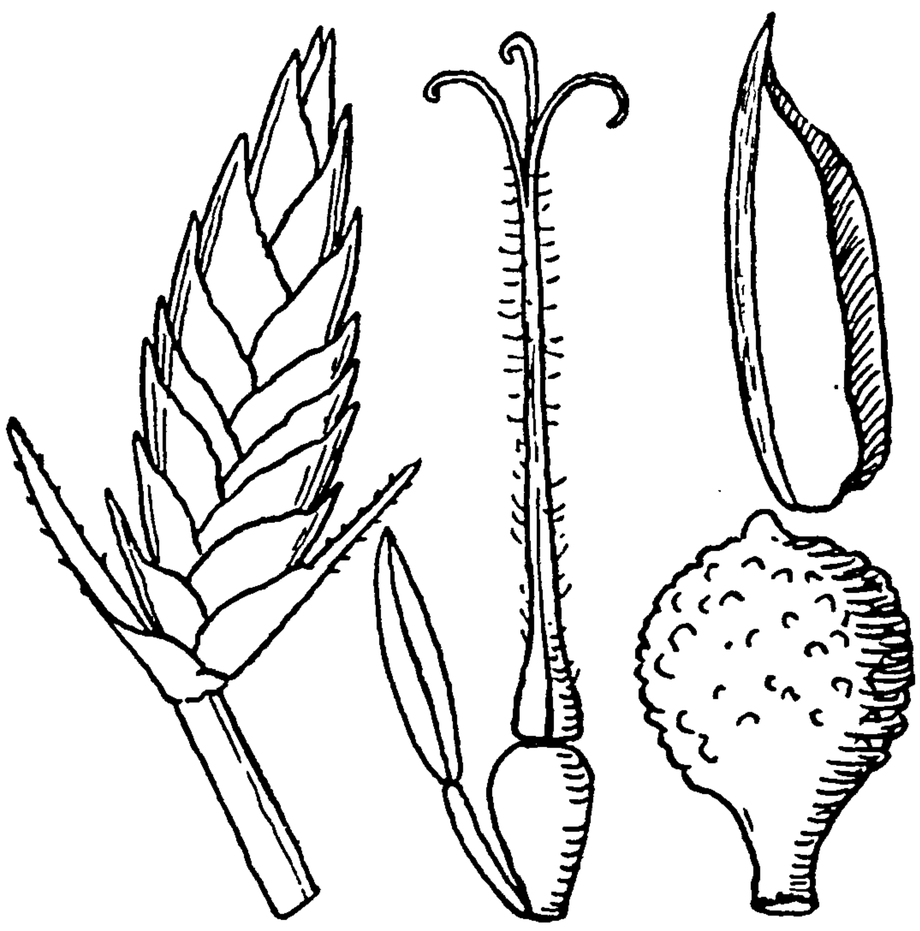
spreading or reflexed: spikes ellipsoid or ovoid-ellipsoid, 6–7 mm. long, solitary or accompanied by 1 or 2 smaller ones: spikelets 2.5–3 mm. long, the scales minutely pointed the 2 larger ones very unequal: achene-body ellipsoid, fully 1 mm. long, mucronulate.—Moist stream-banks and wet soil, various provinces, Fla. to Tex., Mo., Ohio, and Md.—(*W. I., Mex., C. A., S. A.*)



2. K. brevifolia L. Perennial, tufted or gregarious, the scapes up to 3 dm. tall: leaf-blades 1–2.5 mm. wide: bracts of the involucre 3, one erect, the others spreading: spikes solitary, globose or ovoid, 5–10 mm. long, greenish, commonly inclined: spikelets 2.5–3 mm. long, the scales firm-pointed, the two larger ones somewhat unequal: achene-body obovoid or globose-obovoid, nearly 1 mm. long, mucronulate. [*K. monocephala* L.]—Low grounds and moist sandy places, Coastal Plains, Fla. to Tex. and Ga.—(*W. I., Mex., C. A., S. A.*)

3. K. odorata Vahl. Annual or biennial, tufted, the scapes 1–3 dm. tall: bracts of the involucre 4 or 5, becoming reflexed: spikes 2 or 3 together or solitary, ovoid to cylindric, 8–15 mm. long, the terminal one the largest, erect, pale or whitish: spikelets 3–3.5 mm. long, the scales blunt or merely acutish, the two larger ones slightly unequal: achene-body obovoid, fully 1 mm. long, mucronulate.—Moist to wet soil, roadsides, and ditches, Coastal Plain, Fla. to Miss. and Ga.—(*W. I., Mex., C. A., S. A.*)

6. ABILDGAARDIA Vahl. Perennial, or sometimes perhaps annual scapose tufted herbs. Leaf-blades very narrow. Spikelets usually solitary, several–many-flowered, each subtended by a small bract. Scales firm, imbricate mostly in 2 rows, deciduous. Perianth wanting. Stamens 1-3; filaments narrowly linear. Ovary stipitate; style swollen at the base, deciduous. Stigmas 3. Achene 3-angled, stipitate, the body warty.—About 15 species, widely distributed in warm regions.



1. A. monostachya (L.) Vahl. Plant 1–4 dm. tall, glabrous: leaves shorter than the scapes; blades involute: involucre inconspicuous: spikelet ovoid or ellipsoid-ovoid, 1–1.5 cm. long, or longer: scales pale, 5–6 mm. long, acute or mucronulate: anthers nearly 2 mm. long: achene pale, 2.5–3 mm. long, the body globose or broadly obovoid, abruptly pointed, the stipe stout.—Hammocks, pinelands, and adj. Everglades, Everglade Keys, pen. Fla. and on the Florida Keys.—(*W. I., S. A., O. W.*)—All year.

7. FIMBRISTYLIS Vahl. Annual or perennial scapose herbs. Leaf-blades flat or involute. Spikelets in umbel-like or capitate clusters, often rather large, terete, several–many-flowered. Scales firm, deciduous. Perianth wanting. Stamens 1–3: filaments slender. Ovary sessile or nearly so: style

usually dilated or swollen at the base, mostly ciliate, deciduous. Stigmas 2 or 3. Achene lenticular or 3-angled, reticulate, cancellate, or ribbed lengthwise, not tubercled.—About 130 species, of wide geographic distribution.—Sum.–fall.

Stigmas 2: achene lenticular. — I. CASTANEAE.
Stigmas 3: achene 3-angled. — II. AUTUMNALES.

I. CASTANEAE

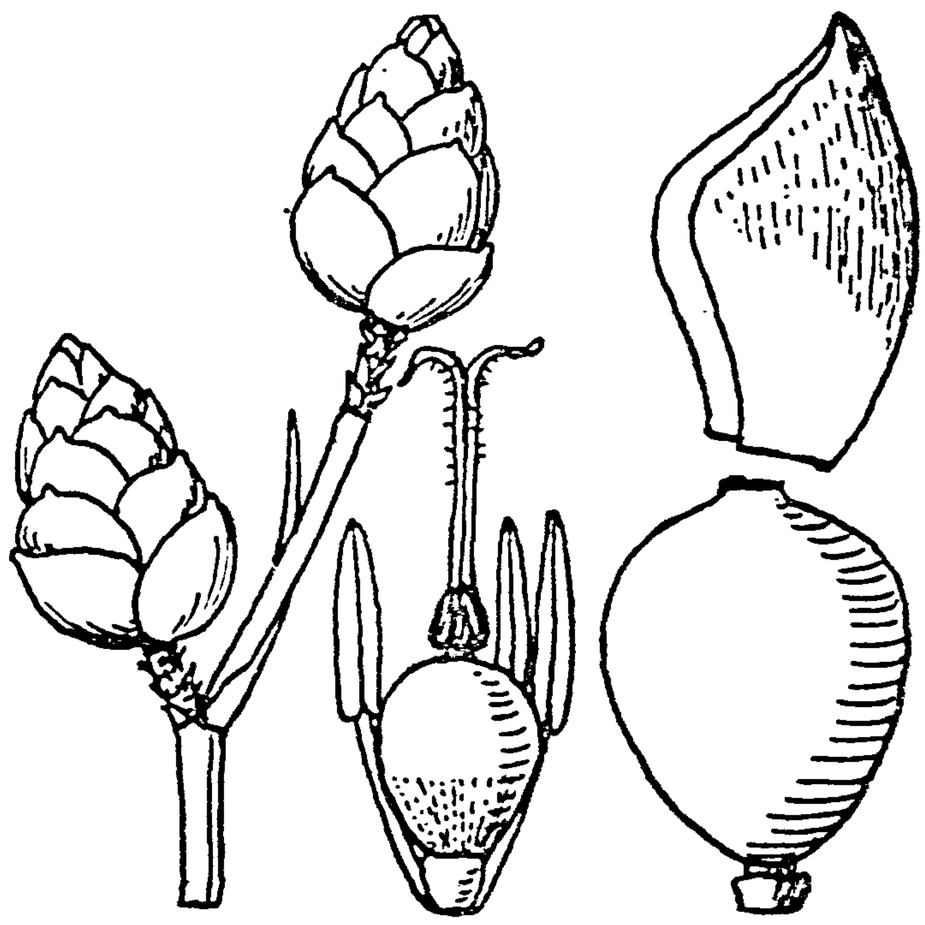
Spikelets peduncled and in umbels, or sessile and solitary.
  Achene not ribbed, smooth or cancellate in rows: leaf-blades mostly involute: plants perennial.
    Spikelets solitary, or with 1, 2, or 3 additional peduncled ones: involucre minute or small, inconspicuous, mostly shorter than the inflorescence. — 1. *F. schoenoides.*
    Spikelets several or many: involucre conspicuous, usually with some of the bracts longer than the inflorescence.
      Styles swollen at the base.
        Scales of the spikelets, at least the lower ones, puberulent or minutely pubescent.
          Achene broadly obovoid, truncate or broadly rounded at the top: leaf-blades strongly involute. — 2. *F. puberula.*
          Achene narrowly obovoid or ellipsoid-obovoid, somewhat narrowed at the top: leaf-blades flat, or somewhat involute in age. — 3. *F. Harperi.*
        Scales of the spikelets glabrous. — 4. *F. castanea.*
      Styles not swollen at the base. — 5. *F. anomala.*
  Achene ribbed lengthwise and reticulate: leaf-blades mostly flat, except in age.
    Achene with smooth or nearly smooth ribs: perennial. — 6. *F. diphylla.*
    Achene with copiously tubercled ribs: plants annual. — 7. *F. Baldwiniana.*
Spikelets several, sessile and borne in a terminal head.
  Scales of the spikelets acuminate: achene obovoid. — 8. *F. Vahlii.*
  Scales of the spikelets subulate-tipped: achene ellipsoid-cylindric. — 9. *F. perpusilla.*

II. AUTUMNALES

Spikelets ovoid or oval to lanceolate.
  Umbel simple or sparingly branched: spikelets stout, ovoid or oval, obtuse. — 10. *F. geminata.*
  Umbel much-branched: spikelets narrow, linear-oblong to lanceolate, acute. — 11. *F. autumnalis.*
Spikelets subglobose: umbel decompound. — 12. *F. miliacea.*

1. F. schoenoides Vahl. Perennial, up to 4 dm. tall, glabrous: leaf-blades attenuate from the slightly dilated bases, involute: bracts of the involucre inconspicuous: spikelets solitary, or with 1, 2, or 3 additional peduncled ones, ovoid or conic-ovoid, 5–12 mm. long, pale-brown: scales 3–3.5 mm. long, blunt or acutish: achene broadly obovoid, less than 1.5 mm. long, whitish.—Low grounds and wet pinelands, W Fla. and S Ga. Introduced.—(*O. W.*)

2. F. puberula (Michx.) Vahl. Perennial, 1–7 dm. tall, finely pubescent, at least in parts: leaf-blades involute, thus often very slender, ciliate, and usually more or less pubescent: involucre small: spikelets ovoid, 5–10 mm. long, brown: scales 3–4 mm. long, usually mucronulate, minutely pubescent: achene broadly obovoid, about 1 mm. long, cancellate, brownish. [*F. castanea puberula* (Michx.) Britton *F. spadicea* (Fl. SE. U. S.)]—Low grounds, swamps, and wet pinelands, Coastal Plain and adj. provinces, Fla. to Tex., Mo., Ill., and N. Y.



3. F. Harperi Britton. Perennial, 2–6 dm. tall, light-green: leaf-blades flat or

somewhat involute in age, ciliate, often puberulent: involucre rather small: spikelets ellipsoid-ovoid, becoming cylindric, 8–14 mm. long, chestnut-colored: scales 3.5–4 mm. long, mucronate, puberulent: achene narrowly obovoid or ellipsoid-obovoid, about 1.5 mm. long, pale.—Sand-dunes, beaches, and swamps, Coastal Plain, Fla. to Miss. and Ga.

4. F. castanea (Michx.) Vahl. Perennial, up to 1 m. tall, deep-green: leaf-blades involute, commonly glabrous: involucre small: spikelets ellipsoid or ovoid-ellipsoid, 6–10 mm. long, brown: scales 3.5–4.5 mm. long, obtuse or acutish, glabrous: achene obovoid or ellipsoid, about 1.5 mm. long, brown.—Salt meadows, marshes, and low pinelands, various provinces, except Appalachian, Fla. to Tex., Nebr., Mich., and N. Y.—(*W. I.*)

5. F. anomala Boeckl. Perennial, up to 9 dm. tall, bright-green: leaf-blades more or less involute, slender, often pubescent: involucre inconspicuous: spikelets ellipsoid-ovoid, often narrow, 9–13 mm. long, pale-brown: scales 3.5–4 mm. long, obtuse or mucronulate, glabrous: achene obovoid, less than 1.5 mm. long, brown. [*F. Drummondii* (Torr. & Hook.) Boeckl.]—Low grounds, Coastal Plain, Miss. to Tex.

6. F. diphylla (Retz.) Vahl. Perennial, 1–6 dm. tall, pubescent: leaf-blades very narrow, involute, at least in age: involucre with one or more of the bracts usually elongate: spikelets ellipsoid to ovoid-ellipsoid, 5–11 mm. long, pale: scales about 2.5 mm. long, mucronate, glabrous: achene broadly obovoid, about 1 mm. long, pale, longitudinally ribbed, the ribs smooth or nearly so and irregularly tubercled. [*F. laxa* Vahl.]—River-banks, low grounds, fields, swamps, and waste-places, Coastal Plain, Fla. to Tex. and Ga. Nat. of trop. —(*W. I., Mex., C. A., S. A., O. W.*)

7. F. Baldwiniana (Schult.) Torr. Annual, 1–4 dm. tall, glabrous or sparingly pubescent: leaf-blades very narrow, flat or nearly so: involucre of 3–5 usually short bracts: spikelets ovoid or ovoid-ellipsoid, 6–13 mm. long, pale, often greenish-brown: scales 2.5–3 mm. long, mucronulate, glabrous: achene broadly obovoid, fully 1 mm. long, pale, longitudinally ribbed, the ribs tubercled.—Low wet to dryish grounds, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Pa.—(*W. I.*)—Formerly included in the next preceding species.

8. F. Vahlii (Lam.) Link. Annual, 1–1.5 dm. tall: leaf-blades setaceous or filiform, scabrous: scapes flattened, very slender: involucre of several setaceous elongate bracts: spikelets ellipsoid-cylindric, 4–8 mm. long, obtuse, greenish-brown; scales 1.5–2 mm. long, acuminate, the tip erect: achene obovoid, about 0.5 mm. long, yellowish-white.—River-banks and low grounds, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and N. C.—(*Mex.*)

9. F. perpusilla Harper. Annual, 3 cm. tall: leaf-blades filiform, smooth or nearly so: scapes setaceous, in small prostrate radiating tufts: involucre of several slender-setaceous bracts exceeding the inflorescence: spikelets globose, 1–2 mm. in diameter, green or yellowish, on peduncles up to 4 mm. long: scales 1–1.5 mm. long, subulate-tipped, the tip loosely spreading: achene ellipsoid-cylindric, about 0.5 mm. long, pale.—Pineland ponds, near Leslie, on the Coastal Plain of Ga.—Fall.—Collected only once.

10. F. geminata (Nees) Kunth. Annual, 0.5–2 dm. tall: umbels usually with short branches: spikelets ovoid or oval, 2–5 mm. long, obtuse, reddish-brown: scales lanceolate, mucronate: achene obovoid, fully 0.5 mm. long, distinctly reticulate. [*F. Frankii* Steud.]—Sandy fields, bottoms, and shores, various provinces, Ga. to La., Ont., and Que.

11. F. autumnalis (L.) R. and S. Annual, 1–4 dm. tall: umbels usually with long branches: spikelets linear-ellipsoid to lanceolate, 6–10 mm. long, acute,

brown or greenish-brown: scales ovate-lanceolate or lanceolate, mucronate: achene obovoid, scarcely 0.5 mm. long, smooth or indistinctly reticulate.—Moist soil, sandy banks, pond-margins, and meadows, various provinces, Fla. to Tex., Kans., Mich., and Mass.—(*W. I., Mex.*, (?), *S. A.*)—Plant erect.

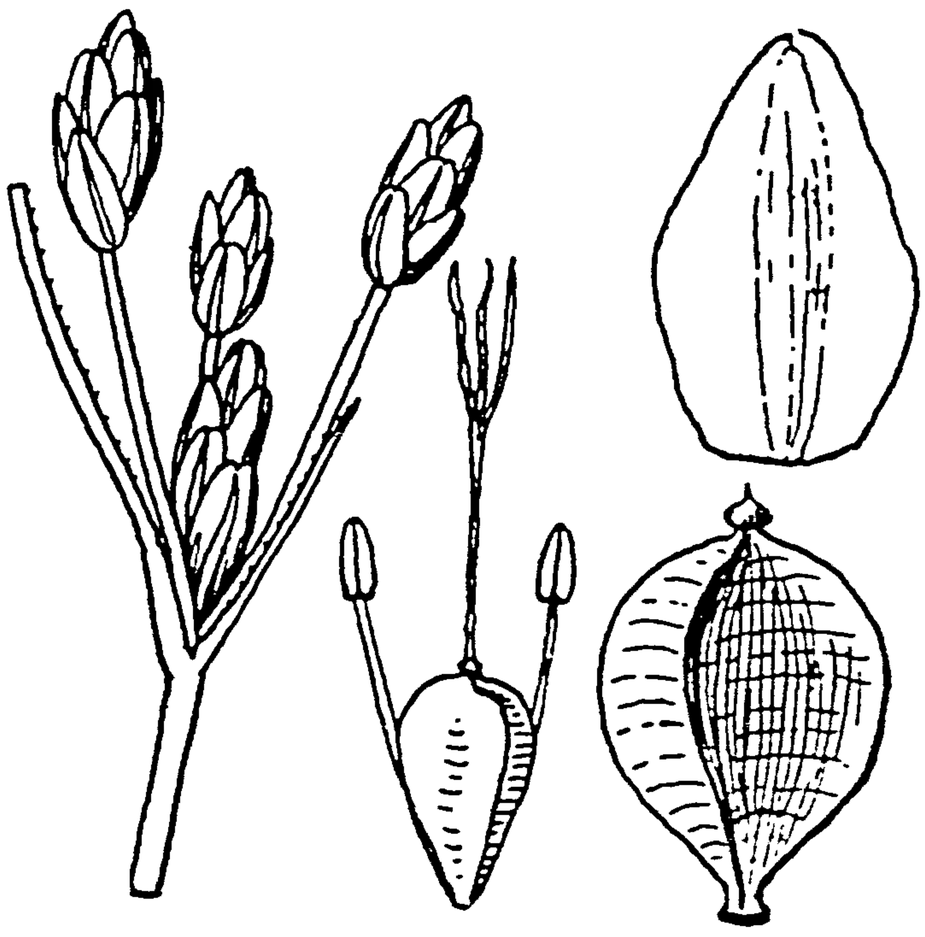
12. **F. miliacea** Vahl. Annual (always ?), 2–6 dm. tall, glabrous: leaf-blades ensiform, long-attenuate: scapes weak, often loosely tufted: spikelets usually numerous, subglobose, 2–3 mm. long, obtuse, pale-brown: scales ovate, fully 1 mm. long, obtuse: achene obovoid, fully 0.5 mm. long, minutely roughened.—Bogs and ditches, N Fla. Nat. of the trop.—(*W. I., Mex., C. A., S. A., O. W.*)—Plant prostrate.

8. **STENOPHYLLUS** Raf. Annual tufted scapose herbs. Leaf-blades setaceous, linear, or filiform. Spikelets in umbel-like clusters, capitate, or solitary, relatively small, terete or nearly so, few–many-flowered. Scales firm, short, deciduous. Perianth wanting. Stamens 2 or 3: filaments very slender. Ovary sessile or short-stipitate: style swollen at the base, glabrous, the base persistent. Stigmas 2 or 3. Achene lenticular or 3-angled, smooth or papillose, surmounted with a tubercle.—About 90 species, abundant in warm regions.—Spr.–fall.

Spikelets in open or compact umbel-like clusters, or rarely solitary.
- Leaf-blades serrulate or minutely ciliate, usually scabrous.
  - Umbel-like cluster of spikelets simple: achene transversely wrinkled. — 1. *S. capillaris*
  - Umbel-like cluster of spikelets compound: achene papillose.
    - Achene about 1 mm. long: umbel-like cluster of spikelets open. — 2. *S. ciliatifolius.*
    - Achene about 0.5 mm. long: umbel-like cluster of spikelets compact. — 3. *S. Carteri.*
- Leaf-blades smooth and glabrous or nearly so. — 4. *S. coarctatus.*

Spikelets in a terminal involucrate head.
- Bracts of the involucre entire at the base.
  - Achene fully 0.5 mm. long, about ⅓ as long as the scale: scales short-tipped. — 5. *S. barbatus.*
  - Achene about 1 mm. long, about ½ as long as the scale: scales slender-tipped. — 6. *S. stenophyllus.*
- Bracts of the involucre fimbriate at the base. — 7. *S. Warei.*

1. **S. capillaris** (L.) Britton. Plant 0.5–2.5 dm. tall: leaf-blades minutely ciliate: scapes smooth, except sometimes near the top: spikelets narrowly ellipsoid, 5–8 mm. long, in a single cluster or solitary: scales oblong to ovate, about 2 mm. long, obtuse or emarginate, often ciliolate: achene obovoid or turbinate, about 1 mm. long, yellow-brown, slightly stipitate.—(HAIR-SEDGE.)—Dry to wet sandy and rocky soil, and fields, various provinces, Fla. to Tex., Calif., Ore., Ont., and Me.—(*W. I., Mex., C. A., S. A.*)



2. **S. ciliatifolius** (Ell.) C. Mohr. Plant 1–3 dm. tall: leaf-blades serrulate-ciliate: scapes often scabrous near the top: spikelets linear-ellipsoid, 2–4 mm. long, in a compound cluster: scales broadly ovate or deltoid, about 1.5 mm. long. obtuse or abruptly pointed, often ciliolate toward the apex: achene broadly obovoid or turbinate, about 1 mm. long, bluish, barely stipitate.—Pinelands, dry sandy soil, and sand-hills, Coastal Plain, Fla. to La. and N. C.

3. **S. Carteri** Britton. Plant 1–2 dm. tall: leaf-blades setaceous, ciliate: scapes smooth: spikelets mainly ovoid, 2–4 mm. long, in a compound cluster: scales ovate, slightly over 1 mm. long, minutely pointed or obtuse: achene broadly obovoid or turbinate, about 0.5 mm. long, not stipitate.—Pinelands, Everglades Keys, Fla.

4. **S. coarctatus** (Ell.) Britton. Plant 1–3 dm. tall: leaf-blades glabrous or nearly so: scapes smooth: spikelets linear-ellipsoid, or ellipsoid, 2–6 mm. long, in a contracted simple cluster: scales broadly ovate, about 1.5 mm. long, obtuse or minutely pointed: achene turbinate, about 1 mm. long, pale, slightly stipitate.—Pinelands and sandy soil, Coastal Plain, Fla. to Ala. and S. C.

5. **S. barbatus** (Rottb.) Britton. Plant 0.5–2 dm. tall: leaf-blades minutely ciliate: scapes smooth or nearly so: spikelets linear to linear-lanceolate, 4–8 mm. long, acute, capitate: scales 1–2 mm. long, each with a minute slightly spreading tip: achene broadly obovoid, fully 0.5 mm. long, pale, minutely stipitate. [*Isolepis barbata* (Rottb.) R. Br. *S. floridanus* Britton.]—(WATER-GRASS.)—Pinelands, roadsides, fields, and gardens, Coastal Plain, Fla. to Ala. and S. C. Nat. of O. W. trop.

6. **S. stenophyllus** (Ell.) Britton. Plant 1–2 dm. tall: leaf-blades bristly-ciliate: scapes scabrous, at least above: spikelets ellipsoid to linear, 5–7 mm. long, capitate, the head sessile in an involucre of setaceous-tipped bracts: scales lax, ovate to lanceolate, mostly 2–3 mm. long, slender-tipped, finely pubescent: achene obovoid, about 1 mm. long, bluish-white, rounded under the tubercle, contracted at the base.—Pinelands, roadsides, and dry sandy soil, Coastal Plain, Fla. to La. and N. C.

7. **S. Warei** (Torr.) Britton. Plant 1–4 dm. tall: leaf-blades smooth or slightly scabrous: scapes smooth and glabrous: spikelets ovoid to ellipsoid-ovoid, 5–7 mm. long, capitate, the head sessile in an involucre of bracts with broad fimbriate bases and setaceous tips: scales ovate, mostly 3–4 mm. long, abruptly short-tipped, finely pubescent: achene turbinate or broadly obovoid, less than 1 mm. long, white, truncate or notched under the tubercle, somewhat constricted at the base.—Dry sandy soil, pinelands, sandhills, and roadsides, Coastal Plain, Fla. and Ga.

9. **ELEOCHARIS** R. Br. Annual or perennial scapose tufted herbs. Leaves reduced to more or less elongate sheaths which are truncate or sometimes produced into tooth-like or more elongate blades. Scapes simple, except when proliferous. Spikelet solitary, terete, angled, or flattened, erect, the subtending bract inconspicuous. Scales spirally imbricate. Perianth of 1–12, usually 6, retrorsely barbed bristles, or wanting. Stamens 2 or 3. Ovary mostly sessile: style swollen at the base. Stigmas 2 or 3. Achene lenticular or 3-angled, smooth or variously roughened, capped by a tubercle formed by the persistent base of the style.—About 150 species, widely distributed in cool and warm regions.—Spr.–fall, or all year S.—SPIKE-RUSHES.

Spikelets scarcely if at all thicker than the scape; scales mostly leathery.	I. CELLULOSAE.
Spikelets manifestly thicker than the scape; scales mostly membranous.	
Stigmas 2: achene lenticulate or biconvex.	II. OBTUSAE.
Stigmas 3: achenes 3-angled or turgid.	III. TENUES.

I. CELLULOSAE

Scape nodose-septate: bristles poorly developed, shorter than the achene or rarely equalling it.	1. *E. equisetoides.*
Scape not nodose-septate: bristles well-developed longer than the achene.	

Scape terete 2 at least above: bristles smooth: tubercle of the achene deltoid. 2. *E. cellulosa.*
Scape angled or flattened: bristles toothed: tubercle of the achene narrow lanceolate or subulate.
Scape stout, mostly over 2 mm. in diameter: tubercle of the achene lanceolate. 3. *E. quadrangulata.*
Scape slender, mostly less than 2 mm. in diameter: tubercle of the achene subulate.
Achene 2–2.5 mm. long, mostly lenticular: bristles about equalling the top of the tubercle. 4. *E. Robbinsii.*
Achene about 1 mm. long, mostly 3-angled: bristles about equalling the base of the tubercle. 5. *E. elongata.*

II. Obtusae

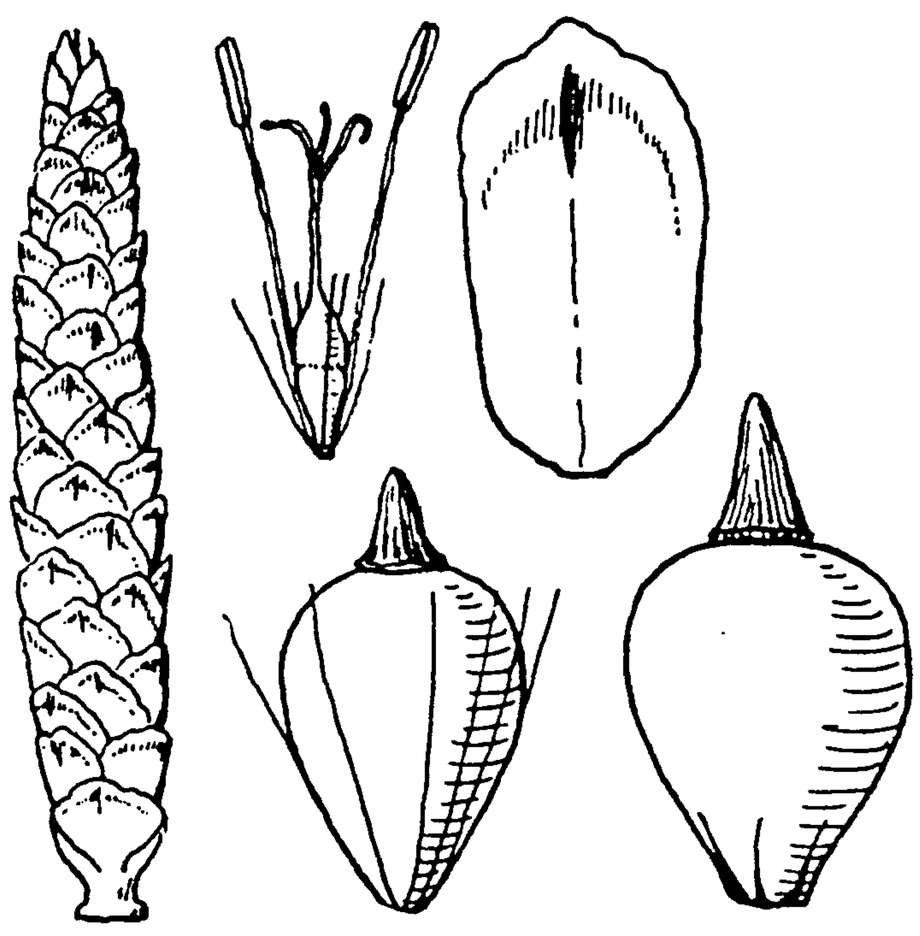
Upper sheath scarious, hyaline: plant perennial by slender rootstocks.
Achene about 0.5 mm. long.
Scales pale-green or rarely white: perianth-bristles longer than the achene. 6. *E. flaccida.*
Scales brown: perianth-bristles shorter than the achene. 7. *E. praticola.*
Achene about 1 mm. long: perianth-bristles longer than the achene; scales brown. 8. *E. olivacea.*
Upper sheath truncate, oblique, or toothed, not scarious.
Plant annual, with fibrous roots.
Scape capillary: spikelets with 1–4 achenes. 9. *E. capillacea.*
Scape slender: spikelets with several to many achenes.
Achene black.
Achene about 0.5 mm. long: perianth-bristles usually 2–4, pale: scape mostly 2–9 cm. tall. 10. *E. atropurpurea.*
Achene about 1 mm. long: perianth-bristles mostly 5–8, brown: scape mostly 5–25 cm. tall. 11. *E. caribaea.*
Achene pale-brown to white.
Scape filiform or bristle-like: achene white.
Scales of the spikelets pale, with brown midrib: achene whitish: upper leaf-sheath short, obtuse. 12. *E. uncialis.*
Scales of the spikelets dark, with whitish midrib and margins on either side of the dark-brown body: achene brown: upper leaf-sheath elongate, acute. 13. *E. bicolor.*
Scape slender: achenes pale-brown.
Perianth-bristles longer than the achene: spikelets ovoid. 14. *E. obtusa.*
Perianth-bristles not longer than the achene, often short or wanting: spikelets cylindric. 15. *E. Engelmannii.*
Plant perennial, with horizontal rootstocks.
Scape nodose-septate: achene about 1 mm. long: tubercle deltoid. 16. *E. nodulosa.*
Scape continuous: achene 1.5 mm. long or nearly so: tubercle conic. 17. *E. calva.*

III. Tenues

Achene cancellate.
Achene longitudinally ribbed. 18. *E. acicularis.*
Achene not longitudinally ribbed.
Scape filiform: spikelets with 1–4 achenes. 19. *E. retroflexa.*
Scape slender: spikelets with several–many achenes.
Spikelets linear-ellipsoid, often proliferous. 20. *E. vivipara.*
Spikelets ovoid to conic-ovoid, not proliferous.
Tubercle conic, smaller than the achene. 21. *E. simplex.*
Tubercle miter-like, as large as the achene or larger. 22. *E. tuberculosa.*
Achene smooth, papillose, or irregularly ridged-reticulate.
Scape capillary or filiform.
Spikelets terete or nearly so, 6–20-flowered.
Achene smooth, ellipsoid-obovoid or pyriform.
Scape capillary: achene-body 0.5 mm. long. 23. *E. microcarpa.*
Scape filiform: achene-body over 0.5 mm. long.
Upper leaf-sheath bladeless: perianth-bristles about as long as the achene: achenes more than 0.5 mm. long, up to 1 mm.
Spikelet-scales lax, not concealing the achenes: perianth-bristles about as long as the achene: achene ellipsoid-obovoid, nearly 1 mm. long, pale-brown, the tubercle minute, depressed-conic. 24. *E. Torreyana.*

Spikelet-scales closely concealing the achenes: perianth-bristles very short or obsolete: achene pyriform, about 0.7 mm. long, whitish, the tubercle a disk-like crown with a minute tip. 25. *E. Brittonii.*
Upper leaf-sheath with an acicular blade: perianth-bristles about one-half as long as the achene: achenes about 0.5 mm. long. 26. *E. carolina.*
Achene ridged-reticulate, broadly obovoid. 27. *E. Curtisii.*
Spikelets flattened, 2–6-flowered, often proliferous.
Achene obovoid: tubercle deltoid or depressed. 28. *E. prolifera.*
Achene ellipsoid or nearly so: tubercle abruptly subulate-tipped. 29. *E. Baldwinii.*
Scape slender or stout.
Tubercle plainly distinguishable from the achene.
Achene smooth.
Tubercle depressed, covering the top of the black achene. 30. *E. melanocarpa.*
Tubercle low-conic, acute, contracted at the base. 31. *E. albida.*
Achene papillose or irregularly ridged-reticulate.
Achene with the 3 angles ribbed. 32. *E. tricostata.*
Achene obtusely 3-angled.
Scape slender to nearly filiform, not flattened: scales obtuse.
Bristles 2–4, shorter than the achene: achene strongly papillose. 33. *E. capitata.*
Bristles 6, the longer as long as the achene: achene faintly reticulate. 34. *E. arenicola.*
Scape flattened: scales acute. 35. *E. acuminata.*
Tubercle conic-subulate or pyramidal, scarcely distinguishable from the achene. 36. *E. rostellata.*

1. E. equisetoides (Ell.) Torr. Perennial, up to 1 m. tall, the scapes nodose, terete: leaf-sheaths often blade-bearing: spikelet cylindric, 2.5–4 cm. long, many-flowered: scales mostly obtuse, 5–6.5 mm. long, narrowly margined: perianth-bristles as long as the achene or shorter, or wanting: achene obovoid, 2 mm. long, or sometimes slightly smaller or larger, light-brown, the tubercle dark, ¼–⅓ as long as the achene.— (KNOTTED SPIKERUSH.)— Shallow water, various provinces, Fla. to Tex., Mich., and Mass.—(*W. I., Mex., C. A., S. A.*)



2. E. cellulosa Torr. Perennial, up to 8 dm. tall, the scapes not nodose, terete above: leaf-sheaths bladeless, sometimes short-tipped: spikelet cylindric, 1.5–3 cm. long, many-flowered: scales rounded, 4–5 mm. long, hyaline-margined: perianth-bristles smooth, longer than the achene: achene obovoid, about 2 mm. long, dark-brown, rather coarsely pitted, the tubercle pale, very stout, ½–⅓ as long as the achene.— Fresh marshes and lagoons near the coast, Fla. to Tex.—(*W. I.*)

3. E. quadrangulata (Michx.) R. and S. Perennial, up to 1.2 m. tall, the scapes 4-angled, not nodose: leaf-sheaths sometimes blade-bearing: spikelet cylindric, 2–5 cm. long, many-flowered: scales many, 5–6 mm. long, firm, broad and rounded: perianth-bristles as long as the achene or longer: achene obovoid, 2–2.5 mm. long, brown, the tubercle lanceolate, about half as long as the achene, constricted at the base. [*E. mutata* (Fl. SE. U. S.)]—Ponds, streams, and swamps, various provinces, Fla. to Tex., Mo., Mich., Ont., and Conn.—(*W. I., Mex., C. A., S. A.*)

4. E. Robbinsii Oakes. Perennial, 2–7 dm. tall, the scapes 3-angled, producing tufts of very slender scapes or leaves: leaf-sheaths not blade-bearing:

spikelet subulate, 1–2 cm. long, few-flowered: scales few, mostly 6–7 mm. long, thin, narrow, obtuse: perianth-bristles much longer than the achene, often twice as long: achene obovoid, sometimes narrowly so, 2–2.5 mm. long, light-brown, the tubercle subulate, about one half as long as the achene, with a raised ring around the base.—Shallow water, often acid, various provinces, Fla. to Ind., Mich., and N. B.

5. **E. elongata** Chapm. Perennial, up to 1 m. tall, the scapes terete, often producing tufts of very slender scapes: leaf-sheaths usually bladeless: spikelet cylindric, 1–2 cm. long, rather few-flowered: scales relatively few, 5–6 mm. long, thinnish, obtuse: perianth-bristles longer than the achene: achene obovoid, about 1 mm. long, brown, the tubercle barely one half as long as the achene, subulate above the ring-like base.—Still water, Coastal Plain, Fla. to La. and Tex. (?).

6. **E. flaccida** (Reichenb.) Urban. Perennial, 0.5–3 dm. tall, the scapes 3-angled: upper leaf-sheath with a hyaline limb: spikelet oval or ovoid, 2–4 mm. long, several-flowered: scales pale-green or rarely white, 2 mm. long, or less, mostly obtuse: perianth-bristles longer than the achene: achene broadly obovoid, 1 mm. long or less, dark-brown, the tubercle depressed-conic. [*E. ochreata* Nees.]—(PALE SPIKERUSH.)—Wet soil, Coastal Plain, Fla. to Miss. and N. J.—(*W. I., Mex., C. A., S. A.*)

7. **E. praticola** Britton. Annual, 2–6 cm. tall, the scapes flattened: upper leaf-sheaths hyaline, lax: spikelets ovoid or ellipsoid-ovoid, 2–3 mm. long, few-flowered: scales brown, less than 2 mm. long, obtuse or acutish, lax in age: perianth-bristles shorter than the achene: achene broadly obovoid, 0.5 mm. long or more, dark-brown, the tubercle minute, depressed.—Low and wet grounds, Everglades and vicinity, Fla.—(*W. I.*)

8. **E. olivacea** Torr. Perennial, 0.5–1.5 dm. tall, the scapes flattened: upper leaf-sheath with a hyaline limb: spikelet ovoid, 3–5 mm. long, several–many-flowered: scales reddish-brown, 2–2.5 mm. long, scarious-margined, lax in age: perianth-bristles longer than the achene: achene obovoid, about 1 mm. long, green to blackish, the tubercle with a saucer-shaped base and a minute tip.—Wet, often acid, soil, shores of ponds, various provinces, S. C. to Mich., Ont., and Me.

9. **E. capillacea** Kunth. Annual, diminutive, 2–5 cm. tall, the scapes capillary: leaf-sheaths with scarious blade-like tips: spikelet linear-cylindric, 2–4.5 mm. long, few-flowered: scales deep-brown or reddish, narrow, mostly 2–3 mm. long, appressed: perianth-bristles about as long as the achenes: achene narrowly obovoid, 0.5 mm. long or more, pale, the tubercle slender-conic above the ring-like base.—Pineland ponds and wet sand, Coastal Plain, Fla. to N. C. —(*W. I., Mex., C. A., S. A.*)

10. **E. atropurpurea** (Reitz.) Kunth. Annual, 3–9 cm. tall, the scapes stiff and slender: upper leaf-sheaths with a tooth-like blade: spikelet ovoid, 3–4 mm. long, several-many-flowered: scales thinnish, purple-brown, except the midrib and narrow scarious margins, broad, 1–1.5 mm. long, rather lax in age: perianth-bristles as long as the achene or shorter: achene obovoid, 0.5 mm. long or more, jet-black, the tubercle saucer-shaped with a minute tip.—Moist soil and sink-holes, various provinces, Fla. to Tex., Colo., Ia., and Ga.—(*W. I., Mex., C. A., S. A., O. W.*)

11. **E. caribaea** (Rottb.) Blake. Annual, up to 2.5 dm. tall, the scapes terete: upper leaf-sheath with a tooth-like blade: spikelet ovoid, 3–5 mm. long or smaller, many-flowered: scales thickish, brown, except the midrib and margins, broad, 1.5–2 mm. long, appressed: perianth-bristles about as long as

the achene: achene obovoid, about 1 mm. long, jet-black, the tubercle depressed or saucer-shaped with a minute tip.—Moist soil, swamps, and sinkholes, Coastal Plain and adj. provinces, Fla. to Tex., Ind., and Md.—(*W. I., Mex., C. A., S. A.*)—Formerly referred to *E. capitata,* in error.

12. E. uncialis Chapm. Annual, mostly 1–6 cm. tall, the scapes bristle-like, angled: upper leaf-sheath oblique, obtuse: spikelet ovoid, 2–3 mm. long, several-flowered: scales pale, with a brown midrib and scarious margins, 1.5–2 mm. long, lax in age: perianth-bristles about one-half as long as the achene: achene ellipsoid-obovoid, 0.7 mm. long, whitish, smooth, the tubercle depressed-conic, much narrower than the achene.—Damp pinelands, N Fla.

13. E. bicolor Chapm. Annual, 1–2 dm. tall, the scapes 4-angled: upper leaf-sheath very thin: spikelet ovoid, 2–3 mm. long, few-flowered: scales thinnish, dark-brown except the pale midrib and margins, 1.5–2.5 mm. long, lax in age: perianth-bristles about ½ as long as the achene: achene ellipsoid-obovoid, about 0.8–1 mm. long, brown, the tubercle depressed, the base nearly as wide as the achene.—Moist to wet pinelands, Coastal Plain, Fla. and Ga.

14. E. obtusa (Willd.) Schultes. Annual, 1–7 dm. tall, the scapes nearly terete: upper leaf-sheaths with a tooth-like blade: spikelet ovoid to ellipsoid-ovoid, 3–13 mm. long, many-flowered: scales thin, dull-brown, 1.5–2 mm. long, usually appressed: perianth-bristles longer than the achene: achene turbinate-obovoid, 1.5 mm. long or less, pale-brown, the tubercle deltoid, the base somewhat narrower than the achene.—Wet soil and mud, various provinces, Fla. to Tex., Ont., and N. S.; also Calif. to B. C.

15. E. Engelmannii Steud. Annual, 1–5 dm. tall: upper leaf-sheath oblique or with a tooth-like blade: spikelet cylindric or conic-cylindric, 5–20 mm. long, many-flowered: scales brown, 1.5–2 mm. long, obtuse, appressed: perianth-bristles about as long as the achene, or sometimes rudimentary or wanting: achene turbinate-obovoid or somewhat cuneate, 1.5 mm. long or less, pale-brown, the tubercle very low, the base nearly as wide as the achene.—Wet soil and ditches, various provinces, Ga. to Tex., Calif., Mo., and Mass.

16. E. nodulosa (Roth) Schultes. Perennial, up to 1 m. tall, the scapes nodose: upper leaf-sheath truncate or minutely pointed: spikelet conic-cylindric, 1–2 cm. long, many-flowered: scales brownish, 2–3 mm. long, or sometimes longer, obtuse, often constricted below the apex, closely imbricate: perianth-bristles as long as the achene or shorter or longer: achene obovoid, about 1 mm. long, turgid, the tubercle deltoid, fully ⅓ as long as the achene.—Swamps, Coastal Plain and Basin-and-Range province, Fla. to Tex. and Ariz.—(*W. I., Mex., C. A., S. A.*)

17. E. calva Torr. Perennial, up to 1 m. tall, the scapes often tufted, slender, not nodose: upper leaf-sheath truncate or slightly pointed: spikelet ellipsoid or ellipsoid-lanceolate, 0.5–1.5 cm. long, many-flowered: scales brown or dark-green, 2.5–3.5 mm. long, blunt or often acute: perianth-bristles as long as the achene or shorter: achene obovoid, about 1.5 mm. long, brown, the tubercle cap-like, much constricted at the base. [*E. glaucescens* (Fl. SE. U. S.)]—Swamps and meadows, various provinces, Fla. to Tex., Nebr., Minn., and Ont.—A related species, *E. macrostachya* Britton, with 2 or 3 empty bracts at the base of the spikelet, instead of one as in *E. calva,* has been found at New Orleans, La.

18. E. acicularis (L.) R. & S. Perennial with slender rootstocks, 0.5–2 dm. tall, or greatly elongate when submersed, the scapes 4-angled, filiform or setaceous: leaf-sheaths truncate: spikelet flattened, narrowly ovate to linear-ellipsoid, 3–10 mm. long, few-flowered: scales pale-green, except the usually brown

bands on either side of the midrib, 1.5–2 mm. long: perianth-bristles fully as long as the achene or shorter: achene ellipsoid obovoid, 1 mm. long or shorter, the tubercle conic from a narrow base, about ¼ as long as the achene.—Wet soil and muddy shores, various provinces, Ga. to Calif., B. C., and Newf.—(*O. W.*)

19. E. retroflexa (Poir.) Urban. Perennial or annual (?), 0.5–2 dm. tall, the scapes 4-angled, filiform: leaf-sheaths often with minute blades: spikelet ellipsoid to ovoid-ellipsoid, 2–3 mm. long, few-flowered: scales pale, 1.5–2 mm. long: perianth-bristles as long as the achene or much shorter: achene obovoid, barely 1 mm. long, the tubercle pyramidal with a broad base, shorter than the achene. [*E. chaetaria* R. & S.]—Sandy soil and low grounds, Coastal Plain, S Ala.—(*W. I., Mex., C. A., S. A.*)

20. E. vivipara Kunth. Perennial, 1–3 dm. tall, the scapes flattened: leaf-sheaths usually with a short blunt tip: spikelet linear-ellipsoid, 4–7 mm. long, several-flowered, often sparingly proliferous: scales whitish, 2–3 mm. long, thin: perianth-bristles unequal, fully as long as the achene or shorter: achene obovoid, about 1 mm. long or less, finely marked, pale, the tubercle often deltoid, with a broad base.—Low grounds and marshy shores, Coastal Plain and occasionally adj. provinces, Fla. to Tex. and N. C.

21. E. simplex (Ell.) A. Dietr. Annual, 1–4 dm. tall, the scapes sharply 3-angled: leaf-sheaths obliquely truncate: spikelet ovoid or ellipsoid, 4–6 mm. long, several–many-flowered: scales pale, 2–3 mm. long, firm: perianth-bristles much longer than the achene: achene obovoid, about 1.5 mm. long, turgid, coarsely marked, the tubercle a cap-like cone, much constricted at the base, attenuate at the apex. [*E. tortilis* (Link) Schultes.]—Wet soil and marshy woods, Coastal Plain, Fla. to Tex. and N. J.

22. E. tuberculosa (Michx.) R. & S. Annual, 1–5 dm. tall, the scapes flattened: upper leaf-sheath obliquely truncate or with a tooth-like blade: spikelet ovoid to conic-ovoid, 6–12 mm. long, many-flowered: scales greenish-brown, except the dark midrib, 2.5–3.5 mm. long, firm: perianth-bristles much longer than the achene: achene obovoid, about 1.5 mm. long, coarsely marked, the tubercle miter-like, as large as the achene or larger.—Moist to wet, often acid, soil, Coastal Plain and adj. provinces, Fla. to Tex., Pa., and Mass.

23. E. microcarpa Torr. Annual, 0.5–2 dm. tall, the scapes slender, 4-angled: leaf-sheaths usually minutely pointed: spikelet oblong or nearly so, 2–3 mm. long, few-flowered: scales pale or with brownish patches on either side of the midrib, 1–1.5 mm. long, thin: perianth-bristles shorter than the achene: achene ellipsoid-obovoid, much constricted at the narrow base, 0.5 mm. long or a little longer, grayish-white, smooth or nearly so, the tubercle depressed-conic, minute, base less than ½ as wide as the achene.—Moist to wet soil, Coastal Plain, Fla. to La. and S. C.—(*W. I.*)

24. E. Torreyana Boeckl. Annual, 1–6 dm. tall, the scapes somewhat 4-angled, sometimes proliferous at the spikelet: upper leaf-sheath obliquely truncate: spikelet ellipsoid or ovoid-ellipsoid, 3–6 mm. long, several-many-flowered: scales brownish-red, except the green midrib and paler margins, 1.5–2 mm. long, firm: perianth-bristles about as long as the achene: achene ellipsoid-obovoid, nearly 1 mm. long, pale-brown, smooth, the tubercle minute, depressed-conic.—Wet sandy, and usually acid, soil, Coastal Plain, Fla. to Tex. and N. J.—(*W. I.*)

25. E. Brittonii Svenson. Annual, like *E. Torreyana* in habit: spikelet ellipsoid to ovoid-ellipsoid, 2.5–5 mm. long, several-flowered: scales obtuse, closely concealing the achenes which they much exceed in length, scarious-margined: perianth-bristles very short or obsolete: achene pyriform, about 0.7 mm.

long, whitish, smooth, the tubercle a disk-like crown with a minute tip.—Flatwoods and shallow ponds, Coastal Plain, N. Fla. to Tex. and S. C.

26. **E. carolina** Small. Annual, mostly less than 1 dm. tall, the scapes bristle-filiform, striate and slightly angled: upper leaf-sheath usually with an acicular blade: spikelet ovoid, 2–2.5 mm. long, several-flowered: scales pale, with a brown midrib and somewhat scarious margins, 1–1.5 mm. long, slightly lax in age: perianth-bristles about one half as long as the achene: achene ellipsoid-obovoid, about 0.5 mm. long, pale-brown, smooth, the tubercle depressed-conic.—Damp pinelands, Coastal Plain, S. C.

27. **E. Curtisii** Small. Annual, 0.5–1 dm. tall, the scapes filiform, striate and somewhat angled: upper leaf-sheath oblique, discolored at the edge, minutely pointed: spikelet ovoid-ellipsoid, 2–3 mm. long, few-flowered: scales pale, with a brownish midrib and scarious margins, 1.5–2 mm. long, lax in age: perianth-bristles shorter than the achene: achene broadly obovoid, 0.8 mm. long, light-brown, irregularly ridged-reticulate, the tubercle broadly conic.—Damp soil, Coastal Plain, Wilmington, N. C.

28. **E. prolifera** Torr. Annual, 1–6 dm. tall, the scapes often diffuse or floating, flattened: leaf-sheaths nearly truncate or minutely pointed: spikelet conic, 4–8 mm. long, usually proliferous or rooting: scales whitish or brown-spotted, 2–3 mm. long, thin: perianth-bristles shorter than the achene: achene obovoid, less than 1 mm. long, pale, smooth, the tubercle deltoid or depressed-conic, minute.—Ponds and ditches, Coastal Plain, Fla. to La. and N. C.

29. **E. Baldwinii** (Torr.) Chapm. Perennial, 0.5–2 dm. tall, the scapes slender, more or less diffuse, grooved: upper leaf-sheath oblique and often minutely pointed: spikelet ellipsoid, 4–6 mm. long, flattened, few-flowered, often proliferous and rooting: scales brown or brownish, narrow, 3–5 mm. long: perianth-bristles unequal, as long as the achene or shorter: achene ellipsoid or nearly so, about 1 mm. long, brown or greenish-brown, the tubercle conic, with a ring-like base, and a subulate tip.—(ROAD-GRASS.)—Damp pinelands, especially along roads, Coastal Plain, Fla. and Ga.

30. **E. melanocarpa** Torr. Perennial, 1–5 dm. tall, the scapes stout, wiry, flattened: upper leaf-sheath usually with a tooth-like blade: spikelet ellipsoid or cylindric-oblong, 6–12 mm. long, thick, many-flowered: scales brown, except the lighter midrib and scarious margins, broad, 3–4 mm. long: perianth-bristles as long as the achene or longer, or shorter or obsolete: achene obpyramidal or cuneate-turbinate, about 1 mm. long, black, the tubercle depressed, about as broad as the achene and covering its top, minutely pointed in the middle.—(BLACK-SPIKERUSH.)—Wet sandy soil, Coastal Plain and New England Coast, Fla. to Mass.; also Great Lake Lowland, Ind.—(*W. I.*)

31. **E. albida** Torr. Annual (?), 1–2 dm. tall, the scapes nearly terete: upper leaf-sheath usually with a tooth-like blade: spikelet ovoid-globose or ellipsoid, 4–8 mm. long, many-flowered: scales pale-green or nearly white, 2–2.5 mm. long, firm: perianth-bristles about as long as the achene: achene broadly obovoid, about 1 mm. long, the tubercle low-conic, sessile on the achene.—Damp to wet, usually brackish, soil, Coastal Plain, Fla. to Tex. and Md.—(*W. I., Mex.*)

32. **E. tricostata** Torr. Perennial, 1–6 dm. tall, the scapes flattened: upper leaf-sheath with a tooth-like blade: spikelet ellipsoid to cylindric, 6–18 mm. long, many-flowered: scales brown except the green midrib and the scarious margins, 2–3 mm. long, acute: perianth-bristles wanting: achene obovoid, 1 mm. long or less, brown, prominently 3-angled, obscurely papillose, the tubercle low-conic, with a broad base, acute.—Wet, often acid, soil, Coastal Plain, Fla. to N. Y.

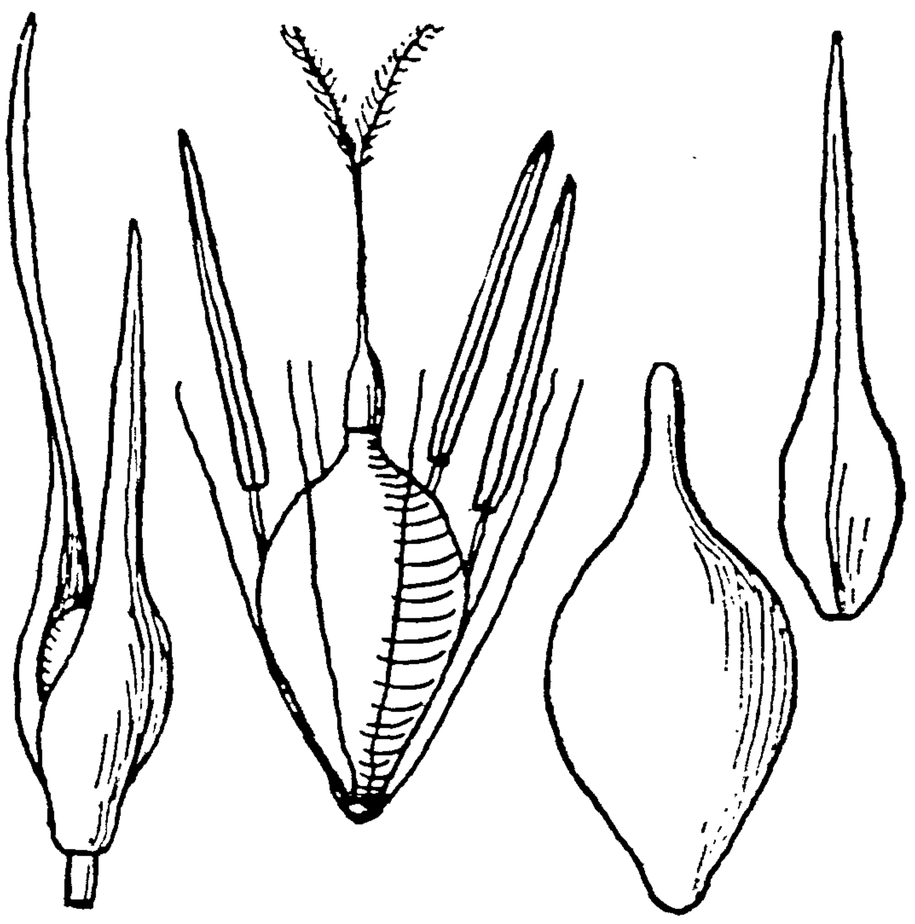
33. E. capitata (L.) R. Br. Perennial, up to 7 dm. tall, the scapes 4-angled: upper leaf-sheath with a tooth-like blade: spikelet narrowly ellipsoid, 4–10 mm. long, many-flowered: scales brownish-purple, except the green midrib and the scarious margins, 1.5–2.5 mm. long, thin: perianth-bristles about ½ as long as the achene or wanting: achene obovoid, about 1 mm. long, yellow to brown, obtusely 3-angled, papillose, often persistent, the tubercle depressed-conic or disk-like. [*E. tenuis* (Willd.) Schultes.]—(POVERTY-GRASS.)—Wet soil, various provinces, Fla. to Tex., Man., Ont., and Newf.

34. E. arenicola Torr. Perennial, 1–4.5 dm. tall, the scapes slender-wiry: upper leaf-sheath truncate or with a tooth-like blade: spikelet ellipsoid or ovoid-ellipsoid, 4–12 mm. long, many-flowered: scales often brown at the apex, and with scarious margins, 2–3 mm. long, thin: perianth-bristles unequal, the longer ones often fully as long as the achene: achene obovoid or ellipsoid-obovoid, about 1 mm. long, brownish, faintly reticulate, the tubercle deltoid or depressed. —Sandy shores and swamps, Coastal Plain, Fla. to Tex. and S. C.

35. E. acuminata (Muhl.) Nees. Perennial, up to 5 dm. tall, the scapes flat, coarse-wiry: upper leaf-sheath sometimes with a tooth-like blade: spikelet ovoid or ellipsoid, 6–12 mm. long, many-flowered: scales purple-brown, except the greenish midrib and the hyaline margins, mostly 2.5–3 mm. long, broad, thinnish: perianth-bristles as long as the achene or shorter: achene obovoid, 1–1.5 mm. long, yellowish-brown, somewhat papillose, often persistent on the rachis, the tubercle depressed-conic.—Wet soil, various provinces, Ga. to La., Wash., Man., Ont., and Anticosti.

36. E. rostellata Torr. Perennial, up to 15 dm. long, the scapes flattened, stout sterile ones reclining and rooting at the apex; leaf-sheaths without blades, usually oblique: spikelet ellipsoid to fusiform, 6–15 mm. long, several-many-flowered: scales light-brown or green, 3–5 mm. long, rather firm: perianth-bristles longer than the achene: achene obovoid or ellipsoid-obovoid, about 1.5 mm. long, brown, the tubercle conic-subulate or pyramidal, ½ as long as the achene or less and confluent with its apex.—Brackish marshes and meadows, Coastal Plain and New England Coast, Fla. to Tex. and N. H.; also saline places in the interior, and Calif. to B. C.

10. WEBSTERIA S. Hart Wright. Perennial aquatic, caulescent herbs. Stems repeatedly branched. Leaves clustered or whorled at the nodes: blades capillary. Spikelets in often compound umbel-like clusters, 1-flowered, narrow. Scales 2, soft, narrow. Flowers perfect. Perianth of 6–10 short, commonly barbed, pale bristles. Stamens 3. Styles not swollen, deciduous. Stigmas 2. Achene lenticular.—A single species.

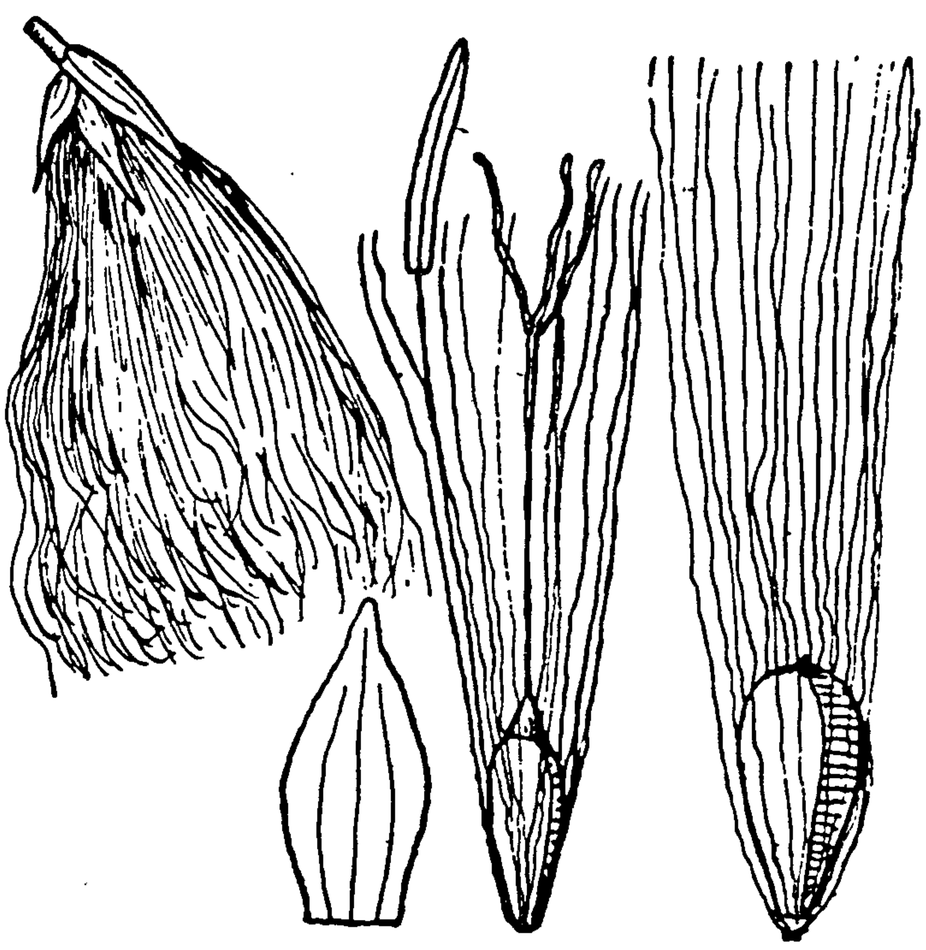


1. W. submersa (Sauv.) Britton. Plant submersed, glabrous: stems elongate, the internodes 8–25 cm. long, partly sheathed, the branches topped by the clusters of spikelets subulate, 8–12 mm. long: scales acuminate, the lower one mostly 3-veined, the upper 1-veined: perianth-bristles longer than the achene, tortuous: anthers slender-subulate, about 3 mm. long: achene obovoid or oval, 1.5–2 mm. long.—Lakes and ponds, pen. Fla.—(*W. I., S. A.*)

11. ERIOPHORUM L. Perennial erect caulescent herbs with rootstocks. Leaves with narrow blades, or some of them mere bladeless sheaths. Spikelets solitary, clustered, or umbellate, often subtended by an involucre of 1 to several bracts. Scales spirally imbricate, usually all fructiferous, or some of the lower ones empty. Flowers perfect. Perianth of numerous naked capillary greatly elongate bristles. Stamens 1–3. Style not swollen, deciduous. Stigmas 3. Achene 3-angled.—About 15 species, in the northern hemisphere.—Sum.–fall.—COTTONGRASSES. COTTONRUSHES.

Spikelets peduncled; scales prominently 1-ribbed, the rib extending to the apex: achene obovoid, rounded at the apex. 1. *E. viridicarinatum.*
Spikelets glomerate; scales prominently striate ribbed, the ribs not extending to the apex: achene oblong-obovoid, abruptly pointed. 2. *E. virginicum.*

1. E. viridicarinatum (Engelm.) Fernald. Stem 3–9 dm. tall: leaf-blades flat below the channeled tip: bracts of the involucre neither spreading nor deflexed: spikelets several or numerous, drooping on slender pubescent peduncles: scales broadly ovate, 3–4 mm. long, acute or acutish: perianth-bristles bright-white: achene obovoid, 2.5–3 mm. long, rounded at the apex, not stipitate.—(HARE-TAIL. TASSEL COTTON-GRASS.)—Bogs and swamps, Blue Ridge and more northern provinces, Ga. to B. C., Mich., and Newf. Formerly included in *E. polystachyon* L.



2. E. virginicum L. Stem 4–12 dm. tall: leaf-blades flat below the channeled tip: bracts of the involucre spreading or deflexed: spikelets crowded in a dense terminal cluster: scales ovate, 3–4 mm. long, obtuse: perianth-bristles brown: achene ellipsoid-obovoid, 3.5–4 mm. long, abruptly narrowed at the apex, short-beaked, stipitate.—(TAWNY-COTTONGRASS.)—Acid bogs and swamps, various provinces, Fla. to Nebr., Man., Ont., and Newf.

12. SCIRPUS L. Annual or perennial, scapose or caulescent herbs. Leaves with blades or represented by mere sheaths. Spikelets few- to many-flowered, terete or somewhat flattened, solitary, capitate, or umbellate, usually involucrate, the involucre, when simple, appearing like a continuation of the scape. Scales spirally imbricate. Flowers perfect. Perianth of 1–6, or 8, barbed or smooth, sometimes pubescent, bristles, or rarely wanting. Stamens 2 or 3. Style not swollen, wholly deciduous or the base persistent. Stigmas 2 or 3. Achene 3-angled or lenticular, beaked or beakless, not tubercled.—About 150 species, widely distributed in cool and warm regions.—Sum.–fall, or all year S.—BULRUSHES. CLUBRUSHES.

Involucre of a single bract, or wanting.
Spikelets solitary, or rarely 2 in No. 5, terminal. I. CAESPITOSI.
Spikelets more than 1, usually several or many, often apparently lateral. II. VALIDI.
Involucre of 2 or more bracts with flat blades.
Spikelets not in dense globose heads. III. SYLVATICI.
Spikelets very numerous in one or several dense globular heads. IV. CUBENSES.

I. Caespitosi

Involucre wanting: annuals. — 1. *S. nanus.*
Involucre present, of a single bract.
  Perianth-bristles present: scales not keeled: perennial plants.
    Scape terete: upper sheath with a subulate blade: perianth-bristles smooth or downwardly barbed.
      Achene about 1.5 mm. long: perianth-bristles smooth: spikelet slightly longer than thick: bog or rock plant. — 2. *S. caespitosus.*
      Achene 2–3 mm. long: perianth-bristles barbed: spikelet several times longer than thick: aquatic or semiaquatic. — 3. *S. subterminalis.*
    Scape triangular: upper sheath with a linear blade: perianth-bristles upwardly barbed. — 4. *S. Clintonii.*
  Perianth-bristles wanting: scales keeled: annual plants. — 5. *S. carinatus.*

II. Validi

Spikelets few, 1–12, appearing lateral.
  Scape not sharply 3-angled: plants annual.
    Achene strongly transverse-rugose: perianth-bristles wanting. — 6. *S. Hallii.*
    Achene smooth or very slightly roughened: perianth-bristles 4–6. — 7. *S. debilis.*
  Scape sharply 3-angled: plants perennial by rootstocks.
    Spikelets acute: scales awned: involucral bract much surpassing the inflorescence. — 8. *S. americanus.*
    Spikelets obtuse: scales mucronate: involucral bract only slightly surpassing the inflorescence. — 9. *S. Olneyi.*
Spikelets several or numerous, in umbels or umbel-like clusters.
  Scape sharply 3-angled: leaves with blades about as long as the scape. — 10. *S. etuberculatus.*
  Scape terete: leaves reduced to mere sheaths.
    Perianth-bristles downwardly barbed: achene gray, or darker, abruptly mucronate. — 11. *S. validus.*
    Perianth-bristles short-plumose below: achene nearly white, narrowed above. — 12. *S. californicus.*

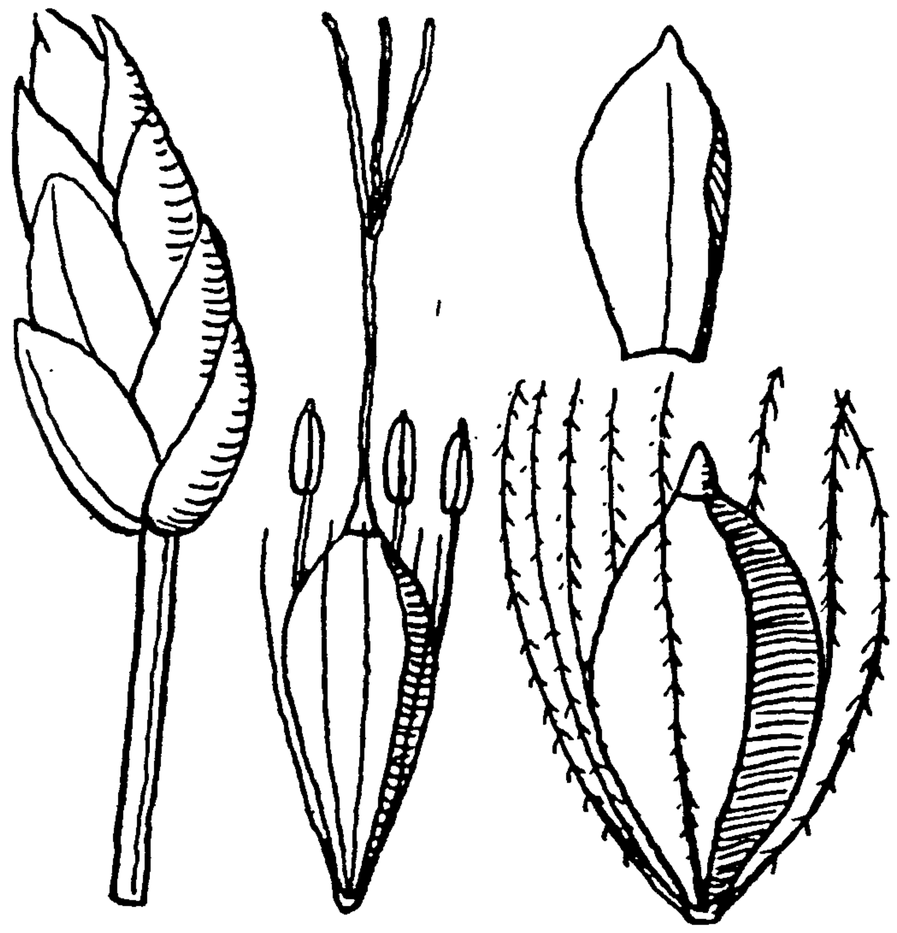
III. Sylvatici

Spikelets few to several, capitate to umbellate, relatively large, in often compound clusters: achene globose-obovoid, dark-brown. — 13. *S. robustus.*
Spikelets very numerous, in compound umbels or umbelled heads, relatively small.
  Perianth-bristles downwardly barbed, or wanting: spikelets in umbelled heads.
    Perianth-bristles present.
      Perianth-bristles equalling or slightly exceeding the achene: leaf-blades 6–16 mm. wide.
        Spikelets 3–8 in each head: scales obtuse: perianth-bristles barbed throughout. — 14. *S. sylvaticus.*
        Spikelets 8–20 in each head: scales acute: perianth-bristles not barbed below. — 15. *S. atrovirens.*
      Perianth-bristles twice as long as the achene: leaf-blades 4–6 mm. wide. — 16. *S. polyphyllus.*
    Perianth-bristles wanting. — 17. *S. georgianus.*
  Perianth-bristles smooth or slightly pubescent: umbel mostly decompound.
    Perianth-bristles shorter than the scales or scarcely exceeding them.
      Perianth-bristles about as long as the achene: scales rather acute.
        Inflorescence merely terminal: spikelets 1 mm. thick: achene not papillose. — 18. *S. divaricatus.*
        Inflorescence terminal and lateral: spikelets 2–3 mm. thick: achene papillose. — 19. *S. fontinalis.*
      Perianth-bristles much longer than the achene: scales mucronate. — 20. *S. lineatus.*
    Perianth-bristles much exserted beyond the scales at maturity.
      Spikelets sessile, in small heads or clusters. — 21. *S. cyperinus.*
      Spikelets, at least some of them, distinctly pedunculed. — 22. *S. Eriophorum.*

IV. Cubenses

Perennial herb, resembling species of *Cyperus*: leaves and bracts of the involucre quite similar. — 23. *S. cubensis.*

1. S. nanus Spreng. Annual, tufted: scapes flattened and grooved, less than 1 dm. tall, the basal sheath bladeless: spikelet ovoid or ovoid-oblong, 2–3 mm. long, 3–8-flowered: scales 1.5–2 mm. long, pale-green: perianth-bristles longer than the achene, barbed: achene oblong or elliptic, varying to ovoid or obovoid, about 1 mm. long, acute.—(DWARFED-BULRUSH.)—Salt to brackish marshes, Coastal Plain and New England Coast, Fla. to Tex. and N. S.; also interior and Pacific Coast provinces.—(*W. I., Mex., O. W.*)



2. S. caespitosus L. Perennial, densely tufted: scapes filiform, nearly terete, 1–5 dm. tall, copiously sheathed at the base, the upper sheath bearing a short, subulate blade: spikelet ovoid-oblong or ovoid, about 4 mm. long, few-flowered: scales 3–4 mm. long, yellowish-brown: perianth-bristles longer than the achene, smooth: achene ellipsoid to obovoid, about 1.5 mm. long, short-beaked.—(DEER-HAIR. DEERHAIR-BULRUSH.)—Bogs and moist rocks, Blue Ridge and more northern provinces, N. C. and Tenn. to Ill., Colo., Alas., C Can., and Lab.—(*Greenl., O. W.*)

3. S. subterminalis Torr. Perennial, mostly aquatic: scapes up to 1 m. tall, nearly terete, the basal sheaths with elongate submersed (except in terrestrial forms) blades: spikelet oblong, narrowly ovoid, or subcylindric, 5–13 mm. long, few-flowered: scales 4–5 mm. long, green or stramineous: perianth-bristles as long as the achene or shorter, downwardly barbed: achene obovoid, 2–3 mm. long, abruptly short-beaked.—(SWAYING-RUSH.)—Ponds and streams, often acid, various provinces, Miss. to B. C., Ont., and Newf.

4. S. Clintonii A. Gray. Perennial, tufted: scapes 3-angled, very slender, sheathed at the base, some of the sheaths bearing slender, often linear blades: spikelet ovoid, 3–4 mm. long, few-flowered: scales 3–3.5 mm. long, pale-brown: perianth-bristles as long as the achene or longer, upwardly barbed: achene oblong or obovoid, 1.5–2 mm. long, obtuse.—Banks, fields, and thickets, Blue Ridge and more northern provinces, N. C. to Mich. and N. Y.

5. S. carinatus (H. & A.) A. Gray. Annual, tufted: scapes 3-angled, channeled, 0.5–2 dm. tall, the basal sheath with a slender blade: spikelet ovoid, about 4 mm. long, 6-8-flowered: scales 1.5–2 mm. long, pale, except the midrib and keel, the scarious margins very wide: perianth-bristles wanting: achene oval or slightly obovoid, about 1.5 mm. long, brown, minutely pointed.—Low grounds, fields, and roadsides, Coastal Plain and adj. provinces, Ala. to Tex., Okla., and Tenn.; also in Calif.

6. S. Hallii A. Gray. Annual, tufted: scapes up to 4 dm. tall, nearly terete or obtusely 3-angled, the upper basal sheath usually with a slender blade: spikelet ovoid, becoming oblong-cylindric, 6–15 mm. long, many-flowered: scales 2.5–3 mm. long, greenish, abruptly pointed: perianth-bristles wanting: achene obovoid-globose, sometimes depressed, fully 1 mm. long, black, transverse-wrinkled.—Wet soil, various provinces, Fla. to Tex., Colo., and Ill.; also in Mass.—(*Mex.*)

7. S. debilis Pursh. Annual, tufted: scapes 1–6 dm. tall, nearly terete or obtusely triangular, yellowish-green, the sheaths bladeless or the upper one with a short blade: spikelets ovoid or oblong-ovoid, 5–10 mm. long, many-

flowered: scales 2.5–3 mm. long, yellowish-brown, except the green midrib and the often tawny margins: perianth-bristles about as long as the achene, downwardly barbed, sometimes very short: achene obovoid, sometimes very broadly so, 1.5–2 mm. long, black, smooth or nearly so, abruptly short-pointed.—Swamps and wet soil, various provinces, N Ga. to Ark., Nebr., Minn., Ont., and Me.

8. S. americanus Pers. Perennial, gregarious: scapes up to 1.5 m. tall, sharply triangular, bright-green, the sheaths (1–3) with elongate-linear blades: spikelets ovoid, mostly 5–12 mm. long, acute, many-flowered: scales 4.5–6 mm. long, brown, erose, minutely subulate-tipped at the notched apex: perianth-bristles as long as the achene or shorter: achene obovoid, about 2.5 mm. long, dark-brown, mucronulate.—(SWORD-GRASS. THREE-SQUARE BULRUSH. CHAIR-MAKER'S RUSH.)—Borders of ponds and streams, various provinces, Fla. to Tex., Calif., B. C., Ont., and Newf.—(*Mex.*, *C. A.*, *S. A.*, *O. W.*)

9. S. Olneyi A. Gray. Perennial, gregarious: scapes up to 2 m. tall, sharply 3-angled or somewhat winged, the upper sheath sometimes with a 3-angled blade: spikelets oblong or ovoid-oblong, or ovoid, 5–9 mm. long, obtuse, many-flowered: scales 3–4 mm. long, dark-brown, except the green midrib, slightly erose, minutely mucronate at the emarginate apex: perianth-bristles shorter than the achene or about equalling it: achene obovoid, about 2.5 mm. long, brown, mucronulate.—Salt and fresh marshes, Coastal Plain and New England Coast, Fla. to Ark. and N. H.; also in Mich. and on Pacific Coast.

10. S. etuberculatus (Steud.) Kuntze. Perennial, sometimes tufted: scapes up to 2 m. tall, sharply 3-angled above, the upper sheath with a 3-angled and channeled blade nearly or quite as long as the scape: spikelets oblong-cylindric, 9–21 mm. long, acutish: scales 5–7 mm. long, pale-brown, acute at the sometimes hooded apex: perianth-bristles equalling the beak of the achene, with spreading barbs: achene obovoid, 3–4 mm. long, including the subulate beak, brown or blackish. [*S. cylindricus* Britton.]—Ponds and swamps, Coastal Plain and adj. provinces, Fla. to La., Ind., and Md.

11. S. validus Vahl. Perennial, gregarious: scapes up to 3 m. tall, light-green, stout (2–3 cm. at the base), the basal sheaths usually bladeless: spikelets ovoid, often becoming oblong-cylindric, 5–16 mm. long, acutish: scales 2.5–3.5 mm. long, minutely pubescent, erose-ciliate, usually mucronulate: perianth-bristles about equalling the achene, downwardly barbed: achene broadly obovoid, about 2 mm. long, gray, reddish, or black, abruptly mucronate. [*S. lacustris* (Fl. SE. U. S.)]—(GREAT-BULRUSH. CATTAIL FLAG. MAT-RUSH. BLACK-RUSH. TULE.)—Ponds, swamps, and streams, throughout temperate N. A.—(*W. I.*, *Mex.*, *C. A.*)

12. S. californicus (C. A. Meyer) Britton. Perennial, gregarious: scapes mostly 1–3 m. tall, obtusely 3-angled, often very stout, the basal sheaths bladeless: spikelets ovoid to oblong-ovoid, 6–11 mm. long, acute: scales 2.5–3.5 mm. long, brown or reddish, glabrous or nearly so, stout-mucronate: perianth-bristles as long as the achene or shorter, plumose-barbed: achene broadly obovoid, about 2 mm. long, nearly white, narrowed above and short-tipped.—Swamps, Coastal Plain and Basin-and-Range province, Fla. to Tex. and Calif.—(*Mex.*, *C. A.*, *S. A.*)

13. S. robustus Pursh. Perennial, tufted or gregarious: stems up to 1.5 m. tall, 3-angled: leaves dark-green: spikelets ovoid-oblong or ovoid, 1.5–3 cm. long, in sometimes dense clusters: scales mostly 7–9 mm. long, reddish or brown, with long markings, puberulent, the awn several times longer than the notched tip: perianth-bristles shorter than the achene or wanting: achene globose-obovoid, sometimes nearly orbicular in outline, 3–3.5 mm. long, abruptly

short-pointed.—(SEA CLUB-RUSH. SALT-MARSH BULRUSH. SPURT-GRASS.)—Brackish marshes, Coastal Plain and New England Coast, Fla. to Tex. and N. S.

14. **S. sylvaticus** L. Perennial, tufted: stems up to 2 m. tall, rather stout: leaves bright-green: spikelets ovoid or oblong-ovoid, 3–5 mm. long, 2–8 in the clusters: scales 1–1.5 mm. long, brown, except the green center, obtuse: perianth-bristles longer than the achene: achene obovoid or ellipsoid, about 1 mm. long.—Swamps and wet stream-banks, various provinces, Ga. to Mich. and Me.—(*O. W.*)

15. **S. atrovirens** Muhl. Perennial, tufted: stems up to 1.5 m. tall, rather slender: leaves bright-green: spikelets ovoid-oblong to cylindric, 3.5–8 mm. long, or longer, 9–30 in the clusters: scales 1.5–2 mm. long, greenish-brown or reddish, acute: perianth-bristles about as long as the achene: achene ellipsoid-obovoid, about 1 mm. long, rather long-pointed.—(GREEN-BULRUSH.)—Swamps and meadows, various provinces, Ga. to La., Sask., Ont., and N. S.

16. **S. polyphyllus** Vahl. Perennial, often tufted: stems up to 1.5 m. tall, sharply 3-angled: leaves light-green: spikelets ovoid, 2.5–3 mm. long, 3–8 in the clusters: scales 1–1.5 mm. long, bright-brown or reddish, mucronulate: perianth-bristles much-bent, about twice as long as the achene: achene obovoid, fully 1 mm. long, short-tipped.—Swamps, wet woods, and meadows, various provinces, Ga. to Ala., Ark., Minn., and Mass.

17. **S. georgianus** Harper. Perennial, often tufted: stems up to 1.2 m. tall, nearly terete: leaves bright-green: spikelets ovoid, 2–4 mm. long, numerous, or sometimes few, in the clusters: scales 1–1.5 mm. long, green, greenish-brown, or reddish, mucronulate: perianth-bristles wanting or mere rudiments: achene broadly ellipsoid, less than 1 mm. long, short-pointed.—Meadows, swamps, and muddy banks, various provinces, Ga. to Ark. and Que.

18. **S. divaricatus** Ell. Perennial, sometimes tufted: stems up to 1.5 m. tall, obtusely 3-angled: leaves deep-green, soft: spikelets cylindric or oblong, 3–5 mm., becoming 10–12 mm. long, mostly solitary at the tips of the inflorescence-branches: scales 1–1.5 mm. long, brown, greenish-brown, or pale, acute: perianth-bristles bent, longer than the achene: achene obovoid or nearly ellipsoid, about 1 mm. long, pale or nearly white, smooth, short-pointed.—Swamps and muddy banks, Coastal Plain, Fla. to La., Mo., and Va.

19. **S. fontinalis** Harper. Perennial and similar to *S. divaricatus* and *S. lineatus* in habit: spikelets ovoid, 2–4 mm. long, becoming narrower and longer in age, mostly solitary at the tips of the inflorescence-branches: scales 1.5–2 mm. long, greenish or brownish-green, the margins often whitish, acute: perianth-bristles bent, about as long as the achene: achene ellipsoid, sometimes broadly so, about 1 mm. long, yellowish or greenish, minutely papillose, long-tipped.—Pond-margins and springy places, Coastal Plain of Ga.

20. **S. lineatus** Michx. Perennial, tufted: stems up to 1.5 m. tall, 3-angled: leaves remote, pale-green, stiff: spikelets oblong, becoming cylindric, 5–10 mm. long, usually solitary at the tip of the inflorescence-branches: scales 2–2.5 mm. long, reddish-brown or pale-brown, except the green midrib, short-pointed: perianth-bristles much bent, much longer than the achene: achene obovoid or ellipsoid-obovoid, fully 1 mm. long, pale-brown, short-pointed.—Swamps and wet meadows, various provinces, Fla. to Tex., Ore., Ont., and N. H.

21. **S. cyperinus** (L.) Kunth. Perennial, up to 1.5 m. tall, nearly terete: leaves bright-green: spikelets ovoid or ovoid-oblong, 4–6 mm. long or longer in age, in dense heads or clusters: scales 1.5–2 mm. long, obtuse or acute: perianth-bristles elongate, much exceeding the achenes and scales, grayish-brown or rust-colored: achene ellipsoid, oval, or obovoid, barely 1 mm. long, pale or nearly white, short-pointed.—(WOOL-GRASS.)—Swamps and wet meadows, various provinces, N. C. to Ark., Mo., Ont., and Newf.

22. S. Eriophorum Michx. Perennial and similar to the next preceding species in habit, sometimes 2 m. tall: leaves pale-green: inflorescence laxer, the branches elongate and often drooping: spikelets ovoid or oblong-ovoid, 3.5–6 mm. long, some of the lateral ones peduncled: scales 1.5–2 mm. long, short-pointed: perianth-bristles pale, long as in *S. cyperinus*: achene ellipsoid to obovoid, less than 1 mm. long, pale, rather long-pointed.—Swamps and low grounds, various provinces, Fla. to Tex., Ark., Ind., and Conn.

23. S. cubensis Poepp. & Kunth. Perennial, resembling species of *Cyperus*, sometimes tufted, the scapes up to 1 m. tall, sharply 3-angled: leaves and bracts of the involucre quite similar, smooth above: spikelets densely crowded into 1 or several subglobose heads: scales firm, 3–4 mm. long, each with a short spreading tip: perianth-bristles wanting: achene ellipsoid, varying to narrowly obovoid or narrowly ovoid, 2–3 mm. long, stout-beaked.—Swamps and river-shores, Coastal Plain, Fla. to La. Nat. of the trop.—(*W. I., Mex., C. A., S. A., O. W.*)

13. FUIRENA Rottb. Perennial or rarely annual caulescent herbs. Leaves sometimes represented only by sheaths. Spikelets many-flowered, terete, often bur-like, clustered, or rarely solitary. Scales spirally imbricate, awned. Flowers perfect. Perianth of 3 usually stalked scales alternating with downwardly barbed bristles. Stamens 3. Ovary stipitate. Style not swollen at the base, deciduous. Stigmas 3. Achene 3-angled, stipitate or nearly sessile, smooth.—About 30 species, most abundant in the warmer regions.—Spr.–fall.—Umbrella-grasses.

Leaves reduced to sheaths without blades, except sometimes near the top of the stem. I. Scirpoideae.
Leaves with well-developed sheaths and blades. II. Squarrosae.

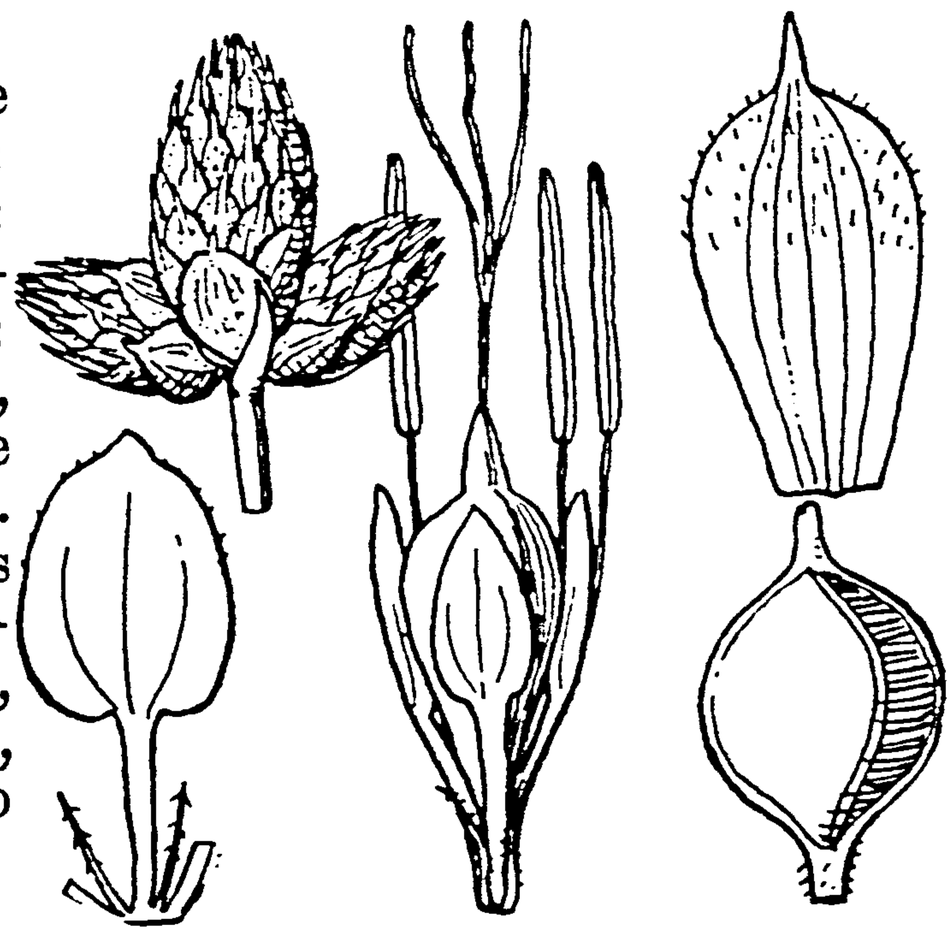
I. Scirpoideae

Leaf-sheaths all bladeless: blades of the perianth-scales ovate. 1. *F. scirpoidea.*
Leaf-sheaths on the upper part of the stem blade-bearing: blades of the perianth-scales suborbicular. 2. *F. longa.*

II. Squarrosae

Perianth-bristles exceeding the achene and perianth-scales: plants annual. 3. *F. squarrosa.*
Perianth-bristles reaching to the middle of the achene or shorter: plants perennial.
  Perianth-bristles very short, not exceeding the stipe of the achene, or slightly longer: perianth-scales with suborbicular or somewhat reniform blades. 4. *F. breviseta.*
  Perianth-bristles reaching to about the middle of the achene: perianth-scales with deltoid-ovate blades. 5. *F. hispida.*

1. F. scirpoidea Michx. Perennial, the stems tufted or gregarious, 2–6 dm. tall: leaves mere sheaths with oblique margins: bracts of the involucre 2–6 mm. long: spikelets solitary or clustered, 5–12 mm. long: scales pubescent, the body 3–4 mm. long, with a short subulate tip: blades of the perianth-scales ovate, acute, fully 1 mm. long, rounded at the base: perianth-bristles as long as the sepal-stalks or longer: achene-body oval-rhombic or somewhat obovoid, fully 1 mm. long.—Lake shores, swamps, and low pinelands, Coastal Plain, Fla. to La. and Ga.



2. **F. longa** Chapm. Perennial, the stems loosely tufted or gregarious, 8–15 dm. long, usually reclining: leaves various, the lower ones mere sheaths, the upper ones with narrow blades: bracts of the involucre 8–16 mm. long: spikelets clustered, 10–15 mm. long: scales pubescent, the body 3–4 mm. long, with a long subulate tip: blades of the perianth-scales suborbicular, abruptly pointed, less than 1 mm. long, truncate or subcordate at the base: perianth-bristles shorter than the sepal-stalks: achene-body obovoid or oval, barely 1 mm. long.—Low pinelands, Coastal Plain, W Fla. to Miss.

3. **F. squarrosa** Michx. Annual, 1–3 dm. tall, or rarely taller: leaves glabrous or the sheaths of the lower ones finely hirsute: spikelets usually clustered: scales pubescent, the body ovate, the awn slender-subulate, one-half as long as the body or more: perianth-scales 3 mm. long or more; blades elliptic or nearly so, each prolonged into a long slender awn, narrowed at the base: achene-body broadly oval, less than 1 mm. long.—(SALT-MARSH UMBRELLA-GRASS.)—Wet, often brackish, grounds, Coastal Plain, Fla. to Mass.; also Great Lake Lowland, Ind. and Mich.

4. **F. breviseta** Coville. Perennial, up to 1 m. tall: leaves finely pubescent, or the sheaths sometimes hirsute, the blades of the upper leaves often deflexed: spikelets mostly clustered: scales pubescent, the body obovate, the awn nearly or quite as long as the body: perianth-scales about 2 mm. long; blades suborbicular or somewhat reniform, short-tipped, abruptly narrowed at the base: achene-body rhombic-oval, less than 1 mm. long. [*F. squarrosa breviseta* Coville.]—Moist sandy soil and swamps, Coastal Plain, Fla. to Tex. and N. C.

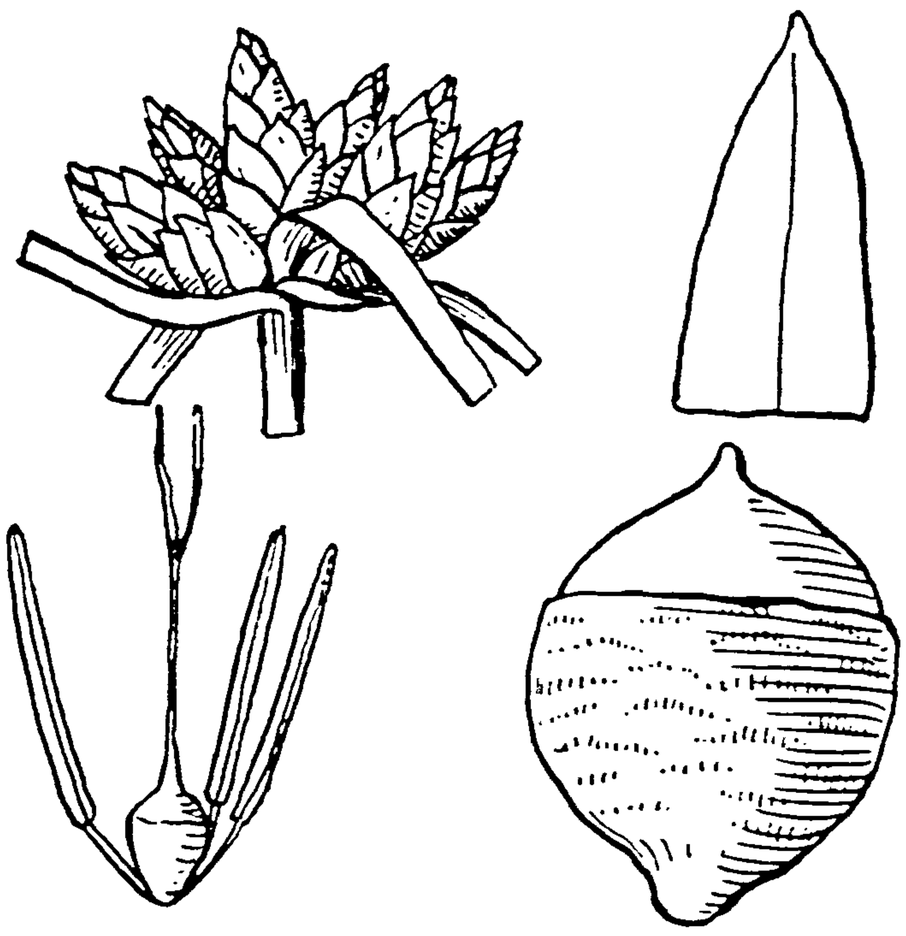
5. **F. hispida** Ell. Perennial, 2–8 dm. tall: leaves, both the sheaths and the blades more or less hirsute: spikelets usually clustered: scales pubescent, the body obovate, the awn subulate, nearly or quite as long as the body: perianth-scales about 2 mm. long; blades deltoid-ovate, abruptly pointed, truncate or cordate at the base: achene-body oval or rhombic, much less than 1 mm. long. [*F. squarrosa hispida* (Ell.) Chapm.]—Swamps and wet pinelands, Coastal Plain and adj. provinces, Fla. to Tex., Okla., Ky., and N. J. (or N. Y. ?)

14. **DICHROMENA** Michx. Perennial caulescent herbs with rootstocks. Leaves mostly near the base of the stem: blades narrow, attenuate. Spikelets few–several-flowered, or rarely many-flowered, crowded in a terminal head which is involucrate by a whorl of leaf-like bracts, the bracts often white or colored at the base, thus serving to attract insects. Scales rather closely imbricate, broad, keeled, white or whitish. Perianth wanting. Stamens 3. Ovary sessile: style subulate. Stigmas 2. Achene short, lenticular, often turgid, transversely wrinkled, crowned with the broad truncate or decurrent tubercle. About 20 species, natives of the warm parts of America.—Spr.–fall. —WHITE-TOPS.

Bracts of the involucre 4–6, linear or slenderly attenuate: tubercle truncate on top of the achene.
  Leaves filiform above the dilated base: achenes dark; tubercle low, blunt. 1. *D. floridensis.*
  Leaves linear above the dilated base: achenes pale; tubercle long, acute. 2. *D. colorata.*
Bracts of the involucre 7–10, lanceolate: tubercle decurrent on the sides of the achene. 3. *D. latifolia.*

1. **D. floridensis** Britton. Plant 1–4 dm. tall, the stem slender, often copiously tufted:. bracts of the involucre 4–6, slenderly attenuate beyond the dilated

bases: heads about 1 cm. in diameter: spikelets elliptic, 5–7 mm. long, pale, often greenish-white: scales 3–4 mm. long, obtuse or mucronulate: achene broadly obovoid or broadly oval, fully 1 mm. long, finely wrinkled.—Pinelands, Everglade Keys, Fla.



2. D. colorata (L.) A. Hitchc. Plant up to 1 m. tall, the stem 3-angled, usually gregarious: leaf-blades narrowly linear-attenuate: bracts of the involucre 4–6, white or yellowish-white at the base, reflexed when mature: heads 1.5–2 cm. in diameter or rarely smaller: spikelets narrowly elliptic: scales 4–5 mm. long, whitish: achene obovoid or globose-obovoid, fully 1 mm. long, not constricted at the base, the tubercle truncate on the top of the achene.—(STAR-RUSH.)—Wet places, low grounds, and swamps, usually calcareous, Coastal Plain and occasionally adj. provinces, Fla. to Tex. and Va. (or N. J.?)—(*W. I., Mex.*)

3. D. latifolia Baldw. Plant up to 1.2 m. tall, the stem nearly terete: leaf-blades broadly linear-attenuate: bracts of the involucre 7–10, becoming colored, often reddish at the base, strongly reflexed when mature: heads 1.5–2 cm. in diameter or rarely longer: spikelets elliptic: scales 4.5–6 mm. long, whitish: achene globose-obovoid or turgid-globose, fully 1 mm. long, often constricted at the base, the tubercle decurrent on the sides of the achene.—(WHITE-TOP RUSH.) Moist or wet pinelands, shallow ponds, and acid sandy swamps, Coastal Plain and rarely adj. provinces, Fla. to Tex. and Va.

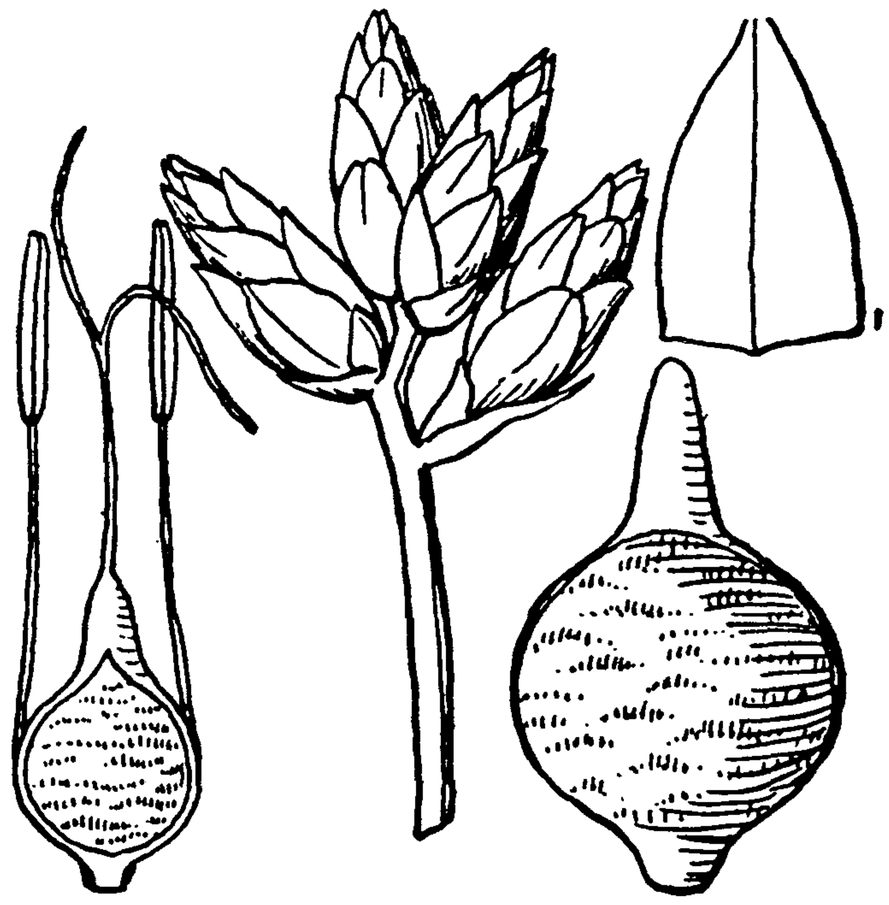
15. PSILOCARYA Torr. Annual, or rarely perennial, caulescent herbs. Leaves few: blades very narrow and elongate. Spikelets few to many, in terminal and axillary umbel-like or cyme-like clusters, not flattened, several–many-flowered. Scales closely imbricate, concave, deciduous. Perianth-bristles wanting. Stamens 2 or rarely 1. Ovary sessile: style with a dilated and enlarging base. Stigmas 2. Achene lenticular, short, sometimes depressed, more or less prominently transversely wrinkled, capped by the short or long tubercle.—About 10 species, natives of the warmer parts of America.—Sum.–fall, or all year S.—BALD-RUSHES.

Tubercle ovate to triangular-lanceolate or subulate, nearly or quite as long as the achene, slightly decurrent.
- Achene finely and shallowly, often obscurely, wrinkled, the tubercle subulate. — 1. *P. scirpoides.*
- Achene coarsely wrinkled, the tubercle ovate to triangular-lanceolate. — 2. *P. corymbifera.*

Tubercle depressed, much shorter than the achene, more or less shouldered at the base.
- Achene about 1 mm. long, slightly, often obscurely, shouldered at the base: spikelet-scales 2–3 mm. long. — 3. *P. nitens.*
- Achene about 1.5 mm. long, prominently shouldered at the base: spikelet-scales 4–5.5 mm. long. — 4. *P. Schiedeana.*

1. P. scirpoides Torr. Plant 0.5–3 dm. tall, or rarely smaller or larger: spikelets ovoid, usually narrowly so, 5–7 mm. long, obtuse or acute: scales 2.5–3 mm. long, obtuse or acute, appressed, chestnut-brown: achene suborbicular in outline, or depressed, barely 1 mm. long, finely and shallowly

wrinkled, slightly margined, somewhat contracted at the base, the tubercle subulate, as long as the achene or longer, slightly decurrent.—(BALD-RUSH.)—Wet soil and margins of ponds, Coastal Plain, N. C., New England Coast, Mass. to R. I., and Great Lake Lowland, Ind. and Mich.



2. P. corymbifera (C. Wright) Britton. Plant 1–7 dm. tall: spikelets ellipsoid-ovoid, 6–10 mm. long, acutish: scales 2.5–3.5 mm. long, acute, rather lax, especially at the tip, brownish, often pale: achene suborbicular in outline, or much depressed, 0.5 mm. long or more, rather coarsely wrinkled, marginless, the tubercle ovate or triangular-lanceolate, nearly or quite as long as the achene, slightly decurrent. [*P. corymbiformis* Benth.]—Wet pinelands and ponds, Coastal Plain, Fla. to La. and Ga.—(*W. I.*)

3. P. nitens (Vahl) Wood. Plant 2–7 dm. tall: spikelets ovoid to ellipsoid-ovoid, 5–7 mm. long, usually acute: scales 2–3 mm. long, mostly acute or slightly acuminate, appressed, brown: achene suborbicular in outline or orbicular-obovoid, about 1 mm. long, coarsely wrinkled, often margined, barely contracted at the base, not decurrent, much shorter than the achene.—Swamps, lake-shores, and wet ground, Coastal Plain, Fla. to Tex. and N. Y., and Great Lake Lowland, Ind. and Mich.

4. P. Schiedeana (Nees.) Liebm. Plant mostly 2–5 dm. tall: spikelets conic-ovoid, 6–8 mm. long, somewhat acuminate: scales 4–5.5 mm. long, acuminate, rather lax, brownish: achene depressed, about 1.5 mm. long, wrinkled-cancellate, marginless, the tubercle much depressed, with a short tip and very prominent shoulders.—Wet soil, pen. Fla.—(*W. I., Mex.*)

16. RYNCHOSPORA Vahl. Perennial or rarely annual caulescent gregarious or tufted herbs. Leaves with narrowly linear, flat, channeled, involute, filiform, or capillary blades, those of the stem with long sheaths. Spikelets mainly globose, ovoid, ellipsoid, or fusiform, 1–2-flowered or rarely few-flowered, borne in terminal and axillary capitate or open, often corymb-like cymes. Scales imbricate, concave. Perianth of 3–6, or fewer or more, barbed or plumose bristles, or obsolete. Stamens mostly 3. Ovary sessile or stipitate: style partly persistent. Stigmas 2. Achene lenticular, sometimes very turgid, smooth, cancellate, or transversely wrinkled, capped or crowned with a depressed or elongate tubercle. About 200 species, most abundant in warm regions.—Spr.–fall, or all year S.—BEAK-RUSHES.

Style elongate: stigmas much shorter than the style.
  Spikelets in 1–4 dense globose heads. I. CAPITATAE.
  Spikelets in panicled clusters: achene capped with a stout tubercle. II. CORNICULATAE.
Style short: stigmas as long as the style or longer.
  Perianth-bristles wanting or very short. III. PUSILLAE.
  Perianth-bristles present and usually well-developed.
    Bristles plumose: achenes wrinkled. IV. PLUMOSAE.
    Bristles more or less distinctly barbed. V. GLOMERATAE.

I. CAPITATAE

Plant stiffly erect: leaf-blades involute, thus elongate-acicular: heads short-peduncled or long-peduncled. 1. *R. Tracyi.*

II. Corniculatae

Achene ellipsoid-obovate, much longer than wide.
  Perianth-bristles shorter than the achene: mature achene 5–6 mm. long. — 2. *R. corniculata.*
  Perianth bristles about twice as long as the achene: mature achene less than 5 mm. long. — 3. *R. inundata.*
Achene broadly-obovate, slightly longer than wide.
  Inflorescence effuse, the primary glomurels with few spikelets: achene less than 5 mm. long: perianth-bristles usually 4. — 4. *R. Careyana.*
  Inflorescence fastigiate, the primary glomurels with many (10–50) spikelets: achene 5–6 mm. long: perianth-bristles usually 6. — 5. *R. macrostachya.*

III. Pusillae

Achene transversely wrinkled. — 6. *R. intermixta.*
Achene smooth or reticulate.
  Achene reticulate, 0.5–0.7 mm. long: spikelets loosely corymbose. — 7. *R. divergens.*
  Achene smooth, 1.5–2 mm. long: spikelets corymbose-capitate.
    Stem-leaves with blades 0.7 mm. wide or less: spikelets 3–4 mm. long. — 8. *R. Chapmanii.*
    Stem-leaves with blades 1.5–2.5 mm. wide: spikelets 4–6 mm. long.
      Achene about 1.5 mm. long, obovoid-ellipsoid or oval, minutely pitted, the tubercle minute, inconspicuous. — 9. *R. pallida.*
      Achene about 2 mm. long, suborbicular or oval-orbicular, smooth, the tubercle prominent. — 10. *R. Rappiana.*

IV. Plumosae

Spikelets solitary or 2–4 together, 6–8 mm. long. — 11. *R. oligantha.*
Spikelets numerous, clustered, 2.5–4 mm. long.
  Perianth-bristles plumose nearly or quite to the top.
    Stems slender, 1.5–3.5 dm. tall: spikelets small. — 12. *R. plumosa.*
    Stems stout, 3–6 dm. tall: spikelets large. — 13. *R. intermedia.*
  Perianth-bristles plumose below the middle or only near the base. — 14. *R. semiplumosa.*

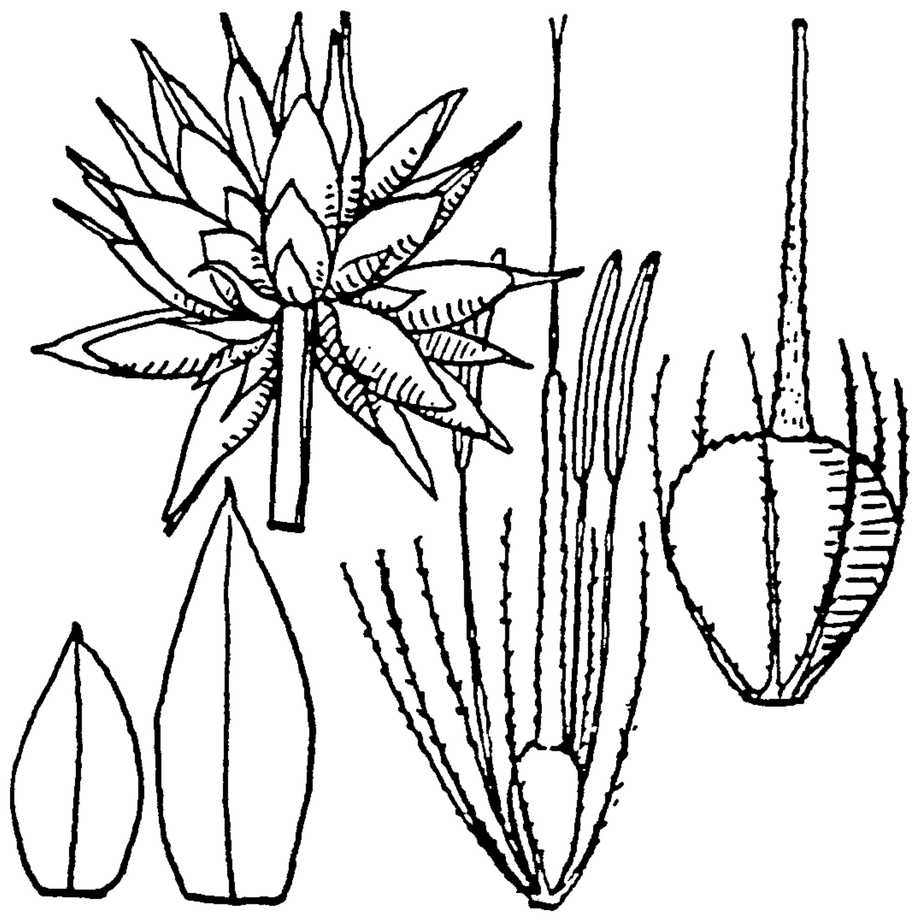
V. Glomeratae

Bristles retrorsely barbed.
  Scales pale-green or white: perianth-bristles 9–24.
    Achene broadly ellipsoid or ellipsoid-obovoid: perianth-bristles mostly fewer than 15. — 15. *R. alba.*
    Achene turbinate-obovoid: perianth-bristles mostly more than 15. — 16. *R. macra.*
  Scales brown: perianth-bristles 6.
    Spikelets few to numerous in rather loose, often panicled clusters.
      Spikelets many together in clusters; scales dark-brown.
        Achene about 1.5 mm. long, the body broadly ellipsoid above the stipe-like base. — 17. *R. capitellata.*
        Achene about 2 mm. long, the body subglobose above the stipe-like base. — 18. *R. glomerata.*
      Spikelets few in distant clusters; scales pale-brown. — 19. *R. leptocarpa.*
    Spikelets numerous, in 2–4 dense globose clusters.
      Spikelets 5–6 mm. long: achene 2.5 mm. long. — 20. *R. axillaris.*
      Spikelets 3–3.5 mm. long: achene 1.5 mm. long. — 21. *R. microcephala.*
Bristles upwardly barbed.
  Achene smooth or cancellate, not transversely wrinkled.
    Achene smooth.
      Tubercle of the achene ciliate to serrulate.
        Leaf-blades flat. — 22. *R. fuscoides.*
        Leaf-blades channeled, involute, filiform or nearly so.
          Achene linear-oblong: perianth-bristles much overtopping the tubercle. — 23. *R. Curtissii.*
          Achene obovoid: perianth-bristles, or some of them at least, not longer than the achene and tubercle, or scarcely so.
            Achene 1 mm. long or less, light-brown. — 24. *R. filifolia.*
            Achene 1.5–2 mm. long, dark-brown.

Achene narrowly obovoid, much less than 1 mm. wide. 25. *R. fusca.*
Achene broadly obovoid, about 1 mm. wide. 26. *R. Harperi.*
Tubercle of the achene smooth or merely granular.
Perianth-bristles as long as the achene or longer.
Leaf-blades 0.5–2 mm. wide.
Perianth-bristles about as long as the achene.
Spikelet-scales very broad, suborbicular to reniform, mostly less than 3 mm. long. 27. *R. distans.*
Spikelet-scales narrow, lanceolate to elliptic, mostly over 3 mm. long. 28. *R. solitaria.*
Perianth-bristles much longer than the achene.
Achene without a stipe-like base, the tubercle conic-subulate. 29. *R. gracilenta.*
Achene with a stipe-like base, the tubercle lanceolate. 30. *R. Smallii.*
Leaf-blades 2–7 mm. wide. 31. *R. Baldwinii.*
Perianth-bristles much shorter than the achene, sometimes very short.
Leaf-blades 0.5–3 mm. wide: spikelets 2–5 mm. long.
Leaf-blades narrowly linear: spikelets 4–5 mm. long. 32. *R. fascicularis.*
Leaf-blades bristle-like, filiform: spikelets 2.5–3 mm. long. 33. *R. Wrightiana.*
Leaf-blades 4–10 mm. wide: spikelets 6–8 mm. long. 34. *R. dodecandra.*
Achene cancellate.
Leaf-blades broadly linear, blunt or merely acute: achene 1.5 mm. long. 35. *R. ciliaris.*
Leaf-blades narrowly linear, attenuate.
Achenes 2.5 mm. long, equalling or shorter than the bristles. 36. *R. Grayi.*
Achenes 1.5 mm. long, much longer than the bristles.
Spikelets ellipsoid or ovoid-ellipsoid, 2.5–3.5 mm. long: tubercle not constricted at the base. 37. *R. Harveyi.*
Spikelets globose-ovoid, about 2 mm. long: tubercle constricted at the base. 38. *R. pinetorum.*
Achene transversely wrinkled.
Perianth-bristles shorter than the achene.
Leaf-blades and stems filiform: spikelets filiform-pedicelled, stalked. 39. *R. rariflora.*
Leaf-blades flat or involute, not filiform: spikelets sessile or short-pedicelled, stalked.
Leaf-blades involute.
Achene flat, 1.5 mm. long, continuous with the tubercle. 40. *R. Torreyana.*
Achene strongly biconvex, 2 mm. long, constricted under the tubercle. 41. *R. Earlei.*
Leaf-blades flat.
Achenes biconvex, not constricted under the tubercle.
Achenes 1 mm. long: tubercle depressed, wider than high.
Achene ellipsoid, decidedly longer than wide, nearly 1 mm. wide, finely wrinkled. 42. *R. Edisoniana.*
Achene orbicular-obovoid, about as long as wide, fully 1 mm. wide, coarsely wrinkled.
Cymes many-flowered, more or less nodding: tubercle confluent with the achene-body. 43. *R. perplexa.*
Cymes few-flowered, erect: tubercle with a ring-like base, thus sharply differentiated from the achene-body. 44. *R. globularis.*

- Achene 1.5 mm. long : tubercle conic, about as high as wide. — 45. *R. cymosa.*
- Achene compressed, constricted under the tubercle. — 46. *R. compressa.*
- Perianth-bristles as long as the achene or longer.
  - Spikelets ovoid to globular, 2–4 mm. long.
    - Achene not stipitate.
      - Cymes with erect or ascending peduncles and pedicels.
        - Tubercle not setose.
          - Tubercle depressed-conic or disk-like. — 47. *R. saxicola.*
          - Tubercle conic or triangular, ¼ to ½ as long as the achene.
            - Achene 2–3 mm. long. — 48. *R. punctata.*
            - Achene 1–1.5 mm. long.
              - Perianth-bristles about as long as the achene, exceeded usually by the tubercle.
                - Spikelets clustered : tubercle bluntish, achene orbicular-obovoid. — 49. *R. microcarpa.*
                - Spikelets sharp-pointed, achene ellipsoid. — 50. *R. decurrens.*
              - Perianth-bristles usually longer than the achene and tubercle. — 51. *R. schoenoides.*
        - Tubercle setose.
          - Spikelets 1–3-flowered.
            - Perianth-bristles not longer than the achene and tubercle. — 52. *R. patula.*
            - Perianth-bristles longer than the achene and tubercle.
              - Achene broadly obovoid or orbicular-obovoid. — 53. *R. caduca.*
              - Achene narrowly obovoid. — 54. *R. mixta.*
          - Spikelets 5–10-flowered. — 55. *R. prolifera.*
      - Cymes with divaricate peduncles and pedicels. — 56. *R. miliacea.*
    - Achene constricted at the base into a stipe: tubercle setose. — 57. *R. stipitata.*
  - Spikelets fusiform to lanceolate, 4–6 mm. long.
    - Leaf-blades filiform : achene obovoid : tubercle smooth. — 58. *R. stenophylla.*
    - Leaf-blades not filiform : achene linear-ellipsoid or oblanceolate : tubercle setose. — 59. *R. inexpansa.*

1. **R. Tracyi** Britton. Stem up to 1.2 m. tall, nearly terete: leaf-blades channeled, 4–8 mm. wide: spikelets in 1–6 dense heads, 5–6 mm. long, pale: scales acute or slightly acuminate: achene obovoid or cuneate-obovoid, 2.5–3 mm. long, ciliate, much exceeded by the perianth-bristles, the tubercle subulate, fully twice as long as the achene. [*Ceratoschoenus capitatus* Chapm.] —Pineland ponds and swamps, Coastal Plain, Fla. to Miss. and Ga.—(*W. I.*)



2. **R. corniculata** (Lam.) A. Gray. Stem up to 2 m. tall, 3-angled: leaf-blades 6–20 mm. wide, rough-margined: spikelets borne in diffuse decompound cymes, fusiform: scales acute or slightly acuminate: achene ellipsoid-obovate, 5–6 mm. long, much exceeding the subulate unequal perianth-bristles, the tubercle subulate, several times longer than the achene.—(HORNED-RUSH.)—Swamps and wet grounds, Coastal Plain and adj. provinces, Fla. to Tex., Mo., Del., and Pa.—A form from the interior, Ala. to Tex., Ark., and Ind., with somewhat smaller achenes has been described as *R. corniculata interior.*

3. **R. inundata** (Oakes) Fernald. Stem, leaves, and inflorescence resembling *R. corniculata,* but plants loosely stoloniferous and widely gregarious: spike-

lets slender-fusiform: scales acute or abruptly pointed: achene mostly 4–4.5 mm. long, about ½ as long as the perianth-bristles, the tubercle about thrice or four times as long as the achene.—(HORNED-RUSH.)—Ponds, lakes, swamps, and marshes, Coastal Plain and New England Coast, Fla. to Mass.

4. **R. Careyana** Fernald. Stem and leaves resembling those of *R. corniculata* and *R. inundata*, the plants like the latter widely stoloniferous: inflorescence effuse, the clusters rather lax: spikelets loosely spreading: scales acute to abruptly pointed: achene mostly about 4 mm. long, about ½ as long as the perianth-bristles, the tubercle nearly thrice as long as the achene.—(HORNED-RUSH.)—Marshes, ponds, ditches, low pinelands, Fla.

5. **R. macrostachya** Torr. Stem up to 2 m. tall, 3-angled, solitary or somewhat tufted, but not stoloniferous: leaf-blades mostly less than 2 cm. wide: spikelets in one or several dense fastigiate clusters, fusiform: scales acute or acuminate and often slender-tipped: achene broadly obovate, 5–6 mm. long, much shorter than the perianth-bristles, the tubercle thrice or four times as long as the achene. [*R. corniculata macrostachya* Britton.]—(HORNED-RUSH.)—Swamps, marshes, ponds, and wet pinelands, sometimes in salt-marshes, various provinces, Fla. to Tex., SE Kans., Mich., and E Mass.—The fruit characters as given above fail occasionally in specimens from west of the Mississippi River, which have narrower achenes and short perianth-bristles.

6. **R. intermixta** C. Wright. Stem 1–3 dm. tall, filiform or capillary: leaf-blades resembling the stem, but more slender, curved: spikelets elliptic-ovoid, about 2 mm. long, borne in 1–3 separate lax clusters: scales obtuse or abruptly pointed, 1.5–2 mm. long: achene ellipsoid-obovoid or cuneate-obovoid, 1 mm. long or nearly so, transversely wrinkled, whitish, not accompanied by perianth-bristles, the tubercle small, depressed. [*R. pusilla* M. A. Curtis.]—Pineland swamps, Coastal Plain, Fla. to Tex.—(*W. I.*)

7. **R. divergens** M. A. Curtis. Stem 1.5–4 dm. tall, filiform or wiry: leaf-blades resembling the stem but more slender, curved: spikelets borne in loose or somewhat contracted corymb-like cymes, elliptic to ovoid-elliptic, 3–3.5 mm. long, acute: scales acute or mucronulate, 2–2.5 mm. long: achene broadly obovoid or orbicular-obovoid, much less than 1 mm. long, constricted at the base, not accompanied with perianth-bristles, the tubercle much depressed.—Moist pinelands, Coastal Plain, Fla. to S. C.—(*W. I.*)

8. **R. Chapmanii** M. A. Curtis. Stem 2–6 dm. tall, filiform: leaf-blades resembling the stem but more slender: spikelets borne in usually a solitary terminal cluster, fusiform, 3–4 mm. long: scales aristate-mucronate, 2–3 mm. long: achene oval, fully 1 mm. long, smooth and shining, not accompanied by perianth-bristles, the tubercle deltoid, sometimes slightly depressed.—Low pinelands, Coastal Plain, Fla. to La. and N. C.

9. **R. pallida** M. A. Curtis. Stem 1–6 dm. tall, stoutish: spikelets numerous, borne in a mostly solitary terminal dense cluster, fusiform, 4–6 mm. long: scales acuminate or abruptly pointed, 2.5–4 mm. long: perianth-bristles very short, rudimentary, or wanting: achene obovoid-ellipsoid or oval, about 1.5 mm. long, smooth, the tubercle inconspicuous, minute, depressed.—Acid pineland bogs, Coastal Plain, N. C. to N. Y.

10. **R. Rappiana** Small. Similar to *R. pallida* in habit, but stouter and with broader leaf-blades: spikelets rather numerous, borne in a single terminal cluster, fusiform, chestnut-colored, 5–6 mm. long; scales abruptly short-pointed, mostly 3–4 mm. long: perianth-bristles very short or wanting: achene suborbicular or oval-orbicular, about 2 mm. long, pale, minutely pitted, the tubercle prominent, somewhat depressed.—Low pinelands, E pen. Fla.

11. R. oligantha A. Gray. Stem 2–4 dm. tall, capillary: spikelets solitary, or few together in a lax cluster, ellipsoid or ellipsoid-fusiform, 6–8 mm. long: scales acute or abruptly pointed, 4–6.5 mm. long: perianth-bristles longer than the achene, densely plumose below the middle: achene obovoid, about 2 mm. long, transversely wrinkled, the tubercle prominent, with a dilated border and a conic tip.—Wet, often acid, sandy soil and pinelands, Coastal Plain, Fla. to Tex. and N. J.

12. R. plumosa Ell. Stem 1–3.5 dm. tall, slender and wiry: leaves few: blades filiform, curving: spikelets borne in 2–4 lax clusters, ellipsoid-ovoid, 2.5–3.5 mm. long: scales short-acuminate or aristulate, 2.5–4 mm. long: perianth-bristles plumose nearly or quite to the top, about as long as the achene or shorter: achene orbicular-obovoid or broadly oval, fully 1.5 mm. long, strongly wrinkled, the tubercle depressed-conic, not constricted under the base.—Pinelands, Coastal Plain, Fla. to La. and N. C.—(*W. I.*)

13. R. intermedia (Chapm.) Britton. Stem 2–7 dm. tall, stout: leaves numerous: blades 1–2 mm. wide, more or less involute: spikelets borne in 4–6 clusters which form a continuous or an interrupted terminal inflorescence, ovoid or elliptic-ovoid, 3–4 mm. long: scales short-acuminate, 3–5 mm. long: perianth-bristles plumose nearly or quite to the top, longer than the achene: achene obovoid, about 2 mm. long, transversely wrinkled, the tubercle depressed-conic, constricted under the base.—Pinelands, Fla.—Reported from Ala.

14. R. semiplumosa A. Gray. Stem 2.5–7 dm. tall, bright-green: leaf-blades 1.5–2.5 mm. wide: spikelets crowded in a terminal head-like cluster, or sometimes with an additional cluster, fusiform, 4–6 mm. long: scales short-acuminate, 2–3 mm. long: perianth-bristles plumose below the middle or only near the base, longer than the achene: achene broadly obovoid or orbicular-obovoid, about 1.5 mm. long, wrinkled, the tubercle conic, often broadly so, above the annular base.—Pinelands, Coastal Plain, Fla. to Tex. and Ga.—(*W. I.*)

15. R. alba (L.) Vahl. Stem 1–6 dm. tall, pale-green: leaf-blades mostly less than 2 mm. wide: spikelets borne in mostly 2–4 dense corymb-like clusters, 4–5.5 mm. long, narrowly fusiform: scales acute or mucronate, 3.5–5 mm. long, white or pale-green: perianth-bristles 9–15 or rarely more, much longer than the achene: achene broadly ellipsoid to ellipsoid-obovoid, fully 1.5 mm. long, pale-brown, constricted at the base, the tubercle lanceolate, one-half as long as the achene or more.—(WHITE BEAK-RUSH.)—Acid bogs, various provinces, Ga. to Ky., Minn., N Calif., Alas., C Can., and Newf.—(*W. I., O. W.*)

16. R. macra (Clarke) Small. Stem 2–8 dm. tall, bright-green: leaves mostly over 2 mm. wide: spikelets borne in mostly 1 or 2 dense corymb-like clusters, 4.5–5.5 mm. long, fusiform: scales mucronulate, 3–4.5 mm. long, whitish-green: perianth-bristles mostly 15–24, much longer than the achene: achene turbinate-obovoid, about 2 mm. long, brown, constricted at the base, the tubercle conic or conic-subulate, about one-half as long as the achene. [*R. alba macra* Clarke.]—Wet pinelands, Coastal Plain, Fla. to Tex. and Ga.

17. R. capitellata (Michx.) Vahl. Stem up to 1.5 m. tall, bright-green: leaf-blades deep-green, mostly 3 mm. wide or less: spikelets borne in few dense corymbose-capitate, mostly erect, distant, clusters, ellipsoid-ovoid, 3–4 mm. long: scales dark-brown, 1.5–3 mm. long, usually mucronulate: perianth-bristles much longer than the achene: achene obovoid, about 1.5 mm. long, constricted at the base, dark-brown, the tubercle subulate or lanceolate-subulate, as long as the achene or nearly so. [*R. glomerata* (Fl. SE. U. S.)]—Low and wet grounds, often acid, various provinces, Fla. to Tex., Mich., and N. B.

18. R. glomerata (L.) Vahl. Stem up to 2 m. tall, bright-green: leaf-blades bright-green, flat, mostly 4–7 mm. wide: spikelets borne in several to many

corymbose-cymose dense clusters which are often nodding, fusiform, 5–6 mm. long: scales dark-brown, mucronate, 2.5–5 mm. long: perianth-bristles much longer than the achene: achene broadly obovoid or pyriform, about 2 mm. long, much constricted at the base, the body thus often orbicular in outline, or even wider than high, the tubercle subulate, as long as the achene or nearly so. [*R. glomerata paniculata* (A. Gray) Chapm.]—Swamps, moist slopes, and ravines, Coastal Plain and adj. provinces, Fla. to Tex. and Md.

19. R. leptocarpa (Chapm.) Small. Stem up to 1 m. tall, light- or pale-green: leaf-blades thinnish, 1.5–2.5 mm. wide: spikelets borne, usually few together, in 3–6 short-stalked clusters, whose bracts and bractlets project as almost capillary tips, ellipsoid or ellipsoid-fusiform, 3–4 mm. long: scales obtuse or acute, very thin, pale-brown, 1.5–3 mm. long: perianth-bristles much longer than the achene: achene obovoid, about 1.5 mm. long, pale, slightly constricted at the base, smooth, shining, the tubercle lanceolate-subulate, shorter than the achene. [*R. glomerata leptocarpa* Chapm.]—Wet woods and low pinelands, Coastal Plain, Fla. to Miss. and S. C.

20. R. axillaris (Lam.) Britton. Stem stout, up to 1 m. tall: leaf-blades 2–3 mm. wide, flat: spikelets borne in several large globular heads (mostly 1.5–2.5 cm. in diameter), fusiform, 5–6 mm. long: scales dark-brown, 3–5 mm. long, aristulate-acuminate: perianth-bristles larger than the achene, usually not exceeding the tubercle: achene globose-obovoid, above the stipe-like base, about 2.5 mm. long, the tubercle subulate, about as long as the achene. [*R. cephalantha* A. Gray.]—Acid bogs and swamps, Coastal Plain and adj. provinces, Fla. to La. and N. S.—(*W. I.*)

21. R. microcephala Britton. Stem slender, up to 1.5 m. tall: leaf-blades involute, thus linear-filiform: spikelets borne in several small globose heads (mostly 1–1.5 cm. in diameter), fusiform, 3–3.5 mm. long: scales chestnut-brown, 2–4 mm. long, mucronulate: perianth-bristles usually longer than the achene and tubercle: achene obovoid, about 1.5 mm. long, constricted at the base, the tubercle subulate-lanceolate, shorter than the achene.—Swamps and low grounds, often acid, Coastal Plain and adj. provinces, Fla. to La. and N. J.

22. R. fuscoides Clarke. Stem slender, 1–7 dm. tall: leaf-blades flat, mostly 1–2 mm. wide: spikelets borne few together in 1–3 stiff clusters, ovoid or ellipsoid-ovoid, 2–2.5 mm. long, acute at both ends: scales mucronate, 2–4 mm. long: perianth-bristles longer than the achene: achene broadly oval or orbicular-oval, 1.5–2 mm. long, not constricted at the base, the tubercle subulate-conic, as long as the achene or longer.—Low pinelands, Coastal Plain, Fla. to Tex.—(*W. I.*)

23. R. Curtissii Britton. Stem filiform, 1–2 dm. tall: leaf-blades strongly involute, thus very narrow: spikelets solitary or borne few together in 1–3 lax clusters, ellipsoid often narrowly so, 4–6 mm. long, acute at both ends: scales mucronate, 2.5–5 mm. long or rarely smaller: perianth-bristles longer than the achene: achene narrowly ellipsoid or linear-ellipsoid, about 1.5 mm. long, smooth, the tubercle lanceolate, fully one-half as long as the achene.—Moist pinelands, W Fla.

24. R. filifolia Torr. Stem 2–6 dm. tall: leaf-blades channeled and involute, thus filiform or bristle-like: spikelets borne in usually 2–4 capitate clusters, lanceolate in outline or ovoid-lanceolate, 3–3.5 mm. long: scales acuminate or mucronulate, 2–3 mm. long, brown: perianth-bristles mostly longer than the achene: achene obovoid, about 1 mm. long, shining, light-brown, the tubercle deltoid to triangular-lanceolate, shorter than the achene.—Pineland ponds, Coastal Plain and adj. provinces, Fla. to Tex. and N. J.—(*W. I.*)

25. R. fusca (L.) Ait.f. Stem 1–6 dm. tall, deep-green: leaf-blades filiform-setaceous, channeled: spikelets borne few together in 1–4 rather lax clusters,

fusiform, 4.5–6 mm. long: scales mucronate, 3–5 mm. long, chestnut-colored: perianth-bristles unequal, some of them longer than the achene: achene narrowly obovoid, about 1 mm. long, smooth, constricted at the base, the tubercle triangular-subulate or lanceolate, shorter than the achene.—Around ponds, often in acid soil, various provinces, Fla. to Ga., Miss.(?), Mich., Ont., and Newf.—(*O. W.*)

26. **R. Harperi** Small. Stem 3–7 dm. tall, slender: leaf-blades involute, thus filiform or linear-filiform: spikelets borne in usually 2 or 3 loose-capitate clusters, fusiform, 4.5–5.5 mm. long: scales aristulate-mucronate, mostly 3–5 mm. long, brown: perianth-bristles longer than the achene: achene obovoid, about 2 mm. long, constricted into a somewhat stipe-like base, smooth, the tubercle subulate, truncate.—Pineland ponds, Coastal Plain, Ga.—Most closely related to *R. leptorhyncha* C. Wright, of Cuba, which was once recorded from Florida, apparently in error.

27. **R. distans** (Michx.) Vahl. Stem 2–7 dm. tall, slender: leaf-blades very narrow, involute, thus filiform or nearly so: spikelets borne, few together or several, in usually 2 or 3 head-like cymes, ovoid, 2.5–3 mm. long: scales mucronate, dark-brown, 2–3 mm. long: perianth-bristles mostly as long as the achene or longer: achene oval or orbicular-oval, varying to ovoid or obovoid, about 1.5 mm. long, the tubercle conic-subulate, about one-half as long as the achene. —Pinelands, Coastal Plain, Fla. to S. C.—(*W. I.*)

28. **R. solitaria** Harper. Stem slender, 3–8 dm. tall, flattened: leaf-blades about 2 mm. wide, or less, mostly flat: spikelets in 1 or 2 capitate clusters, narrowly fusiform or lanceolate in outline, 5–6.5 mm. long: scales aristulate-tipped, brown, mostly 3–6 mm. long: perianth-bristles about as long as the achene: achene obovoid, about 1.5 mm. long, faintly pitted, the tubercle triangular or deltoid, much shorter than the achene.—Moist pinelands, Coastal Plain, S Ga.

29. **R. gracilenta** A. Gray. Stem 1–5 dm. tall, very slender or filiform: leaf-blades flat, or somewhat involute in drying, mostly less than 2 mm. wide: spikelets borne in 1–4 lax clusters, narrowly ovoid, 3.5–4 mm. long: scales acute or abruptly pointed, mostly 2–3 mm. long, brown: perianth-bristles much longer than the achene: achene oval or subglobose, about 1.5 mm. long or more, smooth, the tubercle subulate, as long as the achene or longer.—Low pinelands and acid swamps, Coastal Plain and rarely adj. provinces, Fla. to Tex. and N. J.—(*W. I.*)

30. **R. Smallii** Britton. Stem up to 1.5 m. tall, bright-green: leaf-blades flat, 5 mm. wide or less: spikelets borne in several rather lax, sometimes corymb-like clusters, fusiform, 3–4 mm. long: scales mucronulate, brown 2–3.5 mm. long: perianth-bristles much longer than the achene: achene obovoid, sometimes narrowly so, about 1.5 mm. long, smooth, the tubercle lanceolate, one-half as long as the achene or more.—Swamps and damp hillsides, Blue Ridge, N. C., and various provinces, Va. to Pa. and N. J.

31. **R. Baldwinii** A. Gray. Stem stout, up to 1.2 m. tall, sharply 3-angled: leaf-blades 2–7 mm. wide, more or less glaucous: spikelets borne in 1–3 loosely capitate clusters, ovoid or ellipsoid-ovoid, 5–6 mm. long: scales aristate-tipped, chestnut-colored, 3–5 mm. long: perianth-bristles longer than the achene: achene oval or globose-oval, fully 2 mm. long, minutely granular, the tubercle triangular-conic, shorter than the achene.—Low pinelands, Coastal Plain, Fla. to Miss. and N. C.

32. **R. fascicularis** (Michx.) Vahl. Stem stout, up to 1.5 m. tall, often obscurely 3-angled: leaf-blades 1.5–4 mm. wide, more or less involute, but not very narrow: spikelets borne in 2–5 rather large head-like cymes, broader or ovate-lanceolate in outline, 4–5 mm. long or rarely smaller: scales aristate-

mucronate, 3–4.5 mm. long, dark brown: perianth-bristles shorter than the achene: achene oval or orbicular-oval, 2 mm. long or less, the tubercle triangular, often deltoid.—Low pinelands, Coastal Plain, Fla. to La. and N. C. —(*W. I.*)

33. **R. Wrightiana** Boeckl. Stem very slender or filiform, 2–4 dm. long, spreading or procumbent: leaf-blades involute, thus filiform or setaceous: spikelets borne in usually 2 or 3 cluster-like cymes, fusiform or narrowly ovoid, 2.5–3 mm. long: scales mucronate, 2.5–3 mm. long, brown, often pale: perianth-bristles much shorter than the achene: achene oval or orbicular-obovoid, 1–1.5 mm. long, the tubercle deltoid or depressed. [*R. brachychaeta* Sauv.]—Moist pinelands and grassy swamps, Coastal Plain, Fla. to N. C.—(*W. I.*)

34. **R. dodecandra** Baldw. Stem stout, up to 1.2 m. tall, 3-angled: leaf-blades flat, 4–10 mm. wide: spikelets borne in 4–6 lax corymb-like clusters, ovoid, 6–8 mm. long: scales mucronate, chestnut-colored, 3–8 mm. long: perianth-bristles shorter than the achene: achene orbicular-obovoid or oval, 3–4 mm. long, smooth, the tubercle depressed, with a collar-like base, much shorter than the achene.—Sandy hammocks, sandhills, and scrub, Coastal Plain, Fla. to Miss. and N. C.

35. **R. ciliaris** (Michx.) C. Mohr. Stem stout (?), up to 8 dm. tall, obtusely 3-angled: leaf-blades linear, 5–8 mm. wide, ciliate, glaucous: spikelets usually borne in a solitary capitate cluster, narrowly ovoid, or lanceolate in outline, 5–6 mm. long: scales aristate-tipped, brown, 2.5–4.5 mm. long: perianth-bristles much shorter than the achene: achene oval or orbicular-oval, about 1.5 mm. long, cancellate, the tubercle depressed-conic, much shorter than the achene. [*R. ciliata* Vahl]—Low pinelands, Coastal Plain, Fla. to Miss. and N. C.

36. **R. Grayi** Kunth. Stem relatively slender, 2–7 dm. tall, 3-angled: leaf-blades narrowly linear, mostly 2–4 mm. wide, not ciliate, shining: spikelets borne in 2–4 loose capitate clusters, ovoid, 5–6 mm. long: scales mucronate, 3–5 mm. long, light chestnut-colored: perianth-bristles much longer than the achene: achene obovoid or broadly ellipsoid, about 2.5 mm. long, cancellate, dark-brown, the tubercle depressed-conic, much shorter than the achene.—Dry pinelands, Coastal Plain and adj. provinces, Fla. to Tex. and N. C.

37. **R. Harveyi** W. Boott. Stem up to 1 m. tall, 3-angled, bright-green: leaf-blades flat or nearly so, 1.5–4 mm. wide: spikelets borne in 1–4 capitate cymes or clusters, especially those of the terminal inflorescence in corymb-like cymes, ovoid, 2.5–3.5 mm. long: scales aristate-tipped or mucronate, 2–3 mm. long, chestnut-colored: perianth-bristles much shorter than the achene: achene broadly obovoid or orbicular-obovoid, fully 1.5 mm. long, finely cancellate, brown, the tubercle depressed, with a somewhat collar-like base. [*R. Plankii* Britton]—Low grounds, Coastal Plain and adj. provinces, Ga. to Tex., Okla., and Ark.

38. **R. pinetorum** Britton & Small. Stem up to nearly 1 m. tall, sharply 3-angled and striate, light-green: leaf-blades flat, 1.5–2 mm. wide: spikelets borne in several cluster-like cymes, globose-ovoid, about 2 mm. long, the bracts inconspicuous: scales acute or mucronulate, 2–2.5 mm. long, chestnut-colored: perianth-bristles much shorter than the achene: achene orbicular-obovoid, about 1.5 mm. long, finely cancellate, light-brown, the tubercle depressed, constricted at the base.—Pinelands between Myakka prairie and Punta Gorda, Fla.

39. **R. rariflora** (Michx.) Ell. Stem filiform, 2–5 dm. long, sometimes reclining: leaf-blades involute-filiform or setaceous: spikelets borne in usually 2 or 3 lax open corymb-like cymes, ellipsoid or ovoid, 2.5–3 mm. long: scales acute or obtusish, 2–3 mm. long, brown: perianth-bristles shorter than the achene: achene obovoid or broadly ellipsoid, about 1.5 mm. long, strongly transversely wrinkled, the tubercle depressed-conic.—Pinelands, Coastal Plain and Piedmont, Fla. to Tex. and N. J.—(*W. I.*)

40. **R. Torreyana** A. Gray. Stem 3–9 dm. tall, terete or obscurely 3-angled: leaf-blades involute, those of the upper leaves setaceous: spikelets borne in 1–4 lax, filiform-stalked, corymbose, rather narrow, cymes, ovoid, about 3 mm. long: scales mucronate, brown, mostly 2.5–4 mm. long: perianth-bristles shorter than the achene: achene ellipsoid-obovoid, about 1.5 mm. long, transversely wrinkled, the tubercle broadly conic or depressed, much shorter than the achene. —Wet pinelands and acid swamps, Coastal Plain and New England Coast, Ga. to N. H.

41. **R. Earlei** Britton. Stem 3–8 dm. tall, 3-angled: leaf-blades flat or nearly so, 1.5–3 mm. wide: spikelets borne in 1 or few open corymb-like cymes, ovoid, 3.5–4 mm. long: scales aristulate-mucronate, or some of them acute, 2.5–3.5 mm. long, red: perianth-bristles shorter than the achene: achene broadly obovoid or orbicular-obovoid, about 2 mm. long, transversely wrinkled, reddish-brown, somewhat constricted at the apex, the tubercle much depressed or nearly flat.—Pinelands, Coastal Plain, S Ga. and Ala.

42. **R. Edisoniana** Britton. Stem slender, up to 1.8 m. tall, 3-angled: leaf-blades deep-green, flat or nearly so, 4 mm. wide or less: spikelets borne in a terminal, compound, corymb-like cyme, and also often in few smaller axillary clusters, ovoid, 1.5–2 mm. long: scales mucronulate, 1.5–2 mm. long, chestnut-brown: perianth-bristles shorter than the achene: achene ellipsoid, fully 1 mm. long, cancellate and transversely wrinkled, the tubercle depressed, low-conic or somewhat rounded.—Swamps and ponds, pen. Fla.

43. **R. perplexa** Britton. Stem slender, up to 1.2 m. tall: leaf-blades deep-green, flat, 1–2.5 mm. wide: spikelets borne in a terminal, and also sometimes 1 or few smaller, compound corymb-like cymes, ovoid or orbicular-ovoid, about 2 mm. long: scales mucronulate, brown, 1.5–2.5 mm. long: perianth-bristles shorter than the achene: achene orbicular-obovoid, about 1 mm. long, transversely wrinkled, brown, not constricted at the apex, the tubercle much depressed.—Swamps, hammocks, and low pinelands, Coastal Plain, Fla. to La. and N. C.—(*W. I.*)

44. **R. globularis** (Chapm.) Small. Stem very slender, 0.1–1.5 m. tall, bright-green: leaf-blades 1–2 mm. wide, but usually strongly involute: spikelets borne in 1 or few small few-flowered close clusters, subglobose or oval-globose, 1.5–2 mm. long, the subtending bractlets capillary-tipped: scales blunt or obscurely tipped, dark-brown: perianth-bristles less than ½ as long as the achene: achene orbicular-obovoid, about 1 mm. long or slightly longer, very turgid, transversely wrinkled, brown, the tubercle depressed-conic.—Pinelands, Coastal Plain, Fla. to Tex. and Va.

45. **R. cymosa** Ell. Stem slender, 0.5–1 m. tall, light-green: leaf-blades 2–5 mm. wide, flat or somewhat involute: spikelets borne in few several–many-flowered corymb-like cymes, ovoid or ellipsoid-ovoid, 2.5–3.5 mm. long, the subtending bractlets with long capillary tips: scales slender-mucronate to aristate, reddish-brown or dark-brown: perianth-bristles over ½ as long as the achene: achene obovoid or ellipsoid-obovoid, about 1.5 mm. long, strongly transversely wrinkled, the tubercle low-conic.—Swamps, meadows, ponds, pinelands, and woods, various provinces, Fla. to Tex., Kans., Ind., and N. J. —(*W. I.*)

46. **R. compressa** Carey. Stem rather stout, up to 1.2 m. tall: leaf-blades 3–5 mm. wide: spikelets borne in 2–5 cluster-like or corymb-like cymes, with projecting bracts and bractlets, ovoid, 2–4 mm. long: scales mucronate, 1.5–2.5 mm. long, brown: perianth-bristles shorter than the achene: achene rhombic-obovoid or orbicular-obovoid, about 2 mm. long, somewhat constricted at both

ends, transversely wrinkled and cancellate, the tubercle low-conic, with a collar-like base.—Low pinelands and ponds, Coastal Plain, Fla. to La., S Mo., and Ga.

47. **R. saxicola** Small. Stem 2–3 dm. tall, somewhat 3-angled: leaf-blades 1–1.5 mm. wide, nearly flat: spikelets borne 2–6 together in 2–6 corymb-like cymes on filiform peduncles, ovoid to ellipsoid, 2.5–3 mm. long: scales mucronulate, dark-brown: perianth-bristles longer than the achene: achene obovoid, about 1.5 mm. long, transversely wrinkled, yellowish or light yellow-brown, the tubercle depressed-conic or disk-like, a sixth or an eighth the length of the achene.—Boggy slopes, Stone Mountain and Little Stone Mountain on the Piedmont of Ga.

48. **R. punctata** Ell. Stem 3–7 dm. tall, slender, 3-angled: leaf-blades 2–5.5 mm. wide, flat or nearly so: spikelets borne, rather few together, in few irregular corymb-like or cluster-like cymes, ovoid, 3–4.5 mm. long: scales mucronate, 2–4 mm. long, light chestnut-colored: perianth-bristles longer than the achene: achene obovoid, 2–3 mm. long, prominently transversely wrinkled, the tubercle triangular, often deltoid, much shorter than the achene.—Pinelands, Coastal Plain, Ga. and S. C.

49. **R. microcarpa** Baldw. Stem up to 1 m. tall, nearly terete: leaf-blades channeled, 1.5–4 mm. wide: spikelets borne usually many together, in 2–3, often somewhat nodding, corymb-like cymes, ovoid, 2–3 mm. long: scales mucronulate, 1.5–2.5 mm. long, very broad, dark-brown: perianth-bristles about as long as the achene or slightly longer: achene broadly obovoid or orbicular-obovoid, about 1 mm. long, strongly transversely wrinkled, the tubercle depressed, obtusish, much shorter than the achene.—Low grounds, moist pinelands, and ponds, Coastal Plain and adj. provinces, Fla. to Tex. and N. C.—(*W. I.*)

50. **R. decurrens** Chapm. Stem 0.5–1.2 m. tall, nearly terete: leaf-blades lax, 2–4 mm. wide, flat: spikelets borne in 4–7 lax, spreading or drooping, corymb-like cymes, ovoid, 2–2.5 mm. long: scales mucronulate, 1.5–2.5 mm. long, brown: perianth-bristles about as long as the achene or longer: achene narrowly obovoid or cuneate-obovoid, about 1 mm. long, transversely wrinkled, the tubercle triangular, acute, somewhat decurrent on the achene-sides.—Swamps and muddy banks, W Fla.

51. **R. schoenoides** (Ell.) Britton. Stem up to 1.2 m. tall, 3-angled: leaf-blades mostly 2–3 mm. wide, flat or slightly involute: spikelets borne many together in 3–5 lax, often somewhat nodding, corymb-like cymes, ovoid, 2.5–3 mm. long: scales mucronulate, mostly 2–3 mm. long, dark-brown: perianth-bristles, unequal, as long as the achene or longer: achene oval or orbicular-oval, fully 1 mm. long, strongly transversely wrinkled, constricted at the base, the tubercle depressed, much shorter than the achene.—Wet grounds and ponds, Coastal Plain and occasionally adj. provinces, Fla. to La. and N. C.

52. **R. patula** A. Gray. Stem rather slender, 0.7–1.2 m. tall: leaf-blades 2–6 mm. wide or more: spikelets borne in 1 or more compound corymb-like cymes, ovoid, 3–3.5 mm. long: scales mucronate, brown, 2–3 mm. long: perianth-bristles as long as the achene or longer: achene broadly obovoid, orbicular-obovoid, 1.5 mm. long or more, transversely wrinkled, the tubercle low-conic or depressed.—Swamps and low pinelands, Coastal Plain and adj. provinces, Fla. to Miss. and N. C.

53. **R. caduca** Ell. Stem 0.9–1.5 m. tall, sharply 3-angled: leaf-blades 4–10 mm. wide: spikelets borne very many together in 3–6 irregular corymb-like cymes, ovoid, sometimes narrowly so, 4–6 mm. long: scales mucronulate, 2–3.5 mm. long, dark-brown: perianth-bristles longer than the achene: achene broadly obovoid or orbicular-obovoid, about 1.5 mm. long, finely transversely wrinkled,

the tubercle low-conic, much shorter than the achene.—Swamps and shaded banks, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and N. C.—(*W. I.*)

54. **R. mixta** Britton. Stem up to 1.5 dm. tall, 3-angled: leaf-blades 3–7 mm. wide: spikelets borne relatively few together in open or lax corymb-like cymes, fusiform, or lanceolate in outline, 3–4 mm. long: scales short-acuminate or somewhat mucronate, 2.5–3.5 mm. long, brown: perianth-bristles longer than the achene: achene narrowly obovoid or ellipsoid, about 1.5 mm. long, finely transversely wrinkled, the tubercle conic, often one-half as long as the achene. —Swamps and low pinelands, Coastal Plain, Fla. to Tex. and Ga.

55. **R. prolifera** Small. Stem 0.5–1 m. tall, slender, weak, 3-angled: leaf-blades 2–6 mm. wide, flat: spikelets borne, usually many together, in several corymb-like cymes, flat, ovoid or ellipsoid-ovoid, 6–8 mm. long: scales obtuse or acutish, mostly 2–3 mm. long, thin, deciduous: perianth-bristles fully as long as the achene: achene broadly obovoid to suborbicular, 1–1.5 mm. long, slightly transversely wrinkled, persistent on the rachis, the tubercle conic, somewhat constricted at the base.—River-banks, moist sandy soil, and pinelands, Coastal Plain, Fla. to Miss. and N. C.

56. **R. miliacea** (Lam.) A. Gray. Stem up to 1.5 m. tall, 3-angled: leaf-blades 3–8 mm. wide, flat: spikelets borne many together in mostly 6–8 lax corymb-like cymes with divergent stalks, ovoid, 2.5–3 mm. long: scales mucronulate, 1.5–3 mm. long, brown: perianth-bristles longer than the achene: achene obovoid, oval, or suborbicular, 1–1.5 mm. long, transversely wrinkled, pale, the tubercle depressed or depressed-conic, much shorter than the achene.—Calcareous low hammocks and pond-margins, Coastal Plain, Fla. to La. and N. C.—(*W. I.*)

57. **R. stipitata** Chapm. Stem up to 1 m. tall, arching above: leaf-blades flat, 4–10 mm. wide: spikelets borne many together in 3–5 more or less nodding corymb-like cymes, narrowly ovoid or broadly fusiform, 7–8 mm. long, brown: scales mucronate, 3.5–7 mm. long, brown: perianth-bristles much longer than the achene: achene orbicular-obovoid, 1.5–2 mm. long, finely transversely wrinkled, with a stipe-like base, the tubercle depressed-conic, about one-half as long as the achene.—Swamps and low pinelands, Coastal Plain, Fla. to N. C.—(*W. I.*)

58. **R. stenophylla** Chapm. Stem 1–4 dm. tall, wiry-filiform: leaf-blades channeled or somewhat involute, very slender: spikelets borne few together in lax erect corymb-like cymes, narrowly fusiform or lanceolate in outline, 4–5 mm. long: scales mucronulate, 3–4.5 mm. long, pale-brown: perianth-bristles longer than the achene: achene obovoid or obovoid-ellipsoid, about 1.5 mm. long, transversely wrinkled, the tubercle conic, about one-half as long as the achene. —Grassy pinelands, Coastal Plain, Fla. to Ala. and S. C.—(*W. I.*)

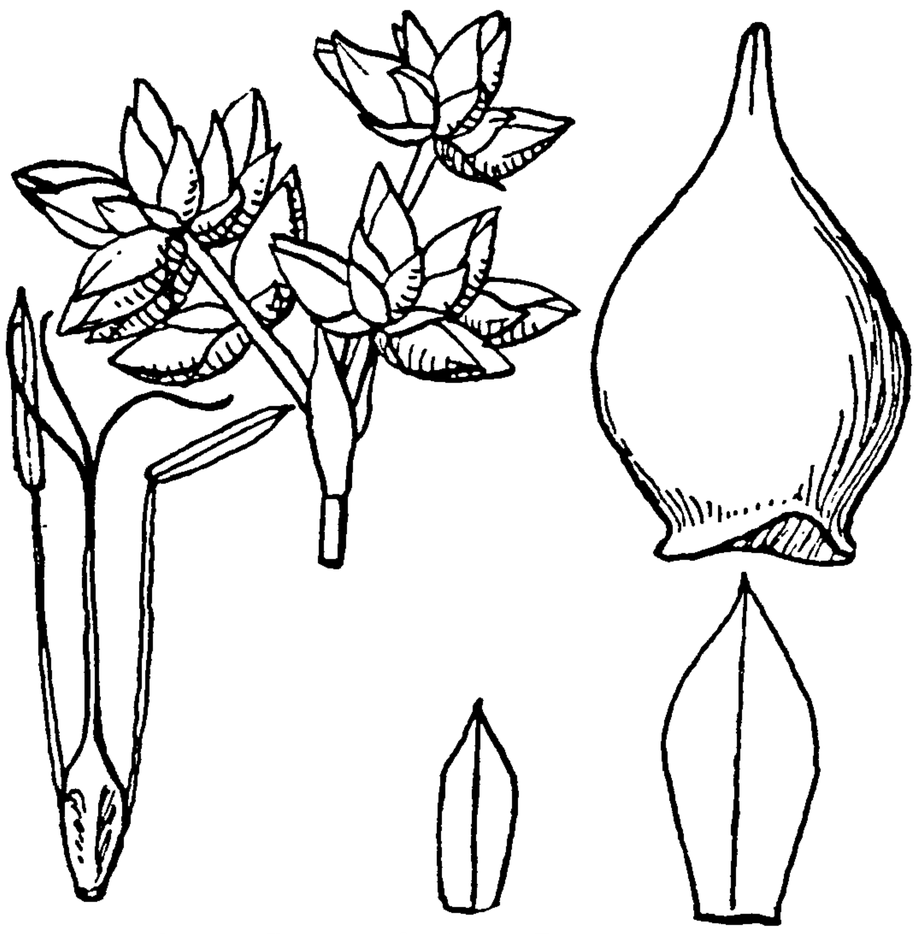
59. **R. inexpansa** (Michx.) Vahl. Stem up to 1 m. tall, slender, 3-angled: leaf-blades flat, 2 mm. wide or less: spikelets borne many together in 1–4 narrow, ultimately drooping panicle-like cymes, fusiform, 5–6 mm. long: scales acuminate or slightly mucronulate, 2.5–5 mm. long, brown, or reddish-brown: perianth-bristles about twice as long as the achene: achene narrowly ellipsoid or linear-ellipsoid, or slightly broadened upward, about 2 mm. long, transversely wrinkled, the tubercle triangular-lanceolate or triangular-subulate, one-half as long as the achene or more.—Damp roadsides and pinelands, Coastal Plain and adj. provinces, Fla. to La. and Va.

17. **MARISCUS** [Hall.] Zinn. Perennial caulescent, often tall, herbs. Leaves few, not crowded: blades elongate, flat, or revolute in age, sometimes with spinulose-serrulate margins. Spikelets short, in small clusters which are borne in short rigid or long plume-like panicles, with the terminal flower per-

fect and fructiferous. Scales rather loosely imbricate, broad. Perianth wanting. Stamens 2. Ovary sessile: style deciduous. Stigmas 2 or 3. Achene short, usually ovoid, turgid-lenticular or obscurely 3-angled, striate or wrinkled, not tubercled. [*Cladium* P. Br.]—About 40 species, most abundant in warm regions.—Sum.–fall.

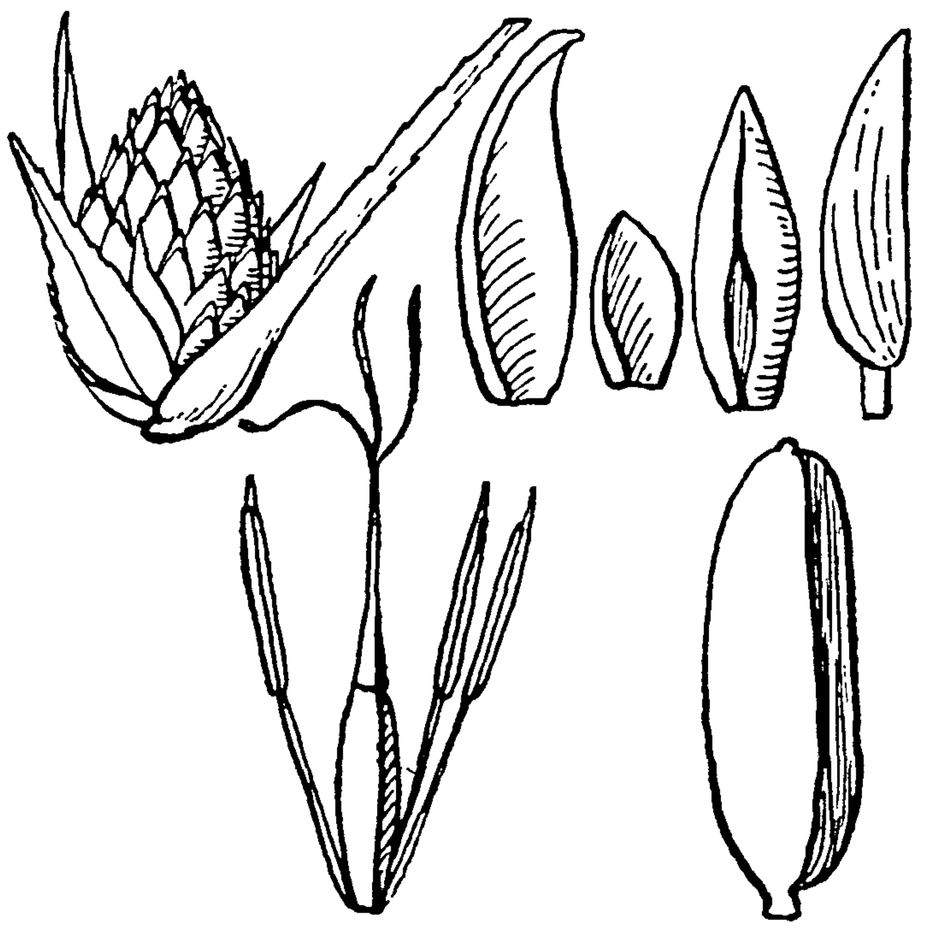
Achene with a broad flat base which often has a flaring edge: leaf-blades smooth or nearly so. 1. *M. mariscoides.*
Achene with a narrowed base: leaf-blades with spinulose-serrulate margins and midrib beneath. 2. *M. jamaicensis.*

1. M. mariscoides (Muhl.) Kuntze. Stem up to 1 m. tall, obscurely 3-angled, with stiff branches: leaf-blades channeled, 3 mm. wide or less, nearly smooth: clusters of spikelets on rigidly erect or ascending branches: larger scales over 4 mm. long: achene ovoid, 3–4 mm. long, including the beak-like tip, longitudinally striate, the flat base often with a flaring edge.—(POND-RUSH. TWIG-RUSH.)—Swamps, marshes and wet sandy shores, various provinces, Fla. to Ala., Minn., and N. S.



2. M. jamaicensis (Crantz) Britton. Stem mostly 1–3 m. tall, obtusely 3-angled, with lax branches: leaf-blades flat, 5 mm. wide or more, spinulose-serrulate on the margins and on the midrib beneath: clusters of spikelets on lax, often recurving branches: larger scales less than 3.5 mm. long: achene ovoid, 2–2.5 mm. long, obtuse or abruptly short-pointed, wrinkled, narrowed at the base. [*C. effusum* (Sw.) Torr.]—(SAW-GRASS.)—Swamps and marshes, mostly less than 100 ft. above sea-level, Coastal Plain, Fla. to Tex. and Va.—(*W. I., Mex., C. A., S. A.*)—In mass and large areas of pure growth the saw-grass excels any other sedge in our range. It is the characteristic plant of the Everglades and of other marshes, and also of swamps ranging from saline to fresh. The numerous very sharp-edged leaves make progress through colonies of it difficult.

18. REMIREA Aubl. Perennial gregarious caulescent herbs with elongate horizontal rootstocks. Leaves numerous, crowded, imbricate at the base: blades not elongate, striate. Spikelets several or many in a sessile terminal involucrate head. Scales few, closely imbricate, short and relatively wide, blunt. Perianth wanting. Stamens 3. Ovary sessile: style slender, deciduous. Stigmas 3. Achene rather narrow, 3-angled, not tubercled.—A single species, widely distributed in the tropics.

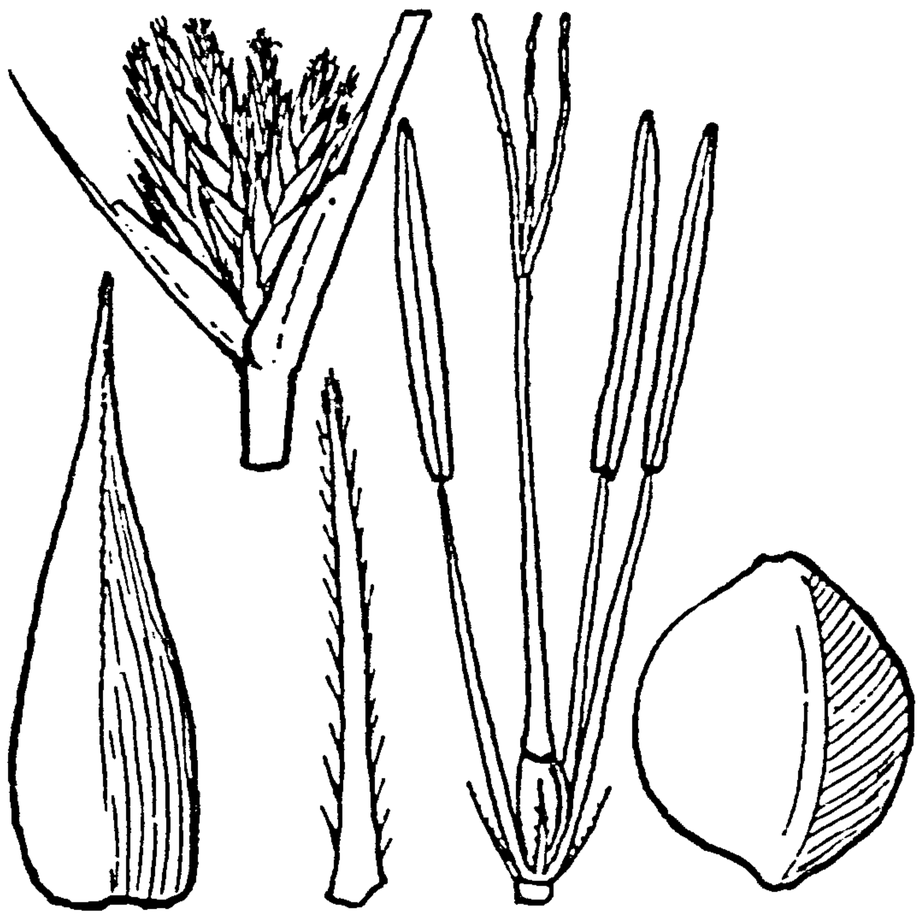


1. R. maritima Aubl. Stem 1–3 dm. tall, arising at intervals along the elongate rootstock, simple: leaf-blades recurved-spreading, 2–10 cm. long, attenuate, smooth: head ovoid, 1–2 cm. long: spikelets 3–5 mm. long, slightly curved: scales hooded at the apex: achene narrowly ellipsoid, 2–2.5 mm. long or rarely longer, obtuse.—(BEACH-STARS.)—Sand-dunes along the beach, east-

ern coast of S pen. Fla. and the Keys.—(*W. I., O. W.*)—Although relatively small, this plant is conspicuous on account of the lines of starry tufts which arise at intervals from the long rootstocks which are buried in the beach sand.

19. **SCHOENUS** L. Perennial scapose rush-like tufted herbs with short rootstocks. Leaves few, erect: blades elongate, involute, thus slender. Spikelets black, in a dense sessile terminal head subtended by a long involucral bract. Scales few, closely imbricate, long and narrow, acute. Perianth of 3–6 scabrous or plumose bristles. Stamens 3. Ovary sessile: style slender, deciduous. Stigmas 3. Achene short and stout, 3-angled, not tubercled.—About 60 species, mostly natives of the Old World.

1. S. nigricans L. Plant densely tufted, up to 1 m. tall, glabrous: leaf-sheaths dark-brown or almost black at the base; blades rigid: head of spikelets 1–2 cm. long: spikelets linear-lanceolate in outline, 9–12 mm. long, dark-chestnut: scales lanceolate or lanceolate-subulate, or the lower ones broader, acute, scabrous-ciliolate on the keel near the apex: achene oval, 1.5 mm. long or rarely longer, white, shining, somewhat constricted at both ends.—Calcareous low pinelands, prairies, and Everglades, pen. Fla. and L Keys; also Calif. coast.—(*W. I., Mex., O. W.*)—A second species of *Schoenus* may occur within our range. There is a specimen of *S. ferrugineus*, preserved in the Columbia University herbarium, labelled in Dr. Torrey's handwriting as having been collected in Florida and received from Dr. Chapman. *S. ferrugineus* differs from *S. nigricans* in having only 1–3 spikelets in a head and perianth-bristles as long as the achene or longer. *S. nigricans* has 5–15 spikelets in a head and very short or obtuse bristles.



20. **SCLERIA** Berg. Annual or mostly perennial, caulescent herbs with horizontal rootstocks. Leaf-blades elongate-linear, usually very narrow. Flowers monoecious. Spikelets in terminal or in both axillary and terminal clusters, the pistillate 1-flowered, the staminate several-flowered: scales imbricate. Perianth none. Stamens 1–3: anthers narrow. Ovary sometimes borne on a disk (hypogynium). Styles deciduous. Stigmas 3. Achene crustaceous, bony, or enamel-like, the body globular or slightly elongate, ours white or nearly so, smooth or variously roughened.—About 200 species, most abundant in warm regions.—Spr.–fall, or all year S.—NUT-RUSHES.

Achene with a circular, angled, or lobed disk (hypogynium) which often bears tubercles.
  Achene-body smooth. — I. TRIGLOMERATAE.
  Achene-body papillose, wrinkled, or reticulate. — II. SETACEAE.
Achene without hypogynium, sometimes narrowed into a stipe-like base.
  Spikelets in a single terminal cluster. — III. GRACILES.
  Spikelets in several separated clusters along the upper part of the stem. — IV. VERTICILLATAE.

I. TRIGLOMERATAE

Hypogynium papillose-crustaceous. — 1. *S. triglomerata.*
Hypogynium with 8 or 9 tubercles. — 2. *S. oligantha.*

II. SETACEAE

Achene-body reticulate.
  Hypogynium 3-lobed, the lobes appressed to the achene-body.
    Achene 2 mm. long or less, the body glabrous. 3. *S. reticularis.*
    Achene 2.5–3 mm. long, the body pubescent. 4. *S. setacea.*
  Hypogynium disk-like, with 3 pairs of tubercles. 5. *S. Curtissii.*
Achene-body papillose or somewhat wrinkled.
  Hypogynium with 3 entire, notched or 2-lobed tubercles: achene 2.5–3 mm. long.
    Plant pubescent: achenes about 3 mm. long.
      Hypogynium-tubercles 2-lobed: spikelet-scales pubescent on the back. 6. *S. Elliottii.*
      Hypogynium-tubercles entire or merely notched: spikelet-scales glabrous or pubescent on the keel. 7. *S. ciliata.*
    Plant glabrous: achene about 2.5 mm. long. 8. *S. Brittonii.*
  Hypogynium with 6 distinct tubercles: achenes 1.5–2 mm. long. 9. *S. pauciflora.*

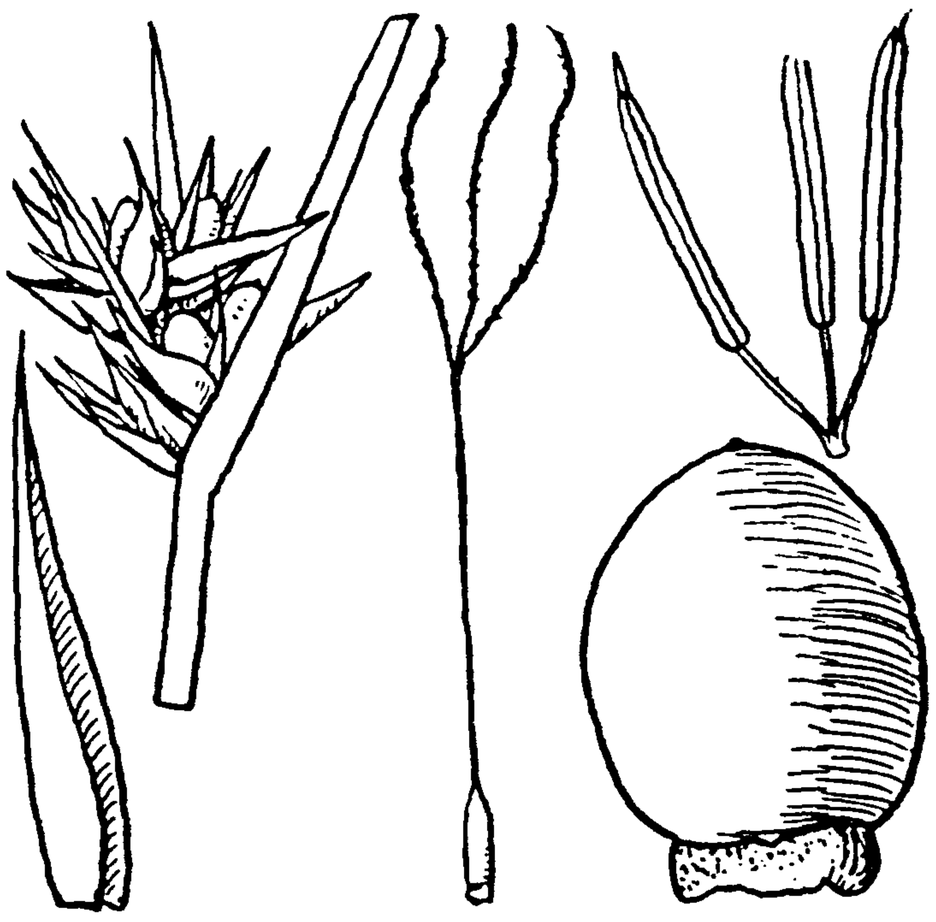
III. GRACILES

Achene 3 mm. long or less, with a pair of prominent pits on each side of the base. 10. *S. gracilis.*
Achene over 3 mm. long, without pits, or with a single pit on each side of the base.
  Achene-body smooth and even, the base, each side, with a shallow excavation and often 2 obscure pits in it. 11. *S. Baldwinii.*
  Achene-body ribbed lengthwise, the base prominent, each side with a deep excavation, but without pits. 12. *S. costata.*

IV. VERTICILLATAE

Achene 2–2.5 mm. long. 13. *S. lithosperma.*
Achene about 1.5 mm. long.
  Achene-body papillose-ridged: bracts merely serrulate near the apex. 14. *S. verticillata.*
  Achene-body smooth: bracts with long spreading hairs. 15. *S. hirtella.*

1. **S. triglomerata** Michx. Plant up to 1 m. tall, the stems somewhat scabrous, stout: leaf-blades flat, 3–9 mm. wide, scabrous: clusters of spikelets terminal, and usually 1 or 2 long-stalked ones from the upper leaf-axils: achene about 3.5 mm. long, the body ovoid to globose-ovoid, obtuse, smooth and even, the hypogynium low, obscurely triangular, papillose-crustaceous.—(TALL NUT-RUSH.)—Moist to dry sandy soil, meadows, and thickets, various provinces, Fla. to Tex., Kans., Ia., and Vt.



2. **S. oligantha** Michx. Plant up to 9 dm. tall, the stems nearly smooth, slender: leaf-blades flat, 3–6 mm. wide, smooth, or scabrous near the apex: clusters of spikelets terminal, and sometimes 1 or 2 long-stalked ones from the upper leaf-axils: achene about 3 mm. long, the body ovoid, sometimes narrowly so, obtuse or acute, smooth and even, the hypogynium low, obtusely triangular, supporting 8 or 9 tubercles just under the achene-body.—Moist soil, often in woods, Coastal Plain and adj. provinces, Fla. to Tex., Ind., and D. C.

3. **S. reticularis** Michx. Plant 2–7 dm. tall, the stems smooth, slender: leaf-blades 2–3 mm. wide, smooth: clusters of spikelets terminal and usually also in 1–3 sessile or nearly sessile in the upper leaf-axils: achene 2 mm. long or less, the body dull-white, globose, glabrous, reticulate, the hypogynium 3-lobed, the lobes appressed to the achene-body.—Moist meadows, damp sand, and pinelands, Coastal Plain and adj. provinces, Fla. to Mo. and Mass.; also Great Lake Lowland, Ind.—(*W. I., Mex.*)

4. S. setacea Poir. Plant often spreading, up to 7 dm. long, the stems erect, spreading, or diffuse, 8 dm. long or less, usually tufted: clusters of spikelets terminal and axillary, the axillary ones stalked, nodding or sometimes nearly erect: scales mostly 3–5 mm. long: achene 2.5–3 mm. long, the body globose or spheroidal, rugose or reticulate, pubescent, the hypogynium 3-lobed, appressed to the achene-body. [*S. hemitaphra* Steud. *S. Torreyana* Walp. *S. trichopoda* C. Wright.]—Low pinelands and sandy swamps, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Conn.; also Great Lake Lowland, Ind.—(*W. I., Mex., C. A.*)

5. S. Curtissii Britton. Plant weak, often reclining, 1.5–4.5 dm. long, the stems relatively slender, glabrous or nearly so: leaf-blades 1–2 mm. wide, smooth: clusters of spikelets scant, the axillary ones, when present, slender-stalked: scales 3–5 mm. long, pubescent on the keel: achene about 2 mm. long, the body globose or slightly depressed, reticulate, glabrous, the hypogynium supporting 3 pairs of tubercles.—Pinelands, near Jacksonville, Fla.

6. S. Elliottii Chapm. Plant 2–7 dm. tall, the stems stoutish, usually copiously pubescent: leaf-blades broad, mostly 4–6 mm. wide, usually flat: clusters of spikelets large, terminal and commonly 1 or 2 stout-stalked axillary ones present: scales 5–7 mm. long, usually pale, finely pubescent all over: achene about 3 mm. long, the body subglobose or slightly elongate, wrinkled or coarsely papillose, some of the basal papillae elongate and deflexed, the hypogynium with 3 strongly 2-lobed tubercles.—Pinelands, hammocks, and dry hillsides, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Va.—(*W. I.*)

7. S. ciliata Michx. Plant up to 1 m. tall, the stems slender, stout, glabrous or pubescent on the angles: leaf-blades narrow, 1–2.5 mm. wide, becoming revolute: clusters of spikelets small, terminal, and sometimes also axillary, slender-stalked ones present: scales 4–6 mm. long, usually chestnut-colored, glabrous or pubescent on the keel: achene about 3 mm. long, the body subglobose or ovoid, finely and usually sharply papillose, some of the basal papillae elongate and deflexed, the hypogynium with 3 entire or merely notched tubercles.—Woods, pinelands, sandhills, and meadows, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Va.

8. S. Brittonii Core. Plant up to 9 dm. tall, the stems pliable, relatively slender, often reclining, glabrous: leaf-blades 2–3 mm. wide or less, glabrous: clusters of spikelets small, terminal, and sometimes also axillary and short- or slender-stalked: scales mostly 4–5 mm. long, glabrous, often light or dark chestnut-colored: achene about 2.5 mm. long, the body globose or ovoid-globose, papillose, or papillose-wrinkled, the hypogynium with 3 tubercles. [*S. glabra* (Chapm.) Britton, not Boekl.]—Pinelands, sandhills, and ditches, Coastal Plain, Fla. to Miss. and N. C.

9. S. pauciflora Muhl. Plant 1–6 dm. tall, the stems slender, pubescent: leaf-blades less than 2 mm. wide, or rarely more, pubescent: clusters of spikelets few together, terminal and often also 1 or 2 short-stalked or long-stalked axillary ones present: scales 2.5–5 mm. long, glabrous, or pubescent about the keel: achene 1.5–2 mm. long, the body globose or ovoid-globose, papillose, some of the lower papillae elongate and reflexed, the hypogynium with 3 pairs of small tubercles.—Woods, pinelands, meadows, and swamps, various provinces, Fla. to Tex., Kans., Ohio, and N. H.—(*W. I*).

10. S. gracilis Ell. Plant 1–4 dm. tall, the stems slender, sometimes filiform, smooth: leaf-blades involute, thus filiform, smooth: spikelets in a single terminal cluster: scales glabrous, the larger ones 4–5 mm. long: achene 2–3 mm. long, the body ovoid or globose-ovoid, ribbed lengthwise, obtuse or minutely pointed, with a pair of pits on each side of the triangular base, the hypogynium

wanting.—Low pinelands, and shallow ponds, Coastal Plain, Fla. to Tex. and S. C.—(*W. I.*)

11. S. Baldwinii (Torr.) Steud. Plants up to 1 m. tall, the stems stout, rough, at least above: leaf-blades flat, 2–5 mm. wide, or sometimes narrower, smooth or somewhat scabrous: spikelets in a single terminal cluster: scales glabrous, the longer ones 8–9 mm. long: achene fully 4 mm. long, the body ovoid or oval-ovoid, smooth and even, prominently pointed, the base obscure, often with 2 obscure pits in the shallow transverse excavations, the hypogynium wanting.—Pineland ponds and low grounds, Coastal Plain, Fla. to Tex.

12. S. costata (Britton) Small. Similar to *S. Baldwinii* in habit, but with smaller spikelets and clusters: scales glabrous, the larger ones less than 8 mm. long: achene less than 3.5 mm. long, the body globose, ribbed lengthwise, prominently pointed, the base prominent, triangular, each side with a deep transverse excavation without pits, the hypogynium wanting. [*S. Baldwinii costata* Britton.]—Swamps and ponds, Coastal Plain, Fla. to Tex. and Ga.

13. S. lithosperma (L.) Sw. Plant 1–6 dm. tall, the stems smooth, slender: leaf-blades 1.5–2.5 mm. wide, with scabrous-ciliate margins and keel: clusters of spikelets 2–4, often separated, the lower with leaf-like bracts, the upper with bristle-like bracts: achene 2–2.5 mm. long, or rarely smaller, the body bright-white, oval, ellipsoid, or obovoid, smooth and even, narrowed into a stout stipe-like base with 3 depressions, the hypogynium wanting.—Low pinelands and hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I., Mex., O. W.*)

14. S. verticillata Muhl. Plant up to 9 dm. tall, the stems slender, often filiform, sometimes diffuse, usually glabrous: leaf-blades very narrowly linear, 0.5–1 mm. wide, glabrous: clusters of spikelets several on the upper part of the stem, separated: scales 1.5–3 mm. long: achene about 1.5 mm. long, the body globose, papillose-ridged with the ridges sometimes connected and thus reticulate, beaked, with a broad stipe-like base.—Moist pinelands, sandy woods, swamps, and wet rocks, various provinces, Fla. to Tex., Minn., Ont., and Mass. —(*W. I., Mex.*)

15. S. hirtella Sw. Plant 1–6 dm. tall, the stems slender, smooth or nearly so: leaf-blades 2–4 mm. wide, pubescent: clusters of spikelets several on the upper part of the stem, separated, sessile, often nodding: scales mostly 2–3 mm. long: achene about 1.5 mm. long, the body subglobose, smooth, sometimes slightly pointed, contracted into a triangular base.—Moist pinelands and river-swamps, Coastal Plain, Fla. to La. and S. C.—(*W. I., Mex., C. A., S. A.*)

21. CAREX [Rupp.] L.[1] Grass-like sedges, perennial by rootstocks, the plants monoecious or sometimes dioecious. Culm (stem) mostly triangular, often strongly phyllopodic or aphyllopodic. Leaves 3-ranked, the upper (bracts) elongate or short, and subtending the spikes of flowers, or wanting. Flowers solitary in the axils of scales (glumes). Spikes one to many, either wholly pistillate, wholly staminate, androgynous or gynaecandrous, sessile or peduncled, the base of the peduncle often with a perigynium-like or spathe-like organ (clado-prophyllum) surrounding it. Perianth none. Staminate flowers of three (or rarely two) stamens, the filament filiform. Pistillate flowers of a single pistil, with a style and two or three stigmas. Style jointed with the apiculate-tipped or rounded achene and withering, and at length deciduous, or continuous with achene persistent and not withering. Achene 3-angled, lenticu-

[1] Contributed by Kenneth Kent Mackenzie.

lar, or plano-convex, completely surrounded by the perigynium or rarely rupturing it in ripening. Racheola occasionally developed.—Comprises 1,000 species, widely distributed, but most abundant in temperate regions.—SEDGES.

Achene lenticular and stigmas two: lateral spikes sessile: terminal spike partly pistillate, or if (rarely) staminate the lateral spikes short, or heads dioecious.
Spikes strictly androgynous (*i.e.*, with the staminate flowers uppermost).
Spikes few (ten or less): perigynium green until over-ripe. — I. MUHLENBERGIANAE.
Spikes numerous: perigynium yellowish or brownish.
Perigynium abruptly contracted into the beak.
Perigynium yellowish: opaque part of leaf-sheath usually transversely rugulose. — II. MULTIFLORAE.
Perigynium brownish: opaque part of leaf-sheath not transversely rugulose. — III. PANICULATAE.
Perigynium tapering into the beak. — IV. STENORHYNCHAE.
Spikes, some or all of them, gynaecandrous (*i.e.*, staminate at base): some often entirely pistillate or some occasionally entirely staminate or staminate at both ends.
Perigynium white-puncticulate. — V. CANESCENTES.
Perigynium not white-puncticulate.
Perigynium at most thin-edged.
Perigynium appressed. — VI. DEWEYANAE.
Perigynium spreading or ascending at maturity. — VII. STELLULATAE.
Perigynium narrowly to broadly wing-margined. — VIII. OVALES.
Achene triangular and styles three, or lenticular and styles two: if lenticular, lower lateral spikes conspicuously peduncled, or terminal spike staminate and lateral spikes elongate.
Achene rounded at apex, strongly constricted at base: lower scales bract-like. — IX. PHYLLOSTACHYAE.
Achene apiculate-tipped, not strongly constricted at base: lower scales not bract-like.
Spike one: perigynium rounded at apex, beakless, glabrous. — X. POLYTRICHOIDEAE.
Spikes one or more, when one not as described above.
Perigynium triangular, or circular in cross-section, closely enveloping the achene, 2-ribbed, stipitate, tapering at the base, pubescent or puberulent, at least at the base of the beak: bracts sheathless or nearly so.
Perigynium obtusely triangular: foliage not pubescent. — XI. MONTANAE.
Perigynium acutely triangular: foliage often pubescent. — XII. TRIQUETRAE.
Perigynium glabrous or minutely hispidulous or pubescent: if pubescent some or all of the other characters differing from those given above.
Lowest bract strongly green-sheathing: beak of perigynium, if present, rarely bidentate, but if so the apex hyaline and the teeth weak.
Spike normally one. — XIII. PICTAE.
Spikes two or more.
Bracts with obsolete or rudimentary blades.
Leaf-blades flat: perigynium puberulent to pubescent. — XIV. DIGITATAE.
Leaf-blades filiform: perigynium glabrous. — XV. ALBAE.
Bracts with well-developed blades.
Pistillate spikes short-oblong to linear, erect, or if drooping the spikes short and perigynium acutely triangular: terminal spike staminate.

Rootstock long-creeping: scales reddish-purple-tinged.	XVI. PANICEAE.
Rootstock not long-creeping: scales greenish or reddish-brown-tinged.	
Perigynium triangular, tapering at the base, closely enveloping the achene.	
Perigynium with few–many strong nerves or nerveless.	XVII. LAXIFLORAE.
Perigynium finely many-striate.	XVIII. OLIGOCARPAE.
Perigynium suborbicular in cross-section, rounded at the base.	
Perigynium with few–many strong nerves, rather loosely enveloping the achene.	XIX. GRANULARES.
Perigynium finely many-striate.	XX. GRISEAE.
Pistillate spikes elongate, linear to cylindric, slender-peduncled, the lower drooping.	
Perigynium beakless or short-beaked; terminal spike gynaecandrous.	XXI. GRACILLIMAE.
Perigynium conspicuously or strongly beaked.	
Culm strongly reddish-purple-tinged at the base, aphyllopodic.	XXII. SYLVATICAE.
Culm not strongly reddish-purple-tinged at the base, phyllopodic.	XXIII. LONGIROSTRES.
Lowest bract sheathless to strongly green-sheathing: if green-sheathing, perigynium with strongly bidentate non-hyaline apex and stiff teeth.	
Foliage (at least the lower sheaths) pubescent: perigynium-beak not bidentate.	XXIV. VIRESCENTES.
Foliage not pubescent (save in some species of the HIRTAE having a strongly bidentate perigynium).	
Perigynium rough-papillose.	XXV. ANOMALAE.
Perigynium not rough-papillose.	
Perigynium beakless or very short-beaked: achene triangular.	
Terminal spike if staminate without rough-awned scales.	
Scales dark-tinged.	XXVI. ATRATAE.
Scales not dark-tinged.	XXVII. SHORTIANAE.
Terminal spike staminate: scales rough-awned.	XXVIII. PENDULINAE.
Perigynium strongly beaked, the beak usually strongly bidentate; or if not so, the achene lenticular.	
Achene lenticular: stigmas two.	
Scales not long-aristate: achene not constricted in middle.	XXIX. ACUTAE.
Scales long-aristate: achene usually constricted in the middle.	XXX. CRYPTOCARPAE.
Achene triangular: stigmas three.	
Style jointed with the achene; perigynium strongly pubescent to glabrous, coriaceous.	XXXI. HIRTAE.
Style continuous with the achene.	
Perigynium coriaceous (impressed, nerved in our species).	XXXII. PALUDOSAE.
Perigynium membranous, the nerves or ribs not impressed.	

Perigynium lanceolate or lance-subulate, tapering into the beak, many-nerved.
  Perigynium-teeth reflexed: perigynium green, early deciduous. — XXXIII. COLLINSIAE.
  Perigynium-teeth not reflexed: perigynium yellowish-green. — XXXIV. FOLLICULATAE.
Perigynium broader, abruptly contracted into the beak, usually strongly ribbed.
  Perigynium less than 1 cm. long.
    Perigynium-body ovoid or globose, not truncately contracted.
      Perigynium coarsely ribbed or nerveless. — XXXV. VESICARIAE.
      Perigynium finely and closely ribbed. — XXXVI. PSEUDO-CYPEREAE.
    Perigynium with an obovoid or obconic body truncately contracted into the prominent beak. — XXXVII. SQUARROSAE.
  Perigynium 1 cm. long or longer. — XXXVIII. LUPULINAE.

I. MUHLENBERGIANAE

Perigynium conspicuously corky-thickened at base, usually widely radiating or reflexed at maturity.
  Beak of perigynium smooth: scales acuminate, deciduous: spikes mostly approximate.
    Body of perigynium broadly ovate, unequally biconvex, deep-green, many striate at base ventrally. — 1. *C. retroflexa.*
    Body of perigynium lanceolate or ovate-lanceolate, plano-convex, light-green, nerveless. — 2. *C. texensis.*
  Beak of perigynium serrulate: scales obtuse or acutish, persistent: spikes mostly separate.
    Stigmas slender, not twisted, elongate, light-brownish-red: perigynium light-green tapering or but little contracted into beak, inconspicuously white-hyaline at the orifice. — 3. *C. rosea.*
    Stigmas stouter, twisted, short, deep-brownish-red: perigynium deep-green, contracted into beak, conspicuously white-hyaline at the orifice.
      Leaf-blades averaging 2.5 mm. wide: spikes usually with 9–12 perigynia: perigynium 3.25–4.5 mm. long, widely radiating. — 4. *C. convoluta.*
      Leaf-blades averaging little more than 1 mm. wide: spikes usually with 2–6 perigynia; perigynium 2.5–3 mm. long, more ascending. — 5. *C. radiata.*
Perigynium not or but little corky-thickened at base, spreading or ascending.
  Perigynium nerveless dorsally or 2- or 3-nerved: scale (excluding awn) much exceeded by body of perigynium: sheaths not or but slightly thickened at mouth; head ovoid-orbicular.
    Perigynium elliptic-ovate, narrowed at base, broadest below middle, with narrow raised margin to base. — 6. *C. cephalophora.*
    Perigynium broadly ovate, broadest at the truncate-cordate base, and sharp-edged only towards the base, flat on inner face. — 7. *C. Leavenworthii.*

Perigynium strongly many-nerved dorsally: body of scale little shorter than to exceeding perigynium: sheaths thickened at mouth.
Perigynium strongly nerved ventrally, narrowly wing-margined to base, the margin and center slightly elevated: head oblong: achene suborbicular. 8. *C. Muhlenbergii.*
Perigynium nerveless or nearly so ventrally, sharp-edged below the middle, flat or very nearly so.
Head oblong, 1.5–4 cm. long: culms tall, stiff: leaf-blades elongate: achene ovoid-orbicular. 9. *C. plana.*
Head suborbicular, 0.7–2 cm. long: culms low, not stiff, spreading: leaf-blades short. 10. *C. mesochorea.*

II. MULTIFLORAE

Beak of perigynium equalling the body: leaves usually exceeding culm: perigynium dull-yellowish. 11. *C. vulpinoidea.*
Beak of perigynium shorter than the body: leaves shorter than culm: perigynium deeper-yellow.
Body of perigynium reniform or broadly orbicular, strongly resinous-dotted: perigynium squarrose, mostly exceeding awn of scale. 12. *C. triangularis.*
Body of perigynium ovate to broadly orbicular, but little resinous-dotted: perigynium more ascending, mostly exceeded by awn of scale. 13. *C. annectens.*

III. PANICULATAE

Represented by one species in our range. 14. *C. decomposita.*

IV. STENORHYNCHAE

Perigynium 4–6 mm. long; beak 1–2 times length of body: leaf-sheaths not red-dotted ventrally.
Sheaths cross-rugulose ventrally, easily broken, not thickened at mouth.
Leaf-blades 4–8 mm. wide; perigynium 4–5 mm. long, the beak about the length of the body. 15. *C. stipata.*
Leaf-blades 8–15 mm. wide: perigynium 5–6 mm. long, the beak longer than the body. 16. *C. uberior.*
Sheaths not cross-rugulose ventrally, not easily broken, thickened at mouth. 17. *C. laevi-vaginata.*
Perigynium 6–7 mm. long, with a disk-like base: beak 2–3 times length of body: leaf-sheaths conspicuously red-dotted ventrally. 18. *C. crus-corvi.*

V. CANESCENTES

Represented by one species in our range. 19. *C. brunnescens.*

VI. DEWEYANAE

Represented by one species in our range. 20. *C. bromoides.*

VII. STELLULATAE

Body of perigynium broadest near middle; beak not serrulate on margins. 21. *C. seorsa.*
Body of perigynium broadest near base; beak and often upper part of body serrulate on margins.
Perigynium 2.25–3.25 mm. long: perigynium-beak ¼–⅓ length of body, very shallowly bidentate: scale one-half to two-thirds length of body of perigynium.
Spikes strongly separate: leaf-blades 0.25–1 mm. wide. 22. *C. Howei.*
Spikes aggregated in a dense head: leaf-blades 1–2.5 mm. wide. 23. *C. Mohriana.*
Perigynium 2.75–4.75 mm. long: perigynium-beak sharply bidentate, the ventral false suture conspicuous.
Body of perigynium suborbicular or very broadly ovate, deep-green at maturity (before overripe); beak less than half the length of the body.

Scale acutish to short-cuspidate, ⅔ to nearly the length of the perigynium, sharply keeled with the prominent mid-vein extending to apex: achene ovate, widest at base. 24. *C. incomperta.*

Scale obtuse, about half the length of the body of perigynium, the midvein not forming a sharp keel, obsolete or nearly so at apex: achene orbicular, widest near middle. 25. *C. atlantica.*

Body of perigynium ovate to lanceolate, straw-colored at maturity or often darker-tinged; beak half the length of the body or more.

Body of perigynium noticeably exceeding the obtusish to acute scale: leaf-blades 3–3.5 mm. wide: culm stout. 26. *C. Ruthii.*

Body of perigynium equalled or exceeded by the sharp-pointed scale: leaf-blades 0.75–1.75 mm. wide: culm slender. 27. *C. angustior.*

VIII. Ovales

Perigynium narrowly to broadly lanceolate, at least 2½ times as long as broad, very thin and scale-like.

Leaf-blades at most 3 mm. wide, those of sterile shoots few, ascending. 28. *C. scoparia.*

Leaf-blades broader, those of sterile shoots numerous, spreading. 29. *C. tribuloides.*

Perigynium ovate-lanceolate or broader, at most twice as long as broad.

Body of perigynium obovate (often broadly) broadest at top, very abruptly beaked: leaf-sheaths green-striate ventrally nearly to the mouth.

Scales obtuse to short-acuminate: achene sessile or substipitate: perigynium 1.5–3 mm. broad.

Scales obtuse or acute: spikes silvery-green: culm stiff: perigynium with body rounded at apex, very short-beaked, the beaks not conspicuous at top of spikes. 30. *C. Longii.*

Scales acute or short-acuminate: spikes not silvery-green: culm slender: perigynium with body truncate-rounded at apex, twice length of beak, the beaks conspicuous at top of spikes. 31. *C. straminea.*

Scales long-acuminate or aristate: achenes stipitate: perigynia 2.5–4 mm. broad. 32. *C. alata.*

Body of perigynium ovate to orbicular, broadest at middle or base: leaf-sheaths conspicuously hyaline ventrally.

Perigynium 3–4 mm. long, strongly nerved ventrally.

Perigynium-body ovate: leaf-blades 2.5–6 mm. wide: spikes short-clavate at base. 33. *C. normalis.*

Perigynium-body orbicular: leaf-blades 1.5-2.5 mm. wide: spikes mostly long-clavate at base. 34. *C. festucacea.*

Perigynium 4–6 mm. long, nerveless ventrally.

Perigynium plano-convex with suborbicular body 2.5–3.5 mm. wide: scales usually acute. 35. *C. brevior.*

Perigynium very flat with reniform body 3.5-4.5 mm. wide: scales obtuse. 36. *C. reniformis.*

IX. Phyllostachyae

Body of perigynium oblong: pistillate flowers usually 3–10. 37. *C. Willdenovii.*

Body of perigynium globose: pistillate flowers usually 2 or 3. 38. *C. Jamesii.*

X. Polytrichoideae

Represented by one species. 39. *C. leptalea.*

XI. Montanae

None of the culms short and hidden among the base of the leaves.

Culm aphyllopodic and but little fibrillose at base: stolons wanting: ligule conspicuous, longer than wide. — 40. *C. communis.*

Culm phyllopodic and strongly fibrillose at base: ligule short, much wider than long.

Body of perigynium globose: staminate spike 10–25 mm. long: plants conspicuously long-stoloniferous.

Beak of perigynium less than half the length of the body. — 41. *C. pennsylvanica.*

Beak of perigynium as long as, or longer than the body. — 42. *C. lucorum.*

Body of perigynium oblong-ovoid: staminate spike 4–12 mm. long.

Plants without long slender stolons. — 43. *C. varia.*

Plants with very long slender stolons. — 44. *C. physorhyncha.*

Many of the culms short and hidden among the base of the leaves.

Achene normally triangular: scales strongly dark-margined: stolons short, ascending: culm copiously fibrillose at the base. — 45. *C. nigro-marginata.*

Achene normally lenticular: scales at most moderately dark-margined: stolons long, horizontal: culm little fibrillose at the base. — 46. *C. floridana.*

XII. Triquetrae

Foliage not pubescent: perigynium short-pubescent, many-ribbed, obovoid: achene very short stipitate: scales strongly several-ribbed. — 47. *C. validior.*

Lower foliage soft pubescent: perigynium densely villous above, many-nerved, elliptic-oblanceolate: achene long stipitate: scales slenderly ribbed. — 48. *C. dasycarpa.*

XIII. Pictae

Represented by one species. — 49. *C. picta.*

XIV. Digitatae

Represented by one species in our range. — 50. *C. Baltzellii.*

XV. Albae

Represented by one species in our range. — 51. *C. eburnea.*

XVI. Paniceae

Perigynium with very short, often bent beak or beakless: staminate scales strongly purplish-brown-tinged.

Culm phyllopodic, not strongly purplish-tinged at the base, spreading by deep-seated slender white rootstocks. — 52. *C. Meadii.*

Culm aphyllopodic, strongly purplish-tinged at the base, with interwoven stout rootstocks. — 53. *C. biltmoreana.*

Perigynium with prominent beak 1.5 mm. long: staminate scales slightly yellowish-brown-tinged. — 54. *C. Chapmanii.*

XVII. Laxiflorae

I. Staminate scales purplish. Bract-sheaths (usually) and base of the culm (always) strongly purplish.

Bracts bladeless: pistillate spikes closely flowered above: perigynium sharply triangular.

Leaf-blades 3–6 mm. wide: pistillate spikes 2–6-flowered on long capillary peduncles. — 55. *C. austro-caroliniana.*

Leaf-blades 10–25 mm. wide: pistillate spikes 4–12-flowered on stiff peduncles. — 56. *C. plantaginea.*

Bracts long-bladed: pistillate spikes with perigynium widely separate: perigynium obtusely triangular. — 57. *C. purpurifera.*

II. Staminate scales never purplish. Bract-sheaths not purplish-tinged, the base of the culm but rarely so.

Perigynium acutely triangular, short-tapering at base, hispidulous.

Leaf-blades very smooth (except edges), the larger 12 mm. wide or more, those of the fertile culm much smaller than those of the sterile. — 58. *C. platyphylla.*

Leaf-blades hispidulous on the veins, 10 mm. wide or less, those of the fertile culm moderately smaller than those of the sterile.
Sessile inconspicuous staminate spike and approximate upper pistillate spikes subtended by subspathaceous bracts.
Leaf-blades 1–3 dm. long: perigynium 2.5–3.5 mm. long, the sides 1.5 mm. wide, essentially beakless. 59. *C. abscondita.*
Leaf-blades 1.5–3.5 dm. long: perigynium 4–4.5 mm. long, the sides 2 mm. wide, the beak 1 mm. long. 60. *C. magnifolia.*
Staminate spike conspicuous, peduncled: pistillate spikes scattered: bracts not at all spathaceous.
Lowest scale of pistillate spikes with a pistillate flower: leaf-blades not glaucous, erect, 2.5–5 mm. wide. 61. *C. digitalis.*
Lowest scale of pistillate spikes empty or with a staminate flower: leaf-blades more or less glaucous, spreading, 4–8 mm. wide. 62. *C. laxiculmis.*
Perigynium obtusely triangular, long-tapering at base, smooth.
Sterile shoots reduced to tufts of leaves.
Pistillate scales very rounded-truncate: beak of perigynium short, abruptly bent: culm strongly narrowly wing-margined: leaves not semi-evergreen. 63. *C. albursina.*
Pistillate scales acuminate to strongly cuspidate: beak of perigynium conspicuous, straight or oblique: culm less wing-margined: leaves semi-evergreen.
Perigynium appressed-ascending, membranous, 3–4.25 mm. long: leaf-blades beneath and culm conspicuously white-striolate: culm narrowly wing-margined. 64. *C. heterosperma.*
Perigynium spreading-ascending, subcoriaceous, 4–5 mm. long: leaf-blades not white-striolate beneath, except at apex: culm not wing-angled. 65. *C. laxiflora.*
Sterile shoots developing conspicuous culms: leaves not semi-evergreen.
Perigynium obovoid-elliptic or fusiform, rather sharply angled above and with straight conspicuous beak.
Perigynium strongly nerved, 3.5–5 mm. long.
Pistillate spikes short-oblong, few-flowered, the lower on long capillary peduncles: culm and bract-sheaths not retrorsely serrulate; staminate spike usually long-peduncled. 66. *C. styloflexa.*
Pistillate spikes linear-oblong, 10–20-flowered, on erect peduncles: culm and bract-sheaths (at mouth) retrorsely serrulate: staminate spike and uppermost pistillate spikes closely contiguous. 67. *C. crebriflora.*
Perigynium nerveless or nearly so, 3–4 mm. long: pistillate spikes linear-oblong, many-flowered, erect: bract-sheaths strongly retrorsely serrulate towards mouth. 68. *C. leptonervia.*
Perigynium very obtusely triangular-obovoid and with abruptly bent short beak: spikes many-flowered.
Culm not purplish-tinged at the base: perigynium obovoid, 3–4 mm. long: staminate scales usually greenish-white. 69. *C. blanda.*
Culms strongly purplish-tinged at the base: perigynium broadly obovoid, 2.5–3 mm. long: staminate scales usually reddish-brown-tinged. 70. *C. gracilescens.*

XVIII. Oligocarpae

Represented by one species in our area. — 71. *C. oligocarpa.*

XIX. Granulares

Rootstock not long-creeping: staminate spike short-peduncled: bracts over-topping the culm, their sheaths conspicuously prolonged upward at mouth. — 72. *C. granularis.*

Rootstock long-creeping: staminate spike long-peduncled: bracts rarely over-topping culm, their sheaths not prolonged upward at mouth.

Perigynium nerved, 3–3.5 mm. long, very short-beaked, the orifice nearly entire: pistillate spikes 5–6 mm. wide: leaf-blades 1.5–3 mm. wide. — 73. *C. Crawei.*

Perigynium ribbed, 3.5–4.5 mm. long, moderately beaked, the orifice emarginate: pistillate spikes about 7.5 mm. wide: leaf-blades 3–6 mm. wide. — 74. *C. microdonta.*

XX. Griseae

Perigynium elliptic, 1.5 mm. wide: leaf-blades 4 mm. wide or less: bract-sheaths rough and peduncles very rough. — 75. *C. conoidea.*

Perigynium oblong or broadly obovoid, 2–2.5 mm. wide: leaf-blades 2.5–18 mm. wide: bract-sheaths smooth and peduncles nearly so.

Leaf-blades not glaucous: larger spikes normally less than 12-flowered: lower scales usually equalling perigynia: bract-sheaths tight.

Culm strongly purplish-tinged at base: perigynium little turgid: leaf-blades 2–4 mm. wide, erect: spikes widely scattered, the lower nearly basal. — 76. *C. amphibola.*

Culm brownish-tinged at the base: perigynium turgid: leaf-blades 4–6 mm. wide, spreading: lower spikes not nearly basal. — 77. *C. grisea.*

Leaf-blades glaucous: larger spikes more than 12-flowered: lower scales shorter than perigynia: bract-sheaths enlarged upward.

Tip of achene bent: perigynium 3–5 mm. long, somewhat exceeding scale. — 78. *C. glaucodea.*

Tip of achene straight: perigynium 4.5–6 mm. long, two to three times exceeding the scales. — 79. *C. flaccosperma.*

XXI. Gracillimae

Plant glabrous: lowest bract very short-sheathing: perigynium 3.5 mm. long or less. — 80. *C. prasina.*

Sheaths, and often foliage, pubescent: at least lowest bract strongly sheathing.

Terminal spike gynaecandrous: pistillate scales not reddish-brown: lowest bract, at least, strongly sheathing.

Perigynium 1.75–2.5 mm. thick, strongly nerved, with short shallowly bidentate beak: lateral spikes closely flowered except at base: bracts strongly sheathing: leaf-blades 3–6 mm. wide.

Upper scales acuminate or short-cuspidate: perigynium 3.5–4 mm. long, less than 2 mm. wide, little swollen: spikes linear-cylindric. — 81. *C. oxylepis.*

Upper scales long-cuspidate: perigynium 4–5 mm. long, more than 2 mm. wide, strongly swollen: spikes linear-oblong or oblong-cylindric. — 82. *C. Davisii.*

Perigynium 1 mm. thick, obscurely nerved, beakless, the orifice entire: lateral spikes alternately flowered: lower bract only strongly sheathing: leaf-blades 1.5–2.5 mm. wide. — 83. *C. aestivalis.*

Terminal spikes staminate: pistillate scales reddish-brown-tinged: lowest bract not sheathing. — 84. *C. misera.*

XXII. Sylvaticae

Perigynium firm, strongly several-nerved; scales tinged with reddish-brown; upper sheaths puberulent at mouth.
- Perigynium glabrous, strongly ribbed, subcoriaceous, the beak thickish, flattened. — 85. *C. oblita.*
- Perigynium pubescent, strongly nerved, submembranous, the beak more slender, conic. — 86. *C. venusta.*

Perigynium membranous, light nerved: scales hyaline with green mid-rib or somewhat reddish-brown-tinged: upper sheaths not pubescent at mouth.
- Scales cuspidate or awned, the midvein extending to the tip: perigynium hispidulous, short-stipitate, the beak sharply but unequally bidentate: sterile shoots aphyllopodic. — 87. *C. allegheniensis.*
- Scales obtuse, hyaline at apex, the midvein not extending to tip: perigynium normally glabrous, sessile.
  - Perigynium 6–10 mm. long, light-green or greenish-straw-colored, the beak subulate, very obliquely cleft, very conspicuously white-hyaline tipped, the apex more or less cleft: scales white-hyaline-margined, rounded on back. — 88. *C. debilis.*
  - Perigynium 4.5–7 mm. long, green, the beak less subulate, deeply bidentate, little or not at all obliquely cleft, hyaline between the teeth: scales tawny-tinged, sharply keeled. — 89. *C. flexuosa.*

XXIII. Longirostres

Represented by one species in our range. — 90. *C. cherokeensis.*

XXIV. Virescentes

Perigynium densely pubescent: lower spikes distant, peduncled: ligule conspicuously longer than wide.
- Leaves exceeding culm: lowest bract setaceous, 0.5 mm. wide: pistillate spikes oblong-cylindric: perigynium obovoid. — 91. *C. Swanii.*
- Culm exceeding leaves: lowest bract leaflet-like, 0.5–3 mm. wide: pistillate spikes linear-cylindric: perigynium ellipsoid. — 92. *C. virescens.*

Perigynium glabrous at least at maturity: spikes contiguous, sessile or nearly so: ligule shorter than wide or at least not longer.
- Perigynium much flattened, rounded at apex, lightly nerved: tip of achene straight or little bent.
  - Leaf-blades glabrous, stiff: perigynium granular roughened, nerveless ventrally. — 93. *C. complanata.*
  - Leaf-blades pubescent, not stiff: perigynium not granular roughened, nerved ventrally. — 94. *C. hirsutella.*
- Perigynium turgid, nearly orbicular in cross-section, short-pointed at apex, coarsely nerved or ribbed: tip of achene very abruptly bent.
  - Perigynium 2 mm. long, brownish-green: scales not pilose, not rough-cuspidate: leaf-blades smooth or nearly so. — 95. *C. caroliniana.*
  - Perigynium 2.5–3.5 mm. long, green: scales rough-cuspidate, sparingly pilose above: leaf-blades hairy. — 96. *C. Bushii.*

XXV. Anomalae

Represented by one species. — 97. *C. scabrata.*

XXVI. Atratae

Terminal spike staminate: lateral spikes slender-stalked, the lower drooping: pistillate scales obtuse or acute, shorter than perigynia. — 98. *C. Barrattii.*

Terminal spike gynaecandrous: lateral spikes short-stalked or sessile, erect: pistillate scales strongly awned, normally exceeding perigynia. — 99. *C. Buxbaumii.*

XXVII. Shortianae

Represented by one species. — 100. *C. Shortiana.*

XXVIII. Pendulinae

Perigynium strongly ribbed, squarrose, often but slightly glaucous: staminate scales tapering into the awn: basal sheaths not filamentose. — 101. *C. Joorii.*

Perigynium nerved, ascending, very glaucous: staminate scales abruptly awned.

Pistillate spikes erect: scales purplish-brown-tinged: perigynium conspicuously nerved. — 102. *C. verrucosa.*

Pistillate spikes nodding: scales reddish-brown-tinged: perigynium obscurely nerved. — 103. *C. glaucescens.*

XXIX. Acutae

Culm stout at base, smooth above: beak of perigynium prominent, twisted when dry: stolons very short, ascending. — 104. *C. torta.*

Culm more slender, very rough above: beak of perigynium very short or absent, not twisted: stolons, when present, elongate, horizontal.

In large beds: leaf-blades bluish-green or glaucous-green, flat at base: scales dark-purplish-brown. — 105. *C. strictior.*

In dense tussocks: leaf-blades deep-green, channeled at base: scales reddish-brown. — 106. *C. stricta.*

XXX. Cryptocarpae

Perigynium smooth or slightly granular: achenes normally constricted in the middle.

Sheaths rough hispid dorsally: lower pistillate scales tapering into the awn. — 107. *C. gynandra.*

Sheaths smooth dorsally: lower pistillate scales abruptly contracted into the awn. — 108. *C. crinita.*

Perigynium strongly papillate: achenes normally not constricted in the middle: lower sheaths slightly hispidulous dorsally: lower pistillate scales abruptly awned. — 109. *C. Mitchelliana.*

XXXI. Hirtae

Perigynium glabrous to sparsely pubescent.

Pistillate spikes oblong to globose, their scales strongly 5–7-ribbed; perigynium 8–11 mm. long, coarsely ribbed. — 110. *C. turgescens.*

Pistillate spikes narrowly oblong, their scales 3-nerved; perigynium 4–6 mm. long, impressed nerved. — 111. *C. Walteriana.*

Perigynium densely pubescent. — 112. *C. lanuginosa.*

XXXII. Paludosae

Represented by one species in our range. — 113. *C. hyalinolepis.*

XXXIII. Collinsiae

Represented by one species. — 114. *C. Collinsii.*

XXXIV. Folliculatae

Perigynium narrowly lanceolate, 2.5 mm. wide at base: pistillate scales acute to short-awned, averaging half length of perigynium: pistillate spikes staminate at apex: bract-sheaths enlarged upward. — 115. *C. Smalliana.*

Perigynium lanceolate, 3 mm. wide at base: pistillate scales awned, averaging three-fourths length of perigynium: pistillate spikes not normally staminate at apex: bract-sheaths enlarged upward. — 116. *C. folliculata.*

XXXV. Vesicariae

Pistillate scales (except rarely lowest) not rough awned.

Perigynium abruptly beaked, strongly inflated: pistillate spikes oblong or cylindric, 20–40-flowered. — 117. *C. bullata.*

Perigynium more gradually beaked, much less strongly inflated: pistillate spikes globose to short oblong, 10–20-flowered. — 118. *C. Elliottii.*

Pistillate scales rough-awned.

Pistillate spikes cylindric to nearly globose, 14–18 mm. thick: perigynium contracted into beak. — 119. *C. lurida.*

Pistillate spikes narrowly cylindric, 8–12 mm. thick: perigynium abruptly contracted into beak. — 120. *C. Baileyi.*

XXXVI. PSEUDO-CYPEREAE

Perigynium obtusely triangular, scarcely inflated, closely enveloping achene below: rootstock not long stoloniferous: ligule much longer than wide. 121. *C. comosa.*

Perigynium suborbicular in cross-section, more or less inflated: rootstock long stoloniferous: ligule wider than long. 122. *C. Schweinitzii.*

XXXVII. SQUARROSAE

Scales exceeding perigynia: terminal spike small, normally staminate. 123. *C. Frankii.*

Scales much shorter than perigynia: terminal spike gynaecandrous.

Achene linear-oval with flattish sides: style strongly sinuous or abruptly bent below: spikes oval, the perigynia with widely radiating beaks: pistillate scales acuminate or awned. 124. *C. squarrosa.*

Achene obovoid with concave sides: style straight below: spikes oblong-cylindric, the perigynia mostly with beaks appressed-ascending: pistillate scales obtusish. 125. *C. typhina.*

XXXVIII. LUPULINAE

Pistillate spikes globose or subglobose: style straight: stolons very short, ascending.

Perigynium rounded at base, membranaceous, shining, smooth: leaf-blades 2.5–8 (averaging 3–5) mm. wide, their sheaths short-prolonged upward at mouth beyond base of blade: pistillate spikes 1–15-flowered. 126. *C. intumescens.*

Perigynium cuneate at base, firm, dull, often hispidulous: leaf-blades 4.5–14 (averaging 7–10) mm. wide, their sheaths not prolonged upward at mouth beyond base of blade: pistillate spikes 6–30-flowered. 127. *C. Asa-Grayi.*

Pistillate spikes oblong or cylindric: style abruptly bent: stolons long, slender, horizontal.

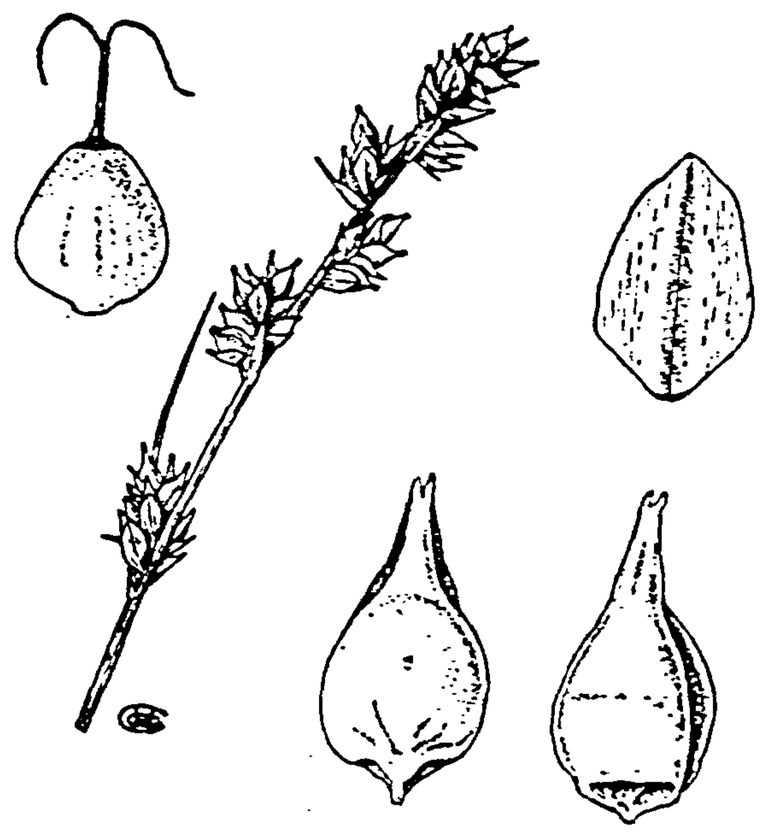
Perigynium ascending, the beak less than twice the length of the body.

Culms arising singly from elongate rootstocks: leaf-blades 2–5 mm. wide: pistillate scales acute or acuminate. 128. *C. louisianica.*

Culms cespitose: leaf-blades 4–12 mm. wide: pistillate scales acuminate or aristate. 129. *C. lupulina.*

Perigynium spreading at right angles, the beak two to three times the length of the body. 130. *C. gigantea.*

I. MUHLENBERGIANAE Tuckerm. Densely cespitose or a few species with the rootstock elongate, tough, and dark-colored. Culm not flattened. Opaque part of sheaths neither transversely rugulose nor red-dotted. Spikes usually 10 or less, androgynous or pistillate, but not gynaecandrous, rarely at all compound. Bracts from little to strongly developed. Perigynium plano-convex, green or chestnut-tinged or light-brownish in age, from appressed to reflexed, often strongly spongy at base, nerveless or sparingly nerved, narrowly sharp-margined, conspicuously beaked, the beak sharply bidentate. Achene lenticular. Style-base more or less thickened. Stigmas 2.



1. C. retroflexa Muhl. Culm slender, stiffish, 2–5 dm. tall: leaf-blades 1–2.5 mm. wide: spikes 4–8, 4–10-flowered, the upper aggregated, the lower 1–3 separated: perigynium 3 mm. long, 1.6 mm. wide, green-brown, the beak more than one-third length of

the body.—Woods and thickets, various provinces, Fla. to Tex., Ill., Mich., and Vt.—Spr.–early sum.

2. C. texensis (Torr.) Bailey. Culm very slender, 1.5–4.5 dm. tall: leaf-blades about 1 mm. wide: spikes 4–7, 4–8-flowered, the upper aggregated, the lower separated: perigynium 3 mm. long, 1 mm. wide, green at maturity, the beak about half as long as the body.—Woods and thickets, inner part of Coastal Plain and adj. provinces, N. C. and Ga. to Tex., Mo., and S Ill.—Spr.

3. C. rosea Schk. Culm 2–5 dm. tall, slender: leaf-blades 1–2 mm. wide, light-green: spikes 4–8, 4–12-flowered, the upper aggregated, the lower 3–5 separated: perigynium light-green, 3–3.5 mm. long, 1.5 mm. wide, nerveless, or obscurely nerved, the beak ¼ length of the body.—Woods and thickets, various provinces, Ga. to La., N. D., Que., and N. S.—Spr.–early sum.

4. C. convoluta Mackenzie. Culm 3–6 dm. tall, strict: leaf-blades deep-green, the sheaths somewhat septate-nodulose: spikes 4–7, 6–20-flowered, the upper aggregated, the lower strongly separate: perigynium 1.75 mm. wide, nerveless or obscurely nerved, the beak ⅓ length of the body.—Woods and thickets, various provinces, Ala. to Kans., Man., Que., and N. S.—Spr.–early sum.

5. C. radiata (Wahl.) Dewey. Culm very slender, weak, 2.5–5 dm. tall: leaf blades light-green, the sheaths not septate-nodulose: spikes usually 4, the two upper contiguous, the two lower strongly separate: perigynium at first erect, at maturity more or less strongly spreading, 1.5 mm. wide, nerveless or obscurely nerved, the beak half length of the body.—Woods and thickets, Blue Ridge and more northern provinces, N. C. and Tenn. to Mich., Que., and Me.—Sum.

6. C. cephalophora Muhl. Culm slender, 2–6 dm. tall, rough above: leaf-blades 2–4 mm. wide: head 8–15 mm. long, subglobose, the spikes densely aggregated: perigynium 2.5 mm. long, 1.5 mm. wide, narrowed into a bidentate beak much shorter than the body.—Dry open woodlands, various provinces, Fla. to Tex., Man., Que., and Me.—Spr.–early sum.

7. C. Leavenworthii Dewey. Culm very slender, erect or spreading, roughish above, 1.5–5 dm. tall: leaf-blades 1–3 mm. wide: head short-oblong, 8–15 mm. long, the spikes densely aggregated: perigynium 2–2.5 mm. long, 1.25–1.75 mm. wide, nerveless or nearly so, the bidentate beak ¼ length of the body.—Dry open woodlands and fields, various provinces, Ga. to Tex., Ont., and N. J. (introduced.)—Spr.–early sum.

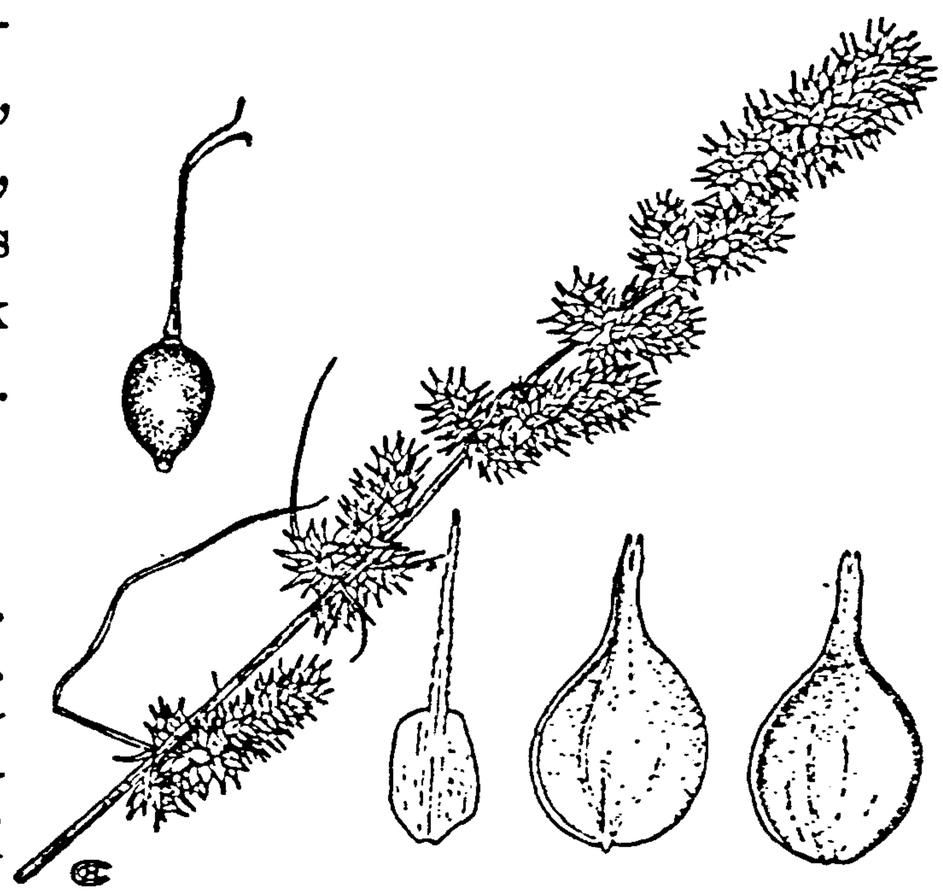
8. C. Muhlenbergii Schk. Culm slender but stiff and erect, rough above, 5–9 dm. tall: leaf-blades 2–5 mm. wide, somewhat involute: head oblong, 2–4 mm. long, the spikes 4–10, distinct but aggregated: bracts bristle-form, conspicuous: scales cuspidate or short-awned: perigynium 3.5 mm. long, 2 mm. wide, strongly ribbed on both sides, the beak conspicuous, deeply bidentate.—Sterile sandy fields and dry rocky slopes in non-calcareous regions, various provinces, Fla. to Tex., Minn., and R. I.—Spr.–early sum.

9. C. plana Mackenzie. Culm stiff, erect, rough above, 3–7 dm. tall: leaf-blades 2–5 mm. wide, little involute: head oblong, 1.5–4 cm. long, the spikes 4–10 distinct but not aggregated: bracts except lowest not conspicuous: scales cuspidate or short-awned: perigynium 3 mm. long, 2.25 mm. wide, the beak rather short, deeply bidentate. [*C. Muhlenbergii enervis* Boott.]—Dry fields

and open woods in calcareous regions, various provinces, Ala. to Tex., Nebr., Mich., and Maine.—Spr.–early sum.

10. C. mesochorea Mackenzie. Culm slender, spreading or reclining, 1.5–10 dm. tall: leaf-blades 2.5–4 mm. wide, usually about half length of culms: head ovoid, 10–17 mm. long, 10 mm. thick, the spikes densely aggregated: perigynium 3.5 mm. long, 2 mm. wide or slightly more, nerved dorsally, contracted into a bidentate beak half the length of the body.—Dry sunny places, often on roadsides, Coastal Plain and adj. provinces, Tenn. to D. C.; becoming sparingly introduced northward.—Spr.–early sum.

II. MULTIFLORAE Kunth. Densely cespitose. Culm sharply triangular. Opaque part of sheaths usually transversely rugulose, red-dotted. Spikes numerous, small, androgynous or pistillate, but not gynaecandrous, the lower more or less compound. Bracts frequently conspicuous. Perigynium plano-convex, not very thick, yellowish-brown, appressed-ascending or somewhat spreading, not thick-walled, somewhat spongy at base, short-stipitate, sharp-margined, more or less nerved, conspicuously rough-beaked, the beak bidentate. Achene lenticular. Stigmas 2. Style-base more or less enlarged.



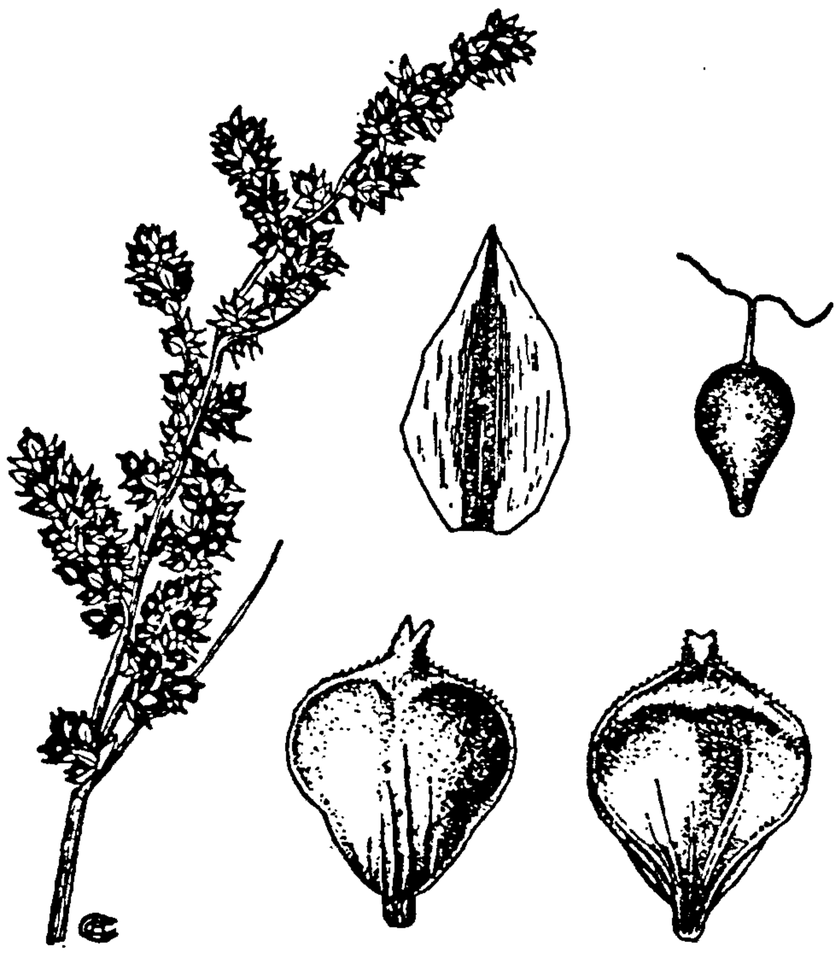
11. C. vulpinoidea Michx. Culm 3–10 dm. tall, very rough above: leaf-blades 2–5 mm. wide, elongate: sheaths tight, transversely rugulose: head 3–15 cm. long, with very many small spikes, often somewhat compound or interrupted: bracts setaceous, usually conspicuous: scales strongly awned: perigynium 2–3 mm. long, narrowly to broadly ovate, ascending or spreading at maturity.—Swamps and wet meadows, various provinces, Fla. to Tex., Ore., Vanc., and N. B.—Sum.

12. C. triangularis Boeckl. Culm 3–8 dm. tall, stiff, roughened above: leaf-blades 2–6 mm. wide: sheaths transversely rugulose: head 3–8 cm. long with very many small spikes, more or less compound at base: bracts short, setaceous, often conspicuous: scales awned: perigynium 3 mm. long, 2.5 mm. wide.—Low prairies and meadows, Coastal Plain and adj. provinces, Miss. to Tex., Okla., and Ark.—Spr.–early sum.

13. C. annectens Bicknell. Culm 3–10 dm. tall, stiff, rough above: leaf-blades 2–5 mm. wide: sheaths transversely rugulose, strongly prolonged upward at mouth: head 2–7 cm. long, more or less compound at base and with very many small spikes: bracts short, setaceous, rarely conspicuous: scales strongly awned: perigynium 2.6–3.2 mm. long, 1.7–2.25 mm. wide, nerveless or nearly so ventrally. [*C. setacea ambigua* (Barratt) Fernald.]—Fields, mostly east of the mountains in non-calcareous districts: frequently introduced, various provinces, Fla. to Ark., Ia., and Me.—Sum.

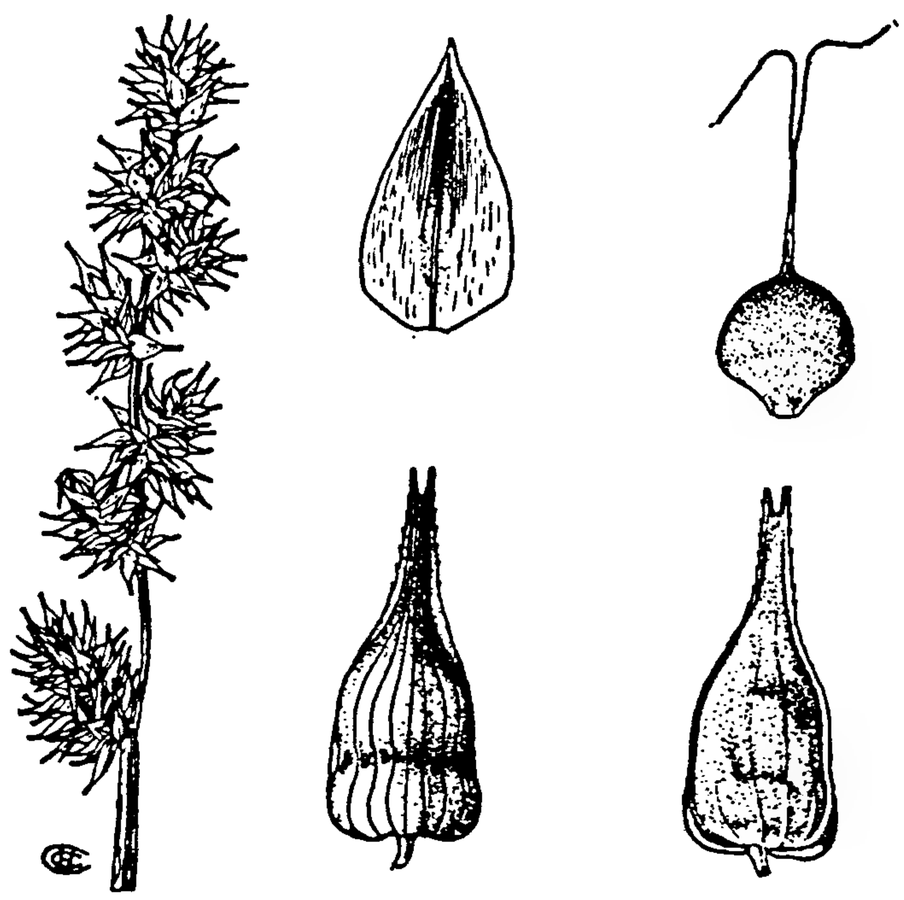
III. PANICULATAE Kunth. Densely or loosely cespitose. Culm not flattened. Opaque part of sheaths strongly red-dotted. Spikes numerous, small, androgynous or pistillate, but not gynaecandrous, the lower compound or decompound. Bracts usually inconspicuous. Perigynium thick, strongly convex

on the dorsal, and often somewhat convex on the ventral face, brownish or chestnut in age, ascending or spreading, coriaceous, spongy at base, stipitate, narrowly margined, more or less nerved, conspicuously rough beaked, the beak bidentate. Achene lenticular. Style-base more or less thickened. Stigmas 2.



14. C. decomposita Muhl. Culm 5–10 dm. tall, stout, roughened above, obtusely triangular or terete below: leaf-blades 2.5–8 mm. wide, longer or shorter than the culm: head 4–15 cm. long, decompound with very numerous small spikes: bracts inconspicuous: scales ovate, acute, nearly the length of the perigynia: perigynium short-obovoid, 2–2.5 mm. long, tapering at base, very abruptly short-beaked, strongly nerved dorsally, faintly nerved ventrally.—Swamps, various provinces, Fla. to La., Mo., Mich., and W N. Y.—Late spr.–sum.

IV. STENORHYNCHAE Holm. Densely cespitose or with a more or less elongated rootstock. Culm triangular or somewhat flattened. Opaque part of sheaths usually transversely rugulose or red-dotted. Spikes few to many, androgynous to pistillate, but not gynaecandrous, the lower from simple to compound. Bracts little developed. Perigynium plano-convex, yellowish or yellowish-brown, appressed-ascending to spreading, not thick-walled, but strongly spongy at base, stipitate, strongly many-nerved, the margins nearly obsolete on the lower half, conspicuously beaked, the beak bidentate. Achene lenticular. Style-base more or less thickened. Stigmas 2.



15. C. stipata Muhl. Culm 2–12 dm. tall, stout at base, sharply 3-angled, slightly winged and strongly serrulate above, rather weak: leaf-blades 4–8 mm. wide: head 2.5–10 cm. long, somewhat compound, the spikes numerous, small, yellowish-brown: bracts inconspicuous: scales ovate or lanceolate, acuminate, much shorter than the perigynia: perigynium 4–5 mm. long, lanceolate, strongly nerved.—Swamps and wet meadows, neutral soils, various provinces, Tenn. to Mo., N. M., Calif., S Alas., and Newf.—Spr.–sum.

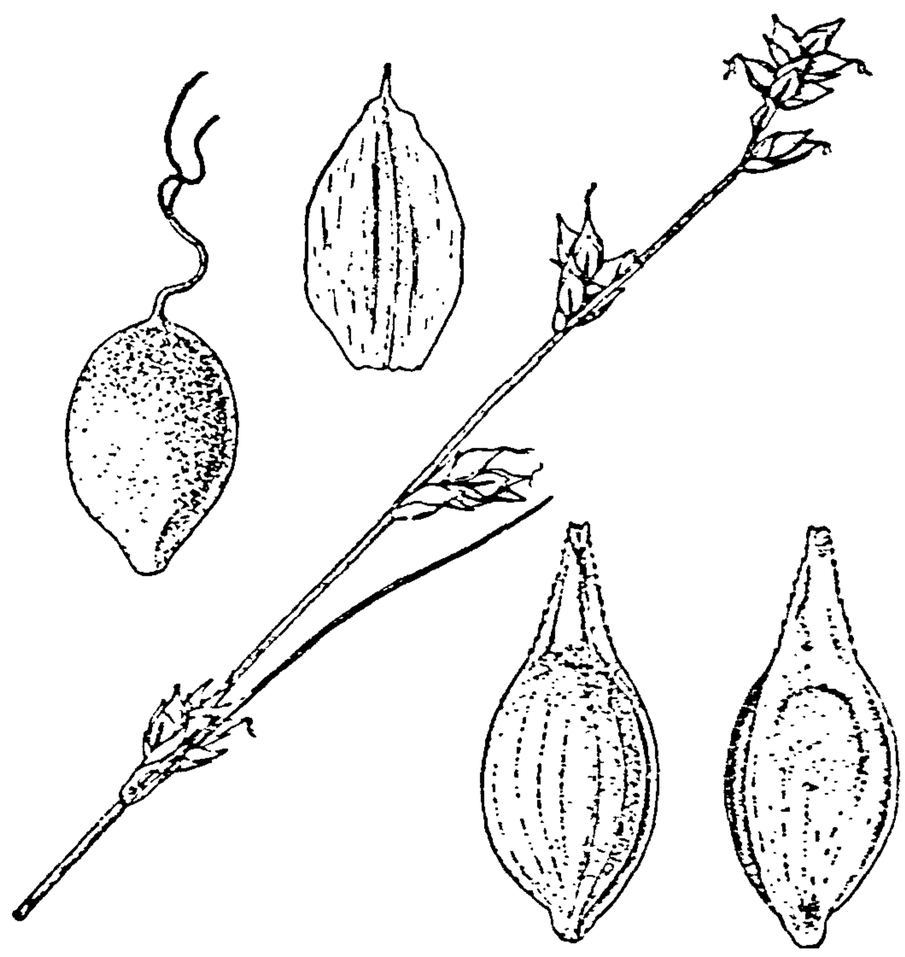
16. C. uberior (C. Mohr) Mackenzie. Culm 4–9 dm. tall, very thick, but weak, sharply triangular, very rough above, much flattened in drying: leaf-blades 8–15 mm. wide: head 4–10 cm. long, compound, the spikes numerous, small, yellowish-brown: bracts inconspicuous: scales lanceolate, cuspidate or awned, much shorter than perigynia: perigynium 5–6 mm. long, lanceolate, strongly nerved. [*Carex stipata uberior* C. Mohr.]—Deep swamps, neutral soils, Coastal Plain, Fla. to Ala. and S N. J.—Spr.–early sum.

17. C. laevi-vaginata (Kükenth.) Mackenzie. Culm 4–8 dm. tall, little thickened at base, sharply 3-angled, slightly winged and strongly serrulate above, rather weak: leaf-blades 3–6 mm. wide: head 2.5–6 cm. long, the spikes numer-

ous, small, yellowish-green: bracts inconspicuous: scales ovate or lanceolate, acuminate, much shorter than the perigynia: perigynium 4–5.5 mm. long, lanceolate, strongly nerved.—Wooded swamps, neutral soils, various provinces, Fla. to S Mo., Ill., and Mass.—Spr.–sum.

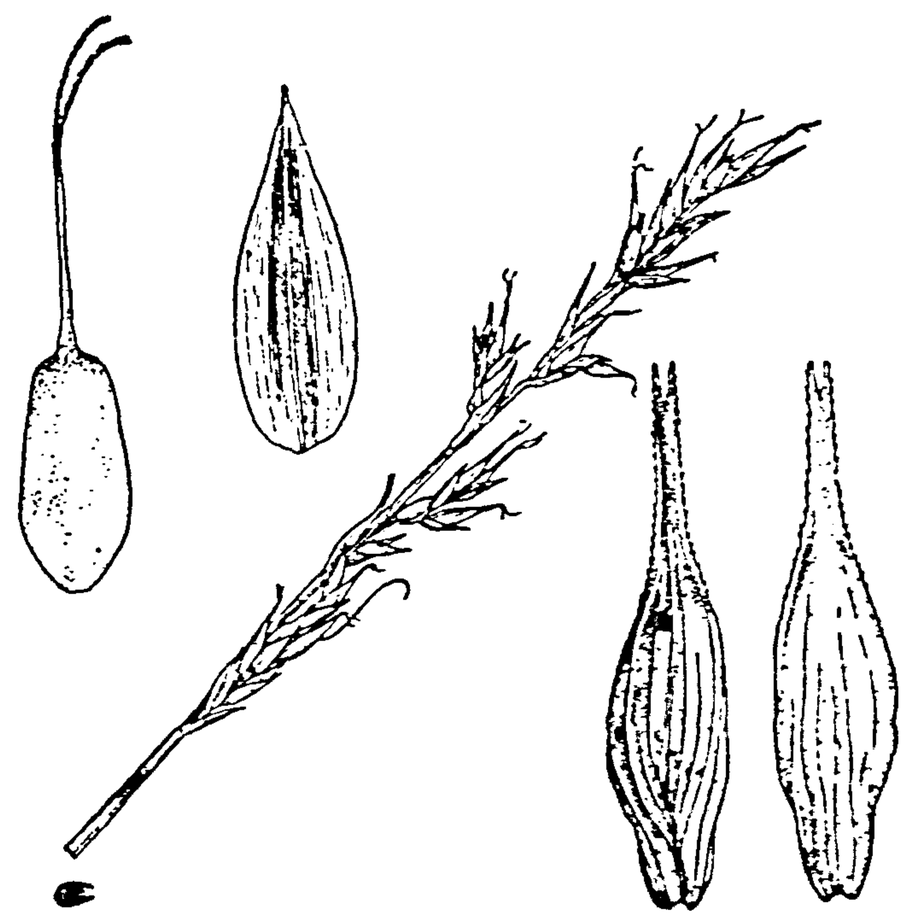
18. C. crus-corvi Shuttleworth. Culm 5–12 dm. tall, stout, very rough above: leaf-blades 5–12 mm. wide, the sheaths conspicuously red-dotted: head compound, branching, 1–3 dm. long, 2.5–7.5 cm. wide, the spikes very numerous: perigynium much exceeding scales, elongate-lanceolate, 2.75 mm. wide, 6–7 mm. long, the base hard and disk-like.—Swamps, neutral soils, Gulf Coastal Plain and more northern provinces, Fla. to Tex., Nebr., Minn., and Ind.—Late spr.–sum.

V. CANESCENTES Fries. Cespitose, but in some species with slender stolons. Culm triangular. Sheaths not cross-rugulose. Spikes 1–10, with few to many perigynia, the terminal one gynaecandrous, the lateral pistillate or gynaecandrous, simple. Bracts inconspicuous. Perigynia plano-convex, white-puncticulate, lanceolate, ovate, oval, or obovoid, appressed to spreading, beakless to prominently beaked, more or less nerved on both sides, not winged or margined, but acute-edged above, nearly or entirely filled by lenticular achene. Style-base not enlarged. Stigmas 2.



19. C. brunnescens (Pers.) Poir. Culm 2–5 dm. tall, slender, stiff: leaf-blades 1–2.5 mm. wide, dark-green, not glaucous: spikes 4–8, subglobose or short-oblong, 4–10-flowered: scales ovate, shorter than the perigynia: perigynium loosely spreading when mature, 2–3 mm. long, 1–1.5 mm. wide, the minutely bidentate roughish beak ¼ length of body.—Wet soil and cliffs, in acid soils, Blue Ridge, N. C. and Tenn., various provinces, N N. J. to Mich., B. C., Lab., and Newf.—Sum.—Very widely distributed and abundant N. In our region only in the higher mountains.

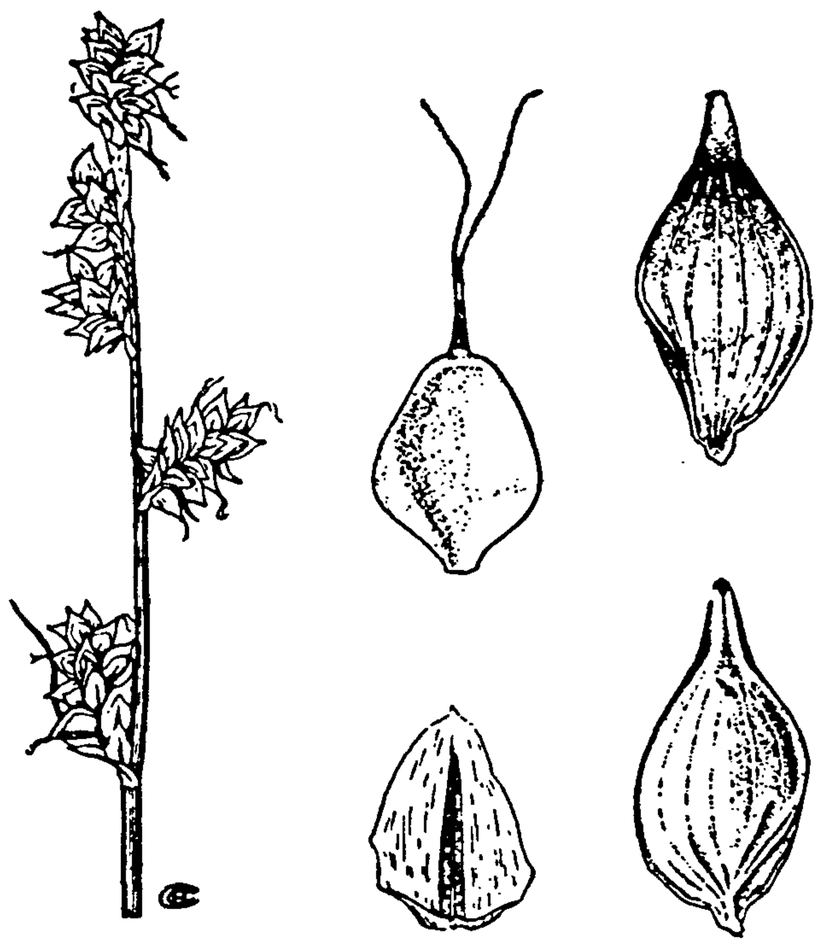
VI. DEWEYANAE Tuckerm. Densely cespitose. Culm triangular. Sheaths not red-dotted or cross-rugulose. Spikes 3–8, gynaecandrous, pistillate, or rarely staminate, simple. Lower one or two bracts often conspicuous. Perigynium plano-convex, with a narrowly ovate or linear-oblong body, light- or yellowish-green, 3.5–5.5 mm. long, appressed, strongly spongy at base, only the upper-half sharp-edged, round-tapering at base, nerved on the outer face, nerved or nerveless on the inner face, the beak bidentate to deeply bidentate. Achene lenticular. Stigmas 2.



20. C. bromoides Schk. Culm 3–6 dm. tall, slender, very rough above: leaf-blades 2 mm. wide, bright-green: spikes 3–7 narrowly oblong-cylindric, 7–18 mm. long, 3 mm. thick, the staminate flowers basal or terminal, or both: perigynium narrowly lanceolate, exceeding the oblong-lanceolate scale, 4–5.5

mm. long, 1 mm. wide, little margined, little nerved, the rough beak at least half the length of the body.—Swampy woodlands, acid or neutral soils, various provinces, Fla. to La., Mich., and N. S.—Late spr.–sum.

VII. STELLULATAE Kunth. Densely cespitose. Culm triangular. Sheaths not red-dotted or cross-rugulose. Spikes 2–10, or by reduction one, gynaecandrous or pistillate, or in a few species staminate, not compound. Bracts inconspicuous. Perigynium plano-convex, with orbicular, ovate, or broadly oval bodies, green, yellowish-brown or brown, spreading or reflexed at maturity, 2.5–4.5 mm. long, strongly spongy at base, sharp-edged nearly, if not entirely, to the rounded or truncate base, not puncticulate, nerved on the outer surface, nerved or nerveless on the inner, the beak bidentate or obliquely cut. Achene lenticular. Stigmas 2.



21. C. seorsa E. C. Howe. Culm 3–7 dm. tall, weak: leaf-blades 2–4 mm. wide, deep-green: spikes 3–7, the upper approximate, the terminal 6–12 mm. long, the lateral 4–7 mm. long, 4–6 mm. wide, with 5–20 at length widely spreading perigynia: scales orbicular-ovate, narrower and shorter than perigynia bodies: perigynium 2.5 mm. long, 1.5 mm. wide, deep-green, strongly nerved on both faces. [*C. rosaeoides* E. C. Howe.]—Acid swampy woodlands, various provinces, Ga. to Ark., Ind., and Mass.—Spr.–early sum.

22. C. Howei Mackenzie. Very densely cespitose in large clumps: culm 2–7 dm. tall, usually very weak: leaf-blades 0.25–1 mm. wide, more or less involute, usually exceeding the culm: spikes 2–5, more or less strongly separate, the terminal long-clavate at base, the lateral 4–6 mm. long and as wide, the 5–10 perigynia at length widely spreading: scales broadly ovate, whitish or opaque with green midvein: perigynium ovate, 2.5 mm. long, 1.25 mm. wide. [*Carex interior* (Fl. SE. U. S.) Not Bailey.]—Acid swampy woods (usually coniferous), various provinces, Fla. to La., Vt., and N. S.—Spr.–sum.

23. C. Mohriana Mackenzie. Densely cespitose in large clumps: culm 2–7 dm. tall, very slender, usually weak: leaf-blades 1–2.5 mm. wide, canaliculate, usually exceeding the culm: head 0.75–1.5 cm. long, the spikes 2–5, the terminal inconspicuously staminate at base, the lateral suborbicular, 4–6 mm. long, the 4–10 perigynia at length widely spreading: scales broadly ovate, white-hyaline except the green center: perigynium ovate, concave-convex, 2.25–2.5 mm. long, 1.75 mm. wide.—Pinelands, acid soil, Coastal Plain, Fla. and Ala.—Spr.

24. C. incomperta Bickn. Culm 2.5–6 dm. tall, wiry: leaf-blades flat or canaliculate, 1.5–2.5 mm. wide: spikes 3–4, aggregated or lower slightly separate, the terminal 6–10 mm. long, clavate at base, the lateral 4–6 mm. long, suborbicular, with 6–15 spreading perigynia: scales yellowish-brown tinged, except the green midrib: perigynium 3 mm. long, 2 mm. wide, strongly nerved on both sides, the body serrulate above.—Acid swampy woods, various provinces, N Fla. to Miss., Mich., and N. S.—Spr.–early sum.

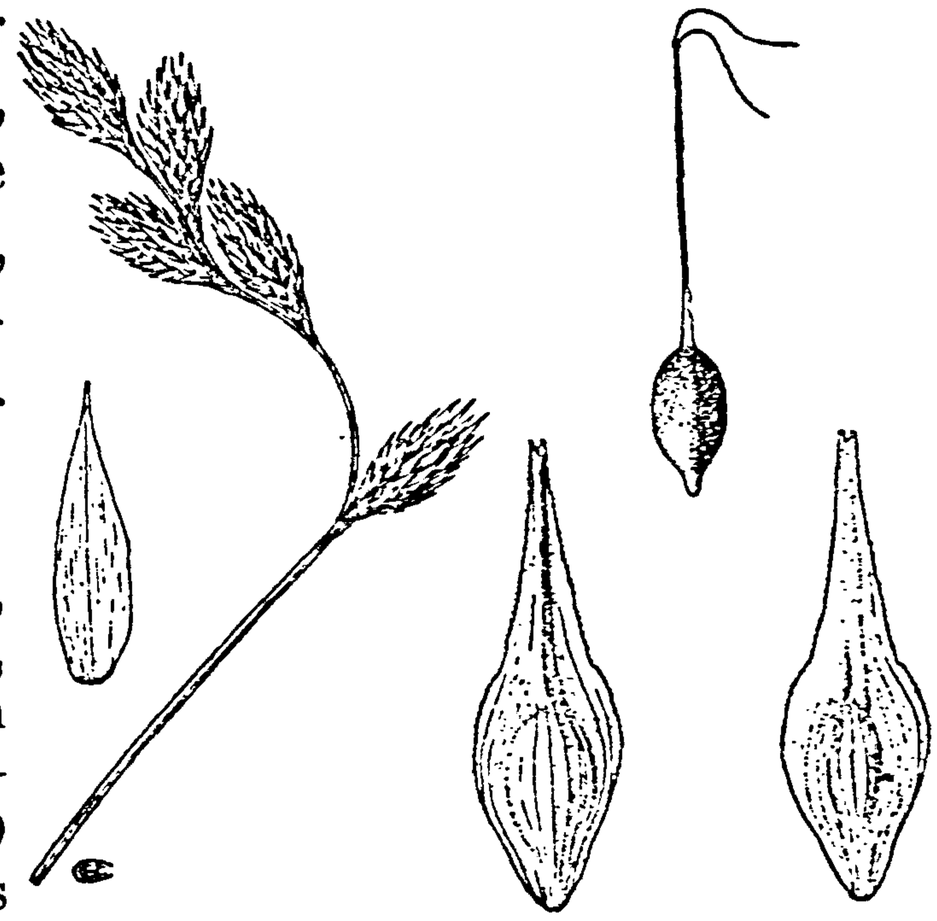
25. C. atlantica Bailey. Culm 2–7 dm. tall, stiff, thickish at base: leaf-blades flat or canaliculate, 1.5–4 mm. wide: spikes 3–5, more or less separate or rarely aggregated, the terminal 8–15 mm. long, strongly clavate at base,

the lateral 8–15 mm. long, 6–7 mm. wide, suborbicular, with 8–20 at length widely spreading perigynia: scales light-brownish-tinged except the green center: perigynium 3 mm. long, 2.25 mm. wide, strongly nerved on both sides, the body serrulate above.—Acid swampy woods near the coast, Coastal Plain and New England Coast, Fla. to Tex. and N. S.—Spr.–early sum.

26. **C. Ruthii** Mackenzie. Culm 3–7 dm. tall, 3 mm. thick at base: leaf-blades flat or canaliculate, averaging 3–3.5 mm. wide: spikes 5–6, the lower widely separate, the lateral subglobose, 3–6 mm. long, 5–7 mm. wide, the terminal similar, but longer and clavate at base: scales light reddish-brown-tinged except the broad hyaline margins: perigynium 3.25–3.75 mm. long, 1.5 mm. wide, nerved dorsally, nerveless ventrally, serrulate above.—Wooded slopes, Blue Ridge, Ga. to N. C.—Sum.

27. **C. angustior** Mackenzie. Culm 1.5–6 dm. tall, slender but strict: leaf-blades flat or canaliculate: spikes 3–5, approximate or little separate, the lateral suborbicular, 4–6 mm. long, 5–15-flowered, the terminal similar, but longer and clavate at the base: scales yellowish-green with sharply defined midvein and ill-defined margins: perigynium 2.5–3.5 mm. long, 1.25 mm. wide, impressed-nerved ventrally, the body not serrulate.—Open swampy places, various provinces, mts. of N. C. to Calif., Wash., Mich., and Newf.—Sum.

VIII. Ovales Kunth. Densely cespitose or (rarely) with short-prolonged rootstocks. Culm triangular. Opaque part of sheaths not red-dotted or cross-rugulose, but sometimes green-striate. Spikes 2 or 3, up to 20, each with several to many perigynia, the terminal gynaecandrous, the lateral pistillate or gynaecandrous, simple, the inflorescence varying from capitate to moniliform. Lower bracts from inconspicuous to very conspicuous. Perigynium varying from scale-like or flat (except where distended by the achene) to thick and plano-convex, the body subulate to reniform, narrowly to broadly wing-margined, appressed or ascending or spreading, little corky thickened at base, prominently beaked, the beak bidentate or obliquely cut, becoming bidentulate, usually serrulate on the margins. Style-base scarcely thickened. Achene lenticular. Stigmas 2.



28. **C. scoparia** Schk. Culm 1.5–10 dm. tall, slender, roughish above: spikes 3–10, mostly ellipsoid-ovoid, narrowed at both ends, or sometimes truncate above, brownish or straw-colored, 6–16 mm. long, 3–9 mm. wide, aggregated or more or less separate: bracts inconspicuous: scales thin, acute or acuminate, shorter than perigynia: perigynium 4–6.5 mm. long, 1.2–2 mm. wide, appressed, tapering into the serrulate bidentate beak.—Moist soil, various provinces, S. C. to Mo., Colo., Ore., B. C., and Newf.—Sum.

29. **C. tribuloides** Wahl. Culm 3–10 dm. tall, rather stout, or sometimes slender, roughish above: leaf-blades 2.5–12 mm. wide, the sheaths loose: spikes 6–20, aggregated or slightly separate, obovoid or turbinate varying to suborbicular, blunt, 6–12 mm. long, 5–8 mm. wide: perigynium thin, little distended over achene, ascending or erect, 3–5 mm. long, 1–1.5 mm. wide, strongly exceeding the acute lanceolate scale.—Wet meadows, various provinces, Fla. to Tex., Minn., and N. B.—Sum.

30. C. Longii Mackenzie. Culm 3–8 dm. tall, strictly erect, roughish above: leaf-blades 2–4 mm. wide: spikes 3–10, aggregated or lower somewhat separate, 6–12 mm. long, 4–6 mm. wide, silvery-green or in age silvery-brownish, the lateral rounded or little clavate at base: bracts inconspicuous: perigynium appressed, 3–4.5 mm. long, 2 mm. wide, nerved on both faces, firm, the serrulate beak one-third length of body or less: scale nearly equalling perigynium. —Wet, often acid soil, Coastal Plain and adj. provinces, Fla. to Tex. and Mass. —(*W. I., Mex., C. A., S. A.*)—Late spr.–sum.

31. C. straminea Willd. Culm 2.5–9 dm. tall, very slender, roughish above: leaf-blades 2–3 mm. wide: spikes 3–10, aggregated or more or less separate, ovoid, 6–10 mm. long, 4.5–6 mm. wide, rounded at apex, clavate or rounded at base: bracts except lowest inconspicuous: perigynium appressed, green, 3.5 mm. long, 1.5–2 mm. wide, thinnish, many-nerved dorsally, lightly about 7-nerved ventrally, abruptly contracted into a strongly serrulate beak less than half the length of the body, the scale hyaline, greenish-tinged and narrower and shorter than the perigynium. [*C. albolutescens* Schw.]—Acid swampy woods, various provinces, Fla. to Tex., Ind., and N. S.—Late spr.–sum.

32. C. alata Torr. Culm 3–12 dm. tall, rather stout, slightly roughish above: leaf-blades 2–4 mm. wide: spikes 5–8, more or less aggregated, 8–16 mm. long, 6–10 mm. wide, suborbicular and rounded at base or short clavate, rounded or short pointed at apex, whitish-green or in age brownish-green: bracts, except the lowest, inconspicuous: perigynium appressed-ascending, 4–5 mm. long, nerved dorsally, faintly nerved ventrally, abruptly contracted into a strongly serrulate beak ⅓ the length of the body, the scale somewhat shorter and much narrower than the perigynium.—Moist meadows near the coastal salt marshes or in calcareous districts inland, Coastal Plain and adj. provinces, Fla. to Tex., Ind., and N. H.—Spr.–early sum.

33. C. normalis Mackenzie. Culm 3–15 dm. tall, roughened above: spikes 4–10, from aggregated to more or less moniliform, greenish or brownish, 6–9 mm. long, 5–8 mm. wide: bracts except lowest inconspicuous: perigynium ascending, thickish, 1.5–2 mm. wide, few-nerved ventrally, with the serrulate beak less than half the length of the body, longer than the scale. [*C. mirabilis* Dewey.]—Dry woodlands, in neutral or calcareous soils, various provinces, N. C. to Okla., Man., and Que.—Late spr.–sum.

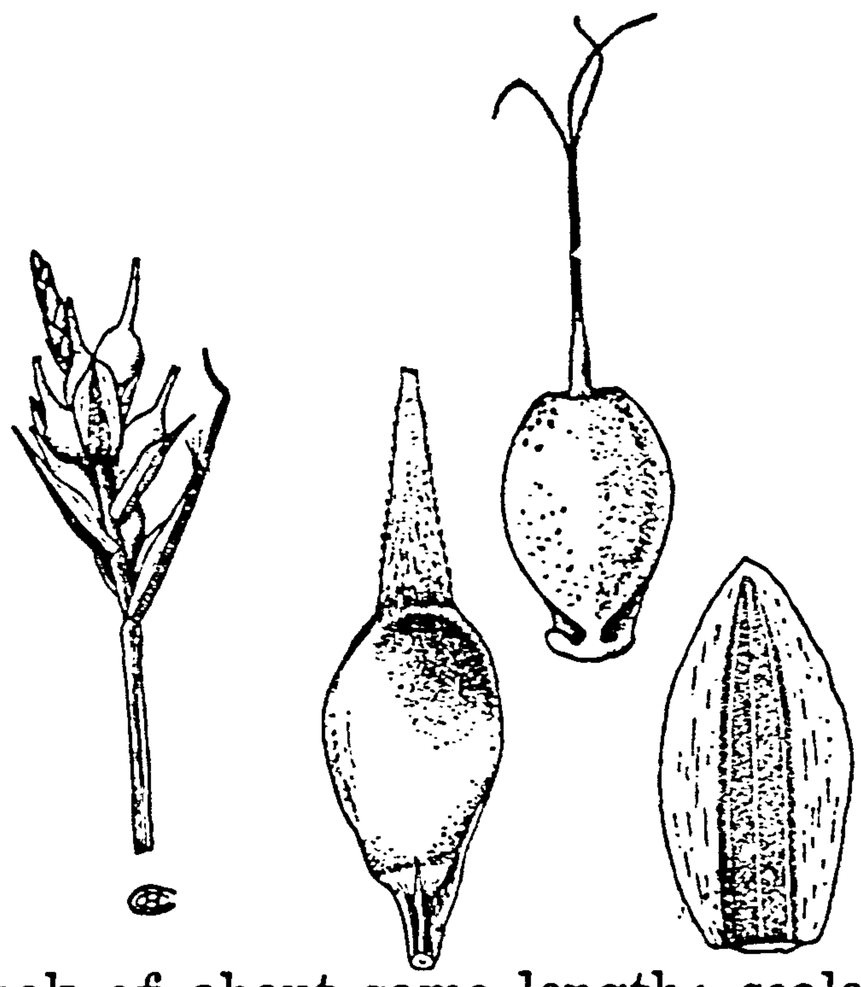
34. C. festucacea Schk. Culm slender, 5–10 dm. tall, roughish above: spikes 4–10, moniliform, 6–16 mm. long, 5–6 mm. wide, rounded at apex: bracts, except lowest, inconspicuous: perigynium 3.5 mm. long, 2 mm. wide, green or in age straw-colored, appressed-ascending, the body thick, orbicular, nerved on both sides, the beak nearly as long, strongly serrulate, exceeding the ovate, acute scale: achene oblong-ovoid, 1.5 mm. long, nearly 1 mm. wide.—Dry soil, various provinces, N. C. to Tenn., La., Ind., and Mass.—Spr.–early sum.

35. C. brevior (Dewey) Mackenzie. Culm rather stout, 3–9 dm. tall, slightly roughish above: leaf-blades 2–4 mm. wide: spikes 3–10, approximate or more or less separate, 7–14 mm. long, 4–9 mm. wide, oblong or suborbicular, rounded or clavate at the base: bracts inconspicuous: perigynium somewhat spreading or ascending, 2.5–3.5 mm. wide, with the serrulate beak ⅓ the length of body, longer and wider than the scale: achene suborbicular, 2.5 mm. long. [*C. festucacea* (Fl. SE. U. S.)]—Dry fields and open places in calcareous or neutral soils, various provinces, Tenn. to Tex., N. M., B. C., and N. B.; rare S.—Sum.

36. C. reniformis (Bailey) Small. Culm 3–9 dm. tall, roughened above: leaf-blades 2–2.5 mm. wide: spikes 3–6, more or less separate, 6–10 mm. long, 5–8 mm. wide, suborbicular, rounded at the base and apex, greenish: bracts inconspicuous: perigynium appressed-ascending, very abruptly beaked, with

the serrulate beak 1.5–2 mm. long, about the length of the scale.—Moist soil, Coastal Plain and occasionally adj. provinces, S. C. to Tex. and Ark.—Spr.

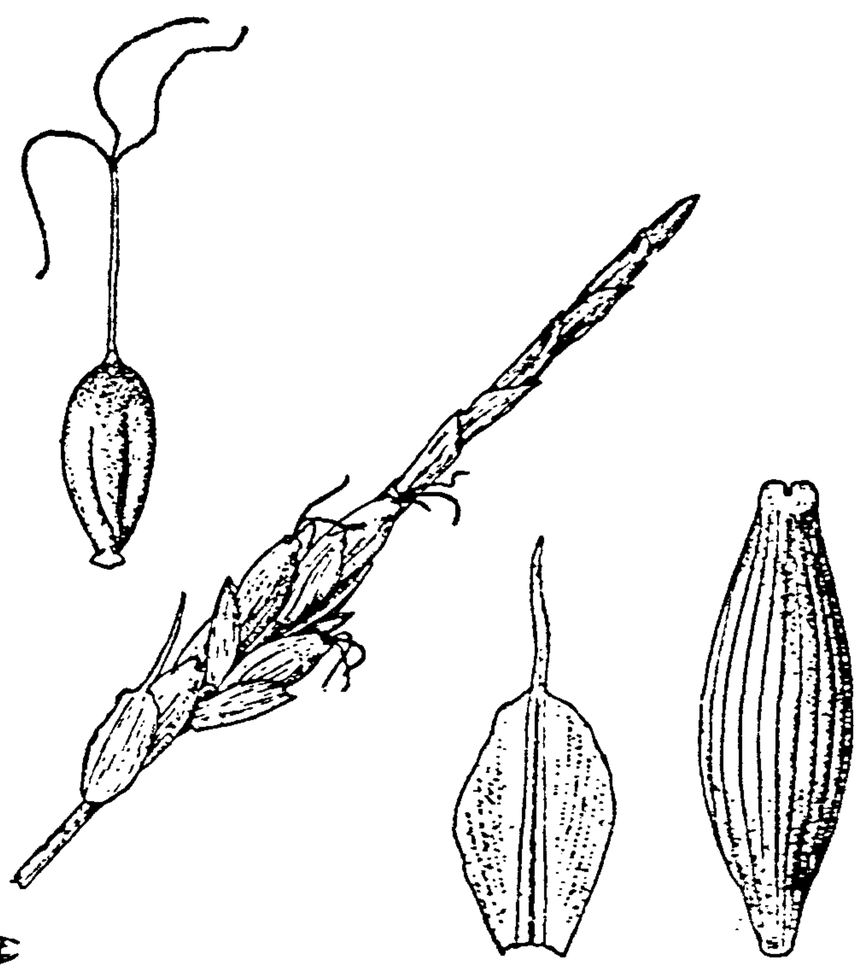
IX. PHYLLOSTACHYAE Tuckerm. Culm densely cespitose, weak, compressed, dilated below the spikes, mostly much exceeded by the leaves. Spikes 2–4, androgynous, the rachis zigzag, dilated; one spike terminal, the others basal on often much elongate peduncles; staminate portion with small tight scales united at base; pistillate portion loosely one–several-flowered, the scales elongate and conspicuous. Perigynium glabrous, 2-keeled, but otherwise nerveless, nearly round in cross-section, more or less beaked, the beak flattened-triangular, the orifice hyaline. Achene closely enveloped, triangular, stipitate, the sides convex, the apex rounded. Stigmas 3, short. Style jointed at the base with achene, soon withering.



37. C. Willdenovii Schk. Culm very short up to 2.5 dm. tall, little serrulate: leaf-blades pale-green, 1.5–4 mm. wide, 1–4 dm. long: spikes 1–5 mostly androgynous, the lowest appearing nearly basal: perigynium with a body 2–3 mm. long, less than 2 mm. thick, narrowed into a flattened 2-edged serrulate beak of about same length: scales acuminate or awned, the lowest commonly bract-like and foliaceous.—Dry woods and thickets, in acid soils, various provinces, Fla. to Tex., Mich., and Mass.—Spr.–early sum.

38. C. Jamesii Schw. Similar to the next preceding species in habit, but the culm very rough above, the leaf-blades rather narrower, soft, much surpassing the spikes: terminal staminate portion of spikes very slender: body of perigynium subglobose, 2 mm. in diameter, contracted at the base, abruptly contracted into a subulate, serrulate beak of more than its own length: lower scales bract-like, foliaceous, the upper sometimes not exceeding the perigynia.—Rich woods, in calcareous districts, various provinces N of Coastal Plain, Tenn. to Okla., Ia., Mich., N. Y., and N. J.—Spr.

X. POLYTRICHOIDEAE Tuckerm. Densely tufted. Culm slender. Leaf-blades narrow. Spike solitary, linear, androgynous, bractless. Rachis straight, not dilated. Perigynium appressed, membranous, with the upper part empty, oblong-elliptic, many-nerved (not 2-ribbed), compressed triangular, beakless. Achene triangular. Style slender, flexuous, its base not enlarged. Stigmas 3, short.



39. C. leptalea Wahl. Culm very slender, smooth, 1.5–6 dm. tall: leaf-blades very narrow: spike narrowly linear, 4–16 mm. long, 2–3 mm. thick: perigynium narrowly oblong, light-green, 2.5–5 mm. long, 1–1.5 mm. thick: lowest scale cuspidate, the upper short acuminate to very obtuse and much shorter than the perigynium. [*C. polytrichoides* Muhl. *C. Harperi* Fernald.]—Acid bogs

and swampy meadows, various provinces, Fla. to Tex., Colo., N Calif., Alas., Lab., and Newf.—Sum.

XI. MONTANAE Fries. Culm slender, leafy at the base. Leaf-blades narrow, rough above. Terminal spike linear, normally staminate. Lateral spikes 1–5, small, pistillate, or sometimes androgynous, subglobose to oblong, closely few–many-flowered, approximate and sessile or short-peduncled, or in some species basal and long-peduncled. Lowest bract squamiform or leaflet-like, sheathless or sub-sheathing. Scales often reddish-brown-tinged, acute to cuspidate. Perigynium membranous, ascending, the body pubescent, at least at the base of the beak, obovoid to elliptic, triangular, 2-keeled, strongly stipitate at the base, abruptly contracted into a cylindric or terete, emarginate to deeply bidentate beak, hyaline-tipped. Achene normally triangular, the sides concave, closely enveloped, short-apiculate. Style short, jointed with apex of achene, thickish. Stigmas normally 3, long.

40. C. communis Bailey. Loosely cespitose: culm 1.5–5 dm. tall, roughish above: leaf-blades 2–4 mm. wide, shorter than culm: staminate spike 4–18 mm. long: pistillate spikes 2–4, short-oblong, 3–10-flowered, usually separated, sessile or short-stalked: perigynium obovoid, the body 2–2.5 mm. long, and 1.2 mm. thick. pale, the beak ¼ of its length: scales acuminate to obtuse, nearly equalling the perigynia.—Rocky woods, various provinces N of Coastal Plain, Ga. to Ky., Minn., and N. S.—Late spr.–sum.

41. C. pennsylvanica Lam. Strongly long-stoloniferous: culm slender but strict, 0.5–4 dm. tall: leaf-blades 1.5–3 mm. wide: pistillate spikes 1–4, short-oblong, 4–20-flowered, contiguous or somewhat separate, sessile or short-peduncled: perigynium with body round-triangular in cross-section, 1.5 mm. thick, tipped with a bidentate beak much shorter than the body: scales acute or cuspidate, equalling or exceeding the perigynia.—Dry, often acid, soil, various provinces, S. C. to Tenn., N. D., and N. B.—Spr.

42. C. lucorum Willd. Strongly long stoloniferous: culm slender, 1–3 dm. tall: leaf-blades 1.5–2.5 mm. wide: pistillate spikes 2–3, suborbicular or short-oblong, 4–10-flowered, contiguous, sessile or short-peduncled: perigynium with body obtusely triangular in cross-section, 1.5 mm. thick, tipped with a slender bidentate beak as long or longer than the body: scales acute to long-acuminate, exceeding the perigynia.—Dry woodlands, acid soils, Blue Ridge and more northern provinces, N. C. to Wis. and Me.—Spr.—In our region only in the mountains.

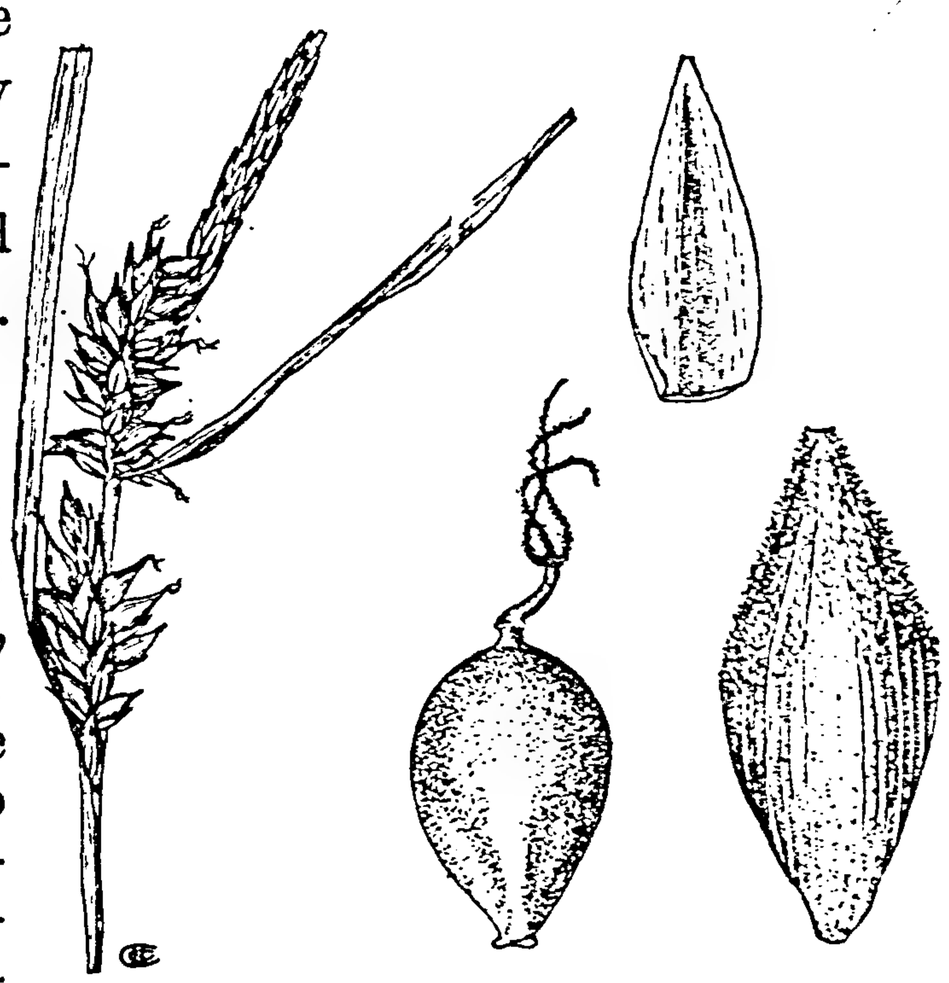
43. C. varia Muhl. Cespitose: culm slender, erect, 0.5–5 dm. tall, rough above, usually exceeding leaves: leaf-blades 0.5–2.5 mm. wide: staminate spike 3–14 mm. long, sessile or slightly peduncled, rather conspicuous: pistillate spikes 1–4, the upper approximate, the lower separate, 4–12-flowered: perigynium sparingly short-pubescent, 3–3.5 mm. long, the body ellipsoid-ovoid, 1–1.5 mm. thick, the beak about half length of body, bidentate: scales purplish-tinged, about equalling perigynia.—Dry soils, various provinces, N. C. to Tenn., Man., and N. S.—Spr.

44. C. physorhyncha Liebm. Freely stoloniferous, the slender stolons often 8 cm. long, very conspicuous: culm slender, 1.5–3.5 dm. tall, reddened and fibrillose at base, exceeding the leaves: leaf-blades 1.75–2.75 mm. wide: lowest bract not sheathing, from much shorter than to exceeding the inflorescence: staminate spike sessile, 5–8 mm. long, 2 mm. wide: pistillate spikes 3–4, sessile and approximate, or the lowest somewhat remote and short-peduncled: scales ovate, acute to short-cuspidate, more or less purplish-tinged: perigynium 2.5–3 mm. long, more than 1 mm. thick, abruptly strongly stipitate, puberulent, abruptly contracted into a shallowly bidentate beak half its length. [*C. varia australis* Bailey.]—Dry soil, Coastal Plain, Ala. to Tex., Ark., and S. C.—(*Mex.*)—Spr.–early sum.

45. C. nigro-marginata Schw. Cespitose: culm 2–10 cm. tall, rough: leaf-blades 2–4 mm. wide: staminate spike sessile, 5–8 mm. long, usually 2–4 mm. wide: pistillate spikes 2–3, sessile, erect, contiguous or slightly separate, 4–7 mm. long, 3–5 mm. wide: scales about about length of perigynia, ovate, usually conspicuously dark-margined: perigynium 3–4 mm. long, puberulent, the beak 1 mm. long, bidentate.—Dry woods, in acid soils, Coastal Plain and adj. provinces, Ala. to La., SE Mo., and Conn.—Spr.

46. C. floridana Schw. Long stoloniferous: culm from very short to 2 dm. tall, roughened: leaf-blades 1–2 mm. wide: staminate spike inconspicuous, sessile, 3–5 mm. long, 0.75 mm. wide: pistillate spikes 2, closely contiguous, sessile, 4–8 mm. long, 2.5–4 mm. wide; scales shorter than the perigynia, little or not at all dark-margined: perigynium 3.25 mm. long, puberulent, the beak 0.75 mm. long, nearly entire.—Dry woods, Coastal Plain and occasionally adj. provinces, Fla. to Tex. and Ga.—Spr.

XII. TRIQUETRAE Carey. Cespitose, leafy towards the base. Leaf-blades narrow, the sheaths not purplish-tinged. Terminal spike linear, staminate. Lateral spikes 2–4, approximate or separate, or sometimes radical, 5–30-flowered in few ranks, the peduncles included or exserted. Bracts sheathing, not purplish-tinged, the lowest with a well-developed blade. Pistillate scales greenish or hyaline, or reddish-brown-tinged. Perigynium membranaceous, ascending, obovoid, short-pubescent or puberulent, triangular, tapering and stipitate at base, abruptly contracted into the minute beak, the orifice obliquely cut, minutely bidentate. Achene triangular, closely enveloped. Style very short, thickish, jointed with the apex of the achene, withering. Stigmas 3, early deciduous.

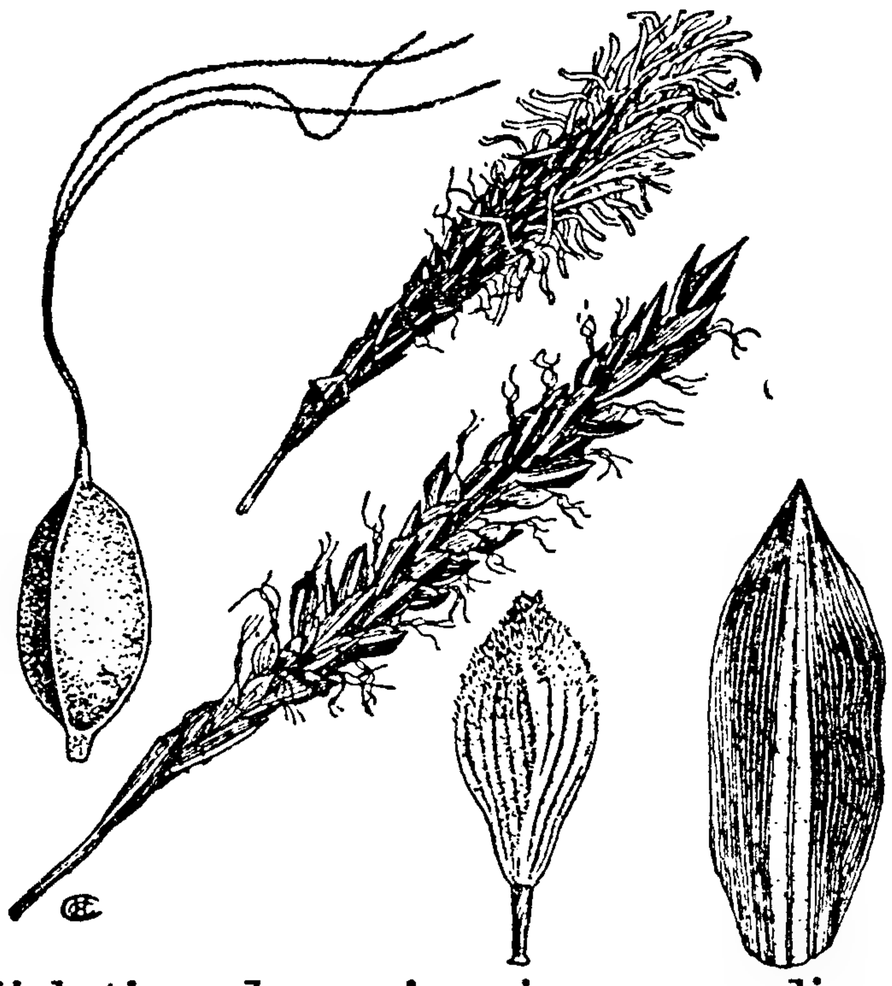


47. C. validior Mackenzie. Rootstock short: culm 2.5–3.5 dm. tall, stiff, roughened above: leaf-blades 1.5–2.5 mm. wide, canaliculate, often stiffly spreading, hispidulous at base: staminate spike 1–3 cm. long: pistillate spikes 1–3, approximate, suborbicular to short-oblong, 5–18 mm. long, closely 3–20-flowered: scales half length of the mature perigynia, ovate, acute to short-cuspidate: perigynium 4.5 mm. long, sharply triangular, the beak 0.5 mm. long, emarginate. [*C. Chapmanii* Sartw. Not Steud.]—Dry ridges, in acid soils, Coastal Plain and adj. provinces, Fla. to Miss. and S. C.—Spr.–early sum.

48. C. dasycarpa Muhl. Rootstock short creeping: culm 1.5–4 dm. tall, slender, minutely pubescent: leaf-blades 2–4.5 mm. wide, flat or nearly so, the

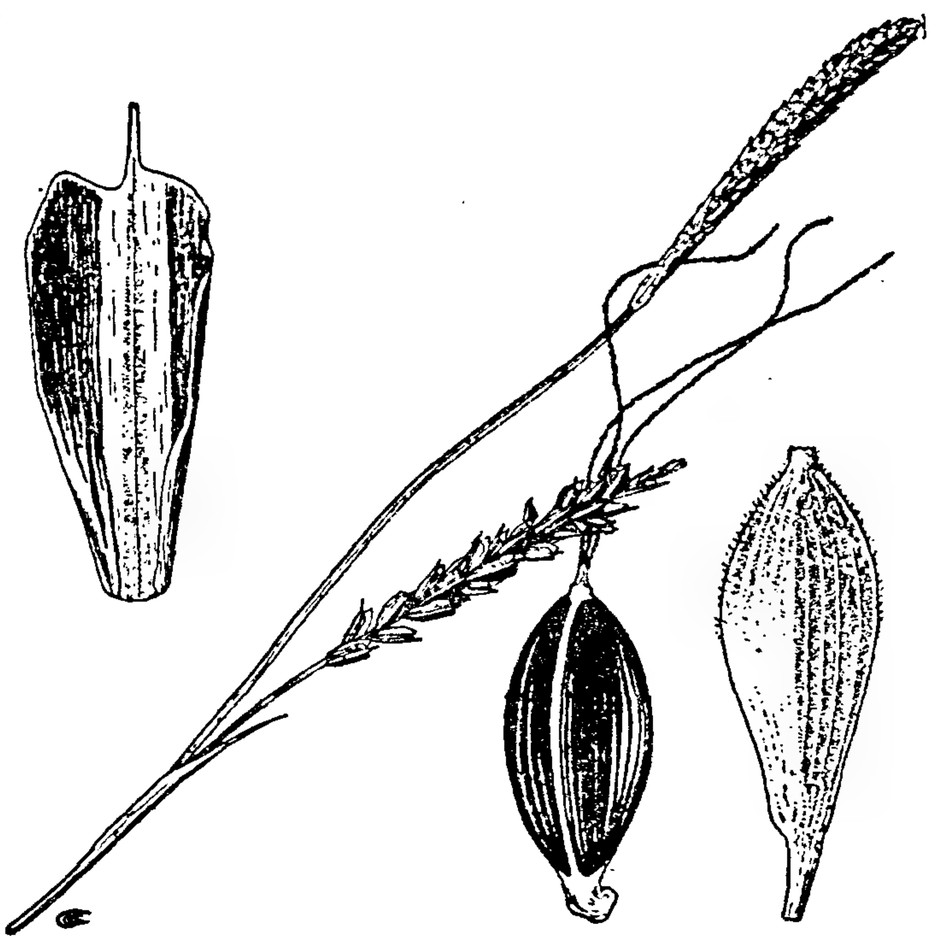
lower at least pubescent: staminate spike 1–2 cm. long: pistillate spikes 1–4, approximate or but little separate, oblong, 6–20 mm. long, closely 5–25-flowered: scales less than half length of the mature perigynia, ovate, acute to short-cuspidate: perigynium 4.5–6 mm. long, sharply triangular, strongly soft-villous towards the apex and less so below, the beak 0.5 mm. long, emarginate.—Sandy woods, in acid soils, Coastal Plain, Fla. to Miss. and S. C.—Spr.–early sum.

XIII. PICTAE Kükenth. Culm lateral. Leaf-blades flat. Spike one, pistillate or staminate, linear-cylindric, densely many-flowered, long-peduncled, the bract sometimes present or more often the culm with one to several colored bract-like sheaths towards the base. Scales scarcely ciliate, short-cusped. Perigynium appressed, narrowly obovoid, many-nerved, strongly stipitate, flattened-triangular, short-pubescent, obtuse, beakless, thickish, closely enveloping achene. Achene triangular. Style slender, long-exserted, little enlarged at base. Stigmas 3.



49. C. picta Steud. Rootstock thick, creeping: culm 1–2.5 dm. tall, usually fibrillose at the base: leaf-blades 2–4.5 mm. wide: staminate spikes 2–5 cm. long: pistillate spike 4–6 cm. long, 3–6 mm. wide, bractless, the scales obovate-oblong, obtuse to cuspidate, concealing the numerous perigynia, purplish-tinged: perigynium ascending, oblong-obovoid, triangular, many-striate, 4–5 mm. long, 1.5 mm. wide, tapering at the base and stipitate, short-tapering to the pointed but beakless apex.—Coastal Plain, near New Orleans, La.; also Interior Low Plateaus, NW Ala. to C Ind.—Spr. and early sum.—Grows in circular colonies. Known only from a few, mostly, widely separated stations. Very local in dry woods and neutral soils.

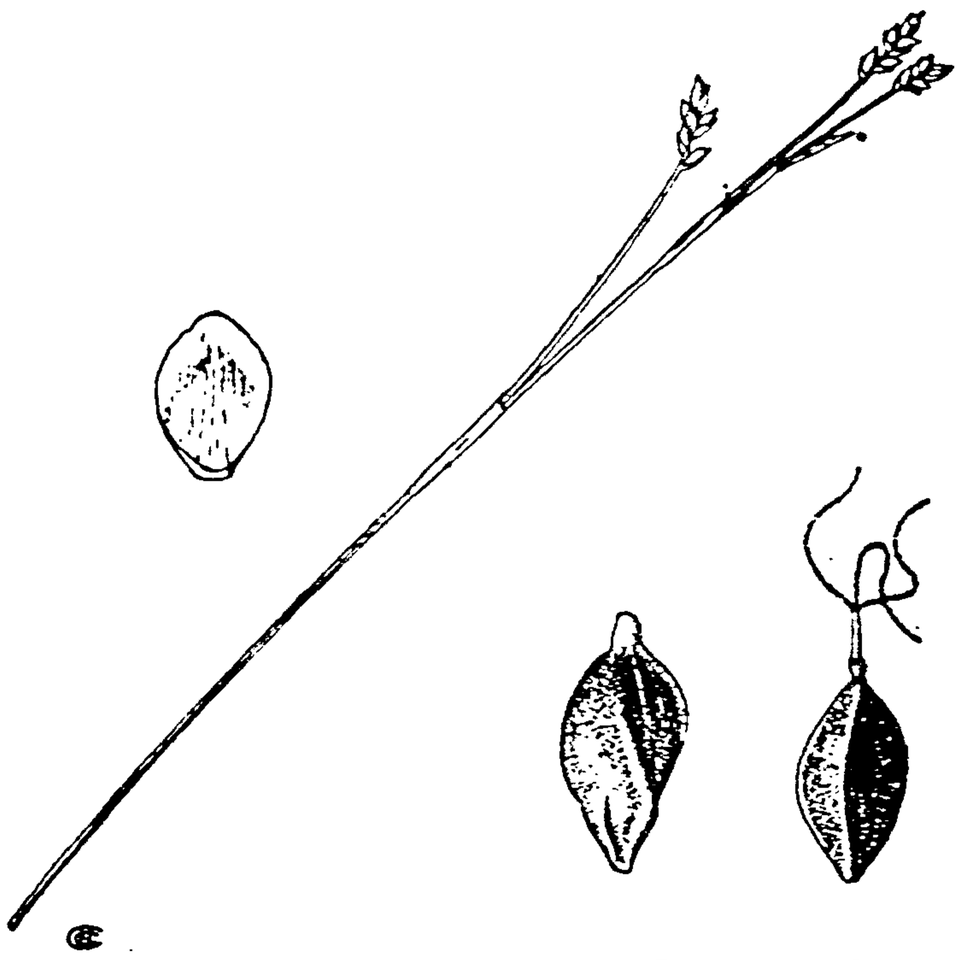
XIV. DIGITATAE Fries. Culm slender, leafy at the base. Leaf-blades narrow, the sheaths usually strongly purplish. Terminal spike linear, staminate. Lateral spikes 1–5, approximate, or separated or sometimes basal, oblong to linear, 5–20-flowered in few rows, the peduncles included or exserted. Bracts sheathing, more or less strongly purplish-tinged, subspathaceous, the blade absent or rudimentary. Pistillate scales strongly purplish or reddish-brown-tinged. Perigynium membranous, appressed, oblong-obovoid, pubescent to glabrate, triangular, long tapering into the stipitate base, abruptly contracted into the minute beak, the orifice entire or nearly so. Achene triangular, closely enveloped. Style-base short, thickened, jointed with the apex of the achene. Stigmas 3, early deciduous.



50. C. Baltzellii Chapm. Rootstock thick, creeping: culm 1.5–3 dm. tall, nearly smooth, fibrillose at base: leaf-blades 4–8 mm. wide, much exceeding the culm: staminate spike 1.5–2.5 cm. long, long-peduncled, the pistillate spikes one at the top and several at the base of the culm, long-peduncled, 1.5–3.5 cm. long, 4–6 mm. wide: peri-

gynium 5–15, ascending, oblong-obovoid, triangular, many-striate, 4–5 mm. long, 1.5 mm. thick, tapering and stipitate at base, abruptly minutely beaked, about equalling the oblong-obovate, abruptly mucronate, brownish-purple-tinged scales.—Sandy ravines, Gadsden Co., Fla. and SW Ga.—Spr.—A very well-marked species which has not been collected for many years.

XV. ALBAE Aschers. & Graebn. Slenderly long-stoloniferous. Culm very slender, obtusely triangular, leafy near the base. Leaf-blades of the fertile culm very narrow, involute. Terminal spike linear, staminate. Lateral spikes 2 or 3, (or 4), oblong or linear, loosely 4–8-flowered, all long-peduncled, linear or oblong, often overtopping the staminate one. Bracts sheathing, subspathaceous, bladeless, white-hyaline above. Scales white-hyaline, yellowish-tinged. Perigynium erect, obovoid, triangular, glabrous, nerved, tapering at the base, abruptly minutely beaked, the orifice entire, hyaline. Achene triangular, closely enveloped, the sides concave. Style-base very short, bulbous-thickened, jointed with the achene. Stigmas 3, long.



51. C. eburnea Boott. Culm 1–3.5 dm. tall, slender, smooth: leaf-blades 0.5 mm. wide: staminate spike 4–8 mm. long, sessile or nearly so: pistillate spikes 2–4 usually 2, 2–6-flowered, exsert-peduncled, the upper overtopping the staminate spike: scales exceeded by perigynia, whitish, obtuse or acutish: perigynium elliptic-obovoid, membranous, 2 mm. long, obscurely nerved, tapering at base, abruptly very short-beaked.—Calcareous ledges, talus-slopes, and gravel, various provinces N of Coastal Plain, Va. and Tenn. to Nebr., B. C., Mackenzie, and Newf.—Spr.–early sum.—In our area in cool shaded situations.

XVI. PANICEAE Tuckerm. Stoloniferous. Culm central, slender, leafy towards the base. Basal sheaths brownish or purplish-tinged. Terminal spike staminate, linear or linear-oblong. Lateral spikes 1–5, pistillate, loosely to rather closely several–many-flowered, in few or several ranks, on erect, exserted or included peduncles. Bracts sheathing, not colored or dark-auricled, the blades developed. Scales purplish or reddish-brown-tinged. Perigynium ascending or spreading, ovoid or obovoid, membranous, obtusely triangular, slightly inflated, glabrous, puncticulate, light- or olive-green, pointed or beaked, the orifice entire or nearly so. Achene triangular. Style-base slender, jointed with achene. Stigmas 3.

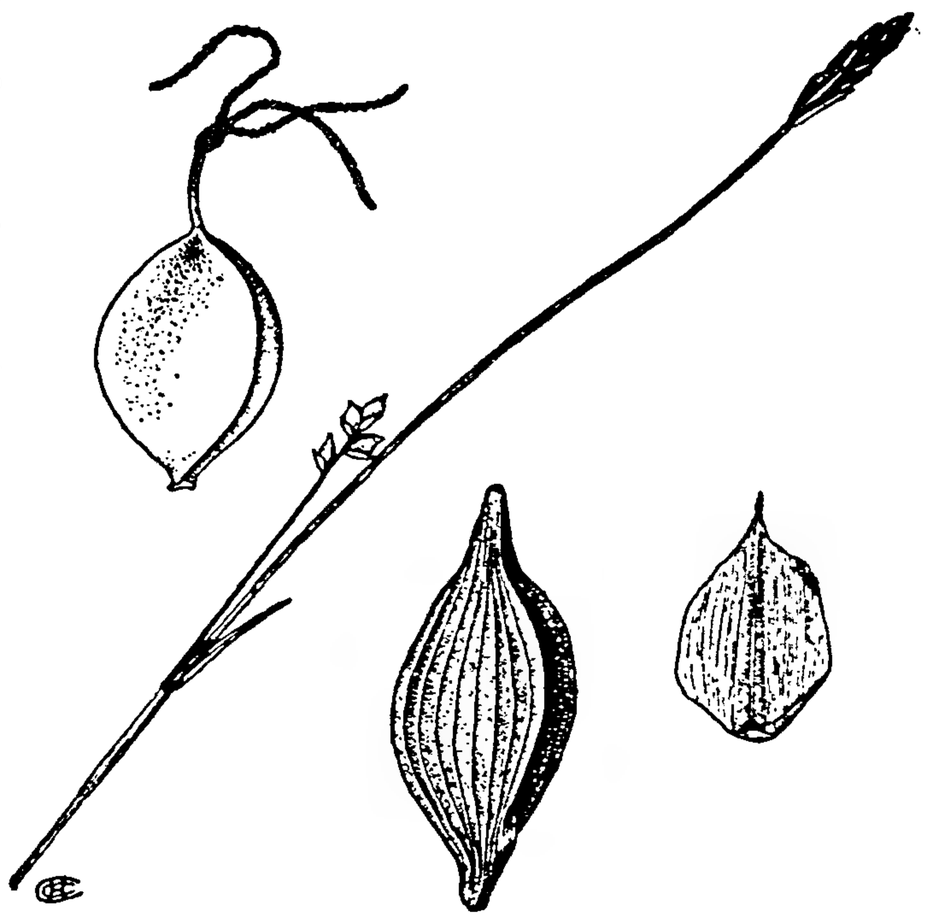
52. C. Meadii Dewey. Rootstock deep-seated, white, slender: culm phyllopodic, stoutish, 2–5 dm. high, not or but little purplish-tinged at the base: leaf-blades 2.5–7 mm. wide: staminate spike 1.5–4 cm. long, the peduncle long, rough: pistillate spikes 1–3, oblong or linear-oblong, 1–3.5 cm. long, 5–7 mm. wide: scales ovate, obtuse to cuspidate: perigynium obovoid,

3–5 mm. long, 1.75–2.5 mm. wide, strongly nerved, tapering to the base, abruptly minutely beaked.—Open places, meadows and prairies, in calcareous districts, various provinces, Ga. to Tex., Sask., Mich., and W N. J.—Spr.–early sum.

53. C. biltmoreana Mackenzie. Rootstock stout, interwoven: culm strongly purplish-tinged at base, 3–7 dm. tall, 3–4 mm. thick at the base, aphyllopodic: leaf-blades 3.5–5 mm. wide: bract-sheaths 5–30 mm. long: staminate spike strongly rough-peduncled: pistillate spikes 1–3, erect, distant, usually strongly peduncled, 1.5–3.5 cm. long, loosely or somewhat closely flowered above: scales ovate, obtuse to cuspidate, usually purplish–brown-tinged: perigynium obovoid, many-nerved, 2.5–3.5 mm. long, abruptly rounded at apex and minutely beaked or beakless, the orifice entire. [*C. tetanica* (Fl. SE. U. S.) not Schk.]—Rocky soil, Blue Ridge, N. C.—Spr.

54. C. Chapmanii Steud. Cespitose, the clumps small, sending forth long horizontal stolons: culm 1–3 dm. high, not winged or serrulate: sterile shoots elongate: leaf-blades light-green, 2.5–5 mm. wide: staminate spike short-peduncled, 7–20 mm. long: pistillate spikes 2–4, rather closely 8–18 flowered, the lowermost widely separate, more or less strongly exsert-peduncled: bract-sheaths sparingly retrorsely serrulate at mouth: scales mucronate or cuspidate, usually markedly exceeded by the perigynia: perigynium obovoid-fusiform, obtusely triangular, 4.5 mm. long, subcoriaceous, tapering into the conspicuous, straight or excurved beak. [*C. fusiformis* Chapm.]—Hammocks and woodlands, Fla.—Spr.

XVII. LAXIFLORAE Kunth. Cespitose. Fertile culm mostly lateral, the sterile shoots leafy, conspicuous. Basal sheaths brownish- or purplish-tinged. Terminal spike staminate, linear. Lateral spikes 2–5, pistillate or androgynous, loosely to closely few–many-flowered, in few–several ranks, on erect to drooping, included or exserted, peduncles. Bracts sheathing, the sheaths green or purplish-tinged, the blades leaf-like or sometimes reduced. Scales green with hyaline margins or more or less colored. Perigynium ascending, membranous, triangular, usually nerved, closely enveloping the achene, glabrous or hispidulous, tapering at the base, short-beaked or beakless, the orifice entire. Achene triangular. Style-base slender, jointed with the achene. Stigmas 3.



55. C. austro-caroliniana Bailey. Culm 2–4.5 dm. tall, weak, nearly smooth: leaf-blades 3–6 mm. wide, those of the sterile shoots 3–3.5 dm. long: staminate spike long-peduncled, 1–2 cm. long: pistillate spikes about 3, widely separated, capillary-peduncled, 2–6-flowered: scales ovate-orbicular, obtuse to cuspidate: perigynium broadly ovoid, triangular, minutely hispidulous, finely many-nerved, 2.5–3.75 mm. long, tapering at the base and apex, short-beaked.—Mountain gorges, Blue Ridge and adj. provinces, S. C. to Tenn. and N. C.—Spr.—A very rarely collected species, but a handsome plant.

56. C. plantaginea Lam. Culm 2.5–6 dm. tall, erect or reclining, smooth: leaf-blades 10–25 mm. wide, those of the sterile shoots 1.5–3.5 dm. long: staminate spike long-peduncled, 1–2 cm. long: pistillate spikes 3–4, widely separated,

4–12-flowered on erect peduncles: scales broadly ovate, acuminate or cuspidate: perigynium ovoid-elliptic, triangular, minutely hispidulous, finely many-nerved, 4–5 mm. long, tapering at base, abruptly beaked, the beak 1 mm. long.—(PLANTAIN-LEAF SEDGE.)—Woodlands, in calcareous districts, apparently avoiding strongly magnesian rocks, various provinces, N. C. to Ill., Sask., and N. B.—Spr.

57. **C. purpurifera** Mackenzie. Culm 2–4 dm. high, weak, not flattened in drying, the angles papillose: leaf-blades 3–8 mm. wide: staminate spike long-peduncled, 2–3 cm. long: pistillate spikes 2–3, the lower strongly exsert-peduncled, widely separate, very loosely alternately 7–15-flowered: scales obovate, the midvein excurrent as an awn: perigynium oblong-obovoid, 3.75–4.25 mm. long, many-nerved, tapering into the straight or somewhat excurved short beak.—Open dry rich woodlands, in calcareous soil, Appalachian Valley, Morley, Campbell County, Tenn.—Sum.

58. **C. platyphylla** Carey. Culm 1.5–3 dm. tall, slender, not winged, strongly lateral, cinnamon-brown at base: sterile shoots mostly reduced to tufts of leaves: leaf-blades glaucous, 9–25 mm. wide: staminate spike more or less peduncled, 8–15 mm. long: pistillate spikes 2–4, widely separated, the lower short-peduncled, 4–10-flowered: scales short-awned to acuminate, exceeded by perigynia: perigynium obovoid, 2.5–3.5 mm. long, finely many-nerved.—Dry wooded slopes, often in loose shale, various provinces, N. C. to Ill., Mich., and Que.—Spr.–early sum.

59. **C. abscondita** Mackenzie. Culm 0.5–2 dm. tall, slender, smooth: leaf-blades 4–9 mm. wide: staminate spike 4–9 mm. long: pistillate spikes 2 or 3, approximate and short-peduncled or lowest remote and long-peduncled, all loosely 3–10-flowered: scales ovate, half the length of the perigynia, obtuse to short cuspidate: perigynium oblong-obovoid, 2.5–3.5 mm. long, the sides 1.5 mm. wide, finely many-nerved, tapering at the base and apex, short-beaked. [*C. ptychocarpa* Steud. *C. laxiculmis floridana* Bailey.]—Woodlands, in acid soils, Coastal Plain and occasionally adj. provinces, Fla. to La., Ind., N. J., and Mass.—Sum.

60. **C. magnifolia** Mackenzie. Culm smooth, slender, 1–2 dm. high, much shorter than the leaves: leaves glaucous; blades 5–8 mm. wide, 1.5–3.5 dm. long, numerous and very conspicuous: lower bracts foliaceous: staminate spike sessile or nearly so, about 1 cm. long: pistillate spikes usually 3, erect, the lowest long-peduncled, nearly basal, the upper two and the staminate contiguous, loosely 5–14-flowered: scales ovate, obtuse or acutish, about ¼ the length of the perigynia: perigynium broadly fusiform, acutely triangular, 4–4.5 mm. long, the sides 2 mm. wide, finely many-nerved, the nearly straight beak 1 mm. long, with entire orifice. [*C. digitalis glauca* Chapm.]—In shaded moist woodlands, in acid soils, Fla.—Spr.

61. **C. digitalis** Willd. Culm 1–5 dm. tall, slender, smooth: leaf-blades bright-green: staminate spike 1–2 cm. long: pistillate spikes 2–4, widely separated, the upper short- and the lower long-peduncled, loosely 3–12-flowered: second bract usually exceeding the culm: scales ovate-lanceolate, rather shorter than perigynia, acute to short cuspidate: perigynium oblong-ovoid, 2.5–4 mm. long, the sides 1.5 mm. wide, finely many-nerved, tapering at the base and apex, short-pointed.—Woods and thickets, in acid or neutral soils, various provinces, Fla. to Tex., Minn., and Me.—Spr.–early sum.

62. **C. laxiculmis** Schw. Culm 1.5–6 dm. tall, weak, smooth: leaf-blades glaucous-green: staminate spike 8–20 mm. long: pistillate spikes 2–4, widely sepa-

rated, the upper short-peduncled and erect, the lower drooping on filiform peduncles, rather loosely 5–10-flowered: second bract usually shorter than culm: scales ovate, shorter than perigynia, acute to cuspidate: perigynium oblong-obovoid, 3–4 mm. long, the sides 1.75–2.25 mm. wide, finely many-nerved, tapering at base and very short-beaked at apex.—Woods and thickets, in acid or neutral soils, various provinces, rarely Coastal Plain, N. C. to Mo., Wis., and Me.—Spr.

63. C. albursina Sheldon. Culm 2–6 dm. tall, strongly flattened in drying, narrowly winged, roughened: leaf-blades 7–30 mm. wide: staminate spike sessile or nearly so, 5–17 mm. long, the scales very obtuse: pistillate spikes 2–4, linear, the upper closely approximate and scarcely exsert-peduncled, the lower distant and slender-peduncled, loosely 3–18-flowered: scales strongly scarious-margined: perigynium ascending, obovoid, 3–4 mm. long, 2 mm. wide, finely many-nerved.—Wooded calcareous bluffs, various provinces N of Coastal Plain, Va. and Tenn. to Mo., Minn., and Que.—Spr.

64. C. heterosperma Wahl. Densely cespitose: culm lateral, 1.5–4 dm. tall, flattened in drying, weak: leaf-blades 5–20 mm. wide, soft, the basal rarely more than 3 dm. long, their sides not strongly parallel: staminate spike sessile or short- or occasionally long-peduncled: pistillate spikes 3–4, narrowly linear, 1.5–4.5 cm. long, 2–3 mm. wide, loosely-flowered, erect, the lower distant and long-peduncled: scales ovate, acuminate or short-cuspidate: perigynium narrowly obovoid, 3–4.25 mm. long. [*C. anceps* Muhl.]—Dry woods, in acid or neutral soils, Blue Ridge, N. C. to Tenn., and various provinces, Va. to Mich. and Me.—Spr.—In the mountains in our range.

65. C. laxiflora Lam. Loosely cespitose: culm 2–6 dm. tall, slender, lateral and central: leaf-blades 7–14 mm. wide, firm, the lcnger basal ones more than 3 dm. long with sides strongly parallel: staminate spike usually long-stalked, its scales often reddish-brown-tinged: pistillate spikes usually 2, linear-oblong, 1.5–5 cm. long, 6–20-flowered: scales ovate, short-cuspidate, slightly reddish-brown tinged: perigynium obovoid-fusiform, 4–5 mm. long. [*C. striatula* Michx.]—Dry woodlands, in acid soils, Coastal Plain and adj. provinces, Fla. to Tex., Ind., and Conn.—Spr.–early sum.

66. C. styloflexa Buckley. Culm 2–8 dm. tall, slender, smooth, brownish at the base, loosely cespitose: leaf-blades 2.5–3.5 mm. wide: staminate spike mostly long-stalked, its scales usually reddish-brown-tinged: pistillate spikes 1–4, 1–2 cm. long, loosely 4–15-flowered, the lower drooping on elongate filiform peduncles: scales ovate, acute or cuspidate, reddish-brown-tinged: perigynium 4–5 mm. long, 1.5–2 mm. thick, divergent, tapering at both ends.—Dry woodlands, in acid soils, Coastal Plain and occasionally adj. provinces, Fla. to Tex. and Conn.—Spr.–early sum.

67. C. crebriflora Wiegand. Loosely cespitose: culm 2–6 dm. tall, stoutish, slightly winged, brownish at base, both lateral and central: leaf-blades green, 3–8 mm. wide: staminate spike 1–2.5 cm. long, sessile or short-peduncled: pistillate spikes 2 or 3, closely 10–20-flowered, the lowermost strongly separate, and long-peduncled: scales oblong-obovate, obtuse to cuspidate, half the length of the perigynia: perigynium elliptic-obovoid, 3.5–4.5 mm. long, subcoriaceous, many-nerved.—Woodlands, in acid soils, Coastal Plain, Fla. to La. and S. C.—Spr.

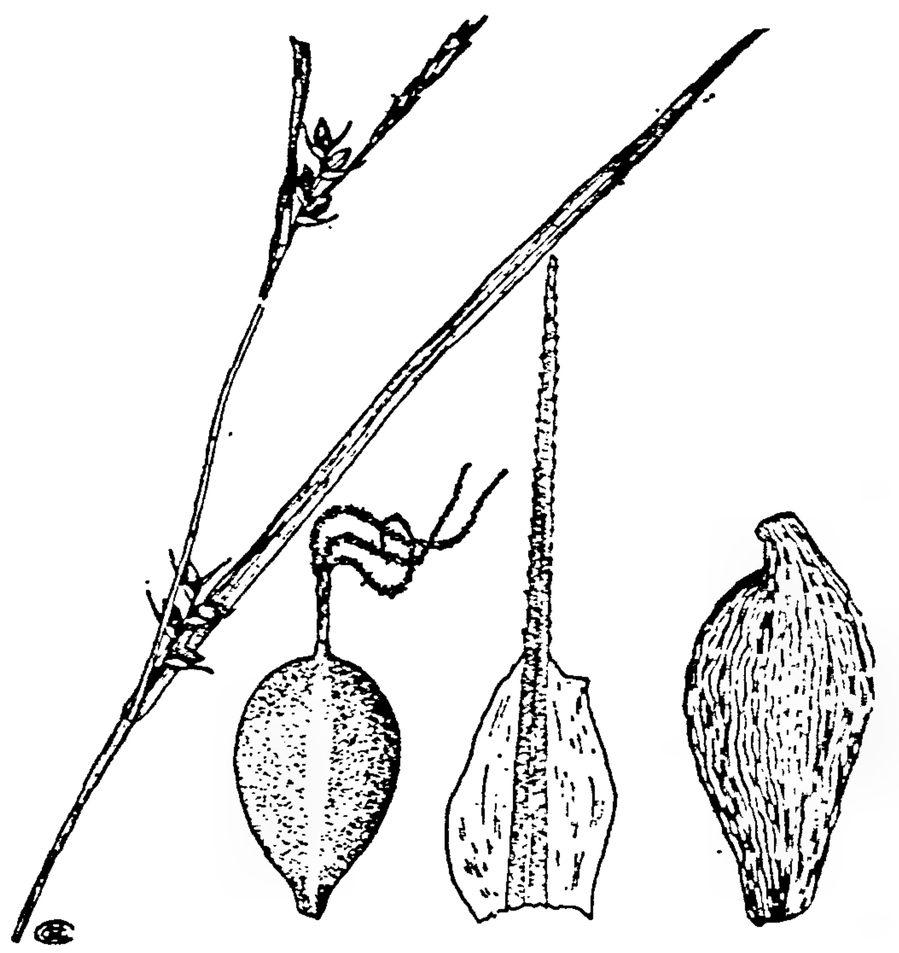
68. C. leptonervia Fernald. Culm 1.5–7 dm. tall, slender, becoming decumbent, the sterile shoots well-developed: leaf-blades 3–10 mm. wide, their sheaths

tight: bract-sheaths strongly retrorsely serrulate at the mouth: staminate spike sessile or nearly so: pistillate spikes 2–4, linear-oblong, 1–3 cm. long, rather loosely 10–20-flowered, the upper contiguous, the lower widely separate: scales obtuse to acuminate, greenish: perigynium 3.5–4.5 mm. long, obovoid-elliptic, nerveless or nearly so, straight-beaked, rather sharply angled above.—Damp woodlands, in acid soils, Blue Ridge and more northern provinces, N. C. to Mich., Newf., and N N. J.—Spr.—A widely distributed northern species reaching our area in the higher mountains only.

69. **C. blanda** Dewey. Culm 1–6 dm. tall, thick but weak, flattened in drying, serrulate, slightly winged above: leaf-blades 3.5–15 mm. wide, soft, the sheaths very loose with much crinkled margins: staminate spike sessile or short-peduncled or rarely even long-peduncled: pistillate spikes 2–5, oblong or linear-oblong, 0.5–3 cm. long, 3.5–5 mm. wide, closely 8–25-flowered, erect, closely contiguous or lower widely separate: scales ovate, the lower at least strongly awned: perigynium obovoid, 3–4 mm. long.—Dry woodlands, in calcareous or neutral soils, various provinces, Fla. to Tex., N. D., and Me.—Spr.–sum.—One of the most widely distributed and abundant species in the E U. S.

70. **C. gracilescens** Steud. Culm 1.5–6 dm. tall, slender, erect, scarcely winged, serrulate above, not flattened in drying: leaf-blades 3–7 mm. wide, their sheaths tight, with margins little crinkled: staminate spike usually long-stalked: pistillate spikes 2–4, linear-cylindric, 7–30 mm. long, 3–4 mm. thick, loosely 7–20-flowered, widely separate, the lower long-peduncled: scales ovate to broadly obovate, the lower at least strongly awned, usually much shorter than the perigynia and reddish-brown-tinged: perigynium 2.5–3.5 mm. long, the beak conspicuous, strongly bent. [*C. laxiflora* (Fl. SE. U. S.) not Lam.]—The more open parts of woodlands, mostly in neutral soils, various provinces, rarely Coastal Plain, Tenn. to Ark., Mich., and E Que.—Spr.–early sum.

XVIII. Oligocarpae Carey. Culm slender, central, leafy. Leaf-blades flat. Basal sheaths brownish or purplish. Terminal spike staminate, linear. Lateral spikes 2–4, pistillate, few–many-flowered in few-several ranks, erect, on more or less strongly exserted peduncles. Bracts sheathing, not colored or dark-auricled, the blades leaf-like. Scales ovate, pointed. Perigynium ascending, oblong-elliptic or obovoid, glabrous, subcoriaceous, finely many-striate, obtusely triangular in cross-section, tapering at base, constricted at apex, closely enveloping the achene, beakless or slightly beaked, the orifice entire. Achene triangular, apiculate, jointed with the slender style. Stigmas 3.



71. **C. oligocarpa** Schk. Culm 1–5 dm. tall, roughened, purplish-tinged at the base: leaf-blades 2–4.5 mm. wide, the sheaths not hispidulous: staminate spike 1–2.5 cm. long, more or less peduncled: pistillate spikes 2–4, erect, widely separated, loosely 2–8-flowered: scales ovate, strongly cuspidate: perigynium ascending, 3.5–4 mm. long, scarcely 2 mm. wide, the body obovoid, obtusely triangular, abruptly contracted into a straight beak 0.75 mm. long.—Slopes and rocky banks

in rich woods in calcareous regions, various provinces, rarely Coastal Plain, Fla. to Tex., Ia., Mich., and Vt.—Spr.–early sum.

XIX. GRANULARES Bailey. Culm central, slender, leafy. Leaf-blades flat. Basal sheaths brownish. Terminal spike staminate, linear. Lateral spikes 2–4, pistillate, closely many-flowered, in several ranks, erect on more or less strongly exserted peduncles. Bracts sheathing, not colored or dark-auricled, the blades leaf-like. Scales ovate, pointed, slightly ferruginous. Perigynium ascending, elliptic to ovoid, membranous, glabrous, with many elevated nerves, suborbicular in cross-section, loosely enveloping the achene, rounded at the base, short tapering and minutely beaked, the orifice entire or sub-emarginate. Achene triangular, strongly apiculate, jointed with the slender style. Stigmas 3, short.

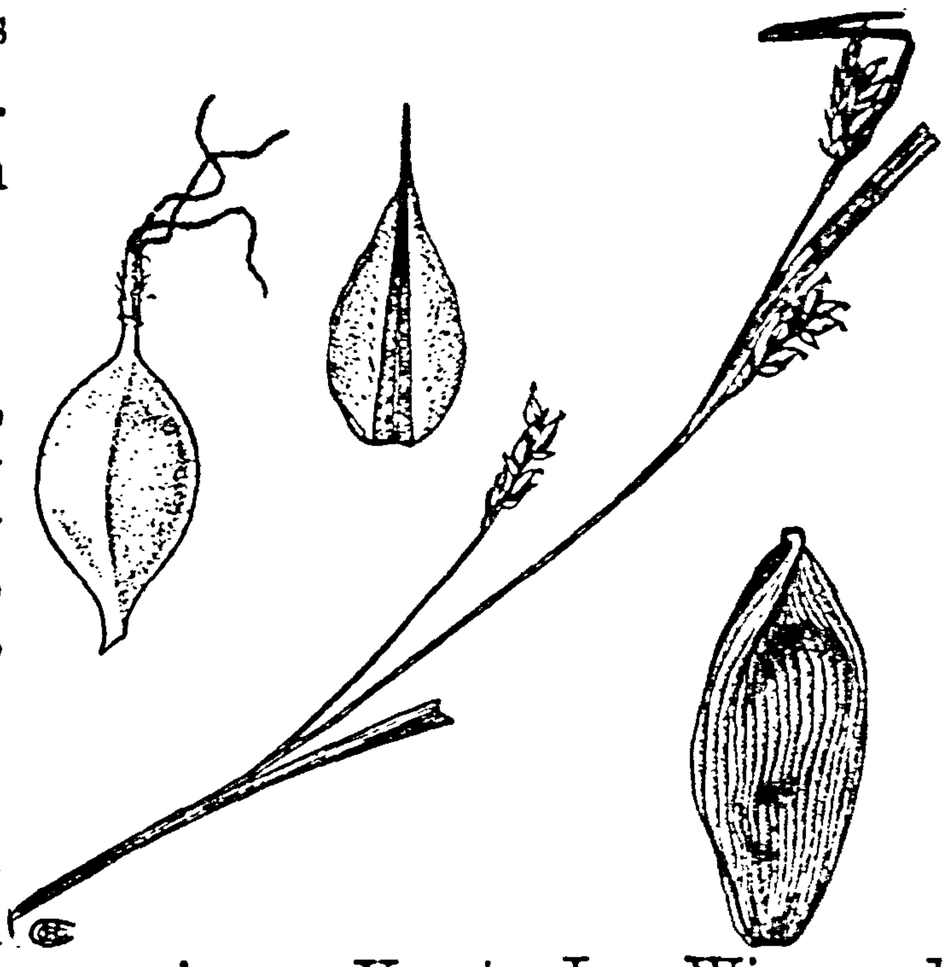
72. C. granularis Muhl. Culm 2–9 dm. tall, smooth: leaf-blades 3–9 mm. wide: staminate spike 1–2.5 cm. long: pistillate spikes 2–5, distant or upper two contiguous, 0.5–3 cm. long, 5–6 mm. wide, closely 10–50-flowered: scales exceeded by the perigynia, ovate-lanceolate, acuminate or cuspidate: perigynium turgid, broadly ovoid or obovoid, suborbicular in cross-section, 2.5–4 mm. long, 2–2.5 mm. thick, abruptly contracted into the short beak.—Moist meadows, in calcareous regions, various provinces, Ga. to La., Minn., and Vt.—Spr.–early sum.

73. C. Crawei Dewey. Culms in small clumps, 1–3 dm. tall, smooth or nearly so: leaf-blades 1.5–3 mm. wide, thick, spreading, channeled: staminate spike 1–3 cm. long: pistillate spikes 2–4, widely separate, 1–3 cm. long, 5–6 mm. wide, closely 10–45-flowered: scales about half the length of the perigynia, ovate, acuminate or cuspidate: perigynium turgid, ascending, ovoid, suborbicular in cross-section, 3–3.5 mm. long, 1.25–2 mm. thick, abruptly contracted into the minute beak: achene straight-tipped.—Moist rocky ledges in calcareous regions, various provinces N of Coastal Plain, Tenn. to Kans., Wyo., Alb., Que., Cape Breton Id., and N N. J.—Spr.–early sum.

74. C. microdonta Torr. & Hook. Culms in small clumps, 1.5–6 dm. tall, smooth or nearly so: leaf-blades 3–6 mm. wide, flat, spreading: staminate spike 2–4 cm. long: pistillate spikes usually 3, widely separate, 1–3.5 cm. long, 5–7 mm. thick, closely 10–45-flowered: scales shorter than the perigynia, ovate, acuminate or cuspidate: perigynium turgid, ascending, ovoid, suborbicular in cross-section, 3–4.5 mm. long, ribbed, moderately beaked, the orifice emarginate: achene with bent tip.—Wet prairies, in calcareous regions, Coastal Plain and Central Lowland, Miss. to Tex. and Okla.—Spr.

XX. GRISEAE Bailey. Culm slender, leafy. Leaf-blades flat. Basal sheaths brownish or purplish. Terminal spike staminate, linear. Lateral spikes 2–4, pistillate, many-flowered in several ranks, erect, on more or less strongly exserted peduncles. Bracts sheathing, not colored or dark-auricled,

the blades leaf-like. Scales ovate, pointed. Perigynium ascending, oblong, glabrous, membranous or subcoriaceous, finely many-striate, rounded at both ends, suborbicular in cross-section, beakless or nearly so, the orifice entire or emarginate. Achene triangular, apiculate, jointed with the style. Stigmas 3.



75. C. conoidea Schk. Culm 1–7 dm. tall, roughened: leaf-blades 2–4 mm. wide: staminate spike 1–2 cm. long, usually long-peduncled: pistillate spikes 1–3, distant, erect, peduncled, oblong, 0.5–2.5 cm. long, 4–5 mm. thick, rather closely 8–25-flowered: scales ovate, acuminate or rough-awned: perigynium oval, 3 mm. long, 1.5 mm. thick, suborbicular in cross-section.—Meadows, mostly in neutral soils, occasionally in other types, Blue Ridge, N. C., and various provinces, Va. to Ia., Wis., and Newf.—Spr.–early sum.

76. C. amphibola Steud. Culm 2–6 dm. tall, smooth or slightly roughened above: staminate spike usually peduncled: pistillate spikes 2–4, erect, 1–2.5 cm. long, 2.5–4 mm. thick, loosely 4–12-flowered, widely separated, the lower often nearly basal and on long filiform peduncles: scales ovate, awned: perigynium firm, 3.5–4.5 mm. long, 2 mm. thick, pointed, but beakless.—Dry open woodlands, in neutral soils, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and W N. J.—Spr.–early sum.

77. C. grisea Wahl. Culm 2–8 dm. tall, stoutish, slightly roughened above: staminate spike sessile or very short peduncled: pistillate spikes 3–5, 7–25 mm. long, 4–7 mm. thick, closely 4–15-flowered, widely separated, but the lower not nearly basal, the lower at least long-peduncled: scales ovate, cuspidate or awned: perigynium about 5 mm. long, 2 mm. thick, tapering at apex, beakless.—Rich woods and thickets, in calcareous or neutral soils, various provinces, Ga. to Tex., Minn., and Me.—Spr.–early sum.

78. C. glaucodea Tuckerm. Culm 1–6 dm. tall, smooth: leaf-blades 3–10 mm. wide, often rather rigid, the basal usually shorter than the culm: staminate spike 10–25 mm. long, sessile to strongly peduncled: pistillate spikes 3–5, 1–4 cm. long, 5 mm. thick, erect, widely separate, the lower slender-peduncled: scales ovate, acute to awned: perigynium oblong-elliptic, 1.5–1.75 mm. thick, beakless.—Fields and meadows, in clayey places, various provinces, N. C. to Ark., Ill., and Ont.—Spr.–early sum.

79. C. flaccosperma Dewey. Strongly resembling *C. glaucodea,* but rather less glaucous: culm 1.5–6 dm. tall, smooth: leaf-blades 4–18 mm. wide, thin, not rigid, the basal rather shorter than the culm: staminate spike 10–25 mm. long, sessile to strongly peduncled: pistillate spikes 2–5, 1–3.5 cm. long, 4.5–6 mm. thick, erect, widely separated, the lower slender-peduncled: scales ovate, acute to awned, often reddish-brown-tinged: perigynium ovoid-elliptic, 2–2.25 mm. thick, beakless.—Moist clayey places in fields and meadows, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and N. C.—Spr.–early sum.

XXI. GRACILLIMAE Carey. Culm slender, leafy. Leaf blades flat. Terminal spike gynaecandrous or sometimes staminate. Lateral spikes 2–4, elon-

gate, linear or cylindric, the lower at least slender-peduncled and drooping. Lower bract at least usually strongly green-sheathing, rarely sheathless, the blades leaf-like. Perigynium oblong or ovoid, membranaceous, little or not at all inflated, 2-keeled and otherwise nerveless, or strongly several-nerved, beakless or short-beaked, the orifice truncate or emarginate. Achene triangular, apiculate, jointed with the style. Stigmas 3, short.

80. C. prasina Wahl. Culm 3–8 dm. tall, erect, slender, slightly roughened above: leaf-blades 2.5–5 mm. wide: terminal spike strongly peduncled, sometimes partly pistillate: pistillate spikes 2–4, narrowly cylindric, 2–6 cm. long, about 4 mm. thick, densely many-flowered, attenuate at base, separated, the lower at least nodding on long peduncles: scales ovate, acute to short awned: perigynium light-green, sharply triangular, 3–4 mm. long, 1.5 mm. thick, nerveless or nearly so.—(DROOPING-SEDGE.)—Springy banks of shaded streamlets, neutral soils, various provinces, rarely Coastal Plain, Ga. to Ky., Mich., Que., and Me.—Spr.–early sum.

81. C. oxylepis Torr. & Hook. Culm 2.5–8 dm. tall, erect, slender: terminal spike gynaecandrous, 1.5–3.5 cm. long, peduncled: pistillate spikes 2–3, somewhat remote, the lower usually more or less drooping, 1.5–4.5 cm. long, 3–4 mm. wide, closely (except at base) 15–40-flowered: perigynium elliptic-lanceolate, obscurely triangular, scarcely inflated, strongly several-nerved, rounded at apex and abruptly minutely beaked, the orifice emarginate. [*C. gracillima* (Fl. SE. U. S.) not Schw.]—Rich woods, Coastal Plain and occasionally adj. provinces, Fla. to Tex., SE Mo., Tenn., and Va.—Spr.

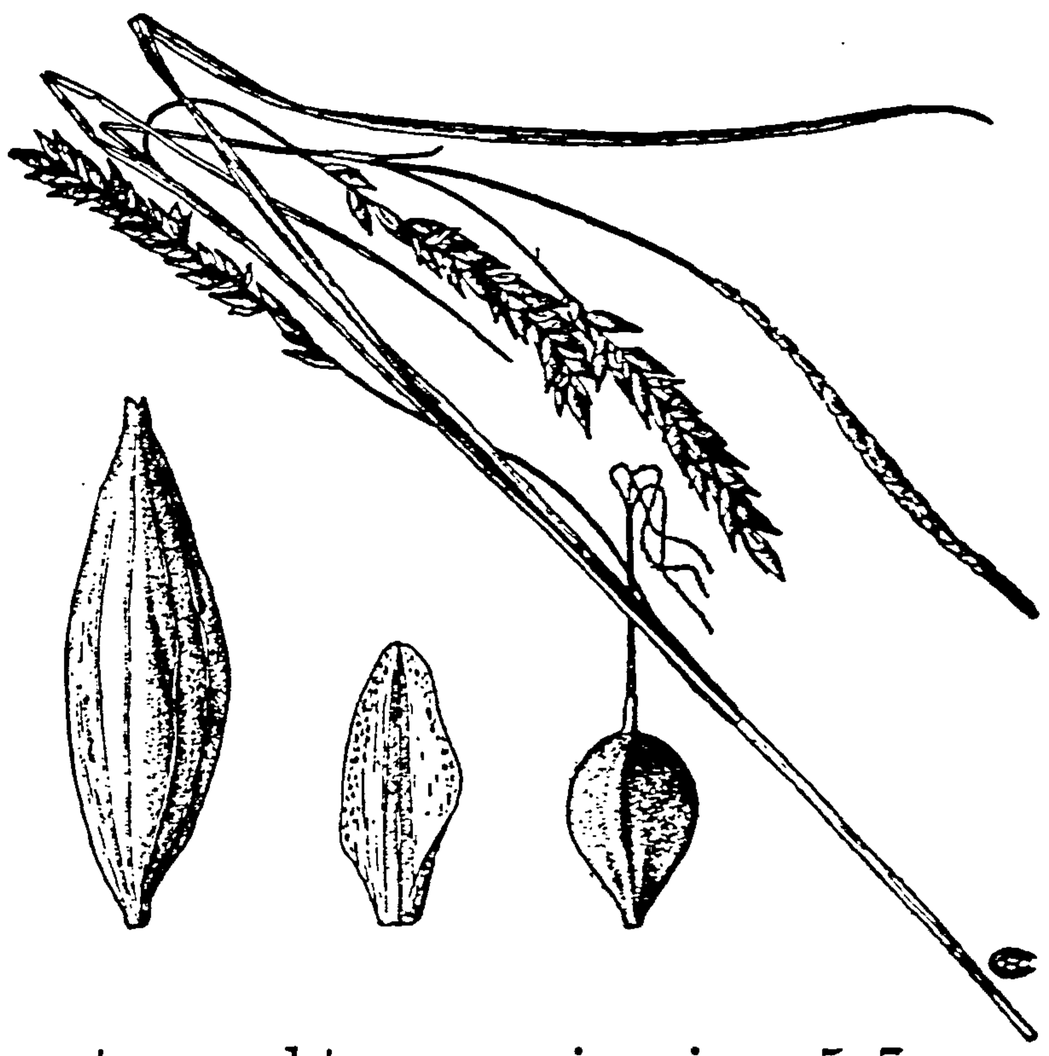
82. C. Davisii Schw. & Torr. Culm 3–9 dm. tall, erect: leaf-blades often pubescent: terminal spike gynaecandrous, 1.5–3.5 cm. long, peduncled: pistillate spikes 2 or 3, somewhat remote, the lower usually more or less drooping, 2–4 cm. long, 3–6 mm. wide, closely 10–40-flowered: perigynium oblong-ovoid, obscurely triangular, somewhat inflated, strongly several-nerved, rounded at apex and abruptly minutely beaked, the orifice bidentate.—Rich alluvial woodlands in calcareous regions, various provinces, rarely Coastal Plain, Tenn. to Tex., Minn., Que., and Vt.—Spr.–early sum.

83. C. aestivalis M. A. Curtis. Culm 3–6 dm. tall, erect, slender, roughened above, reddish at the base: leaf-blades 1.5–2.5 mm. wide, sometimes slightly pubescent, the lower sheaths short-pubescent: terminal spike gynaecandrous, the upper half pistillate, rather closely flowered: pistillate spikes usually 3, approximate or somewhat remote, 2–4 cm. long, 2–3 mm. thick, erect, nearly sessile to long-peduncled, loosely flowered: scales half the length of the perigynia, obtusish to cuspidate: perigynium lanceolate-elliptic, rather sharply triangular, smooth, 2.5–3 mm. long, the sides 1 mm. wide, tapering at both ends, not beaked.—Mt. woods, in acid soils, Blue Ridge and more northern provinces, Ga. to N. Y., N. H., and Mass.—Sum.

84. C. misera Buckley. Culm 2.5–4.5 dm. tall, minutely pubescent, strongly reddish-purple at base: leaf-blades 1–1.5 mm. wide, sparsely pubescent: ter-

minal spike staminate, 1–2 cm. long, peduncled: pistillate spikes 2 or 3, strongly separate, the lower long-peduncled, 12–35 mm. long, 3 mm. wide, with 10–25 appressed-ascending perigynia: scales oblong-ovate, about half length of perigynia, mostly obtuse, brownish-red-tinged: perigynium oblong-lanceolate, 4–4.5 mm. long, 1.25 mm. wide, obscurely triangular, lightly few-nerved, sparsely pubescent above, tapering at base and apex, the orifice entire: achene narrowly oblong-obovoid. [*C. juncea* (Fl. SE. U. S.) not Willd.]—Mt. summits, in acid soils, Blue Ridge, N. C.—Sum.

XXII. SYLVATICAE Boott. Culm aphyllopodic, strongly purplish tinged at the base, tufted, slender, leafy. Leaf-blades flat. Terminal spike normally staminate. Lateral spikes 2–5, elongate, narrowly linear, slender-peduncled, the lower drooping. Bracts green-sheathing, the blades leaf-like. Perigynium appressed or ascending, lanceolate to ovoid, membranous, obsoletely nerved, rather closely enveloping the achene, tapering to a well-developed conic beak, obliquely cut at orifice and strongly hyaline-tipped, at length bidentate. Achene triangular, apiculate, jointed with the slender style. Stigmas 3.



85. C. oblita Steud. Culm 2.5–6.5 dm. tall, slender, little roughened above: leaf-blades 2–6 mm. wide: staminate spike slender-peduncled, 1.5–4 cm. long: pistillate spikes 2 or 3, the lower distant, linear, 1–5 cm. long, 3–5 mm. wide, rather loosely flowered, the lower at least nodding, the peduncles long, slender, rough: scales ovate-lanceolate, less than half the length of the perigynia, acute or obtuse: perigynium 5–7 mm. long, 2–2.25 mm. wide, oblong-oblanceolate, obscurely triangular, prominently about 10-ribbed, tapering at both ends, minutely beaked, the orifice shallowly bidentate.—Moist sandy acid woods and thickets, Coastal Plain and occasionally adj. provinces, Ala. to La., N. Y., and N. J.—Late spr.–sum.

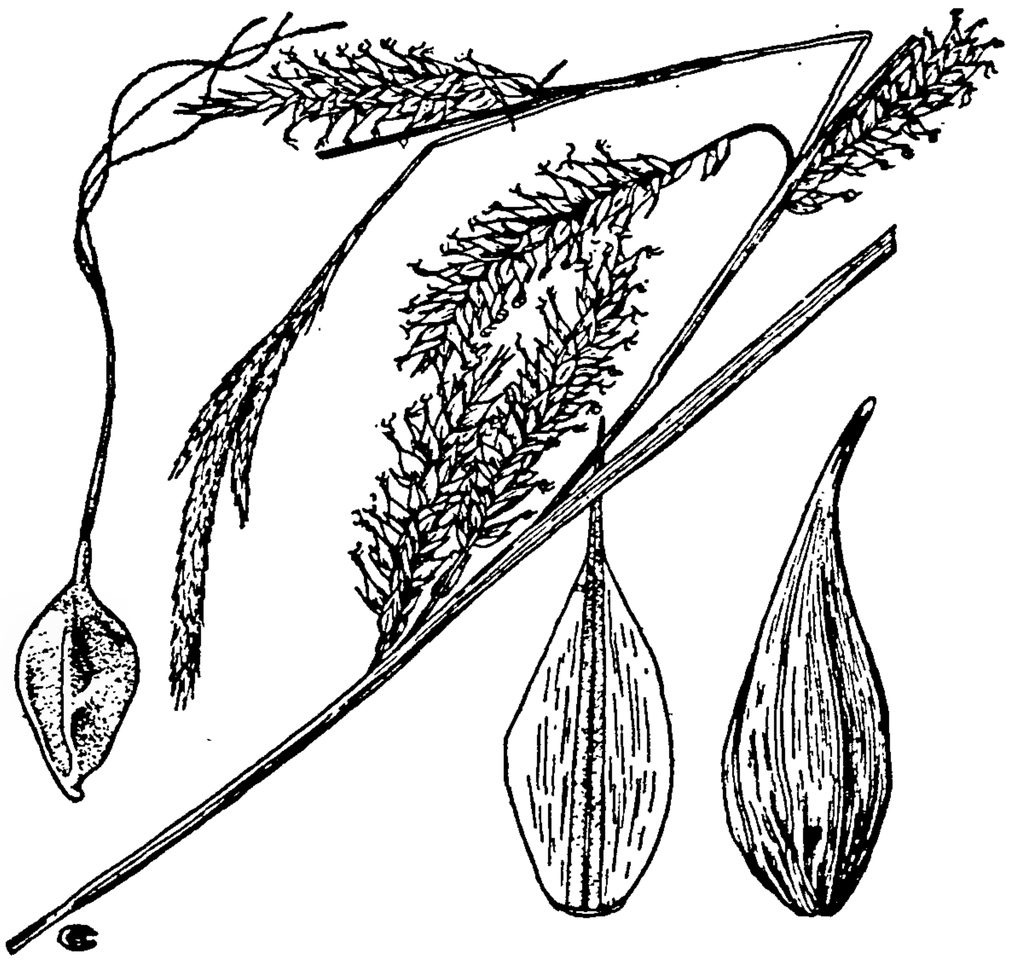
86. C. venusta Dewey. Culm 3–9 dm. tall, slender, little roughened above: leaf-blades 3–8 mm. wide: staminate spike slender-peduncled, 2.5–5 cm. long: pistillate spikes 3 or 4, the lower distant, linear, 3–5 cm. long, 3–5 mm. wide, rather loosely flowered, the lower at least drooping on long, slender, rough peduncles: scales oblong-ovate, less than half length of perigynia, obtuse to acuminate: perigynium 6–7.5 mm. long, 2 mm. wide, oblong-lanceolate, flattened triangular, strongly nerved, tapering at both ends, short beaked, the beak obliquely cut.—Low pine woods, in acid soils, Coastal Plain, Fla. to N. C.—Spr.–early sum.

87. C. allegheniensis Mackenzie. Culm 2.5–6 dm. tall, slender, slightly roughened above: sterile shoots aphyllopodic: leaf-blades 2–3 mm. wide, light-green; staminate spike peduncled, 1.5–3 cm. long: pistillate spikes 2–4, narrowly linear, 2.5–5 cm. long, 3–4 mm. wide, drooping or weakly erect on slender peduncles, the lower distant: scales oblong-obovate, sharply keeled, the mid-vein prominent to tip, cuspidate or awned, much shorter than the perigynia: perigynium 5–7 mm. long, strongly nerved, with slender unequally cleft sharply bidentate beak.—Dry woodlands, in acid soils, Blue Ridge and adj. provinces, Ga. to Tenn., Pa., and Md.—Spr.–early sum.

88. C. debilis Michx. Culm 2.5–12 dm. tall, slender, slightly rough above: sterile shoots aphyllopodic: leaf-blades 2–4 mm. wide, light-green: staminate spike peduncled, 1.5–5 cm. long: pistillate spikes 2–4, the lower distant, linear, 2.5–6 cm. long, 3–4 mm. wide, the lower at least on long slender rough peduncles: scales ovate, ⅓ to ½ length of perigynia, closely appressed, very membranaceous, obtuse: perigynium subulate-lanceolate, flattened triangular. 1.5 mm. wide, glabrous or rarely puberulent, sessile, the beak 1.5–2 mm. long: achene strongly stipitate.—Dry woods and copses, in acid or neutral soils, Coastal Plain and adj. provinces, Fla. to Tex., Ind., N. J., and Long Id., N. Y. —Spr.

89. C. flexuosa Muhl. Culm 2–10 dm. tall, slender, roughened above: sterile shoots phyllopodic: leaf-blades 2–4 mm. wide: staminate spike peduncled, 1.5–5 cm. long: pistillate spikes 2–4, the lower distant, linear or elongated linear, 2–8 cm. long, 3–4 mm. wide, the lower at least on long slender rough peduncles: scales ovate or oblong, firm, half the length of the perigynia, usually obtuse, the tips not appressed: perigynium lanceolate or ovoid-lanceolate, triangular, slightly flattened, nearly 2 mm. wide, glabrous, sessile, the beak 1 mm. long: achene stipitate. [*C. tenuis* Rudge.]—Dry woods and copses in acid or neutral soils, Blue Ridge and more northern provinces, N. C. to Wis. and Newf.—Spr.–early sum.—In our area only in the mountains.

XXIII. LONGIROSTRES Kükenth. Culm phyllopodic, tufted, leafy towards the base. Leaf-blades flat. Terminal spike staminate. Lateral spikes 2–5, linear-oblong or oblong-cylindric, peduncled, many-flowered in several rows. Bracts green-sheathing, the blades developed. Perigynium appressed to spreading, membranous, globose-triangular, somewhat inflated, prominently beaked, the apex bidentate, the teeth weak, scarious. Achene triangular, apiculate, the apiculation very abruptly bent, jointed with the slender style. Stigmas 3.



90. C. cherokeensis Schw. Rootstock stout: culm 3–6 dm. tall, stout, smooth: leaf-blades thick, 3–7 mm. wide, strongly striate: staminate spike 2.5–6 cm. long, peduncled, usually with 1–2 smaller ones at base: pistillate spikes 3–6, widely separate, the lower at least on long peduncles, oblong-cylindric, 1.5–4.5 cm. long, 6–9 mm. thick, closely 10–50-flowered: scales somewhat shorter than the perigynia, lanceolate, acuminate: perigynium ovoid, obtusely triangular, 5–6 mm. long, 2.5 mm. wide, contracted into a beak ¼ the length of the body, scarious and oblique at apex.—Wet woodlands and swamps, Coastal Plain and rarely adj. provinces, Fla. to Tex., SE Mo., and Ga.—Spr.—The basal leaf-sheaths are often chestnut-colored.

XXIV. VIRESCENTES Kunth. Culms largely aphyllopodic, tufted, leafy towards the base. Leaves with at least the sheaths pubescent. Terminal spike gynaecandrous or staminate. Lateral spikes pistillate, closely many-flowered in several rows. Bracts sheathless or nearly so, at least the lower

leaflike. Scales cuspidate. Perigynium green, round-triangular in cross-section, membranous, from little to rather strongly inflated, several-nerved or ribbed, glabrous or hairy, rounded or pointed at apex, the orifice entire or nearly so. Achene triangular, apiculate, jointed with the short thick style. Stigmas 3.

91. C. Swanii (Fernald) Mackenzie. Culm 1.5–6 dm. tall, erect, reddened at base, rough above: leaf-blades 1.5–2.5 mm. wide, the uppermost normally about 3 cm. below the spikes: spikes 2–5, very short-peduncled, erect or nearly so, oblong-cylindric, densely many-flowered, 5–20 mm. long, 3–5 mm. thick: lowest bract twice exceeding spikes: scales slightly shorter than the perigynia, the lower cuspidate: perigynium obovoid, triangular, 2–2.25 mm. long, few-nerved, beakless, the orifice entire. [*C. virescens* (Fl. SE. U. S.) not Muhl.]—Dry woods and thickets, in acid or neutral soils, various provinces, N. C. to Ark., Wis., and N. S.—Sum.

92. C. virescens Muhl. Culm 4–10 dm. tall, erect, slender, strongly reddened at base: leaf-blades 2–4 mm. wide, the uppermost usually 2–3 dm. below the spikes: spikes 2–5, the lower at least strongly peduncled, erect or spreading, linear-cylindric, many-flowered, 1–4 cm. long, 2.5–4 mm. thick: lowest bract somewhat exceeding spikes: scales shorter than the perigynia, acuminate or cuspidate: perigynium oblong-elliptic to obovoid, triangular, 2–2.5 mm. long, narrowed at each end, several ribbed, tapering at apex but beakless, the orifice entire. [*C. costellata* Britton.]—Dry wooded slopes, in acid soils, various provinces N of Coastal Plain, Ga. to Ky., Ind., and Me.—Sum.

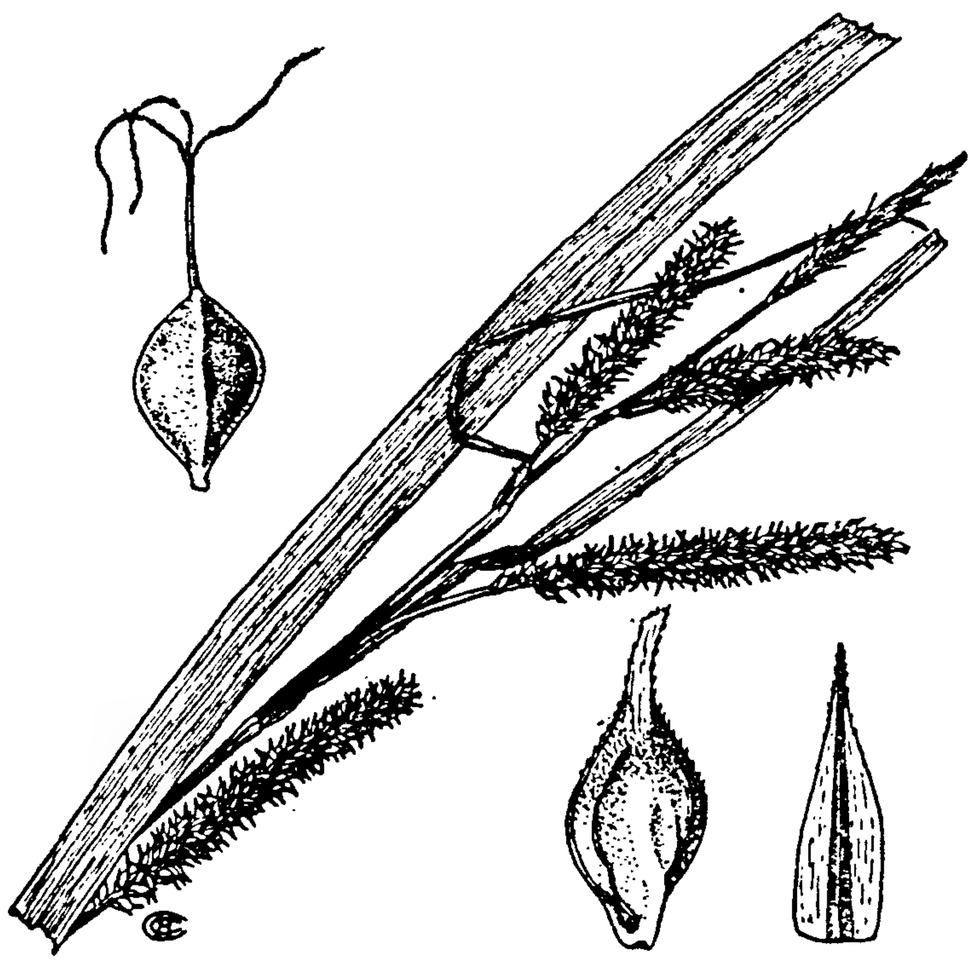
93. C. complanata Torr. Culm 2–6 dm. tall, erect, rather stiff, roughish above, strongly reddened at base: leaf-blades 1.5–3 mm. wide, stiff, spreading, glabrous or very nearly so, the sheaths pubescent: spikes 2–5, sessile or nearly so, approximate, oblong, densely-flowered, the lateral 6–15 mm. long, 5–7 mm. thick: scales cuspidate, mostly shorter than the perigynia, scarious margined: perigynium obovoid, flattened, brownish-green, appressed or ascending, glabrous, 2 mm. long, more or less nerved dorsally, rounded at apex and beakless: anthers reddish. [*C. triceps* Michx.]—Dry pine woodlands, in acid soils, Coastal Plain and rarely adj. provinces, Fla. to Tex. and S N. J.—Spr.–early sum.

94. C. hirsutella Mackenzie. Culm 2–9 dm. tall, erect, slender, roughish above, strongly reddened at base: leaf-blades 1.5–4 mm. wide, flaccid, softly pubescent as are the sheaths: spikes 2–5, sessile or nearly so, approximate, oblong or oblong-cylindric, densely-flowered, the lateral 6–18 mm. long, 5–7 mm. thick: scales obtuse to short cuspidate, mostly shorter than the perigynia, scarious margined: perigynium obovoid, flattened, greenish, appressed or ascending, glabrous, 2–2.25 mm. long, strongly several-nerved dorsally, rounded at apex and beakless: anthers yellowish. [*C. hirsuta* Muhl.]—Fields and dry open woods in calcareous or neutral soils, various provinces, Ala. and Miss. to Mo., Mich., and Me.—Spr.–early sum.

95. C. caroliniana Schw. Culm 2.5–8 dm. tall, slender, erect, roughish above, strongly reddened at base: leaf-blades 1.5–3 mm. wide, glabrous, the sheaths pubescent: spikes 2–4, sessile or nearly so, oblong, 8–18 mm. long, 4 mm. thick, densely-flowered, approximate: scales ovate, mucronate: perigynium pointed at apex, the orifice entire or emarginate: achene bent at summit or tipped with bent style. [*C. Smithii* Porter.]—Meadows in non-calcareous districts, various provinces, N. C. to Tex., Ind., and N. J.—Spr.–early sum.

96. C. Bushii Mackenzie. Culm 3–9 dm. tall, slender, erect, reddish at base: leaf-blades 1.5–3 mm. wide, short-pubescent especially below, as are the sheaths: spikes 2–3, sessile or nearly so, oblong or oblong-cylindric, 5–20 mm. long, 5–8 mm. thick, densely many-flowered, approximate: scales triangular-lanceolate, usually strongly exceeding perigynia: perigynium 2.5–3.5 mm. long, 1.5–2 mm. thick, tapering to the blunt or slightly constricted apex, the orifice entire or emarginate: style bent.—Dry open woodlands, barrens, and fields in calcareous districts, Coastal Plain and occasionally adj. provinces, Miss. to Tex., Ind., N. Y., and Mass.—Spr.–sum.

XXV. ANOMALAE Carey. Culm stout, leafy. Leaf-blades broad, flat, glabrous, not septate-nodulose. Terminal spike staminate, linear. Lateral spikes pistillate, linear-cylindric, scattered, closely many-flowered in several rows. Bracts leaf-like, sheathless. Perigynium ascending or in age spreading, obovoid, small, 2.5–4 mm. long, olive-green, nerved, tapering at the base, triangular, slightly inflated, abruptly beaked, the beak conic, shallowly bidentate. Achene triangular, subapiculate, the style short, thickish, jointed with achene. Stigmas 3.



97. C. scabrata Schw. Long stoloniferous: culm 2.5–9 dm. tall, very rough above: leaf-blades 5–18 mm. wide, elongate, very rough on upper surface: staminate spike peduncled, 1.5–4 cm. long: pistillate spikes 3–8, densely many-flowered, narrowly oblong, 1.2–6 cm. long, 5–8 mm. thick, the upper erect, the lower distant and long peduncled: scales lanceolate, exceeded by perigynia, acute to cuspidate: perigynium brownish-green, 2.5–4 mm. long, the body obovoid, 1.5–2 mm. wide, strongly nerved, papillose, abruptly long-beaked, the orifice obliquely cut and hyaline.—Springy banks in woods, in the less calcareous districts, but not in strongly acid districts, various provinces N of Coastal Plain, S. C. to Tenn., Mich., and P. E. Id.—Late spr.–sum.

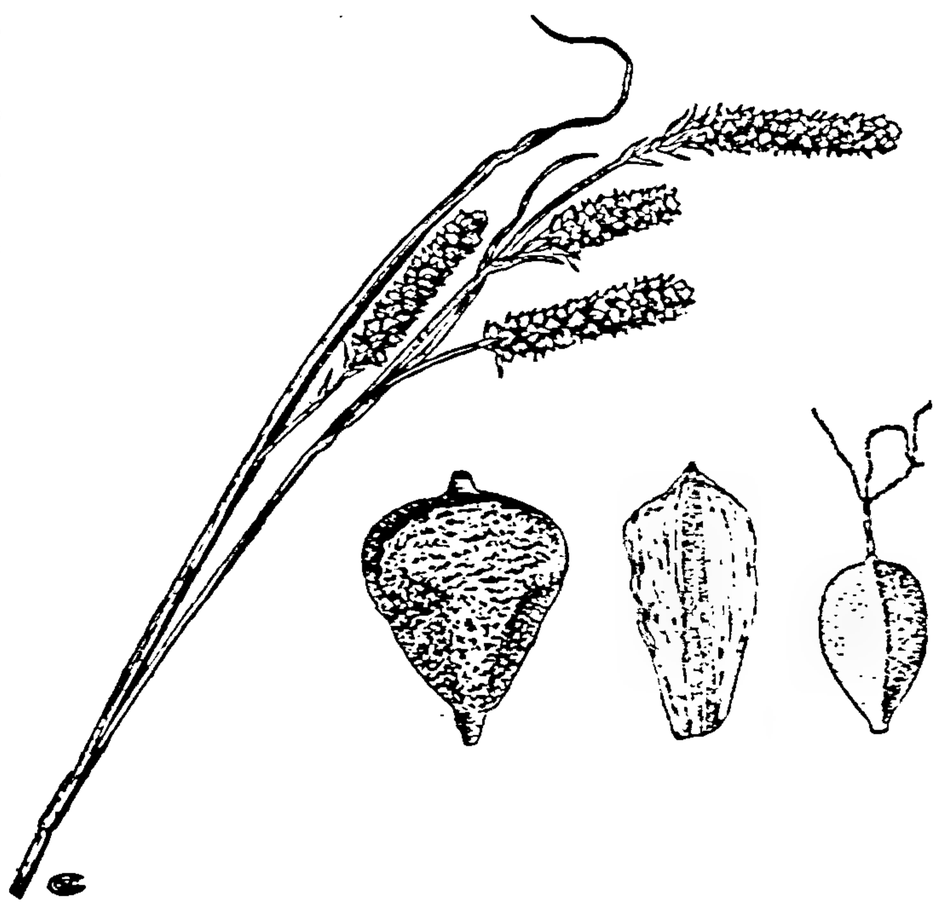
XXVI. ATRATAE Kunth. Culm leafy below. Terminal spike staminate or gynaecandrous, the lateral 1–10, normally pistillate, from sessile, erect, and closely approximate, to long-peduncled, nodding, and distant. Bracts sheathless or nearly so, dark-colored at the base, the blades short. Scales dark-tinged. Perigynium membranaceous, straw-colored, often dark-tinged, elliptic

to broadly obovoid, circular in cross-section to much-flattened, papillose to puncticulate, glabrous, abruptly short-beaked or beakless, the orifice entire or bidentate. Achene triangular, the style slender, straight, often exserted, its base not enlarged. Stigmas 3.

98. C. Barrattii Schw. & Torr. Culm 3–9 dm. tall, slender, smooth, aphyllopodic and strongly filamentose at base: leaf-blades 2–4 mm. wide, pale- or glaucous-green: staminate spike 3–5 cm. long, long-peduncled (often with 1–2 smaller ones at base): pistillate spikes 2–4, linear-cylindric, 1–5 cm. long, 4.5–6 mm. thick, closely many-flowered: scales ovate, brownish-purple: perigynium 2.5–3 mm. long, ovoid or oval, faintly few-nerved, obscurely triangular, abruptly minutely beaked. [*C. littoralis* Schw.] —Very acid swamps and bogs, Coastal Plain and occasionally adj. provinces, N. C. to Pa. and Conn.—Spr.

99. C. Buxbaumii Wahl. Culm 2.5–10 dm. tall, slender, rough above, aphyllopodic and strongly filamentose at base: leaf-blades 1.5–4 mm. wide, glaucous-green: spikes 2–7, oblong, 1–4 cm. long, 8–12 mm. thick, approximate or lowest distant, the terminal rarely entirely staminate: scales black or dark-brown with green midvein: perigynium very light-green, elliptic or obovate, triangular biconvex, 2.5–4 mm. long, faintly nerved, nearly beakless, the orifice minutely 2-toothed. [*C. fusca* (Fl. SE. U. S.) not All.]—Open swamps in calcareous districts, various provinces, Ga. to Ark., Colo., Calif., B. C., and Greenl.—(*Eurasia.*)—Spring.–early sum.

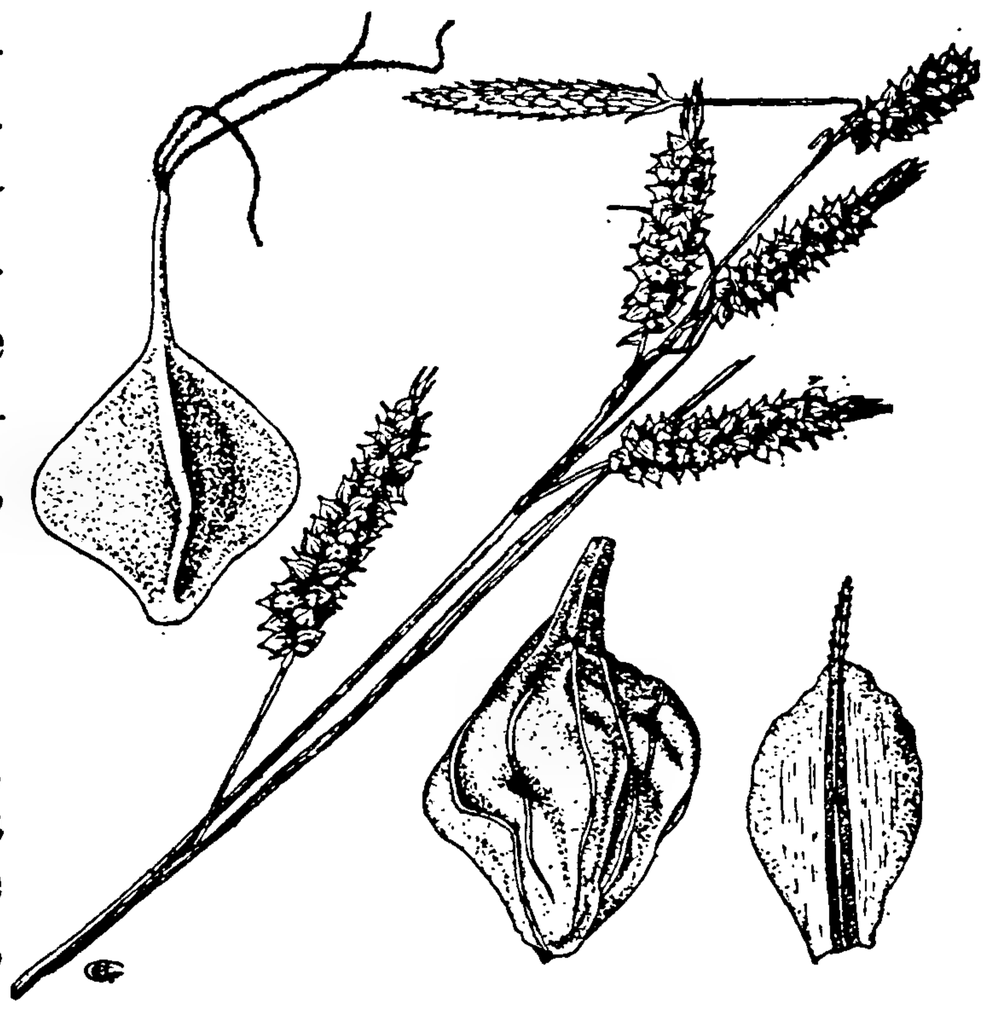
XXVII. SHORTIANAE Bailey. Culm leafy. Leaves glabrous, the blades flat. Spikes 4–5, the terminal gynaecandrous, the lateral pistillate with a few staminate basal flowers, erect, cylindric, more or less peduncled, closely many-flowered. Bracts sheathless, the lower leaf-like. Pistillate scales 3-nerved, mucronate. Perigynium orbicular-obovate, compressed-triangular, membranous, corrugated, nerveless, margined, short-stipitate, abruptly short-beaked, the orifice nearly entire. Achene triangular, jointed with the short deciduous style. Stigmas 3, short.



100. C. Shortiana Dewey. Rootstock short, thick: culm 3–9 dm. tall, rough above: leaf-blades elongate, 4–8 mm. wide: spikes 3–7, gynaecandrous, linear-cylindric, densely many-flowered, 1–3.5 cm. long, 4–5 mm. thick, erect, the lower distant and long-peduncled: scales about equalling perigynia, sharp-pointed: perigynium orbicular or obovate, flattened, 2-edged, 2.5–3 mm. long, 2 mm. wide, slightly wrinkled, nerveless but ridged at apex, abruptly minutely beaked, the orifice entire or nearly so.—Moist meadows and thickets in calcareous dis-

tricts, various provinces, rarely Coastal Plain, Tenn. to Okla., Ia., and Pa.—Spr.–early sum.

XXVIII. PENDULINAE Fries. Phyllopodic. Culm leafy below. Spikes two to seven, the upper 1–3 staminate, linear, the lower 2–4 pistillate, linear or oblong-cylindric, closely very many-flowered, the lower at least long-peduncled and often more or less drooping: lowest bract from nearly equalling to exceeding the inflorescence, sub-sheathing. Scales sharp-pointed to long-awned. Perigynium coriaceous to submembranaceous, firm, appressed-hispidulous to granular, nerveless, except for the two marginal nerves, to strongly ribbed, scarcely inflated, minutely or short-beaked, the orifice entire to shallowly bidentate. Achene rather closely enveloped, triangular, apiculate, jointed with the style. Stigmas 3, slender.



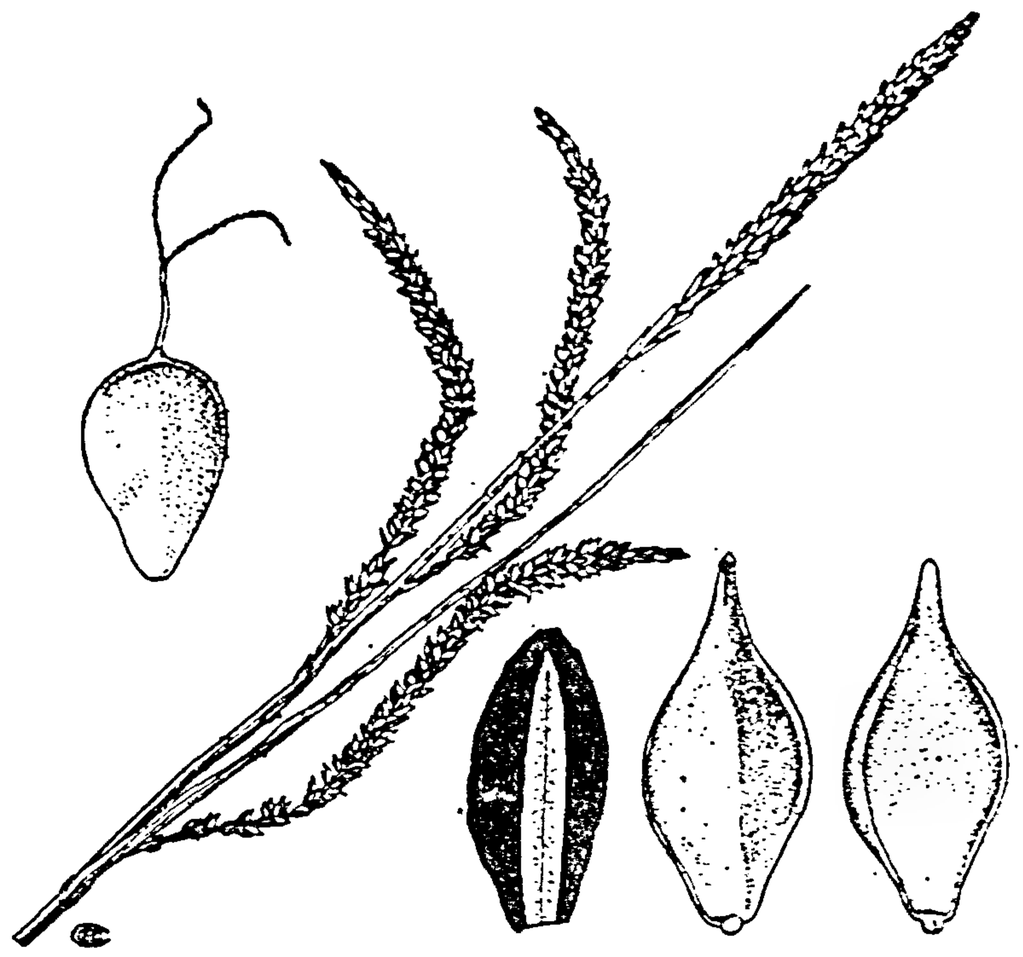
101. C. Joorii Bailey. Rootstock stout: culm strongly phyllopodic, 4–10 dm. tall, stout, much roughened above: leaf-blades 3–10 mm. long, glaucous-green: staminate spike long-peduncled: pistillate spikes 3–5, cylindric, densely 15–50-flowered, 1.5–6 cm. long, 7–10 mm. thick, little separated, erect, sessile or peduncled: scales abruptly awned, reddish-brown-tinged: perigynium broadly obovoid, 4 mm. long, 3–3.5 mm. thick, abruptly beaked, the beak ¼ the length of body, the orifice entire.—Cypress swamps, in humus-rich and sometimes acid soils, Coastal Plain, Fla. to Tex., Mo., and S. C.—Sum.

102. C. verrucosa Muhl. Culm 6–12 dm. tall, not filamentose at base, rather slender above, smooth: leaf-blades somewhat glaucous, 4–10 mm. wide: staminate spike 3–6 cm. long, usually solitary: pistillate spikes 3–6, cylindric, strongly separate, densely many-flowered, 2.5–8 cm. long, 7–10 mm. thick, sessile or short-peduncled: perigynium broadly obovoid, 3-angled, 3–4.5 mm. long, 2.5 mm. thick, very short-beaked, the orifice entire. [*C. macrokolea* Steud.]—Pineland swamps, in acid soils, Coastal Plain, Fla. to La. and S. C.—Early spr.–late sum.

103. C. glaucescens Ell. Culm 5–12 dm. tall, strongly filamentose at base, somewhat roughened above: leaf-blades glaucous, 3–5 mm. wide: staminate spike 2.5–6 cm. long, peduncled: pistillate spikes 3–4, cylindric, strongly separate, densely many-flowered, 2.5–5 cm. long, 7–10 mm. thick, slender-peduncled: perigynium ovoid or obovoid, 3-angled, 3–3.5 mm. long, 2–2.25 mm. thick, very short-beaked, the orifice entire.—Pineland swamps, in acid soils, Coastal Plain, Fla. to La. and Va.—Sum.

XXIX. ACUTAE Fries. Culm leafy below, aphyllopodic or phyllopodic. Terminal 1–several spikes staminate (rarely gynaecandrous), linear, the remaining pistillate, linear to cylindric or oblong, closely many-flowered, sessile or peduncled. Bracts sheathless (rarely short-sheathing), leafy or squamiform, biauriculate and often darkened at the base. Perigynium membranaceous to

coriaceous, plano- or bi-convex, or turgid, elliptic to obovate, puncticulate, margined, beakless or abruptly minutely beaked, the orifice entire to deeply bidentate. Achene normally lenticular. Style slender, straight, sometimes exserted, its base not enlarged. Stigmas normally 2.



104. C. torta Boott. Culm 2.5–9 dm. tall: leaf-blades 3–4 mm. wide, light-green, the lower sheaths not filamentose: staminate spike usually one, peduncled: pistillate spikes 3–6, 2–7.5 cm. long, 2.5–4.5 mm. thick, linear, closely many-flowered, sometimes loosely so at base, erect to drooping, the lower slender-peduncled: scales ovate-oblong, shorter than perigynia, obtuse or acutish: perigynium oblong-ovate, light-green, nerveless, 2.5–3 mm. long.—Rocky banks of swift-flowing streams, various provinces, though rarely Coastal Plain, N. C. to S Mo., Minn., Que., and N. S.—Spr.–early sum.—Our only species habitually growing among the boulders in or on the very edges of torrents.

105. C. strictior Dewey. Growing in beds, long-stoloniferous: culm 3.5–9 dm. tall, slender, purplish-tinged at base: leaf-blades 2.5–3.5 mm. wide, light- or glaucous-green, flat to the base, the margins very rough: lower sheaths filamentose, rounded and hispidulous dorsally: staminate spike strongly peduncled, 2–3 cm. long: pistillate spikes usually 3, sessile to long-peduncled, approximate or lower distant, 1.5–6 cm. long, 4–5 mm. wide, closely many-flowered: lowest bract little shorter than inflorescence: scales purplish-black-tinged: perigynium ovate, plano-convex, 2-edged, puncticulate, granular, green, 2.25–2.75 mm. long, 1.5 mm. wide, obscurely nerved dorsally, very minutely beaked. [*C. stricta* (Fl. SE. U. S.) not Lam.]—Swampy meadows, without marked soil preferences, Blue Ridge and more northern provinces, N. C. to Tenn., Ia., Wis., Que., and N. S.—Spr.–early sum.—Does not have the troublesome characteristics of the next following species.

106. C. stricta Lam. Growing in large very dense tussocks: culm 3–8 dm. tall, slender to base, brownish or light-purplish-brown at the base: leaf-blades 1.5–3 mm. wide, deep-green, channeled and keeled towards the base, the margins very rough: lower sheaths filamentose, subcarinate and smooth or nearly so dorsally: principal staminate spike 2–4 cm. long: pistillate spikes 2 or 3, sessile or short-peduncled, approximate or the lower distant, 2–6 cm. long, 3–5 mm. wide, closely many-flowered: lower bract usually much shorter than the inflorescence: scales reddish-brown-tinged: perigynium ovate, plano-convex, 2-edged, puncticulate, granular, dark-green, 2.25–2.75 mm. long, 1.5 mm. wide, obscurely nerved dorsally, beakless or nearly so.—Swampy meadows or woods, in acid soils, various provinces, N. C. to Mich. and N. H., mostly east of the mtns. Spr.–early sum.—Our most troublesome species. Its large, very dense, and tough tussocks cover great areas in the lowlands to the practical exclusion of other vegetation. The water stands in small pools between the tussocks, and cannot readily be drained off, while the tussocks themselves cannot be broken up except at prohibitive cost, so that lands where it occurs in quantity are practically valueless. The leaves are very rough margined, and are avoided by stock; they are sometimes used to make mats.

XXX. CRYPTOCARPAE Tuckerm. Stoloniferous. Culm aphyllopodic or phyllopodic. Terminal one or two spikes staminate, linear, the others pistillate, linear or oblong, closely many- or very many-flowered, the lower or all peduncled, and erect or very often pendulous. Bracts sheathless, the upper at least biauriculate at base. Scales 3-nerved, usually cuspidate or aristate, but in some species obtuse. Perigynium coriaceous or membranaceous, plano- or bi-convex or turgid, elliptic to obovate, puncticulate, margined, abruptly minutely beaked or beakless, the orifice entire or nearly so. Achenes lenticular, usually constricted in the middle. Style straight, slender, jointed with achene, at length deciduous. Stigmas 2.

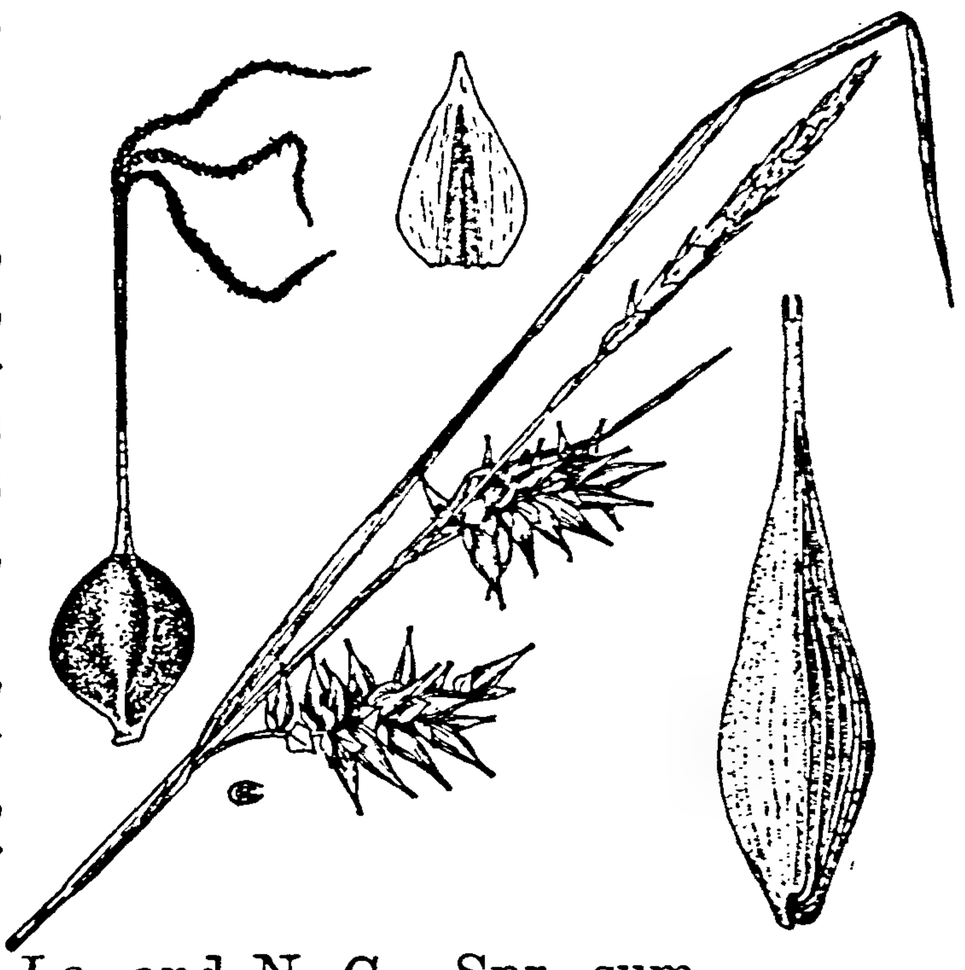
107. C. gynandra Schw. Culm 4–10 dm. tall, reddened and filamentose at base, roughened above: leaf-blades 3–12 mm. wide: staminate spikes 1–3, 2–6 cm. long: pistillate spikes 2–5, approximate, peduncled, drooping, 2.5–10 cm. long, 8–12 mm. wide: scales with 3-ribbed center, brownish-tinged, ascending: perigynium oblong-obovoid to oval, ascending, compressed, 3–4 mm. long, 1.5–2 mm. thick, 2-edged but otherwise nerveless or nearly so, scarcely inflated, the walls thin but rather firm, abruptly minutely beaked: achene constricted in middle.—Woodland swamps, in acid or neutral soils, various provinces, N. C. to Tenn., Wis., and Newf.—Sum.

108. C. crinita Lam. Culm 4–12 dm. tall, reddened and filamentose at base, roughened above; the basal sheaths prominently keeled: leaf-blades 3–10 mm. wide: staminate spikes 1–2, 2–6 cm. long: pistillate spikes 2–6, approximate, drooping or somewhat erect, peduncled, 2.5–10 cm. long, 8–12 mm. wide: scales with 1–3 ribbed center, brownish-tinged, spreading: perigynium inflated, 2–3.5 mm. long, 1.25–2 mm. thick, nerveless or faintly nerved, the walls thin, abruptly minutely beaked.—(TASSEL-SEDGE.)—Swampy places in woodlands, in acid or neutral soils, various provinces, N. C. to Tex., Minn., and N. S.—Sum.

109. C. Mitchelliana M. A. Curtis. Cespitose, sending forth horizontal stolons: culm 5–9 dm. tall, smooth or nearly so, dull purplish-brown at the base, the basal sheaths little or not at all filamentose: leaf-blades 2.5–4.5 mm. wide: staminate spike 2.5–4 cm. long: pistillate spikes usually 3, more or less strongly separate, peduncled, drooping, 2–4.5 cm. long, 6–8 mm. wide: scales reddish-brown-tinged, 3-nerved, the lower retuse, strongly rough-awned, much exceeding the perigynia, the upper shorter-awned: perigynium oblong-ovate, flattened-biconvex, 2.5–3 mm. long, 1.75 mm. wide, normally slenderly few-nerved, strongly papillate, abruptly beaked: achene normally not constricted in the middle.—Swampy woodlands, in acid soils, Coastal Plain, mostly near the coast, Fla. to Mass.—Spr.–early sum.

XXXI. HIRTAE Tuckerm. Culm stout, leafy. Rootstock with long stolons. Leaves septate-nodulose. Spikes 3–10, the upper 1–5 staminate, slender, the others pistillate, many-flowered, erect. Bracts leaf-like, equalling or exceeding the culm, often sheathing. Pistillate scales acute or aristate, ovate or lanceolate. Perigynium mostly ascending, coriaceous or subcoriaceous, ovoid or oblong-ovoid, somewhat inflated, nearly orbicular in cross-section,

many-nerved, often hairy, round-tapering at base, tapering into a bidentate beak. Achene triangular, often stipitate, the faces flat or deeply concave, apiculate, jointed with the straight or slightly flexuous slender style. Stigmas 3.

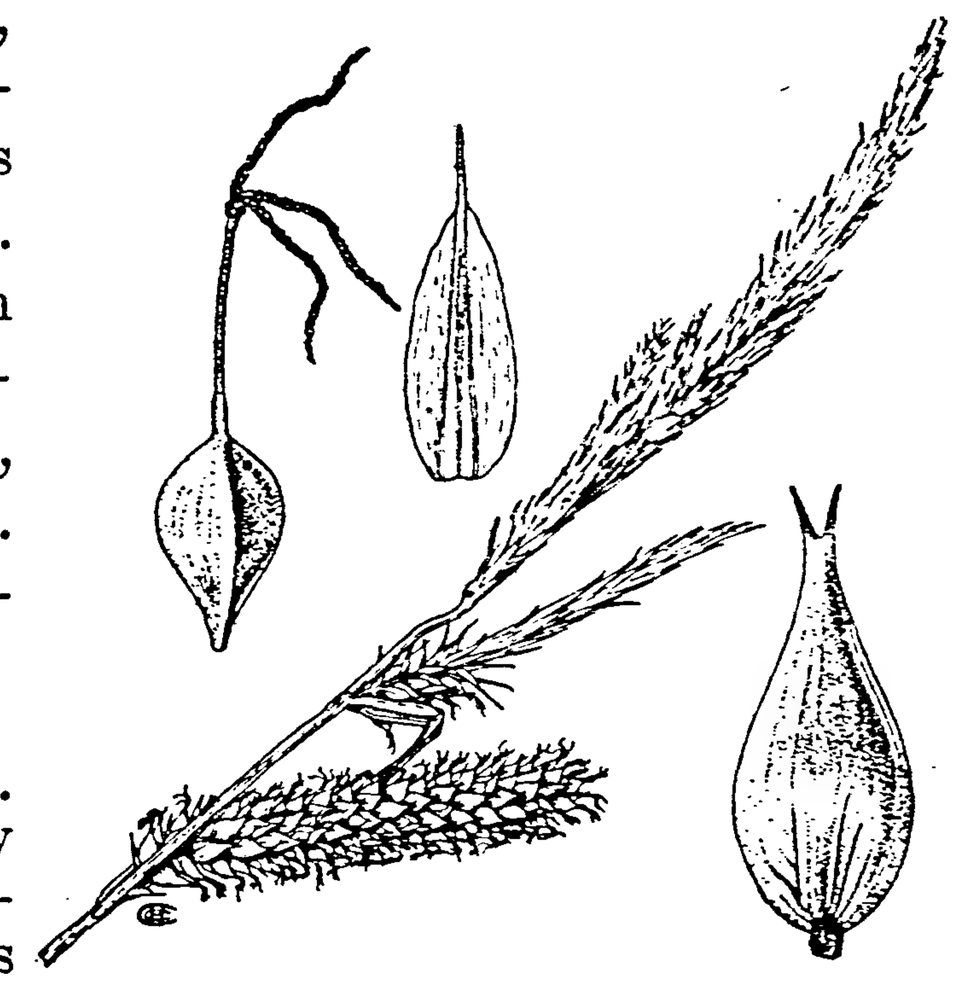


110. C. turgescens Torr. Culm 6–9 dm. tall, slender, smooth: leaf-blades 1.5–5 mm. wide, nearly flat: staminate spike slender-peduncled, 3.5–5 cm. long: pistillate spikes 2 or 3, widely separate, short-oblong, 2–3 cm. long, 1.5–2.5 cm. thick, 10–20-flowered, strongly peduncled: bracts conspicuous: scales half length of perigynia or less, ovate, acute to cuspidate: perigynium ovoid-lanceolate, 3–3.5 mm. thick, coarsely many-nerved, yellowish-green, tapering into the smooth or slightly serrulate bidentate beak, 2–3 mm. long.—Wet pinelands, Coastal Plain, Fla. to La. and N. C.—Spr.–sum.

111. C. Walteriana Bailey. Culm 2–8 dm. tall, slender, stout, roughish above, reddened and filamentose at base: staminate spikes 1–2, 1.5–5 cm. long: pistillate spikes 1–2, oblong-cylindric, 2–6 cm. long, 5–8 mm. thick, distant, sessile or very short-peduncled, many-flowered: lowest bract prominent: scales ovate, acute to short awned: perigynium ovoid, 4–6 mm. long, 2–2.5 mm. thick, ascending, coriaceous, glabrous or sparsely short-pubescent, many-nerved, the beak ⅓ length of the body, the teeth 0.5 mm. long. [*C. striata* Michx. *C. polymorpha* (Fl. SE. U. S.) not Muhl.]—Open pineland swamps, in acid soils, Coastal Plain and New England Coast, Fla. to Mass.—Spr.–early sum.

112. C. lanuginosa Michx. Culm 3–10 dm. tall, stoutish, sharply triangular, rough above, reddened and filamentose at base: staminate spikes 1–2: pistillate spikes 1–3, cylindric, 1–5 cm. long, 5–8 mm. thick, usually distant, sessile or the lower slender-peduncled, 25–75-flowered: bracts conspicuous: scales lanceolate, long-acuminate or awned: perigynium broadly ovoid, 2.5–3.5 mm. long, 1.75–2 mm. wide, ascending or spreading, coriaceous, densely soft-hairy, many-nerved, short-beaked, the teeth 0.5 mm. long. [*Carex hirta* (Fl. SE. U. S.) not L.]—Open swamps and wet meadows in calcareous districts, various provinces, N. C. to Tex., S Calif., B. C., and Que.—Sum.

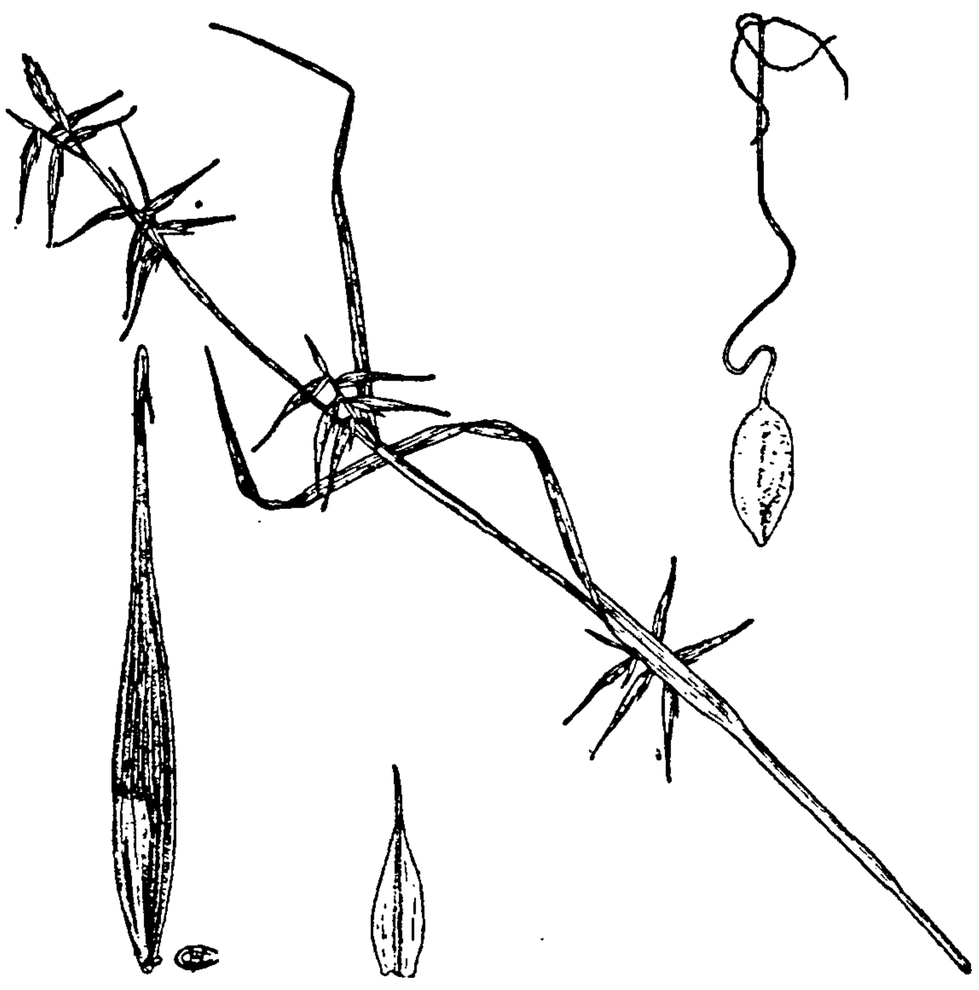
XXXII. PALUDOSAE Fries. Phyllopodic or aphyllopodic. Rootstock with stout stolons. Culm leafy, the leaves often more or less glaucous. Staminate spikes 1–3, linear. Pistillate spikes 2–6, cylindric or oblong, densely many-flowered, erect, peduncled. Bracts sheathless to strongly sheathing, the lower leaf-like. Scales cuspidate or aristate. Perigynium coriaceous, ovoid, suborbicular in cross-section, many-nerved or ribbed, abruptly beaked, the orifice emarginate to deeply bidentate. Achene triangular, continuous with the persistent style. Stigmas 3.



113. C. hyalinolepis Steud. Culm 5–10 dm. tall, stout, phyllopodic, smooth or nearly so, neither conspicuously reddened nor filamentose at base: leaf-blades more or less

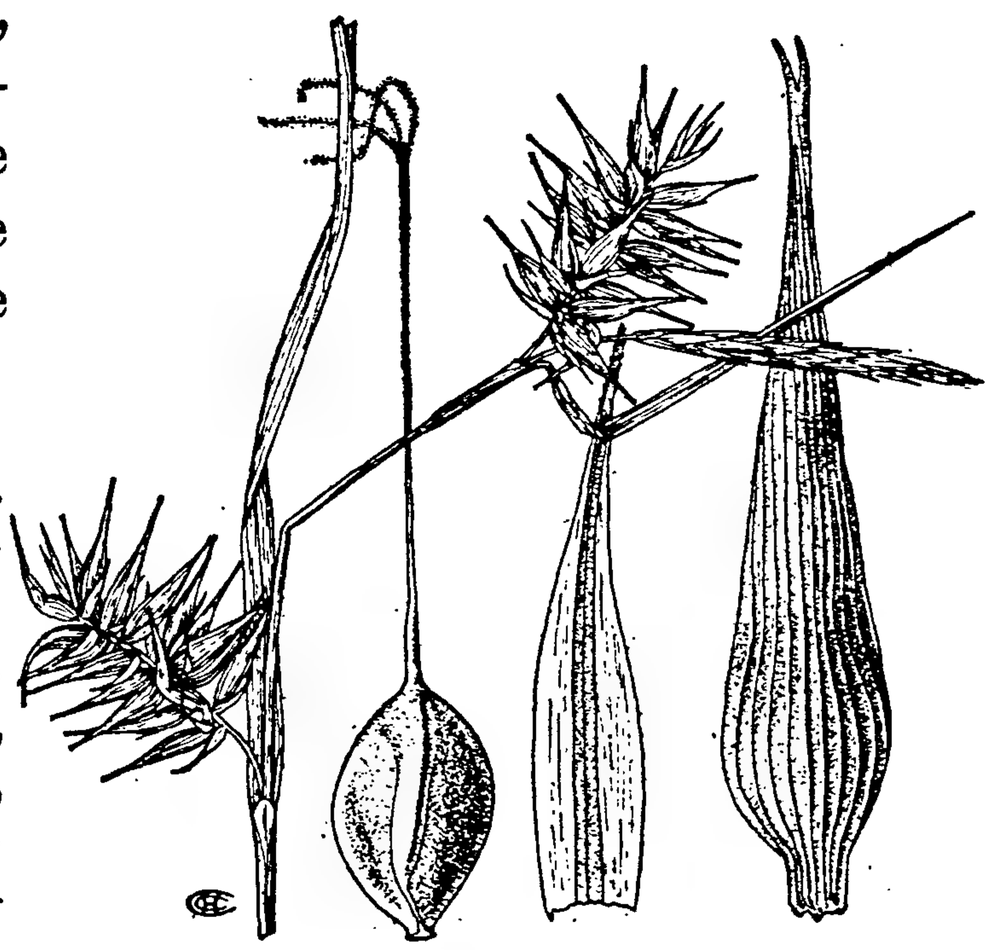
glaucous, the ligule short: staminate spikes 2–4, 1–4 cm. long: pistillate spikes 2–4, cylindric, 1–7.5 cm. long, 10–14 mm. thick, widely separate, short-peduncled, very many-flowered: bracts prominent: scales ovate to lanceolate, acute to awned: perigynium narrowly ovoid, 6 mm. long, 2.5 mm. thick, ascending, coriaceous, glabrous, impressed-nerved, the beak short, the teeth 0.5 mm. long. [*C. riparia* (Fl. SE. U. S.) not Curtis. *C. impressa* (S. H. Wright) Mackenzie]—Open neutral swamps and wet swales, various provinces, Fla. to Tex., Kans., Ont., and S N. J.—Spr.

XXXIII. Collinsiae Mackenzie. Cespitose. Culm leafy. Leaf-blades flat, septate-nodulose, deep-green. Terminal spike staminate, short, few-flowered. Lateral spikes 3–4, androgynous, erect, the pistillate part loosely 1–8-flowered, the staminate part few-flowered. Bracts strongly sheathing, leaf-like. Scales short, whitish, pointed. Perigynium subulate, widely spreading or reflexed, deep-green, membranaceous, many-nerved, tapering to the long beak, deeply obliquely cut and sharply bidentate, the slender awns abruptly reflexed. Achene linear-obovoid, continuous with the slender flexuous style. Stigmas 3, short.



114. C. Collinsii Nutt. Culm 1.5–6 dm. tall, slender, smooth: leaf-blades thin, soft, 2–5 mm. wide: staminate spike short- or long-peduncled, 5–10 mm. long: pistillate spikes 2–4, distant, 1–8-flowered, staminate above, the upper short- and the lower long-peduncled: bracts leaf-like, strongly sheathing: scales lanceolate, ⅓ the length of the perigynia, short awned, persistent: perigynium subulate, 8–14 mm. long, 1–2 mm. thick, light-green, horizontal or reflexed at maturity, readily detached, many-nerved, tapering into a smooth beak half the length of body, the teeth slender 1.5–2 mm. long, strongly reflexed.—In the most wet sphagnum in deep shade in densely wooded very acid (usually white-cedar) swamps, Coastal Plain and rarely more N provinces, Ga. to R. I.—Sum.

XXXIV. Folliculatae Mackenzie. Cespitose. Culm leafy, obtusely triangular. Leaf-blades flat, septate-nodulose, yellowish-green. Terminal spike staminate. Lateral spikes 3–4, pistillate or androgynous, erect, 5–15-flowered. Bracts long-sheathing. Scales 3-nerved, pale. Perigynium at length more or less spreading, yellowish-green at maturity, many-nerved, subcoriaceous, sparingly inflated, contracted into the long bidentate beak, the teeth scarcely spreading. Achene triangular, obovoid, continuous with the slender flexuous style. Stigmas 3, short.

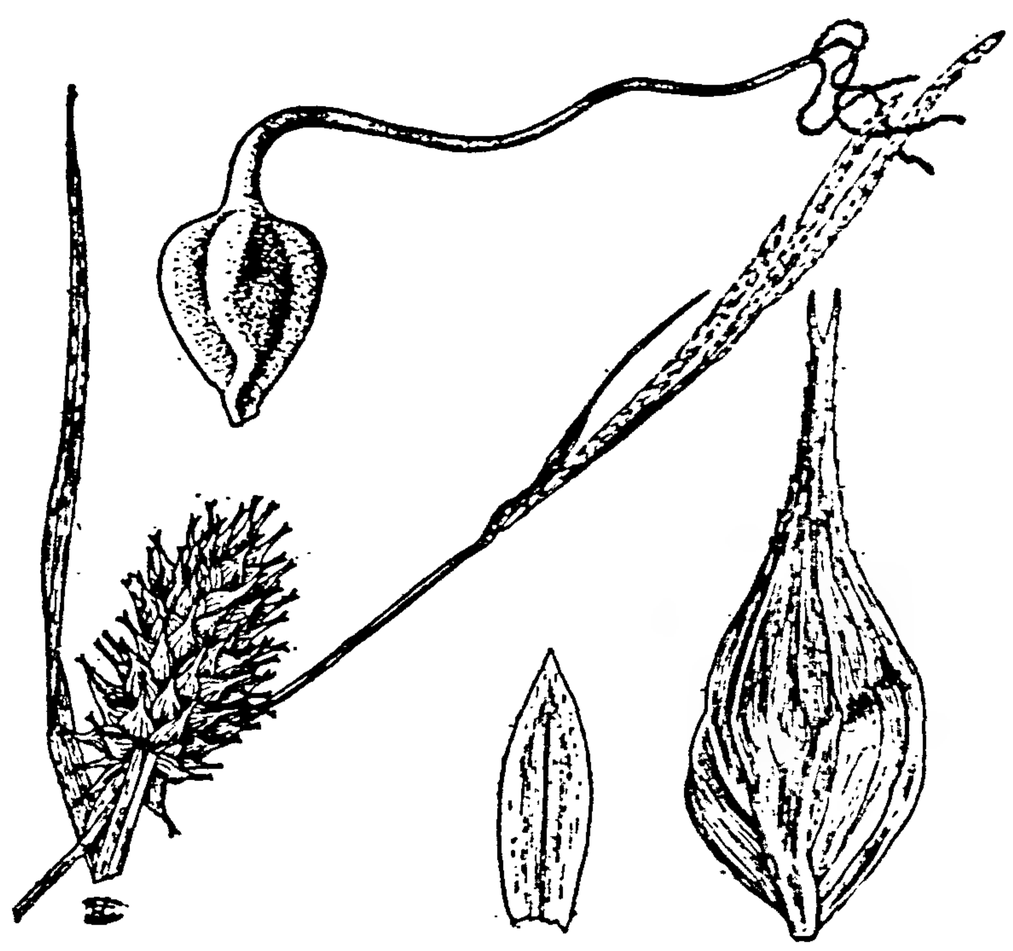


115. C. Smalliana Mackenzie. Culm 4–8 dm. tall, smooth or nearly so, somewhat fibrillose at base: leaf-blades 3.5–12 mm. wide: staminate spike short-peduncled, 2–3 cm. long: pistillate spikes 1–3, widely separate, 1.5–2.5 cm. long, 2–3 cm. wide, 8–20-flowered, the upper short- and the lower long-peduncled: bracts leaf-like: perigynium 10–14 mm. long, deep-green, or at matur-

ity yellowish-green, finely many-nerved, rounded at base, gradually tapering into the beak, the teeth 0.5–1 mm. long. [*C. folliculata australis* Bailey.]—Swamps and wet woods, in acid soils, Coastal Plain, Fla. to Tex. and S. C.—Spr.–early sum.

116. C. folliculata L. Culm 3–12 dm. tall, smooth, fibrillose at base: leaf-blades 6–16 mm. wide: staminate spike peduncled, 1–2.5 cm. long: pistillate spikes 2–5, widely separate, 1.5–2.5 cm. long, 1.5–2 cm. wide, 5–20-flowered, the upper short- and the lower long-peduncled: bracts leaf-like: perigynium 10–15 mm. long, yellowish-green, many-nerved, rounded at base, tapering into the rough beak, the teeth 1 mm. long.—Swampy woodlands, in acid soils, various provinces, N. C. and Tenn. to Mich. and Newf.—Late spr.–sum.

XXXV. VESICARIAE Tuckerm. Culm mostly tall and stout, leafy below. Leaves not hairy, septate-nodulose. Spikes 2–10, the upper 1–5 staminate, the others normally pistillate, subglobose to linear-cylindric, generally closely many-flowered, erect, short-peduncled, more or less remote. Bracts leaf-like, much exceeding the inflorescence, normally sheathless. Perigynium ascending, spreading, or even reflexed, membranaceous, smooth, from little to much inflated, suborbicular in cross-section, coarsely many-ribbed or nerveless, contracted into a beak, the beak entire or bidentate. Achene much shorter than the perigynium, triangular or lenticular, continuous with the usually tortuous style. Stigmas 3 or 2.



117. C. bullata Schk. Culm 4–10 dm. tall, sharply triangular, rough above, reddish-purple-tinged and filamentose at base: leaf-blades 2–6 mm. wide: staminate spikes 1–3, 2–4 cm. long: pistillate spikes 1–3, widely separate, oblong-cylindric, 2–5 cm. long, 12–15 mm. wide, 20–40-flowered, short-peduncled or sessile: bracts leaf-like: scales ovate, ⅓ length of perigynia, acute or obtusish: perigynium broadly ovoid, 5–9 mm. long, 3 mm. thick, firm, yellowish-green, strongly about 10-nerved, abruptly beaked, the beak more or less roughened, the slender teeth 0.5–1 mm. long.—Swampy acid meadows, Coastal Plain and New England Coast, Ga. to Me.—Sum.

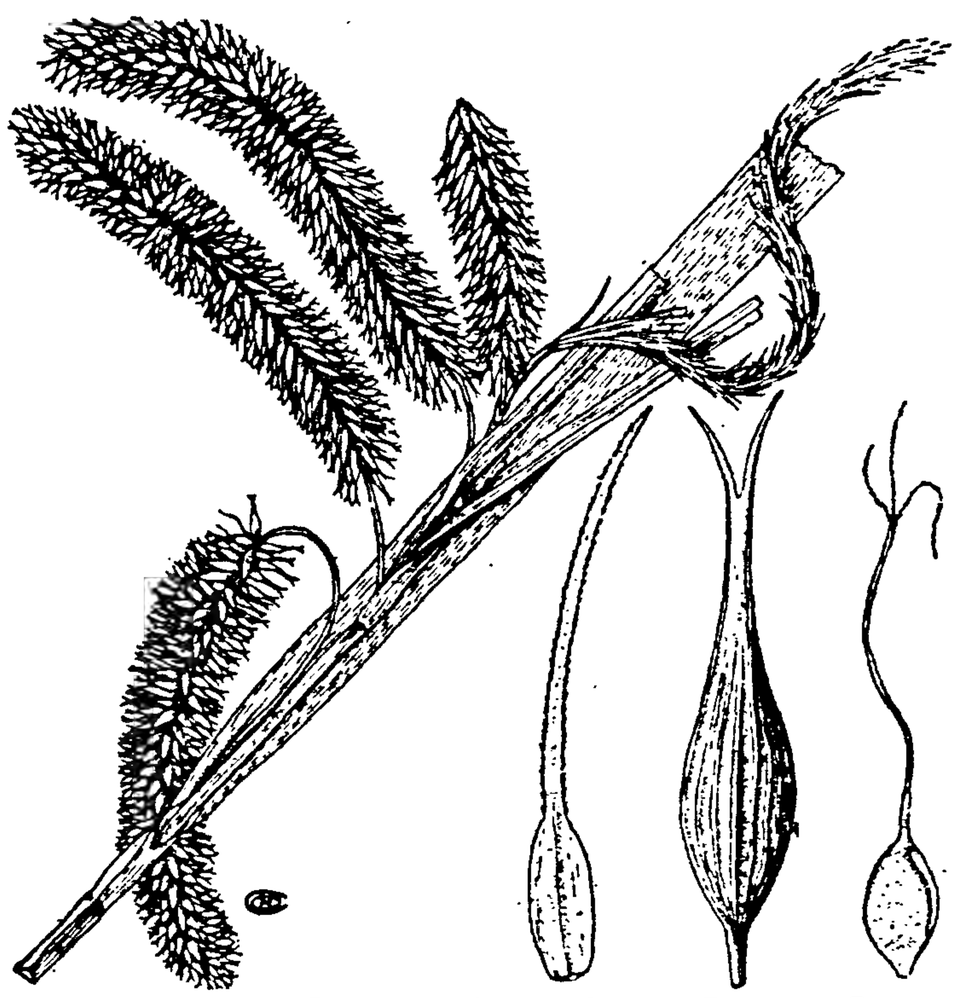
118. C. Elliottii Schw. & Torr. Culm 2.5–9 dm. tall, slender, somewhat roughened above: leaf-blades 1.5–5 mm. wide, channeled, the basal sheaths purplish: staminate spike slender-peduncled, 2–4 cm. long: pistillate spikes 2–3, the upper approximate, the lower widely separate, suborbicular, 12–18 mm. in diameter, 10–20-flowered: bracts conspicuous: scales less than half length of perigynia, ovate, obtusish or acute: perigynium ovoid, 2.5–3 mm. thick, strongly about 10-nerved, green, tapering into the slightly serrulate or smooth strongly bidentate beak, 1.5–3 mm. long.—Wet pinelands, in acid soils, Coastal Plain, Fla. to Ala. and N. C.—Spr.–early sum.

119. C. lurida Wahl. Culm 1.5–10 dm. tall, little roughened above, purplish-red at base: leaf-blades 2–7 mm. wide: staminate spike 1–7 cm. long, short- or long-peduncled: pistillate spikes 1–4, 1–7.5 cm. long, very variable in size, densely many-flowered, varying from sessile (the upper sometimes) to long-peduncled (the lower): perigynium ovoid, 6–9 mm. long, 2.5–3 mm. wide,

spreading-ascending, straw-colored, strongly about 10-nerved, tapering into the long slender smooth or roughish beak, the teeth 0.5–1 mm. long. [*Carex hystricina* (Fl. SE. U. S.) not Muhl.]—Swampy meadows and woods, apparently without any strongly marked soil preferences, various provinces, Fla. to Tex., Minn., and N. S.—(*Mex.*)—Sum.–early fall.

120. **C. Baileyi** Brit. Culm 2–7 dm. tall, slender to base, roughened above, strongly purplish-red at base: leaf-blades 2–4 mm. wide: staminate spike 1.5–3 cm. long, peduncled: pistillate spikes 1–4 cm. long, densely 20–40-flowered, sessile or peduncled: perigynium ovoid, 5–7 mm. long, 2.5 mm. wide, squarrose, straw-colored, strongly about 10-nerved, abruptly contracted into the smooth beak about length of body, the teeth 0.5 mm. long.—Swampy meadows and bogs, Blue Ridge and more northern provinces, Tenn. to Va., Vt., and N. H.—Sum.

XXXVI. PSEUDO-CYPEREAE Tuckerm. Culm tall, generally stout, acutely angled, leafy below. Leaf-blades flat, septate-nodulose. Spikes 3–9, the upper 1–3 slender, staminate, the others normally pistillate, densely flowered, the upper approximate, the lower remote and strongly peduncled, often nodding. Bracts leaf-like, much exceeding the culm, mostly not sheathing. Pistillate scales aristate. Perigynium spreading or reflexed, membranous or stiff, triangular or circular in cross-section, 3–8 mm. long, closely many-ribbed, greenish-straw-color, smooth, stipitate, contracted into a ridged, slender beak. Achene triangular, continuous with the slender often flexuous style. Stigmas 3, short.

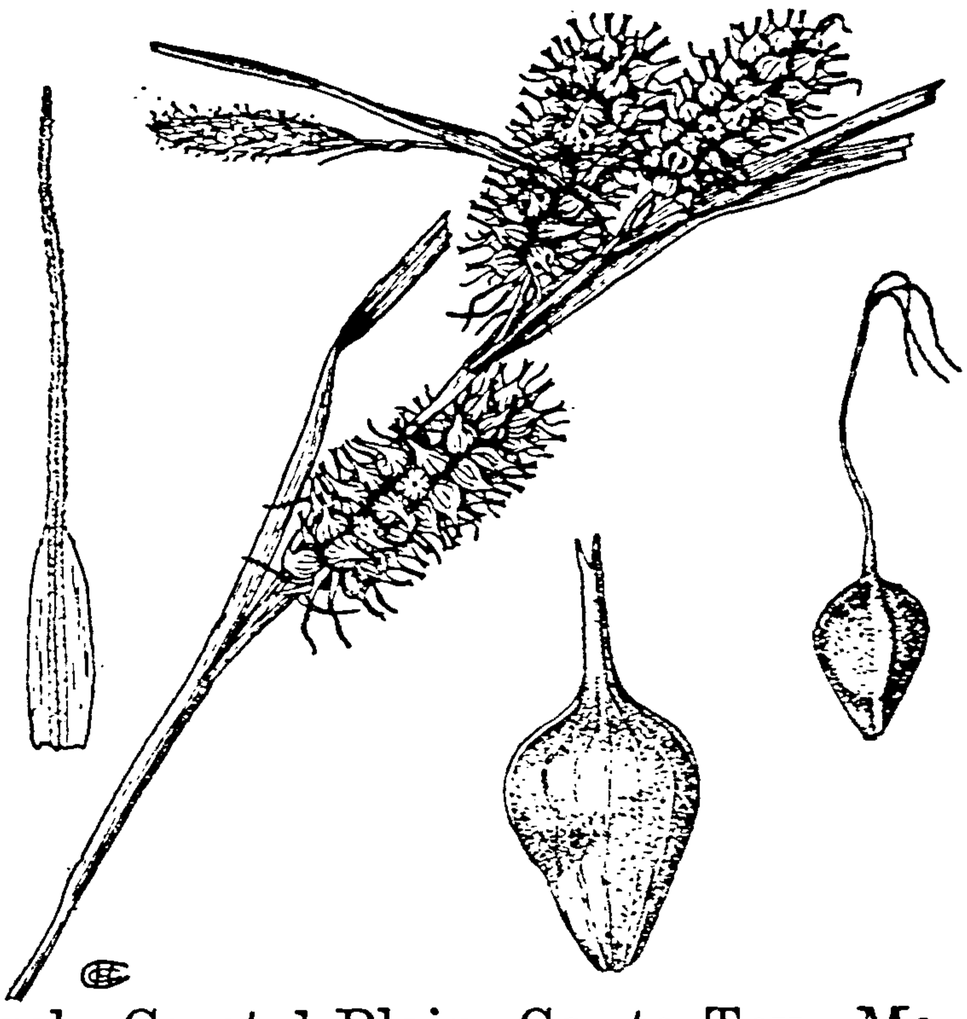


121. **C. comosa** Boott. Cespitose and not stoloniferous, the culm 5–15 dm. tall, stout, light-brownish at base, roughened above: leaf-blades 6–16 mm. wide: staminate spike slender-peduncled, the scales rough-awned: pistillate spikes 1–4, densely many-flowered, 1.5–7.5 cm. long, 12–17 mm. wide, the lower slender-peduncled and at length nodding: scales very rough-awned: perigynium rigid, greenish or brownish-tinged, reflexed when mature, 5–7 mm. long, many-ribbed, the beak smooth, the awns spreading, 1.5–2 mm. long.—(BOTTLE-BRUSH SEDGE.)—Open swamps, in calcareous or neutral soils, various provinces, Fla. to La., Minn., and Que.; also Calif. to Wash. and Ida.—Sum.

122. **C. Schweinitzii** Dewey. Culm solitary from creeping rootstocks, 2.5–7.5 dm. tall, smooth: leaf-blades 5–10 mm. wide, yellow-green: staminate spike solitary, slender peduncled: pistillate spikes 2–5, the upper approximate, narrowly cylindric, 2.5–9 cm. long, 8–14 mm. thick, many-flowered: scales rough-awned: perigynium ovoid, 5–7 mm. long, rather coarsely several-ribbed, smooth beaked.—Swamps and bogs, calcareous districts, various provinces N of Coastal Plain, Tenn. to Mo., N Mich., and Vt.—Sum.—An extremely local species.

XXXVII. SQUARROSAE Carey. Cespitose or stoloniferous. Culm leafy. Leaf-blades flat, septate-nodulose. Terminal spike staminate or gynaecandrous. Lateral spikes 1–5, pistillate or gynaecandrous, ovoid to oblong-cylindric, closely many-flowered. Bracts setaceous or leaf-like, sheathless or sheathing. Perigynium yellowish-green or greenish, obconic and depressed at apex, inflated, several-nerved, membranaceous, very abruptly truncately contracted into a

bidentate beak. Achene triangular, continuous with the flexuous style. Stigmas three, short.

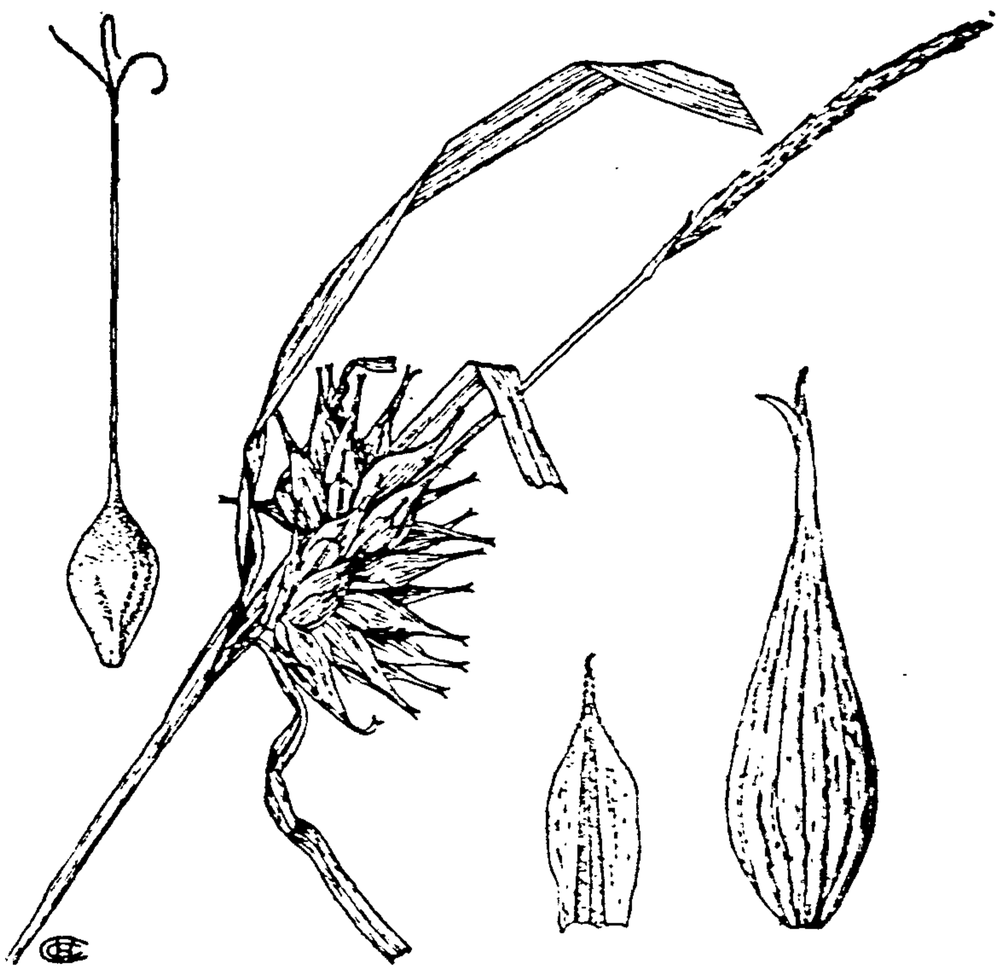


123. C. Frankii Kunth. Culm stout, very leafy, 1–8 dm. tall: leaf-blades 3–10 mm. wide: staminate spike peduncled or nearly sessile: pistillate spikes 3–7, cylindric, erect, 1–4 cm. long, 8–12 mm. thick, very densely many-flowered, the lower slender-peduncled: scales linear-subulate, very rough: perigynium squarrose, green, 4–5 mm. long, 2–2.5 mm. thick, obconic, with a depressed summit from which arises the subulate bidentate beak. [*C. stenolepis* Torr.]—Open swamps and wet meadows, in calcareous districts, various provinces, rarely Coastal Plain, Ga. to Tex., Mo., Ill., W N. Y. and S Pa.—Sum.

124. C. squarrosa L. Culm 3–9 dm. tall, slender, rough above: leaf-blades elongate, 2–6 mm. wide: spikes 1–3, usually erect, peduncled, exceedingly dense, the pistillate portion 1–3 cm. long, 15–22 mm. thick, the uppermost conspicuously staminate at base: perigynium squarrose or the lower reflexed, obovoid, 4–5 mm. long, 3 mm. thick, yellowish-green, becoming tawny, few-nerved, truncately contracted into the subulate minutely bidentate beak: achene linear-oval, 3 mm. long, flat-sided, tapering into the stout strongly flexuous style.—Swampy woods, in acid soils, various provinces, N. C. to Ark., Nebr., Mich., and Que.—Sum.

125. C. typhina Michx. Culm 3–9 dm. tall, rather stoutish, rough above: leaf-blades elongate, 3.5–10 mm. wide: spikes 1–6, usually 3, erect, peduncled, very dense, the pistillate portion 1.2–4.5 cm. long, 8–16 mm. thick, often staminate at both ends: perigynium ascending or the lower spreading or reflexed, obovoid, dull straw-colored, few-nerved, truncately contracted into the slender bidentate beak: achene obovoid, 2.5 mm. long, the sides concave, tipped with the slender style which is straight below. [*C. typhinoides* Schw.]—Rich alluvial woods, in calcareous districts, various provinces, Ga. to La. and Que.—Sum.

XXXVIII. LUPULINAE Tuckerm. Culm stout and leafy. Leaf-blades flat, strongly septate-nodulose. Upper 1–3 spikes staminate, linear. Lateral spikes 1–5, pistillate, or staminate at apex, densely several–many-flowered. Bracts sheathless or lowest more or less sheathing. Perigynium large, 10–20 mm. long, green, ovoid, strongly ribbed or nerved, membranaceous or subcoriaceous, tapering to the deeply bidentate beak. Achene triangular, continuous with the style. Stigmas 3, short.



126. C. intumescens Rudge. Cespitose, the culm 3–10 dm. tall, slender, reddish-purple at base; leaf-blades elongate, dull-green: staminate spike usually long-peduncled: pistillate spikes 1–3,

sessile or short-peduncled: perigynium spreading or upper ones erect, 10–17 mm. long, 3.5–8 mm. thick, many-nerved, contracted into the subulate bidentate beak, the teeth nearly erect.—Swampy woods in acid soils, various provinces, Fla. to Tex., Man., and Newf.—Spr.–fall.

127. **C. Asa-Grayi** Bailey. Cespitose, the culm 3–10 dm. tall, rather stout, strongly reddish-purple at base: leaf-blades elongate, light-green: staminate spike usually long-peduncled: pistillate spikes 1–2, sessile or short-peduncled: perigynium spreading, 12–18 mm. long, 6–7 mm. thick, glabrous or hispidulous, many-nerved, contracted into the subulate bidentate beak, the teeth somewhat spreading or erect.—Rich alluvial woods in calcareous districts, various provinces, Ga. to Mo., Mich., and Que.—Sum.

128. **C. louisianica** Bailey. Culm 2–6 dm. tall, slender, smooth or nearly so: staminate spike solitary, long-peduncled: pistillate spikes 1–4, about 2–3.5 cm. long, 1.5–2.5 cm. thick, the lower slender-peduncled: scales ovate or lanceolate, half length of perigynia, sharp-pointed: perigynium ovoid, 10–13 mm. long, 4–6 mm. thick, smooth, strongly-nerved, contracted into the long bidentate beak, the teeth mostly slightly spreading.—Swampy woods, in acid soils, Coastal Plain and rarely adj. provinces, Fla. to Tex., W Mo., Ind. and N. J.—Sum.

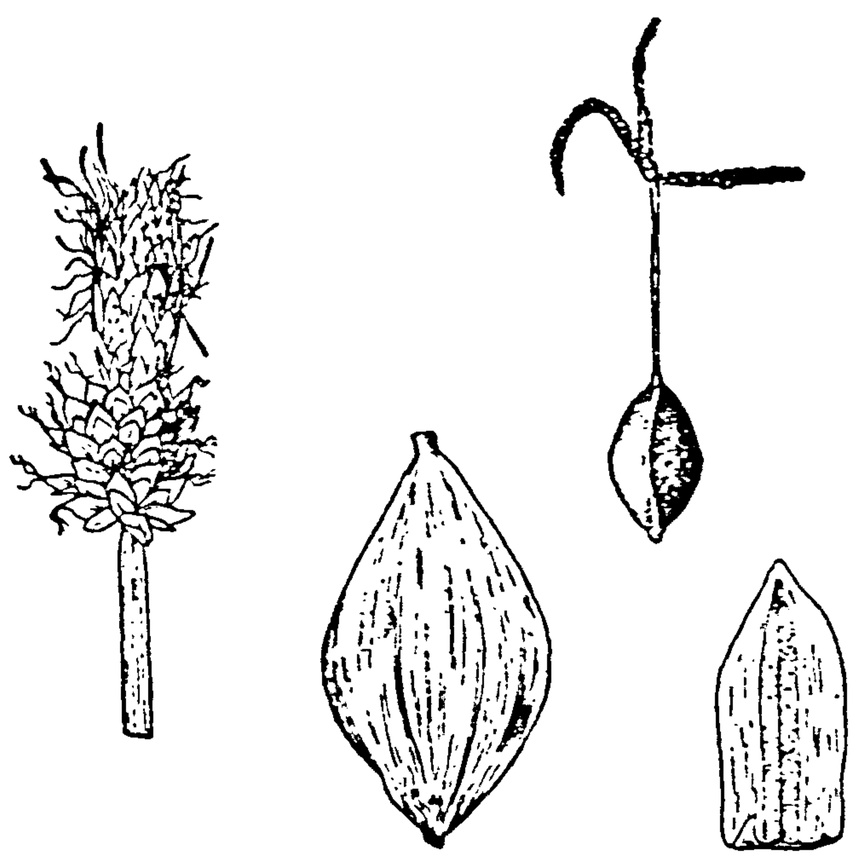
129. **C. lupulina** Muhl. Culm 3–12 dm. tall, stout, smooth: staminate spike solitary, nearly sessile to long-peduncled, 2–10 cm. long; pistillate spikes 2–5, 2–8 cm. long, 2–3.5 cm. thick, densely many-flowered: scales lanceolate, much shorter than perigynia; perigynium lanceolate-ovoid, 10–20 mm. long, 4–7 mm. thick, many-nerved, contracted into the subulate bidentate beak, the teeth more or less spreading.—(Hop-sedge.)—Swamps, various provinces, Fla. to Tex., Ia., Minn., Que., and N. B.—Sum.

130. **C. gigantea** Rudge. Culm 4–10 dm. tall, smooth: leaf-blades 7–16 mm. wide: staminate spikes 1–3, sessile or peduncled: pistillate spikes 2–5, peduncled or the upper sessile, 2–8 cm. long, 2.5–3 cm. thick, densely many-flowered: scales lanceolate, ¼–⅓ length of perigynia, acuminate or awned: perigynium lanceolate, much swollen at base, 12–18 mm. long, 4–6 mm. thick, many-nerved, contracted into the very long subulate beak, the teeth more or less spreading.—Open swamps in acid soils, Coastal Plain and adj. provinces, Fla. to Tex., Mo., Ky., and Del.—Sum.

The following species included in Fl. SE. U. S. have been omitted because no evidence has been found that they occur within our area: *Carex trichocarpa* Muhl., *C. hystricina* Muhl., *C. vestita* Willd., "*C. filiformis* L" (*C. lasiocarpa* Ehrh.), *C. hirta* L., *C. gracillima* Schw., *C. polymorpha* Muhl., *C. Sartwellii* Dewey, *C. interior* Bailey, *C. hormathodes* Fernald (*C. tenera* authors); and the following have been omitted because found only in territory covered by above mentioned Flora, but not by this: *Carex planostachys* Kunze, *C. filifolia* Nutt., "*C. gravida* Bailey," *C. Brittoniana* Bailey, *C. hyalina* Boott, *C. Bicknellii* Britton.

22. **CYMOPHYLLUS** Mackenzie. Perennial sedge with short rootstocks and culms flattened in drying. Culms with four to six overlapping striate bladeless sheaths and after flowering developing one large blade-bearing leaf without sheath, ligule, or midrib, and with undulate margins appearing minutely serrulate. Spike one, bractless, androgynous, the flowers monoecious,

solitary in the axils of the scales. Perianth none. Staminate flower of three stamens, the filaments filiform. Pistillate flower of a single pistil, with ovary, style, and three or very rarely four stigmas enveloped by a bladder-like perigynium. Achene triangular. Racheola often developed.



1. C. Fraseri (Andr.) Mackenzie. Culm smocth, weak, 1.5–4.5 dm. tall: leaf-blade 1.5–6 dm. long, 2.5–5 cm. wide, flat, firm, finely many-ribbed: spikes 1.2–2.5 cm. long, the pistillate portion dense, nearly 1 cm. thick: scales broadly ovate, much shorter than perigynium, obtuse to acute: perigynium elliptic-ovoid, milk-white, 5–6 mm. long, 2.25–2.5 mm. thick, thin, faintly nerved, tipped with a short nearly truncate beak. [*Carex Fraseri* Andre.]—(LILY-LEAF SEDGE.)—Rich woods, Appalachian provinces, S. C. to Tenn., W. Va., and S Va.—Late spr.–sum.—The phylogenetic position of this plant is very obscure. It has no near relatives.

ORDER **ARECALES** — ARECAL ORDER

Shrubs or trees, typically with a single terminal bud, but the stem sometimes branching, the branches erect or diffuse. Leaves aggregated at the end of the stem: blades plaited, pinnate, or flabellate. Flowers perfect, polygamous, or dioecious, on axillary compound spadices. Perianth of 6 fleshy members in 2 series. Androecium of 6, or 9–12 stamens. Gynoecium of 3 distinct or united carpels. Fruit drupaceous or baccate.

FAMILY 1. **ARECACEAE** — PALM FAMILY

Stem, and branches, with a crown of leaves. Leaf-blades flabellate or pseudoflabellate and plaited, or pinnate, the segments induplicate or reduplicate, long-petioled. Inflorescence at first included in a large bract (spathe), from which it ultimately protrudes, borne in the crown of leaves or on the stem below it, the usually copious branching of the spadix most evident in fruit. Perianth white, yellowish, or greenish.—About 150 genera and 1,200 species, most abundant in the tropics.

Leaves with pinnate blades, the divisions often separated, sometimes clustered.	I. PINNATAE.
Leaves with simple lobed blades.	
Leaf-blades with partial midrib and partly pinnately veined and lobed, thus pinnately flabellate.	II. PINNATIPALMATAE.
Leaf-blades without midrib, palmately veined and lobed, thus flabellate.	III. PALMATAE.

I. PINNATAE

Carpels 3, united, or sometimes 1 or 2 by abortion: seed short and thick, not grooved on one side: leaf-segment reduplicate.

Leaves with short bases: spadices protruding from the crown of leaves: drupe orange-scarlet or green.
Stamens included: drupe 3-angled, with the style, or stigmas, terminal: seed hollow. 1. Cocos.
Stamens exserted: drupe globular or 2- or 3-lobed, with the style, or stigmas, nearly basal: seed solid. 2. Pseudophoenix.
Leaves with long sheathing bases clothing the upper part of the trunk: spadices borne on the trunk far below the crown of leaves: drupe violet-purple. 3. Roystonea.
Carpels 3, distinct: seed long and narrow, grooved on one side: leaf-segments induplicate. 4. Phoenix.

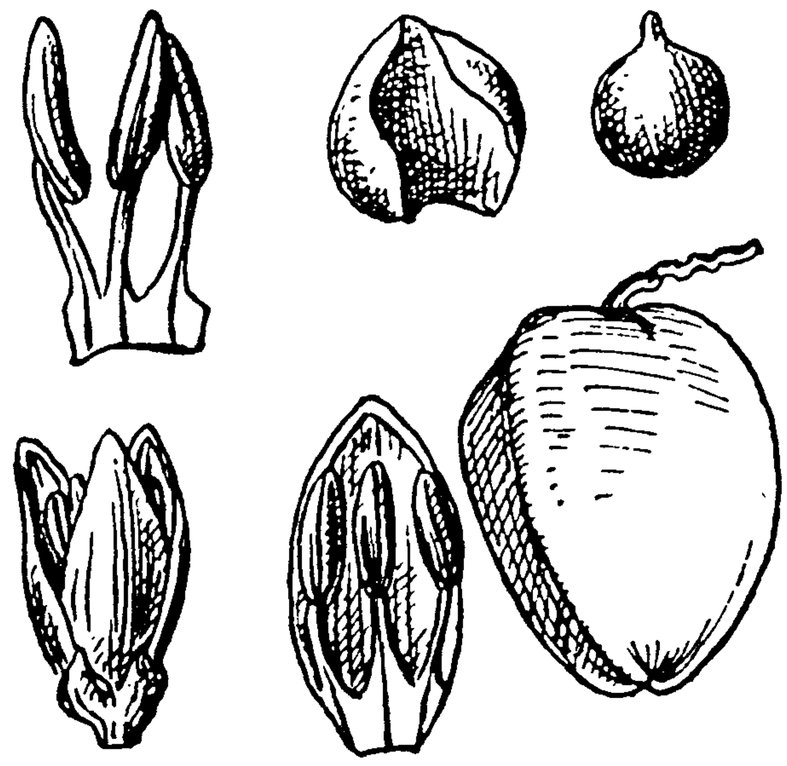
II. Pinnatipalmatae

Plants with subterranean or erect stems: leaf-blades fan-like, but with the midrib running up into the blade. 5. Sabal.

III. Palmatae

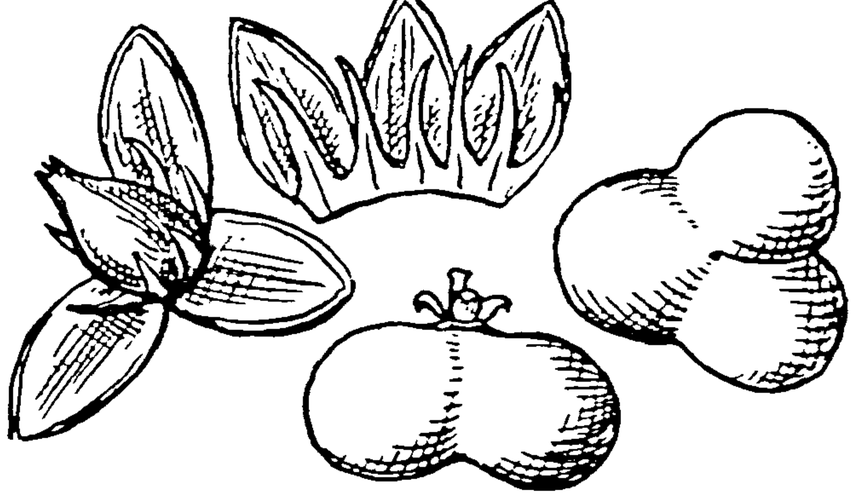
Leaves with unarmed sheaths: flowers perfect: petals valvate: style present: drupe glabrous.
Calyx and corolla united into a 6-lobed or truncate perianth, or obsolete.
Drupe with white flesh: endosperm even: spadix elongate in flower and fruit. 6. Thrinax.
Drupe with dark flesh: endosperm ruminate: spadix permanently very short. 7. Coccothrinax.
Calyx and corolla distinct and manifestly in 2 series.
Anthers elongate: seed elongate. 8. Serenoa.
Anthers didymous: seed depressed. 9. Paurotis.
Leaves with armed sheaths: flowers polygamo-dioecious: petals imbricate: styles wanting: drupe pubescent. 10. Rhapidophyllum.

1. COCOS L. Unarmed trees, except for some long needle-like structures mostly hidden in the leaf-sheath. Leaves spreading in all directions: blades pinnate. Spadix ultimately drooping, relatively short. Sepals and petals of the staminate flowers valvate, those of the pistillate flowers imbricate, much enlarged and persistent on the fruit. Drupe 3-angled, with a fibrous pericarp and a hard endocarp, the endosperm with a large cavity which contains a fluid.—A single species, the following, now widely distributed in tropical regions.



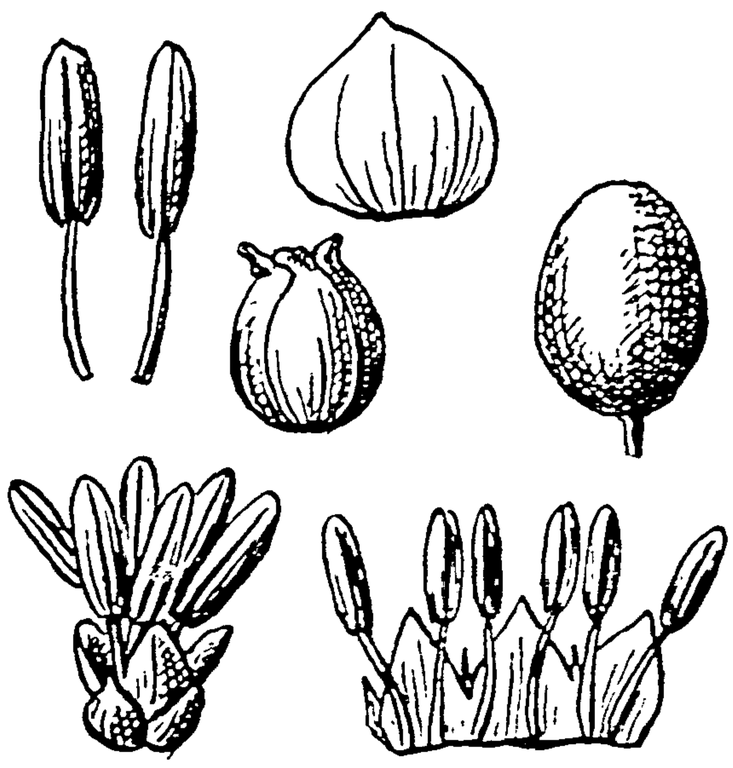
1. C. nucifera L. Stately tree up to 30 m. tall, the trunk often with a conspicuously swollen inclined or decumbent base: leaf-blades 3–7 m. long, the numerous segments 5–10 dm. long: perianth of the staminate flower fully 1 cm. long, that of the pistillate larger: drupe oval or ovoid, 2–3 dm. long, green or brown, sessile: endosperm enclosing a watery juice which later turns milky.—(Coconut. Coco-palm.)—Shores and shore hammocks, pen. Fla. and the Keys. Nat. of the Malayan or Indo-Pacific region.—(*W. I., Mex., C. A., S. A., O. W. trop.*)—The coconut-palm produces flower-stalks at frequent intervals, thus flowers and several generations of fruits are borne on a tree at one time. Approximately nine months are required to mature a coconut. May have been native on the Fla. Keys, but most of the present representatives were planted or are the descendants of planted trees. Now grown commercially in Fla., but only to supply the demand for horticultural purposes.

2. **PSEUDOPHOENIX** H. Wendl. Unarmed trees, the trunk rather smooth and conspicuously banded. Leaves spreading: blades pinnate: petioles concave throughout. Spadix spreading during anthesis, elongate, with stiff-spreading branches. Petals valvate, persistent. Drupe pedicelled, globular or 2- or 3-lobed.—Only the following species known.



1. P. vinifera (Mart.) Becc. Tree up to 8 m. tall, the trunk often slightly fusiform: leaf-blades 1–1.5 m. long, the larger segments 4–4.5 dm. long: perianth about 1 cm. wide: petals oblong to oval, yellowish, reflexed in age: drupe globular, or 2- or 3-lobed, 11–14 mm. long, orange-scarlet. [*P. Sargentii* H. Wendl.]—(SARGENT'S-PALM. BUCANEER-PALM. HOG CABBAGE-PALM. DATELET. DUMMY-DATE.)—Dry hammocks, upper Fla. Keys.—(*W. I.*)—Spr.—Plants slow-growing. Found only on Sand's Key, Elliott's Key, and Long Key, as solitary specimens or few individuals together. The colony of several hundred individuals on Long Key, where this palm was discovered in Fla. nearly a half century ago, has been destroyed by vandals who have removed the trees and sold them as royal-palms.

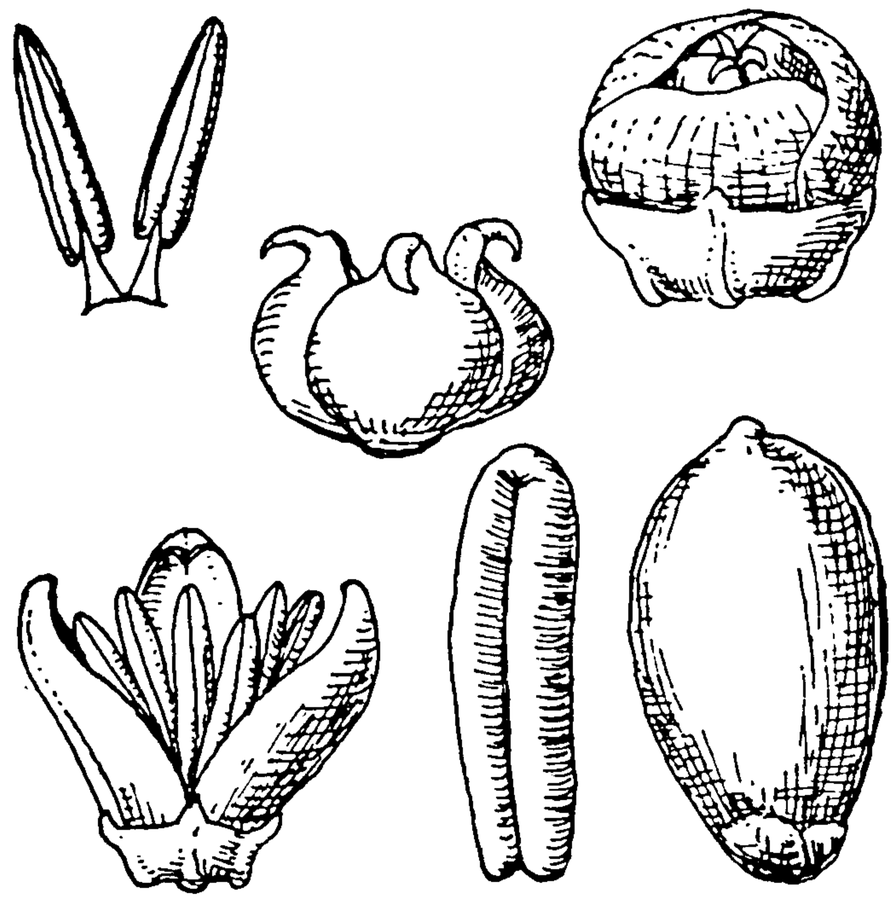
3. **ROYSTONEA** O. F. Cook. Unarmed trees, the trunk gray, concrete-like, not conspicuously banded. Leaves spreading: blades pinnate: petiole nearly terete above. Spadix drooping, short, with numerous pendulous branches. Petals valvate, deciduous. Drupe sessile, not lobed, short.—About six species, natives of tropical America.



1. R. regia (H. B. K.) O. F. Cook. Stately tree up to 40 m. tall, the pale, smooth trunk often fusiform: leaf-blades 2.5–3.5 m. long, the larger segments 7–9 dm. long: perianth of the staminate flowers 6–7 mm. long, that of the pistillate barely ½ as large: drupe oval or globose-oval, 12–14 mm. long, violet-blue. [*Oredoxa regia* H. B. K., *R. floridana* O. F. Cook.]—(ROYAL-PALM.)—Low hammocks, mostly in the Everglades, Cape Sable region and Big Cypress, S pen. Fla.—(*W. I.*)—Spr.—Plants fast-growing. Now confined to limited areas in S Fla., the royal-palm once grew on the St. John's R. near Lake George. Apparently a vanishing type in Fla. The fruits which are borne in great masses were an aboriginal food. Much planted as an ornamental.

4. **PHOENIX** L. Shrubs or trees, the stems rough but unarmed. Leaves in a dense crown, recurved-spreading: petioles short: blades pinnate, the divisions numerous. Spadix erect, or ultimately drooping, arising from the leaf-axils, fastigiately branched. Flowers dioecious, the staminate ones larger than

the pistillate. Calyx cup-like, shallowly 3-lobed, the lobes broad. Petals 3, much longer than the calyx. Stamens mostly 6: anthers narrow. Carpels 3, distinct. Berry terete, with a fleshy pericarp, yellow, orange, brown, or black.—About a dozen species, mostly natives of tropical Asia.



1. P. dactylifera L. Stem stout, irregularly roughened by the persistent leaf-blades: leaves numerous, spreading, the lower part of the rachis spiny; divisions stiff, the larger ones about the middle of the rachis, pale green: spadix spreading and drooping, much shorter than the leaves: petals of the staminate flowers ovate, several times longer than the calyx: petals of the pistillate flowers reniform, about twice as long as the calyx: drupe ellipsoid or cylindric, 30–40 mm. long, orange-brown.—(DATE-PALM.)—Hammocks, coastal dunes, and about dwellings, S Fla.—Nat. of N Afr. and Arabia.—Spr.—A food-plant of the first importance, especially in desert countries. Grown as an ornamental.

5. **SABAL** Adans. Unarmed shrubs, with horizontal or contorted rootstocks, or trees. Leaves upright or spreading: blades flabellate, glabrous. Spadix upright in anthesis, or spreading. Stamens equal or nearly so: filaments narrow. Drupe globose, spheroidal, or obovoid, the seed usually depressed.—Spr.–sum.—PALMETTOS. CABBAGE-TREES.—About 18 species, natives of southeastern United States, the West Indies, and continental tropical America.

Leaf-blade flat, the segments not filiferous, the midrib short or only partly developed into the blade, the ligule short and rounded or ovate: spadix erect or ascending, the inflorescence slender and more or less interrupted: anthers ovoid. (Subgenus EUSABAL.) — I. MINORES.

Leaf-blades recurved and with the sides more or less folded along the stout midrib which extends nearly or quite through the blade except in *S. Jamesiana*, the segments filiferous, the ligule lanceolate: spadix spreading or drooping, the inflorescence thick, dense, and continuous: anthers ellipsoid. (Subgenus INODES.) — II. PALMETTONES.

I. MINORES

Stem (rootstock) subterranean: leaves in a crown arising from the ground: petals ellipsoid. — 1. *S. minor.*

Stem erect: leaves in a crown terminating a stout trunk: petals suborbicular. — 2. *S. Deeringiana.*

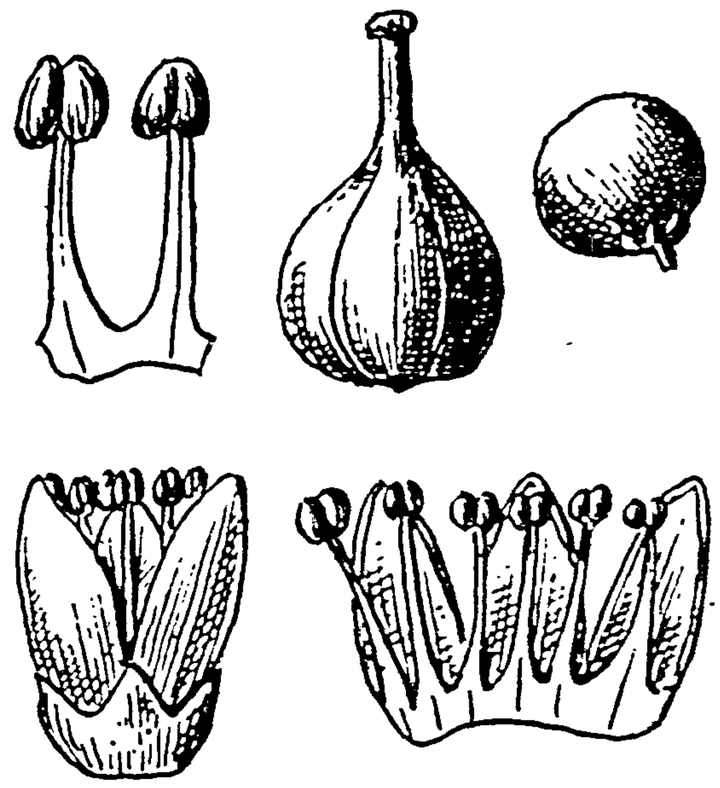
II. PALMETTONES

Stem (rootstock) subterranean, short, S-shaped or more or less spiral: drupe subglobose or depressed, mostly over 1.5 cm. in diameter. — 3. *S. Etonia.*

Stem erect, up to 20 m. tall or more: drupe subglobose, mostly less than 1 cm. in diameter.

Leaf-blades recurved, often strongly so, with the sides more or less strongly folded along the midrib; the segments stiff, longer than the undivided part of the blade, copiously filiferous. — 4. *S. Palmetto.*

Leaf-blades straight, flat, the segments limber, shorter than the undivided part of the blade, sparingly filiferous. — 5. *S. Jamesiana.*



1. S. minor (Jacq.) Pers. Rootstock straight or merely curved: leaf-blades glaucous or pale-green, the segments sparingly if at all filiferous, the midrib very short: spadix narrowly branched at long intervals, 1–2 m. long, erect or ascending at maturity: petals about 2 mm. long: drupes 6–8 mm. in diameter: seeds 5–6 mm. broad. [*S. Adansonii* Guerns. *S. glabra* Sarg.]—(DWARF-PALMETTO. BLUE-STEM.)—Hammocks, swampy or sometimes rocky, often along streams, Coastal Plain and rarely adj. provinces, Fla. to Tex., Ark., and N. C.—More frequently browsed by cattle than any other palm.

2. S. Deeringiana Small. Tree up to 8 m. tall: leaves spreading in all directions, up to 3 m. long: blades suborbicular, deep-green, the segments filiferous, the midrib extending ⅓ to ½ the length of the blade: spadix elongate, up to 5 m. long: petals fully 2 mm. long: drupes 10–13 mm. in diameter: seeds 8–9 mm. broad.—(DELTA-PALMETTO. PALMETTO-WITH-A-STEM.)—Flat alluvial places, along the lower Mississippi River, bayous, and lakes, S La.

3. S. Etonia Swingle. Rootstock S-shaped and more or less spiral: leaves erect or ascending, deep-green, copiously filiferous: spadix closely branched, 5–8 dm. long, often prostrate at maturity: petals 3–3.5 mm. long: drupes 15–20 mm. in diameter: seeds 10–13 mm. broad. [*S. Adansonii* ? *megacarpa* Chapm. ?]—(SCRUB-PALMETTO. SCRUB-CABBAGE.)—Dry pinelands and scrub, pen. Fla.—The leaves are usually less than half as large as those of the following species, as well as relatively shorter-petioled. The bud is eaten like cabbage. The stem is sometimes so strongly spiral that the plant is known as CORKSCREW-PALM.

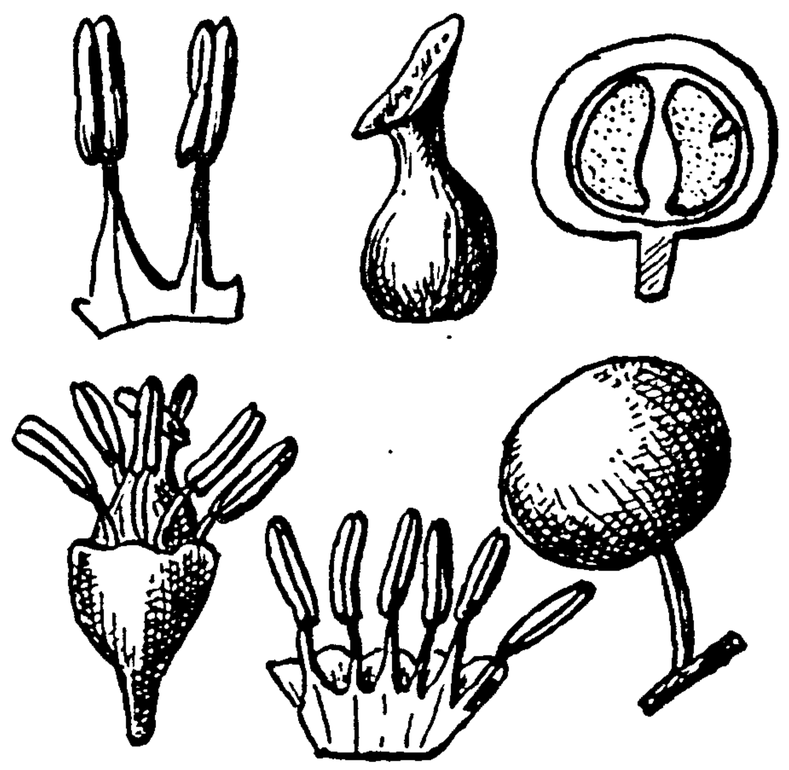
4. S. Palmetto (Walt.) Todd. Tree up to 20 m. tall: leaves spreading in all directions, 2–3 m. long; blades often wider than long: spadix 1–2 m. long or less, the ultimate branches slender: calyx-lobes deltoid: petals about 3 mm. long: drupes subglobose, 5–9 mm. in diameter: seed somewhat depressed, less than 8 mm. broad.—(CABBAGE-TREE. CABBAGE-PALMETTO. CABBAGE-PALM.)—Prairies, marshes, pinelands, and hammocks, Coastal Plain, Fla. to islands off the coast of N. C.—(*W. I.*)—Almost ubiquitous in pen. Fla. where it grows not only in wet and dry places, but in all kinds of soil and in fresh, sulphur, and salt waters. Rare on the upper Florida Keys: abundant on some of the lower keys. The fruits were an aboriginal food. The Seminoles use it almost exclusively in the structures comprising their villages. The trunks are used for piling. The young part of the bud is used as food, while the unfolded leaf-blades are gathered at Easter time and distributed by religious organizations as amulets. Within and near its range much planted as an ornamental. The plant of the Everglade Keys has been described as *Inodes Swartzii* O. F. Cook, but does not appear to be distinct. The exact position in the genus of *S. Adansonii* ? *megacarpa* as cited above, is uncertain. It is not a true *Sabal*, but a cabbage. We have not yet been able to decide whether it is conspecific with *S. Etonia* or merely a juvenile condition of *S. Palmetto*.

5. S. Jamesiana Small. Tree up to 5 m. tall, the stout, often inclined trunk usually 1–3 m. tall, usually clothed with the persistent leaf-bases: leaves loosely spreading in all directions, mostly 2–4 m. long; blades longer than wide, mostly 1–1.5 mm. long, flat, the very numerous (70–100) segments much shorter than the undivided part of the blade, sparingly filiferous: spadix about 1 m. long: drupes depressed, about 1 cm. in diameter: seed 7.5–8.5 mm. broad, much depressed.—High hammocks, Everglade Keys, S pen. Fla.

6. **THRINAX** L. Unarmed trees. Leaves with flabellate blades pale or silvery scurfy beneath, and smooth petioles; the leaf-segments rather stiff: spadix relatively long, often decidedly elongate, erect or ascending in anthesis, the branches borne at intervals on a long spadix. Stamens mostly 6: filaments united at the base. Style concave or flat. Drupe ivory-white.—About 12 species of tropical America.—THATCH-PALMS. REEF-THATCHES.

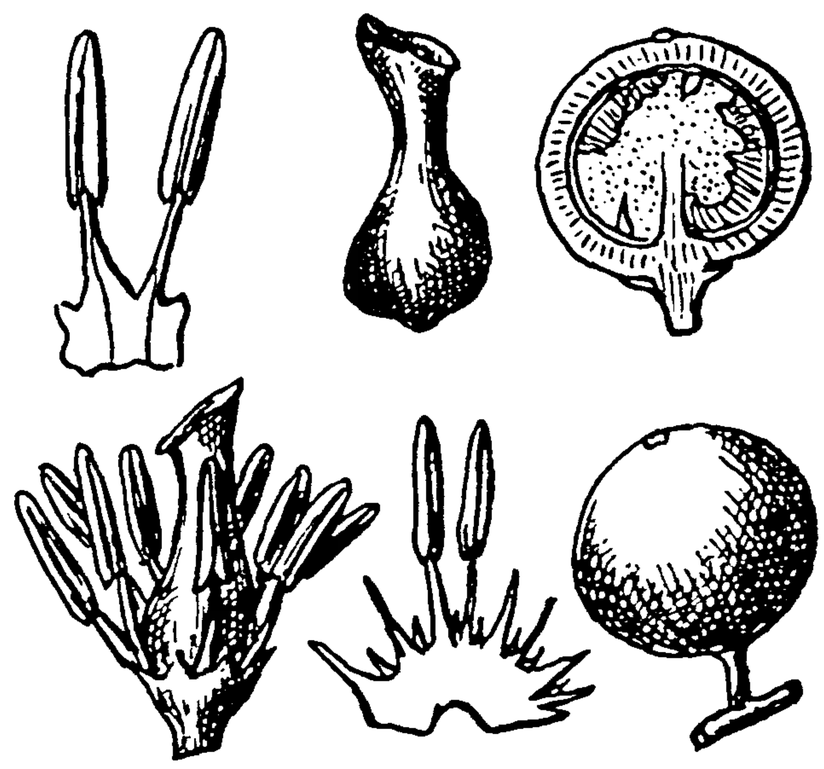
Flowers, and fruits, on slender pedicels: sepals and petals united into an obscurely lobed or truncate cup: filaments subulate. 1. *T. parviflora.*
Flowers, and fruits, on stout disk-like pedicels: sepals and petals partly united, the lobes acute: filaments nearly triangular. 2. *T. microcarpa.*

1. T. parviflora Sw. Slender tree up to 9 m. tall: leaves with relatively short stiff petioles; blades mostly 9–13 dm. wide, yellowish-green above: pedicels 3–4 mm. long: drupe 8–12 mm. in diameter, with thick flesh. [*T. floridana* Sarg.]—(FLORIDA THATCH-PALM.)—Hammocks and sandy shores, pen. Fla. and the Keys.—(*W. I.*)—Spr.—First detected in Florida on Cape Romano, but now extinct there. Occasional in the coastal hammocks on the lower eastern coast, where migratory birds have carried seeds northward of its usual range. The trunks of this and of the following species are used where light piling is needed. The leaves are gathered in great quantities, treated and made into artificial house palms for northern latitudes. Plants sometimes referred to the Cuban *T. Wendlandiana* seem to belong here.



2. T. microcarpa Sarg. Stout tree up to 10 m. tall: leaves with long pliable petioles; blades 10 dm. wide or more, usually pale-green above: pedicels mere disks: drupe 3–6 mm. in diameter, with thin flesh.—(BRITTLE-THATCH.)—Pinelands, hammocks, and sandy shores, S pen. Fla. and the Keys.—(*W. I.*)—Spr.—The status of *T. keyensis* Sarg. (KEY-THATCH) is doubtful. The assigned diagnostic characters—the elongate spadices and large (5–6 mm.) fruits—together with a hammock habitat, may, upon further study, prove it to be entitled to specific rank.

7. **COCCOTHRINAX** Sarg. Unarmed shrubs or trees. Leaves with flabellate blades silvery or pale-scurfy beneath, and smooth petioles; the leaf-segments pliable and somewhat drooping. Spadix relatively short, nodding, the branches congested on a short spadix. Stamens mostly 9: filaments distinct or nearly so. Style funnelform. Drupe black or purple-black—About 10 species, West Indian.

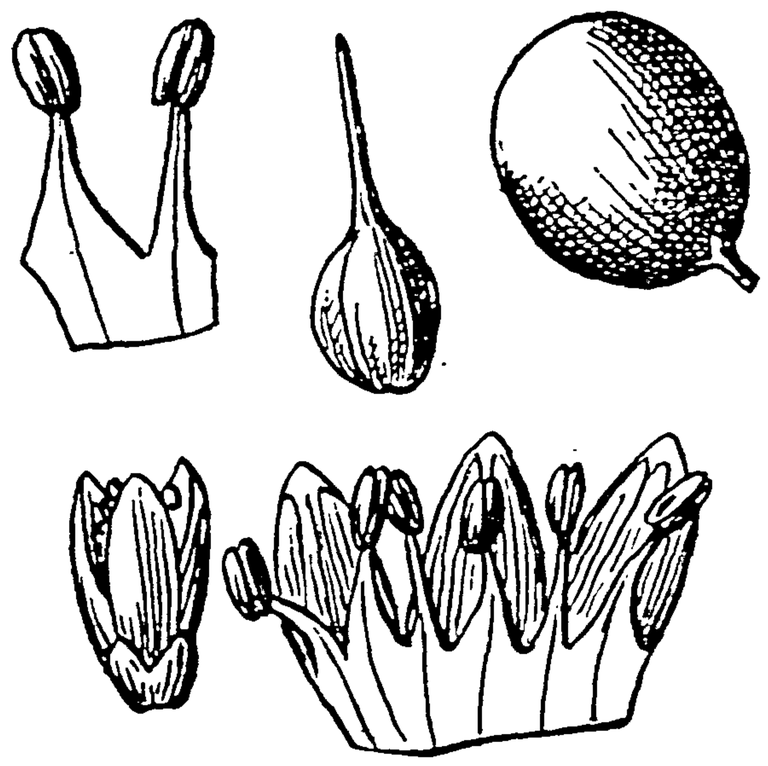


1. C. argentea (Lodd.) Sarg. Shrub or small tree up to 8 m. tall: leaf-blades 2–8 dm. broad, with the ligule 1–1.5 cm. broad: spadix 2–4 dm. long: mature pedicels 1–2 mm. long: drupe 7–10 mm. thick. [*Thrinax argentea* Lodd. *C. jucunda* Sarg.]—(SILVER-PALM. BISCAYNE-PALM.)—Rocky pinelands or rarely in hammocks, Everglade Keys and Cape Sable, Fla. and Florida Keys.—(*W. I.*)—Spr., or other seasons following forest fires.—*C. Garberi*

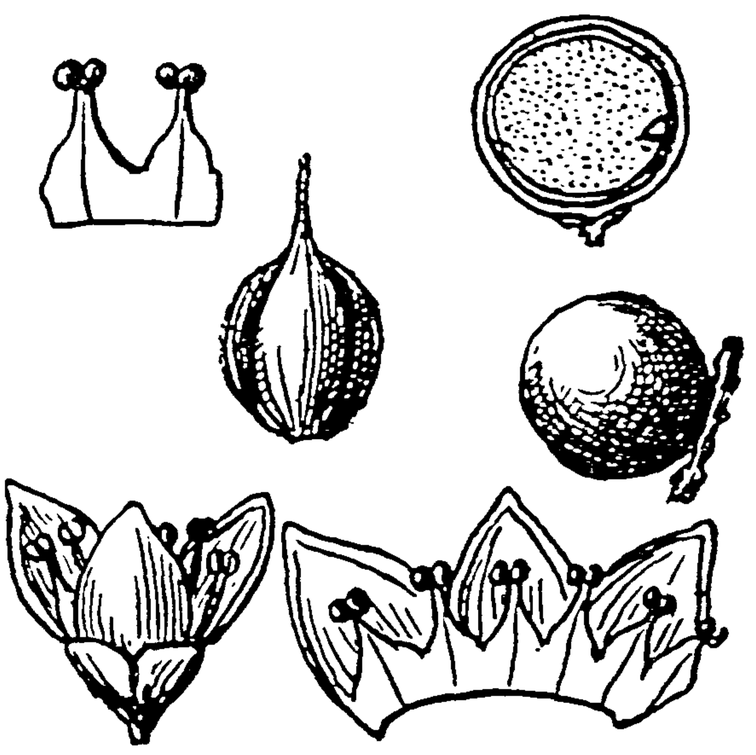
(Chapm.) Sarg. is a stunted form at the northern end of its natural range, near Miami. The most graceful of our smaller palms. On the mainland confined to the Cape Sable region, the Everglade Keys, and to the lower coastal dunes where seeds have been carried by migratory birds.

8. **SERENOA** Hook. Armed shrubs or trees. Leaves upright or spreading: blades flabellate, cordate at the base: petioles armed with short recurved spines along their edges. Stamens unequal, those opposite the petals with the broader filaments. Drupe and seed ellipsoid or oval.—One species.

1. **S. repens** (Bartr.) Small. Shrub with simple or branched stems, or a tree, the trunk 7 m. tall or less, or usually horizontal: leaf-blades suborbicular, green or glaucous, 3–8 dm. broad, cordate at the base; petioles with firm spines: petals 4–4.5 mm. long: drupe 15–25 mm. long. [*S. serrulata* (Michx.) Hook.]—(SAW-PALMETTO.)—Hammocks, pinelands, scrub, sand-dunes, and savannahs, Coastal Plain, Fla. to La. and S. C.—Spr.—This palm occupies a large range of habitats. Along the eastern coast of Florida and in the scrub, the foliage is usually glaucous, but in other localities it is green. Plants vary greatly in size. The stem is normally creeping and copiously rooted along the under side. Sometimes, however, single plants or colonies have oblique to erect stems rooted only at the base. Contrary to the habit of most of our palms, the stems are frequently much-branched. The fruits were an important aboriginal food. They are used in medicine. The stems are a source of tannic-acid extract. The flowers are an important source of honey. The deep-red fibrous sheaths at the bases of the petioles are noticeable only when the bud is pulled apart.



9. **PAUROTIS** O. F. Cook. Armed shrubs or trees. Leaves spreading: blades flabellate: petioles with mostly upcurved spines. Spadix elongate, projecting beyond the leaves, with separated branches. Stamens equal or essentially so, the filaments broad. Stigmas terminal. Drupe globular, glabrous. Seed depressed. [*Acoeloraphe* H. Wendl.]—One species.

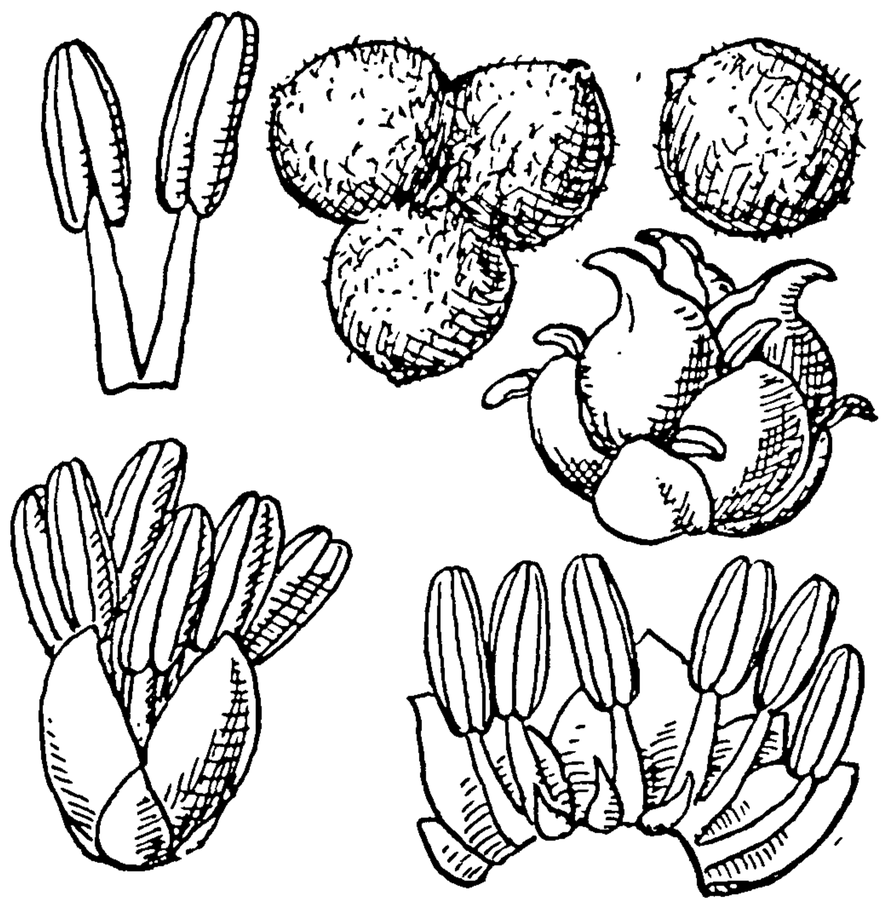


1. **P. Wrightii** (Griseb.) Britton. Shrub with many stems, or a tree, the trunks rarely solitary or several, or very many together, up to 12 m. tall or less: leaf-blades half-orbicular or orbicular, 5–10 dm. broad, sometimes truncate at the base, the segments slenderly attenuate; petioles with flat orange spines: petals about 1 mm. long: drupe 8–10 mm. thick. [*Serenoa arborescens* Sarg.]—(SAW-CABBAGE-PALM. CUBAN-PALM.)—Hammocks and low savannahs, Big Cypress and S Everglades, Fla.—(*W. I.*)—Spr.—Differs from our other palms in the extensive underground stem-system which supports a colony of tall slender often closely placed erect branches. The panicles of maturing red

fruits are very conspicuous, suggesting tongues of flame extending out from tne crown of leaves.

10. **RHAPIDOPHYLLUM** H. Wendl. & Drude. Armed shrubs. Leaves upright: blades flabellate, silvery beneath, the lobes without marginal fibers: petioles rough-edged, with sheaths of interwoven spines and fibers. Spadix erect, slightly exserted from the imbricate involucre. Staminate flowers about half as large as the pistillate. Stigmas introrse, slightly curved. Drupe of a globular type, or 2-lobed or 3-lobed, hirsute.—Only the following species known.

1. **R. Hystrix** (Fraser) H. Wendl. Shrub with short erect or spreading stems, the rootstock proliferous: leaf-sheaths persistent, the fibers fine, the rigid needle-like spines erect, mostly 1–4 dm. long: leaf-blades 5–7 dm. in diameter, scurfy beneath: spadix stout, 1–2.5 dm. long, densely flowered: petals ovate or orbicular: anthers 2 mm. long, exserted, longer than the filaments: drupe ovoid or globular, 15–20 mm. in diameter, red, persistent.—(NEEDLE-PALM. BLUE-PALMETTO. VEGETABLE-PORCUPINE.)—Swamps and hammocks, rarely on dry rocks, Coastal Plain and rarely adj. provinces, Fla. to Miss. and S. C.—Spr.—Remarkable both for its armament and short spadix. The spadix remains so short that the fruits are mostly caught and held in the cluster of petioles and needles. Stolons from the caudex help to maintain the species which otherwise would soon be reduced as a result of the scant propagation by seeds. Frequently planted.



ORDER **ARALES** — ARAL ORDER

Perennial, frequently bog or aquatic herbs; in *Lemnaceae,* mere floating thalloid bodies. Leaves mainly basal. Flowers complete or incomplete, borne on a spadix accompanied by a spathe, or in *Lemnaceae* 1 or few in a pouch in the plant-body. Perianth inconspicuous or wanting. Fruit baccate or utricular.

Plants terrestrial or aquatic, with the flowers on a spadix, this sometimes subtended by or partly enclosed in a spathe. Fam. 1. ARACEAE.
Plants reduced to small floating thalloid structures, with one or few flowers. Fam. 2. LEMNACEAE.

FAMILY 1. **ARACEAE** — ARUM FAMILY

Fleshy mostly acaulescent plants. Leaves with simple or divided blades. Flowers perfect, monoecious, or dioecious. Perianth of 4–6 scale-like members, or wanting. Androecium of 4–10 stamens. Gynoe-

cium of 1 carpel, or of several united carpels. Fruit a berry or a utricle. —About 100 genera and 900 species, mostly in tropical regions.

Rooted land-plants: pistillate flowers several or many.
  Flowers perfect: perianth of several scale-like parts.
    Spadix borne somewhat laterally on the leaf-like scape: marsh-plants. — Tribe I. ACOREAE.
    Spadix terminating the clavate or cylindric fleshy scape: aquatic plants. — Tribe II. ORONTIEAE.
  Flowers monoecious or dioecious: perianth wanting.
    Leaf-blades entire: axis of the spadix completely covered with flowers. — Tribe III. PELTANDREAE.
    Leaf-blades 3–many-divided: axis of the spadix naked above. — Tribe IV. AREAE.
Floating water-plants: pistillate flower solitary. — Tribe V. PISTIEAE.

I. ACOREAE

Marsh plants with ensiform leaves: spathe a mere flat prolongation of the scape. — 1. ACORUS.

II. ORONTIEAE

Spadix naked, merely subtended by a deciduous spathe, narrowly conic, yellow. — 2. ORONTIUM.
Spadix surrounded by a fleshy persistent spathe, globular, green. — 3. SPATHYEMA.

III. PELTANDREAE

Scapose herbs with sagittate or hastate leaf-blades: spathe green or with a white blade. — 4. PELTANDRA.

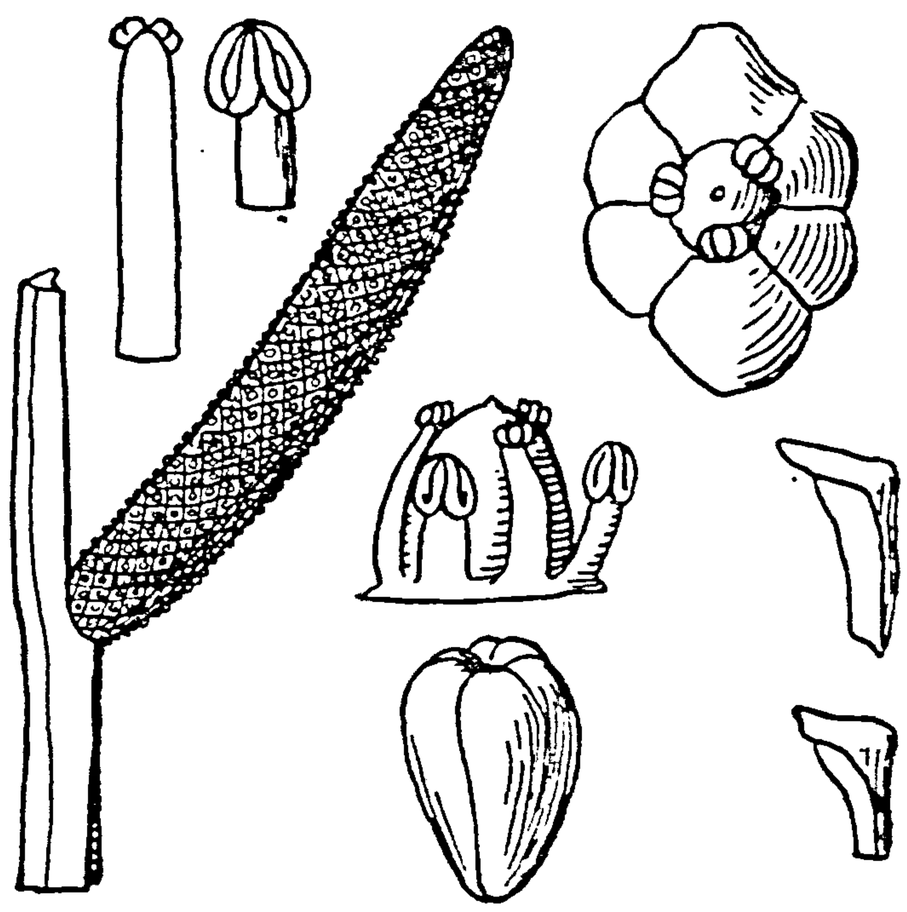
IV. AREAE

Leaf-blades palmately divided: spathe convolute below, with a dilated hood above: spadix included. — 5. ARISAEMA.
Leaf-blades pedately divided: spathe convolute throughout or slightly dilated at the tip: spadix with a long-exserted slender tip. — 6. MURICAUDA.

V. PISTIEAE

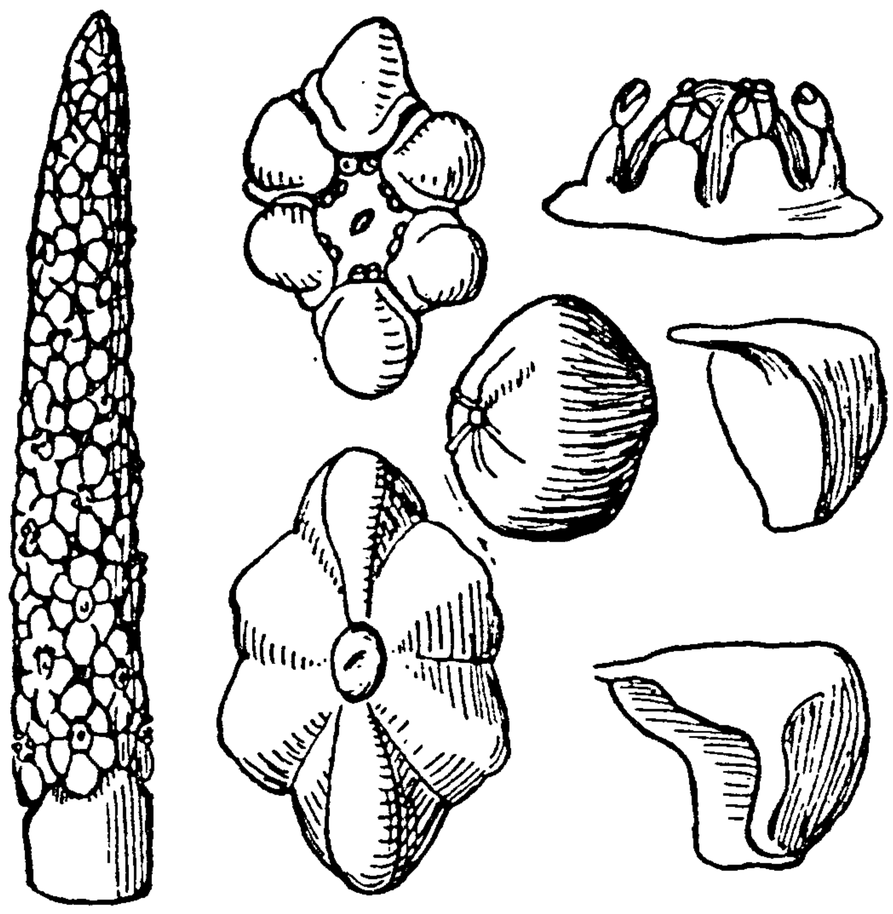
Floating plants: leaves imbricated on a short caudex: spadix adnate to the spathe. — 7. PISTIA.

1. ACORUS L. Herbs with aromatic rootstocks. Leaves with narrowly linear blades. Spadix lateral, elongate, at the base of the linear spathe. Flowers perfect. Perianth of 6 rather narrow concave members: anthers didymous-reniform. Ovary not depressed. Spadix elongate. Fruits crowded.—Two species, one additional to the following in Japan.



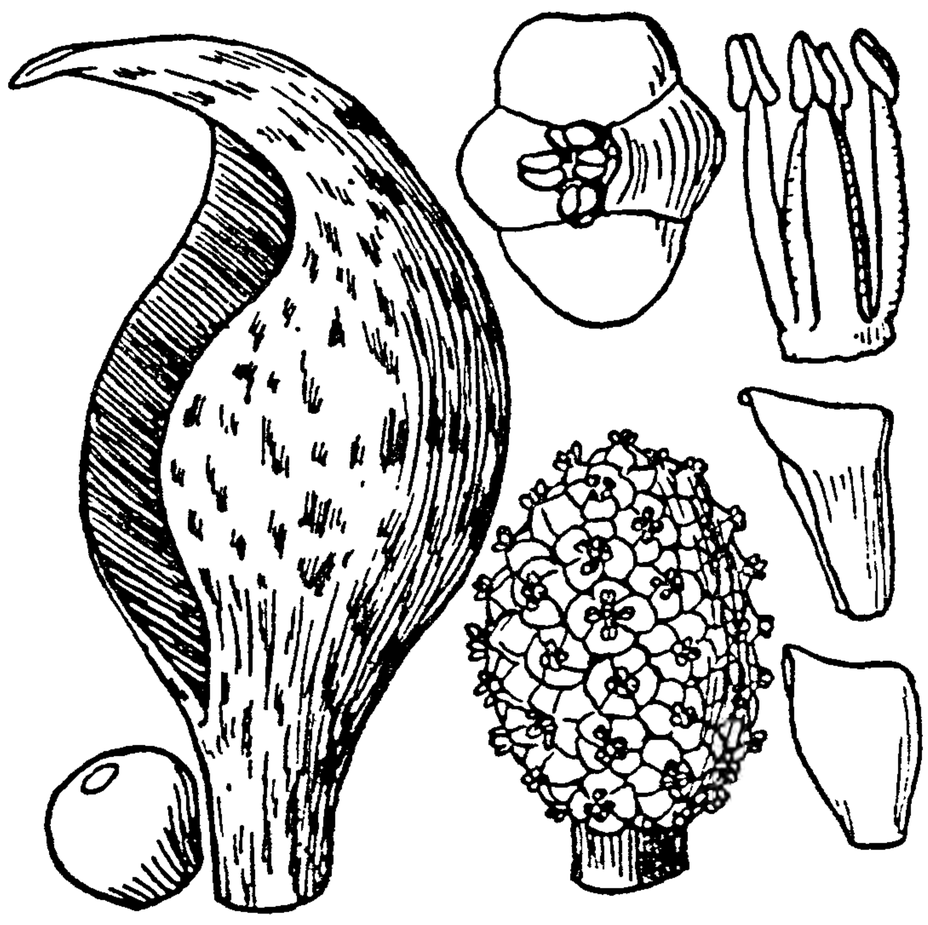
1. A. Calamus L. Rootstock horizontal: leaves 5–20 dm. tall, very pliable: scape resembling the leaves: spathe erect: spadix yellowish, cylindric-conic or elongate-conic, 3–8 cm. long.—(CALAMUS. SWEET-FLAG. FLAG-ROOT.)—Low grounds, meadows, and marshes, various provinces, Fla. to Tex., Ida., Ont., and N. S.—(O. W.)—Spr.-sum.—Both plants and habit of growth resemble irises.

2. **ORONTIUM** L. Aquatic herbs. Leaves with relatively narrow blades. Spadix terminal, elongate, subtended by the thin spathe, the scape elongate, pliable, soon weak, and prostrate. Flowers perfect. Perianth of 4–6 very broad scale-like members (6 below, 4 above). Anthers didymous. Ovary much-depressed. Fruits not immersed.—One species.



1. **O. aquaticum** L. Rootstock deeply buried. Leaf-blades oblong or elliptic, 1–3 dm. long, long-petioled: spadix golden-yellow, elongate-conic, 2–10 cm. long.—(GOLDEN-CLUB. BOG-TORCHES. WATER-DOCK. NEVER-WET. FIRE-LEAF.)—Swamps, ponds, or streams, various provinces, Fla. to La., Tenn., and Mass.—Spr.—The bluish-green, often iridescent leaves shed water like the back of a duck. The bluish-green leaves and the golden spadices are a combination quite unique in our flora.

3. **SPATHYEMA** Raf. Coarse herbs. Leaves with cordate blades, the petioles, and the scapes, partially underground. Spadix ellipsoid or globular, enclosed in the thick cochleate, colored spathe, the scape rigid. Flowers perfect. Perianth of 4 hooded members. Anthers reniform. Gynoecium conic. Fruits immersed in the subglobose spadix.—One species.

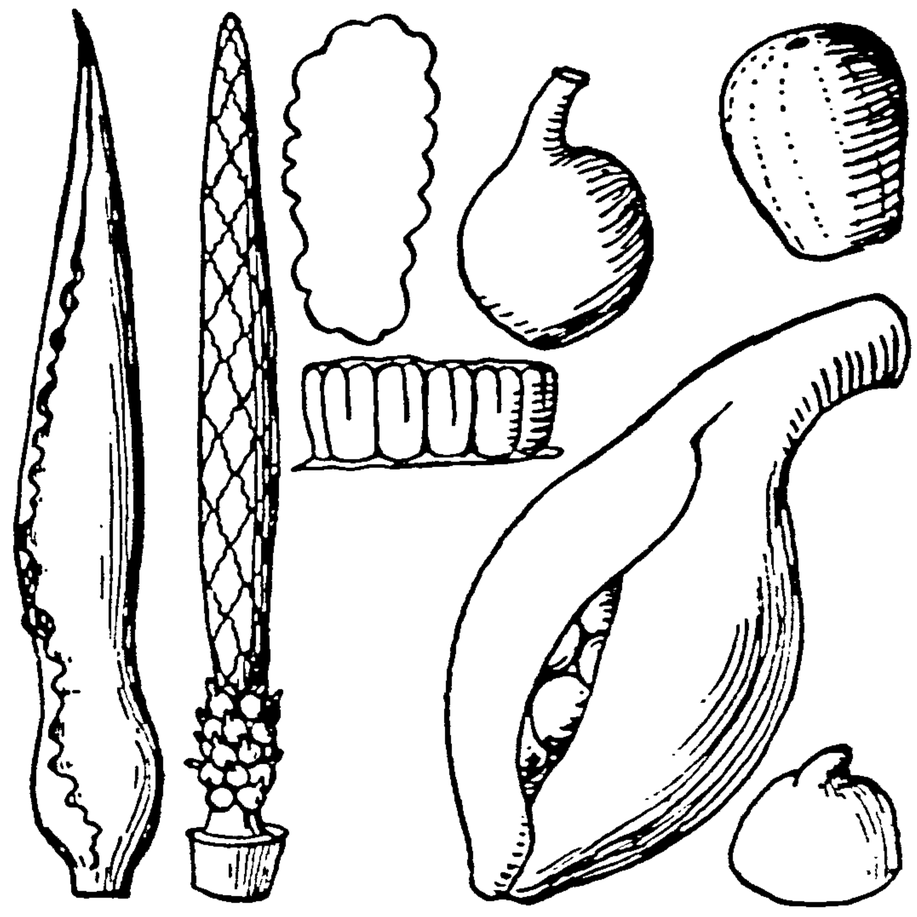


1. **S. foetida** (L.) Raf. Plants garlic-scented, glabrous: leaf-blades 2–5 dm. long, often 3 dm. broad: sepals erect, mainly subterranean: spathe seated on the ground, preceding the leaves, 8–15 cm. long, beaked, purple-mottled. Sepals and filaments fitting tightly about the style: fruit-head persistent, 9–15 cm. in diameter, the berries green. [*Symplocarpus foetidus* Salisb.]—(MIDAS'-EARS. PARSON-IN-THE-PILLORY. SKUNK-CABBAGE. SWAMP-CABBAGE.)—Swamps and low meadows, various provinces, Ga. (or Fla.) to Mo., Minn., and N. S.—Wint.–spr.

4. **PELTANDRA** Raf. Tufted herbs with rootstocks. Leaf-blades of a hastate or sagittate type. Scapes recurved at maturity or permanently erect. Flowers monoecious. Spadix completely covered with flowers. Stamens 6–10. Spathe green or white. Fruits green or red.—Spr.–sum.—Comprises only the two following species.—ARROW-ARUMS.

Spathe convolute throughout, narrow, green: fruits green. 1. *P. virginica.*
Spathe dilated and spreading above, mainly white: fruits crimson. 2. *P. glauca.*

1. P. virginica (L.) Kunth. Leaf-blades sagittate or hastate, with several prominent lateral ribs: spathes 8–20 cm. long, the edges crisped: spadix included, ¼ pistillate, ¾ staminate: scapes recurved at maturity: fruits mostly over 1 cm. thick. [*P. undulata* Raf.]—(VIRGINIA WAKE-ROBIN. POISON-ARUM. GREEN-ARUM.)—Swamps and shallow water, various provinces, Fla. to La., Ont., and N. S.



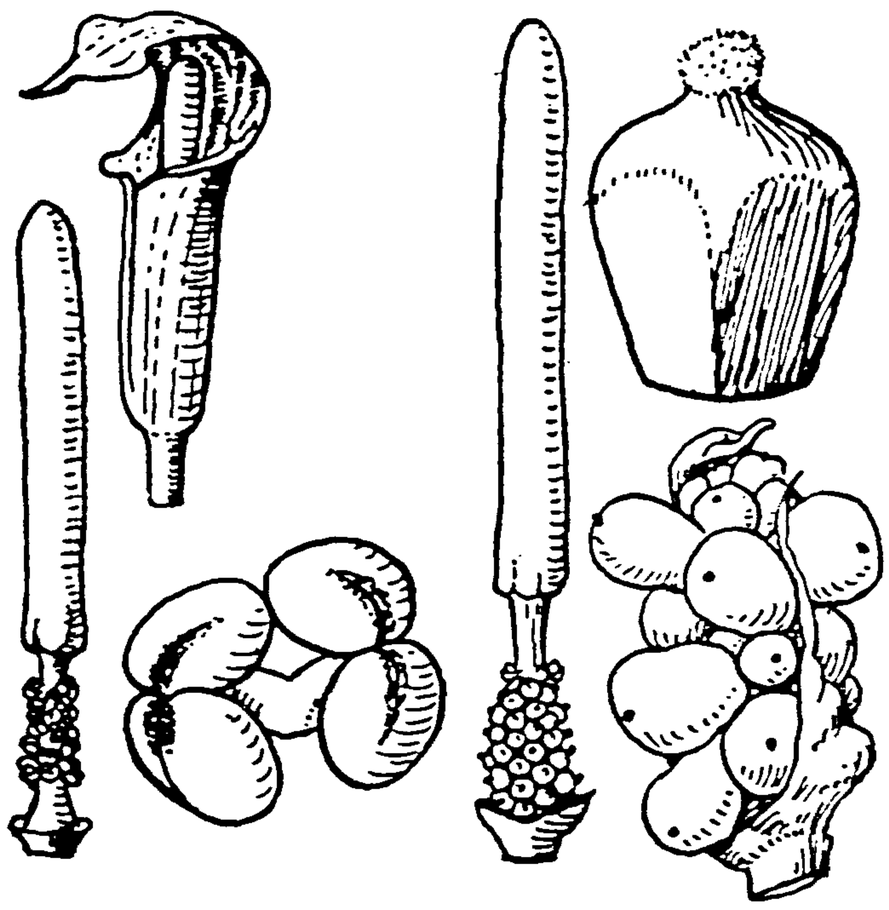
2. P. glauca (Ell.) Feay. Leaf-blades sagittate, without prominent lateral ribs: spathe 4–10 cm. long, the edges flat: spadix exserted above, ½ pistillate, ½ staminate: scapes permanently erect or ascending: fruits mostly less than 10 mm. thick. [*P. alba* Raf. *P. sagittifolia* (Michx.) Morong not Raf. *Xanthosoma sagittifolium* Chapm.]—(WHITE-ARUM).—Non-alluvial swamps, usually in acid soil, Coastal Plain and rarely adj. provinces, Fla. to Ala. and N. C. (or Va.?).

5. ARISAEMA Mart. Herbs with corms. Leaf-blades palmate, 3–5-divided. Scape permanently erect. Spadix clavate or cylindric, the fertile portion partly flower-bearing. Spathe cornucopia-like. Fruits red.—Spr.–sum.—About 50 species, mostly natives of Asia.—JACK-IN-THE-PULPITS. INDIAN-TURNIPS.—The corms of the plants of this genus contain an extremely acrid juice, as well as raphides of calcium oxalate. The combination produces a violent burning sensation if an attempt is made to eat them raw.

Leaf-segments 3 (the lateral ones rarely 2-lobed): spathe acute-acuminate: spadix straight.
- Spathe short-acuminate or acute; blade dark-colored or striped.
  - Hood of the spathe uniformly colored within, black, red-brown or rarely green: naked portion of the spadix cylindric: fruits 4–6 mm. in diameter. — 1. *A. pusillum.*
  - Hood of the spathe strongly striped within, light-green and brown, or dark-green: naked portion of the spadix clavate: fruits 8–12 mm. in diameter. — 2. *A. triphyllum.*
- Spathe caudate-acuminate; blade usually green. — 3. *A. acuminatum.*

Leaf-segments 5 (the lateral ones sometimes partly united): spathe abruptly pointed: spadix curved. — 4. *A. quinatum.*

1. A. pusillum (Peck) Nash. Plants mostly less than 3 dm. tall: leaf-segments 5–12 cm. long: spathe-blades short-acuminate, red-brown to almost black or sometimes pale-green within: fruits 4–6 mm. thick.—Swamps and damp woods, often in acid soil, various provinces, N Ga. to Ky. and N. Y.—Blooms 2–3 weeks later than the next following species.



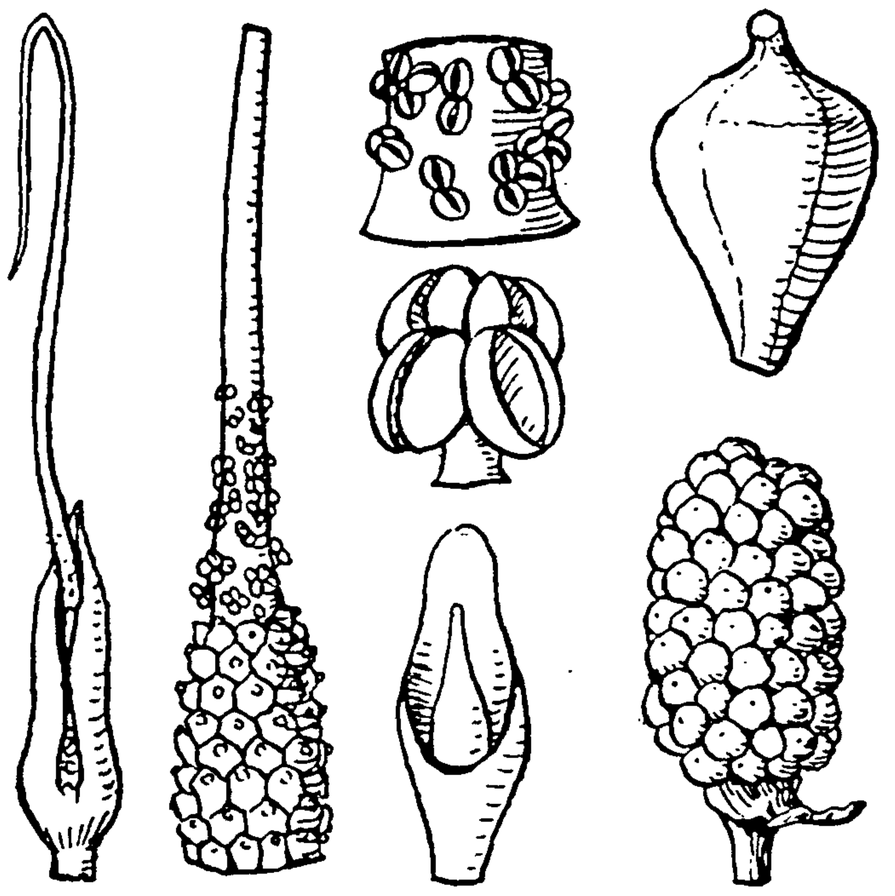
2. A. triphyllum (L.) Torr. Plants mostly over 4 dm. tall: leaf-segments 8–30 cm. long; blades dull, rather abruptly short-acuminate: spathe-blade short-acuminate, pale-green, often striped

with purple, brown or dark-green within: fruits 8–12 mm. thick.—Swamps, moist hillsides, and thickets, various provinces, Fla. to La., Kans., Minn., and N. S.

3. **A. acuminatum** Small. Plants more slender than *A. triphyllum*: leaf-segments 7–12 cm. long: spathe-blade long-acuminate, deeper-green than the convolute portion: fruits 8–9 mm. thick.—(PARSON-IN-THE-PULPIT.)—Woods, often swampy, N Fla.—Forms with the spathe-blade moderately long-acuminate occur in the Coastal Plain as far up as SE Va., and may represent this species.

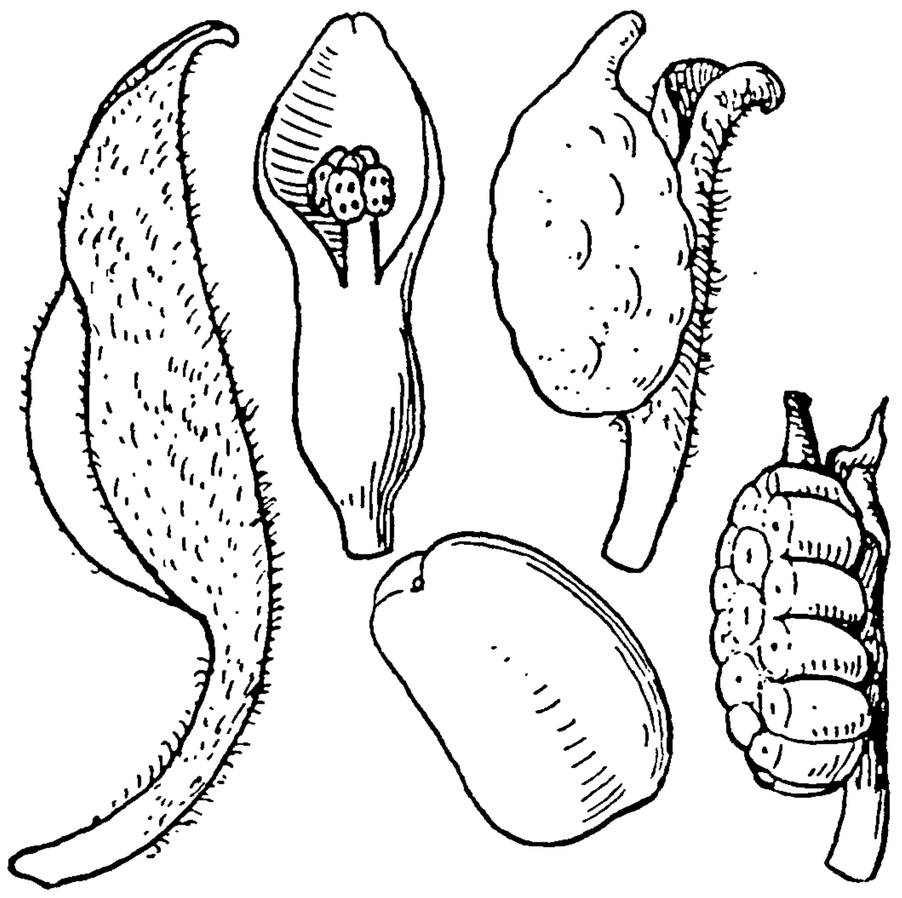
4. **A. quinatum** (Nutt.) Schott. Plants about as large as *A. triphyllum*: leaf-segments 5, the lateral pairs sometimes partly or wholly united, glaucous beneath: spathe green: spadix slender: fruits 6–7 mm. thick.—(PRESTER-JOHN.)—Woods and moist rich soil, various provinces, Ga. to La., Tenn., and N. C.

6. **MURICAUDA** Small. Herbs with clustered corms: leaf-blades pedately 5–17 divided. Scapes permanently erect. Spadix whip-like, the fertile portion covered with flowers. Stamens 4. Spathe wholly convolute or slightly dilated at the tip. Fruits red.—One species.



1. **M. Dracontium** (L.) Small. Leaf-segments cuneate to oblanceolate, 1–3 dm. long: spathe green, 3–10 cm. long: fruits 6–8 mm. thick. [*Arisaema Dracontium* Schott]—(GREEN-DRAGON. DRAGON-ROOT.)—Rich woods and bottoms, various provinces, N pen. Fla. to Tex., Minn., Ont., and Me.—Spr.

7. **PISTIA** L. Floating herbs. Leaves clustered on very short branches at the nodes of the rootstock: blades entire, dilated upward. Spadix adnate to the axillary spathe. Flowers monoecious, the pistillate solitary, the staminate above the pistillate. Perianth wanting.—One species.



1. **P. Stratiotes** L. Leaves in rosettes; blades cuneate or obovate-cuneate, 8–23.5 cm. long, or more, strongly ribbed: spathe about 1.5 cm. long, pubescent, the upper part ovate.—(WATER-LETTUCE. WATER-BONNETS.)—Streams, lakes, and ponds, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A., O. W.*)—Frequently forming a complete, often extensive gray-green carpet. The hairy ribbed myriad leaf-surfaces produce an iridescent effect. Contrary to the usual uniformity in the size in species of aquatics, the plants of water lettuce are extremely variable. The tissues are very spongy.

A variety of *Colocasia antiquorum*—(DASHEEN, TARO)—is cultivated for its edible tubers in Florida and has escaped to marshes and roadsides in some places. It has peltately attached leaf-blades.

FAMILY 2. LEMNACEAE — DUCKWEED FAMILY

Floating herbs, consisting chiefly of very small, often minute, fleshy structures, sometimes with 1 or several roots. Propagative pouches 1 or 2 in each body. Flowers monoecious, one or two staminate and one pistillate in a propagative pouch. Staminate flowers consist of 1 stamen. Pistillate flowers consist of 1 carpel. Fruit a utricle.—Four genera and 26 species, widely distributed.—Comprises the smallest of the flowering plants.

Plant-body not disk-like, rootless: propagative pouch solitary. Tribe I. WOLFFIEAE.
Plant-body disk-like, with a single root or a cluster of roots: propagative pouches 2. Tribe II. LEMNEAE.

I. WOLFFIEAE

Plant-body very thick or globose. 1. BRUNERIA.
Plant-body thin, tongue-like or sabre-form. 2. WOLFFIELLA.

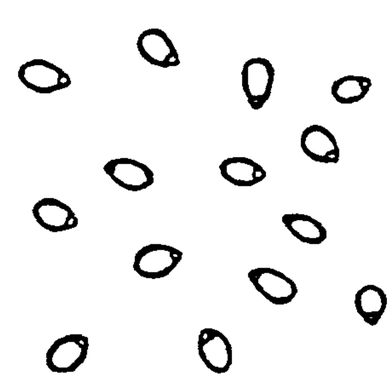
II. LEMNEAE

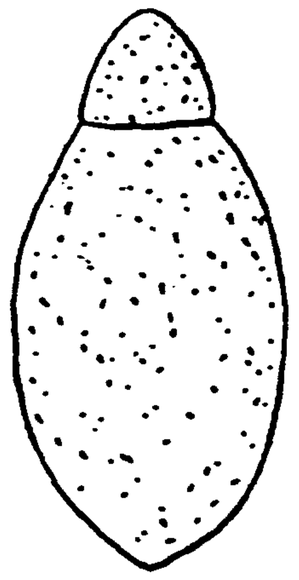
Plant-body inconspicuously nerved: root solitary, without fibrovascular bundle. 3. LEMNA.
Plant-body conspicuously nerved: roots 2-several, each with a fibrovascular bundle. 4. SPIRODELA.

1. BRUNERIA Franch. Plant-body much thickened or subglobose. Propagative pouch funnelform. Spadix of 1 staminate and 1 pistillate flower bursting through the upper surface of the plant-body.—[*Wolffia* Horkel.]—Several species, most abundant in tropical and subtropical regions.—MUDMARYS.

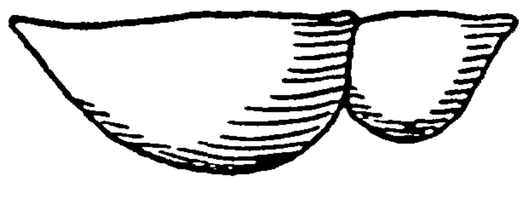
Plant-body smooth, somewhat flattened above, gibbous beneath, brown-punctate. 1. *B. punctata.*
Plant-body ellipsoid or globose, with 2–3 papules on dorsal surface, not punctate. 2. *B. columbiana.*

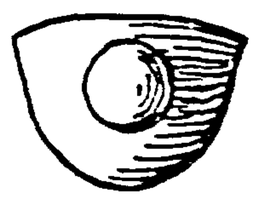
1. B. punctata (Griseb.) Nieuw. Plant-body boat-like, elliptic to ovoid-ellipsoid, 0.58–0.82 mm. long, flat or nearly so above, gradually rising at the apex: tissue various; lower portion of the plant-body composed of larger cells than the upper. [*W. punctata* Griseb.]—Floating on the surface of stagnant water, Coastal Plain and occasionally other provinces, Fla. to Tex. and Ont.



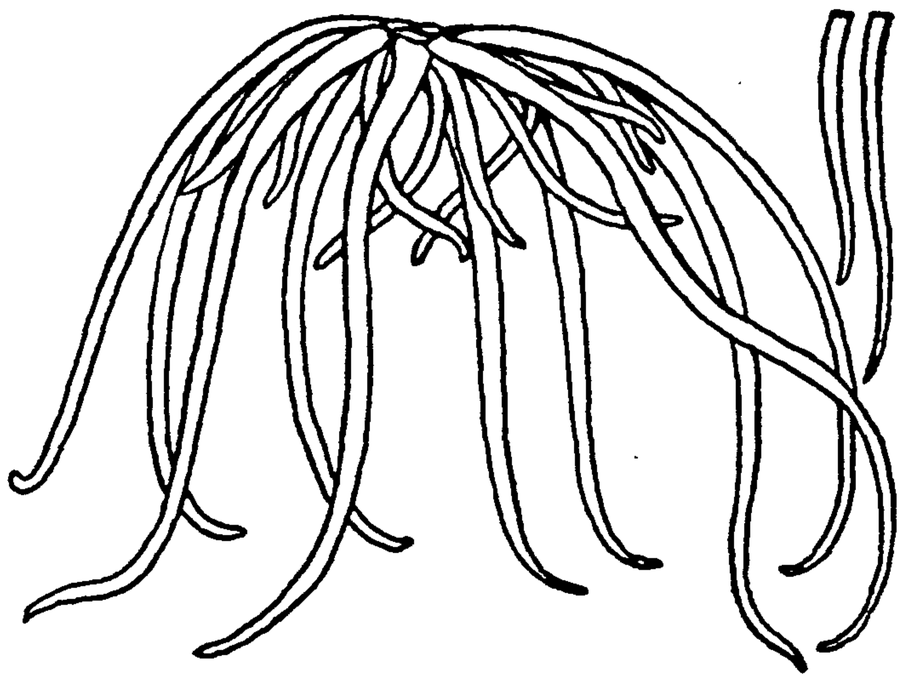


2. B. columbiana (Karst.) Nieuw. Plant-body globose to ellipsoid, 0.48–1 mm. long, the upper surface convex, with a row of inconspicuous papillae, only a small portion emersed, this with 1–10 stomata: tissue of uniform large cells. [*W. columbiana* Karst.]—Floating beneath the surface of stagnant water, various provinces, Fla. to La., Minn., Ont., and Mass.





2. **WOLFFIELLA** Hegelmaier. Plant-body thin, tongue-shaped or sabre-form. Propagative pouch triangular. Inflorescence and fruit unknown.—About 7 species, mostly of tropical distribution.

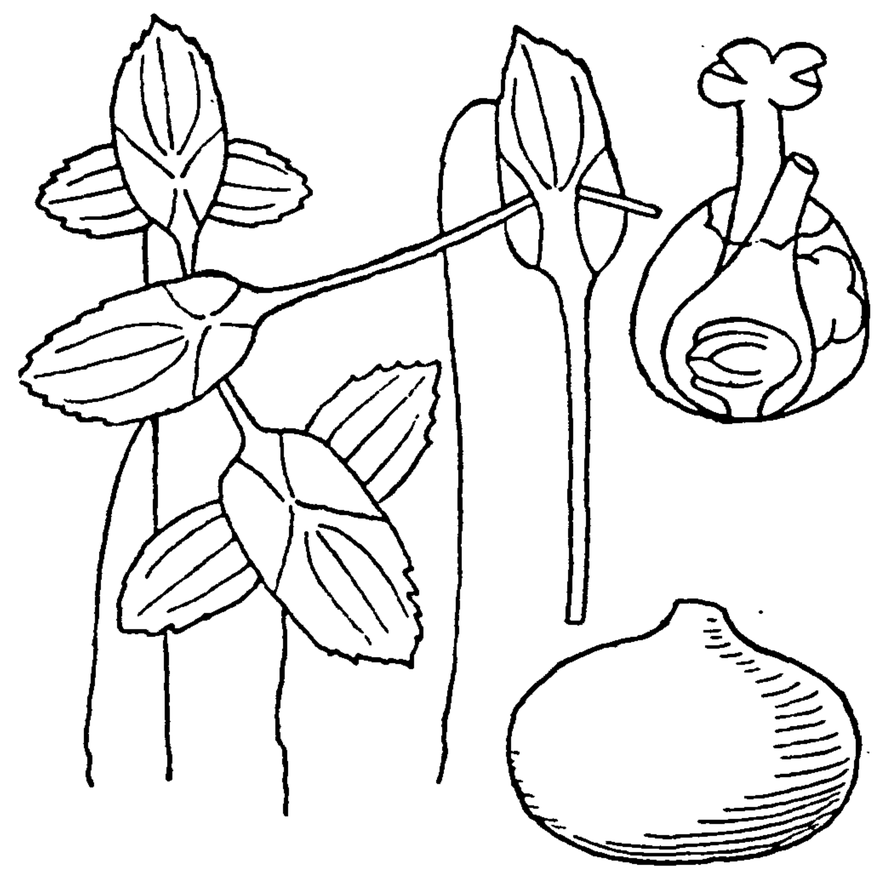


1. W. floridana (J. D. Smith) C. H. Thompson. Plants solitary or usually several generations cohering; body attenuate from the base to the slender apex, 5.5–8.5 mm. long, hollow except near the apex.—(MUD-MIDGET. BOG-MAT.)—Stagnant water, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and N. J.

3. **LEMNA** L. Plant-body disk-like, inconspicuously nerved. Anther-sacs opening transversely. Utricle somewhat flattened, often ribbed.—Sum.—About 8 species, widely distributed in tropical and temperate regions.—DUCKWEEDS. FROG-BUTTONS.

Plant-bodies long-stipitate, forming large submerged masses. 1. *L. trisulca.*
Plant-bodies sessile, or short-stipitate, floating, more or less detached.
  Plant-body symmetrical or nearly so.
    Plant-body elliptic-obovate: utricle lenticular. 2. *L. minor.*
    Plant-body elliptic or oblong: utricle elongate. 3. *L. minima.*
  Plant-body unsymmetrical.
    Plant-body-thick, obliquely obovate, papillose on the median line. 4. *L. perpusilla.*
  Plant-body thin, elliptic, smooth.
    Plant-body manifestly 3-nerved: root-sheath with lateral appendages. 5. *L. trinervis.*
    Plant-body obscurely 1-nerved: root-sheath without appendages. 6. *L. cyclostasa.*

1. L. trisulca L. Root-sheath acute: plant-bodies both submerged and aerial, often falcate, 5–10 mm. long, acute: aerial plants smaller than the submerged and short-stalked, cavernous: submerged plants with twisted stipes.—Ponds and spring-runs, various provinces, Ala. to Calif., Alas., Ont., and N. S.—(*O. W.*)



2. L. minor L. Root-sheath obtuse: plant-bodies elliptic, obovate, or suborbicular, 2–4 mm. long, mostly 3-nerved, commonly keeled on the back and papillose on the midrib: seeds 12–15-ribbed.—Ponds and stagnant water, various provinces, Fla. to Calif., B. C., and Ont.—(*O. W.*)

3. L. minima Philippi. Root-sheath obtuse: plant-body oblong or elliptic, 1.5–3.9 mm. long, rounded at the apex, sometimes slightly oblique, nearly nerveless,

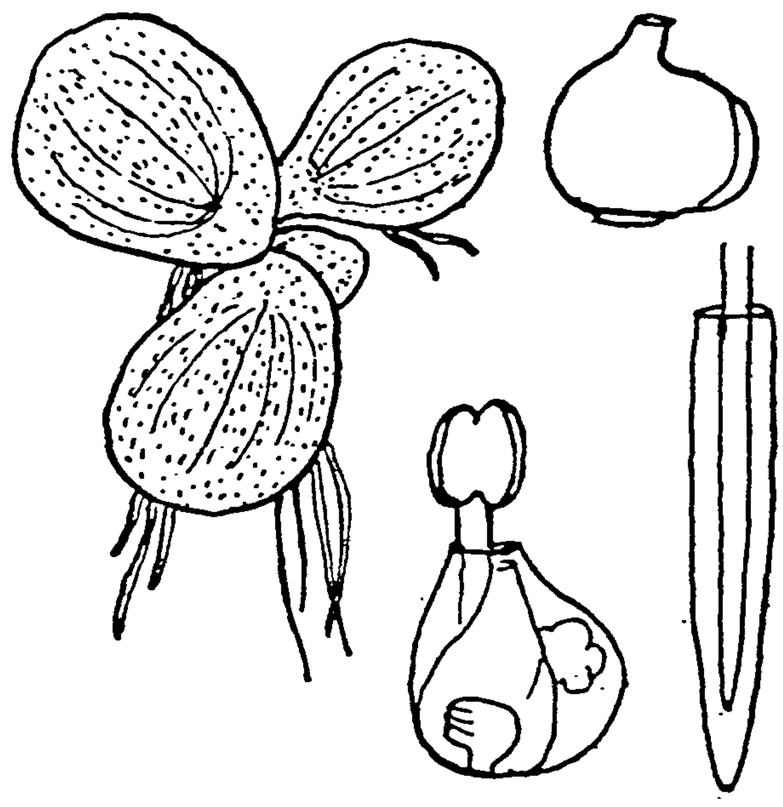
convex above: seeds commonly 16-ribbed.—Pools, various provinces, Fla. and Ga. to Calif. and Wyo.

4. **L. perpusilla** Torr. Root-sheath acute: plant-body obovate, usually obliquely so, 2–3.5 mm. long, obtuse, often papillose along the midrib and with a larger apical papilla: utricle tipped with the eccentric style.—Ponds and stagnant streams, various provinces, Fla. to Kans., N. D., and Mass.

5. **L. trinervis** (Austin) Small. Root-sheath with lateral appendages: plant-body oblong or nearly so, a little convex above, flat beneath, abruptly narrowed to the blunt apex, smooth: utricle tipped with the terminal style.—Still water, various provinces, La. to Kans. and N. J.

6. **L. cyclostasa** (Ell.) Chev. Root-sheath without appendages: plant-body oblong or nearly so, 2.3–4.5 mm. long, obtuse, often somewhat falcate, unsymmetrical at the base, obscurely 1-nerved. [*L. valdiviana* Philippi]—Pools, various provinces, Fla. to Tex., Calif., and Mass.—(*Mex., S. A.*)

4. **SPIRODELA** Schleid. Plant-body disk-like, conspicuously several-nerved. Anther-sacs opening lengthwise. Utricle lenticular, with winged margins.—Three species, 2 in America, the other in S Asia and Australia.



1. **S. polyrhiza** (L.) Schleid. Plants mostly sterile and perennial: roots 4–16: plant-body obovate or suborbicular, 2.5–8 mm. long, 5–15-nerved: seeds smooth.—(DUCKWEED. MINNOW-FOLE.)—Pools, ponds, and along streams, various provinces, Fla. to Tex., Calif., B. C., Ont., and N. S.—(*Mex., C. A., S. A., O. W.*)—Sum.—Floating dense masses of plants give a pale golden-green hue to the surface of pools. They are often purple beneath.

ORDER **XYRIDALES** — XYRIDAL ORDER

Caulescent moss-like or acaulescent rush-like terrestrial herbs. Leaves alternate, equitant when basal: blades narrow, sometimes notched at the apex. Flowers axillary or usually borne in a terminal cone-like spike. Calyx regular or one sepal crested. Corolla regular. Gynoecium with a superior ovary. Fruit a capsule. Seeds minute, often caudate.

Caulescent moss-like herbs: flowers axillary to leaf-like bracts: sepals alike: styles wholly united. Fam. 1. MAYACACEAE.
Acaulescent rush-like herbs: flowers in terminal dense spikes: sepals of 2 forms, or 1 sepal wanting: styles partially united. Fam. 2. XYRIDACEAE.

FAMILY 1. **MAYACACEAE** — BOG-MOSS FAMILY

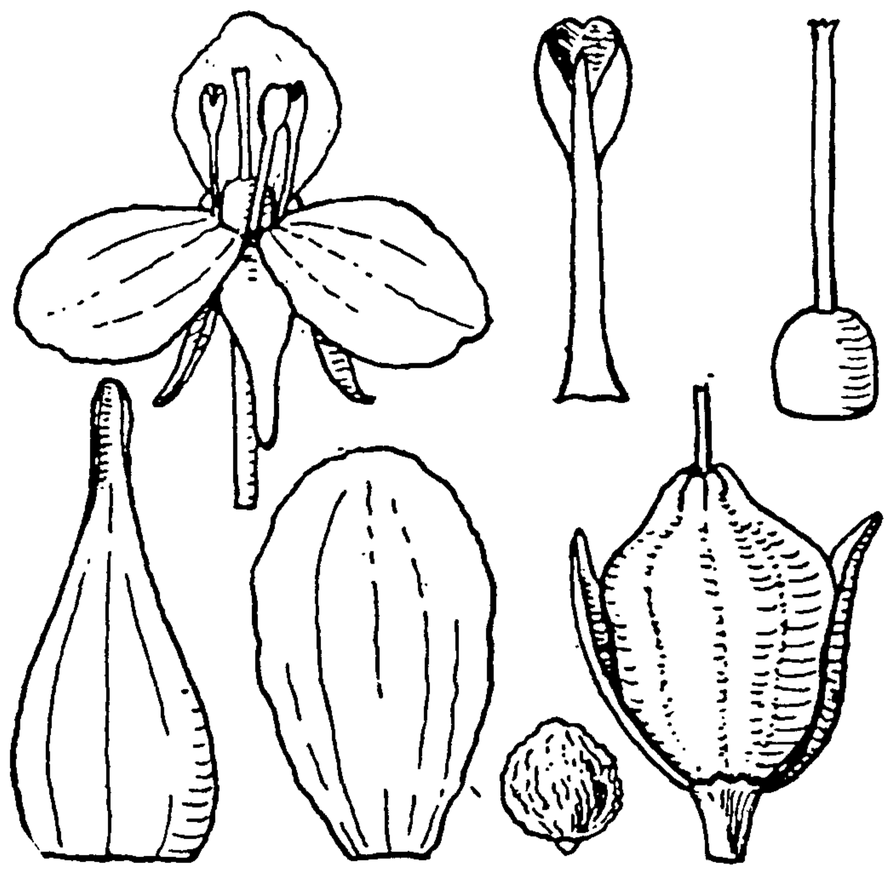
Leaves cauline: blades narrow, flaccid, 1-nerved, minutely notched at the apex. Flowers perfect, borne on axillary pedicels. Sepals 3, nar-

rowed upward. Petals 3, broadened upward. Androecium of 3 stamens: anthers ovoid. Gynoecium 3-carpellary. Fruit a capsule.—Only the following genus.

1. **MAYACA** Aubl. Moss-like aquatic herbs, the stems copiously leafy. Peduncles 1-flowered. Calyx herbaceous. Corolla pink, persistent with the sepals. Anther with an oblique tip.—Spr.–fall.—About 7 species, in the warmer parts of America.—BOG-MOSSES. POOL-MOSSES.

Pedicels much longer than the leaves: capsule globular or ovoid. 1. *M. Aubletii.*
Pedicels shorter than the leaves: capsule ellipsoid. 2. *M. fluviatilis.*

1. **M. Aubletii** Michx. Stems tufted or matted, 2–20 cm. long: leaves approximate or densely crowded; blades narrowly lanceolate or almost linear, 3–5 mm. long, sharply notched at the apex: pedicels 8–20 mm. long: sepals about 4 mm. long at maturity: capsule 4–4.5 mm. long.—Springy places and margins of pools or streams, Coastal Plain, Fla. to Tex. and Va.



2. **M. fluviatilis** Aubl. Larger than *M. Aubletii*, the stems often 40 cm. long: leaves very numerous, approximate; blades narrowly linear-lanceolate to linear-filiform, 4–12 mm. long, very flaccid: pedicels 2–5 mm. long: sepals 3–4 mm. long: capsule 4–5 mm. long.—Pools, ponds, and sluggish streams, Coastal Plain, Fla. to Miss. and Ga.—(*W. I., Mex., C. A., S. A.*)

FAMILY 2. XYRIDACEAE — YELLOW-EYED GRASS FAMILY

Leaves basal: blades thickish. Flowers perfect, in a compact terminal spike. Sepals 3, the two lateral firm, keeled and often appendaged, persistent, the third larger, deciduous. Petals 3, fugacious. Androecium of 3 stamens usually alternating with 3 staminodia: anthers linear. Gynoecium 3-carpellary. Fruit a capsule.—Two genera and about 60 species, most abundant in the tropics.

1. **XYRIS** [Gronov.] L. Rigid herbs of bogs, swamps, prairies, and pinelands. Leaves not forked at the tip, imbricate at the base of the scape. Flowers aggregated in a spike with closely imbricate scale-like bracts. Corolla yellow or rarely white. Anthers narrow, the sacs opening lengthwise.—About 50 species, mostly in the tropics of both hemispheres.—Spr.–fall, or all year S.—YELLOW-EYED GRASSES. VARE-GOLDIES.—The plants of this genus prefer soils of a high degree of acidity.

Annual or biennial plants: leaves mainly shorter than the sheath of the scape. I. BREVIFOLIAE.
Perennial plants: leaves mainly longer than the sheath of the scape.

Sterile filaments bearded: leaf-blades flat.
  Lateral sepals included, i.e., concealed by the bracts. — II. COMMUNES.
  Lateral sepals partially exserted. — III. FIMBRIATAE.
Sterile filaments glabrous: leaves terete, filiform. — IV. BALDWINIANAE.

I. BREVIFOLIAE

Keel of the lateral sepals smooth or erose-scabrous. — 1. *X. brevifolia.*
Keel of the lateral sepals ciliate-fringed. — 2. *X. flabelliformis.*

II. COMMUNES

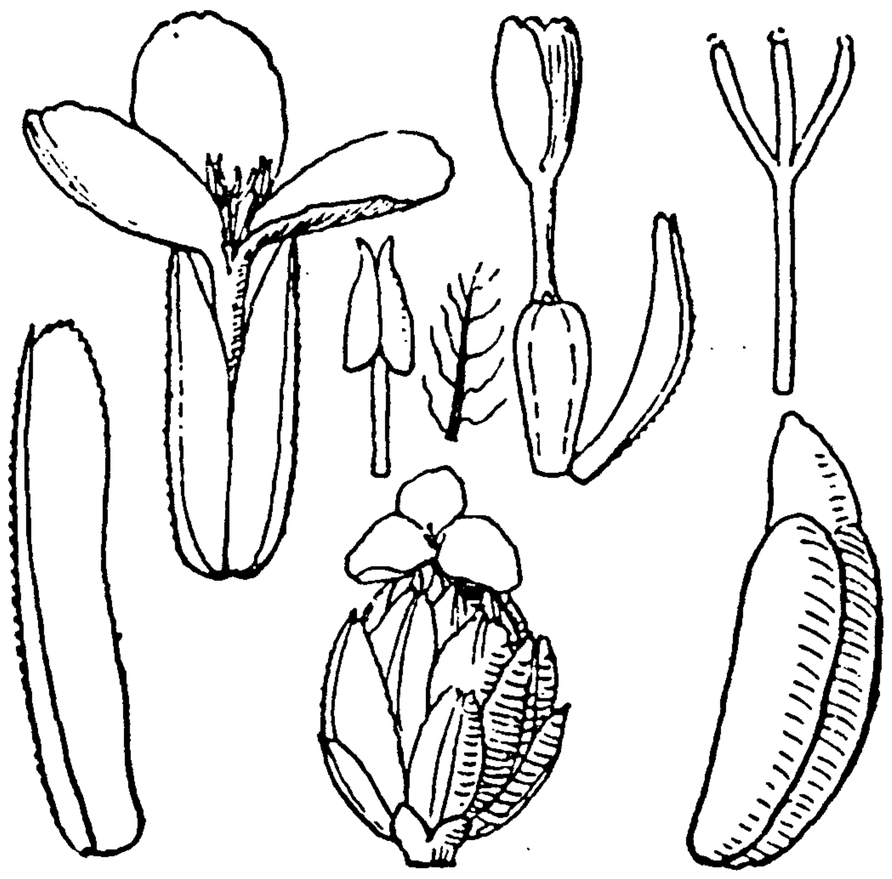
Keel or wing of the lateral sepals ciliate.
  Lateral sepals winged, the wing partially ciliate, not bearded.
    Sepal-wing narrow, narrower than the sepal-body. — 3. *X. ambigua.*
    Sepal-wing broad, broader than the sepal-body — 4. *X. stricta.*
  Lateral sepals keeled, the keel mainly ciliolate its entire length, bearded at the apex. — 5. *X. torta.*
Keel or wing of the lateral sepals incised, erose-toothed or lacerate.
  Keel or wing cross-toothed or incised.
    Lateral sepals crested from below the middle or from the base to the apex. — 6. *X. neglecta.*
    Lateral sepals crested from above the middle to the apex.
      Scape and leaves not scabro-puberulent.
        Spike ovoid, oval or globular, 5–15 mm. long at maturity; bracts in relatively few series.
          Bracts loosely imbricate in few series, deciduous. — 7. *X. caroliniana.*
          Bracts closely imbricate in several series, persistent. — 8. *X. communis.*
        Spike oblong to conic-oblong, 16–23 mm. long at maturity; bracts numerous and in many series. — 9. *X. elata.*
      Scape and leaves scabro-puberulent all over. — 10. *X. scabrifolia.*
  Keel or wing lacerate.
    Lateral sepals crested from about the middle, or below it, to the apex, the crest erect or nearly so.
      Spike ovoid, 11–15 mm. long; bracts rounded at the apex.
        Spike acute: lateral sepals with the wing narrow or obsolete near the base: leaves and scape smooth. — 11. *X. difformis.*
        Spike obtuse: lateral sepals with the wing broad to the base: leaves and scape rough-margined. — 12. *X. serotina.*
      Spike oblong or cylindric, 15–30 mm. long; bracts very broad and broadly rounded or nearly truncate at the apex. — 13. *X. platylepis.*
    Lateral sepals crested from the base to the apex, the crest spreading or partially recurved. — 14. *X. iridifolia.*

III. FIMBRIATAE

Plant not bulbous at the base, the leaf-bases not greatly dilated.
  Leaves numerous; blades mostly 1–2 mm. wide at maturity. — 15. *X. Elliottii.*
  Leaves few; blades mostly 5–10 mm. wide at maturity.
    Crest of the lateral sepals of very short erect segments: upper part of the scape smooth. — 16. *X. Smalliana.*
    Crest of the lateral sepals of very long spreading segments: upper part of the scape rough. — 17. *X. fimbriata.*
Plant markedly bulbous at the base, the leaf-bases greatly dilated and persistent.
  Corolla yellow: upper part of the scape, and the spike, green. — 18. *X. flexuosa.*
  Corolla white: upper part of the scape, and the spike, glaucous or glaucescent. — 19. *X. pallescens.*

IV. BALDWINIANAE

Plants clustered: leaves very slender. — 20. *X. Baldwiniana.*



1. **X. brevifolia** Michx. Leaves narrowly linear, 2–8 cm. long, clustered: scape 8–30 cm. tall, nearly terete: spike subglobose, 4–6 mm. long; bracts eroded: lateral sepals 3.5–4.5 mm. long.—Low pinelands, Coastal Plain, Fla. to N. C.

2. **X. flabelliformis** Chapm. Leaves linear or narrowly linear-lanceolate, 1–2.5 cm. long, spreading in a fan-shaped manner, often curved: scape very slender, 8–30 cm. tall, nearly terete below, slightly flattened above: spike ovoid or ellipsoid, 4–8 mm. long, usually acute; bracts entire: lateral sepals 4–5 mm. long.—Low pinelands, Coastal Plain, Fla. to Miss.

3. **X. ambigua** Beyr. Leaves linear, 1–4 dm. long, tapering from a rather broad base, commonly roughish on the edges: scape 4–10 dm. tall, finely ridged, 2-edged above, the edges often rough: spike ovoid or ellipsoid-ovoid, 1.5–2.5 cm. long, often acute: lateral sepals 5–8.5 mm. long: wing ciliolate.—Swamps or open pinelands, Coastal Plain, Fla. to Tex. and N. C.—An infusion of the herbage of this, and doubtless other, species of *Xyris* is rubbed on the chest by the Seminoles, in cases of colds and pulmonary disorders.

4. **X. stricta** Chapm. Leaves linear or slightly tapering upward, 1–4 dm. long, quite narrow, smooth-edged, often discolored in drying: scapes 4–10 dm. tall, 2-edged and margined above, the margins rough: spikes narrowly ellipsoid or cylindric, 2–3.5 cm. long: lateral sepals 5.5–7 mm. long; wing ciliolate, from the middle to the top.—Shallow pineland ponds, Coastal Plain, Fla. to Miss.

5. **X. torta** J. E. Sm. Leaves narrowly linear, 5–30 cm. long, acute, straight or spirally twisted: scape 2–6 dm. tall, more or less spirally twisted, nearly terete below, 2-edged above, smooth: spike oval or subglobose, 5–10 mm. long: lateral sepals margined, 4–5 mm. long; keel ciliate and bearded at the apex. [X. *flexuosa* Chapm. not Muhl.]—Swamps, damp banks, and wet soil, various provinces, Ga. to Tex., Minn., and Me.

6. **X. neglecta** Small. Leaves few, linear, 3–10 cm. long, acute, straight or slightly curved, rather erect: scape 1–4 dm. tall, spirally twisted, 10-ridged: spike ovoid, 4–9 mm. long; bracts 3–5 mm. long: lateral sepals 3–4 mm. long; wing with erose-serrate crest from near the base to the apex.—Moist pinelands, Coastal Plain, Fla. to Miss. and Ga.

7. **X. caroliniana** Walt. Leaves linear, attenuate, smooth, the longer fully ½ as long as the scape: scape 1–6 dm. tall, flattened and 2-edged above, the edges smooth: spike oval or ovoid, 6–9 mm. long, obtuse; bracts loosely imbricate in few series and splitting in age: lateral sepals 4–5 mm. long; wing narrower than the sepal-body, incised-toothed or eroded beyond the middle.—Shallow ponds and swamps, Coastal Plain and New England Coast, Fla. to La., and Me.; Great Lake Lowland, Ind.

8. **X. communis** Kunth. Leaves gradually attenuate, shorter than the scape: scape 2–7 dm. tall, 2-edged above: spike oval or globular, 8–15 mm. long: bracts closely imbricate in few series: lateral sepals 3–4 mm. long; wing narrower

than the sepal-body, erose-toothed or incised-toothed above the middle.—Low pinelands and swamps, Coastal Plain and rarely adj. provinces, Fla. to La. and Md.—(*W. I.*)

9. X. elata Chapm. Leaves few, 2–6 dm. long: scape 3–12 dm. tall, 2-edged above: spike oblong to conic-oblong, 16–23 mm. long: bracts numerous, closely imbricate in many series: lateral sepals 4–5 mm. long; wing narrow, toothed above the middle.—Low pinelands and swamps, Coastal Plain, Fla. to La. and N. J.

10. X. scabrifolia Harper. Leaves few, very narrow, elongate-linear, scabro-puberulent, 3–4 dm. long: scape surpassing the leaves, and puberulent like them: spike 1–1.5 cm. long; bracts rather numerous, closely imbricate: lateral sepals about 5 mm. long; wing narrow, toothed above the middle.—Bogs, Piedmont, W Ga.

11. X. difformis Chapm. Leaves few, linear, 1–5 dm. long, smooth: scape 2–5 dm. tall, mostly clustered, twisted, sharply 2-edged above, smooth: spike ovoid, 12–18 mm. long, acute, the bracts rounded: lateral sepals 4.5–6 mm. long: wing narrow or obsolete near the base of the sepal, with a crest of fringe extending ½–⅓ the length of the sepal from the tip.—Swamps, Coastal Plain, Fla., Ga., and Ala.

12. X. serotina Chapm. Similar to *X. difformis* in habit. Leaves and scape rough-margined: spike ovoid, 12–18 mm. long, obtuse; bracts rounded: lateral sepals 4.5–5 mm. long; wing broad to the base of the sepal, with a fringed crest mainly above the middle.—Pineland swamps, Coastal Plain, Fla. and Miss.

13. X. platylepis Chapm. Leaves linear, 2–6 dm. long: scape 5–9 dm. tall, 2-ridged above, sometimes slightly roughened on the margins: spike ellipsoid or cylindric, 1.5–3 cm. long; bracts very broad and broadly truncate or nearly so at the apex: lateral sepals 4.5–6 mm. long; wing with a lacerate crest above the middle.—Low sandy places or pinelands, Coastal Plain, Fla. to La. and S. C.

14. X. iridifolia Chapm. Leaves few, linear, 5–8 dm. long, relatively broad: scape 6–10 dm. tall, stout, nearly terete or 1-edged below, flattened and 2-edged above, the edges broad: spike ellipsoid or cylindric, 1.5–3.5 cm. long; bracts rounded: lateral sepals 5–6 mm. long; wing narrow, incised-fimbriate its whole length.—Shallow ponds and wet pinelands, Coastal Plain and adj. provinces, Fla. to Tex. and Ga.

15. X. Elliottii Chapm. Leaves numerous, narrowly linear, grass-like, 3–10 cm. long or longer, acute, often twisted: scape 2–5 dm. tall, twisted, 2-edged throughout, or only 1-edged below, roughish on the edges: spike oval or ellipsoid; bracts with thin eroded edges: lateral sepals 4–6.5 mm. long; wing incised-lacerate above the middle or nearly entire below the terminal tuft or beard.—Wet grassy pinelands and swamps, Coastal Plain, Fla. to Miss. and S. C.—(*W. I.*)

16. X. Smalliana Nash. Leaves few, lustrous, linear, 3.5–7 dm. long, the lower half often purplish, striate: scape 7–10 dm. tall, about twice as tall as the leaves, flattened, unequally 2-edged below the spike, smooth: spike ovoid or at maturity ellipsoid, 1.5–2.5 cm. long: lateral sepals 5–8 mm. long; wing crested with short erect segments from about the middle.—Shallow ponds, Coastal Plain, Fla. to La. and Ga.

17. X. fimbriata Ell. Leaves not lustrous, linear, 3–5 dm. long, smooth: scape stiff and straight, erect, 6–12 dm. tall, roughish, and 2-edged above: spike ovoid

to ellipsoid, 1.5–2.5 cm. long: lateral sepals 7–9 mm. long, relatively broad; wing crested with long spreading segments from about the middle to the apex. —Ponds or swampy places in pinelands, Coastal Plain, Fla. to Miss. and N. J.

18. **X. flexuosa** Muhl. Leaves with dark dilated bases, 1–4 dm. long, usually spirally twisted: scape 3–7 dm. tall, somewhat flattened above, spirally twisted: spike cylindric or conic-oblong, 1.5–3 cm. long, often acute: lateral sepals 8–12 mm. long; fringe of the wing firm: corolla yellow. [*X. torta* Kunth *X. arenicola* Small]—Pinelands, Coastal Plain, Fla. to Tex., Ark., and N. J.

19. **X. pallescens** (C. Mohr) Small. Leaves few, accompanied by the persistent purple or brown bases of those of previous years, 2–4 dm. long, spirally twisted: scape 3–6 dm. tall, spirally twisted, 2-edged above: spike ellipsoid or conic-ellipsoid, 1–1.5 cm. long: lateral sepals 6.5–9 mm. long, very delicate, narrow; fringe of the wing delicate: corolla white.—Pinelands, open hammocks, and sandy shores, Coastal Plain, Fla., Ala., and Ga.

20. **X. Baldwiniana** R. & S. Leaves numerous, filiform, terete, 0.5–2 dm. long, becoming twisted: scape slender, 2–4 dm. tall, 1-angled or nearly terete, smooth: spike ovoid or subglobose, 4–6 mm. long, turbinate at the base: lateral sepals 4–6 mm. long, the upper half of the keel-wing serrate: sterile filaments glabrous.—(ST. MARY'S GRASS.)—Damp pinelands or pineland ponds, Coastal Plain, Fla. to Tex. and N. C.

ORDER **ERIOCAULALES**—ERIOCAULAL ORDER

Acaulescent terrestrial herbs with the narrow leaves often crowded on a short caudex or with the caudex elongate and stem-like. Flowers crowded in a dense depressed or elongate head, monoecious or dioecious. Calyx and corolla minute. Gynoecium with a superior ovary. Fruit a fragile capsule. Seeds very minute, nut-like.

FAMILY 1. **ERIOCAULACEAE** — PIPEWORT FAMILY

Perennial and perhaps rarely annual, mostly acaulescent, bog or aquatic herbs. Rootstocks often creeping or horizontal. Leaves clustered: blades narrow. Scapes simple, subtended by sheathing bracts. Flowers monoecious (androgynous), or rarely dioecious, densely crowded in a terminal involucrate head. Perianth in 2 series (the inner rarely obsolete). Staminate flowers with as many stamens as the sepals or twice as many. Pistillate flowers with a 2–3-celled ovary. Fruit a capsule.—Nine genera and over 500 species, in warm and tropical regions, most abundant in South America.

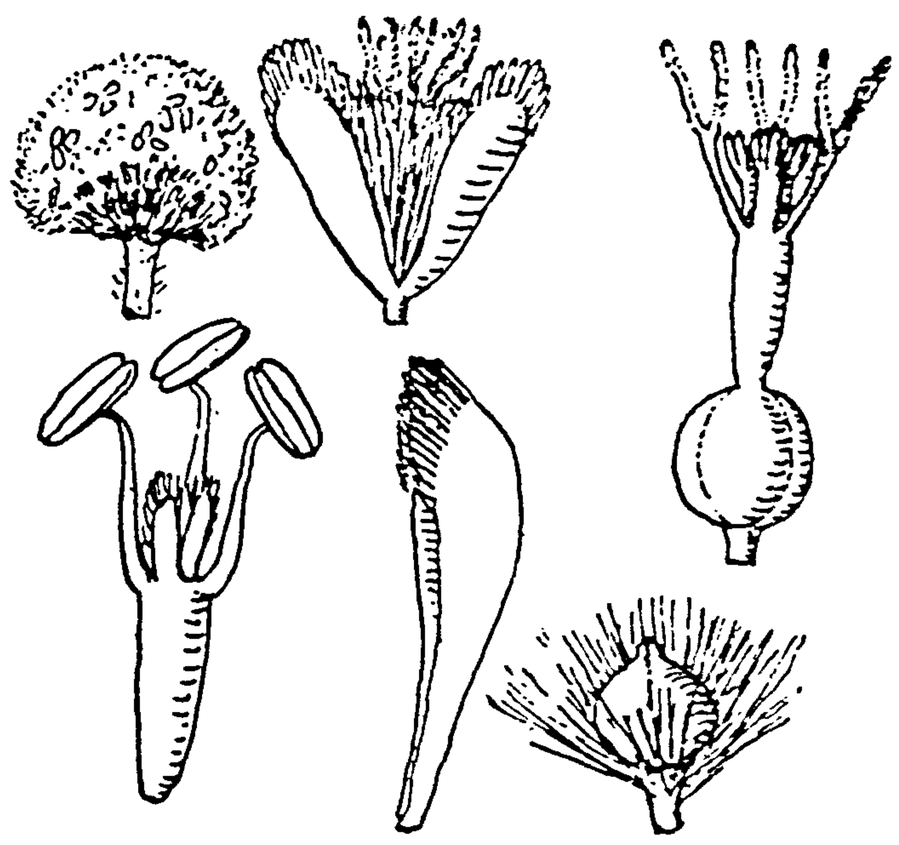
Stamens 2 or 3, as many as the sepals: petals glandless.
  Petals of the pistillate flowers obsolete. 1. LACHNOCAULON.
  Petals of the pistillate flowers resembling the sepals and united at the middle. 2. SYNGONANTHUS.
Stamens 4–6, twice as many as the sepals: petals each bearing a prominent gland. 3. ERIOCAULON.

1. **LACHNOCAULON** Kunth. Flower head not conspicuously involucrate. Staminate flowers: sepals 3; petals obsolete; stamens 3; filaments united below, coalescent with a rudimentary corolla or pistil, this with 3 lobes at the top; anthers 1-celled. Pistillate flowers: sepals 3; petals obsolete.—Repre-

sented only by the following species.—Heads white, gray, brown, or black.—HAIRY-PIPEWORT. BOG-BUTTONS.

Scape glabrous.
  Gynoecium 3-carpellary: stigmas 3: bracts of the involucre obtuse.
    Head dark-brown or black, scarcely, if at all, pubescent: sepals obscurely pubescent near the apex. 1. *L. Engleri.*
    Head white or gray, woolly: sepals copiously ciliate.
      Head gray, globular at maturity: sepals about 1 mm. long: anther as long as the filament. 2. *L. floridanum.*
      Head white, spheroidal at maturity: sepals about 1.5 mm. long: anther shorter than the filament. 3. *L. glabrum.*
  Gynoecium 2-carpellary: stigmas 2: bracts of the involucre acute. 4. *L. digynum.*
Scape pubescent.
  Seeds smooth. 5. *L. Beyrichianum.*
  Seeds cancellate.
    Bractlets and sepals of the pistillate flowers not ciliate. 6. *L. eciliatum.*
    Bractlets and sepals of the pistillate flowers ciliate.
      Head gray or brown-gray, 4 mm. thick or less: seeds oval or ovoid, 0.5 mm. long. 7. *L. minus.*
      Head white, 5 mm. thick or more: seeds ellipsoid, 0.8 mm. long. 8. *L. anceps.*

1. L. Engleri Ruhl. Leaf-blades 1–3 cm. long, linear-attenuate, glabrous, firm: scape 5–30 cm. tall, 3–5-ridged, twisted, glabrous: head cylindric at maturity, 3–6 mm. long: receptacle with slender-clavate hairs: bractlets obovate, minutely pubescent near the apex: sepals obovate, obtuse.—Damp, sandy and springy places, Fla.—(*W. I.*)



2. L. floridanum Small. Leaf-blades 2–4.5 cm. long, linear, less attenuate than those of *L. glabrum,* sparingly ciliate, manifestly cellular at the base: scape 3–11 cm. tall, twisted, glabrous: head 3–3.5 mm. long at maturity: bractlets spatulate or obovate-spatulate, ciliate: sepals similar to the bractlets, ciliate.—Low sandy places, pen. Fla.

3. L. glabrum Koern. Leaf-blades spreading and ascending, linear-attenuate, 4–5 cm. long, glabrous: scape 15–30 cm. tall, twisted, glabrous: head white, 3–4 mm. thick: bractlets and sepals ciliate.—Pinelands, damp woods, and wet sandy places, Coastal Plain, Fla. and Ala.

4. L. digynum Koern. Leaf-blades 8–15 mm. long, linear, glabrous: scape 6–15 cm. tall, glabrous: head globular, about 2 mm. in diameter, gray: bractlets spatulate, each with a nerve-like keel: sepals obtuse, ciliate: ovary 3-celled.—Sandy soil, often in pinelands, Fla.

5. L. Beyrichianum Sporleder. Leaf-blades 1.5–5 cm. long, very narrowly linear or linear-filiform, sparingly ciliate or nearly glabrous: scape 3–14 cm. tall, sparingly hairy: head globular, becoming somewhat elongate, about 3 mm. thick: bractlets spatulate, ciliate: sepals obovate to nearly spatulate, ciliate.—Sandy shores and springy places, Coastal Plain, Ga.

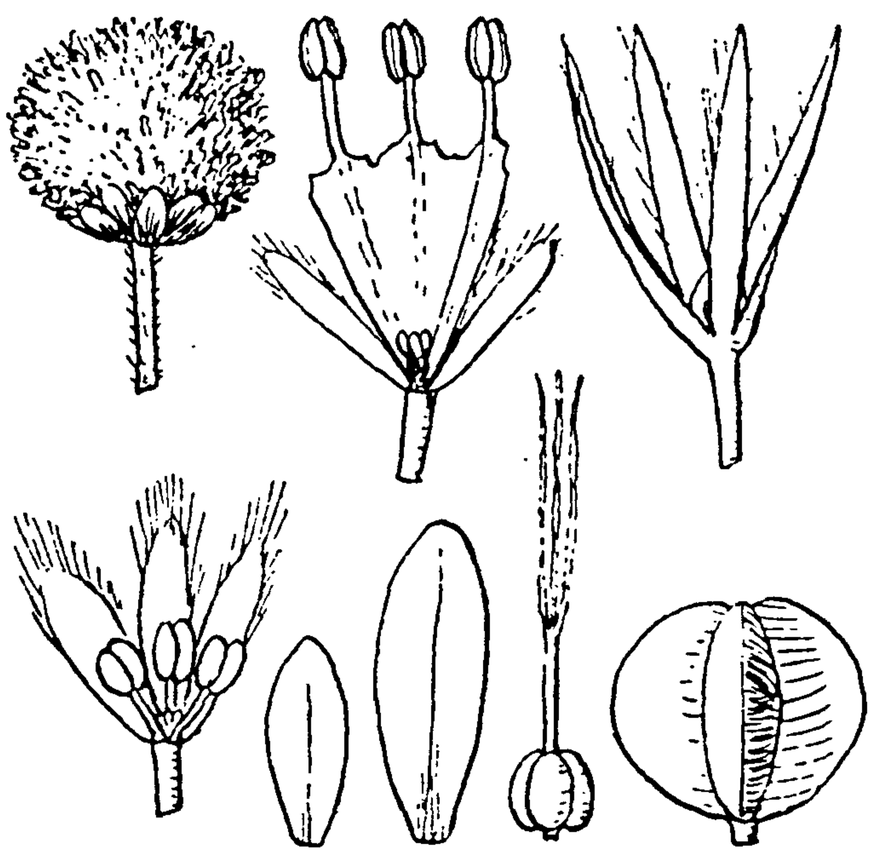
6. L. eciliatum Small. Leaf-blades 1–4.5 cm. long, linear-attenuate, sparingly ciliate: scapes slender, 3–9 cm. tall, pubescent: heads globular, 3–3.5 mm. thick, gray: bractlets spatulate, not ciliate: sepals spatulate to oblanceolate,

eciliate, those of the pistillate flowers wholly glabrous, those of the staminate minutely pubescent at the apex: seeds ovoid, cancellate.—Sandy shores, NW Fla.

7. L. minus (Chapm.) Small. Leaf-blades 1–4 cm. long, linear-attenuate, sparingly ciliate: scape slender, 0.5–3 dm. tall, pubescent: head globular to cylindric, 3–4 mm. thick: bractlets and sepals ciliate with relatively short hairs. [*L. Michauxii minus* Chapm.]—Moist soil, often on pond-margins, Coastal Plain, Fla. to N. C.

8. L. anceps (Walt.) Morong. Leaf-blades 2–6 cm. long, narrowly linear-attenuate, sparingly pubescent or glabrate: scape 0.5 dm. tall, very slender, pubescent: head spheroidal, 5 mm. thick or more: bractlets and sepals ciliate with relatively long hairs.—Sandy places and low or moist pinelands, Coastal Plain, Fla. to Tex. and Va.; and Appalachian Plateau, Ala.

2. **SYNGONANTHUS** Ruhl. Flower-head conspicuously involucrate. Staminate flowers with 2 or 3 distinct sepals and petals: stamens 2–3: filaments distinct: anthers 2-celled. Pistillate flowers with 2 or 3 distinct sepals and 2 or 3 petals united at the middle.—About 80 species, mostly natives of tropical America.—Heads yellowish-white.



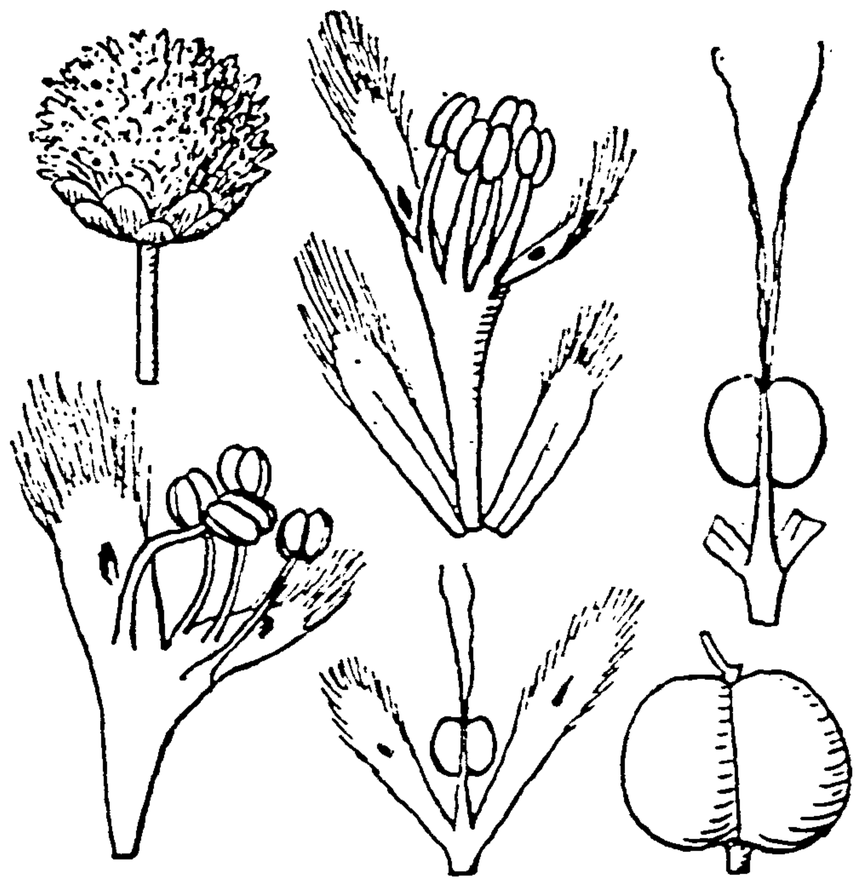
1. S. flavidulus (Michx.) Ruhl. Leaf-blades filiform-linear or linear-subulate, 2–7 cm. long, floccose near the base: scapes 1–3 dm. tall, 5-angled, pubescent, very slender: heads 4–6 mm. thick: bracts of the involucre straw-colored, shining. [*Paepalanthus flavidulus* Kunth] —(SHOE-BUTTONS. BANTAM-BUTTONS.)—Low pinelands, margins of sandhill ponds and bogs, Coastal Plain, Fla. to Ala. and N. C. (or Va. ?)—Spr.

3. **ERIOCAULON** [Gronov.] L. Flower-heads not conspicuously involucrate. Staminate flowers: sepals 2–3; petals 2–3, each with a gland; stamens usually 4–6; filaments distinct. Pistillate flowers: sepals as in the staminate flowers; petals much reduced and narrow; stamens wanting.—About 200 species, mostly in warm temperate and tropical regions.—Heads white, gray, or lead-colored, except in *E. Ravenelii,* in which they are brown or blackish.—PIPEWORTS. BUTTON-RODS. HAT-PINS.

Sheath at the base of the scape surpassing the leaves, except in the case of submerged plants.
- Petals linear to spatulate: scape 4–7 ridged: head less than 10 mm. in diameter. — 1. *E. lineare.*
- Petals broader: scape 10–12-ridged: head over 10 mm. in diameter. — 2. *E. compressum.*

Sheath at the base of the scape surpassed by the leaves, or some of them.
- Head 10–16 mm. thick: bractlets, sepals, and petals ciliate: bractlets acute. — 3. *E. decangulare.*
- Head 3–5 mm. thick: bractlets, sepals, and petals glabrous: bractlets obtuse. — 4. *E. Ravenelii.*

1. E. lineare Small. Leaf-blades 2–5 cm. long, curved, attenuate, sparingly pubescent or almost glabrous: scape deep green, 1–3 dm. tall, 3–5-ridged: head depressed, 5–6 mm. broad: bracts of the involucre rhombic, acute, pubescent near the tip: sepals mainly spatulate: petals at least othesof the staminate flowers, linear.—Wet woods, and moist pinelands, Coastal Plain, Fla., Ala., and Ga.—Spr.—*E. septangulare* as admitted into our range, seems to have been, for the most part, based on small specimens of *E. lineare*.



2. E. compressum Lam. Leaves ascending-spreading; blades 2–12 cm. long, flaccid, longitudinally striate: scape 2–10 dm. tall, 10–12-ridged: head spheroidal, over 10 mm. thick: petals of the staminate flowers ciliate-fimbriate at the apex or above the middle.—Acid ponds and low pinelands, Coastal Plain, Fla. to Tex. and N. J.—Spr. or all year S.

3. E. decangulare L. Leaves erect or ascending: blades 10–50 cm. long: rather firm, finely many-striate, obtuse: scape stout, 3–10 dm. tall, 10–14-ridged: head globular, 10–16 mm. thick: bracts of the involucre acute: bractlets, sepals, and petals ciliate, or pubescent on the back.—Moist pinelands and acid swamps, Coastal Plain and rarely adj. provinces, Fla. to Tex., Pa., and N. J.—Sum. or all year S.

4. E. Ravenelii Chapm. Leaves various, the smaller spreading, the larger ascending or erect; blades 2–13 cm. long, pellucid, attenuate-acute: scape very slender, 4–30 cm. tall, 5–6-ridged: head spheroidal, 3–5 mm. thick: bracts of the involucre obtuse: bractlets, sepals, and petals glabrous.—Swamps and low pinelands, Coastal Plain, Fla. to Miss. and S. C.—Sum.–fall, or all year S.

Order **COMMELINALES**—Commelinal Order

Caulescent or acaulescent terrestrial or aquatic and often fleshy, or epiphytic and firm herbs. Leaves various: thread-like to very broad. Inflorescence an axillary or terminal spike, raceme, or panicle, or spadix-like. Flowers mostly perfect. Calyx and corolla regular or very irregular. Gynoecium with the ovary superior or sometimes inferior. Fruit a utricle or a capsule. Seeds grain-like or sometimes comose.

Terrestrial or aquatic plants: foliage not scurfy: stigmas united.	
Calyx and corolla free, of very different members: stamens free.	Fam. 1. Commelinaceae.
Calyx and corolla of quite similar members and partly united: stamens partly adnate to the perianth.	Fam. 2. Pontederiaceae.
Epiphytes (except in *Ananas*, a spiny-toothed cultivated terrestrial), often with scurfy foliage: stigmas 3.	Fam. 3. Bromeliaceae.

Family 1. **COMMELINACEAE** — Spiderwort Family

Annual or perennial caulescent succulent herbs. Leaves alternate, sheathing at the base. Flowers perfect, the mostly umbel-like or rarely scorpioid cymes involucrate. Calyx of 3 persistent herbaceous or partly petaloid sepals. Corolla of 3 equal or unequal delicate petals. Androecium of 5–6 stamens, sometimes 2 or 3 mere staminodia. Gynoecium

2–3-carpellary. Styles united. Fruit a loculicidally 2–3-valved capsule. —About 30 genera and 350 species, most abundant in tropical regions.

Polleniferous stamens 6, or rarely 5.
  Petals, or both sepals and petals, distinct — Tribe I. TRADESCANTIEAE.
  Petals, or sepals and petals, partly coherent or adnate into a tube. — Tribe II. ZEBRINEAE.
Polleniferous stamens 3, or rarely 2. — Tribe III. COMMELINEAE.

I. TRADESCANTIEAE

Flower-clusters subtended by minute or leaf-like bracts.
  Cymes or cymules subtended by small or minute bracts very unlike the leaves.
    Inflorescence simple: filaments pubescent. — 1. CUTHBERTIA.
    Inflorescence dichotomously compound: filaments glabrous. — 2. TRADESCANTELLA.
  Cymes subtended by an involucre of 1–3 bracts similar to the leaves. — 3. TRADESCANTIA.
Flower-clusters subtended by specialized boat-like involucres. — 4. RHOEO.

II. ZEBRINEAE

Succulent herbs with plain green or variegated leaves. — 5. ZEBRINA.

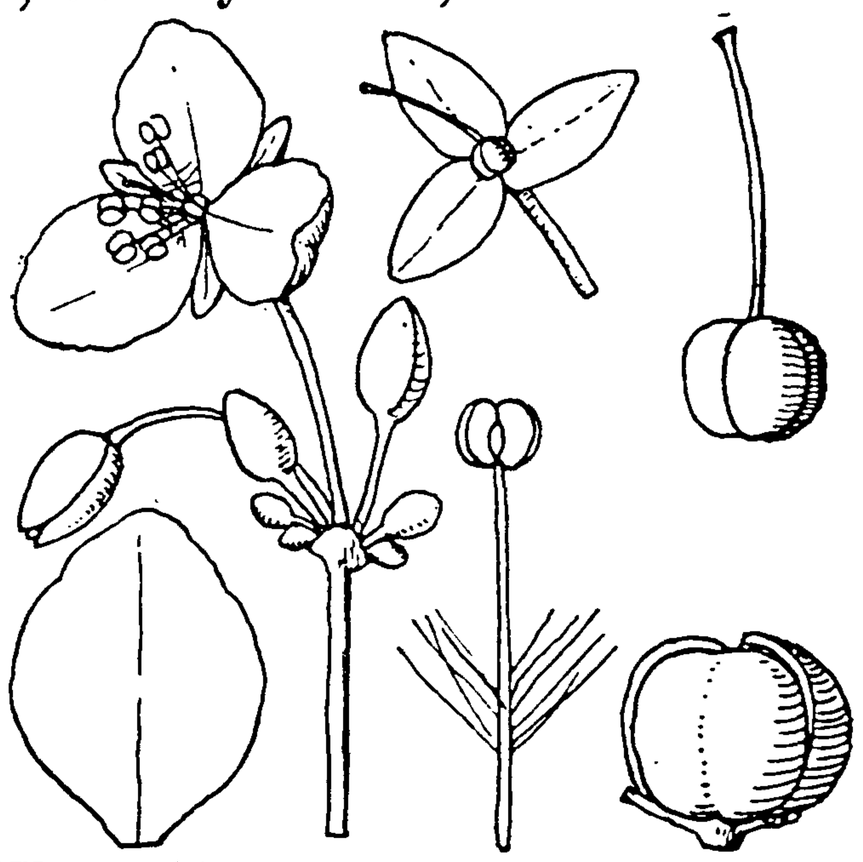
III. COMMELINEAE

Flower-clusters not subtended by folded bracts. — 6. ANEILEMA.
Flower-clusters subtended by a folded spathe-like involucre. — 7. COMMELINA.

1. CUTHBERTIA Small. Stems upright or sometimes ultimately diffuse, often tufted, from a dense cluster of cord-like naked or fuzzy roots. Leaf-blades narrow, elongate, flat or half-terete. Cyme simple, terminating a long peduncle, with scale-like bracts. Petals pink or purplish, equal. Stamens 6: filaments pubescent.—Represented only by the following species.—ROSELINGS.

Leaves erect; blades half-terete or channeled, slender: capsule subglobose.
  Petals entire: corolla 2–2.5 cm. wide. — 1. *C. graminea.*
  Petals crenate: corolla 3–4 cm. wide. — 2. *C. ornata.*
Leaves loosely spreading; blades flat: capsule obovoid or globose-obovoid. — 3. *C. rosea.*

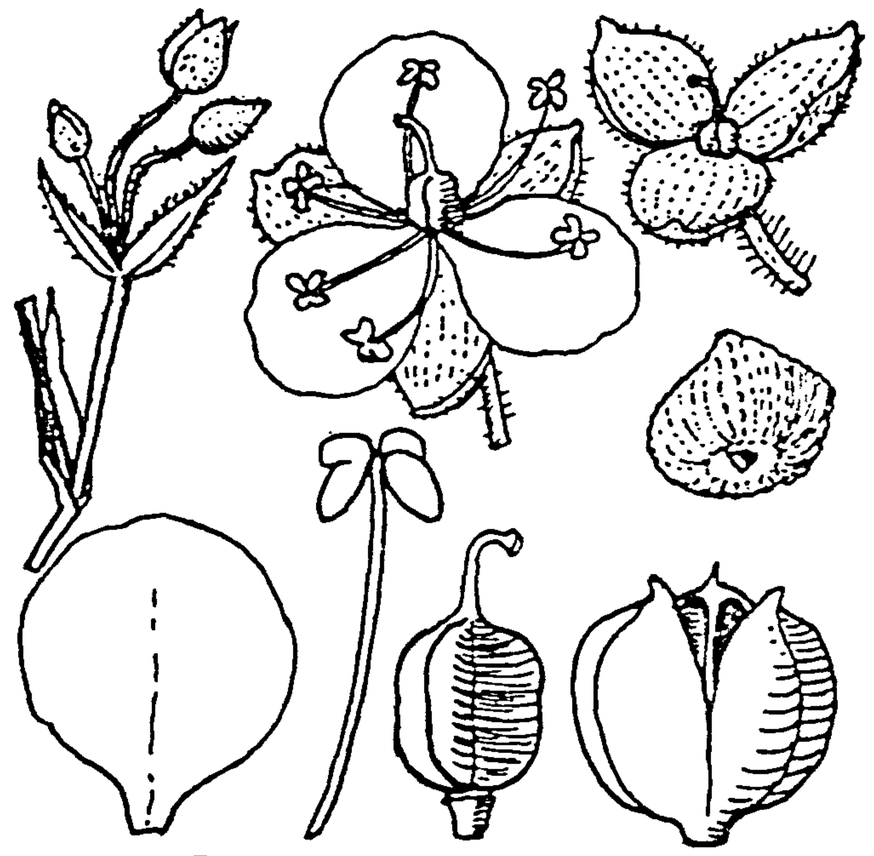
1. C. graminea Small. Plant 0.5–2 dm. tall, densely tufted, the stem slender, nearly straight: leaves erect; blades filiform-subulate: corolla 2-2.5 cm. wide: capsule subglobose, about 4 mm. in diameter: seed about 1.5 mm. wide; prominently ribbed.—Sandy woods, pinelands, and sandhills, Coastal Plain and adj. Piedmont, Fla. to N. C.—Spr.–sum.



2. C. ornata Small. Plant 3–6 dm. tall, single or sparingly tufted, the stem stoutish, nearly straight: leaves erect: blades subulate-acicular: corolla 3–4 cm. wide: capsule globular, about 4 mm. in diameter: seed about 1.5 mm. in diameter, rather shallowly ribbed.—Scrub, pen. Fla.—All year.

3. C. rosea (Vent.) Small. Plant erect, single or sparingly tufted, often becoming diffuse: leaves lax; blades narrowly linear and somewhat attenuate: corolla 2–2.5 cm. wide: capsule obovoid or globose-obovoid, 3.5–4 mm. in diameter: seed about 1.5 mm. in diameter, rather sharply ribbed. [*Tradescantia rosea* Vent.]—Oak-woods, pinelands, and river-swamps, Coastal Plain and Piedmont, Fla. to N. C. (or Va.?)—Spr.–sum.

2. **TRADESCANTELLA** Small. Herbs with creeping stems. Leaf-blades small but relatively broad. Cyme dichotomous, the cymules with scale-like bracts. Petals nearly equal. Stamens 6: filaments glabrous.—One species.



1. T. floridana (S. Wats.) Small. Stem and branches more or less matted: leaf-blades ovate to ovate-lanceolate, 1–2 cm. long, ciliolate: sepals ovate, 2–3 mm. long: petals white: capsule nearly 2 mm. long.—Damp shady places and hammocks, pen. Fla.—Spr.–fall.—Most frequent on kitchenmiddens and sites of aboriginal activity. Often forming a dense ground cover.

3. **TRADESCANTIA** [Rupp.] L. Plants mostly erect. Leaf-blades usually relatively long and narrow. Cyme in an involucre of 1–3 leaf-like bracts. Flowers sometimes fragrant. Petals nearly equal. Capsule sessile.—About 35 species, natives of temperate and tropical America.—Spr.–sum.—SPIDERWORTS. BLUE-JACKETS.—Some species have become favorite garden plants and are greatly admired for their bright-blue or purple flowers which open, however, only in the morning.

Stem and branches erect: flower cluster subtended by an involucre of elongate bracts: leaves elongate.
- Leaf-blades greatly elongate and attenuate: flowers in a terminal cluster or also in stalked axillary clusters at the upper remote nodes of the stem. — I. LONGIFOLIAE.
- Leaf-blades lanceolate to linear-lanceolate, acuminate: flowers in sessile or short-stalked clusters at the approximate successive upper nodes of the stem. — II. BREVIFOLIAE.

Stem and branches decumbent or prostrate, creeping: leaf-blades broad. — III. FLUMINENSES.

I. LONGIFOLIAE

- Stem abbreviated, sometimes only about a centimeter long: bracts of the involucre mostly longer than the leaves. — 1. *T. brevicaulis.*
- Stem elongate, up to a meter tall: bracts of the involucre shorter than the leaves.
  - Stem glabrous or sparingly pubescent.
    - Sepals pubescent with long non-glandular hairs all over. — 2. *T. virginiana.*
    - Sepals with a small tuft of hairs at the tip.
      - Sheaths of the lower leaves glabrous on the back.
        - Bracts of the involucre elongate: petals blue. — 3. *T. reflexa.*
        - Bracts of the involucre very short: petals red. — 4. *T. incarnata.*
      - Sheaths of the lower leaves arachnoid. — 5. *T. foliosa.*
  - Stems hirsute, and also sometimes glandular.
    - Stem, pedicels, and sepals hirsute with non-glandular hairs. — 6. *T. hirsuticaulis.*
    - Stem, pedicels, and sepals glandular-pubescent. — 7. *T. longifolia.*

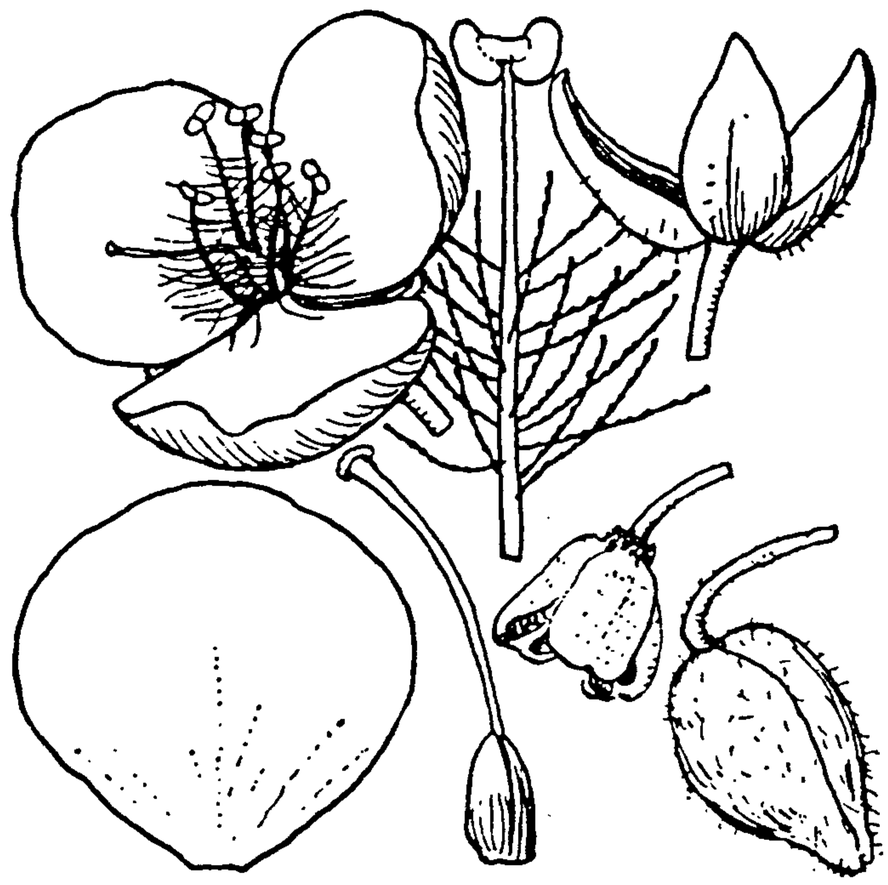
II. BREVIFOLIAE

- Plant very variable in size and habit, but leaves usually distichous, those subtending the very many-flowered clusters mostly saccate at the base. — 8. *T. pilosa.*

III. FLUMINENSES

- Spreading plant with weak creeping stems and branches: leaf-blades ovate, oval, or elliptic. — 9. *T. fluminensis.*

1. T. brevicaulis Raf. Stem very short, somewhat elongating in age, but less than 1 dm. long, densely villous, simple: leaves elongate, with large sheaths that nearly or quite clothe the stem; blades attenuate, less pubescent than the stem: flowers rather few in a cluster, on conspicuously elongate densely villous pedicels: sepals elliptic-ovate, 10–13 mm. long, villous all over: petals blue or purple, 2–2.5 cm. long: capsule globose-obovoid, about 5 mm. long, sparingly pubescent at the top: seed about 2.5 mm. long. — (BLUE-GRASS.) — Prairies, hillsides, and woods, Interior Plateau provinces, Tenn. to Ark., Mo., and Ill.—Spr.



2. T. virginiana L. Stem single or branched at the base, the branches then tufted, 2–5 dm. tall, green, glabrous or finely pubescent, commonly simple: leaves few, elongate; blades attenuate, glabrous or pubescent in plants with pubescent stems: flowers several to many in a cluster: sepals broadly ovate, 12–18 mm. long, more or less villous all over, thin in age: petals blue, violet, rose, or white, 1.5–2 cm. long: capsule ellipsoid-obovoid, 4–5 mm. long, glabrous: seed about 2.5 mm. long.—Woods, meadows, hillsides, stony bluffs, and stream-banks, various provinces, rarely Coastal Plain, N. C. to Ark., Ill., and N. S.—Spr.

3. T. reflexa Raf. Stem usually single, up to 1 m. tall, glabrous, glaucous, branched in robust plants: leaves elongate, glabrous, glaucous or nearly so; blades attenuate, occasionally with scattered hairs near the sheath: flowers several or many in a cluster: sepals elliptic to ovate-elliptic, 8–11 mm. long, one, at least, with a tuft of hairs at the apex, permanently thick: petals blue, ovate, usually broadly so, 1.5–2 cm. long: capsule ellipsoid, about 5 mm. long, glabrous, glaucous: seed about 2.5 mm. long.—Woods, sandhills, dunes, barrens, and pinelands, various provinces, N Fla. to Tex., Minn., and N. C.—Spr.–sum.

4. T. incarnata Small. Stem commonly single, up to 1 m. tall, glabrous, simple or with a branch or two above: leaves elongate, with long, arachnoid sheaths or glabrous, except for hairs on or near the edges; blades linear-attenuate, glabrous or with long hairs near the sheath: flowers rather few in a cluster, or numerous in the terminal cluster: sepals elliptic or elliptic-lanceolate, 6–8 mm. long, one of them, at least, sparingly bearded at the apex: petals bright-red, broadly ovate, 1–1.5 cm. long: capsule glabrous.—Sandy woods, N Miss.—Spr.–sum.

5. T. foliosa Small. Stem often single, mostly 3–7 dm. tall, simple above, or sparingly branched, glabrous: leaves erect, the lower ones several or numerous, with ample imbricate arachnoid sheaths; blades elongate, linear-attenuate, those of the lower ones, at least, with scattered hairs above the sheathing bases: flowers rather numerous in the terminal cluster: sepals elliptic-ovate, 7–8 mm. long, 2 of them, at least, pubescent near the apex: petals blue, broadly ovate, 1.5–2 cm. long: capsule globose-obovoid, 4–5 mm. long, glabrous: seed 3 mm. long.—Hammocks, NE Fla., and N part of the pen.—Spr.

6. T. hirsuticaulis Small. Stem single, or branched at the base, the branches 2–5 dm. tall, simple or sometimes branched, hirsute with long white or pale hairs: leaves elongate; blades narrowly linear-attenuate, hirsute: flowers usually relatively few in a cluster: sepals narrowly ovate to elliptic-ovate, 9–11 mm. long, or rarely longer, hirsute, green or magenta-margined: petals violet, ovate or orbicular-ovate, 1.6–2.2 cm. long: capsule globose-ellipsoid, 6–7 mm. long, glabrous or inconspicuously glandular-pubescent: seed about 3 mm. long.

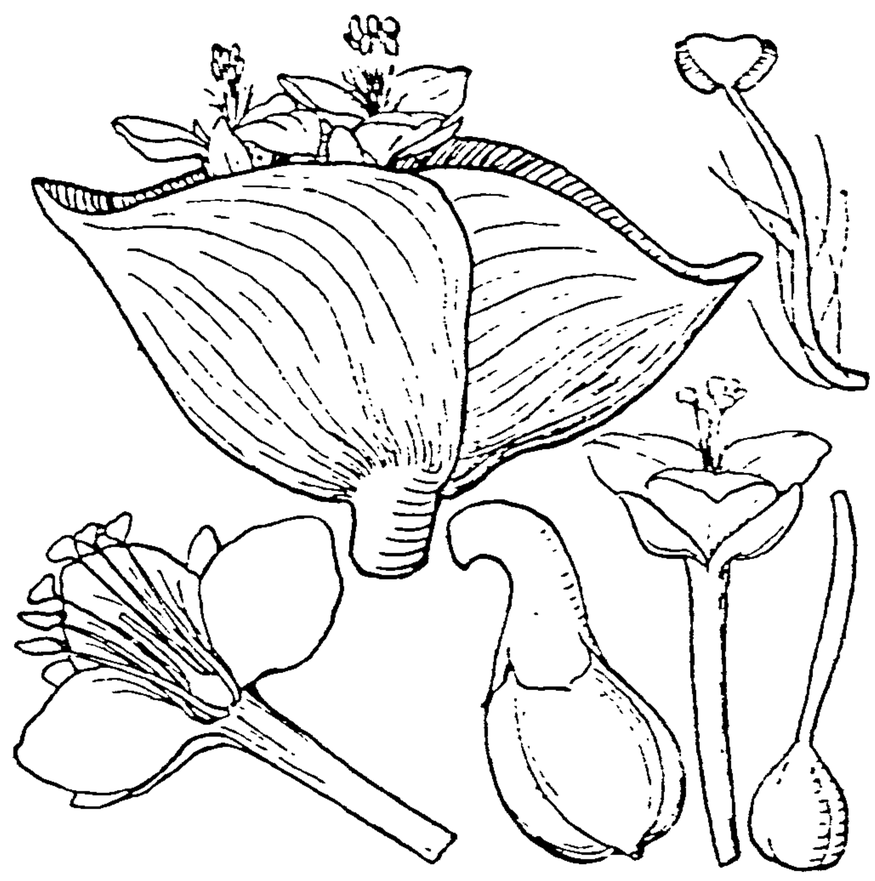
—Sandy woods, rocky hills, and fields, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and Ga.—Spr.

7. T. longifolia Small. Stem single, or branched at the base, the branches tufted, up to 6 dm. tall, sometimes branched above, finely glandular-pubescent and often with additional longer glandless hairs: leaves elongate, the lower ones usually equalling the height of the stem; blades narrowly linear-attenuate, pubescent like the stem: flowers commonly numerous in a cluster: sepals elliptic to elliptic-lanceolate, 9–10 mm. long, glandular-pubescent, often magenta-margined: petals blue to violet, 1.3–2 cm. long, broadly ovate to orbicular-ovate: capsule ellipsoid, 6–7 mm. long, finely glandular-pubescent: seed 3 mm. long. [*T. roseolens* Small]—Scrub, pinelands, and oak-woods, pen. Fla.—All year.

8. T. pilosa J. G. C. Lehm. Stem up to 1 m. tall, usually simple, but often with short or elongate flower-stalks from the axils of some of the upper leaves, or rarely branched, frequently zigzag, glabrous or villous, often gregarious: leaves rather approximate and distichous or ultimately distant; blades lanceolate to linear-lanceolate, or rarely elongate: flowers typically numerous, sometimes very numerous: sepals elliptic-ovate to elliptic-lanceolate, mostly 6–8 mm. long, hairy all over: corolla 3–3.5 cm. wide: capsule oval, about 5 mm. long, glandular-pubescent on the top: seed fully 2.5 mm. long. [*T. montana* Shuttlw. *T. comata* Small]—Rich woods, various provinces, N Fla. to La., Mo., Ohio, and Va.—Of wide distribution, and variable in size and habit. The broad-leaved forms are very distinct; those with narrower sometimes elongate leaves resemble forms of *T. reflexa,* but may be distinguished from that species by the pubescent sepals. Throughout so wide a range there is much variation in the color of the corolla which varies from deep-violet through pale-violet shades to white.

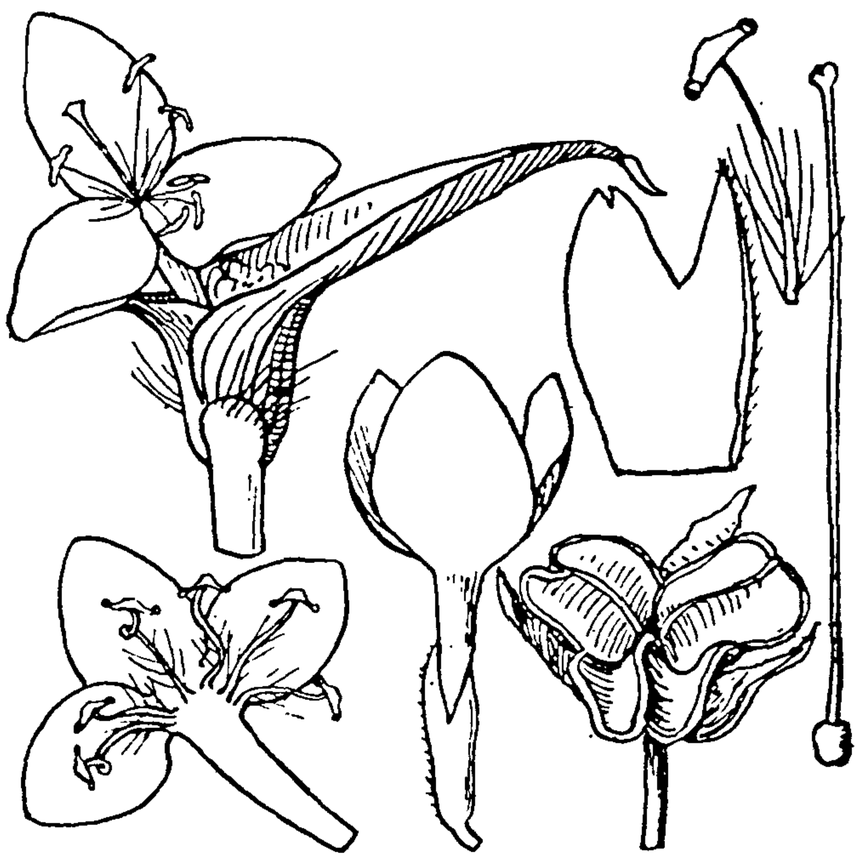
9. T. fluminensis Vell. Stem and branches widely spreading, up to 1 m. long, glabrous: leaf-blades ovate, oval or elliptic, 3–9 cm. long, acute, or slightly acuminate, the sheaths long-ciliate: flowers few in a cluster: sepals ovate, about 6 mm. long, with a finely pubescent median keel: corolla white, 10–13 mm. wide: capsule subglobose, about 3 mm. long: seed scarcely 1.5 mm. long.—(WANDERING-JEW.)—Sandy woods and waste-places, Coastal Plain, Fla. to N. C. Nat. of S. A. and cult.

4. **RHOEO** Hance. Herbs with erect or ascending stiff leaves, crowded on a stout caudex which is a branch of a fleshy rootstock: blades contracted above the sheathing base. Cyme congested, borne in an involucre of imbricate boat-like bracts. Petals equal, not clawed. Capsule sessile.—One species.



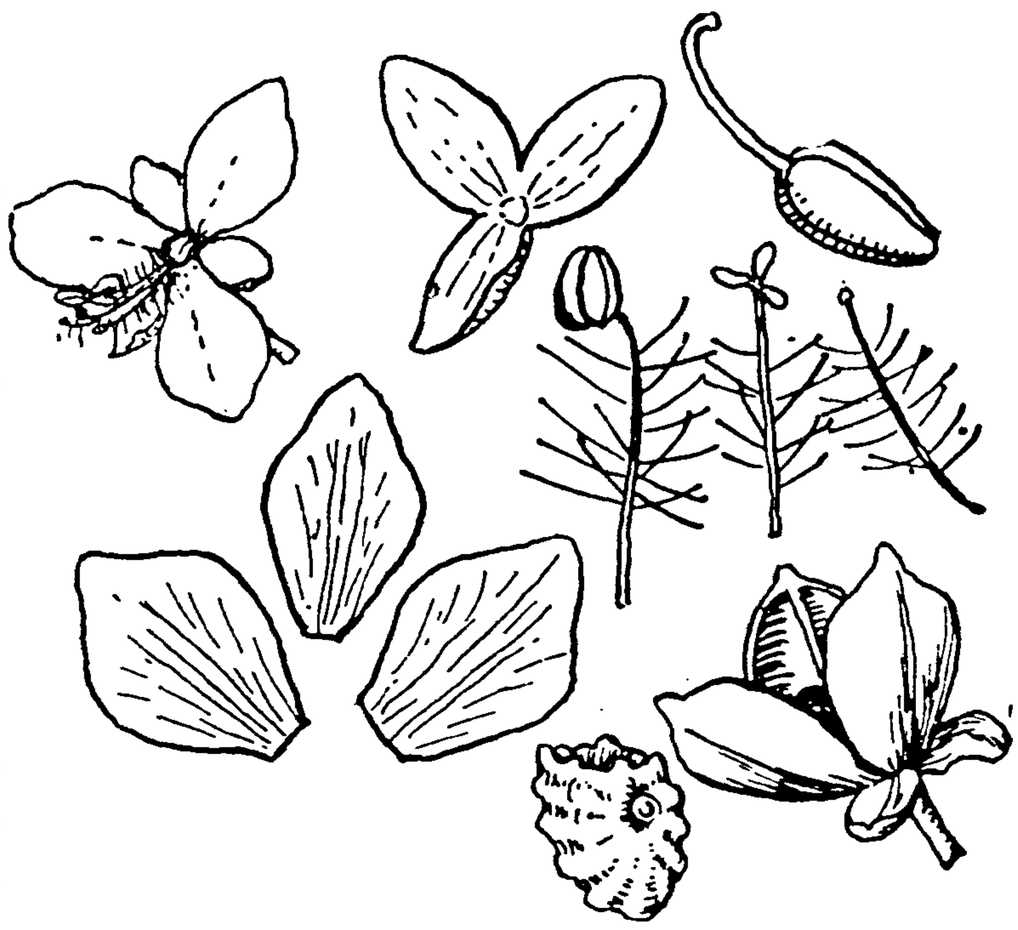
1. R. discolor (L'Her.) Hance. Leaves 2–4 dm. tall; blades very thick, broadly linear, acute, often purple, especially so beneath: flower-stalks clustered: spathes 3–4 cm. long: petals white or blue, 5–8 mm. long: capsule 4–5 mm. long.—(BOAT-LILY. OYSTER-PLANT.)—Pinelands and cult. grounds, pen. Fla. Nat. of Mex., and cult.—(*W. I.*)—All year.—A favorite garden plant in the tropics and frequently grown under glass in extra-tropical regions.

5. **ZEBRINA** Schnizl. Herbs with diffusely branching stems. Leaf-blades relatively broad. Cymes borne in involucres of leaf-like bracts with saccate bases. Corolla-lobes essentially equal. Stamens 6. Capsule slender-pedicelled.—Two species, Mexican.



1. **Z. pendula** Schnizl. Stem and branches very weak, often creeping: leaf-blades ovate to elliptic-ovate, 3–8 cm. long, often purple-striped or mottled: calyx coralloid; lobes lanceolate: corolla rose-purple or white; lobes ovate or suborbicular, 5–8 mm. long: capsule ovoid or ellipsoid-ovoid, 1.5 mm. long: seed about 1 mm. long.—(WANDERING-JEW.)—Hammocks, S pen. Fla. Nat. of Mex. and cult.—(*W. I.*)—All year.—A favorite house plant of long standing, most frequently used in hanging-baskets.

6. **ANEILEMA** R. Br. Herbs with diffuse, often creeping stems and branches. Leaf-blades long and narrow. Cyme subtended by involucres of leaf-like bracts. Perianth regular. Stamens 3, or rarely 2. Capsule not borne in a spathe.—About 60 species, most abundant in the Old World tropics.



1. **A. nudiflorum** (L.) Kunth. Plant 1–3 dm. tall, the stems often branched: leaf-blades linear to linear-acuminate, 3–11 cm. long, ciliate at the base: cymes long-peduncled: petals blue or purplish, 5–8 mm. long: capsule oval or globular, 4–5 mm. long, minutely beaked.—Roadsides, woods, and orange-groves, Coastal Plain, Fla. to Ga. Nat. of E Indies.—Spr.–fall.

7. **COMMELINA** [Plum.] L. Herbs with erect, spreading, or creeping stems. Leaf-blades relatively short. Cyme borne in a specialized folded involucre. Perianth irregular, sometimes only slightly so. Corolla blue, at least the larger petals. Stamens 3 or rarely 2. Capsule hidden in the spathe.—About 100 species, widely distributed in temperate and tropical regions.—Spr.—sum.—DAY-FLOWERS. DEW-FLOWERS.—Some species are frequently grown in gardens for their bright-green foliage and bright-blue flowers. Some tropical species may be grown in the open in temperate latitudes.

Spathe-like involucre open at the base, the edges not united.
- Two posterior petals blue; anterior one much smaller, narrow, white: capsule 2-celled, 4-seeded: spathe short: plants annual, diffuse. — I. COMMUNES.
- All three petals blue, with broad blades; anterior one slightly smaller than the posterior: capsule 3-celled, 5-seeded: plants perennial: spathe elongate. — II. LONGICAULES.

Spathe-like involucre with the edges united at the base.
- Two posterior petals blue; anterior one much smaller, white: leaf-sheaths ciliate with white hairs: capsule with the carpels 1-seeded, or the posterior one reduced or obsolete. — III. ANGUSTIFOLIAE.

All three petals blue; anterior one somewhat smaller than the posterior ones: leaf-sheaths with ferruginous hairs: capsule with the anterior carpels 2-seeded and the posterior carpel 1-seeded. IV. HIRTELLAE.

I. COMMUNES

Plants annual, diffusely spreading, the stems rooting at the lower nodes: leaf-blades lanceolate: anthers 6. 1. *C. communis.*

II. LONGICAULES

Plants mainly erect or diffuse with decumbent or climbing stems and erect branches: involucres mostly 2.5–5 cm. long, long-acuminate: seeds smooth, over 2.5 mm. long.
- Spathe about thrice as long as wide: petal-blades reniform, the posterior ones long-clawed. 2. *C. caroliniana.*
- Spathe about four times as long as wide: petal-blades deltoid, the posterior ones short-clawed. 3. *C. Gigas.*

Plants with creeping stems and branches: involucres mostly less than 2.5 cm. long, acute: seeds reticulate, 2–2.5 mm. long. 4. *C. longicaulis.*

III. ANGUSTIFOLIAE

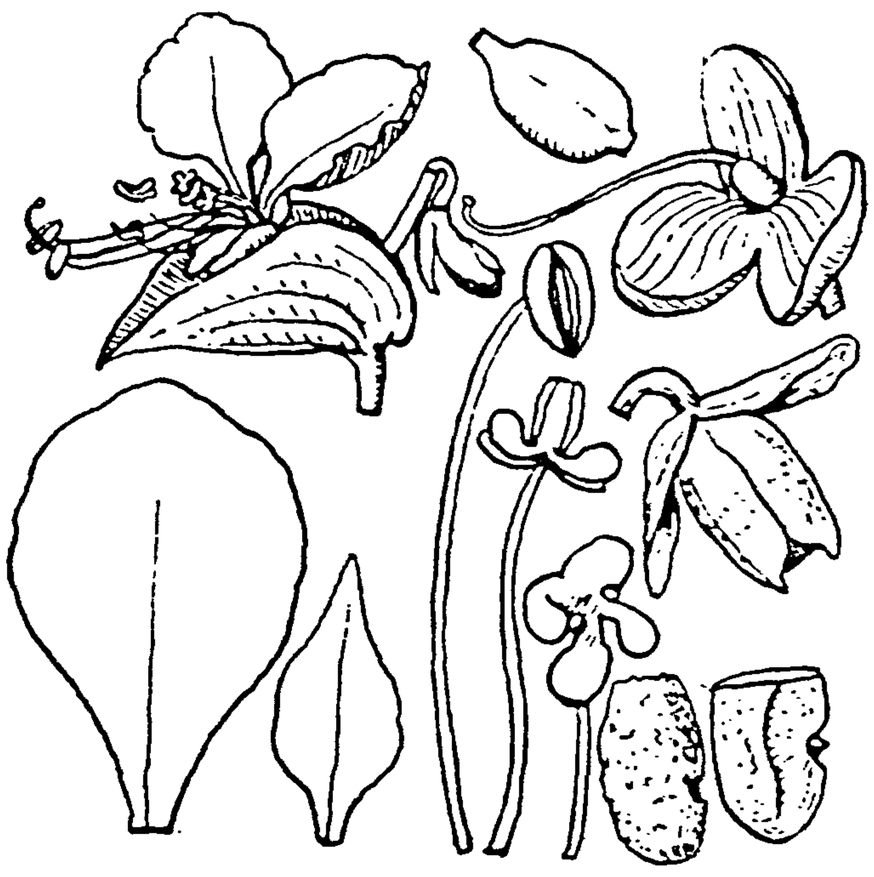
Leaf-blades ovate to elliptic-lanceolate or ovate-lanceolate: posterior petals 8–12 mm. long: seeds scarcely flattened: plant with procumbent creeping stems and branches. 5. *C. elegans.*

Leaf-blades linear, lanceolate, or linear-lanceolate: posterior petals 12–25 mm. long: seeds manifestly flattened: plant with erect or merely decumbent stems and branches.
- Leaf-blades of a lanceolate type: seeds of an ellipsoid type. 6. *C. erecta.*
- Leaf-blades of a linear or linear-lanceolate type: seeds of a spheroidal type.
  - Involucre 2–3 cm. long, mostly with long white hairs near the base. 7. *C. crispa.*
  - Involucre 1–2 cm. long, rarely with long white hairs near the base. 8. *C. angustifolia.*

IV. HIRTELLAE

Relatively coarse herb with usually clustered spathes. 9. *C. virginica.*

1. C. communis L. Stem and branches 3–10 dm. long, somewhat creeping: leaf-blades lanceolate, 4–12 cm. long, acute or acuminate: spathe 2–4 cm. long, mostly about twice as long as wide: sepals 4–5 mm. long: anterior petal white, rhombic-ovate or rhombic-lanceolate; posterior ones with stalked reniform blue blades: anthers 6: capsule 6–7 mm. long: seeds 3.5–4 mm. long.—Waste grounds, about gardens, and moist banks, various provinces, Ala. to Ark., Mo., Mass., and N. C.—Nat. of E Asia.—Equally at home in natural habitats, and as a weed in waste-places.



2. C. caroliniana Walt. Stem and branches erect or diffuse, often more than 1 m. long: leaf-blades lanceolate, 8–12 cm. long, acute or acuminate: spathe 2.5–3.5 cm. long, mostly about thrice as long as wide: sepals 3–4 mm. long: anterior petal less than 5 mm. long, reniform: anthers 5, the larger less than 2 mm. long: seeds 3 mm. long or nearly so.—Moist sandy soil and cult. grounds, Coastal Plain, N Fla. to Miss., Mo., and S. C.

3. C. Gigas Small. Stem and branches reclining and creeping, climbing into shrubs and trees, often 3–5 m. long: leaf-blades lanceolate, often narrowly so, 12 cm. long or less, acuminate: spathe 4–5 cm. long, about 4 times as long as wide: sepals 4–5 mm. long: anterior petal deltoid, over 6 mm. long: anthers 5, the larger ones 2 mm. long: capsule not seen.—Hammocks, Lake Okeechobee region, Fla.—Our most vigorous and robust species. The herbage is frequently eaten by cattle.

4. C. longicaulis Jacq. Stem and branches 3–10 dm. long, creeping, the roots fibrous: leaf-blades lanceolate or oblong-lanceolate, 3–8 cm. long, acute: spathe 1–2.5 cm. long, often twice as long as wide: posterior petals long-clawed: anthers 5: seeds 2–2.5 mm. long. [*C. nudiflora* (Fl. SE. U. S.)] —(BABY-DEWFLOWER.)—Moist soil, sandy places, along streams, or cult. grounds, various provinces, Fla. to Tex., Kans., Ind., and Ga.; occasional as a weed N to Pa. Nat. of trop. Am.

5. C. elegans. H.B.K. Stem and branches 2–9 dm. long, erect or ultimately reclining: leaf-blades thin, ovate to lanceolate, or elliptic-lanceolate, 4–9 cm. long, from long sheaths which are sparingly hairy at the mouth: spathe rather broad, 1.5–2 cm. long, acute: capsule about 4 mm. long.—Moist, often sandy soil, S Fla. and S Tex.—(*W. I., Mex., C. A., S. A.*)

6. C. erecta L. Stem and branches 2–9 dm. tall, erect or ascending: leaf-blades thick, lanceolate, 3–12 cm. long, acuminate, sparingly hairy about the mouth of the sheath: spathe 2–3 cm. long, acuminate: anterior petal shorter than the claws of the posterior ones: capsule 4–5 mm. long. [*C. virginica* (Fl. SE. U. S.) not L. *C. saxicola* Small]—Sandy soil, loam, and rocky woods, various provinces, Fla. to Tex., Kans., and N. Y.

7. C. crispa Wooton. Stem and branches 2–9 dm. long, often decumbent: leaf-blades linear to narrowly linear-lanceolate, 3–8 cm. long, crisped: spathe 2–3 cm. long, acute or acuminate: capsule 4–5 mm. long.—Sandy or rocky soil, Tenn. to Tex., Ariz., Colo., and Ind.

8. C. angustifolia Michx. Stem and branches 2–8 dm. long, erect or decumbent: leaf-blades linear, sometimes narrowly so, flat, attenuate: spathe 1–2 cm. long, acute or acuminate: capsule 4–5 mm. long. [*C. hamipila* C. Wright *C. Swingleana* Nash *C. Nashii* Small]—Pinelands, sand-dunes, and fields, Coastal Plain, Fla. to Tex. and N. C.—(*W. I.*)—The mucilaginous sap is used by the Seminoles to soothe irritations.

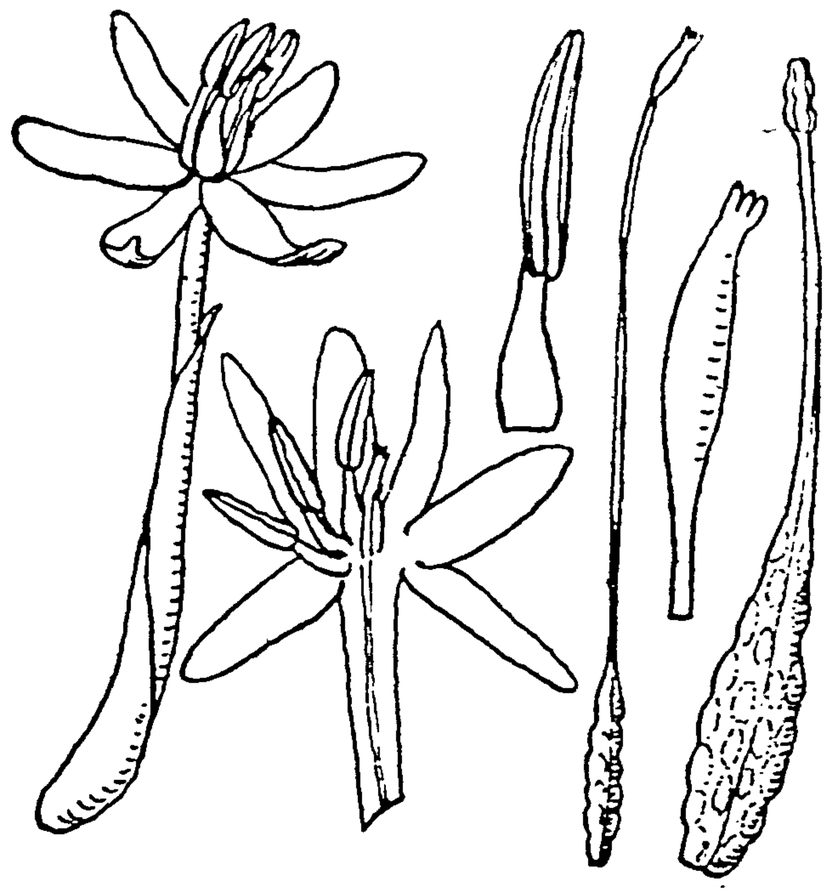
9. C. virginica L. Stem 2–12 dm. tall, simple or sparingly branched: leaf-blades lanceolate or elliptic, 10–20 cm. long, often scabrous: spathes usually clustered, triangular or ovate-triangular, 2–2.5 cm. long, acute: petals ovate: capsule 7–8 mm. long. [*C. hirtella* Vahl]—Moist or wet soil, mostly alluvial swamps and river shores, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Pa.

FAMILY 2. PONTEDERIACEAE — PICKEREL-WEED FAMILY

Bog or aquatic herbs with rootstocks. Leaves alternate: blades dilated, narrow, or mere phyllodia. Flowers 1 or several from a bract-like spathe. Calyx and corolla of rather similar partially united members. Androecium of 3–6 stamens: filaments unequally adnate to the perianth-tube. Gynoecium 3-carpellary but sometimes with a 1-celled ovary. Fruit a 1-seeded utricle or a many-seeded capsule.—About 6 genera and 25 species, fresh-water inhabitants in tropical and temperate regions.

Stamens 3: flowers few: perianth salverform.	
Stamens equal: anthers narrow, erect: leaf-blades narrow.	1. ZOSTERELLA.
Stamens unequal: anthers various, the 2 posterior ones broad, versatile: leaf-blades broad.	2. HETERANTHERA.
Stamens 6: flowers many: perianth 2-lipped.	
Ovary 1-celled: ovule, and seed, solitary: fruit indehiscent.	3. PONTEDERIA.
Ovary 3-celled: ovules, and seeds, many: fruit dehiscent.	4. PIAROPUS.

1. ZOSTERELLA Small. Aquatic plants with regularly leafy stems. Leaf-blades linear, sessile. Spadix 1-flowered. Perianth yellow, regular, the lobes narrow, nearly equal. Stamens 3, equal: anthers narrow, erect. Ovary 3-celled: style conspicuously swollen under the stigma. Ovules numerous. Capsule many-seeded.—Two species of temperate and tropical America.

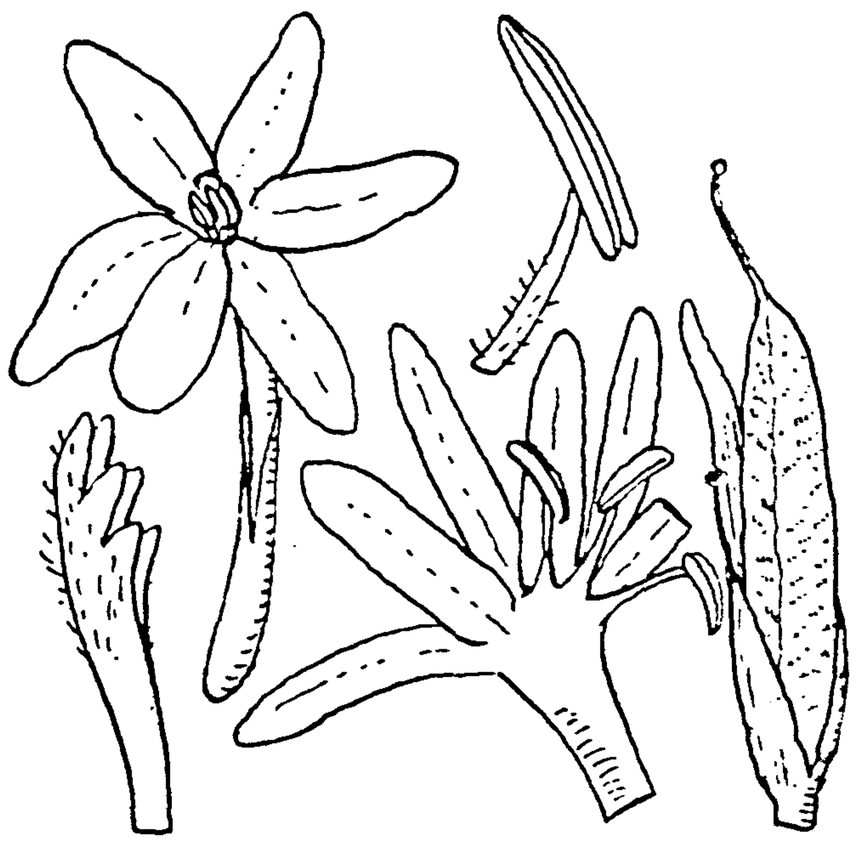


1. Z. dubia (Jacq.) Small. Stem and branches elongate: leaf-blades mainly 4–11 cm. long: perianth lobes linear, 8–15 mm. long: capsule 4–6 mm. long. [*Heteranthera graminea* (Michx.) Vahl] —(WATER STAR-GRASS.)—Still shallow water, various provinces, Fla. to Tex., Ore., and Ont.—(*W. I., Mex.*)—Spr.-sum.—Usually grows with the foliage submersed, but with the flowers extending above the water. On muddy shores the plant sometimes develops a short erect stem.

2. HETERANTHERA R. & P. Plants of muddy places, with rootstocks from which arise short branches bearing a cluster of leaves and a peduncle with a bract. Leaf-blades broad, long-petioled. Spadix 1–few-flowered. Perianth white or blue, the calyx-lobes narrower than the corolla-lobes. Stamens 3, unequal, 1 of them with a longer filament and a larger anther than the others: anthers versatile. Ovary 3-celled: styles barely if at all thickened under the stigma. Ovules numerous. Capsule many-seeded.—About 8 species, mostly natives of tropical America.—MUD-PLANTAINS.

Leaf-blades longer than wide, obtuse at both ends: style glabrous. 1. *H. limosa.*
Leaf-blades wider than long, cordate at the base: style pubescent. 2. *H. reniformis.*

1. H. limosa (Sw.) Willd. Leaf-blades ovate to elliptic-ovate, 1–4 cm. long: spadix 1-flowered: perianth blue; tube 15–20 mm. long: capsule mostly 2 cm. long.—Ditches, shallow water, and mud, various provinces, Fla. to N. M., Colo., and Va.—(*W. I., Mex., C. A., S. A.*)

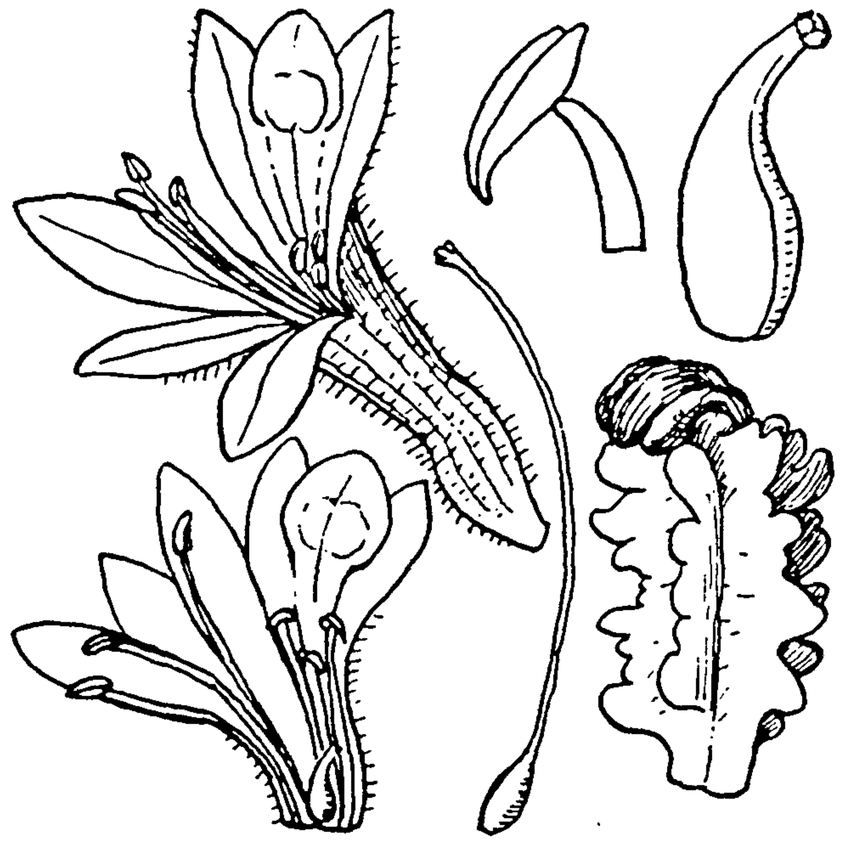


2. H. reniformis R. & P. Leaf-blades reniform or orbicular-reniform, 1.5–6 cm. broad: spadix 2–5-flowered: perianth white; tube 7–10 mm. long: capsule mostly 1 cm. long.—Shallow water and mud, various provinces, Ga. to Tex., and Conn.—(*W. I., Mex., C. A., S. A.*)

3. PONTEDERIA L. Aquatic herbs. Leaf-blades narrow or broad, the basal on tapering petioles. Spadix many-flowered. Perianth 2-lipped, blue with a yellow spot on the upper lip, the lobes nearly equal. Anthers versatile. Ovary 1-celled. Fruit with tubercled or incised crests. Seed solitary.—About 8 species, natives of America.—PICKEREL-WEEDS. DOG-TONGUES. WAMPEES.)—Frequently called BLUE-FLAGS.

Spike densely flowered: perianth villous, at least when young: fruits conic or oblong in outline, about twice as long as thick. 1. *P. cordata.*
Spike loosely flowered: perianth glandular and sometimes also hirtellous, at least when young: fruits subglobose in outline, nearly or quite as wide as long. 2. *P. lanceolata.*

1. P. cordata L. Basal leaves erect, but not very rigid, the tissues soft; blades broadly ovate to deltoid-ovate and cordate at the base, varying to narrowly deltoid or linear-lanceolate and truncate or narrowed at the base; cauline leaves nearly similar to the basal, but short-petioled: spike stout and densely flowered: perianth over 1.5 cm. long; lower lobe 8–10 mm. long: fruit 6–10 mm. long, mostly over 6 mm., with tubercled crests.—Streams, marshes, bogs, and lakes, various provinces, N Fla. to Okla., Ont., and N. S.—Spr.–fall, or all year S.

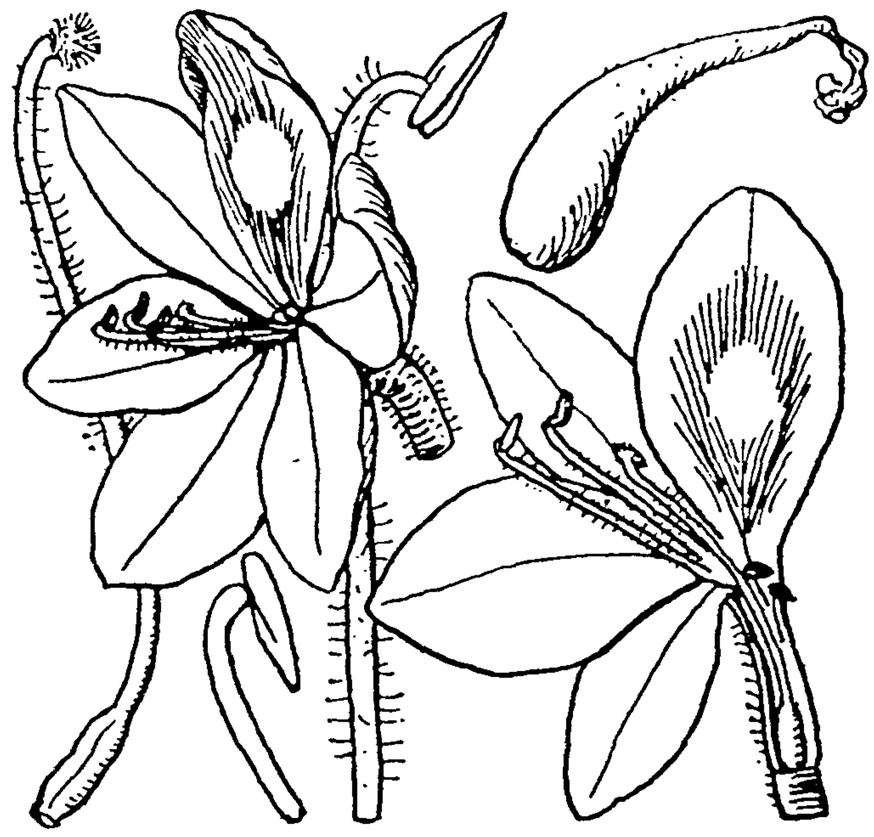


2. P. lanceolata Nutt. Basal leaves stiffly erect; blades lanceolate to linear-lanceolate and narrowed or rounded at the base, varying to deltoid or ovate and truncate, subcordate, or deeply cordate; cauline leaves nearly similar to the basal, but with rather short petioles: spike slender and loosely flowered: perianth less than 1.5 cm. long; lower lobe 5–6 mm. long: fruit 5–6 mm. long, mostly less than 6 mm., with incised crests.—Ponds, ditches, and stagnant water, Coastal Plain, Fla. to Tex. and Va.—Spr.–fall, or all year S.—In pure growth the spikes of this and of the preceding species make a brilliant show in the landscape.

4. PIAROPUS Raf. Aquatic herbs. Leaf-blades dilated, sometimes with inflated petioles. Spadix few-flowered. Perianth somewhat 2-lipped, the lobes unequal. Anthers erect. Ovary 3-celled. Seeds many.—Five species, mostly natives of South America.—WATER-HYACINTHS.

Leaf-blades orbicular to reniform: flowers in a spike or spike-like panicle: perianth over 3 cm. wide. 1. *P. crassipes.*
Leaf-blades ovate: flowers in an open panicle: perianth less than 2.5 cm. wide. 2. *P. paniculatus.*

1. P. crassipes (Mart.) Britton. Plants 1–12 dm. tall: leaves with inflated petioles and mainly orbicular to reniform blades 3–15 cm. broad: perianth bluish-purple; tube 1.5–2 cm. long; limb 4–7.5 cm. broad, the lobes longer than the tube.—(WATER-HYACINTH. RIVER-RAFT. WAMPEE.)—Streams, lakes, ponds, and ditches, Coastal Plain, Ga. and Fla. to Tex.—In part, at least, escaped from cultivation.—(*W. I., Mex., C. A., S. A.*)



—Plants of the water-hyacinth vary greatly in size, the leaves ranging from a few centimeters to a meter in height. The extent of growth also varies, a patch may cover several square feet or many acres of water. It is the most showy, especially *en masse*, of our water plants. The myriad brilliant torches scattered in a sea of deep-green foliage is a unique sight. Whether a native or an immigrant from tropical America cannot be certainly determined. However, its growth in the waters of the rather recently opened up wilderness of the interior of peninsular Florida indicates that it was native there.

2. P. paniculatus (Spreng.) Small. Plant 3–6 dm. tall: leaves with slender petioles and ovate blades, 7–11 cm. long: panicle 1–1.5 cm. long, many-flowered: peduncles relatively slender: perianth mainly blue or purplish: calyx-lobes oblong, 9–11 mm. long: corolla-lobes obovate, slightly longer than and about twice as wide as the calyx-lobes, the narrower one pale and with 2 yellow blotches below the middle.—Ditches and wet pinelands, pen. Fla. Nat. of Brazil and cult.—(*W. I., C. A., S. A.*)

Family 3. BROMELIACEAE — Pineapple Family

Epiphytic or rarely terrestrial herbs, commonly with scurfy foliage. Leaves usually crowded at the base of the flowering stem: blades entire or spiny-toothed. Flowers perfect, regular, solitary or spicate. Calyx of 3 sepals. Corolla of 3 narrow petals. Androecium of 3–6 stamens. Gynoecium 3-carpellary, the ovary superior or inferior: styles united. Ovules numerous. Fruit baccate or capsular.—About 45 genera and 900 species, natives of tropical and subtropical America.

Ovary superior: fruit capsular: leaves spineless: plants epiphytic. — Tribe I. Tillandsieae.
Ovary inferior: fruit a syncarp, baccate: leaves spiny: plants terrestrial. — Tribe II. Bromelieae.

I. Tillandsieae

Corolla cylindric, ovoid, or urceolate, not constricted: stamens with straight filaments and not dilated upward.
- Corolla cylindric; petals of a spatulate type, much longer than the sepals: capsule cylindric.
  - Flowers solitary or 2 together, terminating naked peduncles: style short, columnar.
    - Stems pendant, elongate, filiform: flowers surpassed by the slender-tipped bracts of the involucre. — 1. Dendropogon.
    - Stem not pendent, short: flowers exceeding the short bracts of the involucre. — 2. Diaphoranthema.
  - Flowers several to many in simple or branched spikes which terminate a sheathed flower-stalk: style elongate, filiform. — 3. Tillandsia.
- Corolla ovoid-urceolate; petals ovate, as long as the sepals or slightly longer: capsule ovoid. — 4. Catopsis.

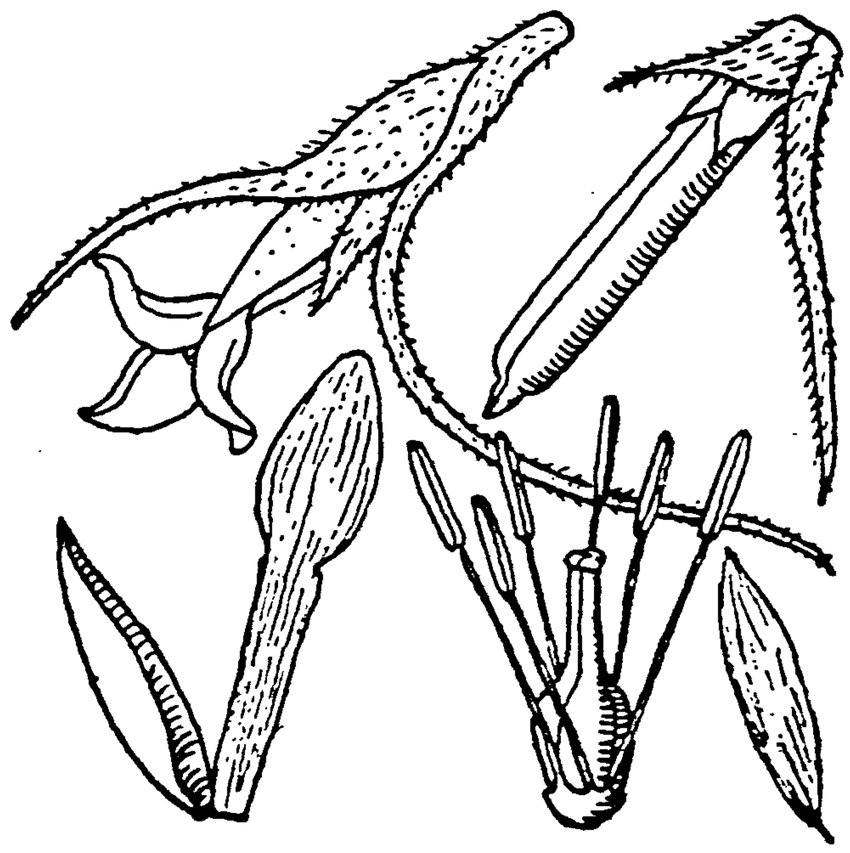
Corolla clavate, much constricted above the middle: stamens with spirally twisted filaments which are spoon-like where the anthers are attached. — 5. Guzmannia.

II. Bromelieae

Coarse plants with a rosette of elongate leaves from which arises a stout flower-stalk upon the top of which the fruit ripens. — 6. Ananas.

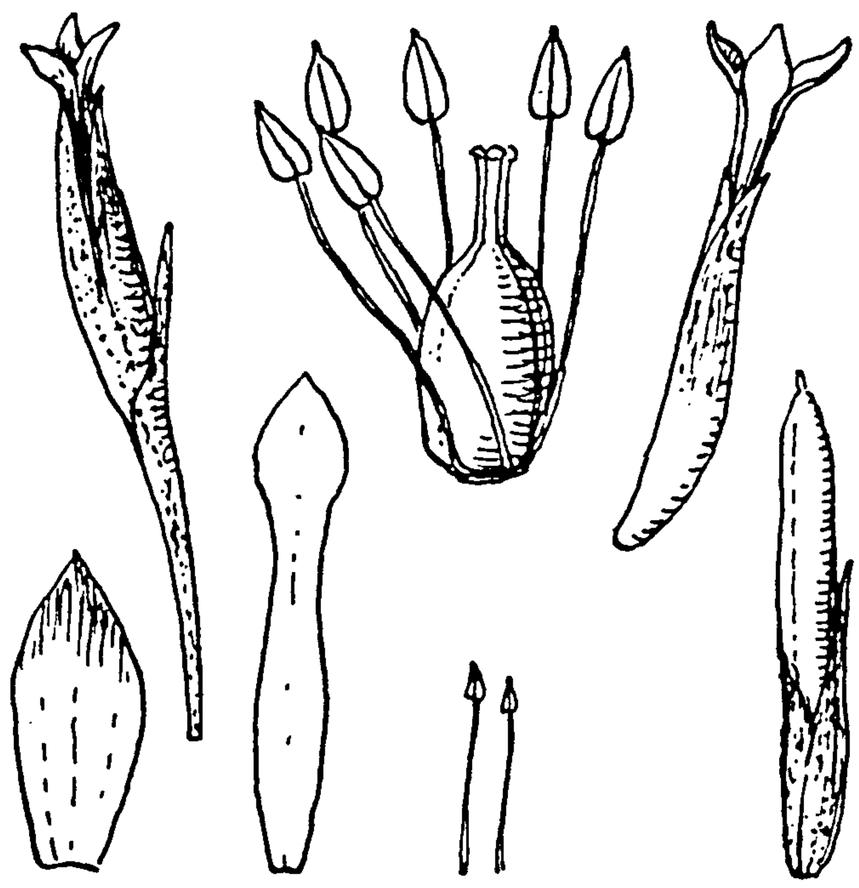
1. DENDROPOGON Raf. Pendent festoon-like epiphytic plants, with regularly leafy stems. Leaves remote: blades linear-filiform above the base. Flowers axillary.—Represented only by the following species.

1. D. usneoides (L.) Raf. Plant clothed with silver-gray scales. Stems filiform, often greatly elongate: leaves 2.5–8 cm. long: flowers fragrant: sepals 5–7 mm. long, green: petals linear-spatulate, about twice as long as the sepals, yellow or yellowish: capsules 15–30 mm. long: seed-body subulate, 2.5-3 mm. long.—(Long-moss. Spanish-moss. Florida-moss. Crape-moss. Wool-crape.)—On trees, especially in hammocks and swamps, Coastal Plain and rarely adj. provinces, Fla. to Tex. and Va.; also Tenn. (?)—(*W. I., Mex., C. A., S. A.*)—Our most widely distributed epiphyte and the most



characteristic feature of the Coastal Plain swamps. The plant is used as fodder and in upholstery.

2. **DIAPHORANTHEMA** Beer. Limp, very gregarious epiphytic plants, with peduncle-like flowering branches. Leaves several on the short stem or branches, the blades elongate-subulate, recurved from the imbricate bases. Flowers in a terminal long-peduncled spike. Style columnar, as long as the ovary or shorter.—About 6 species, mainly tropical American.



1. **D. recurvata** (L.) Beer. Plant gray-fuzzy, 5–15 cm. tall, the stems and branches often densely clustered: leaf-blades mostly 5–10 cm. long, 2–4 mm. wide: peduncles wiry: sepals 7–9 mm. long, acute: petals violet, 12–14 mm. long: capsule 2–2.5 cm. long. [*Tillandsia recurvata* L.] (BALL-MOSS. BUNCH-MOSS.)—Hammocks, scrub, cypress-swamps, and pinelands, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)—Frequently on insulated electric wires and other unnatural habitats.

3. **TILLANDSIA** L. Stiff, epiphytic, solitary or gregarious plants with leafy flower-stems. Leaves several or many, mainly in a basal rosette, flat or dilated and sometimes saccate at the base, those on the flowering stem more or less reduced. Flowers in simple or branched spikes with imbricate bracts. Style filiform, much longer than the ovary.—About 350 species, natives of warm and tropical America.—AIR-PLANTS. WILD-PINES.

Main rachis of the inflorescence covered with the closely imbricate more or less distichous bracts. — I. FASCICULATAE.
Main rachis of the inflorescence exposed, the bracts, at least neither imbricate nor distichous.
  Bracts, flowers, and capsules appressed to the rachis: flowers sessile: corolla cream-color or ivory-white. — II. UTRICULATAE.
  Bracts, flowers, and capsules lax or spreading: flowers pedicelled: corolla lavender to rose-purple. — III. ALOIFOLIAE.

I. FASCICULATAE

Leaves with short slightly-dilated bases which are narrowed into elongate-subulate straight erect tips. — 1. *T. tenuifolia.*
Leaves with long much dilated bases which are narrowed into short or elongate curved or twisted tips.
  Leaf-bases flat or nearly so, not forming a bulb-like swelling at the base of the flower-stem.
    Basal leaves erect or ascending, except the more or less spreading or curled tips.
      Inflorescence not contracted, the lateral branches erect or ascending.
        Leaf-blades with a concave upper face: stem-leaves with ascending or spreading slender tips. — 2. *T. simulata.*
        Leaf-blades with a V-shaped upper face: stem-leaves with erect or appressed filiform tips. — 3. *T. myriophylla.*
      Inflorescence contracted into an ellipsoid head which is subtended by an involucre. — 4. *T. juncea.*
    Leaves and bracts coriaceous: bracts loosely imbricate and separated in fruit. — 5. *T. Valenzuelana.*
    Leaves and bracts chartaceous: bracts permanently approximate and closely imbricate.

Leaves stiff, straight or nearly so, in a bristly spreading basal cluster, the short base abruptly narrowed into an elongate dagger-like tip: petals spatulate. 6. *T. hystricina.*

Leaves not stiff, strongly curved, in a large recurving basal rosette, the long base gradually narrowed into the rather wide tip: petals linear. 7. *T. fasciculata.*

Leaf-bases inflated, forming a bulb-like swelling at the base of the flower stem.

Basal leaves with long pliable whip-like tips: corolla violet: flowering-stem elongate, much exserted from the cluster of basal leaves.

Basal leaves with the tips elongate, tentacle-like, abruptly reflexed and spirally twisted; stem-leaves with abruptly recurved tips: spikes lanceolate, the bracts narrow. 8. *T. Balbisiana.*

Basal leaves with the tips not tentacle-like, ascending: stem-leaves with erect tips: spikes linear-elliptic, the bracts broad. 9. *T. polystachya.*

Basal leaves with short rigid tips: corolla lavender: flower-stem very short, protruding from the cluster of basal leaves only in fruit, if at all. 10. *T. circinata.*

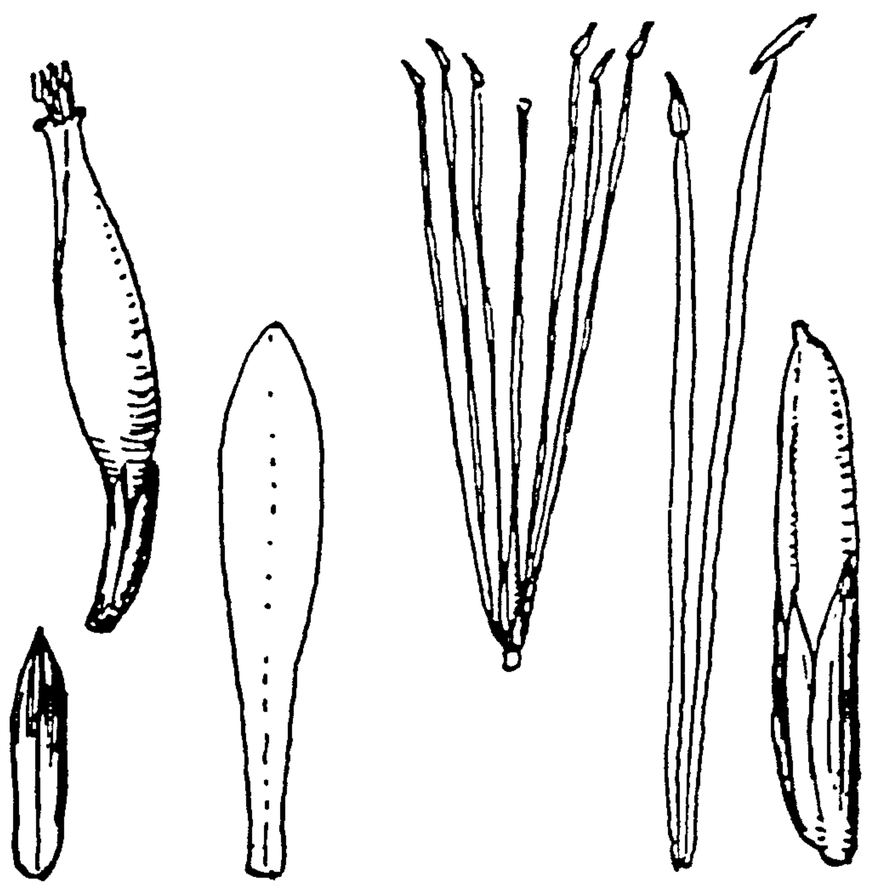
II. UTRICULATAE

Tall plant with numerous long, flat or nearly flat, widely recurving, basal leaves: flower-stem many-flowered. 11. *T. utriculata.*

III. ALOIFOLIAE

Low plant with the few short basal leaves, erect or nearly so and spirally twisted: flower-stem few-flowered. 12. *T. aloifolia.*

1. T. tenuifolia L. Plant green, dark-red, or purple-red, 1–3 dm. tall, the stems and leaves often in dense clusters: leaves quill-like, often exceeding the stem: spikes few-flowered: petals violet, about 3 cm. long: capsule 2.5–3 cm. long. [*T. Bartramii* Ell. *T. caespitosa* LeConte] —Hammocks and swamps, Coastal Plain, Fla. and Ga.—(*W. I., C. A., S. A.*)



2. T. simulata Small. Plant pale-green or gray-green, scurfy and red, 2–4 dm. tall, the stems solitary or few together: basal leaves erect or ascending, with the slender tips often becoming filiform and curled: leaves of the flower-stem with long slender greatly elongate quill-like tips, the upper ones often red: spikes with the bracts red-tinged: petals violet, about 4.5 cm. long: capsule stout, about 3 cm. long. [*T. angustifolia* (Chapm. Fl.) ?.]—Hammocks, often along streams and swamps, pen. Fla.

3. T. myriophylla Small. Plant gray and reddish-pink scurfy, 1–3 dm. tall, the stems few or many together: basal leaves erect or ascending with the very slender tips straight or curved: leaves of the flower-stem with elongate almost filiform but stiff quill-like tips, the upper ones often reddish-pink: spikes with the bracts reddish-pink tinged: petals violet, about 4 cm. long: capsule rather slender about 2.5 cm. long.—Hammocks, often in the hilly parts, pen. Fla.

4. T. juncea (R. & P.) Poir. Plant gray-green, 1.5–3.5 cm. tall, the stems usually several together: basal leaves mostly ascending, some of the outer ones recurved-spreading; leaves of the flower-stem with elongate-subulate, quill-like strictly erect or appressed tips, the upper ones often red-tinged: spikes congested, the lateral branches short, thus the whole inflorescence contracted into a terminal more or less elongate cluster: bracts red or red-tinged: petals violet, about 3 cm. long: capsule stoutish, 2.5–3 cm. long.—Hammocks, pen. Fla.—(*W. I., C. A., S. A.*)

5. **T. Valenzuelana** A. Rich. Plant light-green or red-tinged, 2–5 dm. tall, the stems solitary or few together: basal leaves with the almost flat tip often curled back; leaves of the flower-stem lax with acuminate tips: spikes with the bracts red-tinged or red: petals violet, about 3.5 cm. long: capsule slender, about 3 cm. long. [*T. Houzeavi* (Chapm. Fl.)]—Hammocks, S Fla.—(*W. I., Mex., C. A., S. A.*)—*T. sublaxa* Baker, seems to be the simple spiked condition of this species.

6. **T. hystricina** Small. Plant bright-green, 2–3.5 dm. tall, the stem usually solitary: basal leaves numerous, stiffly spreading, with abruptly dilated short bases and stiff nearly flat knife-like tips; leaves of the flower-stem with stiff erect awl-like tips: spikes few, the bracts mostly green: petals violet, about 4 cm. long: capsule not seen.—Hammocks, Everglade Keys, S pen. Fla.

7. **T. fasciculata** Sw. Plant gray-green, except the inflorescence, 2–6 dm. tall, the stems solitary or few together: basal leaves numerous, recurved-spreading, gradually attenuate above the widely dilated base; leaves of the flower-stem with broad erect tips: spikes several to many, the bracts yellow, red, or green: petals violet, 4.5–5 cm. long: capsule 3–3.5 cm. long. [*T. bracteata* Chapm.]—Hammocks, cypress-swamps, and rarely pinelands, pen. Fla.—(*W. I., Mex., C. A., S. A.*)—*T. Wilsonii* S. Wats. was based on seedling plants of this species.

8. **T. Balbisiana** Schult. Plant gray-green to the inflorescence, 2–9 dm. tall, the stems solitary or few together: basal leaves few, with tips recurved-twisted; leaves of the flower-stem with lax attenuate tips: spikes narrow, slightly flattened, the lateral ones erect, the bracts red: petals violet, about 3.5 cm. long: capsule 4–4.5 cm. long. [*T. juncea* (Chapm. Fl.)]—Hammocks and cypress-swamps, S Fla.—(*W. I., Mex.*)

9. **T. polystachya** L. Plant dark gray-green or slate-colored up to the inflorescence, 2.5–6 dm. tall, the stems solitary or few together: basal leaves often numerous, with long-attenuate slightly involute tips; leaves of the flower-stem with rigid, erect, stout-subulate tips: spikes usually sparingly branched, flattened, the lateral ones erect or ascending, the bracts red or yellow-tinged: petals violet, about 4 cm. long: capsule about 4 cm. long.—Hammocks and cypress-swamps, S pen. Fla.—(*W. I., Mex., C. A., S. A.*)

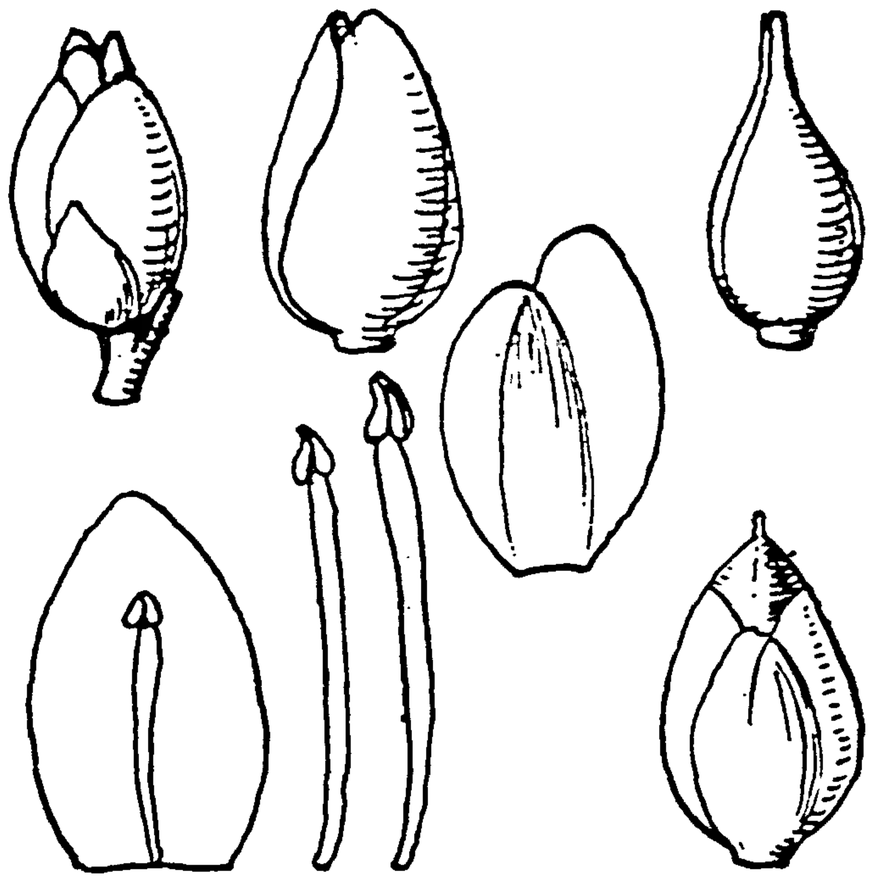
10. **T. circinata** Schlecht. Plant gray, 1–2 dm. tall, the stems usually clustered, sometimes 4–9 together: basal leaves few; leaves of the flower-stem with sheathing bases and short stout-subulate tips: spikes simple or sparingly branched, flattened, the lateral ones appressed to the main one: bracts gray or greenish: petals lavender, about 3 cm. long: pods 5–6 cm. long. [*T. bulbosa* (Chapm. Fl.)]—Hammocks and cypress-swamps, S Fla.—(*W. I., Mex.*)

11. **T. utriculata** L. Plant light-green, 3–20 dm. tall, the stems solitary: leaves numerous, with elongate flat or nearly flat blades attenuate from the wide bases; leaves of the flower-stem more or less remote, with sheathing bases, the lower ones with elongate tips the upper with slender tips or merely acute: inflorescence loosely and usually widely branched: spikes with zigzag rachises and separated green bracts: petals cream-colored or ivory-white, about 4 cm. long: capsule 4.5–5.5 cm. long.—Hammocks, cypress-swamps and scrub, SE Ga. and Fla.—(*W. I., Mex., C. A., S. A.*)—Our largest wild-pine. The plants flower once only and die soon afterward.

12. **T. aloifolia** Hook. Plant light-green, 2–9 dm. tall, the stems solitary or 2 or 3 together: basal leaves few, in a cylindric or cornucopia-like cluster, with long horizontally banded bases and broad tips; leaves of the flower-stem often separated, only the lower ones with subulate tips: inflorescence loosely and sparingly branched, the rachis zigzag: racemes mostly 1-flowered, spreading: petals pink, 3–4 cm. long: capsule 4–6 cm. long. [*T. utriculata* (Chapm. Fl.)]—Hammocks and cypress-swamps, S Fla.—(*W. I., C. A., S. A.*)

4. **CATOPSIS** Griseb. Plants resembling *Tillandsiae* in habit, also epiphytic, but inflorescence inconspicuously bracted. Flowers small and inconspicuous: corolla white. Style short or wanting. Capsule ovoid.—About 10 species, natives of tropical and subtropical America.—All year.—AIR-PLANTS.

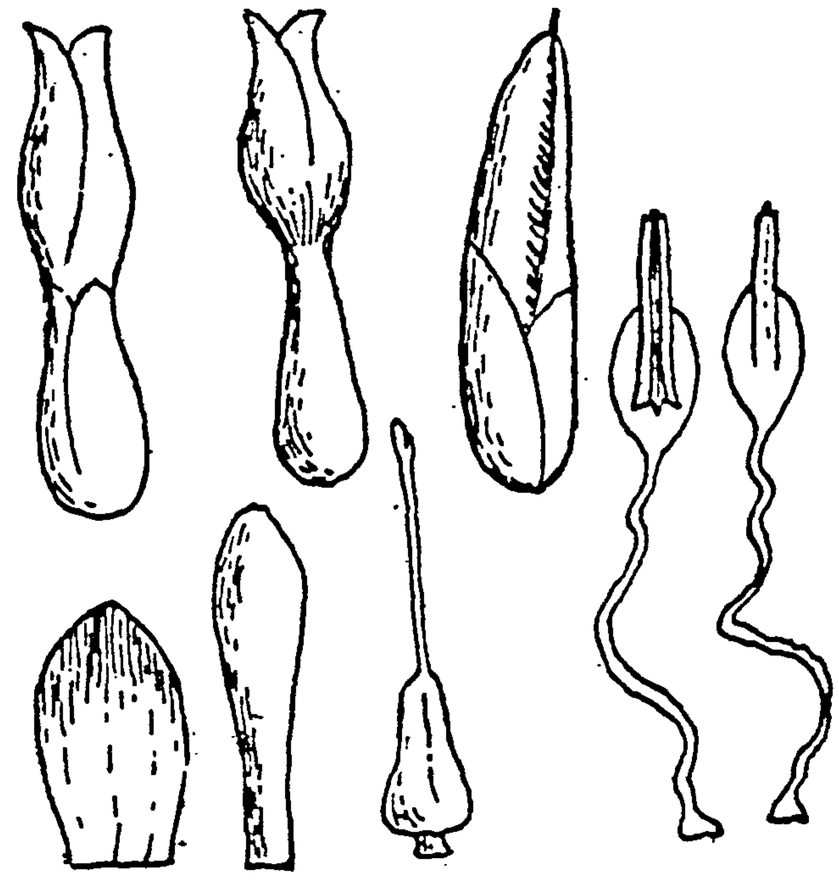
Petals shorter than the sepals: capsule slightly longer than the sepals. 1. *C. Berteroniana.*
Petals longer than the sepals: capsule fully twice as long as the sepals. 2. *C. nutans.*



1. **C. Berteroniana** (Schult.) Mez. Plant yellow: blades of the basal leaves narrowed to the apex: bracts 10–12 mm. long: sepals 11–13 mm. long: capsule 12–13 mm. long, abruptly pointed.—Hammocks, S pen. Fla. and the Keys.—(*W. I.*)

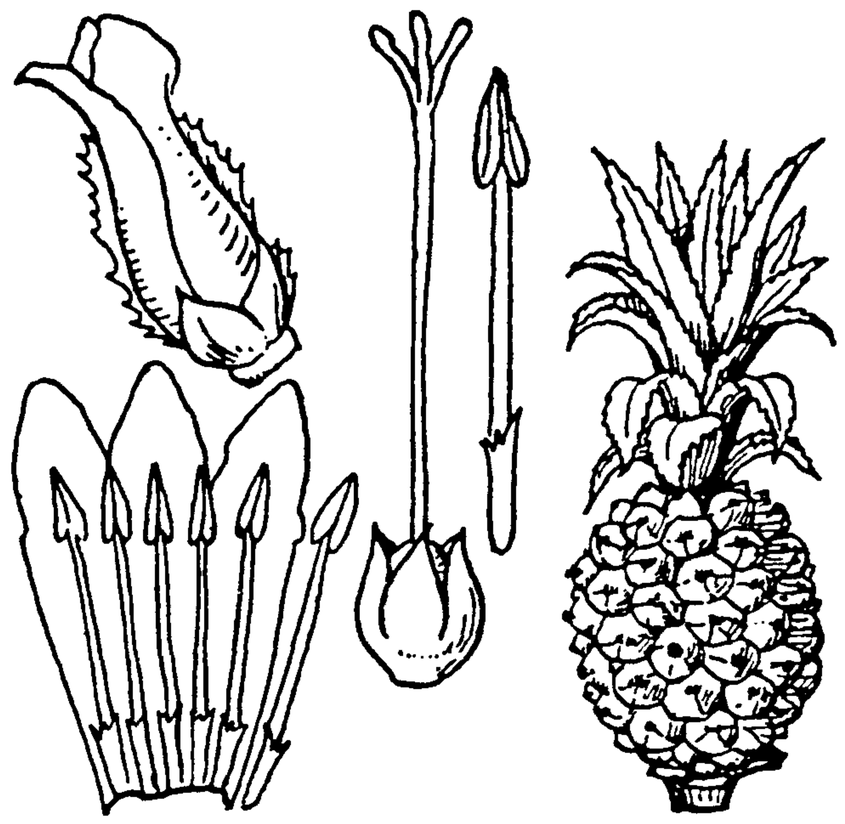
2. **C. nutans** (Sw.) Griseb. Plant green: blades of the basal leaves rather abruptly narrowed into long slender tips: bracts 4–5 mm. long: sepals 5–6 mm. long: capsule 11–13 mm. long, attenuate.—Hammocks, S pen. Fla.—(*W. I., C. A.*)

5. **GUZMANNIA** R. & P. Plants resembling species of *Tillandsia,* but with the blades of the basal leaves less attenuate, the sides above the dilated base nearly parallel up to the abruptly narrowed apex. Flowers in conspicuously bracted spike-like panicles, the bracts becoming membranous. Sepals, and petals, partially united. Anthers coherent around the stigma. Capsule elongate.—Five species, natives of tropical America.



1. **G. monostachya** (L.) Rusby. Plant 3–6 dm. tall: leaves bright-green or variegated, with recurving tips: spike stout: bracts as long as the corolla or longer: calyx firm, 12–15 mm. long: corolla-lobes oblong or ovate, shorter than the tube: capsule becoming 3–3.5 cm. long.—Hammocks, Everglade Keys, Fla.—(*W. I., C. A., S. A.*)—The form with variegated leaves has been introduced into cultivation. The white corollas are in strong contrast to the vermilion bracts which, however, in age become green striate.

6. **ANANAS** Adans. Terrestrial plants, with stout scape-like stems. Leaves mainly basal: blades narrow and elongate, spiny-edged. Flowers in a terminal leafy-bracted spike, the lower part of which, both ovaries and bracts, ripens into an aggregate juicy cone-like fruit.—Five or 6 species, natives of tropical America.



1. A. Ananas (L.) Lyons. Leaves 35–50, crowded, 1–2 m. long, the marginal spines hooked: stem erect: corolla white or yellowish, fully twice as long as the calyx: fruit ovoid, oblong, or oblong-conic, 1–4 dm. long, fragrant.—(PINE-APPLE.) —Pinelands and cultivated grounds, S Fla. Nat. of trop. Am. and cult.—(*W. I., Mex., C. A., S. A., O. W.*)—A tropical fruit of the first order; grown in many varieties. This plant does not reproduce from seeds in our area, but specimens originating from "slips" thrown away in the area where it is cultivated may sometimes be found.

ORDER **LILIALES** — LILIAL ORDER

Herbs, commonly fleshy or grass-like, or vines or trees. Leaves with narrow or dilated blades, sometimes scale-like or terete. Flowers perfect, polygamous, or dioecious, complete, mostly regular. Perianth of 3–6 members which are usually distinguishable into calyx and corolla, sometimes partly united. Androecium of 3–6 stamens. Gynoecium 3-carpellary or rarely 2-carpellary. Ovary superior or essentially so. Fruit capsular or baccate.

Styles present, distinct or united: stigmas terminal.
  Styles distinct: capsule septicidal and rarely also loculicidal. — Fam. 1. MELANTHIACEAE.
  Styles united, often very short or obsolete during anthesis: capsule primarily loculicidal.
    Sepals and petals chaffy, persistent, sometimes only marcescent.
      Perianth firm and persistent: flowers in variously disposed clusters: stigmas elongate. — Fam. 2. JUNCACEAE.
      Perianth marcescent: flowers in a terminal raceme-like panicle: stigmas minute. — Fam. 3. NARTHECIACEAE.
    Sepals and petals not chaffy, deciduous.
      Herbs with bulbs, corms or rootstocks.
        Plants with bulbs or corms.
          Flowers in umbels, at first included in and later subtended by a scarious involucre. — Fam. 4. ALLIACEAE.
          Flowers solitary or racemose, without an involucre. — Fam. 5. LILIACEAE.
        Plants with elongate rootstocks. — Fam. 6. CONVALLARIACEAE.
      Herbaceous or shrubby plants with stout, often woody caudices, or trees.
        Fleshy plants: style filiform: leaf-blades spiny-toothed. — Fam. 7. ALOACEAE.
        Fibrous plants: style short and stout, or obsolete in anthesis: leaf-blades not spiny-toothed. — Fam. 8. DRACAENACEAE.
Styles wanting: stigmas introrse, sometimes elongated.
  Flowers perfect.
    Gynoecium 3-carpellary: fruit a berry. — Fam. 9. TRILLIACEAE.
    Gynoecium 2-carpellary: fruit a capsule. — Fam. 10. ROXBURGHIACEAE.
  Flowers dioecious. — Fam. 11. SMILACACEAE.

FAMILY 1. **MELANTHIACEAE**—BUNCH-FLOWER FAMILY

Perennial herbs with long or short rootstocks. Leaves alternate, sometimes all basal: blades flat or plicate. Flowers borne in a terminal simple or branched inflorescence, or solitary. Perianth of 3 sepals and 3 petals. Androecium of 6, or rarely 9–12 stamens. Gynoecium 3-car-

pellary: styles distinct. Fruit capsular, septicidal and rarely also loculicidal.—About 40 genera and 150 species, of wide geographic distribution.

Anthers oblong or ovoid, 2-celled.
  Anther-sacs introrsely dehiscent. Tribe I. TOFIELDIEAE.
  Anther-sacs extrorsely dehiscent. Tribe II. HELONIEAE.
Anthers cordate or reniform, sometimes becoming peltate, confluently 1-celled.
  Sepals and petals glandless Tribe III. VERATREAE.
  Sepals and petals with glands at or near the base. Tribe IV. MELANTHIEAE.

I. TOFIELDIEAE

Bracts short: flowers subtended by 3 connate bractlets: stamens 6: anthers erect.
  Flowers in centripetal racemes: seeds unappendaged. 1. TOFIELDIA.
  Flowers in centrifugal panicles: seeds appendaged. 2. TRIANTHA.
Bracts spathe-like: bractlets wanting: stamens 9–12: anthers versatile. 3. PLEEA.

II. HELONIEAE

Flowers perfect: sepals and petals ovate or oblong.
  Capsule not depressed, 6-seeded, 2 seeds to each cavity: flowers long-pedicelled: leaves slender and wiry. 4. XEROPHYLLUM.
  Capsule depressed, many-seeded: flowers short-pedicelled: leaves with flat blades and fleshy. 5. HELONIAS.
Flowers dioecious: sepals and petals clavate-spatulate. 6. CHAMAELIRIUM.

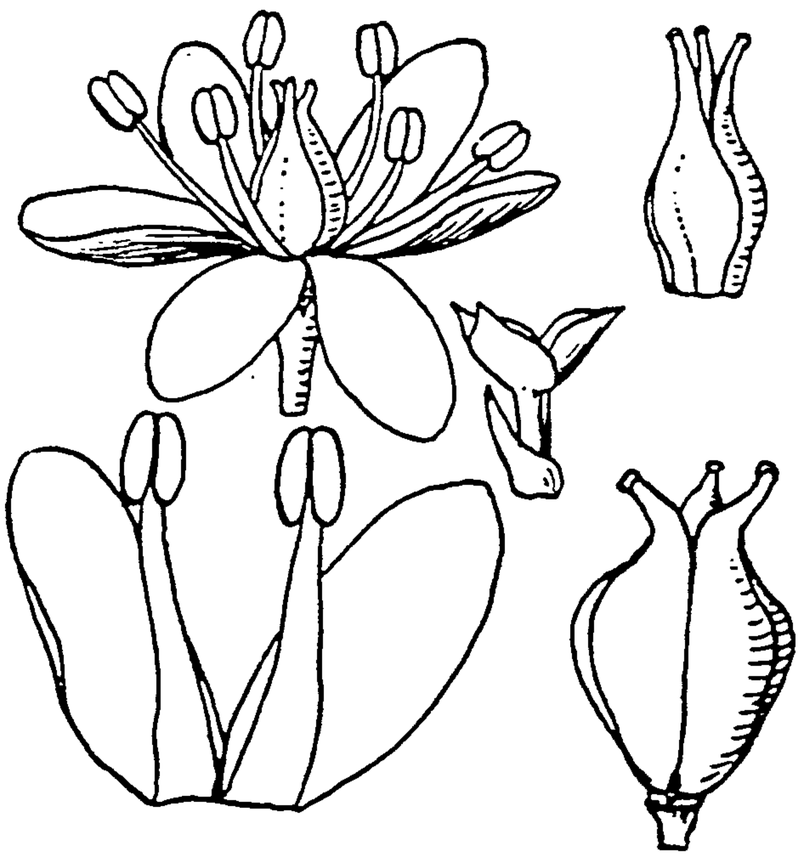
III. VERATREAE

Inflorescence paniculate: flowers polygamous or monoecious.
  Ovary wholly superior: styles slender: petals obtuse. 7. VERATRUM.
  Ovary inferior at the base: styles very short and stout: petals acuminate. 8. STENANTHIUM.
Inflorescence racemose or spicate: flowers perfect.
  Carpels united to near the tips: sepals and petals narrow: filaments longer than the petals: capsule with narrow erect carpels. 9. SCHOENOCAULON.
  Carpels united below the middle: sepals and petals broad: filaments shorter than the petals: capsule with turgid spreading carpels. 10. CHROSPERMA.

IV. MELANTHIEAE

Sepals and petals with a single gland each.
  Flowers polygamous: rootstock fibrous-coated. 11. OCEANOROS.
  Flowers perfect: rootstock membranous-coated.
    Flowers in an ovoid or cylindric raceme: perianth glands obovate or suborbicular.
      Ovary wholly superior: capsule ovoid or ellipsoid. 12. TOXICOSCORDION.
      Ovary inferior at the base: capsule conic. 13. TRACYANTHUS.
    Flowers in a widely branching panicle: perianth-glands obcordate. 14. ANTICLEA.
Sepals and petals with 2 glands each.
  Petals barely clawed: flowers perfect: seeds angled: plant glabrous. 15. ZYGADENUS.
  Petals long-clawed: flowers polygamous: seeds winged: plant pubescent. 16. MELANTHIUM.

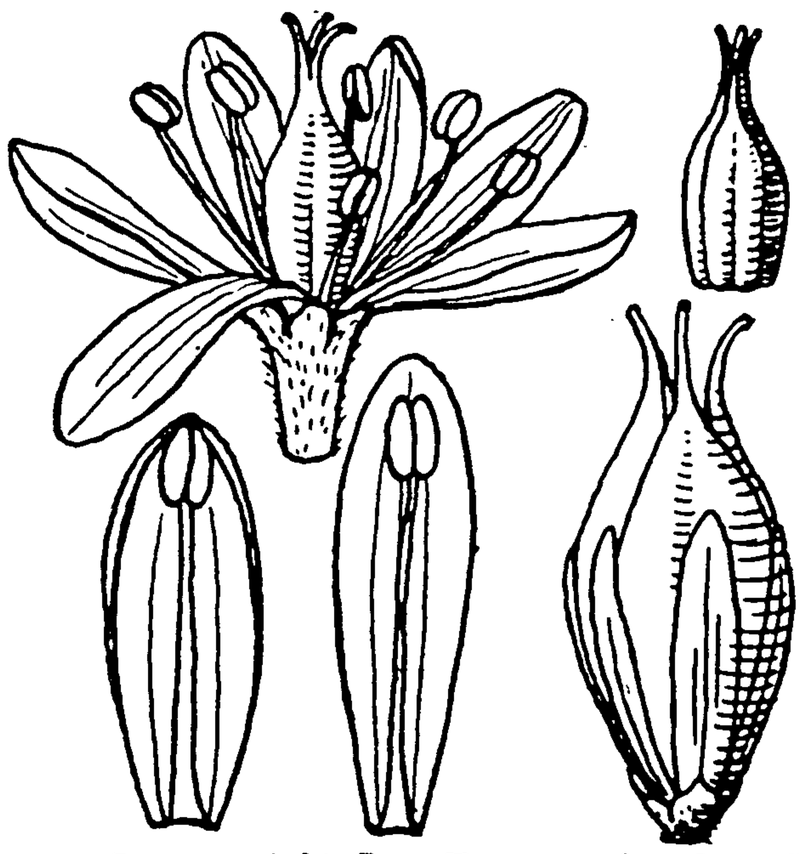
1. TOFIELDIA Huds. Herbs with glabrous foliage. Leaves nearly erect. Flowers perfect, racemose. Petals longer and more concave than the sepals.—About 12 species, mostly natives of the north temperate zone.



1. T. glabra Nutt. Plant 3–6 dm. tall: basal leaves with elongate linear blades: raceme 2–10 cm. long: pedicels 2–4 mm. long: sepals oblong, 2.5–3.5 mm. long: petals white, acute: capsule 3–3.5 mm. long.—(WHITE-FEATHERLING.)—Low pinelands, Coastal Plain, Ga. to N. C.—Fall.

2. TRIANTHA Nutt. Herbs with pubescent foliage. Leaves erect or nearly so. Flowers perfect, paniculate. Petals greenish-white, longer and slightly narrower than the sepals.—Three known species, besides the following, one in Japan.—WOOD-FEATHERLING.

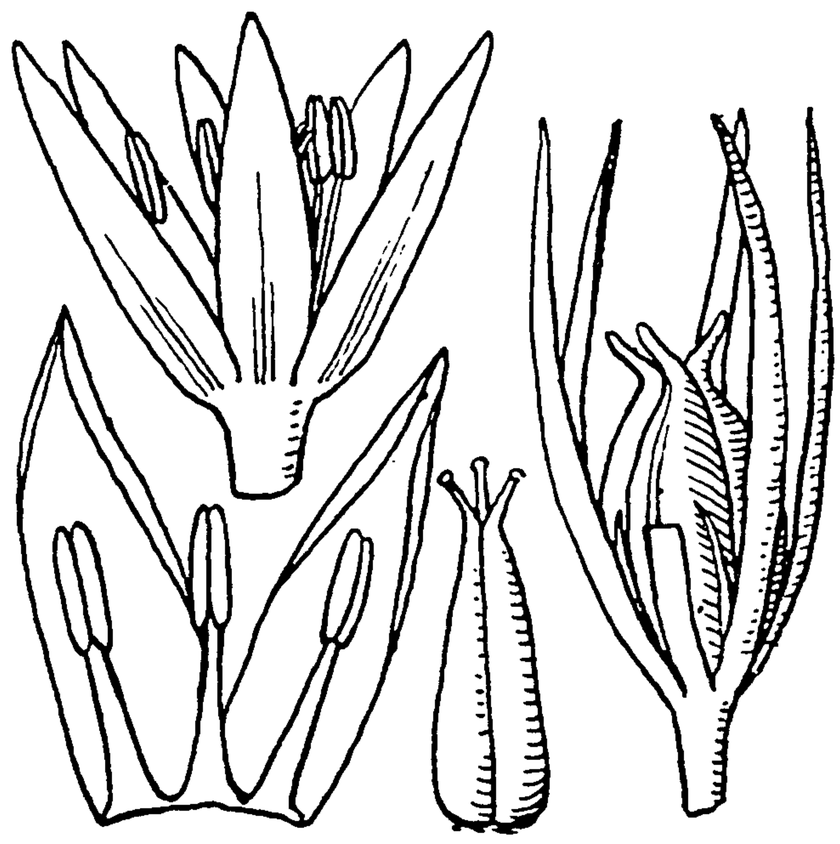
Petals oblong, permanently membranous: capsule 6–7 mm. long. 1. *T. glutinosa.*
Petals cuneate, becoming rigid: capsule 3–4 mm. long. 2. *T. racemosa.*



1. T. glutinosa (Michx.) Baker. Plant 1.5–5 dm. tall: basal leaves with elongate linear blades: panicle 2–4 cm. long; pedicels 3–10 mm. long: petals 3–4 mm. long, much shorter than the capsule.—Bogs and moist ground, Blue Ridge and more northern provinces, N. C. to Ohio, Ore., Alas., Ont., and Me. —Spr.

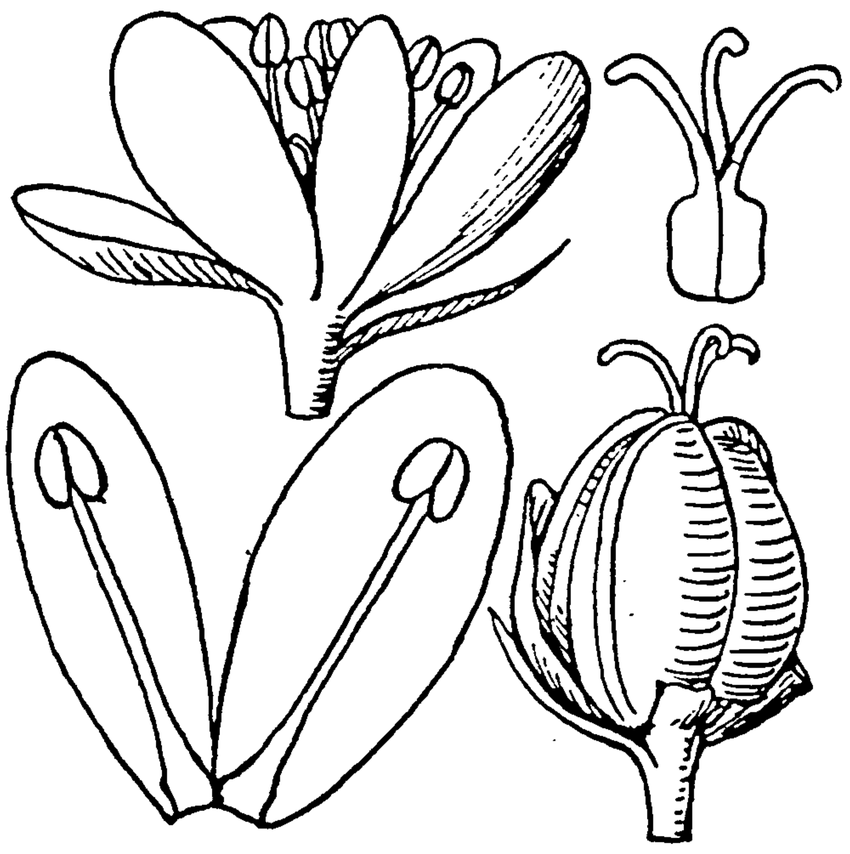
2. T. racemosa (Walt.) Small. Plant similar to the preceding in foliage and habit: panicles 2–10 cm. long; pedicels 1–4 mm. long: petals 4–5 mm. long, slightly shorter than the capsule. [*Tofieldia pubens* Ait.]—Low pinelands, in acid soil, Coastal Plain, Fla. to La. and N. J.—Spr.–fall.

3. PLEEA Michx. Slender rush-like herbs. Leaves few, erect or nearly so, striate. Flowers in a terminal raceme with appressed partially imbricate spathe-like bracts, green. Sepals slightly longer than the petals.—One species.



1. P. tenuifolia Michx. Plant 3–8 dm. tall: basal leaves with elongate linear striate attenuate blades: racemes slender, 3–9-flowered; bracts 1.5–2 cm. long, acuminate: sepals and petals 12–14 mm. long, lanceolate, rather firm: capsule 6–9 mm. long.—(RUSH-FEATHERLING.)—Pineland swamps, Coastal Plain, Fla. to N. C.—Fall.

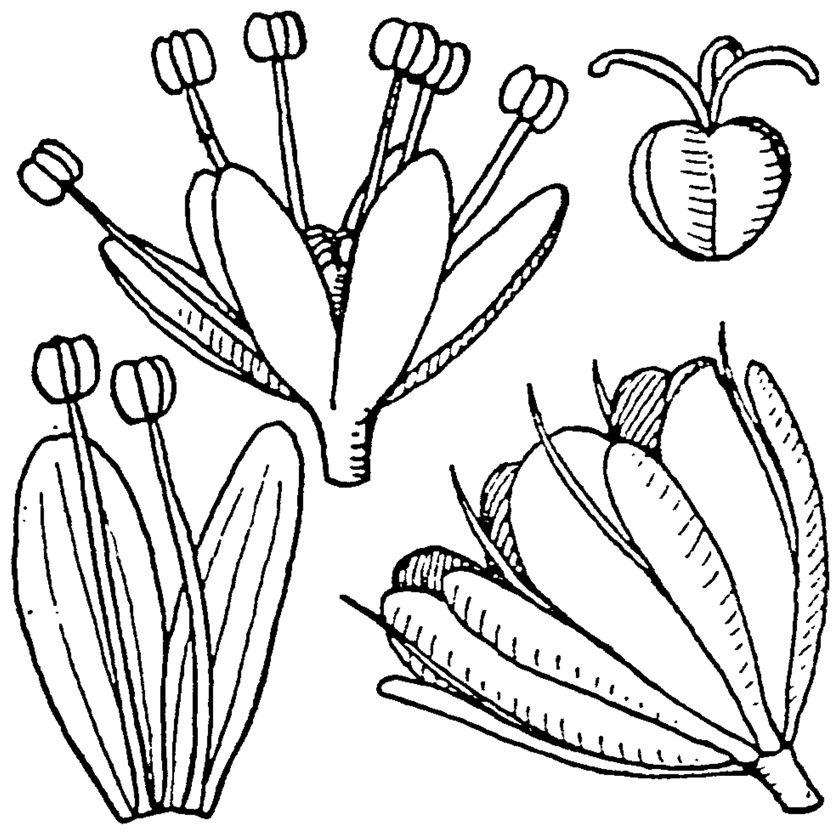
4. XEROPHYLLUM Michx. Stout rigid herbs. Leaves very numerous at the base of the stem, spreading. Flowers perfect, in a raceme-like panicle, white, each subtended by 1–3 narrow branchlets. Sepals and petals broad, 5–9-nerved, the latter longer than the former. Ovules 2–4 in each cavity.—Three known species; besides the following 2 occur in western North America.



1. X. asphodeloides (L.) Nutt. Plant 6–15 dm. tall: leaf-blades slenderly attenuate, stiff and wiry: panicle stout, many-flowered; pedicels 1.5–2 cm. long; petals ovate, about 4 mm. long, obtuse: capsule ovoid, 4–5 mm. long.—(TURKEY-BEARD. MOUNTAIN-ASPHODEL.)

—Sandy acid pinelands, Coastal Plain, N. C. (or Fla. ?) to N. J.; acid woods, Blue Ridge to Appalachian Plateau, N. C., to Tenn. and Va.—Spr.–sum.

5. **HELONIAS** L. Stout caulescent herbs. Leaves several or numerous and persistent at the base of the stem, those on the stem much reduced. Flowers perfect, in a dense terminal raceme. Sepals and petals narrowly oblong, 3-veined. Ovary spheroidal. Ovules numerous in each carpel. Capsule lobed. —Following is the only known species:

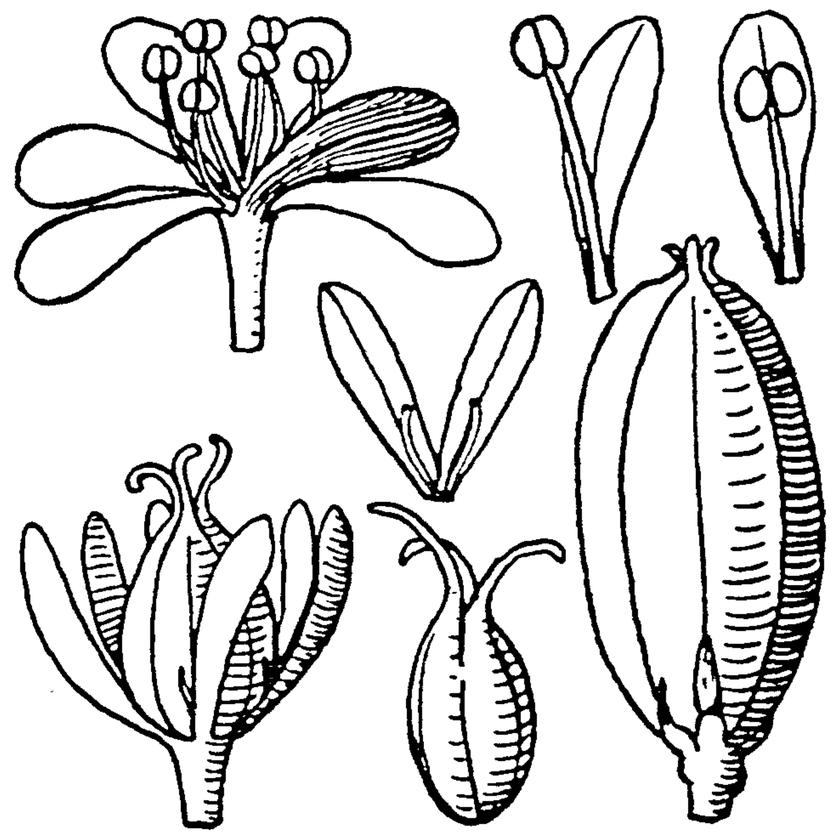


1. **H. bullata** L. Plant 1.5–6 dm. tall: basal leaves 12–40 cm. long; blades oblanceolate to spatulate: raceme becoming 9–20 cm. long: sepals and petals pink, becoming green, 5–7 mm. long, obtuse: anthers blue: capsule broadly obovoid, 8–9 mm. long, notched at the apex.—(SWAMP-PINK.)—Acid bogs, Coastal Plain and Piedmont, Va. (?) or Del. to Staten Id., N. Y.; and acid woods, Blue Ridge, N. C.—Spr.—Flowers hyacinth-scented.

6. **CHAMAELIRIUM** Willd. Fleshy caulescent herbs. Leaves relatively few, the cauline much narrower than the basal. Flowers dioecious, in a bracted spike or raceme. Sepals and petals clavate-spatulate, those of the staminate flowers much longer than those of the pistillate, all 1-nerved. Ovules 6–12 in each cavity.—Following are the only known species.—Spr.–sum.—BLAZING-STARS. DEVIL'S-BITS. SQUIRREL-TAILS.

Capsule ellipsoid or ovoid-ellipsoid, 7–10 mm. long. 1. *C. luteum.*
Capsule obovoid or ellipsoid-obovoid, 12–14 mm. long 2. *C. obovale.*

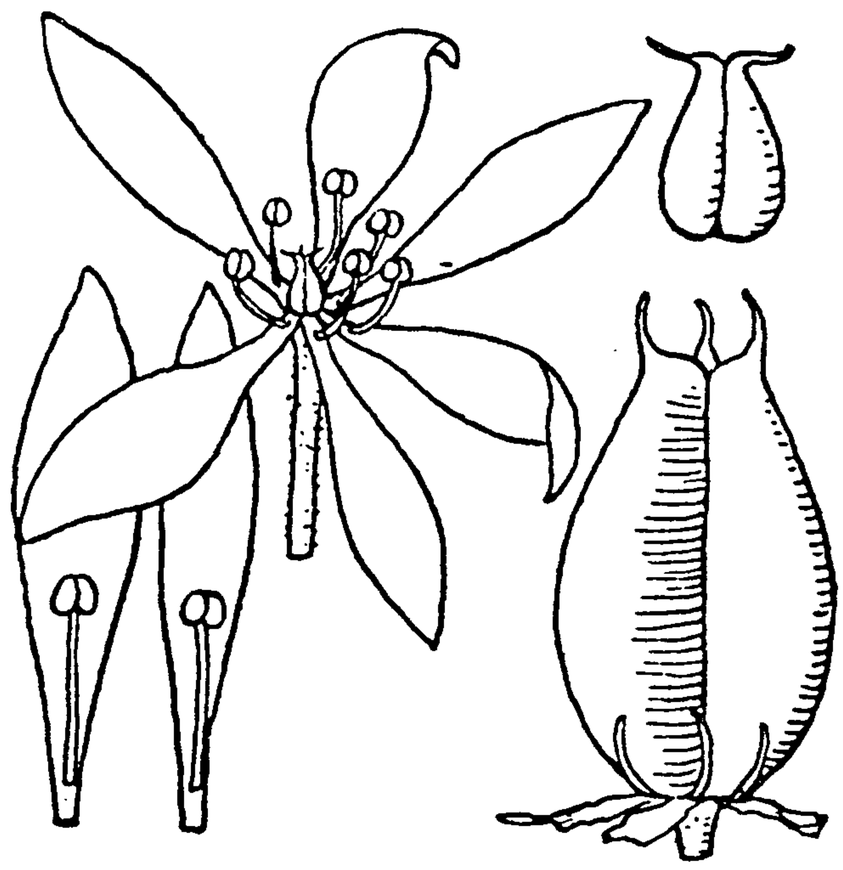
1. **C. luteum** (L.) A. Gray. Stem 2–12 dm. tall, simple: basal leaves spreading; blades spatulate to oblong-spatulate, 5–20 cm. long: staminate perianth white; pistillate green: capsule 7–10 mm. long.—[*C. carolinianum* Willd.]—(FAIRY-WAND. UNICORN-ROOT.)—Moist thickets, meadows, and pinelands, various provinces, Fla. to Ark., Mich., Ont., and Mass.



2. **C. obovale** Small. Similar to *C. luteum*, but with longer flowers: capsule longer-pedicelled, 12–14 mm. long.—Woods, Appalachian provinces, Ala. to N. C., W. Va., and N. Y.

7. **VERATRUM** [Tourn.] L. Coarse herbs. Leaves mainly cauline: blades broad, plicate. Flowers polygamous or monoecious, paniculate, the panicle-branches pubescent. Sepals and petals glandless, greenish, yellow, brown, or purple, the latter larger than the former. Capsule narrow. Seeds winged. —About 12 species, natives of the north temperate zone.—VAREBELLS. FALSE HELLEBORES.

Upper stem-leaves sessile or merely clasping.
  Pedicels more than twice as long as the subtending bracts. 1. *V. parviflorum.*
  Pedicels shorter than the subtending bracts or barely twice as long. 2. *V. intermedium.*
Upper stem-leaves with sheathing bases. 3. *V. viride.*



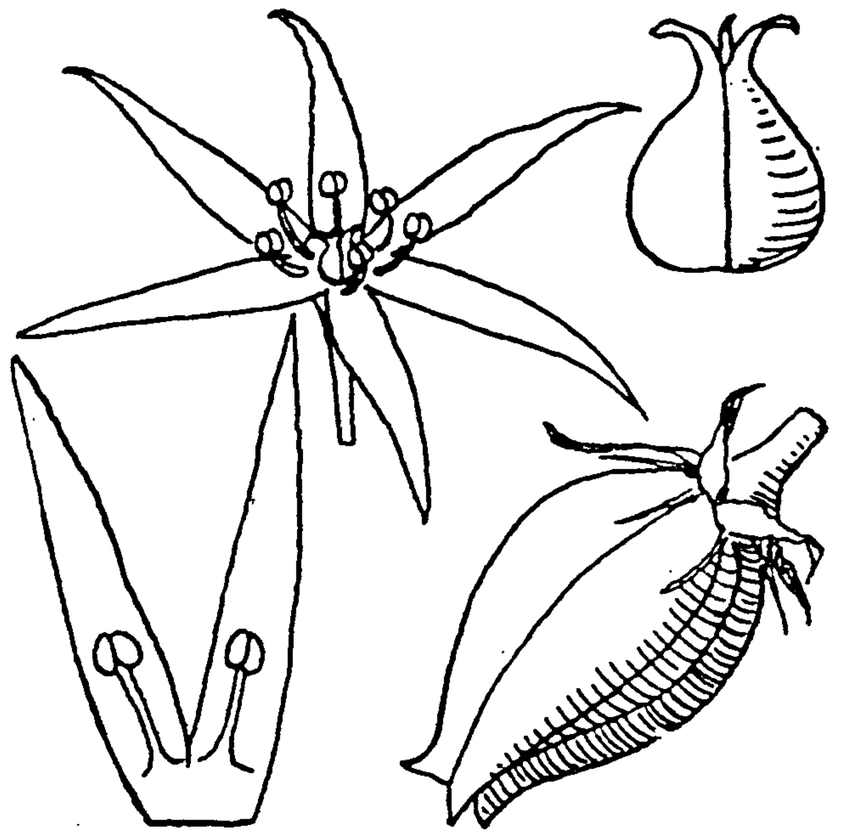
1. V. parviflorum Michx. Stem 6–15 dm. tall: leaf-blades mainly elliptic or oval: panicle-branches spreading: sepals greenish or yellowish-green: petals 4.5–5.5 mm. long.—(HELLEBORE.)—Wooded slopes, Blue Ridge to Appalachian Plateau, Ga. to Tenn., W. Va., and Va.—Sum.

2. V. intermedium Chapm. Stem 9–15 dm. tall: leaf-blades narrowly elliptic: panicle-branches ascending or curving upward: sepals and petals brown: petals 8–10 mm. long.—Hammocks, M Fla.—Sum.

3. V. viride Ait. Stem 6–25 dm. tall: leaf-blades oval, or narrower on the upper part of the stem: panicle-branches ascending: sepals and petals yellowish-green: petals 11–14 mm. long.—(INDIAN-POKE. AMERICAN WHITE-HELLEBORE. VERNAL-VAREBELL.)—Swamps and damp woods, various provinces, Ga. to Minn. and N. B.—Spr.–sum.—An insecticide is made from the powdered dried roots. Large quantities of roots are gathered in the Appalachians.

8. STENANTHIUM Kunth. Graceful caulescent herbs. Leaves mainly basal: blades elongate, channeled. Flowers polygamous or monoecious, paniculate, the panicle-branches glabrous. Sepals and petals white, pinkish, or green, glandless. Seeds angled.—Following are the only known species.—Sum.–fall. —FEATHERBELLS. FEATHER-FLEECES.

Perianth white: capsule deflexed, about 8 mm. long. 1. *S. gramineum.*
Perianth green: capsule erect, fully 10 mm. long. 2. *S. robustum.*

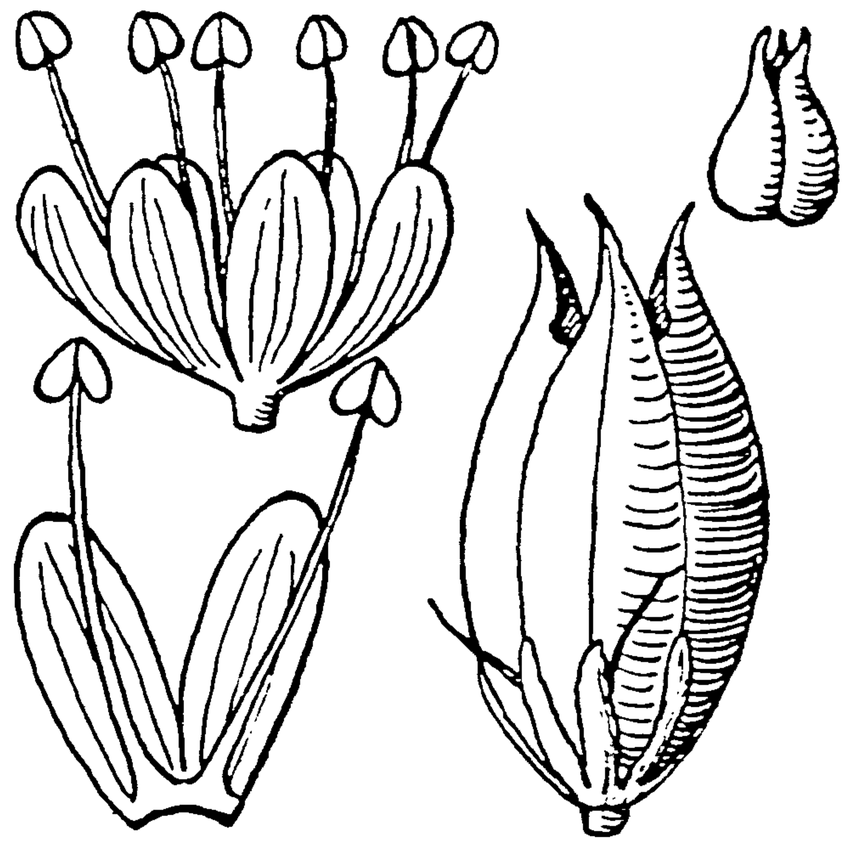


1. S. gramineum (Ker.) Morong. Stem 8–15 dm. tall, slender: blades of the lower leaves mostly less than 10 mm. wide: petals of the pistillate flowers 5–6 mm. long: capsule about 8 mm. long, deflexed.—Dry acid woods and hillsides, various provinces, Fla. to Miss., Ky., and Va.

2. S. robustum S. Wats. Stem 10–20 dm. tall, stout: blades of the lower leaves over 10 mm. wide: panicle plume-like: petals of the pistillate flowers 7–8 mm. long: capsule fully 10 mm. long, erect.—Acid swamps, various provinces, S. S. to Ark., Ohio, and Pa.

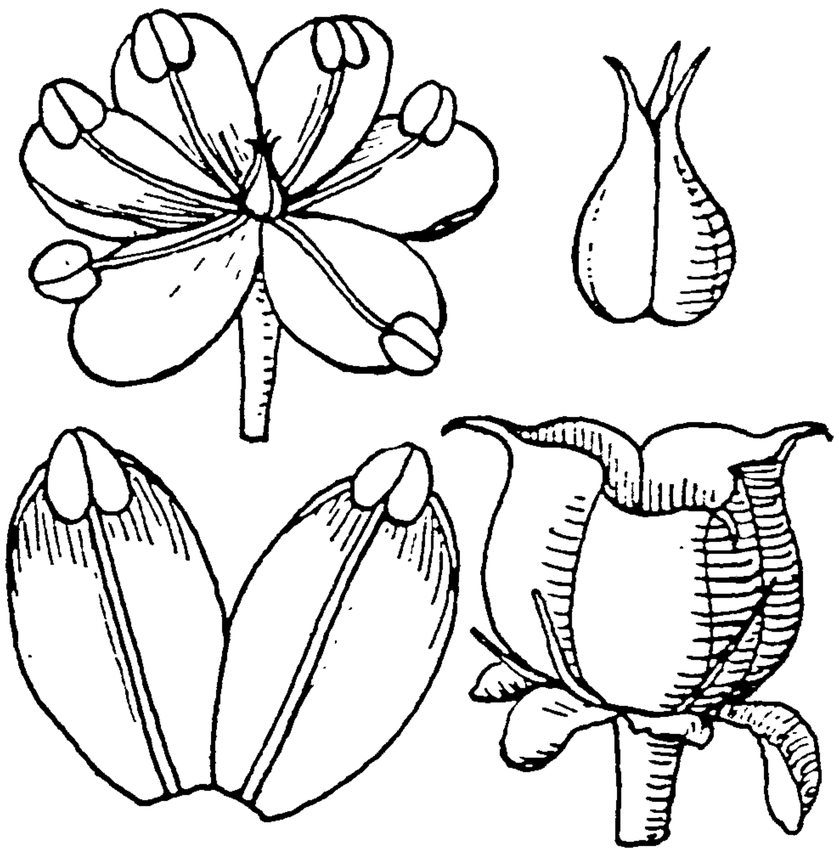
9. SCHOENOCAULON A. Gray. Slender scapose herbs. Leaves basal: elongate, channeled. Scape simple. Flowers perfect, in slender spikes or

spike-like racemes. Sepals and petals green, linear, elliptic, or lanceolate, shorter than the filaments. Ovules 4–8 in each cavity. Capsule of a conic type.—Five known species in North America.



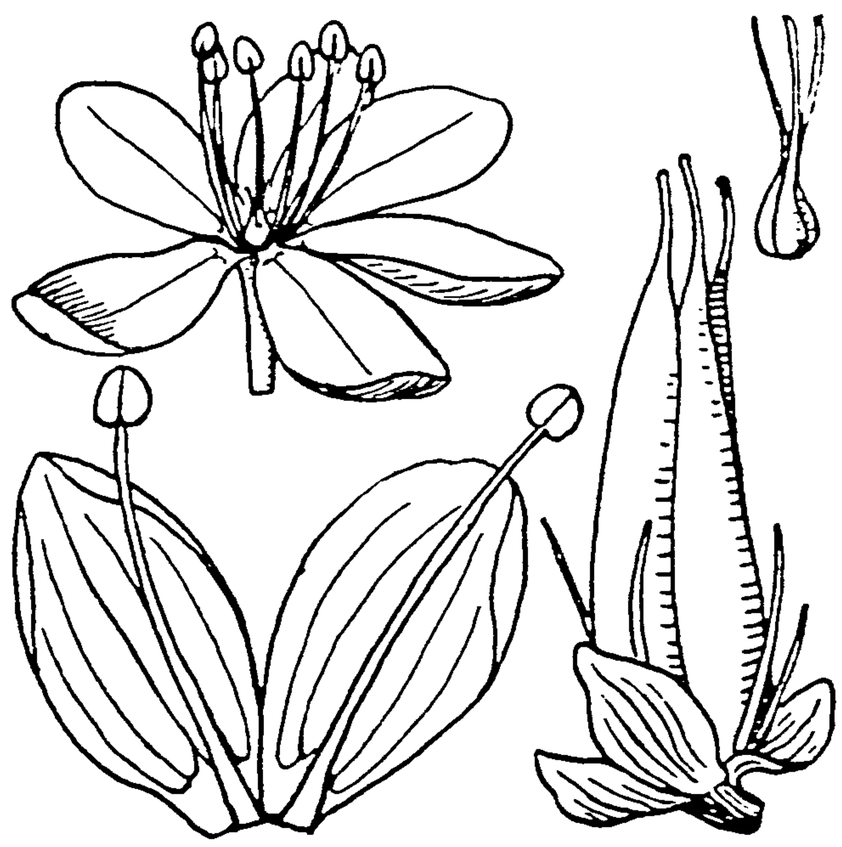
1. S. dubium (Mich.) Small. Scape 3–9 dm. tall, from a fibrous base: leaves green; blades 2–4 mm. wide: spikes 6–8 mm. wide; bracts usually abruptly pointed: sepals and petals about 2 mm. long, the herbaceous tips often incurved: filaments 2–3 mm. long: capsules 7–9 mm. long. [*S. gracile* A. Gray]—(FEATHER-SHANK.) — Pinelands, Coastal Plain, Fla. and Ga.—Spr.–sum.

10. CHROSPERMA Raf. Stout caulescent herbs. Leaves many at the base of the stem, few and small above; blades elongate, flat. Flowers perfect, in a thick raceme. Sepals and petals white, glandless. Carpels united below the middle. Capsule with 3 spreading lobes.—One species.



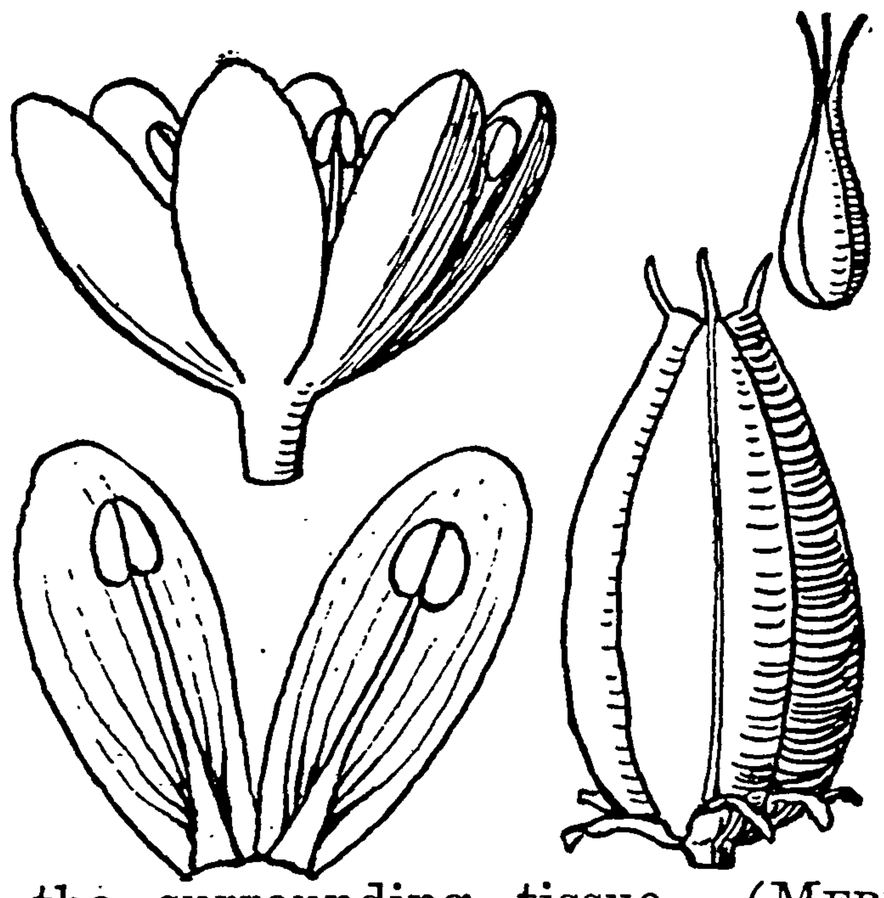
1. C. muscaetoxicum (Walt.) Kuntze. Stem 3–14 dm. tall, sparingly leafy: leaf-blades linear: racemes 5–15 cm. long, about ½ as thick: sepals oval or suborbicular, 3–3.5 mm. long: petals elliptic, 4–5 mm. long: capsule broader than high, the carpels turgid, 4–6 mm. long. [*Amianthium muscaetoxicum* A. Gray]—(CROW-POISON. FLY-POISON. ST. ELMOS-FEATHER.)—Thickets, acid woods, and pinelands, various provinces, Fla. to Ark. and N. Y.—Sum.—A very toxic alkaloid is contained in the foliage and the roots. Cattle are frequently poisoned by eating it.

11. OCEANOROS Small. Slender caulescent herbs, the rootstock fibrous-coated. Leaves mainly basal: blades elongate. Flowers polygamous, paniculate, the upper ones not fruit-producing. Sepals and petals cream-colored or deeper yellow, clawless, each with a pale gland. Seeds few.—Following is the only known species:



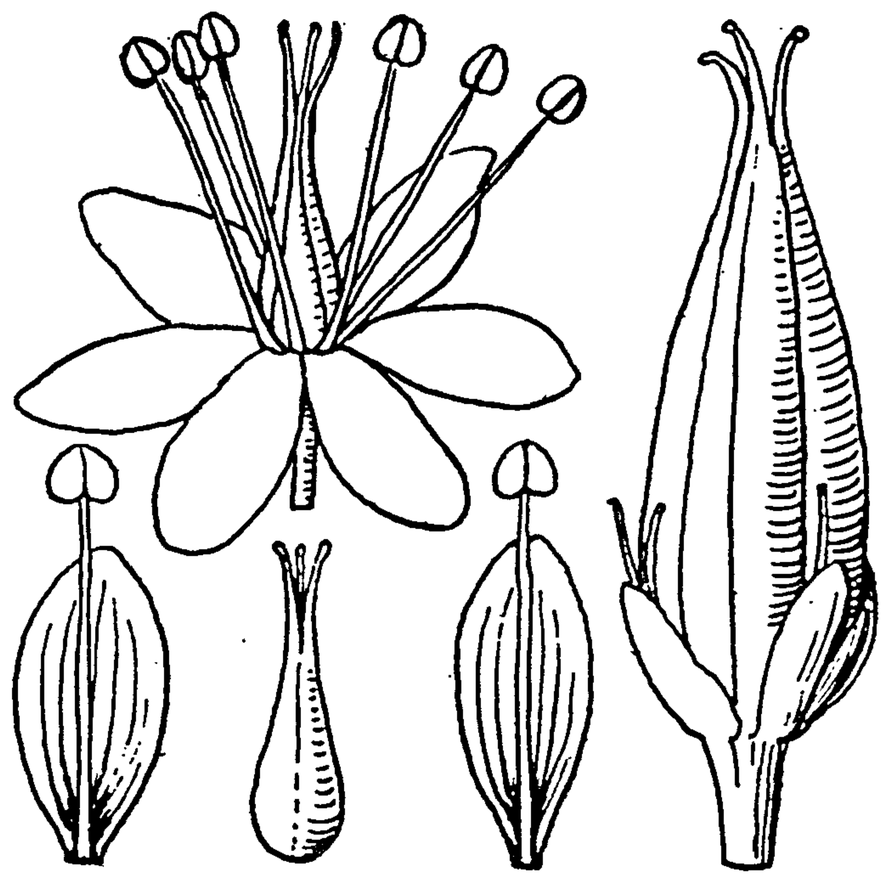
1. O. leimanthoides (A. Gray) Small. Stem 5–24 dm. tall: leaf-blades linear: panicle pyramidal: sepals and petals oval or nearly so, 4–5 mm. long, obtuse: capsule conic, 8–10 mm. long. [*Amianthium leimanthoides* A. Gray *Zygadenus leimanthoides* A. Gray]—Sandy pinelands and acid sand-hill bogs, Coastal Plain, Ga. to S La. and and N. J.; acid woods, Blue Ridge and Appalachian provinces, Ala. to Va.—Sum.

12. **TOXICOSCORDION** Rydb. Slender caulescent herbs, the rootstocks membranous-coated. Leaves mainly basal: blades elongate. Flowers perfect, relatively few in a raceme or a panicle. Sepals and petals white or yellowish, sometimes clawed, each with a gland above the base. Seeds numerous.—About 7 species, natives of North America.



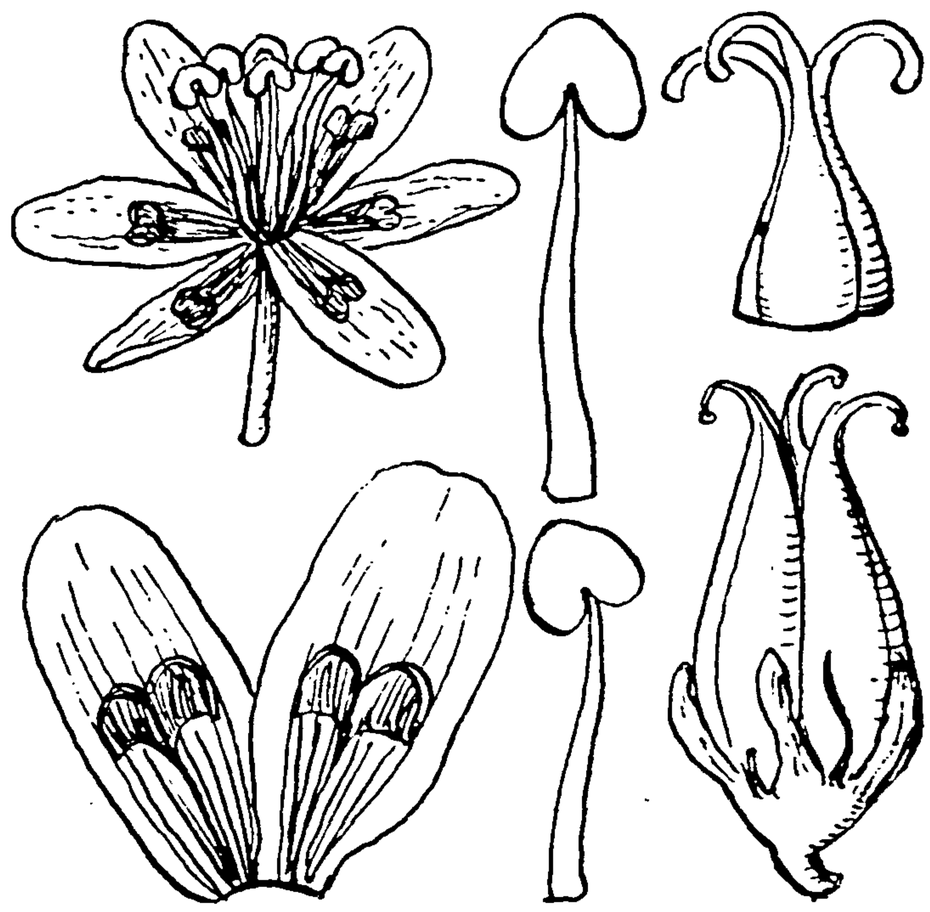
1. **T. Nuttalli** (A. Gray) Rydb. Stem 3–7 dm. tall: upper leaves with sheathing bases: sepals and petals ovate-oval, 6–8 mm. long, the gland merging into the surrounding tissue.—(MERRY-HEARTS.)—Prairies, various provinces, Tenn. to Tex. and Kans.—Spr.

13. **TRACYANTHUS** Small. Herbs similar to *Toxicoscordion*. Leaves mainly basal: blades elongate. Flowers perfect, numerous in a thick raceme. Sepals and petals white, pink, or purplish-red, each with a gland at the very base. Carpels united to above the middle. Seeds few.—Two known species, the following, and one in Texas.



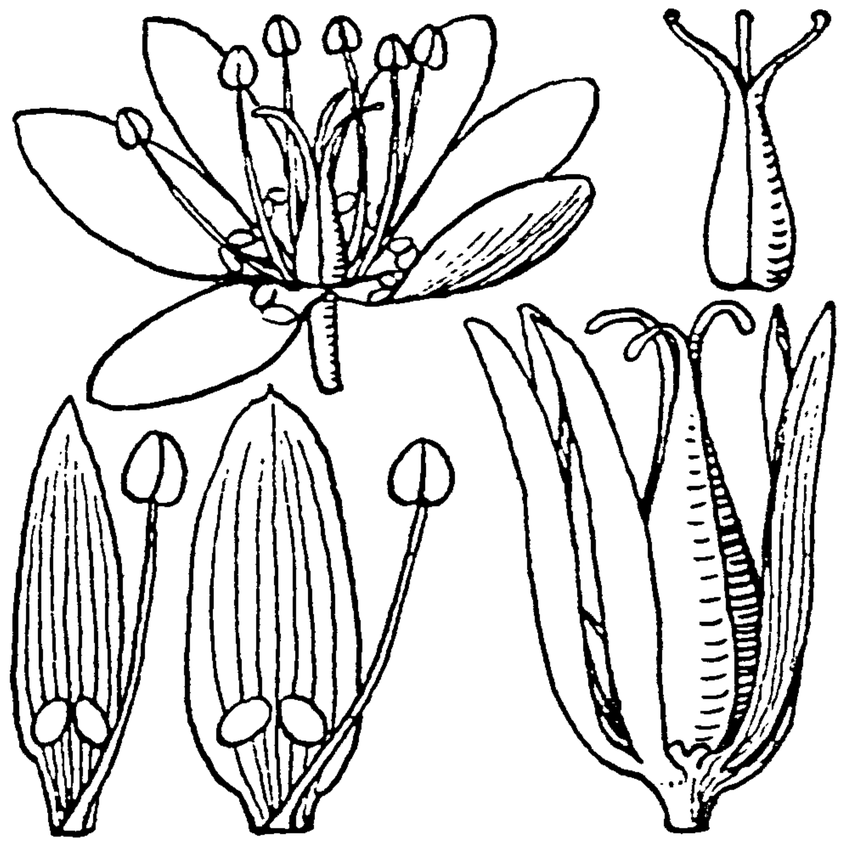
1. **T. angustifolius** (Michx.) Small. Stem 5–10 dm. tall, sparingly leafy: leaf-blades linear: raceme cylindric, 5–10 cm. long, about ½ as thick: sepals and petals obovate, 4–5 mm. long: capsule conic, 15–20 mm. high. [*Helonias angustifolia* Michx. *Amianthium angustifolium* A. Gray] — (CROW-POISON. ST. AGNES' FEATHER.)—Moist pinelands, borders of swamps, and sand-hill bogs, Coastal Plain and occasionally adj. provinces, Fla. to Miss. and N. C.—Spr.

14. **ANTICLEA** Kunth. Herbs similar to *Toxicoscordion* in habit. Flowers perfect, racemose or paniculate. Sepals and petals greenish or yellowish, obscurely or broadly clawed, each with a 2-lobed gland near the middle. Seeds numerous.—About 8 species, North American and Asiatic.



1. **A. chlorantha** (Richards.) Rydb. Stem up to 1 m. tall, glabrous: leaves keeled, the upper sheathing at the base, attenuate, but often blunt at the tip: sepals and petals somewhat spatulate, the gland just below the middle, the blade elliptic or nearly so, obtuse: capsule conic-ovoid, 1.5–2 cm. long.—(WHITE-CAMAS.) — Rocky places and cliffs, Blue Ridge N. C. and various provinces N. Y. to S. D., Sask., and N. B.—Sum.

15. ZYGADENUS Michx. Glaucous caulescent herbs, with horizontal rootstocks. Leaves mainly basal: blades elongate. Flowers perfect, paniculate. Sepals and petals white, each with 2 glands above the base or claw. Seeds angled.—Following is the only known species.



1. Z. glaberrimus Michx. Stem 5–14 dm. tall: leaf-blades linear: panicle-branches ascending: sepals 11–15 mm. long, with an ovate acute or acuminate blade and a stout claw: petals about as long as the sepals, elliptic to lanceolate-elliptic, clawless: capsule about 1 cm. long.—Sandy bogs, Coastal Plain, Fla. to La. and Va.—Sum.

16. MELANTHIUM L. Coarse caulescent herbs. Leaves mainly basal: blades linear or slightly dilated. Flowers monoecious or polygamous, paniculate, the panicle-branches pubescent. Sepals and petals white, cream-colored, or greenish, each with 2 glands above the claw. Seeds winged. The genus comprises only the following species.—Sum.—BUNCH-FLOWERS.

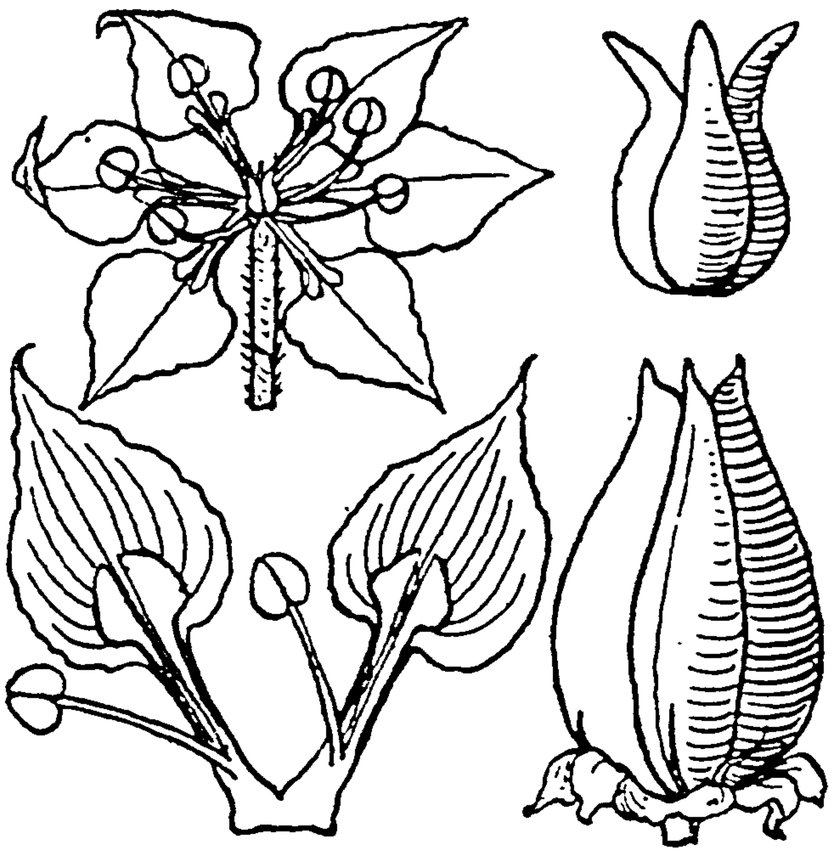
Blades of the sepals and petals suborbicular reniform, often acute, undulate, the filaments adnate the whole length of the claws: leaf-blades manifestly broadest above the middle. 1. *M. latifolium.*

Blades of the sepals and petals elliptic, entire, the filaments adnate to the base of the claws: leaf-blades linear or nearly so.

Panicle narrow, elongate, central axis much surpassing the branches: flowers numerous: blades barely twice as long as the claws of the sepals and petals. 2. *M. virginicum.*

Panicle about as broad as long, central axis not surpassing the branches: flowers few: blades fully thrice as long as the claws of the sepals and petals. 3. *M. dispersum.*

1. M. latifolium Desv. Stem 5–12 dm. tall: leaf-blades broadened above the middle, acute or acuminate: panicle 2–6 dm. long: perianth whitish: sepals and petals with claws nearly as long as the blades.—Swamp margins, meadows, and woods, Piedmont and rarely adj. provinces, S. C. to Pa. and Conn.



2. M. virginicum L. Stem 7–17 dm. tall: leaf-blades linear, attenuate: panicle narrow, 1–5 dm. long: perianth greenish-yellow: sepals and petals with claws about ½ as long as the blades.—Wet meadows, swamps, and moist pinelands, various provinces, N Fla. to Tex., Minn., and R. I.—The persistent perianth often turns red or brown. In the figure the filaments are partly pulled away from the perianth-claws.

3. M. dispersum Small. Stem 9–20 dm. tall: leaf-blades linear, attenuate: panicle very broad: perianth greenish: sepals and petals with claws about ⅓ as long as the blades.—Woods, Coastal Plain, N Fla. to Miss. and N. C.

Family 2. **JUNCACEAE** — Rush Family

Perennial or sometimes annual herbs, usually grass-like in habit. Leaves with flat blades, or terete. Flowers scattered along the inflorescence-branches, or in dense heads. Perianth inconspicuous, whitish, green, yellowish, or brownish. Calyx of 3 chaffy sepals. Corolla of 3 petals nearly or quite similar to the sepals. Androecium of 3 or 6, or rarely 4 or 5 stamens. Gynoecium 3-carpellary. Ovary 1–3-celled. Fruit a loculicidal capsule, or opening irregularly. Seeds sometimes appendaged.—Eight genera and about 300 species, of wide geographic distribution.

Leaf-sheaths open: capsule 1- or 3-celled with axial or parietal placentae: seeds many. 1. Juncus.
Leaf-sheaths closed: capsule 1-celled with basal placentae: seeds 3. 2. Juncoides.

1. JUNCUS [Tourn.] L. Glabrous or merely scabrous herbs. Leaves terete or with flat but thick blades. Bracts subtending the flowers, mostly entire.—About 215 species, most abundant in the Northern Hemisphere.—Spr.–fall, or all year S.—Rushes.

Lower bract of the inflorescence terete, not markedly channeled, erect, appearing like a continuation of the scape, the inflorescence thus appearing lateral. I. Effusi.
Lower bract of the inflorescence not appearing like a continuation of the scape, the inflorescence therefore usually appearing terminal.
  Leaf-blades with their flat surface facing the stem, or terete or channeled, not provided with node-like septa.
    Flowers bracteolate, borne singly on the inflorescence-branches, or sometimes clustered, but never capitate. II. Bufonii.
    Flowers not bracteolate, capitate on the inflorescence-branches. III. Marginati.
  Leaf-blades either terete and not flattened, or flattened or compressed, with the flat surfaces not facing the stem, hollow and provided with septa.
    Leaf-blades terete, the pith perforated with slender tubes: clusters of the inflorescence reduced to a single flower each. IV. Abortivi.
    Leaf-blades either terete, hollow, and with node-like septa, or flattened or compressed or both: clusters of the inflorescence few–many-flowered.
      Stamens 6, one facing each sepal and each petal. V. Articulati.
      Stamens 3, one facing each sepal. VI. Acuminati.

I. Effusi

Flowers bracteolate, borne singly on the branches of the inflorescence.
  Stamens 3: sepals and petals about as long as the capsule: petals acute or acuminate: capsule of an obovoid type. 1. *J. effusus.*
  Stamens 6: sepals and petals about ½ as long as the capsule: petals obtuse: capsule of an ovoid type. 2. *J. gymnocarpus.*
Flowers not bracteolate, borne in heads on the branches of the inflorescence. 3. *J. Roemerianus.*

II. Bufonii

Leaf-blades flat, but sometimes involute in drying so as to appear terete. (See also *J. dichotomus* below.)
  Plant annual: inflorescence, exclusive of its bracts, more than one-third the height of the plant: anthers shorter than the filaments. 4. *J. bufonius.*
  Plant perennial: inflorescence, exclusive of its bracts, less than one-third the height of the plant (except sometimes in *J. Georgianus*, and the anthers then longer than the filaments).
    Inflorescence 1–3-flowered: leaves with fimbriate auricles. 5. *J. trifidus.*
    Inflorescence several–many-flowered: leaves with entire auricles.
      Plant caulescent: sepals and petals obtuse. 6. *J. Gerardi.*
      Plant scapose: sepals and petals acute or acuminate.

Auricles at the summit of the leaf-sheath membranous or scarious, whitish.
Auricles membranous, scarcely scarious, rarely if at all prolonged beyond the point of insertion.
Sepals and petals 2.5–4 mm. long: capsule about as long as the perianth.
Flowers and fruit conspicuously secund: perianth 2.5–3.5 mm. long: anthers longer than the filaments: bracts shorter than the inflorescence: capsules oval. 7. *J. secundus.*
Flowers scarcely or not at all secund: perianth 3–4 mm. long: anthers shorter than the filaments: bracts exceeding the inflorescence: capsules ovoid-ellipsoid or ellipsoid. 8. *J. interior.*
Sepals and petals 4–6 mm. long: capsule shorter than the perianth. 9. *J. georgianus.*
Auricles scarious, markedly prolonged beyond the point of insertion. 10. *J. tenuis.*
Auricles at the summit of the leaf-sheath cartilaginous, yellow to yellow-brown. 11. *J. Dudleyi.*
Leaf-blades terete, channeled along the upper side.
Lowest bract less than 4 times the length of the inflorescence: capsule ellipsoid or obovoid, with the ordinary dehiscence. 12. *J. dichotomus.*
Lowest bract rarely less than 4 times the length of the inflorescence: capsule globose-ovoid, breaking up irregularly in age. 13. *J. setaceus.*

III. Marginati

Stem floating, creeping or diffusely spreading: capsule of a subulate type. 14. *J. repens.*
Stem erect or nearly so: capsule of an obovoid type.
Perianth at least ½ longer than the capsule: anthers yellow. 15. *J. filipendulus.*
Perianth equalling or barely exceeding the capsule: anthers reddish-brown.
Heads of the inflorescence commonly 5–15, usually 5–10-flowered: plants mostly less than 5 dm. tall. 16. *J. marginatus.*
Heads of the inflorescence numerous, except in depauperate plants, usually 2–5-flowered: plants mostly over 5 dm. tall. 17. *J. aristulatus.*

IV. Abortivi

Rootstock thick and woody: leaves rigid: panicle compound, the slender branches diffuse: flowers scattered. 18. *J. abortivus.*

V. Articulati

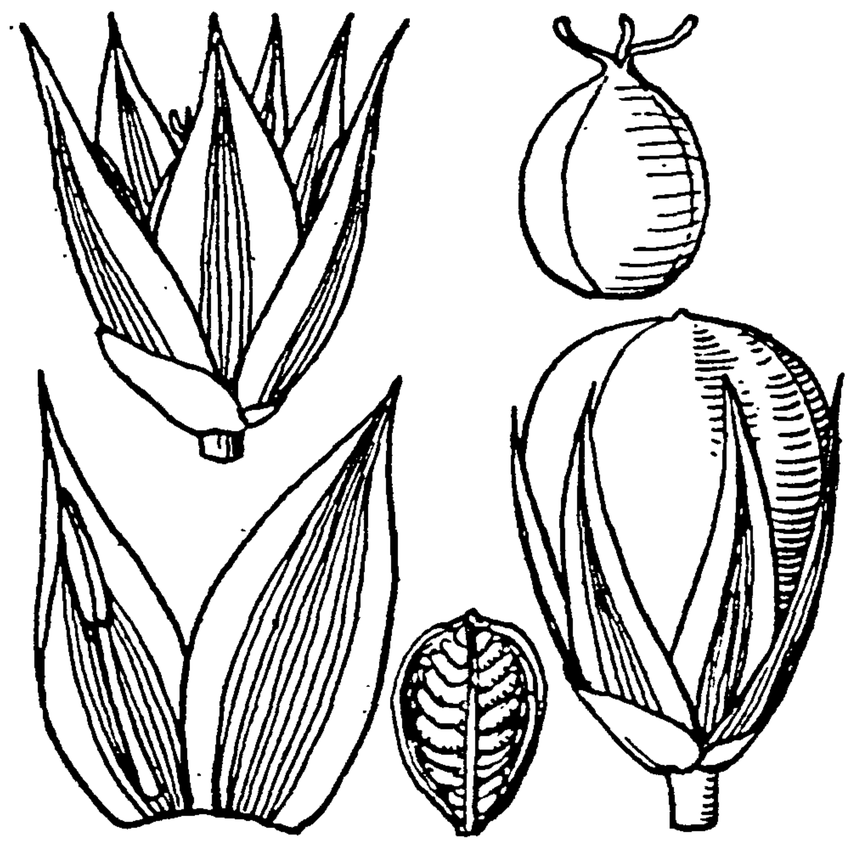
Leaf-blades divergent from the stem: sepals longer than the petals. 19. *J. Torreyi.*

VI. Acuminati

Capsule truly subulate.
Uppermost leaf-sheath with an almost obsolete blade, this seldom exceeding 1 or 2 cm. in length. 20. *J. megacephalus.*
Uppermost leaf-sheath with a normal blade few to several cm. in length.
Stamens as long as the petals, the anthers exserted between them. 21. *J. scirpoides.*
Stamens considerably shorter than the petals: anthers included.
Leaf-blades flattened and usually with incomplete septa: capsule markedly beaked, the valves in dehiscence curved outward in the middle, but united above by the beak. 22. *J. polycephalus.*
Leaf-blades slightly compressed, the septa complete: capsule beakless, the valves separating throughout in dehiscence. 23. *J. validus.*
Capsule ellipsoid to linear-lanceolate in outline, obtuse or acute at the apex, or sometimes mucronate, but not truly subulate.
Capsule one-half to two-thirds as long as the perianth. 24. *J. brachycarpus.*

Capsule equalling the perianth in length or exceeding it.
  Seed 0.7–2.5 mm. long, the body tapering at either end into a white tail of varying length.
    Plant rigid throughout: stem 2–4 mm. in diameter: sepals and petals spinescent: capsule dark red, firm, exceeding the perianth by about ½ their length. 25. *J. trigonocarpus.*
    Plant with none of its parts unusually stiff or hard: stem less than 2 mm. in diameter, or the capsule not exserted from the perianth by more than 1 mm. 26. *J. canadensis.*
  Seed 0.35–0.55 mm. long, the body with a short, rather abrupt, papilla-like, usually dark-colored apiculation at either end.
    Capsule nearly twice the length of the perianth, the two together 3.5–5 mm. long. 27. *J. diffusissimus.*
    Capsule equalling or sometimes about one-third exceeding the perianth, the two together 2–3.5 mm. long.
      Perianth 2–2.5 mm. long.
        Larger basal leaf-blades with more than 40 septa: capsule green or straw-colored: plants usually over 5 dm. tall. 28. *J. robustus.*
        Larger basal leaf-blades with less than 40 septa: capsule dark-brown above at maturity. 29. *J. Elliottii.*
      Perianth 2.5–3.5 mm. long, or if less the capsule straw-colored at maturity and the whole plant less than 5 dm. tall.
        Sepals and petals 2.5–3.5 mm. long: capsule ovoid-lanceolate in outline, broadly acute and mucronate, about as long as the perianth. 30. *J. acuminatus.*
        Sepals and petals 2–2.5 mm. long: capsule linear-lanceolate in outline, obtuse and merely apiculate, about one-third exceeding the perianth. 31. *J. debilis.*

1. J. effusus L. Scape 5–12 dm. tall, striate near the top: leaf-blades obsolete, or mere acicular rudiments: inflorescence open: flowers perfect: mature perianth 2.5–3 mm. long: sepals and petals lanceolate: capsule obovoid, readily dehiscent, rounded at the apex.—(RICE-RUSH. SOFT-RUSH.)—Swamps and low grounds, various provinces, U. S. and S Can.—(*Mex., O. W.*)—The scapes are sometimes woven into matting for floor-covering.



2. J. gymnocarpus Coville. Scape 3–8 dm. tall: leaf-blades obsolete: flowers perfect: sepals ovate-lanceolate, apiculate: petals ovate, obtuse, 1.5–2 mm. long, shorter than the sepals: capsule barely dehiscent.—Acid swamps; known only on Coastal Plain in W Fla. and on Appalachian plateau in E Pa.

3. J. Roemerianus Scheele. Scape 5–12 dm. tall: leaf-blades elongate: flowers mostly dioecious: sepals linear-lanceolate, 2.5–3.5 mm. long: petals linear-elliptic, shorter than the sepals: capsule longer than the sepals.—(BLACK-RUSH. BROWN-RUSH.)—Brackish marshes, Coastal Plain, Fla. to Tex. and N. C.—The copious growth of this dark-hued plant gives a brown aspect to tidal-flats and salt-marshes.

4. J. bufonius L. Stem mostly less than 2 dm. tall: leaf-blades flat, or involute on small plants: panicle diffuse: sepals elliptic-lanceolate, 4–6 mm. long, acuminate: petals linear-elliptic, obtuse, shorter than the sepals: stamens less than ½ as long as the perianth: capsule oblong.—Roadsides, damp grounds, and dried pools, various provinces, U. S. and S Can.—(*W. I., Mex., C. A., S. A., O. W.*)

5. **J. trifidus** L. Stem 1–3 dm. tall: leaf-blades rudimentary, except that of the single stem-leaf: lower bracts resembling the stem-leaf: sepals lanceolate, 3–4 mm. long, acute: petals elliptic, shorter than the sepals: capsule obovoid.—Sterile soil, Blue Ridge and more northern provinces. N. C. to N Can.(*O. W.*)

6. **J. Gerardi** Lois. Stem 2–6 dm. tall: leaf-blades elongate-linear: flowers paniculate: sepals narrowly oblong, 2.5–3 mm. long: petals narrowly lanceolate, slightly shorter than the sepals, the midrib green: capsule ovoid.—(HOG-RUSH. BLACK-GRASS RUSH.)—Salt meadows, Coastal Plain and New England Coast, Fla. to Me.; Great Lake Lowland, Ill. to Mich.—(*O. W.*)

7. **J. secundus** Beauv. Scape 1–4 dm. tall: flowers permanently approximate: sepals becoming 3.5 mm. long: petals green, longer than the sepals, about as long as the capsule.—Swamps, muddy banks, and dry sandy soil, Coastal Plain and adj. provinces, N. C. to Me.

8. **J. interior** Wiegand. Scapes 1–5 dm. tall, pale-green: flowers rather irregularly borne on the inflorescence-branches and scattered: sepals becoming 4 mm. long: petals straw-colored, much shorter than the sepals, slightly longer than the capsule.—Dry woods or prairies, various provinces, Miss. and Tenn. to Ariz., Wyo., and Ill.

9. **J. georgianus** Coville. Scapes 1–4 dm. tall: involucral bract shorter than the inflorescence: sepals becoming 5–6 mm. long: petals green, slightly shorter than the sepals, much longer than the oblong capsule.—Flat granite rocks, Piedmont, Ga. to N. C.

10. **J. tenuis** Willd. Scape 2–9 dm. tall: auricles of the leaf-sheaths scarious: sepals lanceolate, 3–4 mm. long, acuminate: petals slightly broader than the sepals, much longer than the ovoid or obovoid capsule: anthers much shorter than the filaments.—(HEMP-RUSH. WIRE-GRASS RUSH.)—Low grounds, paths, and roadsides, various provinces, U. S. and S Can. Introd. in Eu.

11. **J. Dudleyi** Wiegand. Scape 3–10 dm. tall: auricles of the leaf-sheaths cartilaginous: sepals 4–5 mm. long, lanceolate, becoming very firm: petals shorter than the sepals, acuminate, slightly longer than the oval capsule: stamens 6; anthers shorter than the filaments.—Hillsides and damp calcareous soil, various provinces, Tenn. to Tex., N. M., Wash., Sask., Ont., and Pa.—(*Mex.*)

12. **J. dichotomus** Ell. Scape 2–9 dm. tall: leaf-blades merely terete (flat in *J. dichotomus platyphyllus*): inflorescence terminal: sepals narrowly lanceolate, 3–4 mm. long, becoming very rigid: petals somewhat smaller than the sepals, longer than the ellipsoid capsule.—Sandy soil, Coastal Plain and adj. provinces, Fla. to Tex., Ind., and Mass.

13. **J. setaceus** Rostk. Scapes in dense tufts, spreading, 3–11 dm. long: leaf-blades rudimentary: involucral bract appearing like a continuation of the scape: inflorescence apparently lateral: sepals lanceolate, 3.5–5 mm. long, very rigid: petals ovate-lanceolate, much shorter than the sepals, shorter than the globular-ovoid or spheroidal capsule: stamens 6.—Marshes and springy places, various provinces, Fla. to Tex., Mo., and N. J.

14. **J. repens** Michx. Stem stoloniferous, becoming 4–6 dm. long: leaf-blades 3–8 cm. long, filiform-acuminate at the apex: heads 1–8, panicled, 5–10-flowered: sepals subulate-lanceolate, 4–8 mm. long: petals more attenuate than the sepals, 6–10 mm. long, much longer than the columnar capsule: stamens 3. [*Cephaloxys flabellata* Desv.]—Streams, ponds, swamps, and ditches, various provinces, Fla. to Tex., Okla., and Del.—(*W. I.*)

15. **J. filipendulus** Buckl. Stem 1–3 dm. tall: basal leaves about ½ as tall as the stem; blades 1–2.5 mm. wide: heads commonly 2 or 3, 4–7-flowered: sepals

lanceolate, attenuate, 4–5.5 mm. long: petals similar to the sepals but slightly longer, nearly twice as long as the narrowly obovoid capsule: stamens 3.—Low grounds, interior provinces, Ala. to Tex., and Tenn.

16. **J. marginatus** Rostk. Stem 1.5–5 dm. tall, somewhat bulbous at the base: blades of the basal leaves 1–3 mm. wide: heads relatively large, commonly 5–15 together: sepals ovate to ovate-lanceolate, 2.5–3 mm. long, acute: petals obovate or elliptic-obovate, obtuse, slightly longer than the sepals, slightly longer than the obovoid capsule: stamens 3.—Moist grounds, various provinces, Fla. to Tex., Nebr., Ont., and Me.

17. **J. aristulatus** Michx. Stem 6–12 dm. tall, markedly bulbous-thickened at the base (from thick woody rootstocks in *J. aristulatus biflorus*): blades of the basal leaves mainly 3–5 mm. wide: heads relatively small, 20–100: sepals 2–2.5 mm. long, acute or acuminate: petals slightly longer than the sepals, obtuse or acutish, about as long as the obovoid capsule.—Moist soil or meadows, Coastal Plain, Piedmont, and Great Lake Lowland, Fla. to Tex., Mich., and N. Y.—(*W. I., Mex.*)

18. **J. abortivus** Chapm. Stem 3–6 dm. tall, from a stout rootstock: leaf-blades terete, slightly nodose: panicle-branches filiform: sepals lanceolate, 1.5–2 mm. long, acute: petals slightly longer than the sepals, obtuse, shorter than the conic capsule.—Pond-margins, Coastal Plain, M Fla. to S. C.

19. **J. Torreyi** Coville. Stem 2–10 dm. tall, from a slender rootstock: leaf-blades terete, 1–2.5 mm. thick: heads 1–6 or rarely 15–20, aggregated, surpassed by the involucral bract: sepals subulate, 4–5 mm. long: petals shorter than the sepals, less attenuate: capsule barely exceeding the perianth, the beak 1–1.5 mm. long.—Low grounds and ditches, various provinces, Fla. to Tex., Sask., and Mass.

20. **J. megacephalus** M. A. Curtis. Stem 3–10 dm. tall: leaf-blades rather stout, those of the stem-leaves relatively short: heads 8–12 mm. thick, 1–40, scattered: lowest involucral bract almost bladeless: sepals subulate, 3–3.5 mm. long: petals shorter than the sepals, less attenuate: capsule subulate, about as long as the sepals.—Wet sandy soil or swamps, usually calcareous, Coastal Plain, Fla. to Va.

21. **J. scirpoides** Lam. Stem 2–9 dm. tall: leaf-blades terete, 2–3 mm. thick, the septa complete: heads globose, not lobed (or lobed, sepals about 2 mm. long, and capsule about 2.5 mm. long in *J. scirpoides compositus*): sepals subulate-lanceolate, about 3 mm. long: petals slightly shorter than the sepals: capsule slender, mostly 4–5 mm. long, thus much exceeding the perianth.—Riverbanks, moist sandy places, and swamps, Coastal Plain and Great Lake Lowland, Fla. to Tex., Ind., and N. Y.

22. **J. polycephalus** Michx. Stem mainly 8–11 dm. tall: leaf-blades flat, 3–8 mm. broad, the septa incomplete: sepals lanceolate, 3–4 mm. long: petals slightly shorter and more attenuate: beak of the capsule much exserted.—Ponds and ditches, Coastal Plain, Fla. to Tex. and Va.—The spongy leaves are evidently equitant.

23. **J. validus** Coville. Stem 4–10 dm. tall, compressed: leaf-blades merely compressed, 2–4 mm. wide, septa complete: heads scattered: sepals subulate-lanceolate, attenuate, 3.5–5 mm. long: petals much shorter than the sepals: capsule subulate, much exceeding the perianth.—Sandy soil, Coastal Plain and occasionally adj. provinces, Miss. to Tex. and Mo.

24. **J. brachycarpus** Engelm. Stem 2–9 dm. tall, terete: leaf-blades terete, 2 mm. thick or less: heads scattered or rarely solitary: sepals subulate-lanceolate,

3–3.5 mm. long, attenuate: petals about ¼ shorter than the sepals: capsule oblong, slightly shorter than the petals.—Low grounds or sandy places, various provinces, Ga. to Ark., Ont., and Md.

25. **J. trigonocarpus** Steud. Stem 6–12 dm. tall, terete, or nearly so: leaf-blades nearly as thick as the stem: heads usually numerous and 2–4-flowered: sepals lanceolate, 3–3.5 mm. long, acute: petals somewhat longer than the sepals: capsule narrowly pyramidal, nearly twice as long as the sepals.—Sandy bogs, mostly in pinelands, Coastal Plain and Piedmont, Fla. to La. and S. C.

26. **J. canadensis** J. Gay. Stem 3–12 dm. tall: heads many-flowered, rather crowded: sepals lanceolate, 3–3.5 mm. long: petals longer than the sepals, attenuate, nearly as long as the stout capsule: capsule narrowly conic: seeds long-tailed at each end.—Low grounds, various provinces, Ga. to La., Minn., and Newf.

27. **J. diffusissimus** Buckl. Stem 3–6 dm. tall: inflorescence with elongate widely spreading branches, the heads 3–12-flowered, scattered: sepals narrowly linear-lanceolate, 2.5–3.5 mm. long: petals nearly like the sepals, about ½ as long as the slender capsule: seeds abruptly apiculate.—Low grounds, various provinces, Ga. to Tex., Kans., and Ind.

28. **J. robustus** (Engelm.) Coville. Stem 6–10 dm. tall: inflorescence with 300–500 heads: sepals subulate-lanceolate, 2–3 mm. long: petals nearly equal to the sepals: capsule generally slightly longer than the sepals.—Low grounds, Coastal Plain and Interior Provinces, La. to Tex., Kans., Ill., and Tenn.

29. **J. Elliottii** Chapm. Stem 2–8 dm. tall: inflorescence with 5–50 heads (100–200 heads in *J. Elliottii polyanthemus*): sepals lanceolate, 2–2.5 mm. long: petals slightly shorter than the sepals: capsule exceeding the sepals.—(Bog-rush.)—Bogs and ditches, Coastal Plain, Fla. to Tex. and N. C.

30. **J. acuminatus** Michx. Stem 2–8 dm. tall: heads generally 5–12-flowered: sepals lanceolate-subulate, 2.5–3.5 mm. long: petals slightly shorter than the sepals: capsule about equalling the sepals, ovoid: seeds acute at both ends.—(Knot-leaved rush.)—Moist soil, ditches, meadows, and stream-banks, various provinces, Ga. to Tex., Minn., and Me.; also in W N. A.—(*Mex.*)

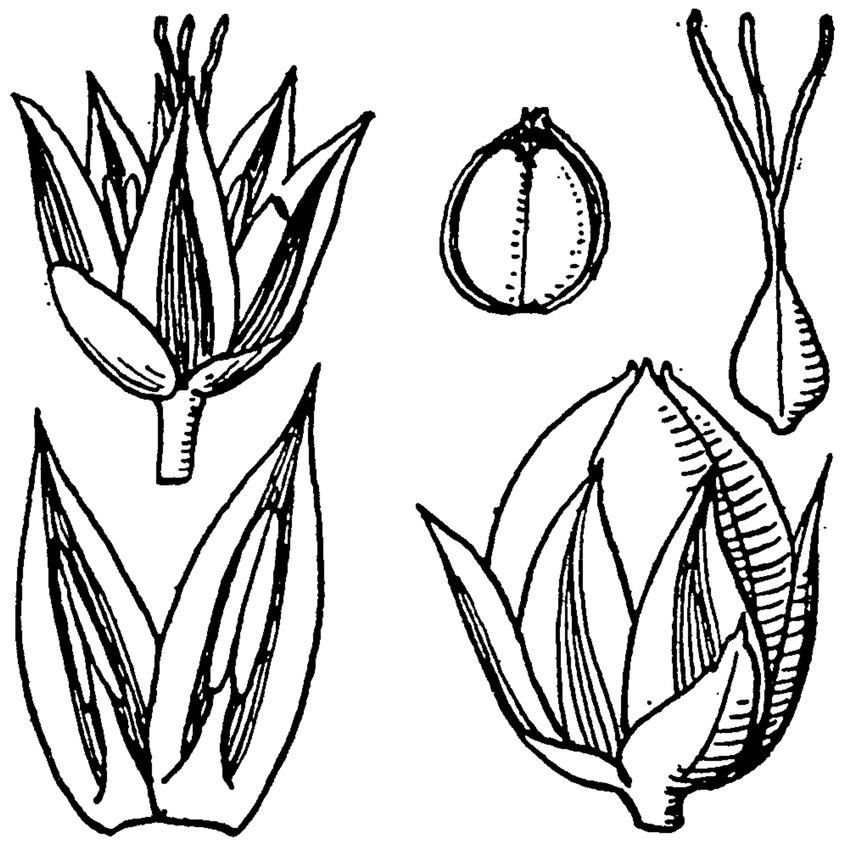
31. **J. debilis** A. Gray. Stem 2–4 dm. tall: heads generally 2–6-flowered: sepals narrowly lanceolate, 2–2.5 mm. long: petals nearly equalling the sepals: capsule oblong, exceeding the sepals and petals. [*J. acuminatus debilis* Engelm.]—Moist soil and wet sandy places, in acid soil, various provinces, Fla. to Miss., Ark., Mo., and R. I.

2. **JUNCOIDES** Adans. Pubescent herbs. Leaf-blades flat and relatively thin, or sometimes involute. Bracts subtending the flowers usually lacerate or denticulate. Perianth greenish.—About 65 species, widely distributed.—Spr. —Wood-rushes.

Peduncles terminated by 1 or 2 flowers or by a cyme: capsule of an ovoid type.
  Filaments deltoid, one-third or one-fourth as long as the anthers: peduncles with 1 or 2 flowers. 1. *J. saltuense.*
  Filaments lanceolate, about as long as the anthers: peduncles cymose at the tip. 2. *J. carolinae.*
Peduncles terminated by compact spikes: capsule of an obovoid type.
  Sepals and petals 3–4 mm. long: capsule much surpassed by the perianth. 3. *J. echinatum.*
  Sepals and petals 2–2.5 mm. long: capsule surpassing the perianth or about equalling it in length. 4. *J. bulbosum.*

1. **J. saltuense** (Fernald) Small. Plants 1–4 dm. tall: stem-leaves 1.5–4.5 cm. long: peduncles 1–2-flowered: sepals and petals broadly lanceolate, becom-

ing 3–4 mm. long: filaments ⅓ or ¼ as long as the anthers: style longer than the stigmas: capsule 3.5–4.5 mm. long. —Woods, various provinces, Ga. and Tenn. to Ore., Alas., Ont., and Newf. —(*Asia.*)



2. J. carolinae (S. Wats.) Kuntze. Plant 1–3 dm. tall: leaf-blades flat, 3–9 mm. wide, ciliate, and webbed on both surfaces, gland-like at the blunt tip: flowers solitary or 2 together: sepals, and petals, 3.5–4 mm. long, lanceolate: filaments nearly as long as the anthers: style shorter than the stigmas: capsule ovoid, surpassing the perianth. [*J. pilosum* (Fl. SE. U. S.)]—Woods, Blue Ridge, N. C. and Tenn.

3. J. echinatum Small. Plant 2.5–5 dm. tall: the stem without bulblets at the base: sepals and petals lanceolate, the tips soft: capsule 2.5–3 mm. long.—Woods and thickets, Piedmont to Appalachian provinces, Ga. to Ala., and N. C.

4. J. bulbosum (Wood) Small. Plant 1–4 dm. tall, the stem arising from a cluster of bulblets: sepals and petals ovate-lanceolate, the tips firm: capsule mainly 2.5–3 mm. long.—Woods, thickets, and barrens, various provinces, Ga. to Tex., Kans., and Md.

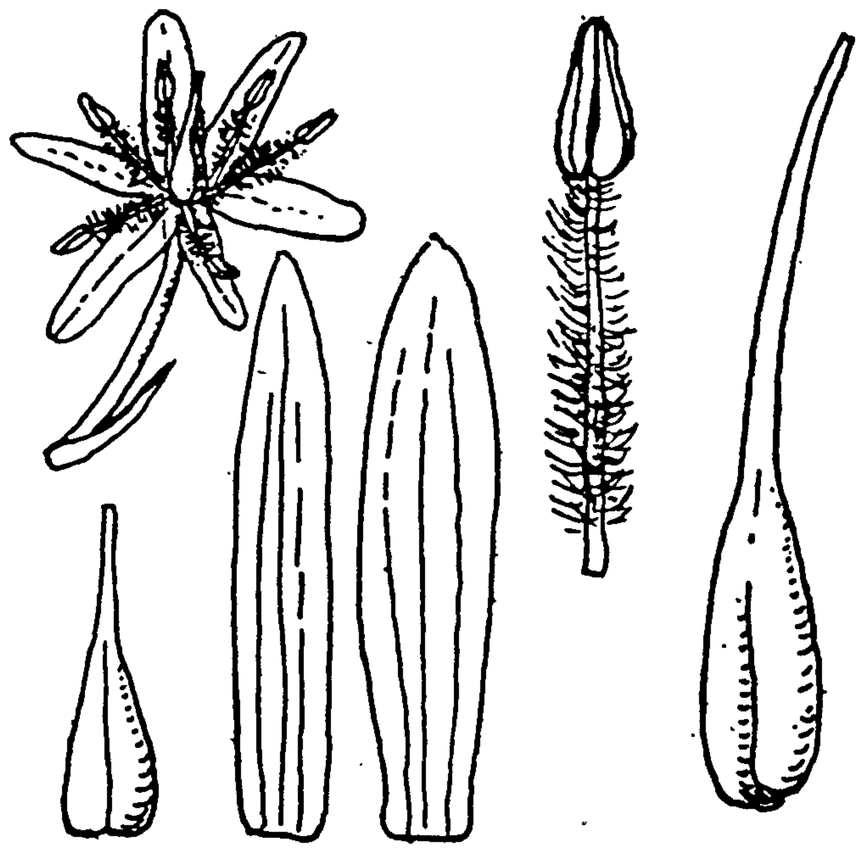
Family 3. **NARTHECIACEAE** — Bog-Asphodel Family

Perennial herbs with elongate rootstocks. Leaves alternate. Flowers borne in an erect narrow raceme-like panicle. Perianth of 3 sepals and 3 nearly similar petals. Androecium of 6 stamens. Gynoecium 3-carpellary: styles united. Fruit capsular, loculicidal. One genus.

1. ABAMA Adans. Rush-like caulescent herbs. Leaves mainly basal, erect and equitant, the blades very narrowly linear. Sepals and petals obscurely 3-veined, glandless. Five species, in the Northern Hemisphere.—Sum.

Sepals and petals 6–7 mm. long: panicle lax, the flower-stalks very slender, much longer than the bracts. 1. *A. montana.*
Sepals and petals 4–5 mm. long: panicle compact, the flower-stalks stoutish, about as long as the bracts or nearly so. 2. *A. americana.*

1. A. montana Small. Stem 2–5 dm. tall, with remote very narrow leaves: panicle lax; flower-stalks longer than the sepals: perianth yellow: anthers lanceolate, fully 1.5 mm. long, scarcely half as long as the filaments: capsule subulate-conic, 8–10 mm. long, long-beaked.—(Mountain-asphodel.) — Swamps, Blue Ridge, N. C.



2. A. americana (Ker) Morong. Stem 3–6 dm. tall, with narrow leaves: panicle close; flower-stalks shorter than the sepals: perianth yellow; anthers ellipsoid, less than 1.5 mm. long, one-third to one-fourth as long as the filaments: capsule narrowly conic, 10-12 mm. long, short-beaked.—(Yellow-asphodel.)—Sandy bogs, pine barrens, Coastal Plain, S. C. to N. J.

Family 4. **ALLIACEAE** — Onion Family

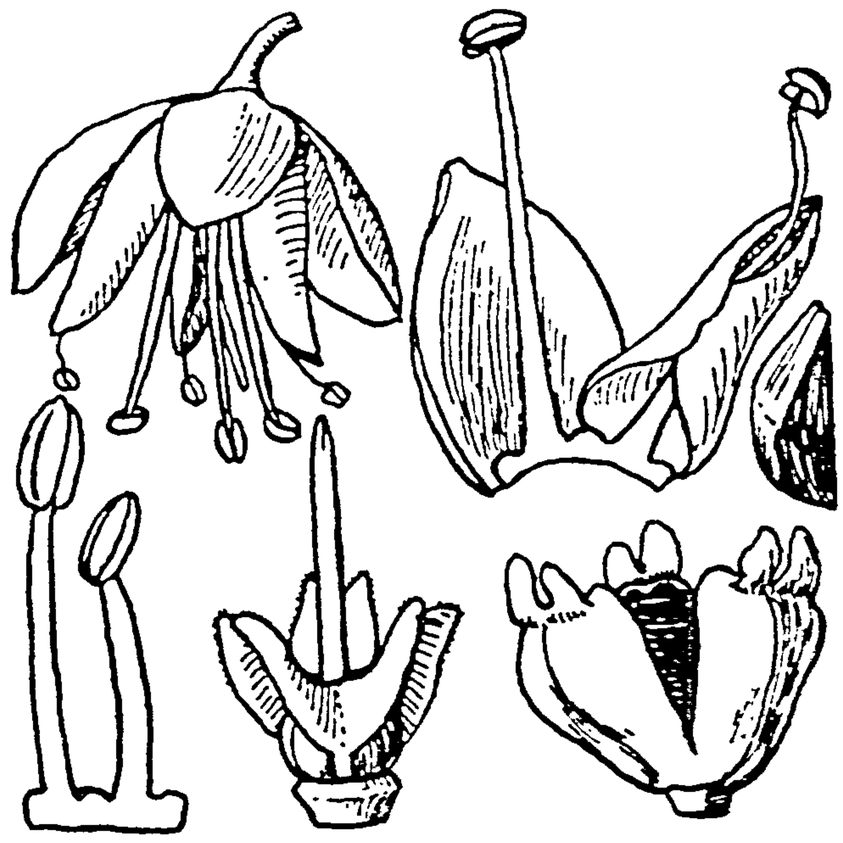
Perennial herbs with coated bulbs or corms. Leaves basal or mainly so: blades typically narrow. Flowers in a terminal umbel subtended by a scarious involucre at the top of the simple scape or stem. Perianth of 3 sepals and 3 petals, persistent. Androecium of 6 stamens. Gynoecium 3-carpellary. Ovary superior. Styles united. Fruit a loculicidal capsule. —About 20 genera and 360 species, widely distributed.

Ovules or seeds 1 or 2 in each cavity: plant with an onion-like odor.
  Ovules 2 in each cavity: scape or stem accompanied by leaves. — 1. Allium.
  Ovule 1 in each cavity: scape not accompanied by leaves. — 2. Validallium.
Ovules or seeds several in each cavity: plant destitute of an onion-like odor. — 3. Nothoscordum.

1. ALLIUM [Tourn.] L. Alliaceous herbs. Leaf-blades narrow, soft, flat, hollow or keeled. Perianth white, pink, or purple in our species. Stamens with nearly equal filaments or alternately appendaged.—About 300 species of wide geographic distribution.—Onions. Garlics.

Bulb with membranous-scaly outer coats.
  Umbel horizontal or nodding: plant scapose: sepals and petals very broad.
    Perianth campanulate, mostly white or pink; sepals acute or abruptly pointed. — 1. *A. cernuum.*
    Perianth urceolate, mostly deep-purple; sepals obtuse or notched. — 2. *A. allegheniense.*
  Umbel erect: plant caulescent: sepals and petals relatively narrow. — 3. *A. vineale.*
Bulb with fibrous-matted outer coats.
  Flowers replaced, at least in part, by bulblets. — 4. *A. canadense.*
  Flowers neither replaced by, nor accompanied by bulblets.
    Ovary and capsule not crested: sepals and petals obtuse.
      Umbel open, the pedicels elongate: petals over 4.5 mm. long. — 5. *A. microscordion.*
      Umbel compact or head-like, the pedicels short: petals less than 4.5 mm. long. — 6. *A. arenicola.*
    Ovary and capsule crested: sepals and petals acuminate. — 7. *A. Cuthbertii.*

1. A. cernuum Roth. Scape 2–6 dm. tall, 2-edged: umbel nodding; pedicels becoming 2–3 cm. long: sepals acute: petals oval or broadly ovate, rounded or abruptly pointed at the apex, 4.5–6 mm. long: capsule 4–5 mm. long.—(Wild-onion. Lady's-leek.)—Rocky hillsides and prairies, various provinces N of Coastal Plain, S. C. to Tex., Sask., and N. Y.—Sum.



2. A. allegheniense Small. Scape 3–5 dm. tall, becoming 2-edged: umbel nodding: pedicels 1.5–2.6 cm. long: sepals obtuse or notched at the apex: petals ovate, notched at the apex, 5–6.5 mm. long: capsule nearly as in *A. cernuum.*—(Mountain-ramp.)—Cliffs and rocky soil, Blue Ridge to Appalachian Plateau, Ga. to Tenn. and Va.—Sum.

3. A. vineale L. Stem 3–9 dm. tall: leaves terete: umbel erect, the flowers wholly or partially replaced with bulblets: perianth green, pink, or purple: sepals narrowly ovate to elliptic-ovate, 4–5 mm. long: petals slightly longer than the sepals: filaments opposite the petals with 2 lateral appendages.—

(FIELD-GARLIC. CROW-GARLIC. RAMP.)—Fields, meadows, and thickets, various provinces, Ga. to Ark., Mo., and N. H. Nat. of Eu.

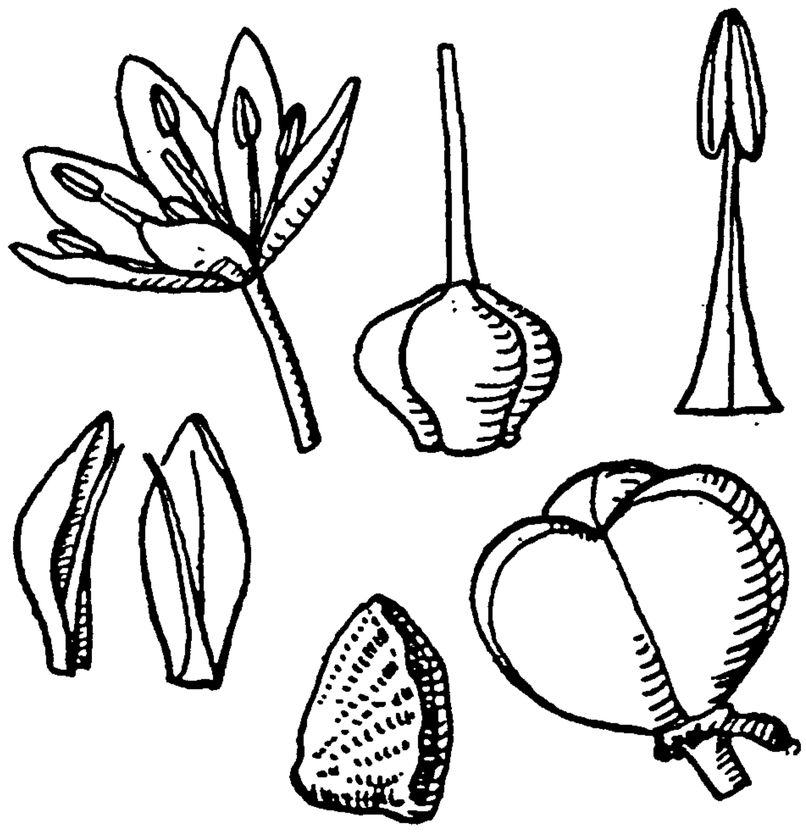
4. **A. canadense** L. Stem 2–6 dm. tall: umbel erect, with most of the flowers replaced with bulblets: perianth pink or white: sepals elliptic to elliptic-lanceolate, 5–7 mm. long: petals lanceolate to elliptic-lanceolate, slightly longer than the sepals, acute or acutish at the apex: filaments alternately longer and shorter. [*A. mutabile* Michx. *A. continuum* Small]—(MEADOW-LEEK. WILD-ONION. ROSE-LEEK.)—Thickets, meadows, and fields, various provinces, Fla. to Tex., Ont., and N. B.—Spr.–fall.

5. **A. microscordion** Small. Scape 2–5 dm. tall: umbel erect, simple: pedicels over 10 mm., mostly 15–25 mm. long: perianth pink: sepals elliptic to elliptic-ovate or elliptic-lanceolate, 4.5–7 mm. long, obtuse: petals mostly narrower than the sepals. [*A. mutabile* Chapm. Not Michx.]—Sandy soil or hillsides, various provinces, W Fla. to Tex. and Nebr.—Spr.

6. **A. arenicola** Small. Scape 1–3 dm. tall: umbel erect: pedicels mostly less than 10 mm. long: perianth deep-pink, not tubular: sepals ovate or elliptic-ovate, or rarely narrower, 3–4.5 mm. long, delicate, obtuse: petals narrower than the sepals.—Sandy woods, Coastal Plain, N Fla. to Tex. and Okla.—Spr.

7. **A. Cuthbertii** Small. Scape 1.5–3.5 dm. tall: umbel erect: pedicels 2–2.5 cm. long: perianth white: sepals narrowly lanceolate to linear-lanceolate, 6–9 mm. long, long-acuminate: petals similar to the sepals: stamens alternately larger and smaller: anthers about 1.5 mm. long: capsule crested.—(STRIPED-GARLIC.)—Sandy woods, Coastal Plain, Fla. to Ala. and N. C.—Spr.

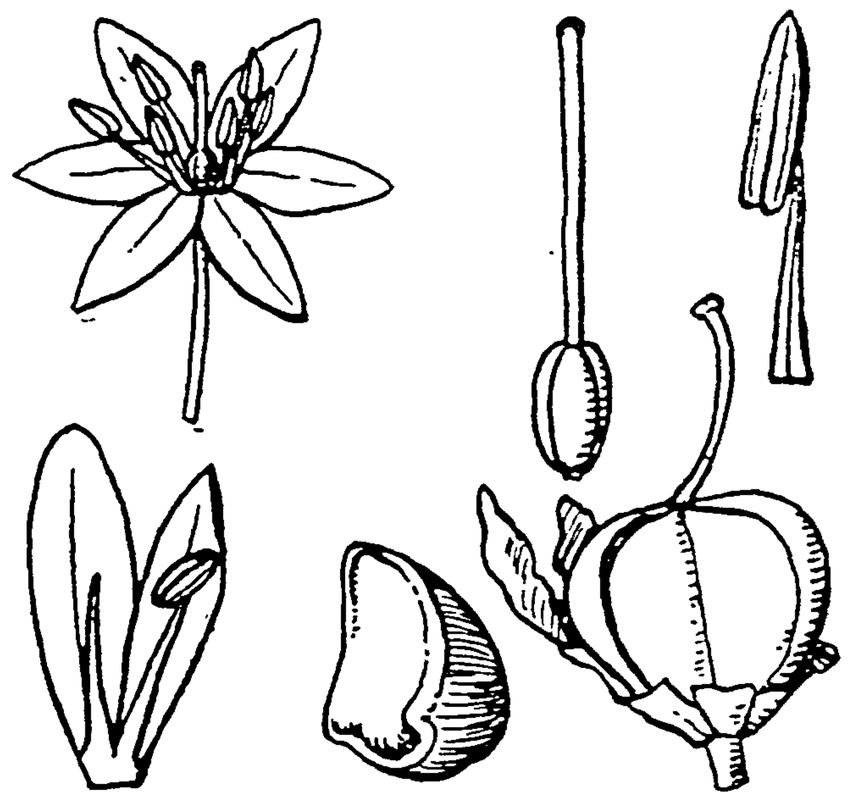
2. **VALIDALLIUM** Small. Alliaceous herbs. Leaf-blades dilated. Perianth white or pale. Stamens unequal, the filaments alternately subulate and lanceolate.—Represented only by the following species:



1. **V. tricoccum** (Ait.) Small. Leaves vernal; blades oblong to oblong-elliptic, 1–3 dm. long: scape 1–4 dm. tall: umbel erect: perianth white: sepals elliptic, 5–7 mm. long, obtuse: petals oval, longer than the sepals, somewhat shorter than the filaments: capsule about 6 mm. broad. (WILD-LEEKS. RAMP. RAMP-SCALLIONS.)—Rich woods and hillsides, various provinces, rarely Coastal Plain, Ga. to Minn. and N. B.—Sum.—The bulbs, being pleasantly flavored, are much sought after by the natives of the mountains.

3. **NOTHOSCORDUM** Kunth. Scapose herbs, resembling *Allium*, but not odorous. Leaf-blades narrow, elongate, straight. Perianth white, greenish, or yellow. Sepals and petals distinct. Filaments distinct, essentially equal. Ovary glabrous.—About 12 species, mostly in tropical America.—Spr.—FALSE-GARLICS. GRACE-GARLICS.

Leaf-blades narrow, mostly 1–3.5 mm. wide: ovary scarcely longer than thick: capsule subglobose. 1. *N. bivalve.*
Leaf-blades broad, mostly 8–12 mm. wide: ovary much longer than thick: capsule obovoid. 2. *N. fragrans.*



1. N. bivalve (L.) Britton. Plant 1–4 dm. tall, the scape slender: leaf-blades mostly less than 4 mm. wide, few-veined: umbel usually few-flowered: sepals and petals elliptic to linear-elliptic, 8–11 mm. long: capsule subglobose, about 5 mm. long, not stipitate, the valves sub-orbicular.—Sandy soil, open woods, rocky places, fields, and prairies, various provinces, Fla. to Tex., Nebr., and Va.—(*Mex.*)

2. N. fragrans (Vent.) Kunth. Plant 3–8 dm. tall, the scape stout: leaf-blades mostly over 7 mm. wide, many-veined: umbel usually many-flowered: sepals and petals elliptic or ovate-elliptic above a narrowed base, 9–12 mm. long: capsule obovoid, 8–10 mm. long, with a stout stipe-like base, the valves elliptic.—Sandy roadsides, woods, and cult. grounds, Fla. to La. and S. C. Nat. of Africa.—(*W. I., Mex.*)

Family 5. **LILIACEAE** — Lily Family

Perennial mainly caulescent herbs. Leaves alternate to whorled, sometimes all basal: blades entire or essentially so. Flowers solitary or variously clustered. Calyx of 3 sepals. Corolla of 3 petals, together with the sepals sometimes partially united into a tube. Androecium of 6 stamens, the anthers distinct. Gynoecium of 3 united carpels. Fruit a loculicidal capsule.—About 100 genera and 1,000 species of wide geographic distribution.

Sepals and petals distinct.	
Anthers not introrse: bulbs scaly or solid (corms).	Tribe I. Lilieae.
Anthers introrse: bulbs coated.	Tribe II. Scilleae.
Sepals and petals partly united.	
Perianth globose-urceolate, blue: anthers very short.	Tribe III. Muscarieae.
Perianth funnelform, brownish-red or yellow: anthers elongate.	Tribe IV. Hemerocallideae.

I. Lilieae

Anthers versatile: leaves several or many, cauline: seeds flat.	1. Lilium.
Anthers erect: leaves 2, basal: seeds globose.	2. Erythronium.

II. Scilleae

Sepals and petals elongate: anthers of a linear type: capsule not three-lobed at the apex.	
Filaments not flattened: perianth blue or purple.	3. Quamasia.
Filaments flattened: perianth greenish-white.	4. Ornithogalum.
Sepals and petals short: anthers of an elliptic type: capsule prominently three-lobed at the apex.	5. Oxytria.

III. Muscarieae

Small succulent herb with narrow leaf-blades and small racemose flowers.	6. Muscari.

IV. Hemerocallideae

Large coarse herb with greatly elongate narrow leaf-blades and large flowers.	7. Hemerocallis.

1. LILIUM L. Tall caulescent herbs with scaly bulbs. Leaf-blades flat, relatively short. Perianth showy, red, orange, or yellow, more or less mottled with brown or black, the sepals, and petals, distinct. Filaments slightly adnate

to the sepals and petals: anthers versatile.—About 45 species, natives of the north temperate zone.—Sum.—LILIES.

Flower or flowers erect: sepals and petals narrowed into claws. I. ERECTA.
Flower or flowers horizontal or nodding: sepals and petals without claws. II. NUTANTES.

I. ERECTA

Leaves erect or nearly so, all alternate: sepals and petals long-acuminate. 1. *L. Catesbaei.*
Leaves spreading, some alternate: sepals and petals merely acute, or obtuse. 2. *L. philadelphicum.*

II. NUTANTES

Leaf-blades finely roughened on the margins and nerves beneath: sepals and petals not recurved.
Sepals and petals erect, abruptly pointed: flowers horizontal. 3. *L. Grayi.*
Sepals and petals spreading at the middle, acuminate: flowers nodding. 4. *L. canadense.*
Leaf-blades smooth: sepals and petals recurved.
Foliage green: leaf-blades broadest at or below the middle. 5. *L. superbum.*
Foliage glaucous: leaf-blades broadest above the middle. 6. *L. carolinianum.*

1. L. Catesbaei Walt. Bulb-scales slender: stem 3–8 dm. tall: leaves alternate; blades linear or narrowly linear-lanceolate, 3–12 cm. long: perianth bright-red: sepals 8–12 mm. long, with linear-lanceolate blades: petals with lanceolate blades: capsule 1.5–2 cm. long. — (LEOPARD-LILY. PINE-LILY.) — Pinelands and acid swamps, Coastal Plain, Fla. to La. and N. C.

2. L. philadelphicum L. Stem 3–9 dm. tall: leaves mainly whorled; blades narrowly elliptic to linear, 3–10 cm. long: sepals 5–6 cm. long, with oblong, elliptic, or oval blades: perianth red: petals broader than the sepals, sometimes ovate: capsule 2–4 cm. long.—(WOOD-LILY. ORANGE-CUP LILY.)—Thickets and open woods, often in acid soil, Blue Ridge, N. C., and various provinces, Va. to Ont. and Me.

3. L. Grayi S. Wats. Stems 5–10 dm. tall: leaves mainly whorled; blades lanceolate to elliptic or elliptic-lanceolate, 4–12 cm. long, roughened on the edges and the nerves beneath; sepals and petals mostly red, 3.5–4.5 cm. long, acute or abruptly pointed: capsule 3–4 cm. long.—(ROAN-LILY. ORANGE-BELL LILY.)—Acid meadows, Blue Ridge to Appalachian Plateau, N. C. and Tenn. to Va.—Because of its supposed rarity this species is sought by specialists in lily-culture. Mountaineers collect it in the fall, distinguishing it from the two following species by the white bulbs.

4. L. canadense L. Stem 6–15 dm. tall: leaves mainly whorled; blades lanceolate to elliptic or elliptic-lanceolate, 5–15 cm. long, acute or acuminate, roughened on the margins and the veins beneath: flowers usually few: sepals and petals red or yellow, often variegated, usually spotted, 4.5–7.5 cm. long, the upper portion spreading: capsule 3–5 cm. long.—(WILD YELLOW-LILY. YELLOW-BELL LILY.)—Wet thickets and meadows, various provinces, rarely Coastal Plain, Ga. and W Fla. to Mo., Minn., and N. S.

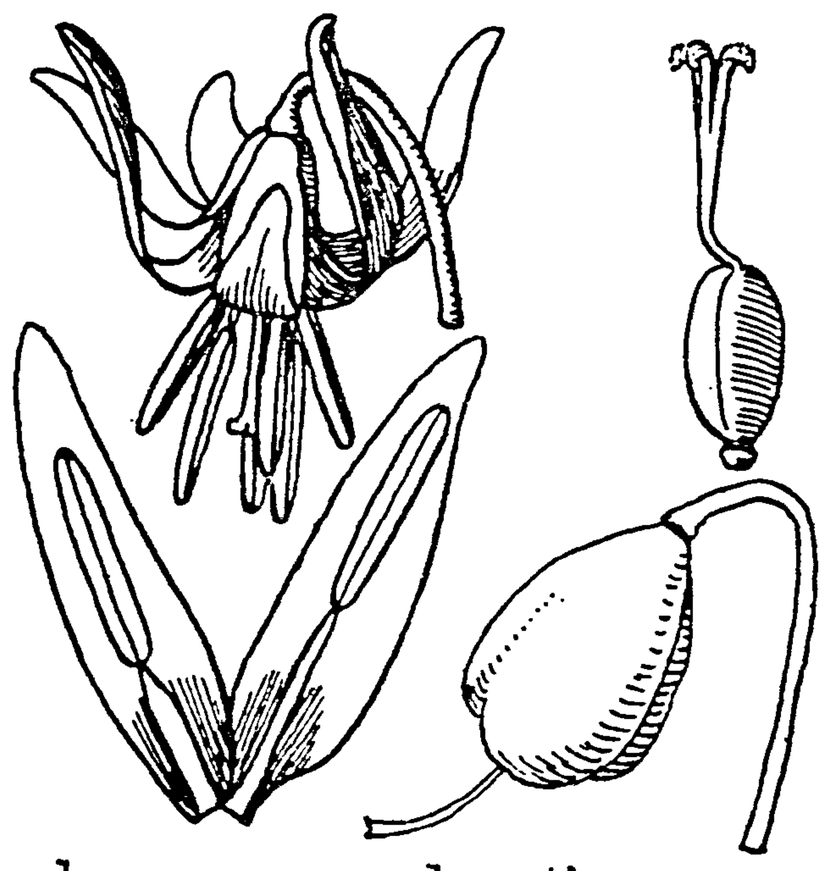
5. L. superbum L. Stem 8–25 dm. tall: leaves mainly whorled; blades elliptic, elliptic-lanceolate, or nearly linear, 5–15 cm. long, acuminate, smooth: flowers usually many: sepals and petals orange, red, or orange-yellow, usually purple-spotted, 6–10 cm. long, recurved from below the middle: capsule 3–5 cm. long. —(LILY-ROYAL.)—Moist slopes, acid meadows, and swamps, various provinces, Ga. to Ark., Minn., and N. B.

6. L. carolinianum Michx. Stem 6–12 dm. tall: leaves scattered or partly whorled: blades obovate, elliptic-obovate or oblanceolate, 3–12 cm. long, abruptly pointed or acuminate: flower usually solitary: sepals and petals orange-red, purple-spotted, 8–10 cm. long, strongly recurved from the middle, the midrib winged beneath: capsule 3–4.5 cm. long.—(TURK'S-CAP LILY.)—Woods, often in acid soil, Coastal Plain, Fla. to La. and N in the Appalachian provinces to S Va.—The large fragrant flowers of this species make it a very desirable subject for gardens, where however it is rarely seen.

2. ERYTHRONIUM L. Low herbs with deeply buried corms and subterranean stems. Leaves generally 2; blades dilated. Perianth white or colored, the sepals and petals distinct. Filaments nearly free: anthers erect.—About 12 species, all, except one, North American.—Spr.—DOG-TOOTH VIOLETS. ADDER'S-TONGUES. LILLETTE. LILIANS. TROUT-LILIES.

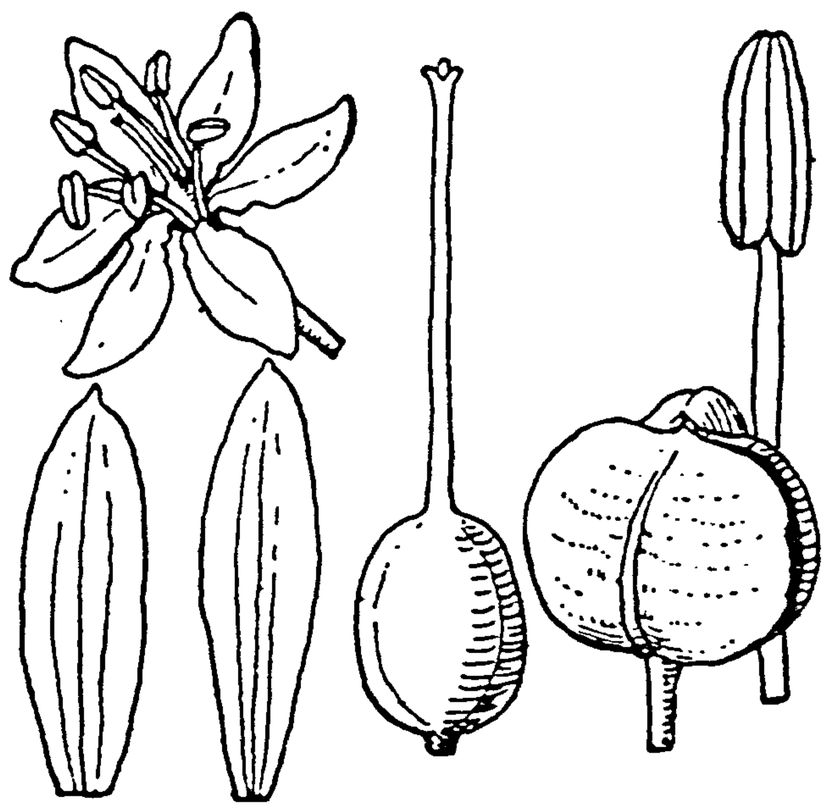
Perianth white, pink, or purplish within: styles united to above the middle, topped by 3 spreading stigmas. 1. *E. albidum.*
Perianth yellow within: styles wholly united: stigmas terminal. 2. *E. americanum.*

1. E. albidum Nutt. Leaf-blades elliptic, 5–15 cm. long, often mottled: scape 1–3 dm. tall: sepals and petals white or pink, (or suffused with rose-purple or red in *E. albidum coloratum*), curved: stigmas spreading or recurved: capsule 1–2 cm. long.—(BLONDE-LILIAN.)—Moist soil, rich woods, or hillsides, various provinces, rarely Coastal Plain, Ga. to La., Minn., Ont., and Md.



2. E. americanum Ker. Leaf-blades elliptic, 10–15 cm. long, commonly mottled: scape 1–3 dm. tall: sepals and petals green or greenish without, yellow within or rarely partly red, 3–3.5 cm. long, recurved: stigmas erect: capsule 1–1.5 cm. long, resting on the ground.—(AMBERBELL.)—Moist banks and swamps, various provinces, Fla. to Ark., Ont., and N. B.—Rare southward.

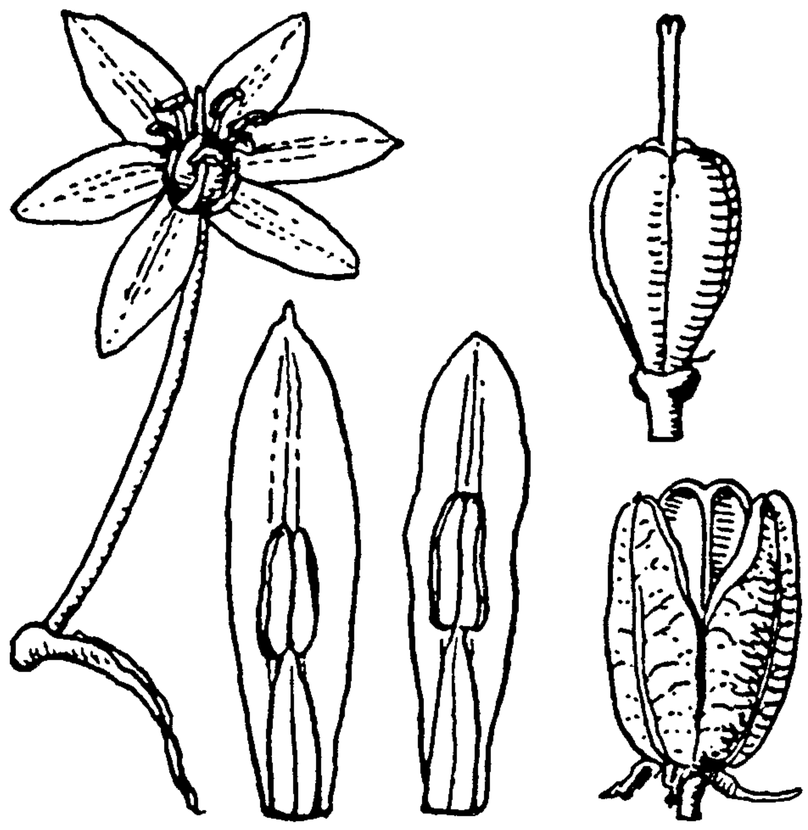
3. QUAMASIA Raf. Scapose succulent herbs with coated edible bulbs. Leaf-blades narrow, elongate. Raceme with narrow bracts. Sepals and petals blue or purple, distinct. Filaments filiform. Anthers versatile. Style longer than the ovary. Ovules numerous in each carpel.—Four species, North American.



1. Q. hyacinthina (Raf.) Britton. Bulbs 2–3 cm. long: leaf-blades narrowly linear: scape 3–6 dm. tall: raceme 8–20 cm. long in anthesis: perianth blue, or rarely white: sepals and petals 14–20 mm. long: capsule 9–10 mm. wide. [*Camassia Fraseri* Torr.]—(WILD-HYACINTH. INDIGO-SQUILL. MEADOW-HYACINTH.)—Thickets and meadows, various provinces, rarely Coastal Plain, Ga. to Tex., Minn.,

and Pa.—Spr.—Plants often become very abundant in abandoned fields and in fence-rows where the mass-effect of the delicate sky-blue flowers is exceedingly attractive.

4. **ORNITHOGALUM** [Tourn.] L. Scapose succulent herbs with coated bulbs. Leaf-blades narrow, elongate. Corymb or raceme bracted. Sepals and petals white or greenish without, nearly equal. Filaments flattened. Anthers versatile. Style shorter than the ovary. Ovules several or numerous in each carpel.—About 75 species, natives of Europe, Asia, and Africa.

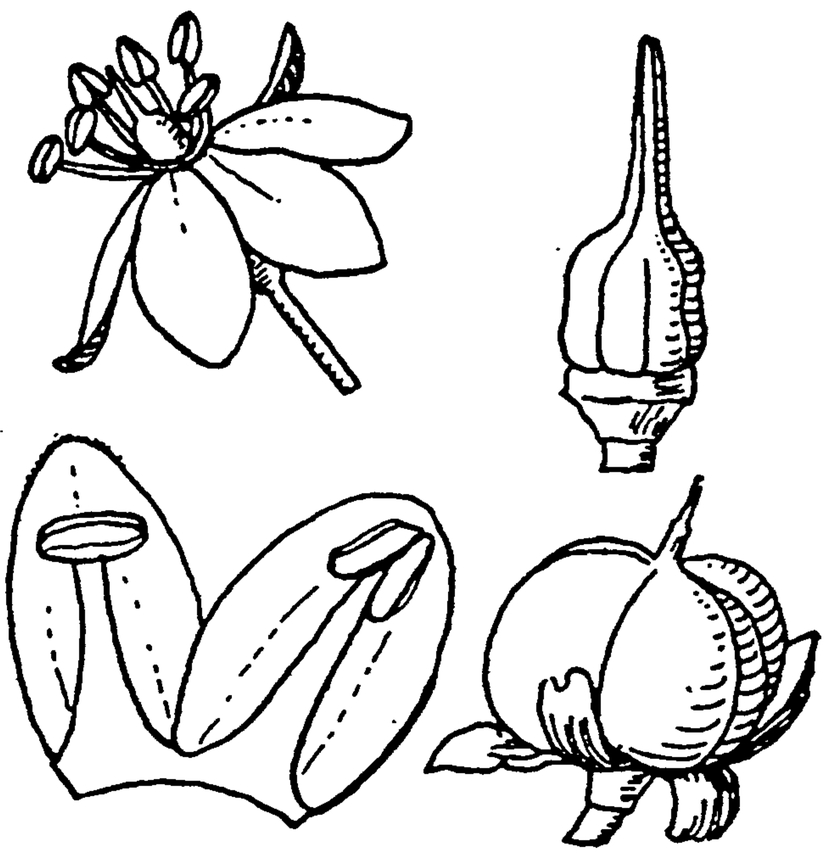


1. **O. umbellatum** L. Scape 1–3.5 dm. tall: leaf-blades usually paler-green near the midrib, 2–5 cm. wide: flowers erect: sepals and petals oblong to oblong-lanceolate, 10–20 mm. long: filaments subulate to subulate-lanceolate: anthers oblong.—(STAR-OF-BETHLEHEM. NAP-AT-NOON. SUMMER-SNOWFLAKE.)—Woods, fields, and roadsides, various provinces, N. C. to Miss., Ohio, and N. H.—Nat. of Eu.—Spr.—Locally becoming a bad weed.

5. **OXYTRIA** Raf. Scapose rather wiry herbs, with bulb-like corms. Leaf-blades elongate and very narrow. Raceme or panicle with short bracts. Sepals, and petals, white or yellow, distinct. [*Schoenolirion* Torr.]—Four species, natives of North America.

Perianth bright-yellow: bracts obtuse.	1. *O. crocea.*
Perianth white or greenish-white: bracts acute or acuminate.	
Raceme mostly simple: bracts acute: seeds 2 mm. long.	2. *O. texana.*
Raceme mostly panicled: bracts acuminate: seeds 4 mm. long.	3. *O. albiflora.*

1. **O. crocea** (Michx.) Raf. Leaf-blades 2–4 mm. wide: scape 3–4.5 dm. tall: raceme simple: sepals and petals bright-yellow, 4–5 mm. long, much longer than the subulate filaments: capsule 4–5 mm. wide. [*S. croceum* A. Gray]—(SUNNYBELL.)—Sandy soil and swamps, Coastal Plain and Piedmont, Fla. to La. and Ga.



2. **O. texana** (Scheele) Pollard. Leaf-blades 3–8 mm. wide: scape 3–4 dm. tall: raceme simple: sepals and petals greenish-white, 4.5–5.5 mm. long, much longer than the subulate filaments: capsule 3–4 mm. wide.—Wet places, Coastal Plain and adj. provinces, Ala. to La., Tex. and W Tenn.

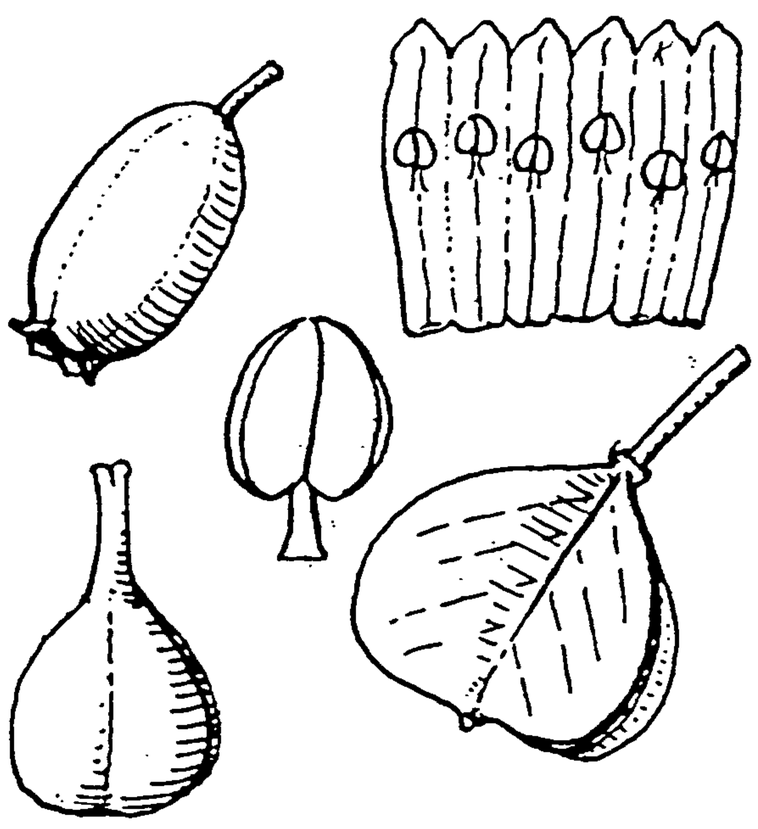
3. **O. albiflora** (Raf.) Pollard. Leaf-blades 2–6 mm. wide: scape 4–6.5 dm. tall: raceme branched: sepals and petals white, 5–6 mm. long: capsule 5–6

mm. wide. [*S. Elliottii* Feay.]—(WHITE-SUNNYBELL.)—Low pinelands and wet prairies, Coastal Plain and rarely adj. provinces, Fla., Ala., and Ga.

6. **MUSCARI** [Tourn.] Mill. Scapose succulent herbs with coated bulbs. Leaf-blades elongate, channeled. Racemes dense, inconspicuously bracted. Perianth globular to urceolate, commonly deep-blue. Filaments adnate to the perianth-tube up to near the anthers. Anthers nearly as wide as long. Ovules 2 in each carpel. Capsules 3-angled or 3-winged.—About 40 species, most abundant in the Mediterranean region.—GRAPE-HYACINTHS. BLUE-BOTTLES.

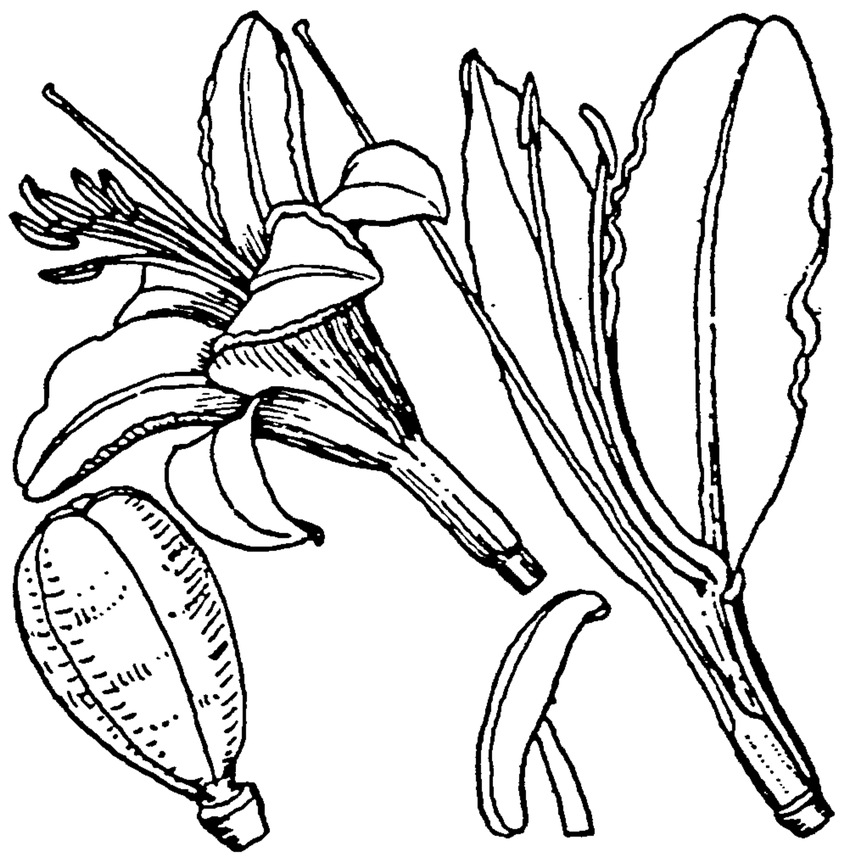
Perianth cylindric-urceolate: anthers borne alternately high and low on the perianth. 1. *M. botryoides.*
Perianth globular-urceolate: anthers borne evenly on the perianth. 2. *M. racemosum.*

1. **M. botryoides** (L.) Mill. Plants 8–25 cm. tall: leaves erect; blades mostly 6–8 mm. wide: perianth mostly 2.5–4 mm. long; lobes as long as wide, about equal: style shorter than the ovary.—Rather common, about gardens and in meadows, E U. S. Nat. of Eu.



2. **M. racemosum** (L.) Mill. Plants 11–28 cm. tall: leaves recurved; blades mostly 2–4 mm. wide: perianth 4.5–5.5 mm. long; lobes broader than long, unequal: style about as long as the ovary. Woods, meadows, and about gardens, various provinces, N. C. to Miss., Md., and N. Y. Nat. of Eu. and cult.—Spr.

7. **HEMEROCALLIS** L. Acaulescent herbs, with thickened coated bulbs. Leaf-blades elongate-linear. Perianth yellow or orange, funnelform, the lobes broad, longer than the tube. Filaments adnate to the perianth-tube. Style elongate. Capsule somewhat elongate. —About 6 species, natives of Eurasia. —DAY-LILIES.



1. **H. fulva** L. Plant 1–2 m. tall: leaf-blades mostly 1.5–2 cm. wide: perianth mainly tawny-orange; tube about 3 cm. long: corolla-lobes 8–10 cm. long, red near the center, orange near the tips, the margins involute, crisped: capsule obovoid, 4–6 cm. long.—(TAWNY DAY-LILY.)—Meadows, roadsides, and thickets, various provinces, N. C. to Tex., Ont., and N. B. Nat. of Eu. and cult.—Sum.—A vigorous colonizer, and often a weed, crowding out native vegetation in meadows, and on banks and edges of woods.

FAMILY 6. CONVALLARIACEAE — LILY-OF-THE-VALLEY FAMILY

Perennial herbs, with rootstocks. Leaves alternate, sometimes all basal, sometimes scale-like. Flowers in a terminal cluster, raceme, or

panicle, or axillary. Calyx of 2 or 3 sepals. Corolla of 2 or 3 petals, together with the sepals sometimes partially united. Androecium of 4 or 6 stamens. Gynoecium of 2 or 3 united carpels. Fruit a berry or rarely a tardily dehiscent capsule.—About 25 genera and 220 species, widely distributed.

Sepals, and petals, distinct or essentially so.
  Fruit baccate.
    Flowers axillary: leaves scale-like: branchlets proliferous. — Tribe I. ASPARAGEAE.
    Flowers terminal: leaves, or most of them, not scale-like: plants not proliferously branched. — Tribe II. STREPTOPEAE.
  Fruit a capsule. — Tribe III. UVULARIEAE.
Sepals, and petals, partly united into a tube.
  Flowers axillary: anthers sagittate. — Tribe IV. POLYGONATEAE.
  Flowers in a terminal raceme or panicle.
    Perianth campanulate: fruit a berry. — Tribe V. CONVALLARIEAE.
    Perianth tubular, the lobes recurved: fruit a capsule. — Tribe VI. SANSEVIERIEAE.

I. ASPARAGEAE

Plant with a short scaly rootstock and very much-branched stem: flowers, and berries, small. — 1. ASPARAGUS.

II. STREPTOPEAE

Flowers in umbels or umbel-like cymes: leaves apparently basal.
  Flowers in a terminal umbel: ovules 2 in each ovary-cavity. — 2. XENIATRUM.
  Flowers in a simple or compound umbel-like cyme: ovules 12 or more in each ovary-cavity. — 3. CLINTONIA.
Flowers in racemes or panicles, or solitary: leaves cauline.
  Flowers in a terminal raceme or panicle.
    Sepals and petals 3 each: stamens 6: gynoecium 3-carpellary. — 4. VAGNERA.
    Sepals and petals 2 each: stamens 4: gynoecium 2-carpellary. — 5. UNIFOLIUM.
  Flowers in extra-axillary clusters or solitary.
    Peduncles scattered along the branches: filaments dilated: anthers acute.
      Anthers 2-horned: stigmas 3. — 6. STREPTOPUS.
      Anthers subulate-tipped: stigmas united. — 7. TORTIPES.
    Peduncles at the ends of the branches: filaments slender: anthers obtuse. — 8. DISPORUM.

III. UVULARIEAE

Sepals and petals with 2 ridges on either side of a deep nectary: capsule obovoid or turbinate, 3-lobed. — 9. UVULARIA.
Sepals and petals without ridges or nectary: capsule elliptic or oval, 3-winged. — 10. OAKESIELLA.

IV. POLYGONATEAE

Caulescent herbs with thick scarred rootstocks: flowers solitary or few in clusters, nodding. — 11. POLYGONATUM.

V. CONVALLARIEAE

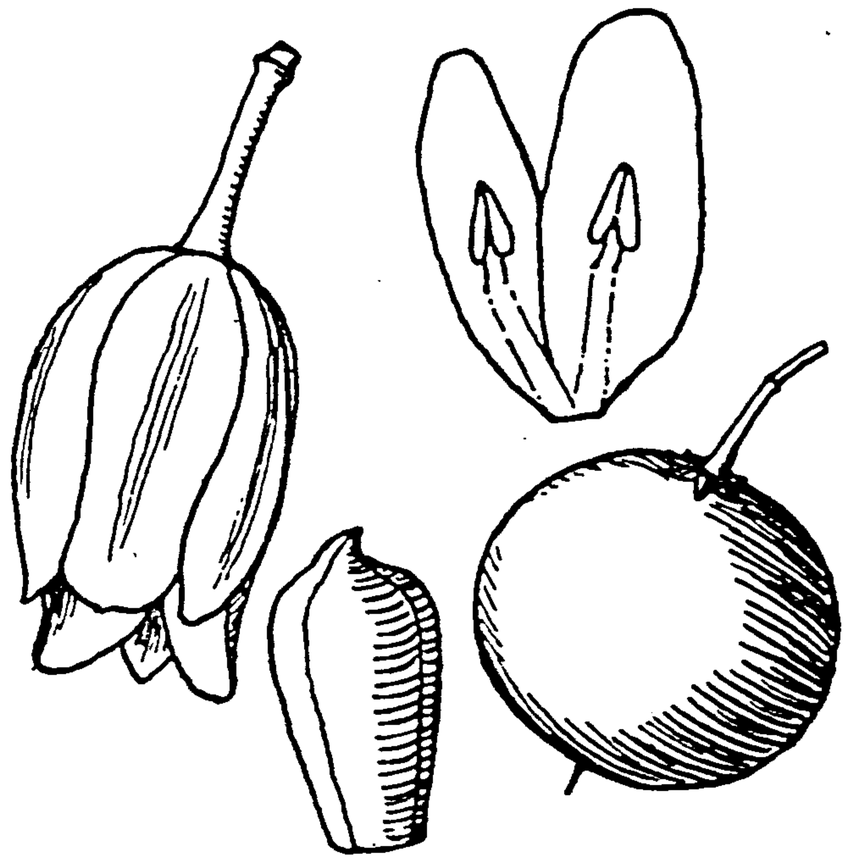
Scapose herbs with slender rootstocks: flowers in a terminal raceme on a scape arising between the erect leaves, nodding. — 12. CONVALLARIA.

VI. SANSEVIERIEAE

Coarse plants with elongate rootstocks: leaves erect or nearly so, fleshy-fibrous: flowers erect or ascending. — 13. CORDYLINE.

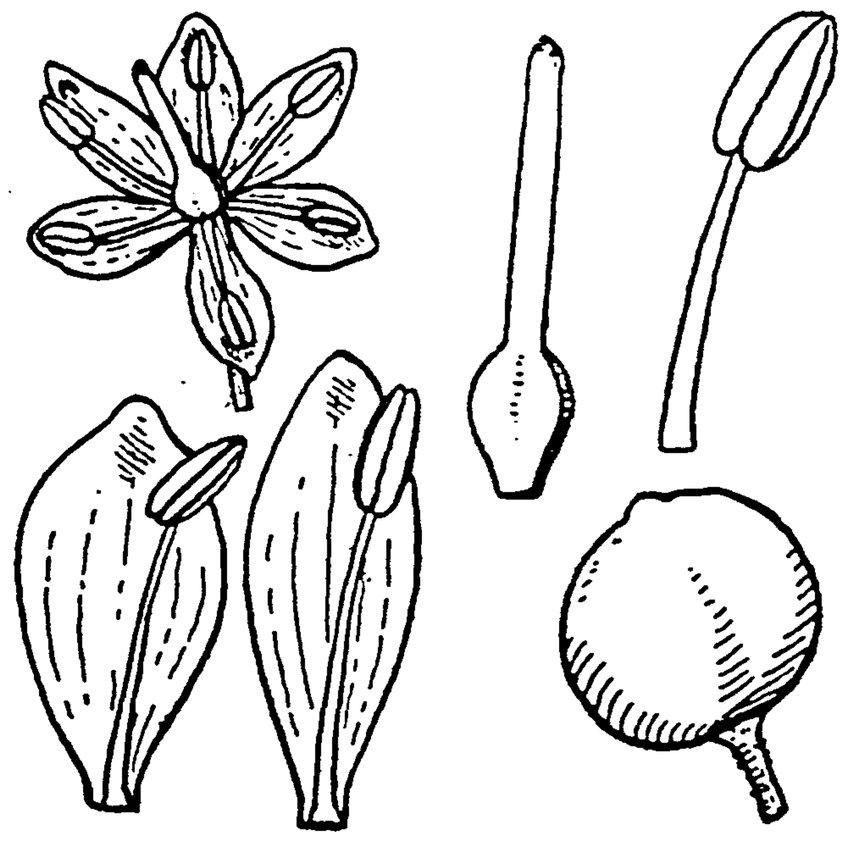
1. ASPARAGUS [Tourn.] L. Caulescent herbs, the branches plume-like on account of the minute branchlets clustered in the axils of the scales. Leaves

scale-like. Flowers mainly solitary in the axils, nodding. Perianth white or yellowish. Berry nodding.—About 100 species, natives of the Old World.



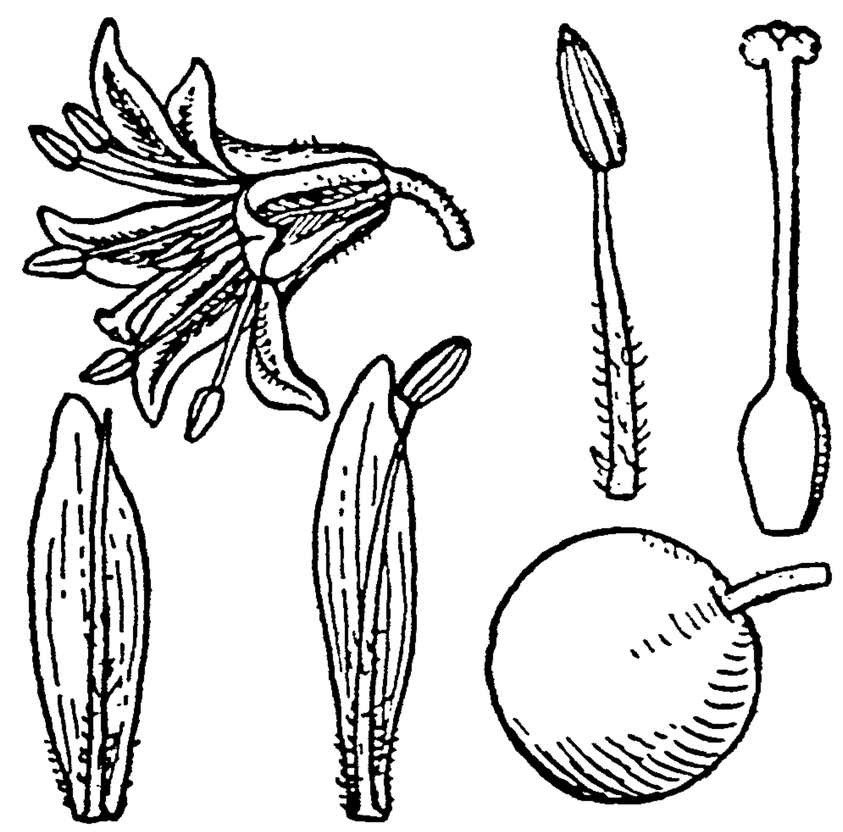
1. A. officinalis L. Stem at first scaly and succulent, becoming slender and firmer, 4–20 dm. tall: sepals and petals 4–7 mm. long, linear or nearly so, the latter broader than the former: berries red, 6–8 mm. in diameter.—(ASPARAGUS.)—Thickets, fence-rows, roadsides, and about gardens, various provinces, Fla. to La., Tenn., and N. B. Nat. of Eu.—Spr.–sum.—The occurrence of this esculent outside of vegetable gardens is due mostly to the agency of birds which are fond of eating the fruits.

2. XENIATRUM Salisb. Short-stemmed herbs, the scape unbranched. Leaves mainly 2 or 3. Flowers erect, in a terminal umbel. Filaments slightly dilated below. Ovules 2 in each ovary-cavity. Berries erect or spreading.—One species.



1. X. umbellulatum (Michx.) Small. Leaf-blades elliptic or elliptic-spatulate, 1–3 dm. long, ciliate: scape as long as the leaves or longer, pubescent: umbel 5–15-flowered: sepals and petals white, speckled with green and purple dots, elliptic or oval, 5–8 mm. long: berry globular, 5–7 mm. in diameter, black. [*Clintonia umbellulata* Torr.]—(GLOBE-AMORETTE. SPECKLED WOOD-LILY.)—Woods and hillsides, Blue Ridge and Appalachian provinces, Ga. to N. Y.—Spr.

3. CLINTONIA Raf. Short-stemmed herbs, the scape unbranched. Leaves 2 or 3. Flowers in simple or compound umbel-like cymes, the cymes sometimes reduced to 1 or 2 flowers. Filaments nearly filiform. Ovules 12 or more in each ovary-cavity. Berries spreading.—About 4 species, natives of North America and Asia.

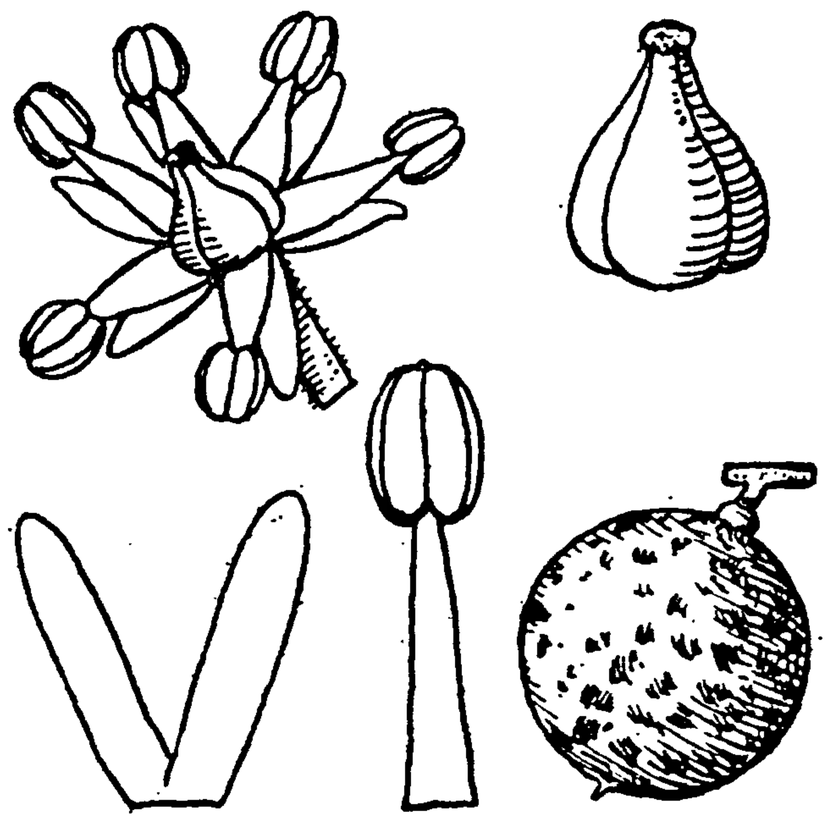


1. C. borealis (Ait.) Raf. Leaf-blades elliptic or oval, 1–3 dm. long: scape surpassing the leaves: flowers 2–7: sepals and petals 1.5–2 cm. long, greenish-yellow: berry oval or subglobose, 8–9 mm. in diameter, bright-blue.—(BALSAM-BELL. BLUE-BEAD LILY. YELLOW WOOD-LILY.)—Deep woods and swamps, often in acid soil, Blue Ridge and more northern provinces, N. C. to Minn., and Newf. —Spr.

4. **VAGNERA** Adans. Herbs with simple stems arising from short rootstocks. Leaves several. Flowers in a terminal raceme or panicle. Sepals and petals of a linear, lanceolate, or elliptic type. Filaments dilated or inflated. Stigma obscurely 3-lobed or nearly entire. Ovules 2 in each ovary-cavity. Berry spreading.—About 25 species, natives of North America and Asia.—Sum.—WILD-SPIKENARDS. SOLOMON'S-FEATHERS. SOLOMON'S-PLUMES.

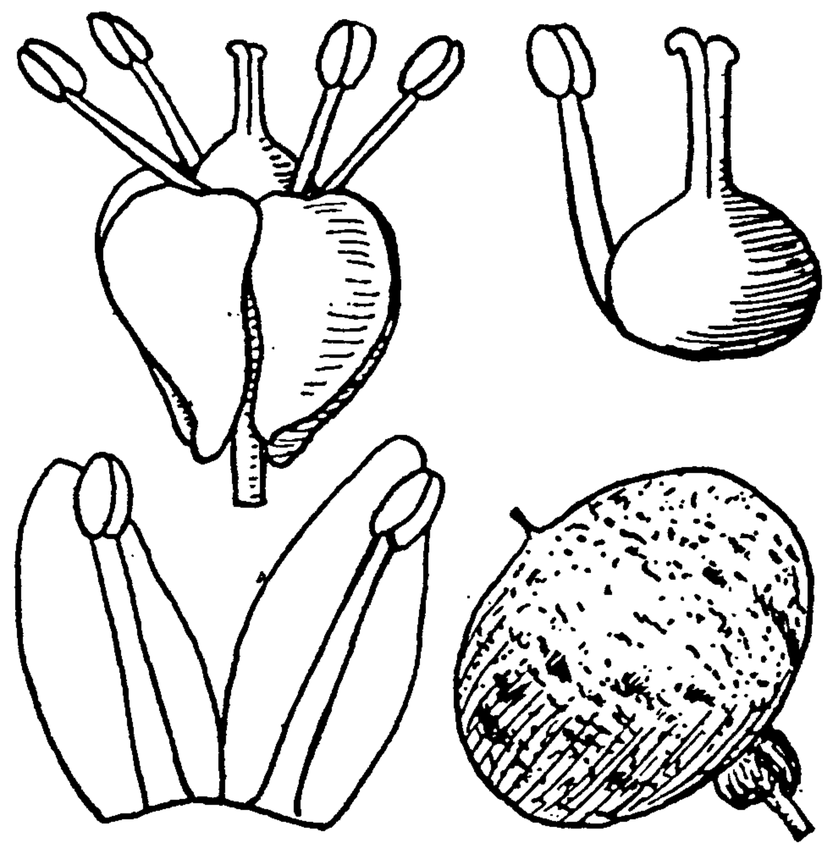
Sepals and petals broadly linear: filaments inflated, about as long as the perianth. 1. *V. racemosa.*
Sepals and petals narrowly linear: filaments flat, twice as long as the perianth. 2. *V. australis.*

1. V. racemosa (L.) Morong. Stem 3–9 dm. tall: leaf-blades elliptic-lanceolate or elliptic, 5–20 cm. long, sessile: panicle 3–10 cm. long, many-flowered: sepals and petals white, 1.5–2 mm. long: berry globular, 4–6 mm. long, red, or spotted with purple. [*Smilacina racemosa* Desf.]—Woods and thickets, various provinces, Ga. to Tex., Calif., B. C., Ont., and N. S.—The berries are edible.



2. V. australis Rydb. Similar to *V. racemosa* in habit, but more slender: leaf-blades relatively narrower, markedly acuminate, prominently 3-ribbed, the other nerves less prominent: panicles loosely flowered, the branches glabrous: sepals and petals smaller.—Woods and hillsides, Piedmont and rarely adj. provinces, Ga. and Ala.—Perianth white as in the preceding species.

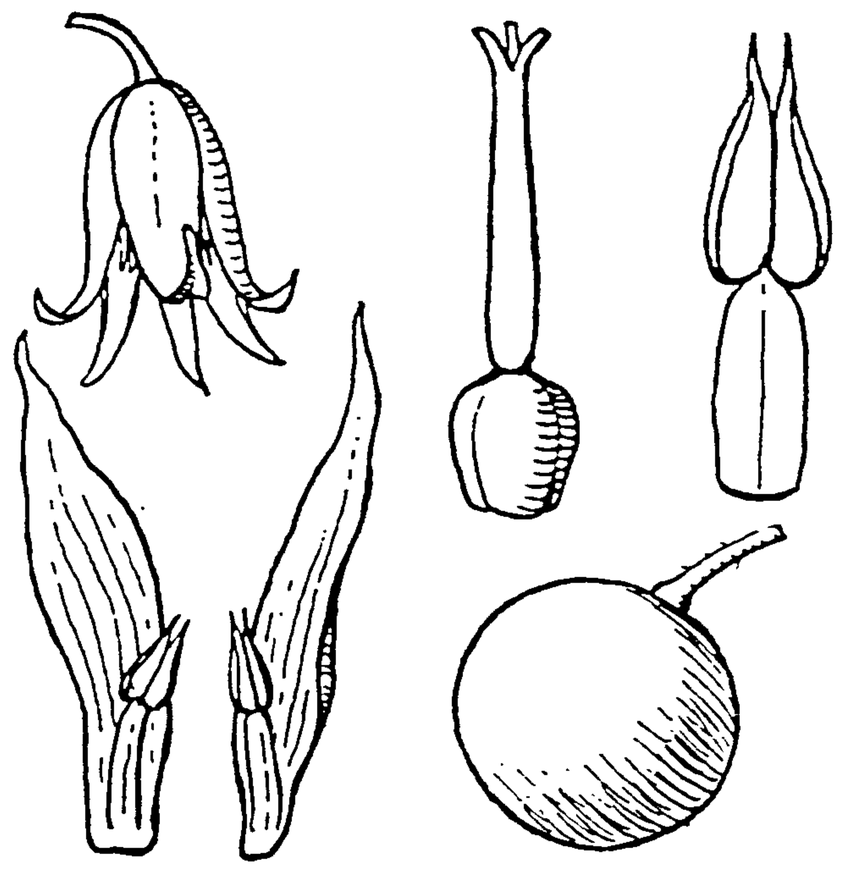
5. **UNIFOLIUM** Adans. Herbs with simple stems arising from slender rootstocks. Leaves few. Flowers in a terminal raceme. Filaments filiform or subulate. Stigmas 2. Ovules 2 in each ovary-cavity. Berry spreading.—Two species, the following and one in western North America and the Old World.



1. U. canadense (Desv.) Greene. Stem 5–15 cm. tall: leaves 2 or 3; blades ovate to lanceolate, 2–8 cm. long, truncate or subcordate at the base: sepals and petals 2.5–3.5 mm. long, white: berries globular, about 4 mm. in diameter, red-speckled. [*Smilacina bifolia* (Chapm. Fl.)]—(TWO-LEAVED SOLOMON'S SEAL. ELF-FEATHER. HEART-LEAF SOLOMON'S-PLUME.)—Moist woods, thickets, and springy places, Blue Ridge, N. C., and various provinces, Va. to S. D., Man., and Lab.—Spr.

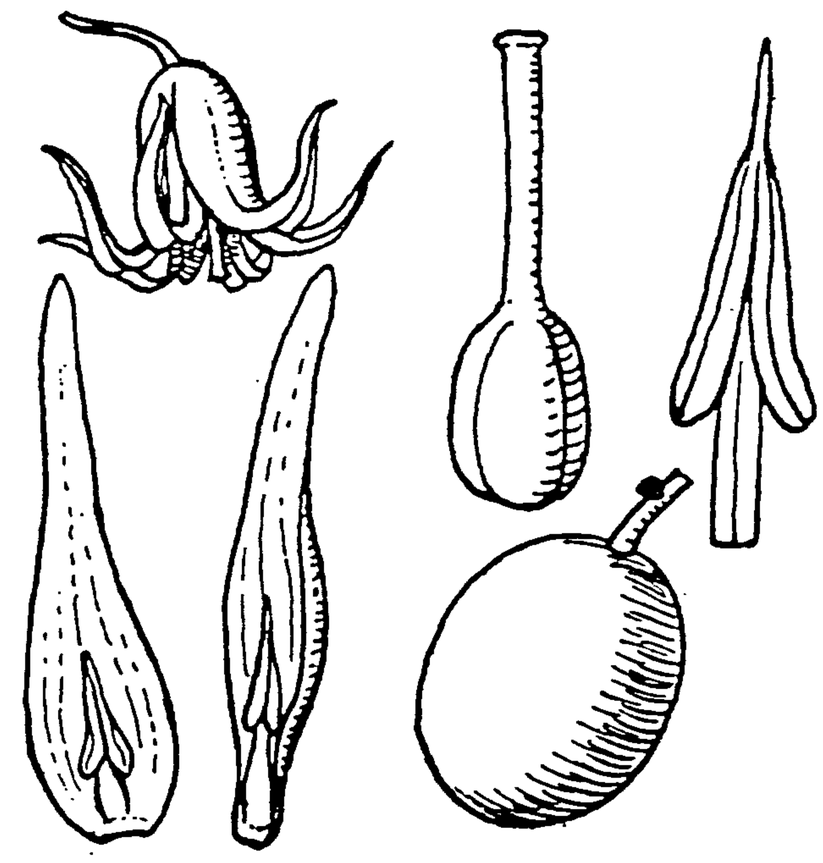
6. **STREPTOPUS** Michx. Herbs with forking stems arising from short or elongate rootstocks. Perianth rose, purple, or purplish: sepals and petals with recurved tips, not transversely veiny. Anthers sagittate, 2-horned at the

apex. Stigmas 3. Ovules several in each ovary-cavity. Berry drooping.—Two or 3 species, widely distributed in the north temperate zone.



1. S. roseus Michx. Stems 3–9 dm. tall: leaf-blades oblong to oblong-ovate or ovate, 5–12 cm. long, sessile: sepals linear-lanceolate or nearly so, 8–12 mm. long, acuminate: berries red, globular or oval-globose, 10–12 mm. long.—(ROSY-TWISTED-STALK. ROSE-BELLS. ROSE-MANDARIN.)—Woods, Blue Ridge and more northern provinces, Ga. to Mich., Ore., Alas., Ont., and Lab.—Spr.–sum.

7. TORTIPES Small. Herbs similar to *Streptopus* in habit. Leaves flimsy: blades not transversely veiny. Flowers solitary or 2 together, nodding, extra-axillary, terminal, the stalk sharply bent or spirally twisted near the middle. Perianth greenish or whitish: sepals and petals with recurved tips, the petals keeled. Anthers sagittate, entire at the apex. Stigmas united. Ovules many in each ovary-cavity. Berry drooping.—Two or 3 species in the north temperate zone.



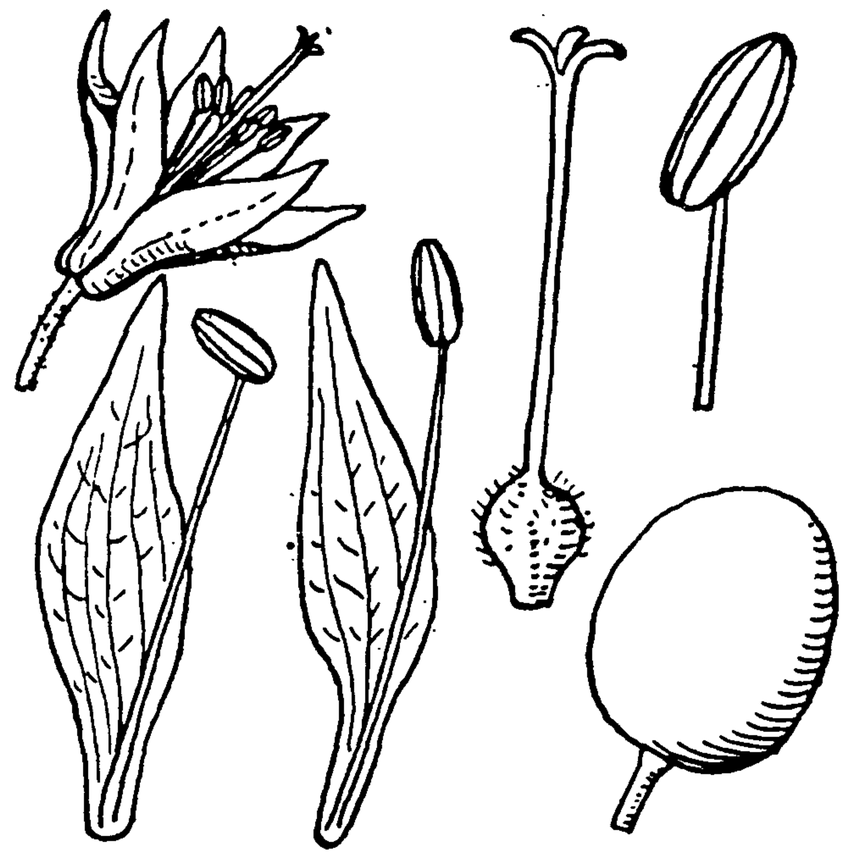
1. T. amplexifolius (L.) Small. Stem 3–12 dm. tall: leaf-blades elliptic to elliptic-lanceolate or ovate-lanceolate, 5–12 cm. long, clasping: sepals narrowly lanceolate, 9–12 mm. long: berry red, oval, 10–15 mm. long. [*Streptopus amplexifolius* DC.]—(PAGODA-BELLS. TWISTED-STALK. WHITE-MANDARIN.)—Woods, Blue Ridge and more northern provinces, N. C. to Ohio, N. M., Alas., Ont., and Lab. Spr.–sum.

8. DISPORUM Salisb. Herbs with branching stems. Leaves firm in age, transversely veiny. Flowers nodding, on straight peduncles near the tips of the branches. Perianth whitish, greenish, or yellowish, sometimes spotted: sepals and petals not recurved at the tip, transversely veiny. Anthers narrowly elliptic. Stigmas 3. Ovules 2 in each ovary-cavity. Berry drooping, mostly red. [*Prosartes* Don.]—About 15 species, natives of North America and Asia.—Spr.–sum.—FAIRY-BELLS.

Sepals and petals yellowish, black-dotted: filaments 12–15 mm. long. — 1. *D. maculatum.*
Sepals and petals greenish, not dotted: filaments 5–7 mm. long. — 2. *D. lanuginosum.*

1. D. maculatum (Buckl.) Britton. Stem 2–6 dm. tall: leaf-blades ovate-lanceolate to elliptic-ovate, 3–6 cm. long: pedicels 5–12 mm. long: sepals and

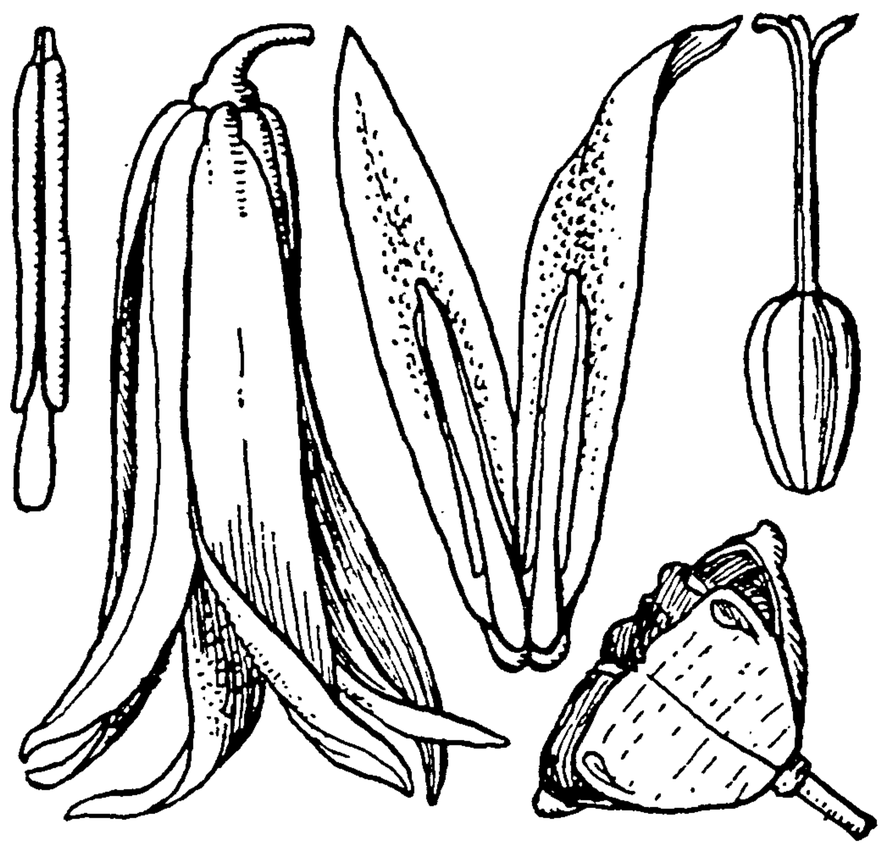
petals 15–20 mm. long, markedly clawed, the blades lanceolate: filaments over twice as long as the anthers. [*P. maculata* Michx.] — (NODDING-MANDARIN.) — Woods, Blue Ridge to Appalachian Plateau, Ga. to Ala., Tenn., Ky., and N. C.



2. **D. lanuginosum** (Michx.) Nichols. Stem 3–9 dm. tall: leaf-blades oblong, lanceolate-elliptic or ovate-lanceolate, 5–12 cm. long, mostly rounded at the base: pedicels 20–30 mm. long: sepals and petals 14–19 mm. long. scarcely clawed, linear-lanceolate: filaments less than twice as long as the anthers: ovary glabrous: berry 10–14 mm. long, few-seeded, smooth. [*P. lanuginosa* Don.]—(YELLOW-MANDARIN.)—Woods, various provinces N of Coastal Plain, Ga. to Ark., Minn., and N. B.

9. UVULARIA L. Herbs with terete forking stems. Leaf-blades perfoliate, membranous, smooth-margined. Perianth mainly yellow. Sepals and petals acuminate. Anthers longer than the filaments. Ovary nearly globular or elongate. Seeds about ½ covered with the thin aril.—Represented by the following species, and possibly another in Ark.—BELLWORTS. STRAW-FLOWERS.

Sepals and petals smooth within, mostly over 3 cm. long: anthers 12–16 mm. long: leaves pubescent beneath. 1. *U. grandiflora.*
Sepals and petals papillose within, mostly less than 2.5 cm. long: anthers 5–8 mm. long: leaves glaucous. 2. *U. perfoliata.*



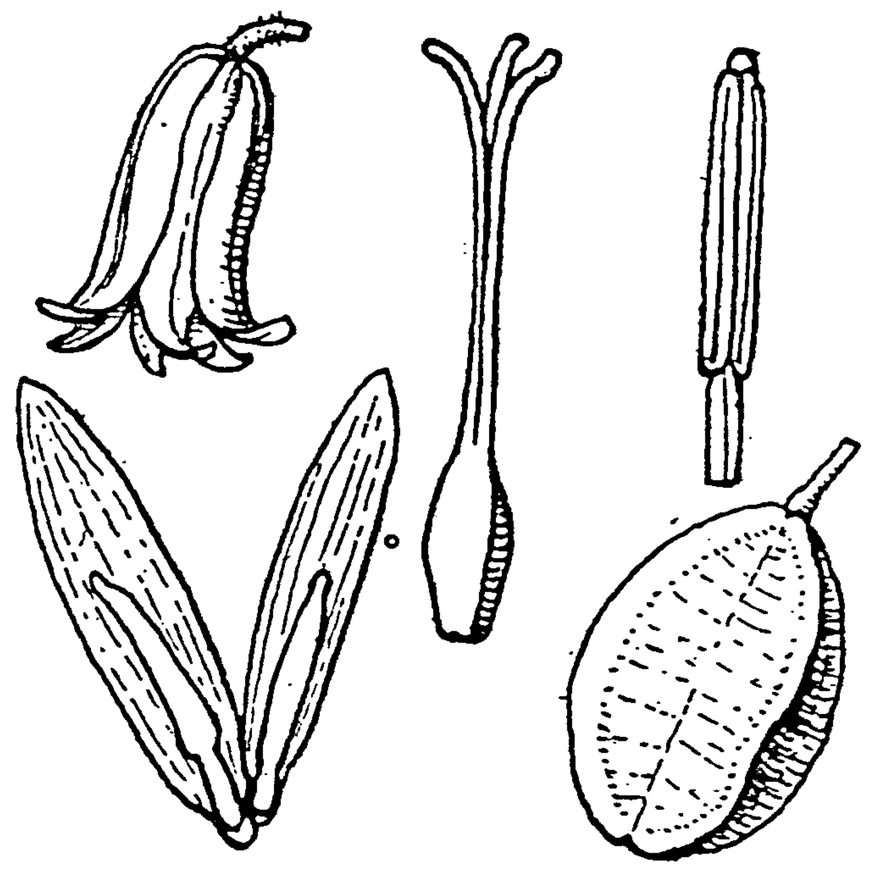
1. **U. grandiflora** J. E. Smith. Relatively larger than *U. perfoliata*: leaf-blades elliptic to elliptic-lanceolate: pedicels 10–40 mm. long: anther-connectives blunt.—Rich woods and thickets, various provinces, N of Coastal Plain, Ga. to Okla., Minn., Que., and N. H.

2. **U. perfoliata** L. Stem 1–8 dm. tall: leaf-blades elliptic or oval, or slightly broadened upward, 3–6 cm. long: pedicels 5–25 mm. long: anther-connectives acute: capsule about 1 cm. long.—(STRAW-BELL.) Rich woods and thickets, various provinces, Fla. to Ark.(?), N. D., and Que.—Spr.

10. OAKESIELLA Small. Herbs with angled forking stems. Leaf-blades sessile, leathery, scabrous-margined. Perianth yellow or greenish-yellow. Sepals and petals blunt. Anthers longer than the filaments. Ovary oblong. Seeds with a swollen spongy raphe.—Four species, the following and one in New Jersey.—BELLWORTS. HAY-BELLS. MERRY-BELLS. COW-BELLS.

Flower-stalk bractless: sepals and petals not attenuate: capsule beakless.
Ovary and capsule not stipitate: plant puberulent. 1. *O. puberula.*

Ovary and capsule stipitate: plant glabrous. 2. *O. sessilifolia.*
Flower-stalk bearing an adnate bract: sepals and petals attenuate: capsule beaked. 3. *O. floridana.*



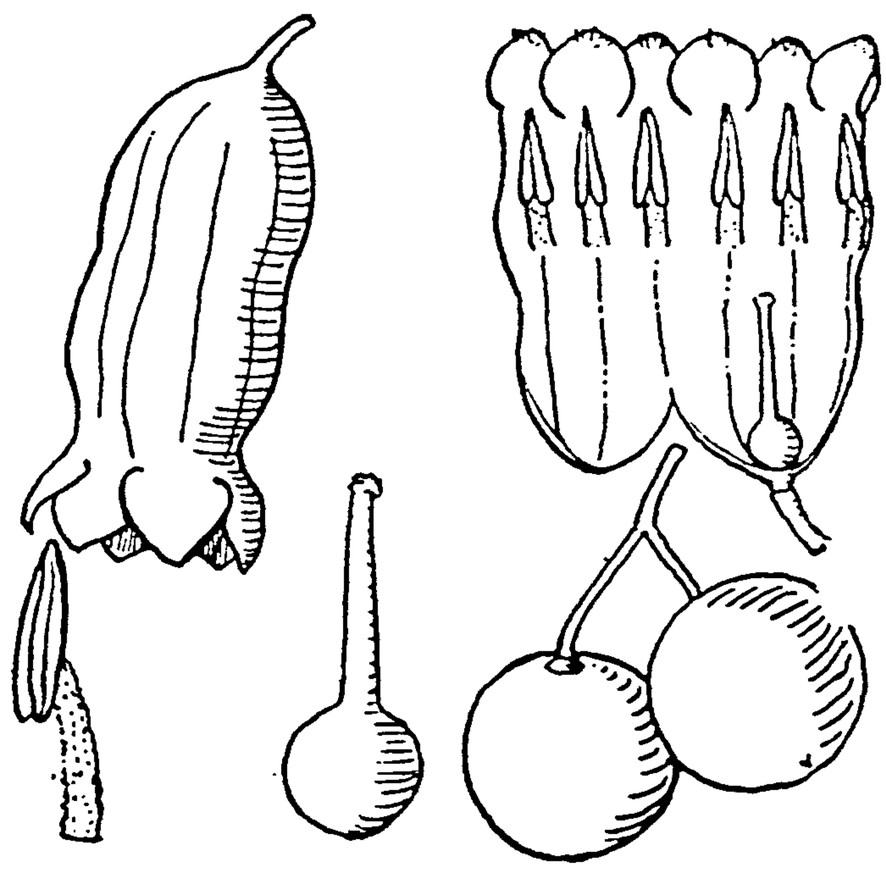
1. O. puberula (Michx.) Small. Stem 1–5 dm. tall: leaf-blades elliptic, elliptic or oval, 3–8 cm. long, thick: sepals and petals 2–2.5 cm. long, nearly linear: capsule elliptic or oval-ovate, 2–2.5 cm. long. [*Uvularia puberula* Michx.]—Woods, Piedmont to Appalachian provinces, Ga. and Ala. to W. Va. and Va.

2. O. sessilifolia (L.) Small. Stem 1–4 dm. tall: leaf-blades elliptic, 3–8 cm. long, thin: sepals and petals 1.5–2 cm. long, nearly linear: capsule oval, 1.5–2.3 cm. long. [*Uvularia sessilifolia* L.]—Thickets moist woods, and banks, various provinces, Ga. to Ark., Minn., and N. B.—Spr.

3. O. floridana (Chapm.) Small. Stem 1–4 dm. tall: leaf-blades mainly elliptic, 3–8 cm. long, thinnish: sepals and petals narrowly linear and attenuate, 2–3 cm. long: capsule rhombic-oval, 2.5–3 cm. long, including the beak. [*Uvularia floridana* Chapm.]—Woods, Coastal Plain, N Fla., Ala., and Ga.

11. POLYGONATUM [Tourn.] Mill. Herbs with jointed rootstocks and simple stems. Leaves spreading: blades sessile. Flowers 1 or few terminating axillary peduncles, drooping. Perianth white or greenish: lobes erect or nearly so. Filaments adnate to the middle of the perianth-tube or above it. Berry globular, blue or nearly black. Seeds flattened. [*Salomonia* Heist.]—About 20 species, natives of the north temperate zone.—Spr.—SOLOMON'S-SEALS.

Filaments rough, adnate to the perianth-tube for about ¾ its length. 1. *P. biflorum.*
Filaments smooth, adnate to the perianth-tube for about ½ its length. 2. *P. commutatum.*

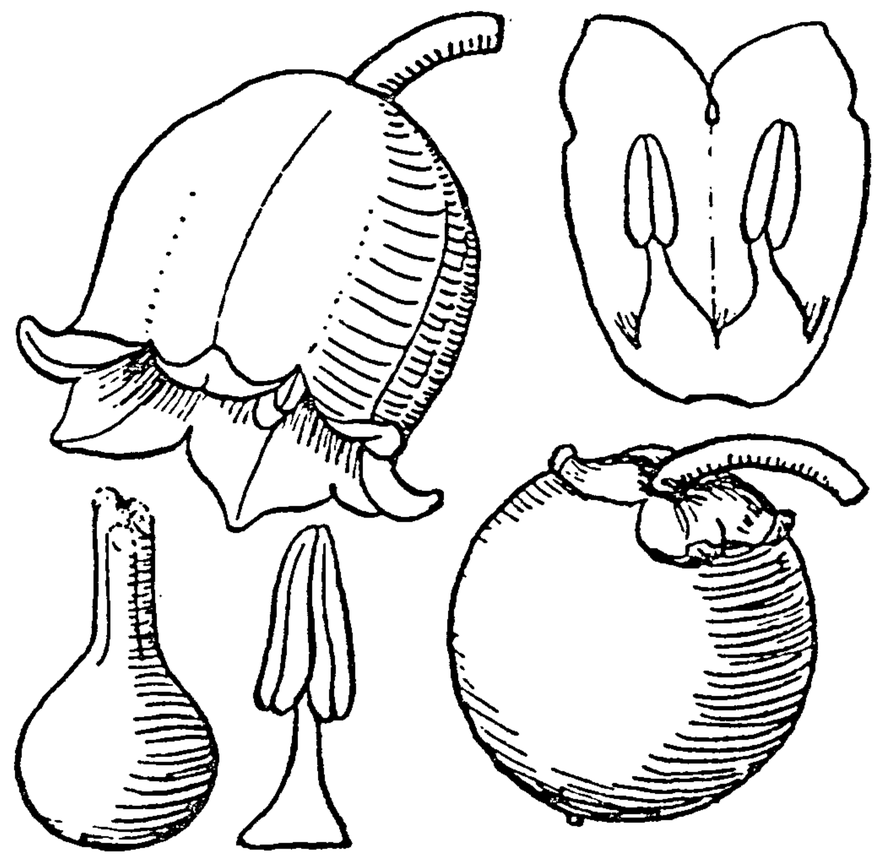


1. P. biflorum (Walt.) Ell. Stem 2–9 dm. tall: leaf-blades oval, elliptic, or elliptic-lanceolate, 4–10 cm. long, pubescent beneath: pedicels commonly 2-flowered: perianth 8–12 mm. long: berry 6–8 mm. in diameter.—Moist woods and banks, various provinces, Fla. to Tex., Kans., Ont., and N. B.

2. P. commutatum (R. & S.) Dietr. Stem 3–25 dm. tall: leaf-blades elliptic, elliptic-lanceolate, oval, or oval-ovate, 5–15 cm. long, glabrous: pedicels usually more than 2-flowered: perianth 10–20 mm. long: berry 8–12 mm. in diameter.—(KING-SOLOMON'S SEAL.)—Rich soil, especially near streams, various provinces, Ga. to La., Utah, Man., Ont., and N. H.

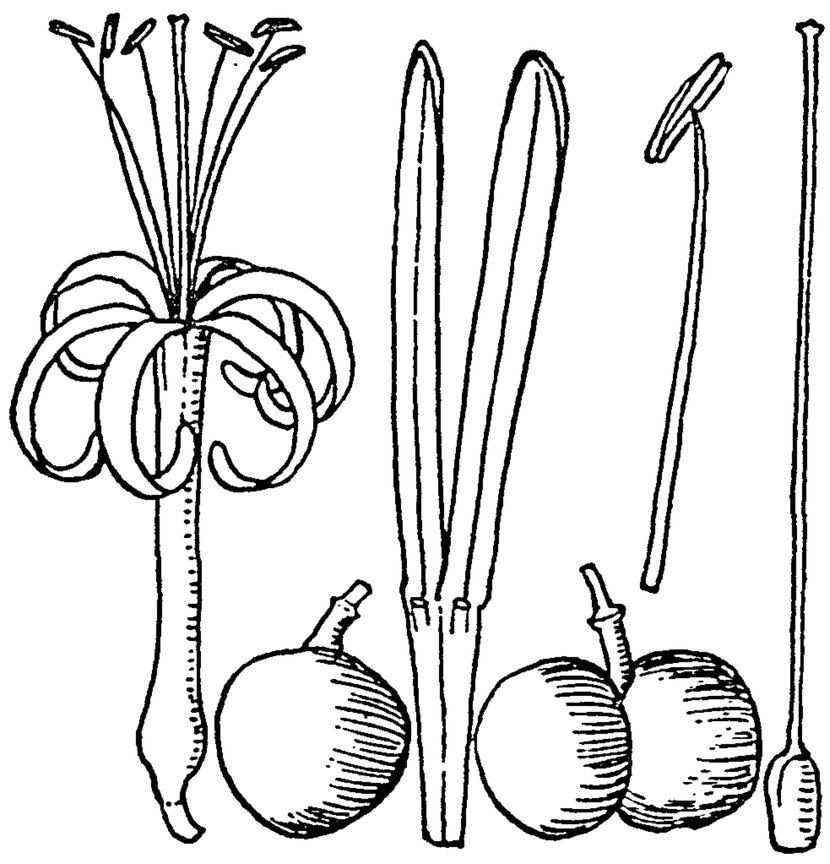
12. **CONVALLARIA** L. Herbs with slender rootstocks and simple scapes. Leaves erect; blades sheathing at the base. Flowers nodding in a 1-sided raceme. Perianth white: lobes recurved. Filaments adnate to the lower part of the perianth-tube. Berry globular. Seed rounded.—One species.

1. **C. majalis** L. Leaves 2 or 3 together; blades elliptic, 1–3 dm. long: scape 1.5–4 dm. tall: perianth 5–7 mm. long: berry 1 cm. in diameter or less, red: seeds 3–4 mm. in diameter.—(LILY-OF-THE-VALLEY.)—Woods, often in acid soil, Blue Ridge and Appalachian provinces, S. C. to Tenn., W. Va., and Va.—Spr. —The native plant of the southern Appalachian mountains appears to be almost identical with the European one, which is much cultivated and sometimes escapes. The native American plant usually has a shorter inflorescence, and has larger bracts and an oblate seed. Like the European plant it also prefers a rather acid soil. The flowers are very fragrant.



13. **CORDYLINE** Adans. Succulent herbs with stout rootstocks. Leaves erect, flat or nearly terete. Flowers in narrow panicles, erect or ascending. Perianth white or greenish: lobes narrow, about as long as the cylindric tube. Capsule membranous. Seeds baccate. [*Sansevieria* Thunb.]—About 25 species, natives of Asia and Africa.

1. **C. guineensis** (L.) Britton. Leaves 4–10 dm. tall, usually mottled: panicle many-flowered: perianth-lobes linear or linear-spatulate, 14–18 mm. long, curled back. [*S. guineensis* Willd.]—(AFRICAN BOWSTRING-HEMP.) — Pinelands, hammocks, and cult. grounds, S Fla. and the Keys. Nat. of Africa, and cult.—(*W. I.*)—Vigorously growing rootstocks often establish this plant about gardens. However, it is frequently met with in localities remote from gardens. The leaves and the feathery panicles arise from the ground often separately. The leaves furnish a strong fiber.

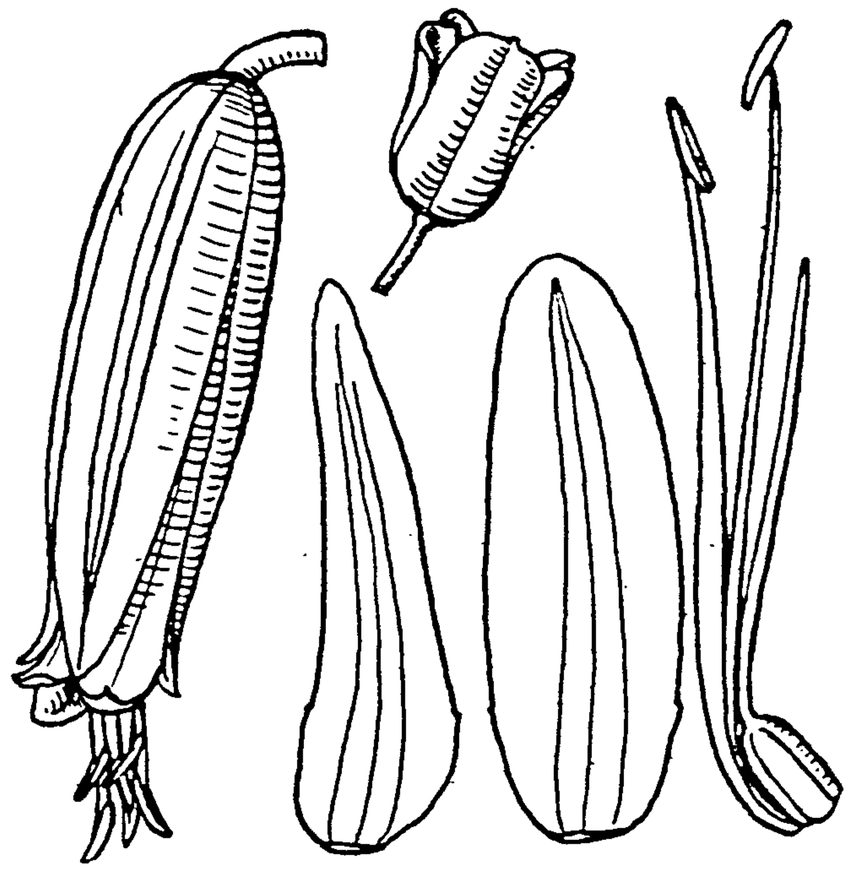


FAMILY 7. **ALOACEAE** — ALOE FAMILY

Coarse succulent or partly woody plants with horizontal rootstocks and short caudices terminating in erect flowering stems. Leaves alternate, crowded on the caudex, erect or spreading, the blades usually closely sessile, entire or spring-toothed. Flowers in a terminal raceme or panicle. Calyx of 3 elongate sepals which together with the 3 nearly similar petals are united into a campanulate or tubular perianth, the lobes erect or slightly spreading. Androecium of 6 stamens with slender elongate free filaments. Gynoecium superior, of 3 united carpels. Style slender, elongate. Fruit

a loculicidal capsule or sometimes baccate.—Four or five genera and 180 species, natives of the Old World.

1. **ALOE** L. Succulent, or partly shrubby or arborescent plants, with simple or branched caudices. Leaves succulent, often crowded, sometimes distichous: blades entire or spiny-toothed. Flower-stalk terminating in a dense raceme, the flowers mostly nodding. Perianth mostly red or yellow. Sepals and petals partially united. Filaments free: anthers much shorter than the filaments. Ovules numerous in each ovary-cavity. Capsule somewhat elongate. —About 75 species, mostly natives of Africa.—ALOES.



1. A. vera L. Leaves clustered at the base of the flowering stem and ultimately raised with the caudex, sessile; blades lanceolate, sometimes narrowly so, 2–5 dm. long, glaucous, curved, the marginal spines mostly 1–1.5 cm. apart: flowering stem with broad scales: raceme strict: flowers nodding, imbricately crowded: perianth 27–33 mm. long: calyx-lobes and corolla-lobes broadly linear to linear-lanceolate, obtuse, longer than the tube.—(BITTER-ALOE. BARBADOES-ALOE. BAMBOO.)—Sandy fields and rocky soil, Florida Keys and S Tex. Nat. of Medit. region.—(*W. I.*)—Colonies of this succulent are very persistent on account of the plant's great vitality. Its abundance on one of the Florida Keys has led to the naming of the island Bamboo Key. Used in medicine.

FAMILY 8. **DRACAENACEAE** — YUCCA FAMILY

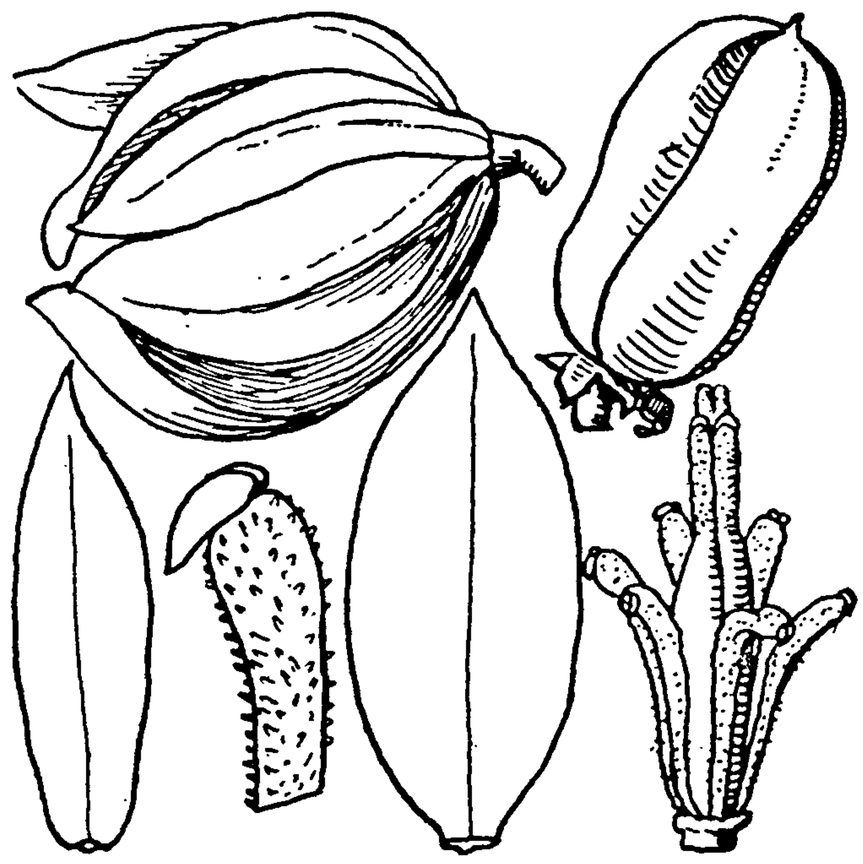
Shrubby plants or trees, with woody, generally copiously leafy, caudices. Leaves alternate: blades narrow, firm or rigid, sometimes filiferous on the margins. Flowers in racemes or panicles, terminating scape-like stems. Calyx of 3 generally white or greenish sepals. Corolla of 3 petals nearly similar to the sepals. Androecium of 6 stamens. Gynoecium superior, of 3 united carpels. Style stout, sometimes obsolete during anthesis. Fruit a primarily loculicidal capsule, sometimes indehiscent or baccate.—Four genera and about 50 species, most abundant in Mex. and Cent. Am.

Anthers sagittate: ovary elongate: capsule not 3-winged: seeds flattened, many in each cavity of the capsule. 1. YUCCA.
Anthers cordate: ovary globular: capsule 3-winged: seeds thick, solitary or few in each cavity. 2. NOLINA.

1. **YUCCA** [Rupp.] L. Caudex commonly leafy throughout. Flowers perfect, relatively large, in panicles or racemes. Sepals and petals several-veined, deciduous. Ovules numerous. Capsule dehiscent, or baccate. Seeds black.—About 18 species, natives of North America.—BEAR-GRASSES. ADAM'S-NEEDLES. YUCCAS.

Fruit an erect, dry, dehiscent capsule.
  Leaf-blades short-attenuate, abruptly pointed, or rounded at the apex; marginal fibers curly: capsule evenly narrowed to the apex.
    Leaf-blades of a linear type, somewhat narrowed toward both ends, attenuate to the slender apical spine, flat. 1. *Y. filamentosa.*
    Leaf-blades spatulate, abruptly narrowed or rounded and concave at the base of the stout apical spine. 2. *Y. concavo.*
  Leaves long-attenuate; marginal fibers straight: capsules truncately narrowed at the apex, the carpels uneven or angulate. 3. *Y. flaccida.*
Fruit a drooping (erect in *Y. recurvifolia*), pulpy, indehiscent, berry-like capsule.
  Seed thin, margined: endosperm even.
    Leaves rigid, stiffly erect or spreading: capsule 6-ribbed: seeds shining. 4. *Y. gloriosa.*
    Leaves pliable, recurving: capsule 6-winged: seeds dull. 5. *Y. recurvifolia.*
  Seed turgid, marginless: endosperm ruminated. 6. *Y. aloifolia.*

1. Y. filamentosa L. Caudex short: leaves firm, 3–6 dm. long, erect and spreading; blades gradually narrowed toward both ends, the terminal spine rather long and slender, the marginal fibers rather short: flowering stalk 1.5–4 m. tall: panicle-branches glabrous: sepals lanceolate to narrowly ovate: petals broadly ovate, 4–5 cm. long: capsule ellipsoid, 5–6 cm. long: seeds decidedly elongate, sometimes angulate.—(BEAR-GRASS. ADAM'S-NEEDLE. CURLY-HAIR. YUCCA.)—Bluffs, sandhills, old-fields, and other habitats protected from fire, Coastal Plain and adj. provinces, Fla. to Miss., Tenn., and N. C.; escaping further N.



2. Y. concava Haw. Caudex short or slightly elongate: leaves very firm, mostly 4–11 dm. long, erect or ascending; blades spatulate, somewhat plicate, concave, the terminal spine short and stout, the marginal fibers long: flowering stalk 2–5 m. tall: panicle-branches glabrous, at least at maturity: perianth similar to that of *Y. filamentosa,* but the sepals and petals usually broader: capsule ellipsoid or somewhat cylindric, 4–5 cm. long: seeds nearly circular.—(SPOON-LEAF YUCCA.)—Sand-dunes and sandy open woods, Coastal Plain, Ga. to Del.

3. Y. flaccida Haw. Similar to *Y. filamentosa,* but less rigid: leaves pliable, with straight fibers, the outer ones recurved: panicle-branches pubescent: capsule 6–7 cm. long: seeds dull, 8–10 mm. long.—(WEAK-LEAF YUCCA.)—Dry or stony soil, Blue Ridge and Appalachian provinces, Ala. to N. C.

4. Y. gloriosa L. Caudex becoming 5 m. tall, sometimes branched: leaves very numerous, firm, 3–5 dm. long, spreading: panicle long-stalked: sepals and petals 4–5 cm. long: capsule nodding, leathery, 5–6 cm. long, indehiscent: seeds lustrous, 6–7 mm. long.—(SPANISH BAYONET. MOUND-LILY YUCCA.)—Dunes, Coastal Plain, Fla. to N. C.; reported from Miss.

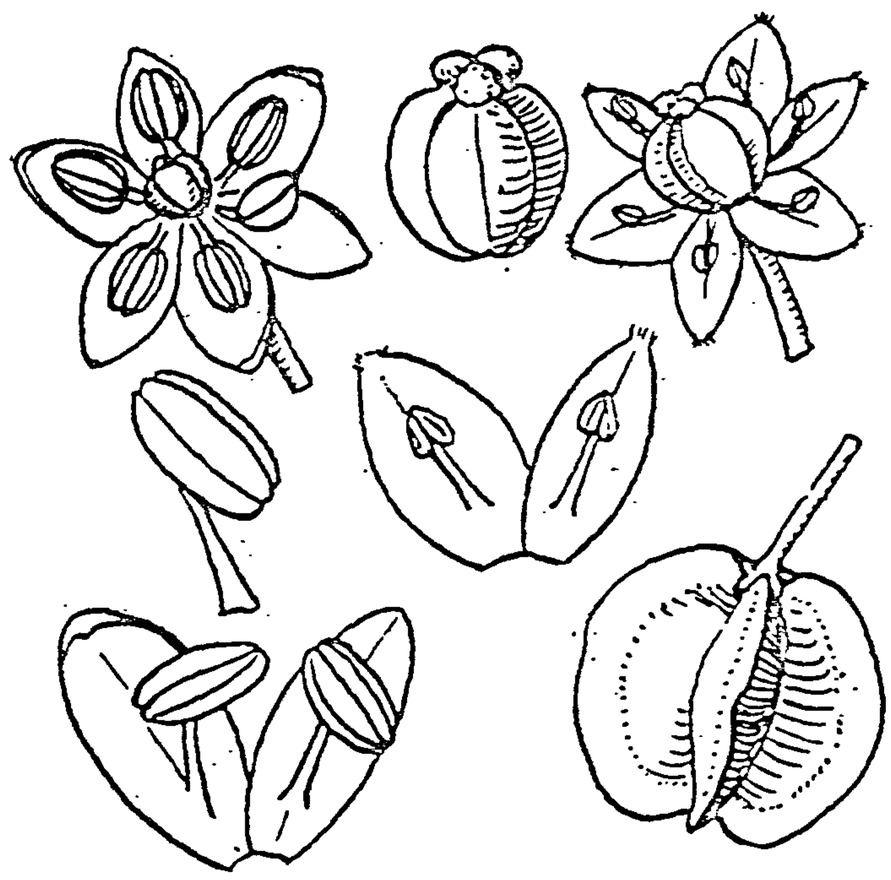
5. Y. recurvifolia Salisb. Caudex commonly 1–2 m. tall, branched: leaves numerous, eventually smooth-margined, recurved: panicle but slightly raised above the leaves: capsule erect, 5–7 cm. long, indehiscent, the 6 ribs winged: seeds dull, 7–8 mm. long.—(CURVE-LEAF YUCCA.)—Dunes, Coastal Plain, Ga. to La.

6. **Y. aloifolia** L. Caudex often 1–2.5 m. tall, commonly branched: leaves very numerous, spreading above, deflexed and deciduous below, scabrous-margined: panicle ample and showy, 3–7 dm. long: sepals and petals 4–6 cm. long: capsule 7–9 cm. long.—(SPANISH-DAGGER.)—Sand-dunes and shell-mounds, Coastal Plain, Fla. to La. and N. C.—(*W. I.*)—Cultivated and escaping in provinces beyond its natural range. The fiber from the leaves of this, and of other species of yucca, have been used by pioneers to make ropes, and for string for hanging up cured meats.

2. **NOLINA** Michx. Caudex short, the greatly elongate entire or serrulate leaves spreading on the ground. Flowers polygamo-dioecious, in a virgate or branching panicle. Sepals and petals 1-veined, entire, marcescent. Ovules 2 in each cavity. Capsule broader than long or as broad as long. Seeds pale.—About 12 species, natives of North America.—Spr.

Ovary rounded at the apex: capsule not notched, at least at the base.
  Capsule symmetrical, 8–10 mm. wide: seeds loosely invested by the capsule. 1. *N. georgiana.*
  Capsule unsymmetrical, 3–4 mm. wide: seeds closely invested by the capsule. 2. *N. atopocarpa.*
Ovary depressed at the apex: capsule conspicuously notched at both ends. 3. *N. Brittoniana.*

1. **N. georgiana** Michx. Plant 5–15 dm. tall: blades of the basal leaves 3–5 mm. wide: sepals and petals mostly oblong, about 3 mm. long: anthers mostly oblong: capsule sharply 3-lobed.—Pinelands and sandhills, Coastal Plain, Fla. to S. C.



2. **N. atopocarpa** Bartlett. Plant 8–15 dm. tall: blades of the basal leaves 2–4 mm. wide: sepals and petals mostly oval, about 3 mm. long: anthers mostly globular: capsule obtusely 3-lobed.—Pinelands, E pen. Fla.

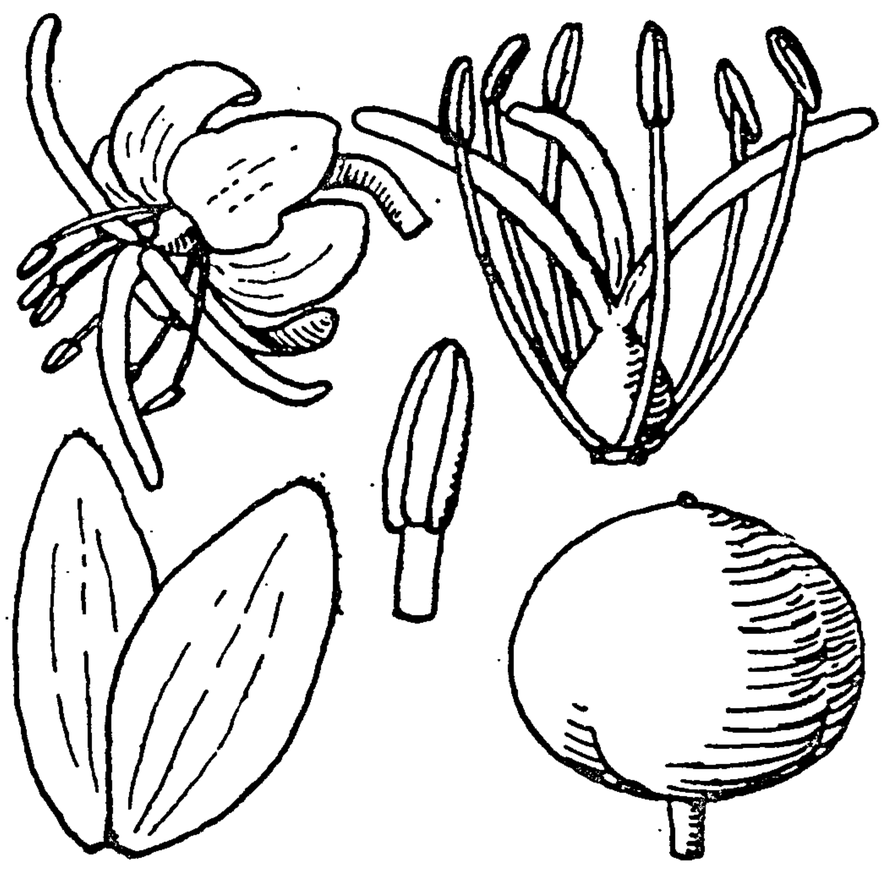
3. **N. Brittoniana** Nash. Plant 10–20 dm. tall: leaf-blades 6–13 mm. wide: panicle with erect or strongly ascending branches: sepals and petals conspicuously glandular at the apex: capsule 9–12 mm. wide, the walls opaque.—Dry pinelands, pen. Fla.

FAMILY 9. TRILLIACEAE —WAKE-ROBIN FAMILY

Perennial herbs with rootstocks. Leaves in a whorl on the stem, or basal and wanting on the mature plant: blades broad. Bracts leaf-like in a whorl at the top of the scape or peduncle. Flowers perfect, solitary or in a terminal cluster. Calyx of 3 sepals. Corolla of 3 petals more or less different from the sepals. Androecium of 6 stamens. Gynoecium of 3 united carpels. Stigmas 3. Ovules several in each ovary-cavity. Fruit baccate.—Four genera and 34 species, natives of the north temperate zone.

Flowers several in an umbel-like cluster: sepals and petals nearly alike: flowering stem with a whorl of leaves and a whorl of bracts. 1. MEDEOLA.
Flowers solitary: sepals and petals very different: flowering stem (scape) with only a whorl of leaf-like bracts. 2. TRILLIUM.

1. **MEDEOLA** [Gronov.] L. Caulescent herbs, with long brittle rootstocks. Leaves and bracts with thinnish blades. Pedicels slender, more or less declined. Anthers shorter than the filaments. Stigmas crimson.—One species.



1. **M. virginiana** L. Stem 2–9 dm. tall: leaves 4–10; blades elliptic, spatulate, or obovate, 5–15 cm. long: bracts smaller than the leaves: sepals and petals greenish, 9–11 cm. long: berry spheroidal, 8–15 mm. thick, dark-purple.—(INDIAN CUCUMBER-ROOT. CUSHAT-LILY.) — Moist woods, various provinces, Fla to La., Minn., and N. S.—Spr.—The white tuber-like root-stock tastes like cucumbers or raw potatoes.

2. **TRILLIUM** L.[1] Scapose herbs with firm corm-like rootstocks. Leaves and bracts with thick blades. Pedicel stout, or solitary flower sessile. Corolla white or of various colors. Anthers usually longer than the filaments. About 25 species, of North America and eastern Asia.—Spr.—WAKE-ROBINS. BIRTH-ROOTS.

Flower sessile.
  Petals with claw-like bases which are sometimes different in coloring from the blades. — I. RECURVATA.
  Petals not narrowed into claw-like blades, normally of one color throughout. — II. SESSILES.
Flower pedicelled (sessile in a form of *T. pusillum*).
  Stigmas sessile, distinct: style wanting. — III. ERECTA.
  Stigmas terminating a short style. — VI. PUSILLA.

I. RECURVATA

Bracts narrowed into petiole-like bases: petals with ovate, elliptic, oval or obovate blades. — 1. *T. recurvatum.*
Bracts not narrowed at the base: petals with linear or linear-elliptic blades.
  Scape smooth and glabrous.
    Bracts with lanceolate or elliptic blades: anthers curved: filaments nearly as long as the anthers. — 2. *T. lanceolatum.*
    Bracts with ovate blades: anthers straight: filaments much shorter than the anthers. — 3. *T. ludovicianum.*
  Scape rough-pubescent near the top (sometimes glabrous at maturity). — 4. *T. viride.*

II. SESSILES

Petals broadly spatulate, one of them prominently apiculate: anthers less than 1 cm. long. — 5. *T. discolor.*
Petals linear, lanceolate, elliptic, or oblanceolate: anthers more than 1 cm. long.
  Scape rough-pubescent near the top: bracts pubescent on the veins beneath.
    Scape erect: bracts raised above the ground: petals 2–3 cm. long: anther-sacs 15–18 mm. long, the connective not much prolonged. — 6. *T. stamineum.*
    Scape decumbent: bracts lying flat on the ground: petals 4–7 cm. long: anther-sacs 8–10 mm. long, the connective much prolonged. — 7. *T. decumbens.*
  Scape and bracts smooth and glabrous.
    Bracts typically 8 cm. long or less: sepals 2–3.5 cm. long. — 8. *T. sessile.*
    Bracts typically 10 cm. long or more: sepals 4.5–5.5 cm. long.

[1] Prepared in part from the studies of Donald Culross Peattie.

Bracts much longer than wide, often twice as long: filaments less than 2 mm. long. 9. *T. Underwoodii.*
Bracts nearly or quite as wide as long: filaments more than 2 mm. long. 10. *T. Hugeri.*

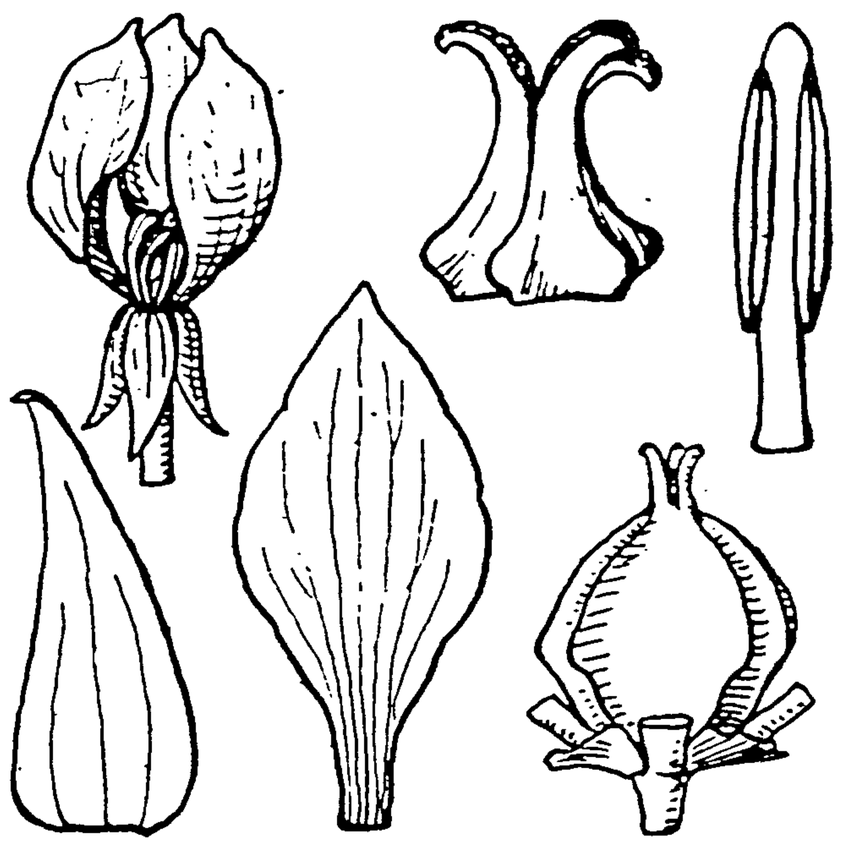
III. Erecta

Bracts not narrowed into petiole-like bases: ovary 6-angled.
Stigmas decidedly curved: petals slightly longer than the sepals.
Petals not recurved, spreading or erect-spreading.
Stamens shorter than the stigmas, or barely exceeding them: filaments stout, much shorter than the anthers: flowers often rather ill-scented. 11. *T. erectum.*
Stamens decidedly longer than the stigmas: filaments slender, as long as the anthers or nearly so: flowers often sweet-scented.
Filaments 8–12 mm. long, as long as the anthers; connective purple: bracts long-acuminate. 12. *T. Vaseyi.*
Filaments 4–6 mm. long, shorter than the anthers; connective yellow: bracts short-acuminate. 13. *T. simile.*
Petals recurved.
Flower short-pedicelled: pedicel 0.5–2.5 cm. long: filaments two-thirds as long as the anther or longer: anther 2.5–4.5 mm. long. 14. *T. cernuum.*
Flower long-pedicelled: pedicel 3–12 cm. long: filament ½ as long as the anther or less: anther 6–15 mm. long. 15. *T. declinatum.*
Stigmas straight or nearly so: petals much longer than the sepals. 16. *T. grandiflorum.*
Bracts narrowed into petiole-like bases: ovary 3-lobed. 17. *T. undulatum.*

IV. Pusilla

Flower on an erect pedicel or rarely sessile: stamens straight: filaments about half as long as the anthers. 18. *T. pusillum.*
Flower on a nodding pedicel: stamens curved: filaments fully as long as the anthers. 19. *T. Catesbaei.*

1. T. recurvatum Beck. Scape 1–4 dm. tall, glabrous: bracts 5–9 cm. long; blades ovate-lanceolate, oval or suborbicular, often mottled, longer than the petiole-like bases: sepals lanceolate, 2–3 cm. long, acute: petals purple, the blades ovate, obovate or elliptic, about twice longer than the claws: anthers 9–12 mm. long.—Woods, Gulf Coastal Plain and Interior provinces, Miss. to Ark., Minn., and Ohio.



2. T. lanceolatum Boykin. Scape 1–4 dm. tall, glabrous: bracts 7–9 cm. long; blades lanceolate to elliptic, sessile, green: sepals linear or linear-lanceolate, green: petals greenish, the blades linear or linear-oblong, about ½ as long as the claws: anthers 6–8 mm. long.—Moist woodlands and river bluffs, Coastal Plain and adj. provinces, W Fla. to La., Tenn., and Ga.

3. T. ludovicianum Harbison. Scape 0.8–2 dm. tall, glabrous: bracts 5–8 cm. long; blades ovate to broadly ovate, mottled: sepals lanceolate to broadly lanceolate, purplish at the base: petals purple or greenish above the purple base, the blades linear or linear-lanceolate: anthers 8–12 mm. long.—Rich woods, Coastal Plain, Fla. to La.

4. T. viride Beck. Scape 1–2 dm. tall, pubescent near the top, but often becoming glabrous at maturity: bracts 5–11 cm. long; blades oblong to ovate, or rarely suborbicular, deep-green, often mottled: sepals linear to linear-lanceolate, 2–4 cm. long: petals green or purplish green, the blades linear or linear-elliptic, longer than the claws: anthers 15–20 mm. long.—(WOOD-TRILLIUM.)—Woods, various provinces, Ala. to Miss., Kans., and SW Va.

5. T. discolor Wray. Scape 1–3 dm. tall, glabrous: bracts 4–13 cm. long; blades oval or oval-ovate, mottled: sepals oblong to oblong-lanceolate: petals broadly spatulate, greenish: anthers 9–13 mm. long.—Woods, various provinces, Ga. to N. C.

6. T. stamineum Harbison. Scape 1–3 dm. tall, pubescent near the top: bracts 5–8 cm. long; blades ovate-lanceolate to broadly ovate, mottled, somewhat pubescent on the veins beneath: sepals broadly lanceolate to elliptic: petals lanceolate, dark purple: anthers 15–18 mm. long.—Rocky woods, various provinces, rarely Coastal Plain, Ga. to Miss.

7. T. decumbens Harbison. Scape 0.4–1 dm. tall, pubescent near the top: bracts 4–8 cm. long; blades broadly ovate to suborbicular, mottled, pubescent on the veins beneath: sepals lanceolate: petals linear or linear-lanceolate, purple: anthers 9–11 mm. long.—Rocky woods, Appalachian provinces, Ala.

8. T. sessile L. Scape 1–2 dm. tall: bracts 4–8 cm. long; blades oval to suborbicular, often mottled: sepals lanceolate: petals narrowly elliptic, maroon: anthers 10–12 mm. long.—(TOAD-SHADE.)—Rich woods, various provinces, Ga. to Miss., Minn., and N. Y.—Instead of maroon-colored petals, some plants have greenish-yellow ones. This form possibly represents what Muhlenberg named *T. luteum.* The flowers have a penetrating scent resembling that of the sweet-shrub (*Calycanthus*).

9. T. Underwoodii Small. Scape 1–3 dm. tall: bracts 10–18 cm. long; blades lanceolate to ovate-lanceolate or broadly ovate, lustrous and with 3 shades of green above: sepals lanceolate, 4.5–5.5 cm. long: petals lanceolate, elliptic or oblanceolate, maroon: anthers 10–15 mm. long. [*T. rectistamineum* (Gates) St. John]—Woods and pastures, Coastal Plain and adj. provinces, Fla. to Ala., Ark., and N. C.

10. T. Hugeri Small. Scape 1–2.5 dm. tall: bracts 10–14 cm. long; blades suborbicular to broadly ovate, green, mottled: sepals oblong to oblong-lanceolate, 4–5.5 cm. long: petals elliptic-lanceolate to spatulate, dark-maroon or brown: anthers 10–20 mm. long.—(WHIPPOORWILL-FLOWER.)—Rich woods, various provinces, Fla. to Miss., Tenn., and N. C.—The typical maroon or brown of the petals sometimes gives way to yellow or green. Several forms in these paler colors—petals broad or petals narrow—have been proposed. *T. luteum* (Fl. SE. U. S.) is such a color form. Flowers scented as in *T. sessile.*

11. T. erectum L. Scape 3–6 dm. tall: bracts 8–18 cm. long; blades rhombic, often broader than long: pedicel 3–10 cm. long, erect to horizontal: sepals oblong or lanceolate, 2–3.5 cm. long: petals lanceolate or ovate-lanceolate, maroon or brown-purple varying to yellow, white or white blotched with purple: anthers 5–9 mm. long: berry purplish-red. [*T. album* (Fl. SE. U. S.), *T. Rugelii* Britt. & Rendle]—(BROWN-BETH. STINKING-WILLIE.)—Rich woods, various provinces, N of Coastal Plain, Ga. to Ala., Man., Ont., and N. S.—Perhaps the most variable of our trilliums. Foliage and floral variations have furnished the basis for the segregation of several forms.

12. T. Vaseyi Harbison. Scape 3–6 dm. tall: bracts 10–20 cm. long; blades oval to broadly rhombic, slightly acuminate: pedicel 4–8 cm. long, declined or nearly horizontal: sepals lanceolate, 4–6 cm. long, acuminate: petals crimson or purple brown, ovate to orbicular-ovate: anthers 8–12 mm. long; connectives purple.—(SWEET-BETH. SWEET-TRILLIUM.)—Woods or slopes, Blue Ridge and Appalachian provinces, Ga. to Tenn. and N. C.—Lack of color in the petals or scant color results in white- or yellow-flowered forms.

13. T. simile Gleason. Similar to *T. Vaseyi,* but bracts usually larger, 10–18 cm. long and broad, broadly obrhombic, very short-acuminate: pedicel 3–7 cm. long, erect, but flower horizontal: sepals lanceolate to ovate-lanceolate, 2.5–3.5 cm. long: petals creamy or white, 3–6 cm. long, broadly ovate or rhombic-ovate, obtuse or acutish: anthers 10–12 mm. long, wholly yellow.—Woods, Piedmont and adj. Blue Ridge, Ga. and N. C.—The plants are rare and local. The flowers are deliciously fragrant.

14. T. cernuum L. Scape 2–6 dm. tall: bracts 6–12 cm. long; blades sometimes decidedly wider than long: petals white, elliptic-lanceolate to ovate, 1.5–2.5 cm. long: anthers 2.5–6.5 mm. long: seed about 2 mm. long.—Rich woods, various provinces, in Coastal Plain only N, Ga. to Ala., Mo., Man., and Newf.

15. T. declinatum (A. Gray) Gleason. Scape 2–4.5 dm. tall: bracts 8–17 cm. long; blades broadly rhombic, often decidedly contracted at the base: petals white, elliptic-lanceolate to ovate, 2–5 cm. long: anthers 6–15 mm. long: seed about 3 mm. long.—Alluvial bottom lands, Interior Low Plateau and more N provinces, Tenn. to Mo., Minn., and C N. Y. In some colonies the petals are pink, purplish, or maroon.

16. T. grandiflorum (Michx.) Salisb. Scape 2–5 dm. tall: bracts 6–14 cm. long; blades oval or rhombic-oval, acuminate: pedicel 5–8 cm. long, erect or nearly so: sepals lanceolate, 2.5–5 cm. long, acute: petals oblanceolate or obovate-lanceolate, white or pink, or later rose, or rarely green or white with green stripes, crisped: berry erect, 2–2.5 cm. thick.—(WHITE WAKE-ROBIN.)—Rich woods, various provinces, rarely Coastal Plain, N. C. to Ark., Minn., Que., and Vt.—The corolla of the typical plant unfolds white and later turns pink. In some forms it is pink from the beginning or more rarely green or white with green stripes. Occasionally the petals are spirally overlapped. Colonies sometimes have bracts with petiole-like bases.

17. T. undulatum Willd. Scape 2–5 dm. tall: bracts 6–20 cm. long; blades ovate, longer than the petiole-like bases: pedicel erect, 2–6 cm. long: sepals lanceolate to oblong-lanceolate, 1.5–2.5 cm. long: petals white striped with pink, oblong to oval, varying to obovate: berry ellipsoid to ovoid-ellipsoid, erect, bright-red. [*T. erythrocarpum* Michx.].—(STRIPED WAKE-ROBIN. PAINTED-LADY. PAINTED-TRILLIUM.)—Damp woods and bogs, often in acid soil, Blue Ridge and more northern provinces, Ga. to Mo., Wis., and N. S.—The preference of this typically northern type of *Trillium* for acid soil distinguishes it from most of the other species of the genus.

18. T. pusillum Michx. Scape 1–2 dm. tall: bracts 3–4 cm. long; blades oblong to lanceolate, sessile: sepals lanceolate to oblong-lanceolate, about 1.5 cm. long, obtuse: petals white or pink, linear-oblong to lanceolate: anthers 5–6 mm. long.—Woods, Coastal Plain, S. C. to Va., and Ozark Plateau, Ark.

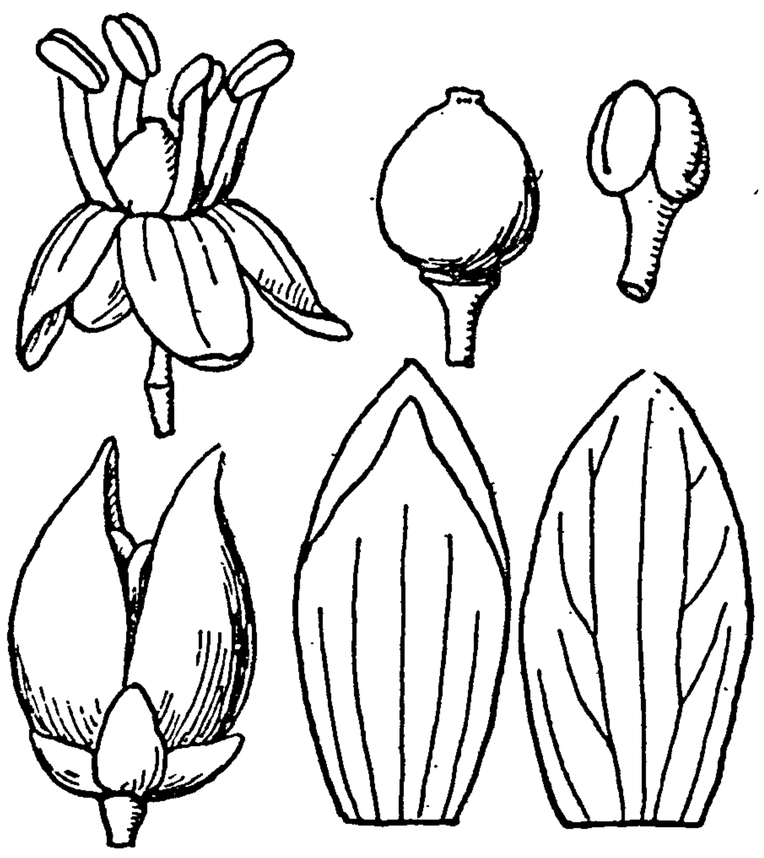
19. T. Catesbaei Ell. Scape 2–5 dm. tall, mottled above: bracts 5–15 cm. long; blades elliptic or oval: pedicel spreading or deflexed, 2–5 cm. long: sepals linear or linear-lanceolate, or sometimes spatulate-oblong, 2–4 cm. long, curled or reflexed: petals pink or sometimes rose, oblong to oblong-lanceolate,

obtuse or abruptly pointed, recurved: berry 1–1.5 cm. thick. [*T. stylosum* Nutt.]—(ROSY WAKE-ROBIN. BASHFUL WAKE-ROBIN.)—Woods, Piedmont and adj. provinces, Ga. to Ala. and N. C.

FAMILY 10. **ROXBURGHIACEAE** — ROXBURGHIA FAMILY

Perennial herbs or shrubs. Leaves alternate: blades with palmately parallel veins. Flowers perfect, in axillary racemes. Calyx of 2 sepals. Corolla of 2 petals. Androecium of 4 stamens. Gynoecium of 2 united carpels. Ovary 1-celled. Stigma sessile. Fruit capsular.—Three genera and 8 species, mostly natives of Asia.

1. CROOMIA Torr. Caulescent herbs with horizontal rootstocks. Leaves approximate near the top of the stem. Flowers nodding. Sepals and petals partially united. Capsule 2-valved.—Two species, the following and one in Japan.



1. C. pauciflora (Nutt.) Torr. Stems 1–4 dm. tall, simple: leaf-blades elliptic or elliptic-ovate, 5–15 cm. long, cordate at the base, petioled: sepals and petals greenish tinged with purple, especially at the base, 3–5 mm. long: filaments purple; anthers yellow: capsule ovoid, 3–6 mm. long.—(CROOMIA.)—Rich woods, mostly on river-bluffs, Coastal Plain and adj. provinces, N Fla. to Ala. and Ga.—Spr.

FAMILY 11. **SMILACACEAE** — SMILAX FAMILY

Perennial armed or unarmed vines or low herbs. Leaves alternate: blades ribbed, netted-veined, commonly persistent: petiole usually bearing a pair of appendages. Flowers dioecious, in axillary peduncled umbels. Perianth regular, usually green, that of the staminate flowers larger than that of the pistillate. Calyx of 3 sepals. Corolla of 3 petals. Androecium of 6 stamens. Anthers erect. Gynoecium 3-carpellary. Stigmas 3, sessile, sometimes elongate. Fruit a berry with 3 bands of strengthening tissue in the pulp connecting the base and apex.—Four genera and 250 species in tropical and temperate regions.

Stem annual, herbaceous, unarmed: ovules 2 in each carpel. 1. NEMEXIA.
Stem perennial, woody, usually prickly: ovule solitary in each carpel. 2. SMILAX.

1. NEMEXIA Raf. Stems erect or climbing, herbaceous, unarmed, annual. Leaf-blades membranous, broad, often ribbed. Flowers often carrion-scented. Perianth pale-green, or yellowish-green, the petals usually narrower than the sepals. Berries black or glaucous.—About 10 species, natives of North America.—Spr.—CARRION FLOWERS. DEAD-MAN'S BRYONYS.—The more common species are well known for their carrion-scented flowers.

Anthers shorter than the filaments: leaf-blades ovate, often cordate, not hastate-lobed. I. HERBACEAE.
Anthers about as long as the filaments: leaf-blades lanceolate or ovate-lanceolate, more or less hastate-lobed. II. TAMNIFOLIAE.

I. HERBACEAE

Mature leaf-blades green and shining beneath, decidedly acuminate: sepals and petals of the staminate flowers 4.5–5.5 mm. long: berry black. — 1. *N. pulverulenta.*

Mature leaf-blades pale beneath, abruptly pointed or short-acuminate: sepals and petals of the staminate flowers 4 mm. long or less, except in no. 5: berry glaucous.

Leaf-blades merely glaucous beneath: scales on the stem below the leaves appressed.

Mature stem with alternate separated leaves: leaf-blades acuminate: sepals and petals of the staminate flowers 3–3.5 mm. long: seeds 3–5 to a berry, 3.5–4 mm. long. — 2. *N. herbacea.*

Mature stem with leaves clustered near the top: leaf-blades abruptly pointed: sepals and petals of the staminate flowers 2.5–3.5 mm. long: seeds 2 to a berry, 4.5–5 mm. long. — 3. *N. biltmoreana.*

Leaf-blades pubescent or puberulent beneath: scales on the stem below the leaves more or less spreading.

Stem elongate, climbing, with numerous tendrils: peduncles axillary to leaves. — 4. *N. lasioneuron.*

Stem short, not climbing, the tendrils usually wanting: peduncles, at least in part, from the axils of scale-like bracts below the leaves.

Leaf-blades acuminate: sepals and petals of the staminate flowers 4–5 mm. long: berry with 3–5 seeds. — 5. *N. ecirrhata.*

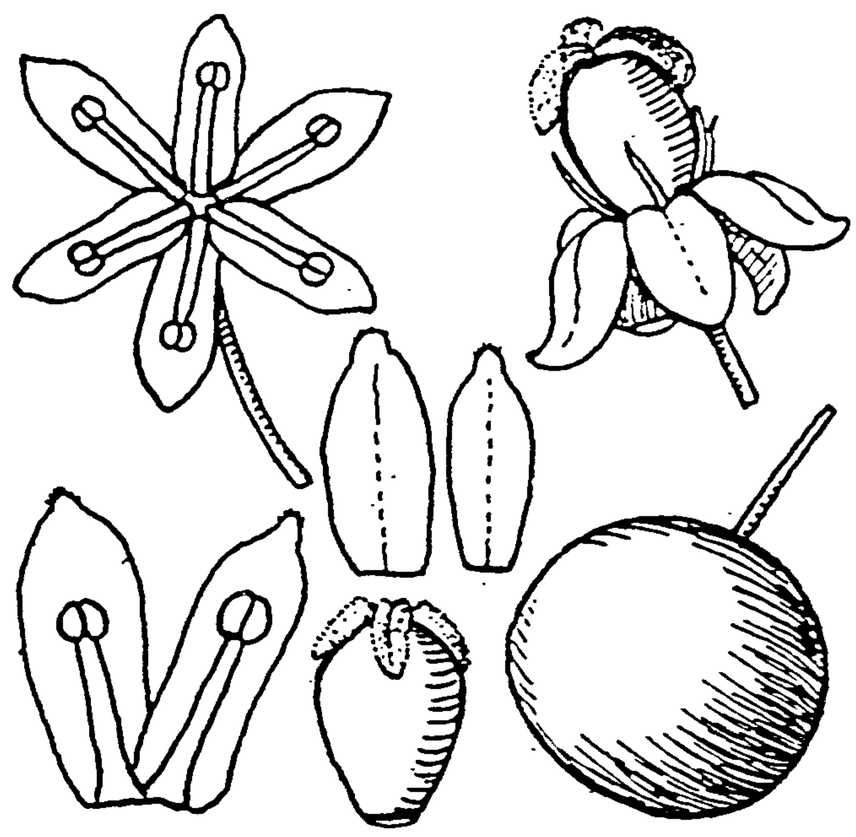
Leaf-blades acute to mucronate: sepals and petals of the flowers 2.5–3.5 mm. long: berry with 2 or 3 seeds. — 6. *N. Hugeri.*

II. TAMNIFOLIAE

Sepals and petals of the staminate flowers 4 mm. long: pedicels elongate, about 2 cm. long. — 7. *N. leptanthera.*

Sepals and petals of the staminate flowers about 3.5 mm. long: pedicels short, less than 1 cm. long. — 8. *N. tamnifolia.*

1. N. pulverulenta (Michx.) Small. Stem stout: leaf-blades ovate to elliptic-ovate, 8–15 cm. long, short-acuminate, usually 9-nerved, cordate at the base: sepals of the staminate flowers ovate, elliptic, or obovate, 4.5–5.5 mm. long; those of the pistillate flowers 3–3.5 mm. long: berry black, 8–10 mm. in diameter, with 3–5 seeds.—Rich woods, various provinces, rarely Coastal Plain, N. C. to Tenn., Mo., and S N. Y.



2. N. herbacea (L.) Small. Stem elongate: leaf-blades ovate, triangular-lanceolate or lanceolate, 4–8 cm. long, short-acuminate, 7–9-nerved, rounded or truncate at the base: sepals of the staminate flowers elliptic or nearly so, 3.5–4 mm. long; those of the pistillate 3–3.5 mm. long: berry 6–8 mm. in diameter. —Moist woodlands, stream-banks, thickets, and barrens, various provinces, Ala. to Nebr. and N. B.

3. N. biltmoreana Small. Stem 2.5–6 dm. tall: leaf-blades ovate, 6–12 cm. long: sepals of the staminate flowers elliptic, sometimes narrowly so, 2.5–3.5 mm. long: anthers ellipsoid: berry glaucous, 7–9 mm. long.—Hillsides and woods, Blue Ridge, and adj. provinces, S. C. and N. C.

4. N. lasioneuron (Hook.) Rydb. Stem 1–3 m. long or more: leaf-blades ovate or elliptic-ovate, or those subtending peduncles lanceolate, 3–5 cm. long, 3–7-ribbed, truncate or cordate at the base, often slightly twisted at the tip:

sepals of the staminate flowers elliptic, about 4 mm. long; those of the pistillate flowers ovate-elliptic, 2–2.5 mm. long: anthers linear-ellipsoid: berry 6–9 mm. in diameter. [*N. diversifolia* Small]—Moist soil, thickets, woods, and stream-banks, Blue Ridge and more northern provinces, Ga. to Ala., Colo., Wyo., and Ont.

5. **N. ecirrhata** (Engelm.) Small. Stem mostly 3–6 dm. tall, occasionally with tendrils: leaf-blades ovate to lanceolate-ovate, 8–12 cm. long, acuminate, paler beneath: sepals of the staminate flowers elliptic, 4–5 mm. long: anthers ellipsoid: berry purple-black, 9–11 mm. in diameter, with 3–5 seeds.—Woods, Blue Ridge and more northern provinces, Ala. to Mo., Ont., and N. C.

6. **N. Hugeri** Small. Stem 2–5 dm. tall: leaf-blades oblong-oval, 9–14 cm. long, obtuse or abruptly pointed at the apex: sepals of the staminate flowers elliptic, 2.5–3.5 mm. long: anthers ellipsoid: berry glaucous, 8–10 mm. in diameter.—Woods, various provinces, N Fla. to Ala. and N. C.

7. **N. leptanthera** (Pennell) Small. Stem elongate: leaf-blades triangular-ovate, 6–11 cm. long, 5–7-nerved, cordate at the base: sepals of the staminate flowers elliptic to linear-elliptic, about 4 mm. long: anthers narrowly linear, 1.5–2 mm. long. [*Smilax leptanthera* Pennell]—Woods, Piedmont, Ga.

8. **N. tamnifolia** (Michx.) Small. Stem elongate: leaf-blades hastate-ovate to hastate-lanceolate, 5–12 cm. long, 5–7-nerved, truncate or cordate at the base, the basal lobes rounded: sepals of the staminate flowers broadly elliptic, about 3 mm. long: anthers narrowly ellipsoid: berry 4–6 mm. in diameter.—Moist sandy soil near streams and acid marshy grounds, Coastal Plain and rarely adj. provinces, S. C. to Miss., Tenn., and N. Y.

1. **SMILAX** L. Stems usually greatly elongate, with very hard wood, and usually armed with prickles. Leaf-blades leathery, prominently ribbed. Flowers often fragrant. Perianth green. Berry red, blue, or black. Vigorous shoots often bear very large leaves.—About 220 species, most abundant in tropical America and Asia.—Spr.–sum.—GREENBRIERS. HORSEBRIERS.—The plants of some species are very vigorous and produce an almost impenetrable tangle of woody, often armed, stems. The large roots of some of our native species furnished a red flour to the aborigines, which was called *Conti Chatee*, meaning red flour-root. The roots of some exotic species are used in medicine under the name sarsaparilla.

Leaf-blades entire or lobed at the base, sometimes merely erose or with fine prickly edges: berry globular. (In *S. pumila* ovoid and red or orange.)
  Leaf-blades glabrous, sometimes merely hispidulous or prickly on the veins beneath: berry globular.
    Peduncles much longer than the petioles.
      Leaf-blades glaucous beneath: berry glaucous. — I. GLAUCAE.
      Leaf-blades green: berry not glaucous. — II. HISPIDAE.
    Peduncles about as long as the petioles or shorter.
      Stigmas 2 or 3: berry 2- or 3-seeded, maturing the first season: leaf-blades thin- or firm-coriaceous.
        Berry black.
          Leaf-blades not reticulate. — III. ROTUNDIFOLIAE.
          Leaf-blades reticulate. — IV. AURICULATAE.
        Berry red. — V. LANCEOLATAE.
      Stigma solitary: berry 1-seeded, maturing the second season: leaf-blades thick-coriaceous. — VI. LAURIFOLIAE.
  Leaf-blades woolly beneath: berry ovoid, red or orange. — VII. PUMILAE.
Leaf-blades sinuate, the teeth firm or shiny, or the thick edges sometimes entire: berry black, ovoid. — VIII. HAVANENSES.

I. GLAUCAE

Vine with terete or nearly terete branches, often armed with scattered prickles: foliage glaucous. — 1. *S. glauca.*

II. HISPIDAE

Leaf-blades thin-coriaceous, with the veins pale beneath. 2. *S. hispida.*
Leaf-blades firm-coriaceous, the veins not pale. 3. *S. Bona-Nox.*

III. ROTUNDIFOLIAE

Leaf-blades not lobed, smooth-margined and smooth on the veins beneath. 4. *S. rotundifolia.*

IV. AURICULATAE

Leaf-blades usually lobed, prominently veined. 5. *S. auriculata.*

V. LANCEOLATAE

Leaf-blades deep-green and shining above, paler beneath: peduncle terete: berry dull-red. 6. *S. lanceolata.*
Leaf-blade equally green on both sides: peduncle flattened: berry bright coral-red. 7. *S. Walteri.*

VI. LAURIFOLIAE

Very vigorous vine, with terete or 1-angled branches: berry green or whitish the first year, black the second year. 8. *S. laurifolia.*

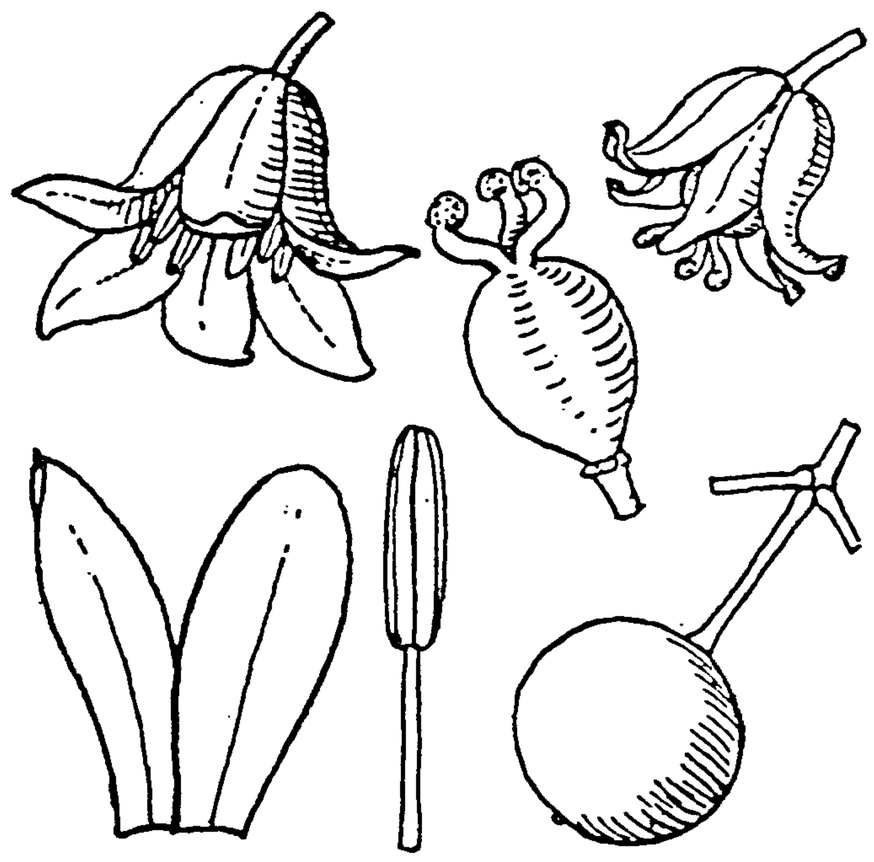
VII. PUMILAE

Soft-woody trailing or low-climbing unarmed vine, the leaves and fruits persistent, the stem pubescent like the leaves: berry 1-seeded. 9. *S. pumila.*

VIII. HAVANENSES

Rigid prickle-armed vine, with angled stems: leaf-blades with the thickened margins sinuate and spiny toothed or entire: berry jet-black. 10. *S. havanensis.*

1. S. glauca Walt. Stem and branches diffuse or widely climbing, terete or nearly so, often with few scattered prickles: leaf-blades ovate, usually broadly so, ranging to elliptic-ovate or orbicular-ovate, or, on vigorous shoots, orbicular-reniform to pandurate-lanceolate, mostly 4–9 cm. long, glaucous beneath, smooth-edged: peduncle longer than the petiole, very slender: sepals and petals of the staminate flowers 3.5–4 mm. long: berry globular, 6–8 mm. in diameter, glaucous: seed 4–5 mm. long, brown.—(WILD-SARSAPARILLA. SAW-BRIER.)—Sandy woods, thickets, margins of swamps, and old fields, various provinces, Fla. to Tex., Kans., and Mass.—Spr.—The leaves are deciduous.



2. S. hispida Muhl. Stem and branches diffuse and high-climbing, somewhat angled, the lower part of the stem often densely beset with dark or rarely pale, acicular prickles which are accompanied by scattered subulate prickles: leaf-blades ovate, usually elliptic-ovate or orbicular-ovate (hastate or pandurate in *S. hispida australis*), 5–15 cm. long, or very broad and larger on vigorous shoots, thin-coriaceous, erose, often more or less prickly on the pale veins beneath, abruptly narrowed to cordate at the base: sepals and petals of the staminate flowers linear or linear-elliptic, 4–5 mm. long: berry globular, 6–8 mm. in diameter, black: seed 4–5.5 mm. in diameter, dark-brown.—(HAGBRIER. HELLFETTER. BRISTLY-GREENBRIER.)—Rich woods and thickets, often along streams, various provinces, rarely Coastal Plain, Ga. to Tex., Minn., Ont., N. Y., and Conn.—Spr.—The dominant rounding of the leaf-bases, with usually no tendency to lobing, serve to distinguish this from the following species.

3. S. Bona-Nox L. Stem and branches extensively climbing, often high-climbing, sometimes with scattered rigid subulate prickles, more or less 4-

angled: leaf-blades dominantly ovate or broadly lanceolate, at least in outline, more or less triangular, often deltoid or hastate, 3–14 cm. long, more or less reticulate, erose or spiny-margined, glabrous, sometimes prickly on the veins beneath, mostly truncate to cordate at the base: sepals and petals of the staminate flowers linear or nearly so, 4–5 mm. long: berry globular, 6–8 mm. in diameter, or rarely smaller, black: seed 5–5.5 mm. in diameter, brown. [*S. Pseudo-China* L. *S. tamnoides* (Chapm. Fl.)] — BAMBOO. CHINABRIER. BULLBRIER. TRAMP'S-TROUBLE. STRETCH-BERRY.)—Woods, thickets, hammocks, and fence-rows, various provinces, Fla. to Tex., Nebr., and Md.—(*Mex.*)—Spr. —The dilation of the leaf-bases resulting in a deltoid or hastate blade is a mark to distinguish this from the next preceding species.

4. S. rotundifolia L. Stem and branches diffuse and often high-climbing, often armed with remote firm prickles, more or less four-angled: leaf-blades ovate varying to orbicular-ovate, or suborbicular (or narrowly ovate to lanceolate and with erose edges in *S. rotundifolia crenulata*), thin-coriaceous, glabrous, abruptly narrowed to subcordate at the base, or cordate in the very broad leaves of vigorous shoots: sepals and petals of the staminate flowers 5–6 mm. long: berry globular, 6–8 mm. in diameter, reddish-brown.—(GREENBRIER. CATBRIER. HORSEBRIER.)—Woods, thickets, fence-rows, and stream-banks, various provinces, Fla. to Tex., Minn., Ont., and N. S.—Spr.

5. S. auriculata Walt. Stem and branches diffuse or high-climbing, sometimes armed with very small prickles, more or less 4-angled, the branchlets zigzag: leaf-blades ovate, oval, or elliptic, at least in outline, more or less hastate, pandurate or rhombic, or broader on shoots, 2–12 cm. long, notched, mucronate, or abruptly pointed at the apex, reticulate, thick-margined, glabrous: sepals and petals of the pistillate flowers linear-elliptic or linear-oblanceolate, 4–5 mm. long: berry globular, 6–13 mm. in diameter, or rarely smaller, black, but sometimes glaucous until maturity: seed about 5 mm. in diameter, brown. [*S. Beyrichii* Kunth *S. lata* Small]—(WILD-BAMBOO.)—Hammocks, pinelands, sandhills, and scrub, Coastal Plain, Fla. to Miss. and N. C.—(*W. I.*)—Spr.–sum. or all year S.—Plants growing in the pinelands show rather abbreviated growth and spread diffusely on the ground or cover brush. In hammocks the plants are larger, often vigorous and high-climbing, and when in flower fill the air with fragrance. The leaves are evergreen.

6. S. lanceolata L. Stem and branches high-climbing, unarmed, often glaucous, terete or nearly so: leaf-blades elliptic-lanceolate to ovate, 4–10 cm. long, firm-coriaceous, glabrous, smooth-edged, shining above, acute to truncate at the base: sepals and petals of the staminate flowers linear-spatulate, 4–5 mm. long, yellowish-green: stamens nearly as long as the petals: berry globular, 5–8 mm. in diameter, dull-red: seed about 5 mm. in diameter, brown. [*S. Smallii* Morong. *S. cinnamomifolia* Small]—(JACKSONBRIER.)—Rich woods, hammocks, roadsides, and other places protected from fire, Coastal Plain and adj. provinces, N Fla. to Tex., Ark., and Va.—Spr.–sum.—In the Coastal Plain the plants, although vigorous, produce leaves with blades of a rather narrow type (elliptic-lanceolate), while in or near the adjacent provinces the leaf-blades are broader, often ovate. The leaves are evergreen. Much used for winter decorations, large quantities being shipped from the Gulf States.

7. S. Walteri Pursh. Stem and branches diffusely climbing, sometimes with scattered prickles near the base, obscurely 4-angled: leaf-blades ovate, ovate-lanceolate, or broadly lanceolate, 5–14 cm. long, thin-coriaceous, often erose, 5-veined, glabrous, abruptly narrowed to subcordate at the base: sepals and petals of the staminate flowers linear or nearly so, 6–7 mm. long, brownish: stamens 5–6 mm. long: berry globular, 6–8 mm. in diameter, bright coral-red: seed 5–6 mm. in diameter, dark-brown.—(SARSAPARILLA. CORAL-GREENBRIER.)

—Pineland ponds, swamps, and stream-banks, in acid soil, Coastal Plain and adj. provinces, Fla. to La. and N. J.—Spr.—The leaves are deciduous.

8. S. laurifolia L. Stem and branches extensively climbing or high-climbing, sometimes armed with very rigid prickles, often 1-angled: leaf-blades lanceolate, elliptic, oval, or ovate, or rarely linear, 5–15 cm. long, thick-coriaceous, acute or rounded, or subcordate at the base on vigorous shoots, mostly 3-veined: sepals and petals of the pistillate flowers linear-lanceolate or elliptic-linear, 4–5 mm. long, or rarely longer: berry globular or ovoid-globose, 5–8 mm. in diameter, black: seed 4–5 mm. in diameter, black.—(BAMBOO-VINE. BLASPHEME-VINE.)—Non alluvial, often acid swamps, wet woods, and hammocks, Coastal Plain and adj. provinces, Fla. to Tex., Tenn., and N. J.—(W. I.)—Spr.-sum.—In size and vigor this outclasses our other kinds of smilax. The long-persistent ultimately hard woody stems and branches form impenetrable entanglements. The character of the fruit in requiring two seasons to ripen is an anomaly among our species. The leaves are evergreen.

9. S. pumila Walt. Stem and branches trailing or low-climbing, woolly, unarmed: leaf-blades quite uniform, ovate to elliptic-ovate or ovate-lanceolate, 5–10 cm. long, woolly beneath, cordate at the base: peduncles about as long as the petioles or shorter, and like them woolly: sepals and petals of the staminate flowers linear or linear-oblanceolate, about 3 mm. long or rarely longer: berry ovoid, 5–8 mm. long, red, acute: seed about 3 mm. long, red.—(SARSAPARILLA-VINE.)—Pinelands, oak woods, sandhills, hammocks, and river-bluffs, Coastal Plain, Fla. to Tex. and S. C.—Fall.—After the manner of our common witch-hazel this smilax blooms in the fall and ripens its fruit in the spring. The berries, however, may persist on the stems for a year longer.

10. S. havanensis Jacq. Stem and branches more or less armed with short stout, dark-tipped slightly recurved prickles: leaf-blades mostly oval or elliptic, varying to ovate or obovate, 4–8 cm. long or smaller on branchlets, sinuate and spiny, or sometimes entire, often spiny on the midrib beneath: sepals and petals elliptic to ovate, about 1.5 mm. long: stamens about 1 mm. long: berry ovoid, 5–8 mm. long, 1–3-seeded: seed nearly 4 mm. in diameter, brown.—Pinelands and hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—Spr. or often at other seasons.—Habitat seems to have a very marked effect on this plant. Specimens in the pinelands are stunted rigid and with armed stems and leaves. In hammocks the plant is vigorous and climbs to the top of the tallest trees. Then the spines of the stem nearly or quite disappear and the leaf-blades are broader and less spiny or entirely smooth. The leaves are evergreen.

Smilax megacarpa Morong (*S. Morongii* Small) was based on a herbarium sheet containing fragmentary specimens of *Smilax laurifolia* and *S. Walteri*.

ORDER **AMARYLLIDALES** — AMARYLLIDAL ORDER

Perennial herbs or vines. Leaves with narrow or dilated blades. Flowers perfect or dioecious, complete. Perianth of 3 sepals and 3 petals, these distinct or partly united. Androecium of 3 or 6 stamens. Gynoecium mostly 3-carpellary, the ovary wholly or partly inferior.

Leaves not equitant: stamens 6.	
Upright herbs: flowers perfect.	Fam. 1. LEUCOJACEAE.
Twining vines: flowers dioecious.	Fam. 2. TAMACEAE.
Leaves equitant: stamens 3 or 6.	
Perianth not woolly.	Fam. 3. IXIACEAE.
Perianth woolly.	Fam. 4. HAEMODORACEAE.

Family 1. **LEUCOJACEAE** — Amaryllis Family

Herbs, commonly succulent, with rootstocks, bulbs, or corms. Leaves alternate, wholly or mainly basal. Flowers perfect, the perianth sometimes with a crown. Calyx of 3 sepals. Corolla of 3 petals, together with the sepals partially united into a tube. Androecium of 6 stamens, the filaments sometimes united into a crown. Gynoecium of 3 united carpels. Ovary inferior or half-inferior. Styles united. Ovules numerous.—About 70 genera and 800 species, most abundant in tropic and warm temperate regions.

Plant perennial by corms or elongate rootstocks.	
Ovary and capsule half-inferior.	Tribe I. Aletreae.
Ovary and capsule wholly inferior.	
Inflorescence umbel-like: capsule circumcissile: leaves grass-like.	Tribe II. Hypoxideae.
Inflorescence spicate, racemose, or paniculate: capsule 3-valved: leaves succulent.	Tribe III. Agaveae.
Plant perennial by bulbs.	
Filaments distinct.	Tribe IV. Crineae.
Filaments connected with a cup-like or funnelform membrane (crown).	Tribe V. Hymenocalleae.

I. Aletreae

Flowers in a raceme or a spike: perianth granular; lobes relatively short, converging, erect or somewhat spreading: stamens included.	1. Aletris.

II. Hypoxideae

Acaulescent herbs with narrow leaf-blades and very slender scapes.	2. Hypoxis.

III. Agaveae

Plant with bulbs, dying down annually: leaf-blades neither spiny-toothed nor spine-tipped.	3. Manfreda.
Plant with caudices, long-persistent: leaf-blades spiny-toothed and spine-tipped.	4. Agave.

IV. Crineae

Scapes 1-flowered: stigmas 3.	5. Atamosco.
Scapes 2–several-flowered: stigmas united.	6. Crinum.

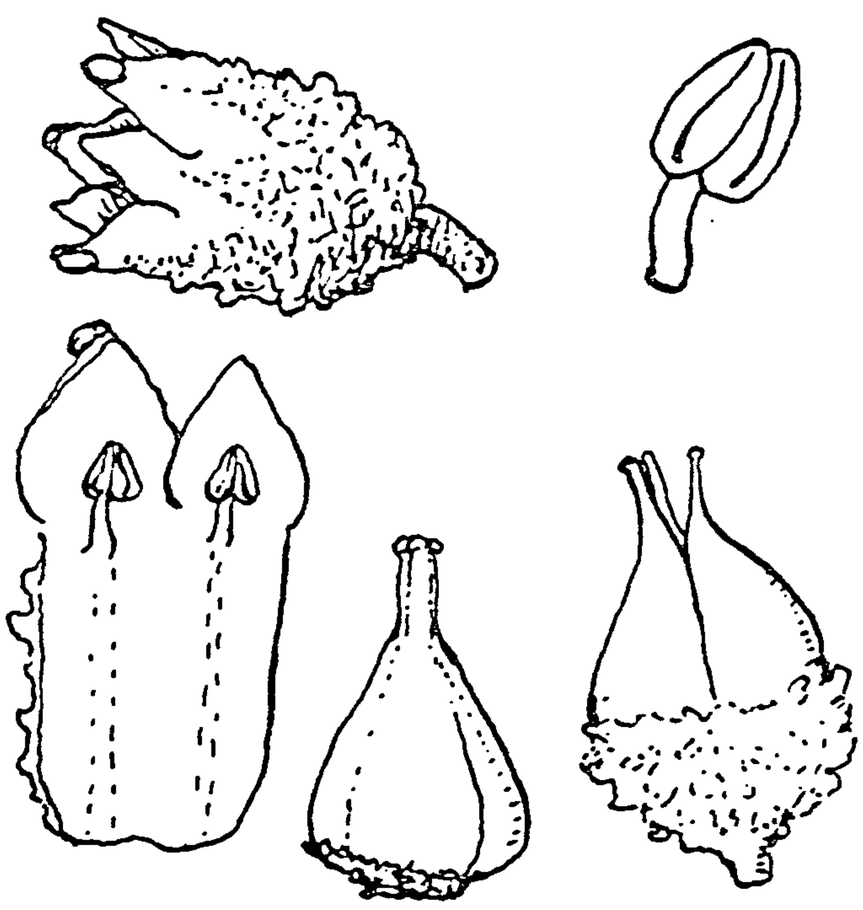
V. Hymenocalleae

Succulent herbs with strap-like leaves: scape terminated by one flower or by a cluster of flowers.	7. Hymenocallis.

1. ALETRIS L. Caulescent herbs with thick rootstocks and scape-like stems. Basal leaves spreading. Flowers in an interrupted spike or raceme. Perianth white to yellow, campanulate, cylindric, or obovoid, granular or mealy: lobes much shorter than the tube. Filaments adnate to the middle of the perianth or above it.—About 8 species, natives of eastern North America and Asia.—Spr.–fall, or all year S.—Colic-roots. Star-grasses.

Perianth cylindric or campanulate: filaments adnate to near the base of the perianth-lobes.	
Perianth campanulate, 5–7 mm. long: lobes erect or converging.	1. *A. aurea.*
Perianth cylindric or constricted above the middle, 7–10 mm. long: lobes spreading.	
Perianth yellow: capsule gradually narrowed into a beak ½ as long as the body.	2. *A. lutea.*
Perianth white: capsule abruptly narrowed into a beak as long as the body.	
Perianth copiously granular: capsule-body ovoid.	3. *A. farinosa.*
Perianth slightly granular: capsule-body conic.	4. *A. bracteata.*
Perianth obovoid: filaments adnate to a little above the middle of the perianth.	5. *A. obovata.*

1. A. aurea Walt. Stem 3–8 dm. tall: blades of the basal leaves oblong to elliptic, 3–8 cm. long: perianth yellow; lobes broader than long, blunt-tipped: style short: capsule ovoid, 5 mm. long, short-beaked.—Moist pinelands, Coastal Plain, Fla. to Tex. and Md.—This and the other yellow-flowered species are conspicuous features in the landscape where the plants are close-set and the golden spikes abundant.



2. A. lutea Small. Stem 3–11 dm. tall: blades of the basal leaves linear to linear-lanceolate, or sometimes broadest above the middle, 4–12 cm. long: perianth yellow, 8–10 mm. long; lobes mostly ovate: capsule conic-ovoid, long-beaked.—Low pinelands, Coastal Plain, Fla. to La. and Ga.

3. A. farinosa L. Stem 3–12 cm. tall: blades of the basal leaves narrowly oblong or elliptic, or elongate and broadly linear, 5–30 cm. long: perianth white or cream-colored, 7–10 mm. long; lobes ovate: style elongate: capsule ovoid, abruptly-beaked.—(MILLER'S-MAID. ALOE.)—Sandy soil, dry woods, prairies, and pinelands, various provinces, Fla. to La., Minn., Ont., and Me.

4. A. bracteata Northrop. Stem 3–6 dm. tall: blades of the basal leaves nearly linear to linear-lanceolate, 6–12 cm. long: perianth white, 6–8 mm. long; lobes lanceolate to triangular, spreading: capsule conic, gradually-beaked.—Pinelands, Everglade Keys and adj. Everglades Fla. and the lower Florida Keys.—(W. I.)

5. A. obovata Nash. Stem 5–8 dm. tall: blades of the basal leaves narrowly elliptic to obovate-lanceolate, 6–8 cm. long: perianth white, obovoid, 5–6 mm. long; lobes broadly ovate, converging: style very short: capsule ovoid, short-beaked.—Pinelands, Coastal Plain, E Fla. and S Ga.

2. HYPOXIS L. Acaulescent herbs with corm-like rootstocks. Leaves with elongate-linear or nearly filiform blades. Scapes slender, sometimes tufted. Flowers solitary or clustered. Perianth mainly yellow, or rarely white. Filaments adnate to the base of the perianth.—About 50 species of wide geographic distribution.—STAR-GRASSES.

Leaf-blades linear, often very narrow and somewhat channeled: seeds muricate or pebbled. I. LINEARES.
Leaf-blades setaceous or filiform-setaceous as a result of the strongly involute margins: seeds with hieroglyphic-like carvings. II. SETACEAE.

I. LINEARES

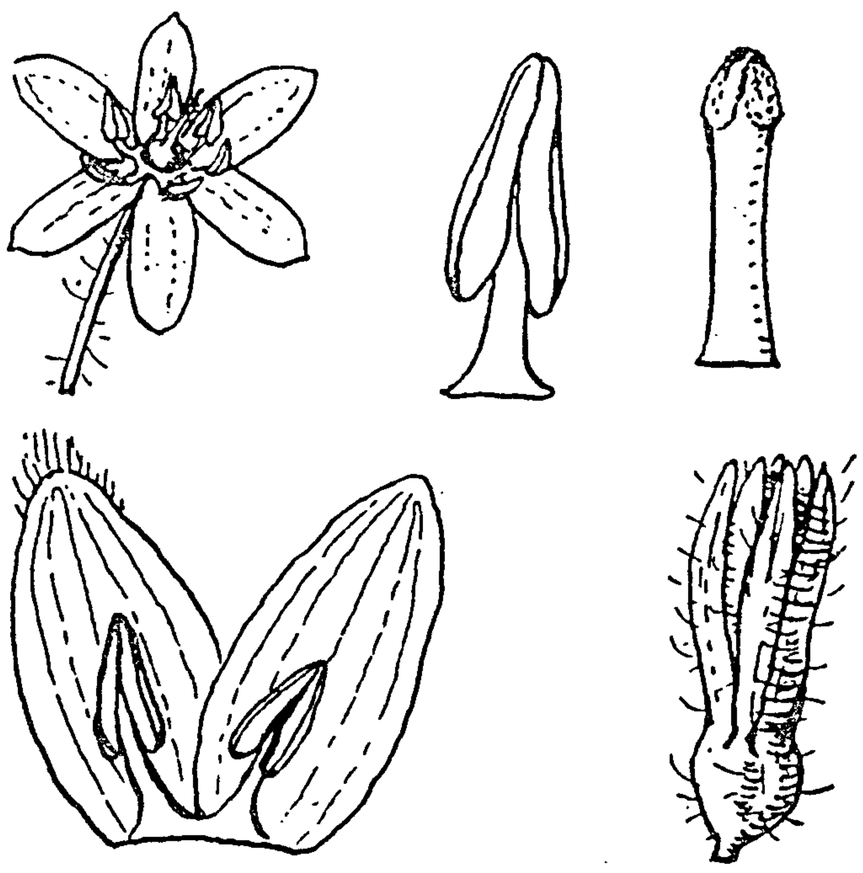
Seed black: leaf-blades linear, flat or nearly so, at least when green.
  Leaf-bases (corm-scales) not breaking down into fibrous bristles.
    Capsule globose to ellipsoid, 2–6 mm. long: leaf-blades pubescent. 1. *H. hirsuta.*
    Capsule clavate to ellipsoid-clavate, 6–11 mm. long or rarely smaller: leaf-blades glabrous. 2. *H. leptocarpa.*
  Leaf-bases (corm-scales) breaking down into fibrous bristles. 3. *H. rigida.*
Seed brown: leaf-blades narrowly linear, often involute.
  Seed iridescent: scape very short or up to 8 cm. long, usually less than 4 cm. long. 4. *H. sessilis.*
  Seed not iridescent: scape 4–18 cm. long, usually over 5 cm. long.

Seed nearly or quite beakless, papillose-muricate: corm-scales membranous, often dark and thick.	5. *H. micrantha.*
Seed beaked, crudely pebbled: corm-scales becoming fibrillose.	6. *H. Wrightii.*

II. SETACEAE

Plants with elongate corms: perianth bright-yellow.	7. *H. juncea.*

1. H. hirsuta (L.) Coville. Corm with membranous pale or brown-tinged sheaths: leaf-blades 8 mm. wide or less, 1–6 dm. long, pubescent, stiff: scape slender, stiffish, 4–35 cm. long, 2–7 flowered: bracts small, subulate or linear-subulate: sepals lanceolate, elliptic, or elliptic-lanceolate, pubescent without: petals elliptic or narrowly ovate, 6.5–15 mm. long: anthers about 3 mm. long: capsule obovoid to globose, 3–4.5 mm. long, pubescent: seed 0.8–1.3 mm. long. [*H. erecta* L. *H. grandis* Pollard.]—Dry, often acid soil, open woods, hillsides, and pastures, various provinces, Fla. to Tex., Man., and N. H.—Spr.–fall.



2. H. leptocarpa Engelm. & Gray. Similar to *H. hirsuta* in habit, but corm usually with dark scales: leaf-blades 15 mm. wide or less, up to 80 mm. long, nearly or quite glabrous, usually flat, very thin, flaccid: scape shorter than the leaves, loosely pubescent especially above: scape filiform, lax, 1–3-flowered: bracts slender, often elongate: sepals linear to narrowly linear-lanceolate, sparingly pubescent: petals linear-lanceolate to elliptic or elliptic-lanceolate, 6.5–8 mm. long: anthers about 1.5 mm. long: capsule clavate to ellipsoid-clavate, 6–11 mm. long, glabrous or sparingly pubescent: seed mostly larger than in *H. hirsuta.* [*H. decumbens* (Chapm. Fl.) *H. Curtissii* Rose]—Damp sandy soil, wet hammocks, swamps, and bottom lands, Coastal Plain and rarely more northern provinces, Fla. to Tex. and N. C.—Spr.–sum.

3. H. rigida Chapm. Corm somewhat elongate, covered with bristly fimbriate scales: leaf-blades linear, rather stiff, 1–4 mm. wide, 0.7–4 dm. long, pubescent: scape very slender, 0.3–3 dm. long, minutely pubescent or nearly glabrous, 1–3-flowered: bracts minute: sepals lanceolate to elliptic, 7–12 mm. long, densely pubescent without: petals slightly broader than the sepals: anthers 2–3 mm. long: capsule narrowly obovoid, 9 mm. long or less, pubescent: seed about 1 mm. in diameter, with short rounded papillae.—Low pinelands, Coastal Plain, Fla. to Tex. and N. C.—Spr.–fall.

4. H. sessilis L. Corm slightly elongate, covered with membranous scales: leaf-blades narrowly linear, 1–4 cm. wide, 7–30 cm. long, rather firm, sparingly pubescent: scape very short or up to 8 cm. long, filiform, pubescent, usually 1-flowered: bract minute: sepals lanceolate or elliptic-lanceolate, 5–11 mm. long, obtuse or acutish: petals slightly broader than the sepals: anthers nearly or quite 2 mm. long: capsule pyriform, 3–4 mm. long, densely pubescent: seed oval, 1–4 mm. in diameter, the flat pebbled surface covered with an iridescent film.—Pinelands, Coastal Plain, Fla. to Tex. and N. C.—Spr.–fall.—Specimens from S. C. sometimes have one whorl of the perianth missing, and the three parts are reported to be often pale or white.

5. H. micrantha Pollard. Corm somewhat elongate, covered with dark scales which rarely break down into fibrous bristles: leaf-blades narrowly linear, 1–6

mm. wide, 8–40 cm. long, pubescent: scape very slender, 5–18 cm. long, pubescent: bracts minute: sepals lanceolate to elliptic, 6.5–15 mm. long, acute: petals slightly broader than the sepals: anthers 2–2.5 mm. long: capsule subglobose, or somewhat elongate, 3.4–9 mm. long, pubescent: seed subglobose, about 1 mm. in diameter, the numerous murications short-subulate.—Pinelands, Coastal Plain, Fla. to Tex. and N. C.—(*W. I.*)

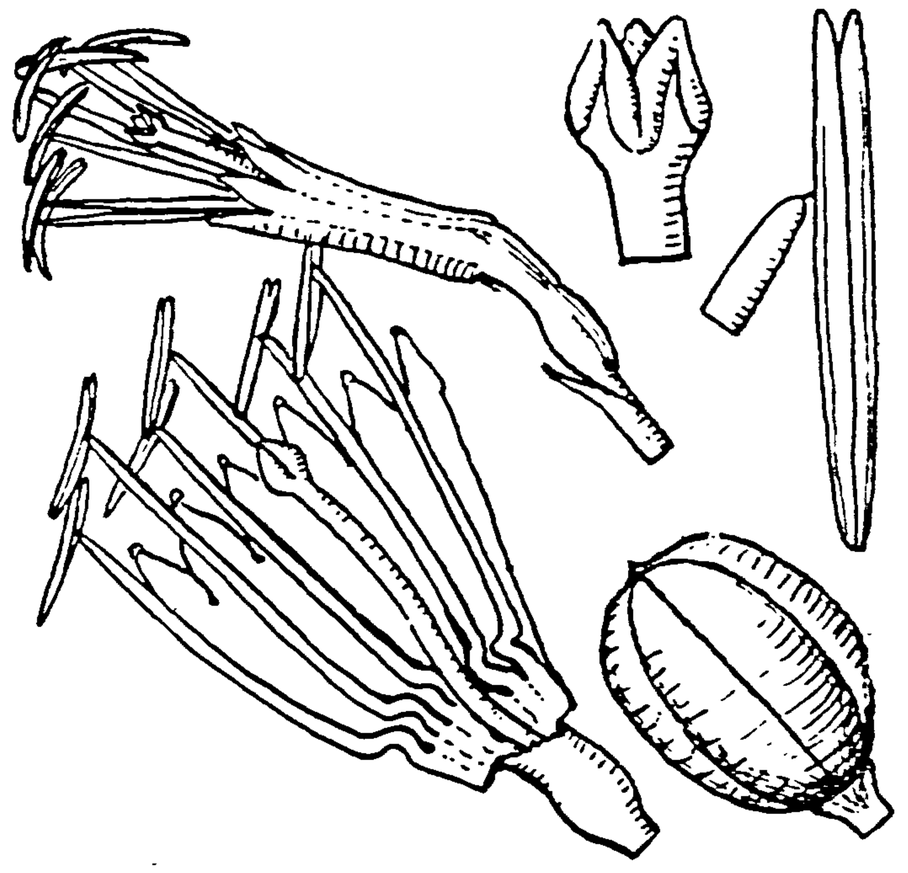
6. **H. Wrightii** (Baker) Brackett. Corm short, covered with brown fibrillous scales: leaf-blades narrowly linear, 0.4–3 mm. wide, 4–26 cm. long, channeled or involute, sparingly pubescent: scape filiform, 4–12 cm. long, 1–2-flowered: bracts minute: sepals lanceolate to narrowly elliptic, 7–8 mm. long, acutish: petals broader than the sepals: anthers 2–3 mm. long: capsule subglobose to ellipsoid, 4–6 mm. in diameter, densely pubescent: seed subglobose, 0.8–1.1 mm. in diameter, the pebbling crudely carved.—Pinelands, Fla., Keys.—(*W. I.*) —Although in flower throughout the year, this plant blooms most vigorously after the land is fire-swept. Its flowers are the first to appear after a fire.

7. **H. juncea** J. E. Smith. Corm elongate, covered with membranous brown scales: leaf-blades involute, thus filiform or setaceous, usually 3-ribbed, with few long hairs especially on the back: scape filiform, usually finely pubescent, 0.5–2 dm. long, 1- or 2-flowered: bracts subulate, minute: sepals lanceolate to elliptic-lanceolate, pubescent: petals elliptic to elliptic-lanceolate, 9–15 mm. long: anthers 2.5–3 mm. long: capsule clavate or ellipsoid, 4–6 mm. long: seed nearly 1 mm. long.—Pinelands, Coastal Plain, Fla. to N. C.—(*W. I.*)—All year.

3. **MANFREDA** Salisb. Succulent herbs, arising annually from bulbs borne on rootstocks, the leaves mostly basal. Flowers in spikes or racemes, or in spike-like panicles. Perianth mainly green.—About 25 species, all American.—Sum.—FALSE-ALOES.—There may be species additional to the following in our range. Herbarium material is scant and very unsatisfactory for study. A proper interpretation of the species will not be possible until after further exploration and the assembling of living plants from all parts of the range for study.

Capsule longer than broad: leaves green.	1. *M. virginica.*
Capsule broader than long: leaves purple-blotched.	2. *M. tigrina.*

1. **M. virginica** (L.) Salisb. Stem 8–18 dm. tall: basal leaves 1–3 dm. long; blades lanceolate, oblong or oblong-spatulate, 3–5 cm. wide, green: perianth greenish or brownish-yellow; lobes linear-oblong, 10–12 mm. long: anthers about 12 mm. long: capsule subglobose: seeds 4–6 mm. broad.—(RATTLESNAKE-MASTER.)—Sandy soil, rocky woods, and dry pinelands, various provinces, Fla. to Tex., Mo., Ky., and N. C. (or Md.?). —The green flowers are poorly adapted for attracting day-flying insects, but their fragrance which increases towards evening attracts nocturnal insects to aid in cross-pollination.

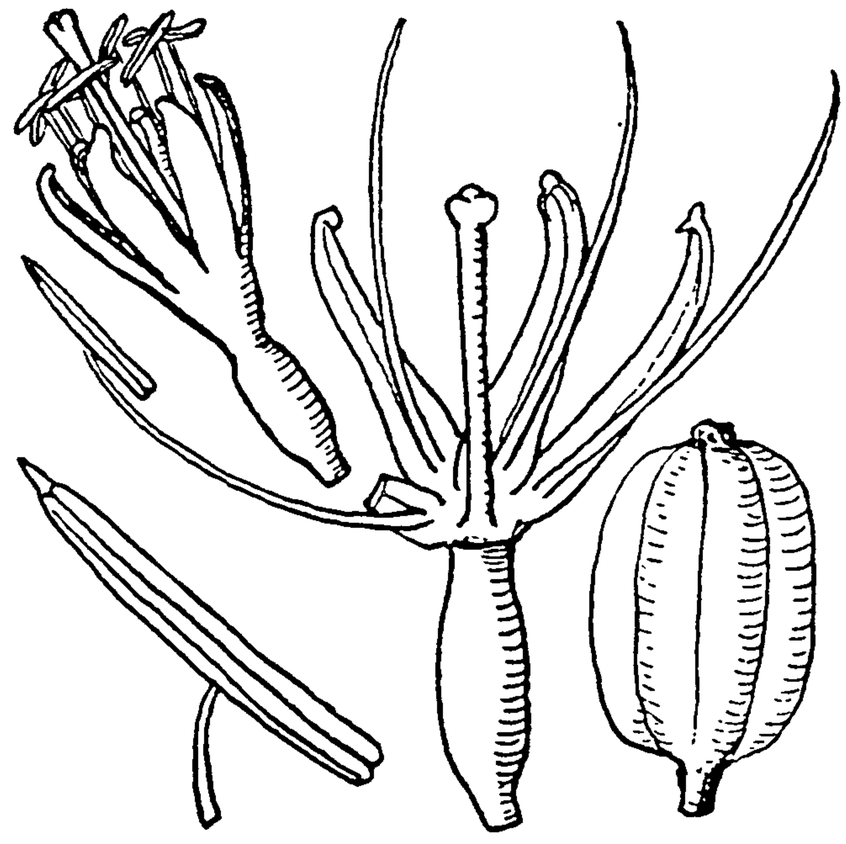


2. **M. tigrina** (Engelm.) Small. Stem 10–25 dm. tall: basal leaves 3–5 dm. long; blades lanceolate or oblong-lanceolate, 5–7 cm. wide, purple-spotted: perianth larger than that of *M. virginica*: capsule spheroidal: seeds 8–10 mm. broad.—(RATTLESNAKE-MASTER.)—Sandy and rocky soil, various provinces, Ga. to Mo., Ky., and N. C.

4. AGAVE L. Usually monocarpic succulent or fibrous herbs rarely with a woody trunk (caudex), the usually large or very large crowded leaves persisting for several years: blade ending in a spine, and usually with horny marginal teeth sometimes connected by a similar border or fraying away in threads as in *Yucca*. Flowers perfect. Perianth of 3 sepals and 3 nearly similar petals, which are partly united, mainly green. Stamens 6: filaments elongate: anthers versatile. Ovary inferior, 3-celled, with many ovules: stigma slightly 3-lobed. Capsule loculicidal. Seeds many, thin, flat.—About 150 species, most abundant in tropical America.—MAGUEYS. CENTURY-PLANTS.—Plants flower only once, then die, but sometimes produce offsets at the base.

Leaf-margins minutely prickly or toothed, the prickles or teeth not raised on fleshy bases.
  Leaf-blades narrow (5–10 cm.) and long: caudex short or up to 2 m. tall.
    Caudex becoming leafless: leaf-blades deeply concave, the margins with recurved or hooked regularly placed prickles. 1. *A. decipiens.*
    Caudex permanently leafy: leaf-blades nearly flat, the margins with few and minute irregular prickles. 2. *A. sisalana.*
  Leaf-blades broad (20–25 cm.) and long: caudex very short, the plants thus acaulescent. 3. *A. neglecta.*
Leaf-margins prominently armed with gray teeth each of which is raised on a fleshy prominence. 4. *A. americana.*

1. A. decipiens Baker. Trunk 1–2 m. high: leaves 5–10 x 100–250 cm.; blades narrowly lanceolate, deeply concave, outcurving, green, each with an abrupt conical brown end-spine 3–4 x 10–15 mm., the somewhat repand margins with recurved or hooked slender prickles about 2 mm. long, and borne 10 mm. apart: panicle 2–3 m. long on a scape of equal length, ellipsoid, with slender branches: flowers greenish-yellow, fetid, 60 mm. long: filaments inserted about the middle of the tube: capsule ellipsoid, 3.5–5 cm. long, but flowers often followed by abundant bulbils.—(FALSE-SISAL.)—Coastal hammocks and kitchenmiddens, pen. Fla. and the Keys.—Our two native century-plants show no relationship to the species of *Agave* in the West Indies. They are related to a Mexican group, and it has been suggested that they represent prehistoric introductions from Mexico. If this be so, their Mexican ancestors have been lost, or the Florida plants have greatly changed.



2. A. sisalana Perrine. Nearly trunkless: leaves 10 x 150 cm.; blades sword-shaped, nearly flat, straight, slightly glaucous, becoming green and glossy, with an abrupt conic glossy brown end-spine 4–5 x 20–25 mm., the margins typically with few and minute prickles: panicle 2 m. long on a scape of equal length, ellipsoid, with slender branches: flowers yellowish-green, fetid, 45–60 mm. long: filaments inserted about the upper third of the tube: capsule rarely produced, but the flowers followed by numerous bulbils.—(SISAL. SISAL-HEMP.)—Hammocks, pinelands, and cult. grounds, pen. Fla. and the Keys, escaped from plants originally introduced from Yucatan. First planted in our range on Indian Key where the descendants of the original planting still grow. One of the more important fiber-plants. The product is used mainly for making twine.

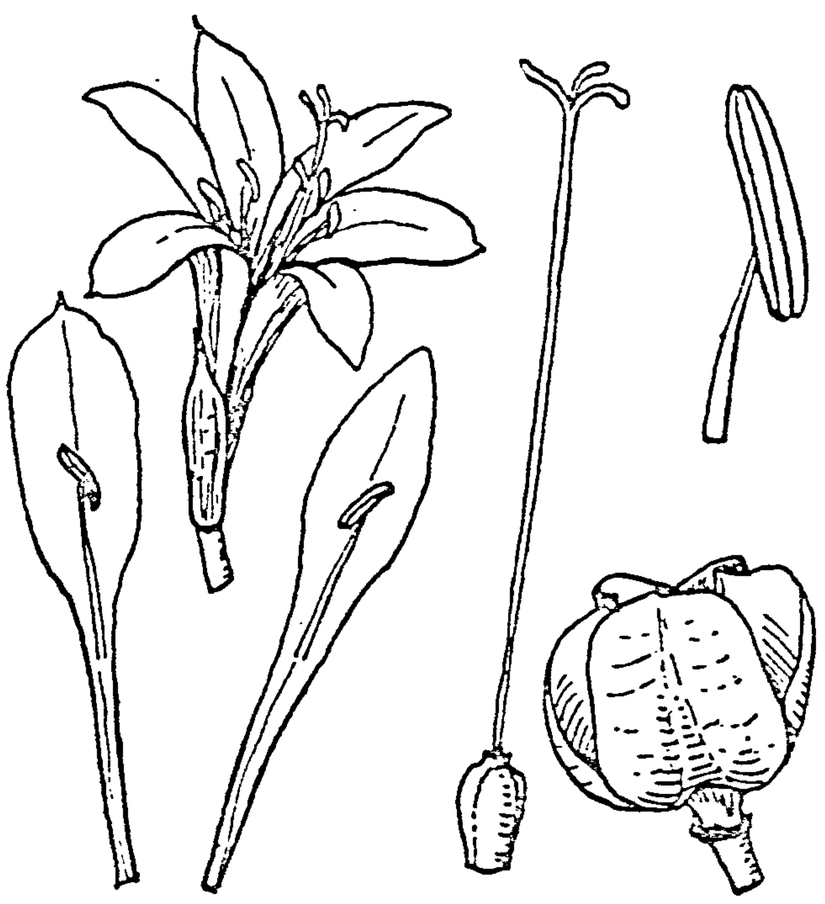
3. **A. neglecta** Small. Acaulescent: leaves spreading, 20–25 x 100–150 cm.; blades broadly lanceolate, concave, pale and glaucous, each with a slender brown scarcely decurrent end-spine, about 3 x 25 mm., the straight margins with numerous close minute prickles: panicle 3 m. long, ovoid, on a scape three or four times as long: filaments inserted about the upper third of the tube: capsule brown, obovoid, accompanied by bulbils.—(WILD CENTURY-PLANT).—Pinelands, hammocks, and kitchenmiddens, pen. Fla.—Like *A. decipiens* this century plant thrives on kitchenmiddens and aboriginal village sites. The Bartrams found "forests" of it in the Mosquito River region in the eighteenth century. William Bartram figured it in his "Travels," under the name of "*Agave vivipara.*" It is extensively planted for ornament, in Florida.

4. **A. americana** L. Acaulescent: leaves 15 x 100–200 cm.; blades oblanceolate, somewhat concave, the outer recurved above the middle, glaucous, each with an abrupt stoutly conical somewhat curved brown or gray end-spine 4 x 20 mm., the margins with heavy straight gray teeth 5–10 mm. long deltoid, on the tops of large fleshy prominences: panicle 1–1.5 m. long, ovoid, on a scape of two or three times its length: flowers yellow, 70 mm. long: filaments inserted towards the throat of the tube: capsule brown, ellipsoid, not accompanied by bulbils.—(CENTURY-PLANT.)—Hammocks, pinelands, and cult. grounds, pen. Fla. and the Keys, and along the Rio Grande, Tex. Nat. of Mex., and escaping from cult.—A variety with variegated leaves is commonly cultivated.

5. **ATAMOSCO** Adans. Herbs with coated bulbs. Leaves basal: blades narrowly linear. Scape 1-flowered. Perianth white, pink, purple, or yellow. Filaments adnate up to the throat of the perianth-tube: anthers versatile. [*Zephyranthes* Herb.]—About 50 species, natives of America.—ATAMASCO-LILIES. STAGGER-GRASSES. AMARYLLIS. ZEPHYR-LILIES. FAIRY-LILIES. RAIN-LILIES.—An infusion made from the bulbs is used by the Seminoles to cure toothache.

Perianth funnelform, the tube 1.5–2.5 cm. long: stigmas 3, narrow.
  Leaf-blades concave, with sharp margins: sepals and petals abruptly pointed.
    Spathe a fourth to a third as long as the perianth: perianth broadly funnelform, the sepals and petals with spreading tips. — 1. *A. Atamasco.*
    Spathe a third to a half as long as the perianth: perianth narrowly funnelform, the sepals and petals with erect or ascending tips. — 2. *A. Simpsonii.*
  Leaf-blades nearly half-terete, with rounded margins: sepals and petals acuminate. — 3. *A. Treatiae.*
Perianth rotate, the tube very short or wanting: stigmas 3-lobed. — 4. *A. candida.*

1. **A. Atamasco** (L.) Greene. Leaves 2–4 dm. long; blades concave, sharp-edged, mostly acute or acuminate: scape 2–3.5 cm. tall, nearly terete: involucral bract mostly shorter than the perianth-tube: perianth mainly white or pinkish within: sepals and petals elliptic, 6–10 cm. long, more or less spreading: capsule oval or globose-oval, slightly 3-lobed.—(EASTER-LILY)—Low ground, usually in rich woods, Coastal Plain and adj. provinces, Fla. to Miss. and Va.—Spr.—Colonies of this plant are so densely populated that year after year great quantities of the flowers are gathered about Easter time and sold especially in southern cities.



2. **A. Simpsonii** (Chapm.) Greene. Leaves 3–5 dm. long; blades concave,

obtuse: scape 2–2.5 dm. tall, flattened, the edges sharp near the base: involucral bract nearly or quite equalling the perianth-tube: perianth mainly white and purple-tinged about the edges: sepals and petals oblanceolate, 4–7 cm. long, ascending or spreading merely at the tips: capsule depressed-globose, usually prominently 3-lobed.—Low pinelands, pen. Fla.—Wint.–Spr.—The perianth resembles that of *Cooperia* of Texas.

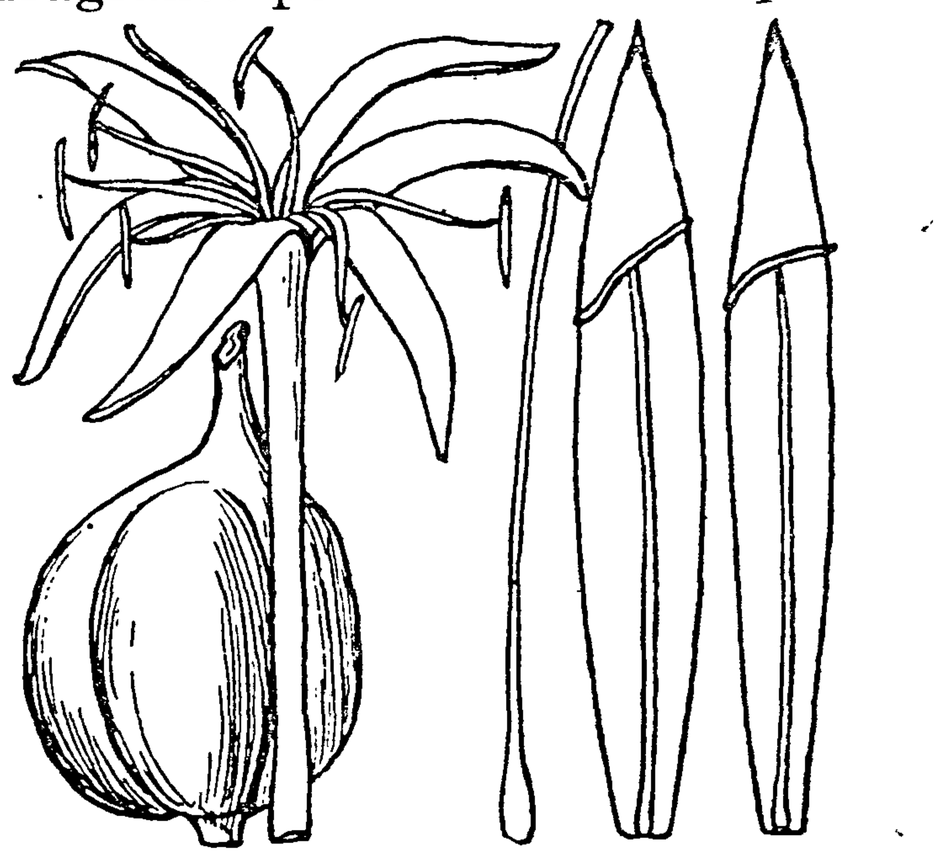
3. **A. Treatiae** (S. Wats.) Greene. Leaves 1–4 dm. long; blades nearly half-terete, blunt-edged, mostly obtuse: scape 1–3.5 dm. tall, terete or nearly so: involucral bract nearly or quite as long as the perianth-tube: perianth mainly white, often turning pink within; sepals and petals narrowly elliptic, narrowly oblanceolate or linear-elliptic, 6–8 cm. long, recurved-spreading above the middle: capsule depressed-globose, more or less prominently 3-lobed.—(EASTER-LILY)—Low pinelands and swamps, Fla.—Spr.

4. **A. candida** (Lindl.) Small. Leaves 1–4.5 dm. long; blades channeled, mostly acute: scape 2–3 dm. tall, slightly flattened: involucral bract equalling the perianth-tube: perianth white within, or sometimes pinkish: sepals and petals elliptic or elliptic-oblanceolate, 2–3.5 cm. long, spreading: capsule sub-globose, often somewhat depressed, more or less 3-lobed.—Waste-places, road-sides and old fields, Coastal Plain, Fla. to Tex. Nat. of the La Plata region, S. A.—Sum.–fall.

6. **CRINUM** L. Herbs with succulent coated bulbs, the neck short. Leaves basal: blades narrow, usually linear or nearly so, often elongate. Scape 2–many flowered. Perianth salverform or funnelform, white, pink, or red: lobes narrow. Filaments adnate up to the mouth of the perianth-tube. Capsule lobed.—Fully 60 species, mostly tropical.

Perianth salverform: sepals and petals shorter than the tube. 1. *C. americanum.*
Perianth funnelform: sepals and petals longer than the tube. 2. *C. longifolium.*

1. **C. americanum** L. Bulb 7–11 cm. thick: leaf-blades 6–12 dm. long, irregularly denticulate: scape 3–8 dm. tall: flowers fragrant: perianth white or pink-tinged: sepals and petals 5–12 cm. long, spreading, acuminate: capsule subglobose or depressed, 4–6 cm. thick, irregularly lobed.— (SWAMP-LILY. STRING-LILY) — Swamps, marshes, and river-shores, Coastal Plain, Fla. to Tex.—Spr.–fall.



2. **C. longifolium** (L.) Thunb. Bulb and leaves like those of *C. americanum*: scape up to 1 m. tall: flowers fragrant, perianth white, or pink within and reddish without; sepals and petals elliptic to elliptic-oblanceolate, ascending or spreading at the tip, acute.—Roadsides and ditches, S. La. Nat. of S. Africa.

Hippeastrum puniceum (Lam.) Urban, a bulbous plant with narrow leaves appearing after the flowers which are borne few in an umbel, the perianth crimson-scarlet with a whitish midstripe on each lobe, the tube funnelform, the lobes broad (the blades ovate), a native of tropical America, occurs in the Gulf States. It is known as RED SPIDER-LILY.

7. **HYMENOCALLIS** L. Herbs with coated bulbs. Leaves basal, spreading: blades linear or nearly so. Scape terminated by a single flower or by a cluster, the flowers erect. Perianth showy, mostly white, pink, or purplish: tube elongate: lobes narrow. Filaments adnate to the perianth-

tube above which they are connected by a crown.—About 40 species, all American.—SPIDER-LILIES.—Following is a tentative interpretation of the species.

Sepals and petals white: scape terminated by 2–16 flowers.
  Scape terminated by several to many (8–16) flowers: crown small (2.5–3.5 cm. wide). I. MULTIFLORAE.
  Scape terminated by few (2–8) flowers: crown large (4–6.5 cm. wide). II. PAUCIFLORAE.
Sepals or sepals and petals green: scape terminated by 1-few flowers.
  Sepals and petals green: scape terminated by 2-few flowers. III. VIRIDIFLORAE.
  Sepals green: petals white: scape terminated by 1 flower. IV. UNIFLORAE.

I. MULTIFLORAE

Crown (flat) hexagonal.
  Crown with the angles of the hexagon formed by the median teeth. 1. *H. keyensis.*
  Crown with the angles of the hexagon formed by the filament-bases. 2. *H. Collieri.*
Crown (flat) circular, the rounded lobes minutely notched. 3. *H. Kimballiae.*

II. PAUCIFLORAE

Filaments arising from a sinus, sometimes very shallow, between the lobes or angles of the crown.
  Flowers several, mostly 4–6, in a cluster. 4. *H. occidentalis.*
  Flowers 2 or 3 together.
    Edge of the crown between the filaments erose. 5. *H. crassifolia.*
    Edge of the crown between the filaments with 2, 3 or 6 teeth.
      Edge of crown between the filaments with 3, sometimes 5, teeth, the middle tooth the largest, often lobe-like. 6. *H. tridentata.*
      Edge of crown between the filaments with a 2-toothed lobe, sometimes with a minute tooth between the pair of large teeth. 7. *H. bidentata.*
Filaments arising from a truncate or sinuate lobe of the crown, the intervening edge a toothed sinus.
  Sinus of the crown between the filaments with small irregular teeth on each side: filaments arising from a truncate lobe. 8. *H. coronaria.*
  Sinus of the crown between the filaments with laciniate teeth on each side: filaments arising from a 2-pronged lobe. 9. *H. laciniata.*

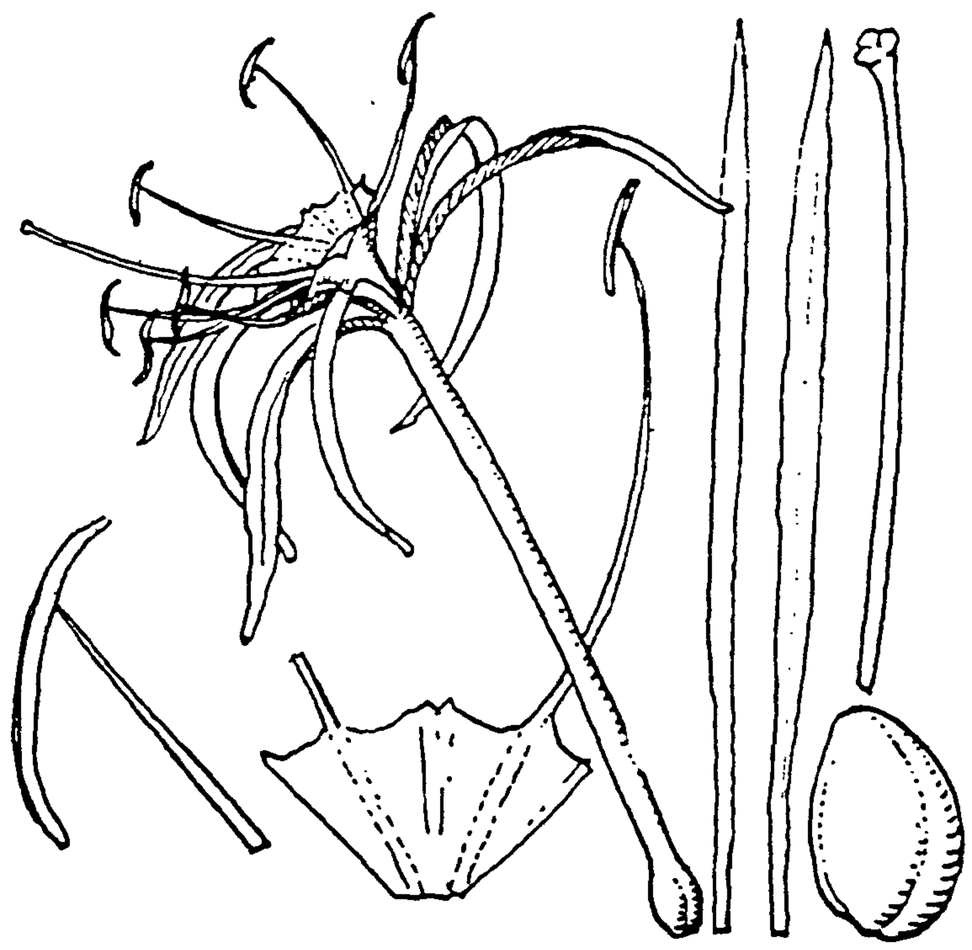
III. VIRIDIFLORA

Stout plants: scape terminated by usually 2, more or less spreading flowers. 10. *H. viridiflora.*

IV. UNIFLORA

Slender plants: scape terminated by a single erect flower. 11. *H. Palmeri.*

1. H. keyensis Small. Bulb-body globose-ovoid: leaves arching, 8 dm. long or less, shallowly channeled, green: scape scarcely as long as the larger leaves, much flattened and sharp-edged, glaucous: flowers 10–16 together: hypanthium-tube 12–17 cm. long, or sometimes shorter in the later flowers, bluntly 3-angled: sepals elongate-linear, nearly as long as the hypanthium, strongly involute, the edges often almost meeting: petals slightly wider than the sepals: crown 2.5–3.5 cm. wide: filaments 5–6 cm. long: anthers orange, 2–2.5 cm. long: capsule ovoid, 4–5 cm. long. [*H. caribaea* (Chapm. Fl.).]—Mangrove swamps, sandy shores, and rarely hammocks, eastern coast of pen. Fla. and the Keys.—Spr.–sum.



2. H. Collieri Small. Bulb-body depressed: leaves arching, barely 1 m. long or less, nearly flat, acute, glaucescent: scape 1 m. tall or less, directly flat-

tened and sharp-edged throughout, glaucous: flowers 8–13 together: hypanthium-tube 11–19 cm. long, decidedly 3-angled, green below, white above: sepals narrowly linear, usually shorter than the hypanthium, involute: petals somewhat wider than the sepals: crown 2.5–3.5 cm. wide: filaments 4–5 cm. long: anthers orange, about 1.5 cm. long: capsule subglobose, often slightly depressed, stout-beaked, 2–3 cm. in diameter.—Sandy shores and banks of estuaries, lower western coastal region, pen. Fla.—Sum.

3. H. Kimballiae Small. Bulb-body ovoid: leaves erect or ascending, often slightly widened upward, 1 m. long, or less, acute, deep-green: scape about as tall as the larger leaves, much-flattened and sharp-edged throughout, glaucescent: flowers 9–15 together: hypanthium-tube 12–16 cm. long, green below, white near the perianth, obscurely 3-angled: sepals very narrowly linear, 9–10.5 cm. long, involute: petals slightly wider than the sepals: crown 2.5–3 cm. wide, with a minute tooth between the filaments: anther about 2 cm. long: capsule broadly ovoid, 2.5–3.5 cm. long.—Swamps about the estuary of the Apalachicola River, Fla.—Sum.—The fragrance of the flowers resembles that of a tea-rose.

4. H. occidentalis (Le Conte) Kunth. Leaves numerous; blades linear, about 6 dm. long or less, shallowly channeled, glaucous: scape about as tall as the longer leaves, 2-edged, glaucous: flowers usually 6 in a cluster, very fragrant: crown with the intervals between the filaments 4–6-toothed.—Meadows, hillsides, and stream-banks, various provinces, rarely Coastal Plain, Ga. to Mo. and Ind.—Spr.–sum.—The bulbs are said not to produce runners.

5. H. crassifolia Herb. Leaves few; blades linear, 5 dm. long or less, nearly flat, bright-green: scape 4–6 dm. tall, somewhat flattened, glaucescent: flowers usually 3 in a cluster, fragrant: crown orbicular-hexagonal in outline, the edges with a series of blunt or acute erose teeth between the filaments.—Marshes and river-banks, Coastal Plain, N E Fla. to N. C.—Spr.

6. H. tridentata Small. Leaves mostly 4 to 6; blades narrowly linear, 4–5 dm. long, somewhat channeled, keeled beneath, deep-green: scape about 3 dm. tall, 2-edged, glaucescent: flowers 2 together, fragrant: crown 5.5–6.5 cm. wide, the edge between the filaments with 3–6 teeth, usually 3 teeth, the middle tooth the largest.—Swamps and marshes, E coast region, Fla.—Spr.—Conspicuous on account of the very large toothed crown.

7. H. bidentata Small. Leaves few, usually 3 or 4; blades narrowly linear, rather flat, deep-green: scape 3–4 dm. tall, decidedly flattened, with sharp edges, green: flowers usually 3 in a cluster: crown 4–4.5 cm. wide, the edge between the filaments with a prominent 2-toothed lobe, and sometimes with a minute tooth between the larger ones.—Wooded hillsides, Appalachian provinces, Ala.—Spr.–sum.—Remarkable for the small prominently lobed crown and relatively broad sepals and petals.

8. H. coronaria (Le Conte) Kunth. Leaves as many as 8 together; blades linear, up to 6 dm. long, shallowly channeled: scape 4–6 dm. tall, 2-edged, green: flowers often 4 together, fragrant: crown 5–6 cm. wide, with truncate lobes at the bases of the filaments, the intervening sinuses with sharp irregular teeth: capsule often 2- or 3-lobed, depressed, 2.5–3.5 cm. in diameter.—Stream-banks, rock islands and shoals, Coastal Plain and adj. Piedmont, Fla. to Ala. and S. C.—Spr.—Bulbs said not to produce stolons. Plants occur mostly above the fall line. Several localities have been destroyed by dams.

9. H. laciniata Small. Leaves few; blades narrowly linear, 5 dm. long or less, nearly flat, deep-green: scape 2–4 dm. tall, much flattened, 2-edged, glaucous: flowers usually 3 together, very fragrant: crown 4–5 cm. wide, with 2-pronged lobes from which the filaments arise, and laciniate-toothed sinuses between them.—Swamps, N Fla.—Spr.

10. H. rotatum LeConte. Leaves usually 2 or 3; blades linear, nearly flat, glaucous: scape 2.5–3.5 dm. tall, flattened, sharp-edged, very glaucous: flowers usually 2 together, fragrant: crown 4–5 cm. wide, truncate at the bases of the filaments, with 2 or 3 teeth between the lateral teeth on the truncate parts: capsule subglobose, slightly lobed, 2.5–3 cm. wide.—Flat woods, N Fla.—Spr.

11. H. Palmeri S. Wats. Leaves 4 dm. long or less; blades narrowly linear, 5–10 mm. wide, channeled, angled on the back: scape 1–4 dm. tall, flattened, glaucescent, the edges rounded: flower erect, faintly fragrant: hypanthium-tube 6–8 cm. long, yellowish-green, nearly terete: sepals narrowly linear, 6–8 cm. long, involute-channeled: petals similar to the sepals, but slightly wider: crown about 5 cm. wide, the limb white, flaring from a short greenish base, the edge between the filament with a short and broad tooth in the middle and 2 longer and narrow teeth on each side: filaments white, about 2.5 cm. long. [*H. humilis* S. Wats.]—(ALLIGATOR-LILY.)—Prairies and Everglades, pen. Fla.—Spr.

FAMILY 2. TAMACEAE — YAM FAMILY

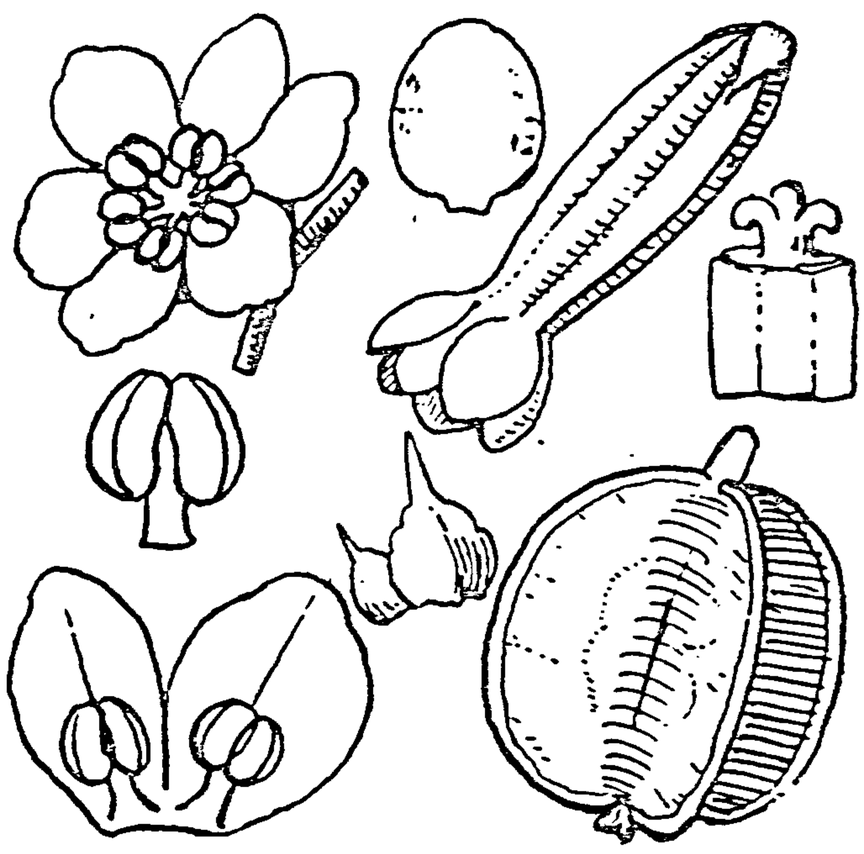
Perennial vines with rootstocks. Leaf-blades ribbed and netted-veined. Flowers monoecious or dioecious, or rarely perfect. Calyx of 3 sepals. Corolla of 3 petals resembling the sepals. Androecium of 3–6 stamens, imperfect in pistillate flowers. Gynoecium of 3 united carpels, imperfect in staminate flowers. Ovary inferior. Styles 3. Ovules 1 or 2 in each cavity of the ovary. Fruit a 3-winged, 3-valved capsule, or baccate.—About 10 genera and 175 species, mostly American.

1. DIOSCOREA [Plum.] L. Upper leaves alternate: blades mainly cordate. Sepals and petals mainly green or whitish.—About 160 species, most abundant in tropical regions.—Early sum.—WILD YAM-ROOTS. YAM-VINES.

Staminate panicles solitary in the leaf-axils.
- Lower leaves whorled in 4's–7's.
  - Leaf-blades green beneath: staminate sepals 1.5 mm. long or less. — 1. *D. quaternata.*
  - Leaf-blades glaucous beneath: staminate sepals over 1.5 mm. long. — 2. *D. glauca.*
- Lower leaves typically alternate.
  - Pistillate racemes many-flowered, many-fruited at maturity: stem internodes glabrous. — 3. *D. villosa.*
  - Pistillate racemes few-flowered, 1–4-fruited at maturity: stem internodes pubescent. — 4. *D. hirticaulis.*

Staminate panicles clustered in the leaf-axils or sometimes individually solitary, and terminating the stem. — 5. *D. floridana.*

1. D. quaternata (Walt.) Gmel. Rootstock slender, mostly 1 cm. thick or less, sometimes forked, often with few short lateral branches: lower petioles densely pubescent at the base and the apex: leaf-blades ovate to ovate-lanceolate, mostly 8–11 cm. long, repand, green and glabrous: staminate sepals elliptic or oval: pistillate racemes few-flowered: fruit obovate, 1.5–3 cm. long.—Woods and banks, Coastal Plain and adj. provinces, Fla. to La., Mo., and S Va.



2. D. glauca Muhl. Root-stock stout, over 1 cm. thick, often forked and with many short stout lateral branches; lower petioles densely pubescent at the apex: leaf-blades ovate to orbicular-ovate, or rarely ovate-lanceolate, usually larger than in *D. quaternata*, sometimes undulate, glaucous and usually finely

pubescent beneath: staminate sepals oval: pistillate racemes few-flowered: fruits few, suborbicular to broadly obovate or obreniform, 2–3.5 cm. long.—Thickets and rich woods, various provinces, rarely Coastal Plain, S. C. to Ark., Mo., and Pa.

3. **D. villosa** L. Rootstock slender, elongate, rarely forked, with few more slender lateral branches: stem glabrous: leaf-blades broadly ovate or orbicular-ovate, more or less pubescent beneath or sometimes glabrous: pistillate racemes many-flowered: fruit numerous, suborbicular, varying to orbicular-obovate or obreniform, 2 cm. long or less.—Moist thickets and woods, various provinces, Va. to Tex., Minn., and Mass.

4. **D. hirticaulis** Bartlett. Rootstock very slender and usually simple, bearing more slender short lateral branches: stem pubescent: leaf-blades broadly ovate, densely pale-pubescent beneath: pistillate racemes few-flowered: fruit few, broadly obovate or deltoid-obovate, about 2 cm. long.—Branch swamps, Coastal Plain, Ga. and S. C.

5. **D. floridana** Bartlett. Rootstock not seen: stem glabrous: leaf-blades broadly ovate to ovate-hastate, decidedly acuminate, green, but paler beneath than above, glabrous: staminate panicles clustered, often greatly elongate: pistillate racemes few-flowered: fruit few, broadly obovate to suborbicular, about 2 cm. long.—Moist thickets, Coastal Plain, Fla. to S. C.

Family 3. **IXIACEAE** — Iris Family

Perennial, mostly caulescent herbs with short or long rootstocks. Leaves equitant, mostly elongate. Flowers perfect, mostly regular, arising from spathe-like bracts. Calyx of 3 sepals. Corolla similar to the calyx or of 3 very different members. Androecium of 3 stamens, the filaments partially adnate to the perianth. Gynoecium of 3 united carpels. Ovary inferior. Styles entire or divided, sometimes petal-like. Ovules few or numerous. Fruit a loculicidal 3-valved capsule.—About 60 genera and 1,000 species of wide geographic distribution.

Style-branches or stigmas alternate with the stamens: stamens not lying against the style-branches. — Tribe I. Sisyrinchieae.
Style-branches or stigmas opposite the stamens: stamens lying against the style-branches. — Tribe II. Irideae.

I. Sisyrinchieae

Filaments distinct or united into a very short tube: sepals and petals obtuse or merely acute: capsule erect, more or less elongate.
- Style-body very short-columnar, surrounded by the filament-tube: style-branches slender-subulate: stigmas capitate or minutely notched. — 1. Nemastylis.
- Style-body elongate, clavate or trumpet-shaped, not surrounded by the filament-tube: style-branches linear, and stigmas reniform or columnar, and stigmas 2-lobed.
  - Flower zygomorphic, the style declined, the stamens ascending: perianth nodding: stigmas reniform, spreading. — 2. Salpingostylis.
  - Flower actinomorphic, the style and stamens erect: perianth erect: stigmas erect. — 3. Belamcanda.

Filaments united into a long tube and around the style: sepals and petals mucronate or aristate at the apex: capsule subglobose. — 4. Sisyrinchium.

II. Irideae

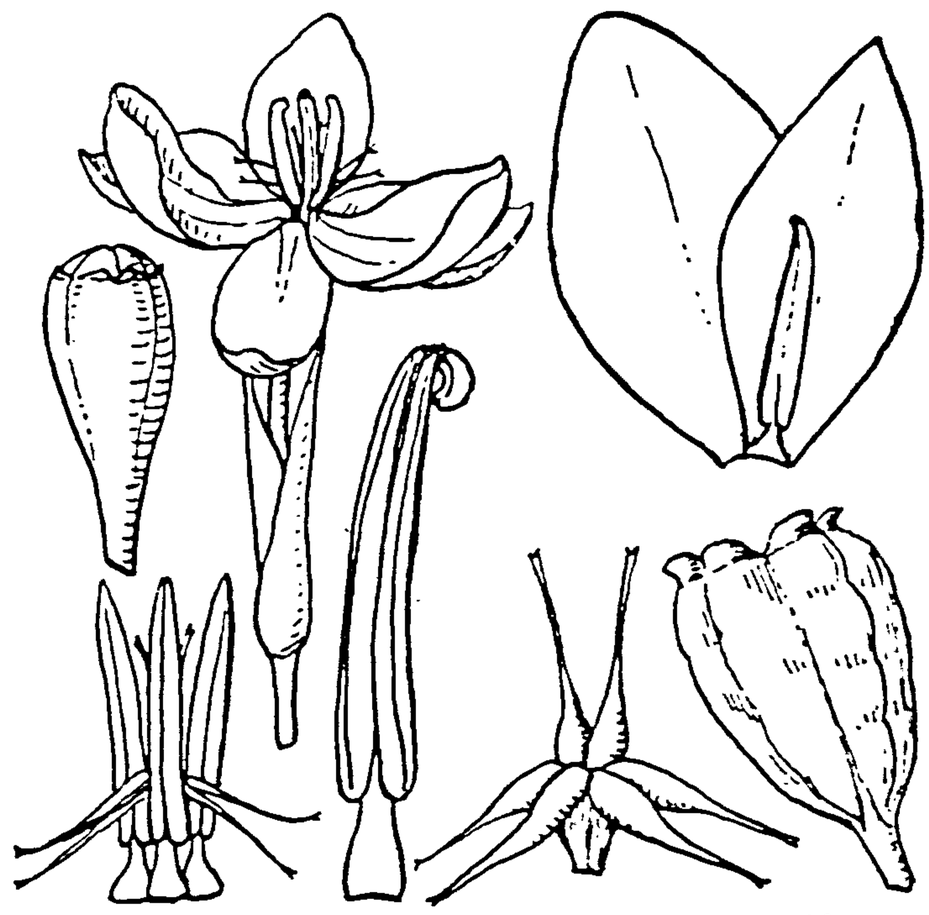
Style-branches petaloid and appendaged at the tip: filaments distinct.
- Flower terminating a short leafy branch from the rootstock: hypanthium tube elongate, nearly or quite as long as the sepals: seeds arillate. — 5. Neubeckia.
- Flower or flower-clusters on tall stems, subtended by foliaceous bracts: hypanthium tube very short: seeds not arillate. — 6. Iris.

Style-branches not petaloid and unappendaged: filaments united. — 7. Herbertia.

1. **NEMASTYLIS** Nutt. Herbs with bulbs and usually branched flower-stems. Leaf-blades narrow, plicate. Flowers erect, actinomorphic. Perianth violet or blue, except the white "eye," or sometimes white, the petals slightly smaller than the sepals. Filaments partly united. Anthers coiling from the tip. Style with 6 slender-subulate radiating branches, longer than the column. Stigmas 6, minutely notched or tufted-capitate. Capsule erect.—A few species, American.—CELESTIALS, CELESTIAL-LILIES.

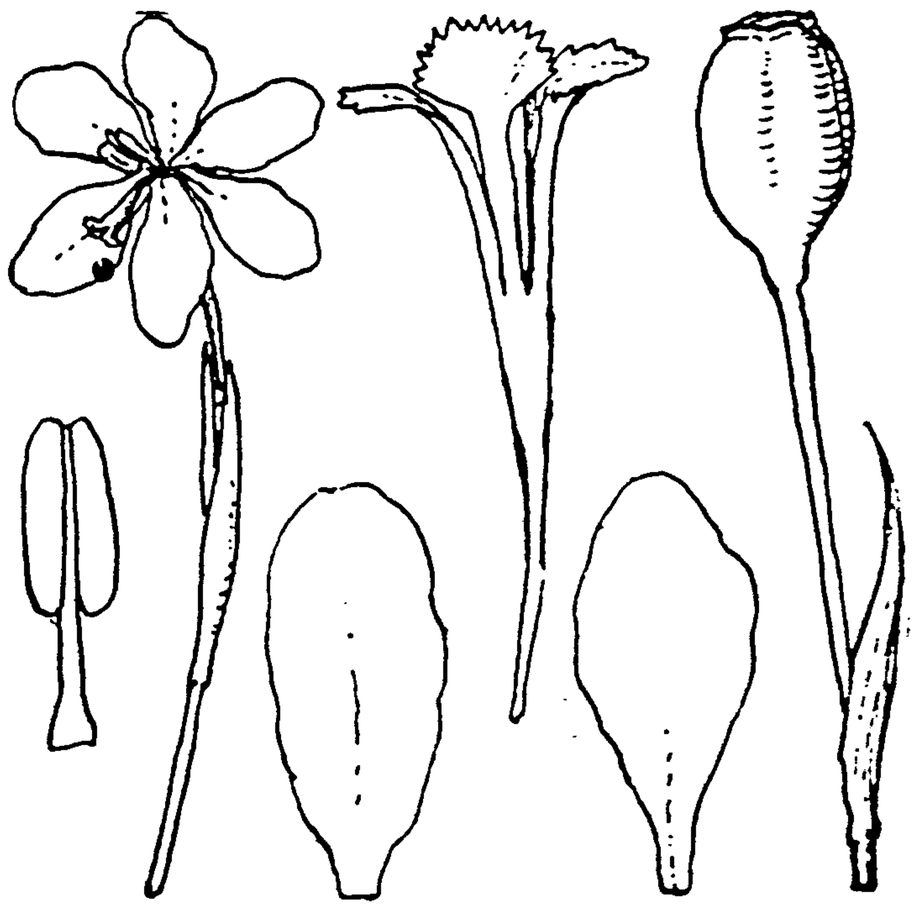
Perianth blue: sepals oval: petals rhombic-oval. 1. *N. acuta.*
Perianth violet: sepals elliptic or narrowly elliptic-obovate: petals elliptic. 2. *N. floridana.*

1. N. acuta (Bart.) Herb. Plant 1.5–4 dm. tall, with a bulb usually 1.5–2 cm. in diameter: leaf-blades narrowly attenuate, sharply plicate: scape slender, usually sparingly and strictly branched: the branches slender: perianth 4–6 cm. wide: sepals oval: petals rhombic-oval: style-branches longer than the body: capsule obovoid or cylindric-obovoid, 1.5–2 cm. long. [*N. geminiflora* Nutt.]—Rich prairies and heavy clay soil on wooded hillsides, Coastal Plain and adj. provinces, La. to Tex., Kan., and Tenn.—Spr.—The flowers of this, like those of most of our iridaceous plants, open in the early forenoon, the perianth lasting for a few hours.



2. N. floridana Small. Plant 4–15 dm. tall, with a bulb usually about 2 cm. in diameter: leaf-blades very narrow and slenderly attenuate, sharply plicate: scape very slender, loosely branched, the branches very slender, often almost filiform: perianth 3–5 cm. wide: sepals elliptic or narrowly elliptic-obovate: petals elliptic: style-branches much longer than the body: capsule obovoid, 1–1.5 cm. long.—Swamps, marshes, and flat-woods, NE coastal region of Fla. —Fall.—The flowers of this autumn flowering plant—our other iridaceous plants being spring-flowering—open about four o'clock in the afternoon and close about six o'clock.

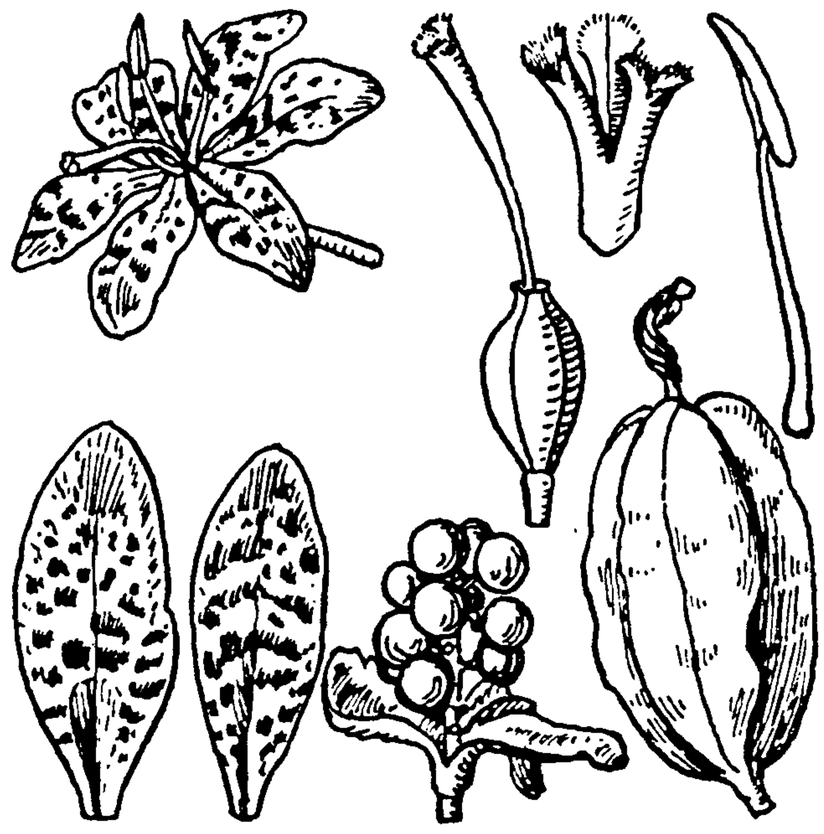
2. **SALPINGOSTYLIS** Small. Herbs with bulbs and usually branching flower-stems. Leaf-blades very narrow, plicate. Flowers 1 or 2 in the terminal erect, spathe. Fowers nodding, slightly zygomorphic: perianth violet except the white "eye," or rarely white, the petals slightly smaller than the sepals. Filaments distinct or nearly so. Anthers not coiled. Style trumpet-shaped. Stigmas 3, reniform, spreading, double-toothed, terminating the short flat, erect style-branches. Capsule erect.—One species.



1. S. coelestina (Bartr.) Small. Plant 2–5 dm. tall, with a bulb 1–1.5 cm. in

diameter: leaf-blades very narrowly linear-attenuate, bluntly plicate: scape very slender, simple or rarely branched: perianth 4.5–6 cm. wide: sepals obovate: petals broadly cuneate or cuneate-obovate: stamens and style nearly or quite 1 cm. long: capsule ellipsoid or ellipsoid-obovoid, 1.5–2 cm. long. [*Ixia coelestina* Bartr. *Nemastylis coelestina* Nutt. in part]—Flatwoods N pen. Fla. and S Ga. (?)—Spr.—The flowers are locally called violets.

3. **BELAMCANDA** Adans. Caulescent herbs with horizontal rootstocks. Leaf-blades folded. Flowers in corymbose cymes. Sepals and petals pink, orange, or reddish, mottled with crimson-purple spots, nearly equal, distinct or nearly so, persistent and coiled on the capsule.—One species.



1. B. chinensis (L.) DC. Stem 3–13 dm. tall: leaf-blades with the faces united above the middle: sepals and petals elliptic, 2.5–3.5 cm. long: capsule 2–2.5 cm. long: seeds black, shining. [*Gemmingia chinensis* Kuntze]—(BLACK-BERRY-LILY. PARDELLE.)—Dry hills, roadsides, and fence-rows, various provinces, Ga. to Tex., Mo., and N. Y. Nat. of China, and cult.—(*W. I.*)—Sum.—An early escape from gardens.

4. **SISYRINCHIUM** L. Perennial scapose usually tufted grass-like herbs, with distinct or obsolete rootstocks and fibrous roots. Leaves basal: blades linear: scapes 2-edged or 2-winged, when branched each node furnished with a bract resembling a leaf-blade: flowers in terminal clusters arising from spathes of mostly 2 bracts each. Perianth blue, white or yellow: lobes spreading. Stamens 3: filaments united to the top or nearly so: anthers clustered. Ovary 3-celled: style-branches filiform, alternate with the anthers, or styles mostly wholly united: ovules few to many in each cavity of the ovary. Capsule subglobose or depressed or longer than thick, globular or angled, readily opening near the apex.—Numerous species, all American.—BLUE-EYED GRASSES. FEVER-GRASSES. IRISETTES.—An interpretation of this genus by the late Eugene Pintard Bicknell, in which are numerous critical species not here included may be found in the Flora of the Southeastern States. This partial revision prepared by Edward Johnston Alexander.

Scape terminated by a sessile or a pair of sessile spathes. I. SESSILES.
Scape terminated by one or more peduncled spathes. II. PEDUNCULATAE.

I. SESSILES

Old leaf-bases not persistent, or if so, merely soft, loose shreds.
  Spathe solitary or normally so.
    Leaf-blades and scapes mostly 1.5–2.5 mm. wide, distinctly winged: capsule 4–6 mm. long. 1. *S. angustifolium.*
    Leaf-blades and scapes mostly less than 1.5 mm. wide, margined or narrowly winged: capsule 2–4 mm. long. 2. *S. mucronatum.*
  Spathes 2 together or rarely 3 or sometimes solitary in no. 5.
    Scape distinctly winged: leaf-blades 1.5–3 mm. wide: spathe and scape smooth and glabrous or nearly so. 3. *S. albidum.*

Scape margined or narrowly winged: leaf-blades 1–2 mm. wide: spathe and scape pubescent with stiff, spicule-like hairs. 4. *S. scabrellum.*

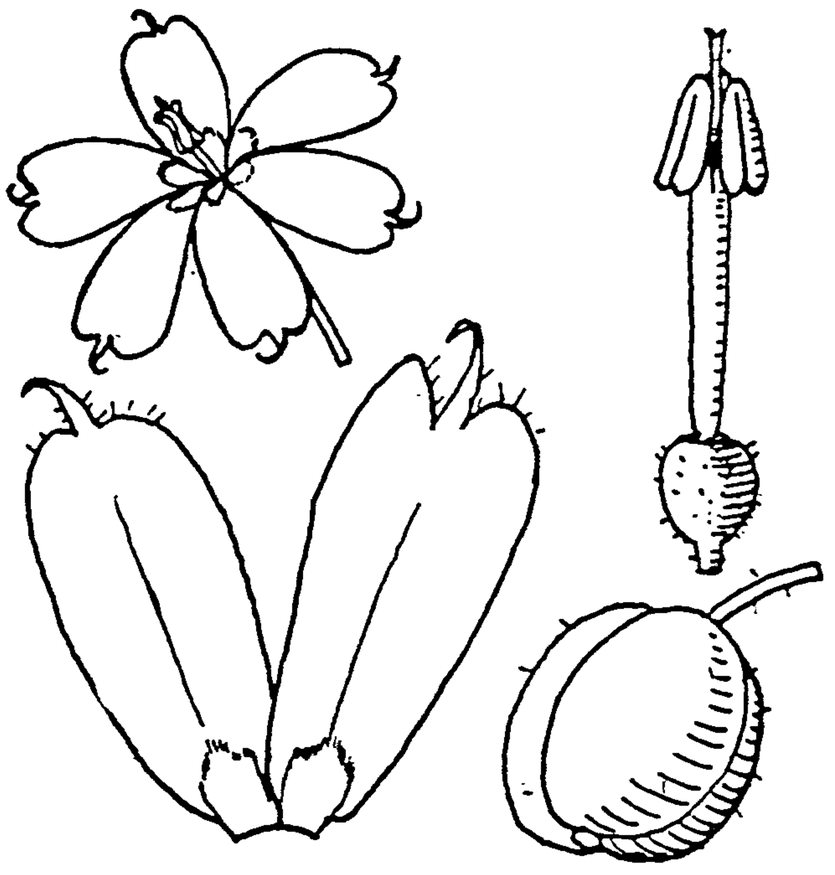
Old leaf-bases persistent, forming dense tufts of straight bristle-like fibers. 5. *S. capillare.*

II. PEDUNCULATAE

Perianth not yellow.
Plant (tuft) erect.
Tufts of plants densely fibrous at the base.
Scape flattened and distinctly winged.
Leaves and spathe-bracts rugose-veined: capsule thick-walled: plant drying dark. 6. *S. xerophyllum.*
Leaves and spathe-bracts not rugose: capsule thin-walled: plant not drying dark. 7. *S. fibrosum.*
Scape margined or narrowly winged.
Plant drying dark.
Flowering scapes serrulate-edged. 8. *S. incrustatum.*
Flowering scapes smooth-edged. 9. *S. fuscatum.*
Plant not drying dark.
Peduncles somewhat fascicled, shorter than the subtending bract. 10. *S. rufipes.*
Peduncles not fascicled, as long as or longer than the subtending bract. 11. *S. floridanum.*
Tufts of plants without fibers or not densely fibrous at the base.
Scape broadly winged. 12. *S. graminoides.*
Scape margined or narrowly winged. 13. *S. atlanticum.*
Plant (tuft) with depressed radially spreading leaves and scapes.
Perianth blue, violet, or purple: capsule subglobose. 14. *S. rosulatum.*
Perianth old-rose: capsule oblong to narrowly obovoid. 15. *S. minus.*
Perianth yellow. 16. *S. Brownei.*

1. S. angustifolium Mill. Plant glaucous, 1–5 dm. tall: leaf-blades 1–3 mm. wide: spathe green or merely purple-tinged, the outer bract with the edges united 3–6 mm. above the base: capsule dull-brown or purple-tinged.—Woods, fields and meadows, various provinces, Ala. to La., Colo., Sask., Ont., Newf., and N. C.—Spr.

2. S. mucronatum Michx. Plant green or glaucescent, mostly 1–4 dm. tall: leaf-blades very slender or up to 1.5 mm. wide: spathe red-purple or rarely green, the outer bract with the edges united a little above the base: capsule stramineous or greenish-yellow.—Meadows, hillsides, and grassy places, various provinces, Fla. to Mich., Ont., and Mass.—Spr.



3. S. albidum Raf. Plant more or less tufted, 1.5–4.5 dm. tall, green or glaucous: leaf-blades mostly 1.5 mm. wide (1.5–3.5 mm.): scapes 1.5–3 mm. wide, often very flat, broadly thin-winged: spathes 2 together, the primary bract 2.5–7 cm. long, much surpassing the others, the edges distinct to the base: perianth 8–12 mm. long, clear white or violet-blue: capsule pale, broadly subglobose, 2–3 mm. long, thick-walled.—Dry or moist soil, often in meadows, various provinces, Ala. to La., Mo., Mich., and N. C.—Spr.

4. S. scabrellum Bicknell. Plant closely tufted, 2.5–4 dm. tall, slightly fibrillose at the base, dull pale-green or glaucescent: leaf-blades 1–2 mm. wide: scapes slender, longer than the leaves, 1–2 mm. wide, flattened: spathes 2, or rarely 3, together, mostly green, the primary bract 3.5–11.5 cm. long, the outer bract attenuate, 1.2–3.8 cm. long, surpassing the inner bracts: perianth pale-blue, 8–12 mm. long.—Hillsides or woods, various provinces, Ga. to N. C.—Spr.

5. S. capillare Bicknell. Plant extremely slender and delicate, 2–4.5 dm. tall, in thin tufts, closely fibrillose at the base, glaucescent, drying a dull olive-

green: leaves almost filiform, 0.5 mm. wide or less: scapes higher than the leaves which they resemble: spathes sessile, mostly in pairs, sometimes solitary, green, bracts nearly equal, 10–13 mm. long, narrowly acute or aculeate: perianth light violet-blue, 6–8 mm. long: capsule pale, subglobose, 2–3 mm. high.—Flat sandy woods, Coastal Plain, Fla. to N. C.—Spr.

6. **S. xerophyllum** Greene. Plant erect, stout, 2–6.5 dm. tall, pale-green and often glaucescent: leaves strictly erect, usually much more than ½ as tall as the scape; blades linear, thick, 3.5–6 mm. wide, or rarely narrower: scape thick, about as wide as the leaf-blades, the wings hyaline-margined: spathes 2–2.5 cm. long: perianth large, about 2 cm. wide: capsule subglobose, 5–8 mm. long. —High pinelands and scrub, pen. Fla.—All year.—The plants dry brown or blackish. The largest and stoutest of our blue-eyed-grasses, and most restricted in range.

7. **S. fibrosum** Bicknell. Plant loosely tufted, 2–3 dm. tall, fibrous-coated at the base, pale and glaucescent, often yellowish-green: leaf-blades 2–5 mm. wide; scapes longer than the leaves, 2–3 mm. wide, broadly winged, the edges mostly serrulate or even ciliolate: spathes 15–20 mm. long, the bracts nearly equal: perianth pale violet-blue, 8–10 mm. long: capsule pale and thin-walled, broadly ovoid, 3–4 mm. high. [*S. carolinianum* Bicknell, not Klatt.]—Woods and fields, various provinces, Fla. to Miss. and N. C.—Spr.

8. **S. incrustatum** Bicknell. Plant 2.5–5 dm. tall, coarsely fibrous at the base, dull-green and glaucescent, drying dark: leaf-blades 1.5–3.5 mm. wide, striate, harshly rugulose-scabrous to densely incrustate-roughened with pale papillae, the edges ciliolate-serrulate: scapes 1.5–3 mm. wide, roughened like the leaves: spathes 1.5–2.5 cm. long, the nearly equal bracts acute to slenderly attenuate: perianth about 8 mm. long: capsule subglobose, dark, 3–4 mm. long.—Moist sandy soil and open grassy woods, Piedmont and Coastal Plain, S. C. to N. C. —Sum.

9. **S. fuscatum** Bicknell. Plant 15–50 cm. high, more or less fibrous at base, dull-green and glaucescent, drying dark: leaf-blades 0.5–2.5 mm. wide: scapes longer than the leaves, 0.75–2 mm. wide, smooth-edged: spathes narrow, the subequal bracts firmly herbaceous, striate, cuspidate-acuminate: perianth about 10 mm. long: capsule 2.5–4 mm. high, broadly subglobose, drying dark.—Sandy soil, Coastal Plain, Fla. to Miss. and Ga.—Spr.

10. **S. rufipes** Bicknell. Plant 1.5–3 dm. tall, with rufous or brown fibers at the base, rather bright-green and glaucescent: leaf-blades 1–2.5 mm. wide: scapes about as tall as the leaves, about 1 mm. wide, narrowly margined, bracteal leaf subtending a cluster of 2 or 3 short-peduncled spathes and sometimes also a short branch: spathes about 12 mm. long, the bracts somewhat divergent: perianth blue, about 8 mm. long: anthers relatively large: capsule about 3 mm. high.—Sand hills, Coastal Plain, Ga. to N. C.—Early Spr.

11. **S. floridanum** Bicknell. Plant tufted, 2.5–5 dm. tall, densely fibrillose at the base, dull-green and glaucescent: leaf-blades 2–3 mm. wide: scapes narrowly firm margined, 2–3 mm. wide: bracteal leaf shorter than the peduncles: spathes green or slightly purplish, 15–20 mm. long, the bracts nearly equal: perianth pale-blue, about 10 mm. long: capsule pale, subglobose, 3–4 mm. high.—Sand, pen. Fla.—Late Wint.–early Spr.

12. **S. graminoides** Bicknell. Plant erect, bright-green, 1.5–6 dm. tall, stoutish: leaves erect, usually about ½ as tall as the scape or less; blades narrowly linear, thinnish, 1.5–6 mm. wide: scape thin, about as wide as the leaf-blades: spathe 1.5–2 cm. long: perianth usually about 1.5 cm. wide: capsule subglobose, 4–6 mm. long, thin-walled. [*S. anceps* (Chapm. Fl.)]—Meadows, wet woods, and grassy places, various provinces, Fla. to Tex., Minn., and Newf.—Spr.–sum.

13. **S. atlanticum** Bicknell. Plant green, often glaucous, 1–7 cm. tall: leaves slender, often wiry, narrowly-margined: spathes green or purplish, 1–2 cm.

long: perianth 8–14 mm. wide: capsule oval to subglobose, 3–5 mm. long.—Fields, moist banks, open woods, pinelands, and edges of salt-marshes, various provinces, Fla. to Miss., Mich., Ont., and Me.—Spr.–sum.—A relatively slender plant of wide geographic range, but variable in the width of the leaves and scapes.

14. **S. rosulatum** Bicknell. Plant rosulate, the branches up to 2 dm. long, often zigzag: leaves 2–8 cm. long, light-green; blades 1.5–2.5 mm. wide: peduncles 2–10 cm. long, slender, but often more broadly winged than the scape: spathes about 2 cm. long: perianth small, about 1 cm. wide: capsule subglobose, pale, but purple-tinged, 2.5–3.5 mm. long.—Sandy, often grassy dunes and meadows, outer part of Coastal Plain, Ala. to S. C.—Spr.—The plants dry green. Unique in its depressed habit.

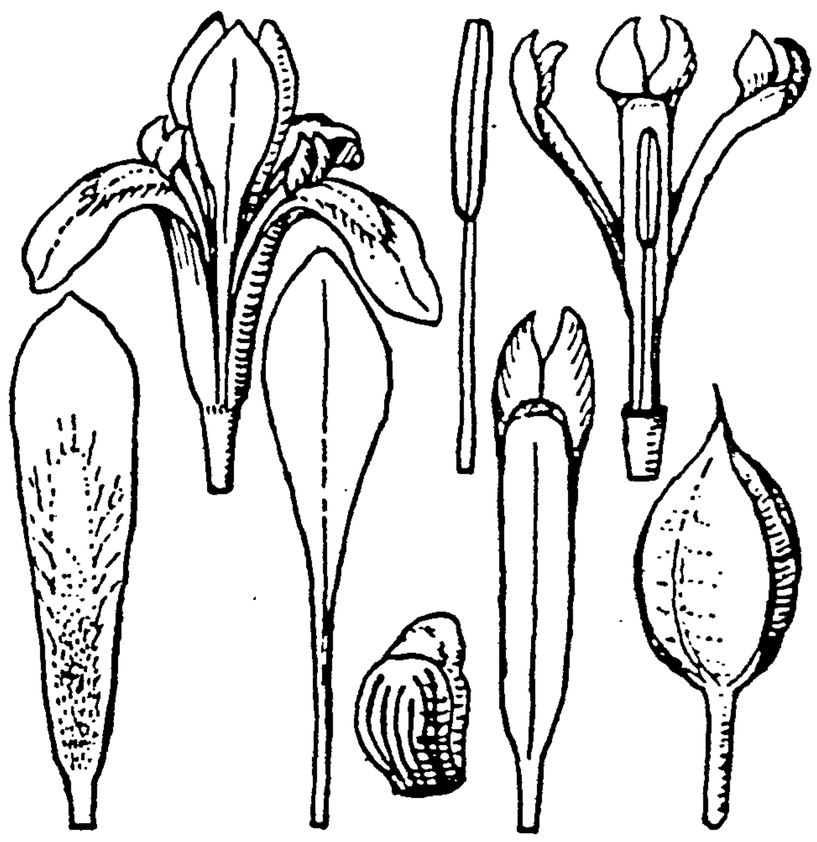
15. **S. minus** Engelm. & Gray. Plant rosulate, in loose tufts, the branches up to 2 dm. long, usually zigzag: leaves 2–7 cm. long, deep-green; blades thin, 1–4 mm. wide: scape branched and leafy from near the base, margined or narrowly winged: peduncle 4–6 cm. long: the larger spathe-bract 1.3–3.5 cm. long: perianth old-rose, barely 1 cm. wide: capsule nodding, light-brown, corrugated, oblong to narrowly obovoid, 3–5 mm. long.—Dry, usually clay soil and prairies, Coastal Plain, La. to cent. Tex.—Spr.

16. **S. Brownei** Small. Plant slightly glaucous, 10–15 cm. tall: leaf-blades 2–3 mm. wide: spathe green, the outer bract with the edges united 1–3 mm. above the base: perianth yellow, 5–7 mm. long, the divisions with a brown nerve without and brown spots at the base within: capsule subglobose, 2–3 mm. long, green with brown stripes.—Low, swampy ground, Coastal Plain, S E La.—Spr.

5. **NEUBECKIA** Alef. Tufted grassy acaulescent herbs of dry woods or rocky ledges, with wiry, more or less knotted rootstocks, the roots fibrous. Leaves imbricate on the flowering branch. Hypanthium-tube elongate, often filiform. Perianth mainly blue or violet, and more or less variegated. Sepals with beaded or papillose crests. Capsules long-stalked, thin-walled. Seeds arillate.—About 12 species, widely distributed in temperate regions.—Albino flowers occur in the several species.—Spr.—DWARF-IRISES.

Sepal with a papillose crest: petals long-clawed: seed with a crest-like aril. — 1. *N. verna.*
Sepal with a beaded crest: petals short-clawed: seed with a caudate aril. — 2. *N. cristata.*

1. **N. verna** (L.) Alef. Leaf-blades narrowly linear, much elongating in age, glaucous, at least on one side, mostly 4–8 mm. wide: flower violet-scented: perianth mainly violet-blue or rarely white: hypanthium-tube scarcely enlarged under the perianth: sepals cuneate or cuneate-spatulate, about 4 cm. long, with a papillose yellow crest extending from the base of the claw well up into the blade and flecked with white along the edges: capsule oval or ellipsoid varying to ovoid or obovoid, 1.5–2 cm. long, slender-beaked, sometimes doubling in size after the seeds mature. [*Iris verna* L.]—(VIOLET-IRIS.)—Open acid woods and dry pinelands, various provinces, Ga. to Miss., Ky., and Pa.—The name violet-iris is quite appropriate. Sandy fields and woods where it abounds look as if dotted with large violets, and, moreover, its delicate fragrance decidedly resembles that of the European sweet-violet.



2. **N. cristata** (Ait.) Alef. Leaf-blades narrowly lanceolate to linear-lanceolate, somewhat elongating in age, often glaucescent, mostly 9–20 mm. wide, usually curved, sometimes falcate: flower faintly scented: perianth mainly pale- or deep-lavender or sometimes white: hypanthium-tube funnel-form under the perianth: sepals cuneate-spatulate to narrowly obovate, 3.5–4 cm. long, with a white or whitish blotch in the beaded crest bordered with violet: capsule ellipsoid or oval, varying to ovoid or obovoid, mostly 1–1.5 cm. long, or sometimes larger, minutely beaked. [*Iris cristata* Ait.]—(CRESTED DWARF-IRIS.)—Rich woods, banks, and cliffs, various provinces, Ga. to Ark. and Md.

6. **IRIS** L.[1] Gregarious reedy acaulescent herbs of swamps and marshes, with fleshy, usually stout rootstocks, the roots fleshy. Leaves basal, elongate, ensiform, mostly erect. Flower-stalk erect or rarely procumbent, with one or more leaf-like bracts. Flowers solitary or several together, each subtended by an involucre of bractlets, which is subtended by a foliaceous bract. Hypanthium-tube short. Perianth violet, blue, red, yellow, or white, often variegated. Sepals without crests or with narrow papillose or hairy crests in the upper part of the claw and the lower part of the more or less variegated blade. Petals shorter than the sepals. Style-branches arching, with a pair of apical inequilateral appendages. Stigma entire or 2-lobed. Capsule thick-walled. Seeds corky.—Fully 100 species, natives of the north temperate zone.—Albino flowers occur in the various species.—FLAGS. BLUE-FLAGS. IRISES. WILD-GLADIOLES.—Some of the species are used by the Seminoles as a remedy for shock following alligator-bite.—Following is an incomplete and necessarily tentative interpretation of the irises of the Gulf States, particularly of the lower Mississippi Delta. A complete interpretation must await further field work and study. Our usual criterion for assigning the status of species is an isolated colony or colonies, the plants persisting through propagation by rootstocks and by an annual accretion of seedlings without showing variation in the characters of the perianth.

Petals present and well developed, nearly as long as the sepals.
  Perianth shades of copper-red, orange-red, salmon or rarely yellow, or even red, usually with an orange cast, but sometimes mauve or lilac; crest not noticeably present except as a midrib of the claw. — I. FULVAE.
  Perianth usually varying from brown-red through red and pink to purple, violet, and lilac to white, sometimes even with an orange cast; crest always present and extending into the sepal-blade.
    Hypanthium surrounding the ovary six-angled: main bract of the terminal involucre with an elongate tip, equalling or exceeding the flower: stigma two-lobed.
      Capsule six-ridged or six-lobed; flower-stalks erect and straight or nearly so.
        Crest of the sepal apparently not present, it and the claw being of the same color as the sepal-blade, the crest therefore indistinguishable. — II. ECRISTATAE.
        Crest of the sepal very apparent as a prominent rib, which is usually some shade of yellow, orange or cream, though sometimes purple or reddish.
      Crest simple, a single ridge in the sepal-blade.

[1] Study of the gulf region irises done with the cooperation of Edward Johnston Alexander. The following interpretation is by Mr. Alexander.

Crest extending but a short distance into the sepal-blade, split downward from the apex by a dark median line. — III. BICRISTATAE.
Crest extending well into the sepal-blade, with an acute or acuminate apex which becomes a dark vein. — IV. UNICRISTATAE.
Crest compound, the median ridge accompanied by one or several additional ones on either side of it.
Crest with one or more laterals on either side of median, but sharply demarked from it, and not radially spreading. — V. LANCICRISTATAE.
Crest with several radially spreading laterals.
Crest-zone not surrounded by a zone of white or paler color, but giving way to sepal-blade color either by merging streaks and dots or by a sharp outline.
Crest median acute or acuminate, not apically cleft. — VI. TRICRISTATAE.
Crest median split downward from the apex by a dark median line. — VII. CORONICRISTATAE.
Crest-zone surrounded by a white or paler colored zone, separating it from the sepal-blade color, and itself either merging in streaks or sharply demarked from the blade color. — VIII. RADIICRISTATAE.
Capsule sharply six-angled; flower-stalks zigzag; erect or reclining. — IX. HEXAGONAE.
Hypanthium surrounding the ovary three-angled; main bract of the terminal involucre much shorter than the flower: stigma not lobed.
Hypanthium and capsule bluntly three-angled; rootstocks stout and fleshy: capsule usually indehiscent, often decaying to release the seeds. — X. VERSICOLORES.
Hypanthium and capsule sharply three-angled; rootstock slender and wiry: capsule dehiscent by three apical valves. — XI. PRISMATICAE.
Petals present, but almost rudimentary and half-hidden by the sepal-claws which far exceed them.
Perianth violet, violet-blue, or white in albinos, sepal-crest not outlined by black streaks. — XII. TRIPETALAE.
Perianth yellow, or cream color in albinos: sepal-crest outlined by black streaks. — XIII. PSEUDACORI.

I. FULVAE

Plant relatively slender, erect: sepals broad with short claws: petals scarcely clawed. — 1. *I. fulva.*

II. ECRISTATAE

Slender plants with purple or red-purple flowers: sepals and petals rather long and slender: the sepals not crested. — 2. *I. ecristata.*

III. BICRISTATAE

Petals drooping immediately upon opening: color of sepal-blade extending down into the upper part of the claw.
Anther-tips exserted: crest clear-colored except for median cleft.
Perianth red, orange-red, or copper-red. — 3. *I. subfulva.*
Perianth mauve, violet, or purple. — 4. *I. regifulva.*
Anther-tips included: crest muddied throughout with dark blotches. — 5. *I. rubea.*
Petals erect or spreading, not drooping until late in the day, if at all: color of sepal-blade and claw markedly distinct.
Perianth roseate. — 6. *I. rosiflora.*
Perianth violet, lavender, or purple.
Perianth lavender or pale-violet.

Perianth lavender: sepal-blade nearly as broad as long. 7. *I. chlorolopha.*
Perianth pale-violet: sepal-blade much longer than broad.
Crest yellowish-green, deeply cleft, extending barely into the base of blade. 8. *I. aclcantha.*
Crest yellow, only notched, extending well into the blade. 9. *I iophaea.*
Perianth deep-violet, red-violet, or purple.
Perianth red-violet. 10. *I. ludoviciana.*
Perianth deep-violet.
Sepal-blade nearly as wide as long. 11. *I. ianthina.*
Sepal-blade much longer than wide. 12. *I. violivenosa.*

IV. Unicristatae

Sepal-crest truly solitary, not even rudimentary laterals present.
Perianth fulvous, orange-red, or orange.
Crest crimson or carmine. 13. *I. pyrrholopha.*
Crest yellow.
Perianth buff or salmon-colored, the veins not prominent. 14. *I. salmonicolor.*
Perianth orange-red or orange: the veins very prominent.
Perianth red or orange-red: crest clear yellow. 15. *I. fulvaurea.*
Perianth pinkish-orange or smoky-orange: crest greenish. 16. *I. fumifulva.*
Perianth otherwisely colored.
Perianth verging towards pink and reddish shades.
Petals drooping: perianth various shades of mauve or pink. 17. *I. fumiflora.*
Petals erect: perianth various shades other than mauve.
Sepal-blade three times as long as claw.
Perianth evenly colored, the flower not fragrant: crest extending nearly half the length of the blade. 18. *I. moricolor.*
Perianth heavily flushed orange on lower portions of sepal-blades, petals, and style-branches: flower rose-scented: crest extending only ⅓ the length of the blade. 19. *I. fuscaurea.*
Sepal-blade not over twice as long as claw.
Perianth intense magenta-purple. 20. *I. purpurissata.*
Perianth not magenta-purple.
Perianth vinaceous. 21. *I. viridivinea.*
Perianth not vinaceous.
Sepal-blade very prominently veined with brown: crest yellow-green. 22. *I. fuscivenosa.*
Sepal-blade not markedly veined: crest dark-yellow. 23. *I. crocinubia.*
Perianth violet or lavender.
Sepal-blade sharply differentiated from claw.
Perianth lavender or white. 24. *I. miraculosa.*
Perianth dark violet-blue. 25. *I. atrocyanea.*
Sepal-blade tapering gradually into claw. 26. *I. tyriana.*
Sepal-crest not truly solitary, rudimentary laterals present.
Perianth violet-purple or rose: sepal-blade fully 3 times as long as the claw. 27. *I. violipurpurea.*
Perianth wine-red: sepal-blade not over twice as long as claw. 28. *I. vinicolor.*

V. Lancicristatae

Crest present as a raised ridge.
Crest-laterals only one well-developed on either side.
Perianth some shade of rose, red, or brown-red.
Perianth not markedly veined.
Crest-laterals standing out very sharply from blade-color: perianth orange-rose. 29. *I. rosilutea.*
Crest-laterals indistinctly outlined: perianth brownish-rose. 30. *I. fuscirosea.*
Perianth markedly veined.
Perianth rosaceous, flushed with pale orange near base of blades.

Perianth veined red-brown over old-rose: crest laterals not extending into claw. 31. *I. rubicunda.*
Perianth flush-veined, flushed pale salmon on lower edges of petals and sepals: crest laterals extending into claw. 32. *I. cerasioides.*
Perianth rose-lilac, flushed with lavender near base of blade. 33. *I. rosipurpurea.*
Perianth red-purple, purple, violet, or lilac.
Perianth red-purple or lilac.
Perianth lilac.
Sepal-blade nearly as broad as long, the base pale: crest-laterals very narrow; perianth pale-lilac. 34. *I. regalis.*
Sepal-blade much longer than broad, the base not pale: crest-laterals broad; perianth deep-lilac. 35. *I. lilacinaurea.*
Perianth red-purple or red-violet.
Crest extending scarcely at all into sepal-blade; laterals, if present, very narrow and indistinct. 36. *I. fourchiana.*
Crest extending well into sepal-blade; laterals usually present and distinct. 37. *I. oenantha.*
Perianth violet or violet-blue.
Crest yellow: anthers not bifurcate: flower not fragrant.
Perianth markedly dark-veined.
Crest-laterals deep-yellow, the zone at the junction of claw and blade dark: outside of sepals greenish-yellow. 38. *I. iocyanea.*
Crest-laterals white or cream, the claw nearly white, as also the zone at the junction: outside of sepals nearly white. 39. *I. ioleuca.*
Perianth not markedly veined. 40. *I. cyanantha.*
Crest greenish: anthers bifurcate: flower very fragrant. 41. *I. bifurcata.*
Crest-laterals 2 or more well-developed on either side.
Perianth red-lilac or rose-lilac. 42. *I. rubrolilacina.*
Perianth violet, blue-violet, or lavender.
Perianth violet or blue-violet.
Crest-laterals the same color as the crest: sepal-blade about twice as long as claw.
Perianth light-violet: sepals spreading. 43. *I. viridis.*
Perianth deep-violet: sepals recurved. 44. *I. citriviola.*
Crest-laterals paler than crest: sepal-blade about 3 times as long as claw.
Crest lemon: sepal-blade entire. 45. *I. iodantha.*
Crest orange-yellow: sepal-blade erose-margined. 46. *I. gentilliana.*
Perianth lavender. 47. *I. lancipetala.*
Crest present as a groove, but colored light-yellow. 48. *I. pseudocristata.*

VI. Tricristatae

Crest-zone not sharply demarked from the sepal-color, but merging gradually into it. 49. *I. rhodantha.*
Crest-zone sharply demarked from the sepal-color.
Crest-laterals well developed, their color extending upward from the claw.
Crest-laterals separated from the median and from each other by veins or bands of another color.
Perianth dull-rose, the crest-laterals very narrow and not prominent. 50. *I. parvirosea.*
Perianth red-purple or maroon, the crest-laterals broad and prominent. 51. *I. Marplei.*
Crest-laterals merging into the median and all together forming a triangular color-blotch at base of sepal-blade.
Perianth verging towards rose and red shades.
Perianth rose or roseate.
Perianth intensely colored: crest evenly colored.

Crest clear yellow: sepal-blade abruptly tapering to claw.
Sepals brilliant carmine-rose, tawny-flushed: petals pale salmon-pink. 52. *I. callirhodea.*
Sepals and petals dull-rose. 53. *I. rhodochrysea.*
Crest olive-yellow: sepal-blade gradually tapering to claw. 54. *I. DéWinkeleri.*
Perianth pale-colored: crest yellow at center, pale elsewhere. 55. *I. pallidirosea.*
Perianth purple or red-purple.
Crest orange-yellow; crest-zone a shortly radial, unspotted area. 56. *I. Thomasii.*
Crest lemon; crest-zone lanceolate, spotted and streaked. 57. *I. amnicola.*
Perianth verging towards violet or violet-blue. 58. *I. cyanochrysea.*
Crest-laterals only short streaks or spot-like, their color not extending upward from the claw.
Perianth deep-violet. 59. *I. iochroma.*
Perianth maroon, magenta, or vinaceous.
Sepal-claw pale, dark-veined only above. 60. *I. atroenantha.*
Sepal-claw dark, dark-veined all over, except median rib. 61. *I. fuscisanguinea.*

VII. Coronicristatae

Crest-radials extending but little into the sepal-blade.
Perianth heavily streaked and spotted with creamy-lavender. 62. *I. albilinea.*
Perianth, if streaked and spotted, so marked by yellow, orange, or brownish.
Radial-zone gradually merging into sepal-color with no distinct outline.
Perianth brown-violet or brown-red: style-branches with yellow wings. 63. *I. auralata.*
Perianth red-violet or purple: style branches not yellow-winged. 64. *I. phoenicis.*
Radial-zone clearly demarked from sepal-color, not merging into it.
Crest median merely notched at apex: laterals forming a straight-sided triangular blotch. 65. *I. violilutea.*
Crest median deeply cleft at apex: laterals not forming a straight-sided triangle.
Crest-laterals forming an elliptic blotch, not streaking into the blade-color. 66. *I. oolopha.*
Crest-laterals radiating into the blade-color. 67. *I. chrysolopha.*
Crest-radials streaked and blotched well into the sepal-blade.
Only the mid-portion of crest yellow, the lateral portions all flushed and overstreaked with brown. 68. *I. chrysaeola.*
Entire radial zone of crest yellow, the lateral portion sometimes brown or violet-spotted on margins.
Radial streakings confined to lower-central half of sepal blade.
Radial zone light-yellow, the radial outline clearly demarked from the sepal-color. 69. *I. chrysophoenicea.*
Radial zone deep-yellow, the radial outline streaked into, and itself streaked with the sepal-color. 70. *I. callilopha.*
Radial streakings extending all over blade. 71. *I. schizolopha.*

VIII. Radicristatae

Capsule six-ribbed: species Floridian.
Perianth white, except the yellow crest. 72. *I. Albispiritus.*
Perianth colored.
Style-appendages shallowly obluntly toothed, capsule 6-ribbed. 73. *I. savannarum.*
Style-appendages deeply and sharply toothed, capsule bluntly 6-sided. 74. *I. Kimballiae.*
Capsule six-lobed: species not Floridian.
Sepal-blade longer than the claw.
Perianth ivory-white: sepal-crest with lateral veinings of lemon or greenish yellow. 75. *I. elephantina.*
Perianth colored, or if white, with no greenish veinings.
Crest-zone nearly white, crest-median yellow: perianth pale with lilac veins. 76. *I. venulosa.*

Crest-zone yellow as well as crest-median, then outlined white: perianth not markedly veiny.
Crest-zone color extending upwards from the claw.
Crest-zone sharply demarked, not overflushed with darker color, and unspotted.
Crest yellow or orange, separated from the sepal color by a zone of white.
White zone completely surrounding the sepal-crest, and streaked and flecked into the sepal blade color. — 77. *I. giganticaerulea.*
White zone only at base of crest and streaked very slightly into the sepal-blade: the crest median extending into the blade with only a dark outline and not paler zone. — 78. *I. paludicola.*
Crest lemon or yellow, with a pale-yellow or pale-lemon zone, but no white zone.
Crest extending ⅓ or less the length of the sepal-blade, the median ridge not markedly raised.
Perianth red-violet: sepal-crest orange-yellow with pale-yellow crest-zone. — 79. *I. Wherryana.*
Perianth violet, or violet blue; sepal-crest lemon with pale-lemon crest-zone. — 80. *I. citricristata.*
Crest extending fully ½ way down the sepal-blade, the median ridge very markedly raised. — 81. *I. alticristata.*
Crest-zone not at all demarked, overflushed with darker color, and heavily spotted. — 82. *I. aurilinea.*
Crest-zone color only on sepal-blade, not extending upwards from claw. — 83. *I. fluviatilis.*
Sepal-blade and claw of equal length. — 84. *I. parvicaerulea.*

IX. Hexagonae

Stem flower-bearing on the upper part, erect: sepal-blade oval.
Style-appendages half-ovate: claw of the sepal yellow-green without: foliage yellow-green.
Crest of the sepal surrounded by a zone of radial white streaks extending into the lower third of the blade: perianth rich-violet. — 85. *I. hexagona.*
Crest of the sepal accompanied near the base of the blade with a narrow zone of yellow streaks, these not surrounded by white, but spotted with violet near the base of the blade: perianth violet-blue. — 86. *I. alabamensis.*
Style-appendages lanceolate: claw of the sepal deep-green without: foliage deep-green. — 87. *I. rivularis.*
Stem flower-bearing from near the base, decumbent or prostrate: sepal-blade ovate.
Petals with long, slender claws: plants with long, large leaves, which usually lie on the ground at flower time. — 88. *I. foliosa.*
Petals with short, broad claws: plants with relatively short, narrow leaves, which are erect or nearly so at flowering time.
Sepal-blade ovate; crest-median extending beyond the white zone. — 89. *I. brevipes.*
Sepal-blade orbicular-ovate; crest-median exceeded by the white zone. — 90. *I. mississippiensis.*

X. Prismaticae

Very slender gregarious plants with grass-like leaves, the brightly variegated sepals with slender claws: rootstock wiry, with brown scales. — 91. *I. prismatica.*

XI. Versicolores

Seeds in two rows in each carpel: sepal-blade orbicular-ovate, crestless, with very short zone of yellow-green extending but little if at all into the blade: perianth violet to purple.
  Sepals and petals with broad claws much shorter than the blades: petals much shorter than the sepals: style-appendages undulate-angulate. — 92. *I. versicolor.*
  Sepals and petals with narrow claws nearly or quite as long as the blades: petals slightly shorter than the sepals: style-appendages incised. — 93. *I. Shrevei.*
Seeds in one row in each carpel: sepal-blade obovate, oval, or elliptic or nearly so, usually slightly crested, the crest papillose, with a zone of yellow or orange-yellow extending far into the claw from one-third to nearly one-half its length: perianth light-violet to lavender or whitish (very rarely violet). — 94. *I. virginica.*

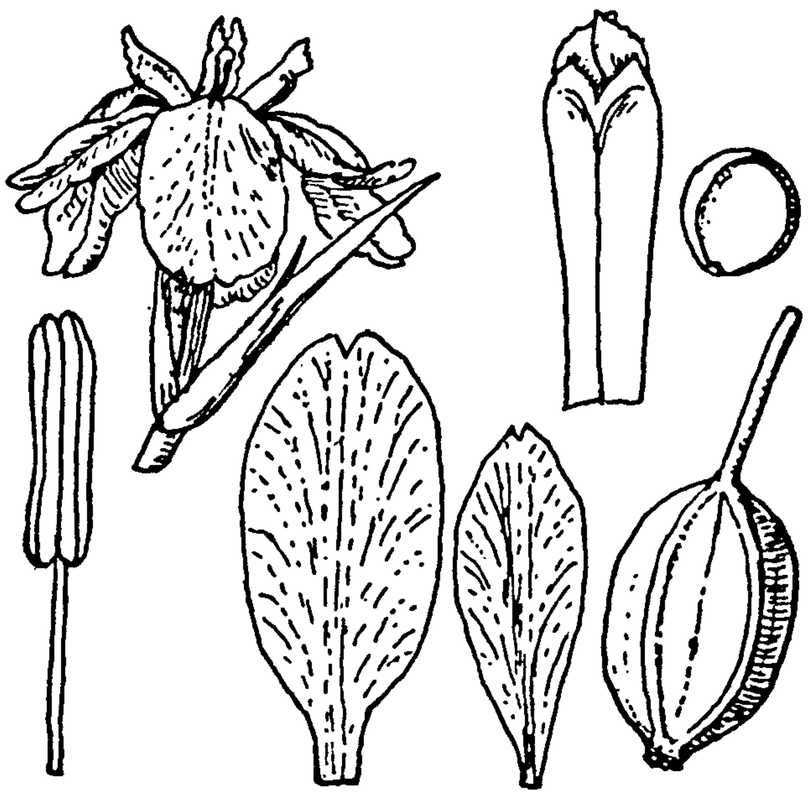
XII. Tripetalae

Relatively slender plants with stout cord-like rootstocks: sepal-blade suborbicular or oval, with yellow blotch at the base: petals entire or slightly 3-lobed, much shorter than the sepal-claw. — 95. *I. tripetala.*

XIII. Pseudacori

Plants with bright-yellow flowers, or cream colored in albinos: leaves overtopping the inflorescence. — 96. *I. Pseudacorus.*

1. I. fulva Ker. Flower-stalk erect, mostly 0.5–1.5 m. tall, slightly zigzag: flowers slightly fragrant: hypanthium covering the ovary sharply 6-angled: sepals red, either pale, often copper-colored, or dark, or rarely yellow, 5–8 cm. long, spreading-arching, the claw red, the blade oval or oval-obovate, crestless or nearly so: petals arching or drooping, colored like the sepals, about two-thirds as long as the sepals, narrowly obovate to elliptic-obovate or cuneate-obovate, not clawed: capsule ellipsoid to oval, 4.5–8 cm. long, 6-angled. [*I. cuprea* Pursh]—Swamps, marshes, bayou-banks, and ditches, Coastal Plain and rarely more northern provinces, Ga. to E Tex., Mo., and Ky.—Spr.—The shades of color through which this species ranges seem endless. They are various shades of orange, salmon, copper, salmon-pink, salmon-red, crimson, and scarlet, many of them curiously streaked. A yellow-flowered form furnishes the only true yellow among our native eastern irises.



2. I. ecristata Alexander. Flower-stalk erect, strict: flowers scarcely fragrant: sepals 8–9 cm. long, arching: the claw greenish-yellow veined with yellow-green, the blades spatulate, about twice as long as the claw, wine-red to wine-purple, irregularly veined with brownish-purple, crestless, but the midrib of the claw extending into the blade as a dark red-purple band: petals somewhat shorter than the sepals, wine-red to wine-purple, except the yellow base of the claw: capsule not seen.—Swamps, ditches, and bayous, S La.—Spr.

3. I. subfulva Small. Flower-stalk erect, rigid: sepals recurved, 7–8 cm. long, the claw yellow, its wings pencilled and flushed brown-red, the blade intense orange-red, sometimes paler or darker, rather veiny, the central zone darker, the crest yellow, split nearly to the base of the sepal-blade by the dark median vein: petals orange-red, somewhat veiny: style-branches dark orange-red, paler on the sides and wings, the wing-margins yellowish; appendages flushed yellow: anther-tips exserted: capsule not seen.—Swamps, marshes, and ditches, S La.—Spr.

4. I. regifulva Alexander. Flower-stalk erect, slender, strict: sepals recurved-spreading, about 7 cm. long, the claw dull orange-yellow at base, its wings apricot, heavily flushed and veined red-purple, the blade royal-purple, scarcely veined, with a median band slightly darker, the crest beginning as a greenish-yellow midrib in the claw and extending into the basal part of the blade where it becomes dull-yellow and is finally split apically by the dark blade-median which replaces it: petals magenta-purple, somewhat shorter than the sepals: style-branches light rose-purple, wing-margined, light-yellow; appendages dark red-purple above, magenta-purple beneath: anther-tips exserted: capsule not seen.—Swamps and marshes, S La.—Spr.

5. I. rubea Alexander. Flower-stalks erect, stiff: sepals reflexed, about 7 cm. long, the claw yellow, its wings veined and streaked with orange-brown, the median rib yellow-green, the blade a dark ruby color veined darker, with a triple median vein of black-crimson and slightly flushed orange on and near lower margin; crest merely the yellow tip of the claw-midrib, but nearly obscured by reason of many splotches and streaks of brown which cover it: petals drooping, brownish-ruby, the lower half flushed and streaked brown-orange: style-branches brownish-ruby, their wings pink-margined: appendages brownish-ruby above, orange-flushed beneath: anther-tips included: capsule oval, about 8 cm. long, 6-angled.—Swamps and marshes, S La.—Spr.

6. I. rosiflora Small. Flower-stalk strict, rigid: flowers slightly fragrant: sepals 7–8 cm. long, spreading, the claw suffused with cream-color or pale yellow-green and brownish-veined, the blade obovate to suborbicular, much longer than the claw, often nearly twice as long, old-rose-lilac and deeper-veined, the crest pale-yellow, apically cleft and replaced by a brown-orange band: petals spatulate, much shorter than the sepals, the claw suffused with pale-yellow, especially near the base, and brownish-veined, the blade usually paler than the sepal-blade: style-branches lilac-rose, the appendages the same color, lacerate-toothed: anther-tips included: capsule not seen.—Marshes, bayous, and ditches, S La.—Spr.

7. I. chlorolopha Small. Flower-stalk strict: flowers not fragrant: sepals 7–8 cm. long, recurved-spreading, the claw suffused with yellow-green, the blade of a lavender ground-color, faintly veined darker lavender and with a light reddish-violet central band, the crest olive-yellow, deeply cleft apically by a brownish vein: petals spatulate, considerably shorter than the sepals, the claw suffused with light-green, the blade paler than the sepal-blade, becoming pinkish toward the base: style-branches salmon, the wings flushed pale reddish-violet, the body irregularly and faintly so flushed; appendages pale lavender-violet, flush-streaked reddish-lavender, deeply lacerate-toothed: anther-tips included: capsule not seen.—Swamps and bayou-banks. S La.—Spr.—In the sunlight, the flower of this species has a decidedly silvery cast.

8. I. acleantha Small. Flower-stalk erect, stiff: sepals reflexed, about 8 cm. long, the claw lemon-yellow, veined yellow-green, the blade a dull, smoky, shade of pale red-violet, irregularly flushed drab, the crest greenish-lemon, apically split by a dull brown-purple vein, a few irregular lemon markings running up from the claw into the base of the blade: petals smoky, light gray-violet, grayish-flushed above, lower half irregularly flushed drab, the lower claw pale olive-drab: style-branches greenish-yellow, the wings yellow, the sides dull, smoky violet-flushed; appendages light, smoky red-violet, flushed drab above, coarsely lacerate-toothed, below smoky-lavender flushed yellowish: anther-tips included: capsule not seen.—Swamps and marshes, S La.—Spr.

9. I. iophaea Alexander. Flower-stalk erect, rigid: sepals spreading, about 8 cm. long, the claw creamy, veined greenish, the veins and the wing-veins pencilled and flushed with lavender, the blade smoky lavender-violet, with a

median band of smoky red-violet, the central vein of which notches the tip of the solitary yellow crest, cream streaks are extended into the basal portion of the blade from the claw, this portion is also drab-flushed, the entire blade is veined somewhat more dark than the ground-color: petals light smoky lavender-violet, slightly veiny, flushed orange-drab in the claw: style-branches greenish at the base, becoming a somewhat roseate shade of smoky lavender-lilac above, the wings and lower portion apricot-flushed; appendages coarsely but deeply and regularly lacerate-toothed: anther-tips included: capsule not seen.—Swamps and marshes, S La.—Spr.

10. I. ludoviciana Small. Flower-stalk erect, rigid and strict: sepals recurved or recurved-spreading, 7–8 cm. long, the claw yellow, veined brown-red, the blade dull red-violet, rather veiny, the crest light-yellow, deeply apically cleft by a dark brown-purple vein, the 1 or 2 laterals very narrow, not radial: petals dull red-purple, flushed red-violet towards center, the claw-channel flushed orange, its wings yellow-margined: style-branches rosy-purple, faintly orange-flushed especially towards the base, the wings margined yellow; appendages smoky rose-purple, flushed orange: anther-tips slightly exserted: capsule not seen.—Swamps, marshes, ditches, and bayou-banks, S La.—Spr.

11. I. ianthina Alexander. Flower-stalk erect, rigid: sepals reflexed-spreading, 7–8 cm. long, the claw cream, veined red-violet, the midrib light-olive, streaked pale red-violet, the blade nearly orbicular, dark-violet, faintly veined, but some veins of red-purple are distinguishable in the lower and central portions; the crest split completely into the claw by a violet-black streak, a few pale-olive streakings showing on its sides: petals violet, flushed reddish near the base: style-branches dark purple-violet: appendages violet, lacerate-toothed: anther-tips included: capsule not seen.—Swamps and marshes, S La.—Spr.

12. I. violivenosa Small. Flower-stalk erect, stiff: sepals spreading, about 8 cm. long, the claw greenish-white with green veins, its wings sparsely violet-veined, the blade dark-violet, almost black in a median band which terminates and splits the yellow-green crest; creamy streaks, over-veined with violet are flushed into the base of the blade: petals nearly as long as sepals, the blade reddish-violet, flush-veined red-purple near the margin, and bluish-purple towards the channel, the claw nearly white, flushed lavender and veined purplish-red, the channel greenish-yellow: style-branches greenish, flushed purplish on the upper part of the keel; appendages finely lacerate, pale rosy-purplish, flushed pale blue-violet: anther-tips included: capsule not seen.—Swamps and marshes, S La.—Spr.

13. I. pyrrholopha Alexander. Flower-stalk erect, strict and rigid: sepals recurved, about 7 cm. long, the claw yellow, veined darker, its wings dark-pencilled and flushed, as also part of the body, the blade orange-red, pinkish, or salmon, usually dark-veined, the crest solitary, crimson or carmine, the color continuing as a median band on to the apex of the blade: petals colored like the sepal-blade, but paler, the channel and claw portion yellowish or salmon flushed: style-branches orange or fulvous, the keel darker, the body and wings flushed yellow; appendages pinkish or reddish, flushed orange or salmon: anther-tips slightly exserted: capsule not seen.—Swamps, marshes, ditches, and bayou banks, S La.—Spr.

14. I. salmonicolor Small. Flower-stalk strict: flowers fragrant: sepals spreading, the claw lemon-yellow, the color flushing up into base of blade, the blade opening dark-buff with yellow-brown veins, fading to pale-pinkish with orange veins, the crest greenish-yellow, becoming brown-lilac at the tip: petals pale pinkish-buff veined light-orange, the channel of the claw flushed pink: style-branches yellow, fringed along margins: tips of the anthers exserted: capsule not seen.—Marshes, S La.—Spr.

15. I. fulvaurea Small. Flower-stalk erect, straight, rather slender: sepals spreading, the claw apricot-yellow veined dark-crimson, the blade crimson-scarlet, veined darker and flushed apricot near the base, the crest single, bright-yellow to red-orange: petals apricot, flushed and veined with crimson, the claw apricot: style-branches salmon-pink: anther-tips exserted: capsule not seen.—Bayous, marshes, and ditches, S La.—Spr.

16. I. fumifulva Small. Flower-stalk erect, stiff: sepals recurved-spreading, 6–7 cm. long, the claw yellow with green midrib, its side- and wing-veins pencilled with brown, the yellow color of claw flushed into the basal portions of the blade; blade smoky salmon-pink, veined with brown-red, the crest light-yellow, surrounded by a zone of crimson-brown, and finally becoming a crimson brown median band: petals light-salmon, over-flushed pink, especially around central portion, the whole veined rose-brown, a median band of orange-yellow running the length of the petal, but widening as it descends until it covers the entire claw: style-branches green at base, the sides further up pale greenish-orange, the wings pink-flushed especially above, the entire keel dull rosy-purple: appendages dull smoky salmon-pink, flushed dull orange: anther-tips included: capsule not seen.—Swamps, marshes, ditches, and bayou-banks, S La.—Spr.—Probably of hybrid origin, but now widespread.

17. I. fumiflora Alexander. Flower-stalk erect, slender, rigid: sepals recurved-spreading or spreading, 7–8 cm. long, within, the claw light greenish-yellow, faintly pencilled on its wings with lavender, the blade mauve or orchid, often with a pink cast, not very prominently veiny, the crest solitary, yellow; without, dull mauve, overlain greenish-yellow on crest region and claw: petals mauve-pink, the lower third smoky, pale buff or salmon: style-branches pale salmon or ecru; appendages smoky salmon-pink, shallow-toothed, flushed pale-orange below: anther-tips exserted: capsule not seen.—Swamps, marshes, bayou-banks, and ditches, S La.—Spr.

18. I. moricolor Small. Flower-stalk rigid: sepals 7–8 cm. long, recurved-spreading; the claw rather short and broad, dark-yellow, flecked and veined with red-violet, the blade oval, much longer than the claw, crimson-maroon veined darker, the crest a single rather prominent ridge of intense yellow, extending into the blade for nearly half of its length: petals broadly spatulate, slightly shorter than the sepals, the claw brownish-apricot, the blade crimson maroon, with a median darker line: style-branches dull purplish old-rose with greenish-yellow margins, the under side yellow-green flushed with old-rose, the appendages obliquely ovate, about 1 cm. long, purplish old-rose, shallow-toothed: capsule ovoid or ellipsoid-ovoid, 6–8 cm. long, 6-ridged-angled.—Bayous and marshes, S La.—Spr.—This is one of the darkest colored and richest of the "reds" yet seen.

19. I. fuscaurea Small. Flower-stalk erect: flowers rose-scented: sepals 7–8.5 cm. long, spreading, firm, the claw flushed with apricot and veined and pencilled orange-brown, with the midrib pale yellow-green, the blade brown-lilac, the lower portion apricot-flushed, especially towards the margin, dark brown-lilac about and beyond the very narrow bright-yellow crest: petals cuneate-spatulate, much shorter than the sepals, the claw with brown-lilac lines and orange margins, the blade flushed with apricot at the base, brown-lilac beyond: style-branches rosy-brown-lilac, the wings yellow; appendages slightly darker-colored, flushed apricot beneath: anther-tips included: capsule not seen.—Ponds and swamps. S La.—Spr.

20. I. purpurissata Small. Flower-stalk erect, rigid: sepals recurved-spreading, within, the claw greenish-white, veined magenta, especially on the wings, the blade ecclesiastic-purple or brilliant magenta-purple, the crest lemon, beyond the yellow green in claw, solitary, but surrounded by a zone of purple veins;

without, dull-plum, overlain light, silvery-green on crest and claw, the claw also speckled purple: petals somewhat paler than the sepals, the claw-wings cream near the base: style-branches and appendages about the same magenta as the petals, the wings paling to the margin, the body white at the base on both sides: anther-tips exserted: capsule not seen.—Swamps and marshes, S La.—Spr.

21. **I. viridivinea** Small. Flower-stalk slender, erect: sepals spreading or recurving, the claw greenish-yellow veined brown, and flushed and splotched red-brown, deep-cream flushings at its upper end extend into the base of the blade heavily veined brown-purple, the blade red-violet or vinaceous, flecked with violet and with purplish-brown veins, the crest greenish-yellow or yellow-green, blackish tipped, eventually becoming a red-violet streak with a red-violet eye zone around the blackish tip: petals red-violet, flushed bluish-lilac in the median part: style-branches light brown-lilac, becoming cream on the margins: capsule not seen.—Marshes, ditches, and bayous, S La.—Spr.—This may prove, upon further study, to contain more than one species.

22. **I. fuscivenosa** Small. Flower-stalk erect and stiff, slender: sepals reflexed, about 8 cm. long, the claw orange-cream, veined yellow-green, the veins and those of the wings pencilled with rose-brown, the blade dull rose heavily and prominently veined rose-brown, flushed down the center band and all over lower third with brown-orange, the crest lemon-green, solitary, the brown veins coming so close together around it as to make a dark central zone: petals light old-rose, veined in channel with rose-orange, lower half rose-orange veined and flushed rose: style-branches dull old-rose, flushed dull pinkish-orange on the sides, the keel dark old-rose, the appendages old-rose, slightly flushed orange-rose: anther-tips included: capsule not seen.—Swamps and marshes, S La.—Spr.

23. **I. crocinubia** Alexander. Flower-stalk erect, stiff and slender: sepals recurved, about 6 cm. long, the claw dull orange-green-veined at the base, veins above clouded over with orange and vein-pencilled rose-brown, the blade smoky lavender-old-rose on outer third, but entire lower two-thirds so heavily clouded over and flushed with dull orange as to almost completely obscure its color, some of these cloudings extend nearly to the apex, the crest solitary, orange-yellow, completely outlined with red-violet: petals smoky gray-pink, clouded and flushed on the lower third with brown-orange: style-branches dull purplish-rose on the keel, the body flushed brown-orange, the wings dull pale-orange; appendages purplish old-rose, irregularly toothed: anther-tips included: capsule not seen.—Swamps and marshes, S La.—Spr.

24. **I. miraculosa** Small. Flower-stalk rigid, strict: flowers slightly fragrant: sepals 10–12.5 cm. long, recurved-spreading, the claw suffused and lined with green, the blade elliptic, oval, or oval-obovate, lavender or white, the prominent crest bright-yellow: petals spatulate or cuneate-spatulate, somewhat shorter than the sepals, white or lavender beyond the greenish-tinged base: style-branches greenish-white, the wings white, faintly flushed pale-lavender; appendages lavender, shallowly lacerate-toothed: anther-tips included: capsule oval, ellipsoid, or obovoid, 6.5–9 cm. long, 6-lobed.—Swamps and ditches, S La.—Spr.

25. **I. atrocyanea** Small. Flower-stalk rigid, strict: flowers fragrant: sepals 7.5–9.5 cm. long, spreading or recurved-spreading, the claw suffused with yellowish-green and with often whitish margins, the blade orbicular-oval or orbicular-ovate, dark violet-blue, the narrow crest yellow: petals broadly spatulate, somewhat shorter than the sepals, the cuneate claw shorter than the blade, greenish at the base, tinged with red-violet above, the blade deep violet-blue and often with dark lines at the base: style-branches red-purple; appendages irregularly lacerate-toothed: capsule ellipsoid or nearly so, 8–10 cm. long, 6-lobed.—Swamps, ditches, and bayou-banks, S La.—Spr.

26. I. tyriana Small. Flower-stalk erect, strict and rigid: sepals recurved-spreading, within, the claw pale orange-cream veined brown, the blade rich violet-purple, flushed around the crest zone pale, dull reddish purple, the crest greenish-yellow, solitary, with the brown veinings of the claw extending up and radiating into the crest zone; without dull slaty-violet, crest and claw overlain pale creamy-green: petals a slightly more bluish cast of purple than the sepal, flushed orange-cream on the claw wings and near base, outside a mid-band of greenish-white: style-branches light red-violet, pale yellow-green at base, the keel purplish-pink, the wings pale-salmon, flushed reddish near apex; appendages dull red-violet, flushed pinkish-purple near base, sharply lacerate toothed: anther-tips included: capsule not seen.—Swamps and marshes, S La.—Spr.

27. I. violipurpurea Small. Flower-stalk rigid, strict: flowers slightly fragrant: sepals 7–11 cm. long, spreading or recurved-spreading, the claw suffused with green, and veined brown-violet, its wings orange-cream, pencilled red-violet, the blade about twice as long as the claw, elliptic or ovate-elliptic, violet-purple, the crest yellow, its rudimentary laterals barely reaching the base of the blade: petals spatulate, much shorter than the sepals, the claw yellowish only at the base, the blade violet-purple and dark-lined at the base: style-branches red-purple, the wings greenish; appendages red-purple, shallowly lacerate-toothed: anther-tips included: capsule oval or ovoid-oval, 7–9 cm. long, bluntly 6-lobed.—Marshes, swamps, and bayous, S La.—Spr.

28. I. vinicolor Small. Flower-stalk erect, strict: flowers slightly fragrant: sepals 7.5–8.5 cm. long, recurved-spreading or drooping, the claw yellow-green at the base, above dull orange-flushed, veined and pencilled brown-violet; the blade vinaceous-purple, especially dark about the narrow yellow crest: petals broadly spatulate, much shorter than the sepals, the claw greenish-yellow and somewhat lined, the blade vinaceous-purple and somewhat suffused with yellow-green at the base: style-branches dull reddish-purple, the wings pale-orange; appendages red-purple, finely erose-toothed: anther-tips included: capsule ellipsoid or obovoid-ellipsoid, 5–7.5 cm. long, sharply 6-angled.—Swamps and bayou banks, S La.—Spr.

29. I. rosilutea Alexander. Flower-stalk erect, stiff, but rather short: sepals reflexed, about 7 cm. long, the claw yellow, its wings penciled and flushed with orange-pink, the blade opening orange-rose, but soon fading to a light but dull rosy-pink, the crest bright-yellow with a single bright-yellow lateral on either side, the median finally becoming a brown vein: petals opening orange-rose, but central and lower blade portions light rosy-purple, the whole fading to the same color to which the sepals fade: style-branches pinkish-orange on the sides, the wings flushed old-rose and margined yellow, the keel purplish rose, which color is flushed on the upper portion of the body, orange-rose beneath, flushed purplish-rose above; appendages deeply toothed, especially near the tips; anther-tips included: capsule not seen.—Swamps and marshes, S La.—Spr.

30. I. fuscirosea Small. Flower-stalk erect, strict, rigid: sepals slightly recurved, 7–8 cm. long, the claw pale-olive, veined darker, the claw-wings pencilled and streaked with brown-rose, the blade dark, brownish old-rose vein-streaked darker, the crest orange-yellow, one lateral of same color on each side, but half obscured by brown-rose blotchings and suffusions: petals dull old-rose wrinkle-streaked darker, the claw-channel olive, as also is the claw-base: style-branches greenish old-rose, the wing margins pale olive-yellow; appendages dull, pale old-rose, lacerate toothed: anther-tips about equalling the stigmas: capsule not seen.—Swamps, marshes, and ditches, S La.—Spr.

31. I. rubicunda Small. Flower-stalk erect, stiff: sepals about 8 cm. long, the claw greenish-yellow within, brown-violet veined and with brown-violet spots

near the upper end, the blade with a ground-color of a brilliant magenta-cerise, prominently veined with brown, the crest-median orange-yellow with one short lateral on either side and two minor laterals more or less brown-spotted, the entire crest-zone surrounded by an outlining zone of brown-violet, giving a dark eye effect; without, the blade dull old-rose, the crest area pale-yellow: petals about 6 cm. long, the blade a lilac-old-rose on both sides, but within with brown-orange veinings and a central band of crimson-orange which spreads with apricot flushings over the entire claw, a central band of pale yellow-green without: style-branches purplish old-rose at the base, fading rapidly above to apricot, the wing-margins of the body pale-yellow, the keel dull-orange; the appendages apricot at the base, becoming flushed towards the edges with purplish old-rose: capsule not seen.—Ditches and marshes, S La.—Spr.

32. I. cerasioides Alexander. Flower-stalk erect and stiff, but overtopped by the leaves: sepals spreading, about 8 cm. long, the claw orange-cream, heavily veined and flushed with dark, purplish-rose, the midrib greenish-yellow, unmarked, the blade flushed light-salmon on the sides near the base, above, dull purplish-rose, the whole streak-veined brownish-rose, the crest bright-yellow, with one or two laterals of the same color, whose color does not extend into the claw proper: petals old-rose at central portion, the outer portions and all but the channel below flushed and streaked light-salmon, the channel brown-orange: style-branches old-rose; appendages deeply but sparsely lacerate-toothed: anther-tips exserted: capsule obovate, about 6 cm. long, 6-angled.—Swamps and marshes, S La.—Spr.

33. I. rosipurpurea Alexander. Flower-stalk erect, rigid: sepals recurved-spreading, within, the claw apparently cream, but obscured by a profusion of red-violet streaks and pencillings except on the median ridge, the blade dull rose-lilac, very much veined darker, especially on the lower portion, which is in addition well streaked and flushed with lavender, the crest dark-lemon, the laterals on either side almost obliterated by the dark brown-purple veins which at this point come very close together; without, light reddish-violet, the crest and claw overlain pale-olive, the claw brown-purple streaked: petals light, purplish-rose within, outside, lavender, with a bluish midflush: style-branches light lavender-rose, the wings white below, the white gradually narrowing to a margin above; appendages light, purplish-magenta, irregularly somewhat shallow-toothed: anther-tips equalling the stigmas: capsule not seen.—Swamps and marshes, S La.—Spr.

34. I. regalis Small. Flower-stalk erect, flowers strongly musk-scented: sepals 9–11 cm. long, spreading, firm, the claw suffused with green, the blade rosy-lilac light with numerous darker veins, the crest yellow, with one or two laterals of intense lemon, sometimes a third rudimentary lateral at the very base of the blade: petals broadly spatulate, slightly shorter than the sepals, the claw suffused with green and dark-lined, the blade elliptic or oval, varying to obovate or ovate, undulate, rosy-lilac on both sides of the greenish-brown median line: style-branches mostly greenish, heavily flushed rosy-lilac, deeply lacerate-toothed, heavily flushed orange-yellow on the lower side: anther-tips included: capsule obovoid, the six ridges very distinct on the lower two-thirds, very faint towards the apex.—Swamps and pools, S La.—Spr.

35. I. lilacinaurea Alexander. Flower-stalk rigid and erect: sepals spreading, the claw yellow except the orange median ridge and the lavender wings, the blade dark rich lilac, with the veinings not prominent, much longer than broad, the crest a broad lanceolate triangle of brilliant orange outlined in red-violet, the two laterals which help form the triangle contiguous with the crest median: petals lilac, paler and reddish flushed in the claw portion: style-branches red-violet, the appendages red-lilac: capsule not seen.—Marshes and bayous, S La. —Spr.

36. I. fourchiana Small. Flower-stalk erect, rigid and strict: sepals 7–8 cm. long, the claw pale yellow-green, veined and pencilled red-violet, the blade dull red-violet, veined darker, the crest yellow, scarcly extending into the base of the sepal-blade, 1–3 laterals, usually narrow and indistinct surrounded by pale yellowish flushings accompany the crest forming a pale but very veiny blotch at the base of the sepal-blade: petals light red-violet, often same color as the sepal-blade, flushed near lower center and in claw with apricot: style-branches light orange-purple, the wings yellowish; appendages light red-violet, deeply lacerate toothed: anther-tips included: capsule not seen.—Swamps, marshes, ditches, and bayou-banks, S La.—Spr.—This may include more than one species. It is one of the most widely distributed and variable of the La. species.

37. I. oenantha Small. Flower-stalk erect, stout, strict: sepals 9–10.5 cm. long, rather laxly drooping, the claw orange-yellow, with the median ribs green, the lateral veins red-brown, and the wings veined red-brown, a zone of brownish flushes and veins at the junction of the claw and blade, the blade nearly three times the length of the claw, wine-purple with a darker median band and a darker zone surrounding the crest; the crest bright-yellow, rather broad, with one or two yellow laterals on either side: petals light red-violet, nearly as long as the sepals, the basal channel orange-flushed, as also are the margins of the lower third and the claw: style-branches red-violet, becoming very pale towards base, the appendages the same color: capsule 8–9 cm. long narrowly ellipsoid, sharply 6-ridged.—Marshes, bayous, and ditches, S La.—Spr.

38. I. iocyanea Small. Flower-stalk erect, strict, rigid: sepals spreading, about 9 cm. long, the claw yellow, veined greenish, the blade blue-violet, the more prominent veins brown, the crest dark-lemon, with one or two paler laterals, the median and laterals outlined by a black-violet zone, which eventually becomes a median band: petals blue-violet, with darker median, the claw portion yellow, veined red-purple in channel and flush-veined red-purple on wings: style-branches violet, their wing-margins greenish; appendages violet, finely and deeply lacerate-toothed: anther-tips included: capsule not seen.—Swamps, marshes, and bayou-banks, S La.—Spr.—There is a closely similar form with the sepal-claw greenish-white with reddish-violet veinings, and the petals pale-violet, flushed cream in the claw; this may prove upon further study to be a species.

39. I. ioleuca Alexander. Flower-stalk erect, stiff: sepals recurved-spreading, 9–10 cm. long, the claw white, veined pale-green, its wings faintly flushed pale-green, their veins and those of the main body faintly pencilled with brown-purple, the blade blue-violet, rather veiny, the crest pale-yellow with a single white lateral on either side and a pale flushed zone in the base of the blade, outside of sepal white, irregularly flushed faintly with pale-violet: petals light-violet, the claw white, its upper channel and wing-margins flushed light-violet: style-branches greenish-lavender, the wings greenish but lavender flushed, the keel violet with a lavender ridge; appendages light-violet, flushed bluish, coarsely lacerate-toothed: anther-tips included: capsule not seen.—Swamps, marshes, ditches, and bayou-banks, S La.—Spr.

40. I. cyanantha Alexander. Flower-stalk erect, strict: flowers slightly fragrant: sepals 8–9 cm. long, the claw pale greenish-yellow, veined yellow-green, the blade with a deep-blue ground-color, fading violet-blue, unstreaked, the crest bright yellow, with one narrow lateral of yellow and a rudimentary lateral of cream: petals spatulate, somewhat shorter than the sepals, the claw red-purple, the blade of the same ground-color as the sepal-blade, but often becoming whitish-streaked: capsule not seen.—Swamps, moist woods, and bayous S La.—Spr.—This is one of the closest approaches to true blue yet found in Louisiana irises.

41. I. bifurcata Small. Flower-stalk erect, stiff, strict: flowers slightly rose-scented: sepals 9–10.5 cm. long, recurved, the claw suffused and lined with green, deeper in the middle, the blade oval-ovate, of a violet-blue ground-color, very prominently dark-veined, with a narrow lemon lateral near the base of the lemon-yellow crest: petals cuneate, somewhat shorter than the sepals, the claw greenish and lined with brownish-green, the blade violet-blue, usually dark-lined down the middle: style-branches violet, flushed red-violet: appendages deep-violet, lacerate toothed: anther-tips included: capsule not seen.—Swamps and meadows, S La.—Spr.

42. I. rubrolilacina Alexander. Flower-stalk erect, rigid and strict, branched: sepals recurved-spreading, the blade dull rose-magenta, prominently veined darker, the crest orange-yellow, long-acuminate, together with 2 or 3 laterals on either side forming a lancehead which extends from well down into the claw to one third the length of the sepal-blade: petals slightly paler than the sepal-blades: style-branches heavily streaked and flushed pale-orange, the keel pale-orange: anther-tips included: capsule not seen.—Swamps and marshes, S La.—Spr.

43. I. viridis Alexander. Flower-stalk erect, strict: flowers slightly musk-scented: sepals 7.5–8.5 cm. long, wide-spreading, the claw suffused with pale yellowish-green, veined yellow-green, the blade violet, the crest and its 2 or 3 contiguous laterals forming a lancehead of bright greenish-yellow: petals spatulate, somewhat shorter than the sepals, the claw suffused with green and green-lined, the blade much longer than the claw, of a violet ground-color, darker toward the tip: style-branches greenish, the body becoming flushed pale-violet above; appendages pale-violet, lacerate-erose-toothed, lavender on the under side: anther-tips exserted: capsule ellipsoid or nearly so, 5–6.5 cm. long, slightly 6-lobed.—Marshes and bayou-banks, S La.—A species with very free-flowering plants, the sepals not always spreading out full, but the brilliant violet-color gives a pleasing effect.

44. I. citriviola Small. Flower-stalk erect, rigid and strict: sepals recurved-spreading, within, the claw greenish-white veined yellow-green, its wings lightly pencilled red-violet, the blade royal-purple, the crest brilliant lemon, with one or two laterals of same color, all outlined deep-violet, the claw-veins becoming brown at top of claw; without the blade light silvery-violet, overlain silvery, the crest and claw yellow-green: petals same color as sepal-blades, within, flushed lavender in the claw portion, without, the claw flushing pale silvery-green: style-branches dull light-violet, fading paler and more greenish at base, the wings white; appendages light-violet, flushed lavender beneath, erose-toothed: anther-tips included: capsule not seen.—Swamps, marshes, ditches, and bayou-banks, S La.—Spr.

45. I. iodantha Alexander. Flower-stalk erect, stout, rigid: sepals recurved, within, the claw greenish-yellow, yellow-green veined, the veins becoming black-purple at base of blade, claw-wings creamy, margined dark-lavender, the veins brown-flecked, the blade rich, brilliant-violet, the crest dark-lemon, with 2 short laterals, the first lemon, the second pale-lemon, barely extend into the base of the blade and all outlined with black-purple; without, the crest-region overlain creamy greenish-white, the claw light yellow-green, streaked purplish: petals same color as sepal-blade, except lower part of blade flushed red-violet, the claw cream-flushed, and red-lilac streaked; without, claw and lower part of blade silvery greenish-white: style-branches dull red-violet, becoming paler towards base, wings white below, white-margined above; appendages violet, flushed withish near base beneath, lacerate-toothed: anther-tips very slightly exserted: capsule not seen.—Swamps and marshes, S La.—Spr.

46. I. gentilliana Alexander. Flower-stalk erect, stout and rigid: sepals recurved, within, the claw pale whitish-green, veined yellow-green, the blade

erose-crenulate, rich-violet, slightly veiny, the crest orange-yellow, laterals 2, the first orange-yellow, the second cream-orange, spotted purple, the veins between and around crest and laterals brown-purple, no crest color descending into the claw; without, light silvery-violet overlain greenish-cream around crest, the crest and claw light-green: petals erose-margined, 3 cm. or more broad, same color as sepal-blades except the channel red-lilac, the claw portion cream, flushed reddish lilac; outside, with a median of pale silvery-green: style-branches dull light red-lilac, the claw portion cream, flushed reddish-lilac; outside with a median of pale silvery-green: style-branches dull light red-violet, becoming greenish at base, the wings silvery-white, only white-margined above; appendages light-violet, irregularly lacerate-toothed, flushed cream at base beneath: anther-tips included: capsule not seen.—Swamps and marshes, S La. —Spr.

47. **I. lancipetala** Alexander. Flower-stalk erect, slender, but rigid: sepals spreading, within, the claw pale-lemon, veined pale-olive, the blade lavender, very veiny, the veins bistre, the crest dark-yellow, very narrow, brown-tipped, the tip continuing as a median vein-like band, laterals 2, yellow, rather faint, the tips slightly streaky; without, lavender, central zone overlain silvery-yellow, crest and claw yellow-green: petals lavender, becoming grayish below and pale lilac-brown veined: style-branches smoky, with faint lavender flush, the keel gray-green, the wings pale silver-pink; appendages lavender, frilly, irregularly erose toothed: anther-tips barely included: capsule not seen.—Swamps and marshes, S La.—Spr.

48. **I. pseudocristata** Small. Flower-stalk rigid, usually rather slender, strict: sepals 8–9 cm. long recurved, the claw sulphur-yellow, the midrib yellow-green, the blade oval or nearly so, of a light lavender-violet ground-color, the crest represented by a groove, but marked by a narrow lancehead of lemon-yellow: petals conspicuous, slightly shorter than the sepals, elliptic spatulate, undulate-crisped, the claw suffused with yellow-green at the base, the blade much longer than the claw, colored like the sepal-blade: style-branches lavender-violet; appendages light lavender-violet, lacerate toothed: anther-tips included: capsule not seen.—Marshes and edges of bayous, S La.—Spr.—Although the sepals appear to have a crest, color alone indicates it, for there is a groove in the base of the sepal blade instead of a ridge.

49. **I. rhodantha** Alexander. Flower-stalk erect, strict: sepals sharply recurved, the claw lemon-yellow with the wings streak-veined rose-brown, the blade deep orange-rose veined orange-brown, the crest intense lemon-yellow with a zone of orange and yellow around it at the base of the sepal-blade, which is so streaked with rose-brown as to make the crest-zone merge with blade-color: petals light-rose, the claw flushed apricot: style-branches old-rose: appendages about 5 mm. long, merely undulate-margined: anther-tips slightly exserted: capsule not seen.—Marshes and ditches, S La.—Spr.

50. **I. parvirosea** Small. Flower-stalk erect and slender, rigid: sepals spreading, about 7 cm. long, the claw light-yellow, the greenish veins of body and wings pencilled with brownish-rose, the blade dull-rose, the crest bright-yellow with about 3 laterals of the same color, these laterals very narrow and separated from each other and from the main crest by orange-brown veins, which veins after passing the crest zone become brown-rose and radiate a short distance into the blade: petals light, dull-rose, flushed along the channel-sides and below with rosy orange, the base of the claw yellow: style-branches dull, greenish-rose, somewhat flushed rosy-orange, the wings pale creamy-yellow; appendages irregularly toothed: anther-tips included: capsule not seen. —Swamps and marshes, S La.—Spr.

51. **I. Marplei** Alexander. Flower-stalk erect, stout, rigid: sepals spreading, the claw lemon-yellow, veined pale yellow-green, its wings veined violet-brown

and dotted with red-violet, the blade plum-color or nearly maroon with a darker central band, the crest deep-yellow with a median brown line on the lower portion, notched at the tip, with 2–4 very broad prominent yellow laterals on either side, each, however, separated by bands of brown-red, the tips of all laterals and the crest together outline a broad radial triangle: petals and style-branches plum-color: capsule not seen.—Swamps, S La.—Spr.—The crest of this species is the most unusual of the Louisiana group, causing a very striking perianth.

52. I. callirhodea Alexander. Flower-stalk erect, stiff: sepals spreading or recurved-spreading, about 8 cm. long, the claw greenish-yellow, its veins yellow-green, pencilled with rose-brown, the blade dark rose, flushed lilac near the margins and prominently veined orange-brown, the crest brilliant-yellow, three distinct laterals on either side forming a large triangle which is outlined with red-brown, a large area around the crest heavily flushed dull-vermilion, becoming yellow at extreme base: petals salmon-pink, salmon-flushed and prominently veined rose-brown, the claw-wings pale orange-yellow veined rose-brown: style-branches with the body mainly smoky-lilac flushed rose, becoming almost magenta above, the keel-ridge greenish, the wings margined green; appendages smoky brown-orange flushed rosy-lilac and veined brown: anther-tips included: capsule not seen.—Swamps, marshes, and partly dried bayous, S La.—Spr.

53. I. rhodochrysea Small. Flower-stalk erect, stiff: sepals spreading, the claw light orange-yellow, its wings veined red-brown, the blade an intense old-rose lilac, veined prominently with violet-brown, the veins at the base forming a brown outline to the crest, the crest a deep brilliant yellow, with a broad triangle of unmarked and intense color, separated from the margins by a zone of rose fleckings mingled with cream, this zone extending all around the base of the blade: petals old-rose, veined lilac, the claw flushed apricot: style-branches pale old-rose, the wings flesh-color, notched their entire length, the appendages about 13 mm. long, old-rose, widely flaring: capsule not seen.—Ditches and marshes, S La.—Spr.

54. I. DeWinkeleri Small. Flower-stalk erect, strict and rigid: sepals recurved-spreading, within, the claw pale-olive, overflushed with pinkish and rose-brown streaks and dots, the veins pencil-streaked with rose-brown, and extending into the blade as radial veins, the blade nearly light rose-pink, but this color is clear only on the outer third, the inner part heavily flushed pale pinkish-brown and prominently veined with pink-brown, the crest olive-yellow, 2 laterals of same color at the base of the blade, the median brown-tipped; without, light orange-pink overlain pale sulphur, except on margin, crest and claw pale yellow-green: petals pale gray-pink, banded down center a rosy orange-brown, claw-wings pale-yellow flushed; without, slightly paler, the center band pale silvery-yellow: style-branches dull orange-rose, the wings pale-green at base, flushed near center with orange-pink, then becoming light old-rose above; appendages light old-rose, irregularly and shallowly frill-toothed: anther-tips included: capsule not seen.—Marshes, swamps, and ditches, S La.—Spr.

55. I. pallidirosea Alexander. Flower-stalk erect, strict and rigid: sepals spreading 7–8 cm. long, the claw pale, creamy-yellow, veined darker yellow, the blade extremely pale-pinkish, flushed rather irregularly with buff and with a median band of buff, the crest orange-yellow, brown-orange tipped, 2 or 3 laterals of light yellow forming a broad triangular crest zone; petals the same color as the sepal blade with the channel light brown-orange, the claw wings pale-yellow: style-branches pale-yellow faintly flushed pinkish on the sides; appendages flushed pinkish, irregularly toothed: anther-tips slightly exserted: capsule not seen.—Swamps and marshes, S La.—Spr.

56. **I. Thomasii** Small. Flower-stalk erect, rigid: sepals recurved-spreading, 7–8 cm. long, the claw deep-yellow, veined yellow-green, the blade red-violet with a darker median band, the crest orange-yellow, a series of short radials around its base which do not however extend into the blade-color but form a sharply outlined narrowly triangular zone: petals red-violet, the channel light orange-brown, the claw wings cream-orange, veined red-violet near channel: style-branches dull red-violet, their wings margined yellowish; appendages dull red-violet edged and flushed slate; shallowly lancerate-toothed: anther-tips included: capsule oval with a tapering, beak-like apex, 6–10 cm. long, bluntly 6-angled.—Swamps, marshes, ditches, and bayou-banks, S La.—Spr.—A form of this with very veiny perianth, a rather smoky-green sepal-claw, widely dilated petals with orange and brown veined claw may represent another species.

57. **I. amnicola** Alexander. Flower-stalk erect, rigid, strict: sepals recurved-spreading, within, the claw sulphur, its upper two-thirds flecked and spotted dull red-violet, the veins green, the blade deep vinaceous-purple, the crest dark-lemon, narrowly lance-shaped, its color streaked, flecked and spotted into the lower part of the blade, and itself spotted and flecked dull red-violet; without, dull, dark violet, overlain greenish-sulphur on crest zone and claw: petals within, deep vinaceous purple, red violet in the lower portion, the claw pale orange-yellow, margined orange-cream; without, slightly more dull-colored, a broad median band of sulphur in the lower half: style-branches dull, light red-violet, the margin creamy; appendages the same color, sparsely and shallowly sharp-toothed, flushed orange at base beneath: anther-tips exserted: capsule not seen.—Swamps, marshes, ditches, and bayou-banks, S La.—Spr.

58. **I. cyanochrysea** Small. Flower-stalk erect, rigid: sepals recurved-spreading, within, the claw greenish cream veined yellow-green, its wings streaked red-violet on the inner side, the blade blue-violet, the crest deep-yellow, two laterals on each side forming an oval blotch of color, outlined with dark-violet and flecked outside of this border with red-violet and white, the median ridge tipped orange-brown, no blade color extending downward into the claw; without, pale-violet, overlain white on crest zone, crest median and claw yellow-green: petals blue-violet, the base of the blade and the channel red-violet, margined by a pinkish zone heavily flushed reddish-violet, becoming white towards base, without, with a greenish-white flush down the lower portion of the channel: style-branches dull red-violet, the wings white below, gradually becoming lilac towards the top, lower third of the keel green; appendages light-violet, erose-toothed, flushed whitish beneath: anther-tips included: capsule not seen.—Swamps and marshes, S La—Spr.

59. **I. iochroma** Small. Flower-stalk erect, strict: sepals recurved-spreading, within, the claw greenish-cream, veined yellow-green, the blade pansy-purple, veined dark violet-brown, the crest lemon, with two lemon laterals on either side about 3 mm. long, their color stopping abruptly at the claw; without, a dull shade of light-violet, overlain with white, the crest median and the claw pale yellow-green: petals pansy-purple, flushed red-violet below, the claw-wings whitish; without, paler colored, the median band nearly white, the claw greenish-yellow its wings whitish: style-branches dull red-violet, greenish white near base, the wings very broad, white below, faintly flushed red-violet above, lower half of the keel white; appendages violet, deeply toothed, flushed lavender beneath: anther-tips exserted: capsule not seen.—Swamps and marshes, S La.—Spr.

60. **I. atroenantha** Small. Flower-stalk erect, strict and rigid: sepals spreading-recurved, within, the claw greenish-yellow, veined brown-purple near top, veined green below, its wings yellow, flushed and veined lilac-brown, the blade dull wine-purple, fading paler near base, the crest yellow, with 2 or 3 laterals on either side about 6 mm. long, crest-veins brown-purple; without, the blade

slightly paler than within, but overlain with sulphur, the crest and claw yellow-green: petals dull wine-purple within, the margins pale creamy-orange towards base, without, a central band of silvery greenish-yellow: style-branches smoky red-violet, the lower third of the keel green, the wings cream-margined; appendages sparsely toothed, flushed pale-orange at base beneath: anther-tips exserted: capsule not seen.—Swamps and marshes, S La.—Spr.

61. I. fuscisanguinea Alexander. Flower-stalk erect, rigid and strict: sepals spreading, within, the claw so heavily flushed with purple-brown as to obscure its color, but the midrib greenish-yellow, the wings pale orange-margined, the blade a rich purplish-red, becoming brown around crest, the crest dark rich lemon, with one or two short laterals sometimes irregularly and imperfectly formed, but always surrounded by a dense mass of brown-purple veinings; without, dull red-purple, overlain sulphur on crest-zone and claw, the claw purple-brown spotted: petals pink, faintly flushed lilac-blue, the channel region flushed red-purple near middle, below, brown-purple flushed, the wings pale-orange near base; without, silvery old-rose, median band pale, silvery-orange: style-branches light orange-rose, the wings old-rose near tip, cream margined, becoming all cream below; appendages smoky heather-red, finely shallow-toothed, flushed orange at base beneath: anther-tips exserted: capsule not seen.—Swamps and marshes, S La.—Spr.

62. I. albilinea Alexander. Flower-stalk erect, strict: sepals recurved-spreading, within, the claw greenish-cream veined yellow-green, the blade light violet-purple, fading somewhat paler, all except the apical portion heavily streaked and splotched with creamy lavender, the crest deep-lemon, one lemon lateral on either side at base of blade, the median apically cleft by a black-purple stripe; without, dull red-violet, overlain with rich yellowish-cream, the crest and claw pale yellow-green: petals the same color as sepals and similarly marked, the claw creamy white, the upper claw-channel brownish-lilac; without, the claw greenish cream: style-branches light smoky lilac, becoming very pale yellow-green below, the lower two-thirds of the keel greenish-white, the wings whitish, flushed near the appendages with red-violet: appendages widely divergent, light red-violet, lacerate-toothed, flushed lavender beneath: anther-tips included: capsule not seen.—Swamps and marshes, S La.—Spr.

63. I. auralata Small. Flower-stalk erect, stout: sepals 9–10 cm. long, the claw pale orange-yellow, green-veined, the blade fully twice the length of the claw, without dull brown-violet, suffused towards base with yellowish-green, within, dull, smoky red-violet with a darker central zone, flushed heavily with dull orange on lower portion, the crest an indistinctly outlined radial zone of light-yellow, spotted at the edges with red-brown, only the median extending into the lower part of the blade proper; petals broadly spatulate, about 7 cm. long, without dull gray-lilac with a pale-green median, within the upper half dull red-lilac with a darker median, the lower half reddish-apricot veined red-violet and becoming yellow towards base: style-branches red-violet, sharply keeled, the wings bright-yellow; appendages broad, blunt, finely and unevenly toothed, bright-yellow at the base on the side next the wings, otherwise dull red-violet streaked with apricot: capsule not seen.—Swamps and bayous, S La. —Spr.

64. I. phoenicis Small. Flower-stalk erect, strict and rigid: sepals recurved-spreading, 8–9 cm. long, the claw pale creamy-yellow, veined pale-green, the veins pencilled brown-purple, the wings heavily flushed brown-lilac in addition to these pencillings, the blade rather rotund, purple, faintly veined darker and flushed reddish at the base, the crest dark-yellow, 2–4 lemon-colored radials coming from the claw into the base of the blades: petals blue-purple, the claw portion red-purple: style-branches dark-purple the wings pale-margined; appendages light-violet: anther-tips included: capsule not seen.—Swamps, marshes, ditches, and bayou banks, S La.—Spr.

65. I. violilutea Alexander. Flower-stalk erect and strict: sepals 7.5–9.5 cm. long, recurved-spreading, the claw whitish-green, veined yellow-green, the blade of a dull-violet ground-color, the crest yellow or orange-yellow, with 1 well developed lateral and 2 or 3 more rudimentary ones forming a radial-based triangular blotch: petals spatulate, much shorter than the sepals, the claw suffused with green and lined with red-violet at the base, the blade dull-violet and darker-veined, except the red-violet midvein and flush at the base: style-branches greenish, faintly flushed dull-lavender on upper portion; appendages pale reddish-lavender, flushed greenish above and beneath, shallowly but finely lacerate-toothed: anther-tips included: capsule long-ellipsoid, 6.5–8 cm. long, shallowly 6-lobed.—Marshes and swamps, S La.

66. I. oolopha Alexander. Flower-stalk erect, strict: sepals recurved, about 8 cm. long, the claw yellow, veined yellow, the blade light smoky lilac or pale-violet, veined darker, the crest deep-yellow, a radial zone, ellipsoidal in outline, formed by the laterals, the median ridge cleft by a nearly black vein, a darkened blotch around the crest-apex: petals light bluish-lilac or pale lavender-violet, the claw-portion streak-pencilled pale greenish brown and flushed yellow, the base yellow: style-branches red-lilac or light violet; appendages deeply toothed: anther-tips included: capsule not seen.—Swamps, marshes and ditches, S La.—Spr.

67. I. chrysolopha Small. Flower-stalk erect, slender, stiff: sepals spreading, 8.5 cm. long, the claw yellow-veined, pale yellow-green, the blade smoky salmon-pink, over-flushed dull-orange and prominently veined dark rose-brown, the crest bright-yellow, the median split nearly to the base by a black-red vein, the first lateral on each side split by a similar vein, the radial laterals all bright-yellow, spotted brownish near their apices: petals light-salmon, flushed salmon-pink and veined brown-orange, the three medial veins black-crimson, the claw orange-yellow, pencilled brown-orange: style-branches dull-salmon, flushed pinkish-orange; appendages shallowly lacerate-toothed: anther-tips slightly exserted: capsule not seen.—Swamps and marshes, S La.—Spr.

68. I. chrysaeola Small. Flower-stalk stout, rigid, strict: sepals 8–10 cm. long, recurved-spreading or recurved, the claw suffused with yellowish-green and faintly veined, the blade oval-ovate or oval, much longer than the claw, the bright-violet ground-color suffused below the middle with flecks and lines of yellow or greenish-yellow, veined brown, and with a yellow crest: petals broadly spatulate, somewhat shorter than the sepals, with the lower parts of the claw yellowish-green, the blade often somewhat paler than the sepal-blade: style-branches red-purple, the wings yellowish: appendages dull-violet, sharply lacerate-toothed: anther-tips included: capsule ellipsoid-ovoid, 7–10 cm. long, bluntly 6-lobed.—Swamps, bayous, and ditches, S La.—Spr.

69. I. chrysophoenicia Small. Flower-stalk strict, rigid, stout: flowers slightly fragrant: sepals 7.5–9 cm. long, recurved-spreading, the claw suffused with greenish-yellow and pale-veined, the blade oval, much longer than the claw, dark violet-purple (plum-color), the crest-median orange-yellow surrounded by a greenish-yellow crest-zone, which forms a radial blotch in the base: petals broadly spatulate, slightly shorter than the sepals, the claw mainly greenish-yellow, flushed red-brown at the base of the blade, often slightly paler than the sepal-blade and with a median brownish line: style-branches dull red-purple, the keel and wings greenish; appendages dull red-violet, finely and irregularly toothed: anther-tips included: capsule ovoid or ellipsoid-ovoid, 6–9 cm. long, rather prominently 6-lobed.—Bayous and swamps, S La.—Spr.

70. I. callilopha Alexander. Flower-stalk erect, stiff: sepals recurved, 9–10 cm. long, the claw yellow, veined greenish-yellow, the blade magenta-lilac or pontificial-purple, prominently darker-veined, with a dark brown-violet median band which splits the crest-median apically, the crest-median orange-

yellow, the entire crest zone a blotch of yellow, veined, flecked, and streaked with brown-violet and itself well streaked into the lower third of the blade: petals the same color as sepal-blades, faintly bluish-tinged near center, the lower blade sides flushed yellow, the nearly wingless claw yellow with orange veins, the blade-channel pale orange-green: style-branches orange-purplish the wing-margins greenish-yellow; appendages slaty-rose-lilac, flushed dull brown-orange: anthers included: capsule not seen.—Swamps, marshes, and ditches, S La.—Spr.—A variety with less prominent veinings and less streaked sepal-crest, the petals without the greenish channel, and with a very broad-winged claw of yellow, veined brown, may represent another species.

71. I. schizolopha Alexander. Flower-stalk erect, stout, strict and rigid: sepals spreading or recurved-spreading, within, the claw creamy-yellow, veined olive-yellow above, olive-green below, the blade ground-color varying from light-violet to light purplish-rose, but a great radial blotch of creamy yellow extends up from the claw and streaks in flecks, blotches, and streaks out nearly to the blade margins, nearly obscuring the ground color, and veined and spotted brown-violet, the crest yellow, split to the base of the blade by a black-violet or brown-red band, which forks just beyond the crest zone into two parts, both of which continue separately to the margin; without, all yellow, except the blade margin: petals marked like sepals: style-branches smoky-colored, faintly flushed with purplish or pinkish, the wings pale greenish-yellow; appendages light-violet or light old-rose, lacerate-toothed: anther-tips included: capsule not seen.—Ditches and bayou-banks, S La.—Spr.

72. I. Albispiritus Small. Flower-stalk erect, rigid: flowers slightly fragrant: sepals 8.5–14 cm. long, more or less recurved, the claw suffused with yellow-green, the blade elliptic to ovate-elliptic, white, the crest greenish-yellow accompanied by a paler blotch, toothed and undulate: petals spatulate, considerably shorter than the sepals, the broad claw suffused and lined with green, the blade longer than the claw, white: style-branches greenish-white; appendages white, deeply lacerate-toothed: capsule ellipsoid, 6–10.5 cm. long, 6-ribbed.—Low pinelands and savannahs, pen. Fla.—Early Spr.—This species is most common in the lower half of the Florida peninsula.

73. I. savannarum Small. Flower-stalk strict, rigid, erect: sepals 8–4 cm. long, recurved-spreading, the claw suffused with green, the blade elliptic to oval, of a violet-blue or violet ground-color, whitish or white-flecked at the base, the narrow crest extending well up into the blade: petals spatulate or nearly linear, often much shorter than the sepals, the claw suffused with green or lavender, the blade longer than the claw, bluish or violet: style-branches with a greenish ground-color, but heavily flushed and streaked red-violet, the wings pale; appendages sharply and irregularly toothed, light-violet: capsule ellipsoid or nearly so, 8–11 cm. long, 6-ribbed.—Prairies, savannahs, and hammocks, pen. Fla.—Early Spr.—Larger areas are exclusively occupied by this prairie iris than by any of our other species. Colonies, in extent as far as the eye can see, often occupy the low prairies where the soils are usually strongly acid. The plant is decidedly influenced by the water-table: following a dry season during the resting period, few flowers are produced, following a wet season, especially if the plants stand in water for a period, myriad flowers appear. This species occurs in deep-violet, lavender and pure white forms as well as the typical blue-violet.

74. I. Kimballiae Small. Flower-stalk erect, rigid: sepals 8.5–10 cm. long, recurved-spreading, the claw suffused with green, the blade ovate or elliptic-ovate, violet except the greenish-yellow blotch, with white-flecked margins beyond which the yellow crest extends: petals spatulate, somewhat shorter than the sepals, the claw whitish or greenish and more or less suffused with red-violet: the blade longer than the claw, mainly blue: style-branches light pink-

ish-violet, becoming paler near the base, the wings whitish; appendages violet, deeply lacerate-toothed near the apex: capsule ellipsoid or oval, 5–9 cm. long, bluntly 6-sided.—Swamps, often calcareous, coastal regions of the Apalachicola delta, N Fla.—Spr.

75. I. elephantina Small. Flower-stalk erect, rigid: sepals 9–10 cm. long, recurved, within, the claw greenish, the blade longer than the claw, oval or nearly so, ochroleucous, especially near the center, white near the edges, the crest lemon, extending half way up the blade, accompanied by lateral veins of yellowish-green which radiate out into the blade: without, greenish near the base and ochroleucous beyond, the claw pale-green: petals spatulate, shorter than the sepals, the claw narrowly cuneate, yellowish-green, the margins and wings white; appendages rather sharply toothed, white: anther-tips included: capsule not seen.—Lake margins, marshes, bayous, and ditches, S La.—Spr.

76. I. venulosa Alexander. Flower-stalk erect, strict and rigid: sepals recurved, within, the claw cream, veined yellow-green below, its wings scarcely veined, flushed lavender near blade, the blade orchid-color, prominently veined darker, and heavily streaked and spotted with white on the lower two-thirds, the crest bright-yellow, brown-purple tipped, all the veins of the blade with a basal tip of brown-purple at the crest zone; without, all overlain rich cream, the claw light yellow-green towards the base: petals lavender-pink, the lower margins cream-flushed, the claw-channel brownish; without, the claw channel silvery-yellow: style-branches pale old-rose, the wings pale orange-cream, the keel dull orangy-cream; appendages orchid, sharply-toothed, flushed greenish-cream at base beneath: anther-tips exserted: capsule not seen.—Swamps and marshes, S La.—Spr.

77. I. giganticaerulea Small. Flower-stalk erect, strict, stout: flowers strongly musk-scented: sepals 9.5–11.5 cm. long, recurved-spreading, the claw suffused with green, except the often white or greenish-margins, the blade oval to oval-orbicular, of a blue or violet-blue ground-color, with white veinings often extending nearly or quite to the margins arising from the whitish zone about the yellow crest: petals broadly spatulate, somewhat shorter than the sepals, the claw cuneate, white or greenish-white at the base, with violet-tinged margins and violet-lines, the blade blue-violet and violet-veined: style-branches dull light-violet, becoming greenish towards base, the wings pale or greenish margined; appendages light blue-violet, deeply sharp-toothed: anthers included: capsule ellipsoid or ovoid-ellipsoid, 6.5–10 cm. long, with 6 rounded ridges.—Marshes, meadows, ditches, and pools, S La.—In abundance, within its range, this species resembles *I. savannarum* of Florida. There are numerous color forms; dark violet, violet-blue, blue-violet, lavender, lilac, and white as well as variously streaked forms—the crest also varies from greenish white to deep orange.

78. I. paludicola Alexander. Flower-stalk erect, rigid and strict: sepals recurved or recurved-spreading, rarely horizontally spreading, 8–10 cm. long, the claw greenish-white, veined yellow-green, the blade various shades of violet, usually light blue-violet, veined darker mostly around and near the crest zone, the crest bright-yellow, the median ridge extending beyond the zone and outlined with black-violet, 2–4 laterals of dull lemon radiate upwards from the claw, one or two of them usually terminating in white blotches, the first one, or rarely the second also with a bright yellow blotch at the exact junction point of the blade and sepal: petals colored like the sepal blade with a red-violet channel, which color is suffused over the entire claw-portion, base of claw creamy white: style-branches dark red-violet, the wing-margins creamy brown-orange; appendages light-violet, lacerate-toothed: anther-tips included: capsule not seen.—Marshes, swamps, bayou-banks, and ditches, S La.—Spr.

79. I. Wherryana Small. Flower-stalk erect, stiff, strict: sepals 9–10 cm. long, the claw suffused with green, the blade ovate, light-violet, the crest orange-yellow, surrounded by a radial zone of pale-yellow paling to whitish-yellow and lavender where it merges with the blade-color, all prominently veined red-violet: petals spatulate, much shorter than the sepals, the short claw greenish at the base, suffused with light red-violet above, the blade pale-violet and darker lined: style-branches light-violet, the wings margined with lavender-pink; appendages flushed greenish beneath, sharply toothed: anther-tips included: capsule not seen.—Swamps, marshes, and ditches, S La.—Spr.

80. I. citricristata Small. Flower-stalk erect, stiff, strict: sepals 8–10 cm. long, recurved, the claw suffused with yellow-green, but pale on the edges, and lined in the middle, the blade oval-obovate, slightly longer than the claw, of a violet-blue ground-color, the crest lemon, surrounded by a pale-lemon zone, with some whitish or lavender flecks where it merges with the blade-color: petals cuneate-spatulate, much shorter than the sepals, the claw often yellow-green at the very base, whitish above and with red-violet lines, the blade violet-blue, except the suffusion of red-purple extending up from the claw: style-branches violet, the wings pale-margined; appendages violet, deeply and sharply lacerate-toothed: anther-tips included: capsule not seen.—Marshes and bayou-borders, S La.—Spr.—This species and *I. giganticaerulea* are the two most abundant and widespread of the Louisiana group, often forming great fields of nearly solid growth. There are albinos of both species.

81. I. alticristata Small. Flower-stalk erect, strict and rigid: sepals recurved, within, the claw cream, veined greenish-yellow, the midrib rich-yellow above middle, cream below, the wings heavily flecked violet on upper half, the blade dark-violet, the crest a very prominent, high ridge, rich-yellow, extending halfway down the blade, the laterals terminating in blotches and flecks of light-yellow, each outlined with black-violet, the median terminating in a ridge of deep-violet, the crest-zone flecked all over with white; outside, the margin violet, otherwise overlain greenish-cream, the claw pale yellow-green, cream-margined: petals dark-violet, with a band of deep violet down channel, the wings whitish-margined towards the claw, the claw-channel deep red-violet; without, a radial marking of silvery-cream on lower half with a central band of slate-green, the claw pale yellow-green: style-branches dark, smoky purple, the wings, keel, and body becoming white on lower portion; appendages dull slaty-violet, sparsely deep-toothed at apex, very shallowly toothed otherwise, flushed creamy at base beneath: anther-tips equalling the stigmas: capsule not seen.—Swamps and marshes, S La.—Spr.

82. I. aurilinea Alexander. Flower-stalk erect, rigid and strict: sepals recurved-spreading, within, the claw apparently yellow, but so heavily streaked, flushed, and spotted with brown-rose, that the yellow is only visible at base, the midrib yellow, the blade brown-rose around and towards the margin, the inner portion so heavily flushed brownish-orange as to blot out ground-color, the crest is dark-yellow, the median brown tipped, lateral flushings of light yellow and great masses of brown spots are all over the crest zone and upper claw; without, dull brownish red-purple overlain sulphur on crest zone and claw: petals light, smoky old-rose, the lower channel orange-brown streaked, the blade covered with pale-orange flushings: style-branches with a yellowish ground color, heavily flush-streaked dull, brownish-rose with a heavy underflushing of bright-yellow on upper half, and an underflushing of pale-green on lower half; appendages scarcely shallow-toothed, flushed orange beneath: anther-tips included: capsule not seen.—Swamps, marshes, ditches, and bayou-banks, S La.—Spr.

83. I. fluviatilis Small. Flower-stalk erect, strict and rigid: sepals recurved, within, the claw pale whitish-green, veined yellow-green, the blade

nearly rotund, frilly, violet, radially veined darker all around crest, the crest median orange-yellow, three laterals at base of blade only making a broad yellow blotch, which color does not extend down into the claw, all around this yellow blotch is a zone of lavender fleckings all over-dotted red-violet; without, dull light-violet, overlain greenish-lavender on crest zone, the claw light-green: petals slightly lighter than sepals, flushed white in the claw, and vein-flushed light red-violet over the white: style-branches dull, smoky red-violet, the keel light green on the lower third, the body light-green towards base, the wings white becoming flushed red-violet above except on margin; appendages red-violet, lacerate-toothed: anther-tips barely included: capsule not seen.—Ditches, bayou-banks, swamps, and marshes, S La.—Spr.

84. I. parvicaerulea Alexander. Flower-stalk erect, slender, rigid: hypanthium covering the ovary 6-angled: sepals spreading, the blade and claw of about equal length, within, the claw greenish-cream, yellow-green veined, its wings cream, veined lilac-brown, the blade light blue-violet, the crest dull-lemon, tipped purplish-brown, the crest-zone veined purplish-brown; without, pale bluish-violet flushed whitish, the crest and claw yellow-green: petals pale violet-blue, lavender flushed towards blade base and veined red-violet: style-branches light blue-violet above, becoming light red-violet below, the wings white below; appendages light violet-blue, sharply toothed: anther-tips barely included: capsule not seen.—Swamps and marshes, S La.—Spr.

85. I. hexagona Walt. Flower-stalk rigid, erect, 8–12 dm. tall: flowers slightly fragrant: hypanthium covering the ovary sharply 6-angled: sepals 8–11 cm. long, spreading or recurved spreading, the claw suffused with green, the blade oval or obovate, violet, often of a deep-violet ground-color, except for the white crest-zone at the base and the prominent yellow crest: petals spatulate, slightly shorter than the sepals, the claw suffused with green at the base, the blade lined in the middle at the base and with whitish edges, deep-violet above: style-branches green below, becoming gradually flushed lavender and then light-violet towards the apex, the wings and keel greenish; appendages violet deeply lacerate-toothed towards the apex: capsule ovoid or oval-ovoid, 3–6 cm. long, each lobe with 2 lateral sharp ridges, the body hence 6-angled.—Swamps, ditches, and stream-beds, Coastal Plain, N Fla. to S. C.—Late spr.–early sum.—A form is known in Florida with the sepal-crest yellow-green. The firmness of the yellowish-green foliage extends to the flowers. A pure white albino is known.

86. I. alabamensis Small. Flower-stalk rigid, erect, slightly zigzag: sepals spreading or recurved-spreading, about 9 cm. long, the claw pale yellow-green, veined olive, the veins of the wings pencilled with dull red-violet, the midrib olive, the blade violet, with a deeper zone around the crest, the crest deep-yellow, a narrow lateral zone of yellow around it becoming pale-lemon towards the blade-margin, all giving way to the blade color in a series of dots and short streaks of violet: petals violet-blue, flush-streaked red-violet, the lower portion of blade red-violet at center, becoming red-lilac, the veins also red-lilac on down into the claw, claw-wings pinkish-lavender, flushed violet, becoming pale-green towards base: style-branches dull red-violet, the keel slightly paler, the wings white; appendages light violet, large-toothed: capsule not seen.—Swamps, ditches, and marshes, W central Ala.—Spr.

87. I. rivularis Small. Flowers-stalks 2.5–6 dm. tall, rigid, sometimes slightly zigzag: flowers slightly fragrant: sepals 6.5–8 cm. long, arching, spreading, or recurved-spreading, the claw suffused with green, the blade oval, violet-blue, except the greenish blotch at the base, the green crest, and the accompanying white flecks: petals spatulate, much shorter than the sepals, the claw greenish at the base, the blade longer than the claw, violet-blue: capsule oval, varying to somewhat ovoid or obovoid, 3.5–7 cm. long.—Streams and swamps, Coastal Plain, N E Fla. and S E Ga.—Spr.

88. **I. foliosa** Mackenzie & Bush. Flower-stalk prostrate, 3–5 dm. long, zigzag, the internodes rather unequal, some of them very short: flowers two together in the terminal involucre and usually single in the several greatly elongate lateral involucres, short-pedicelled: hypanthium covering the ovary prominently 6-angled: sepals 8–10 cm. long, spreading, the claw suffused with yellowish-green, the blade ovate, mainly of a clear-violet or deep-blue ground-color, with white flecks at the base on either side of a yellowish blotch and the yellow crest: petals spatulate, slightly shorter than the sepals, the claw suffused and lined with green, the blade longer than the claw, slightly paler than the sepal-blade and more or less whitish or green-tinged at the base: capsule ovoid or ellipsoid-ovoid, 3–5 cm. long, each lobe with 2 lateral sharp ridges, hence 6-angled.—Open woods and prairies, Coastal Plain and adj. provinces, Ark. to Kans., Ohio, and Ky.—Spr.—The leaves are prostrate and the flower-stalk usually lies on the ground among them or on them. The deep-green, flaccid leaves and the zigzag flower-stalk are in striking contrast to those parts of the next-following species with which it has sometimes been confused.

89. **I. brevipes** Small. Flower-stalk suberect, 1–1.5 dm. long, very zigzag, often flowering from the very base, the internodes short, flowers two together in the terminal involucre and usually one in the two to four lateral involucres: hypanthium covering the ovary sharply 6-angled: sepals spreading, 7–8 cm. long, the claw greenish-cream, its midrib yellow-green, its wings flushed rosy-lavender and veined smoky lilac, the blade ovate, with a truncate base, violet or violet-blue, scarcely veined but darker around crest, the crest yellow, the white lateral markings not exceeding the median: petals light-violet to light violet-blue, becoming paler towards the base, scarcely clawed: style-branches red-violet; appendages violet or blue-violet, shallowly toothed, nearly lanceolate: capsule ovoid, 2–3 cm. long, each lobe with 2 lateral sharp ridges, the capsule hence 6-angled.—Swamps, marshes, ditches, and stream banks, S La.—Spr.—This iris is the lowest growing and most nearly blue-flowered species among the gulf states irises yet discovered.

90. **I. mississippiensis** Alexander. Flower-stalk nearly erect, 1–2 dm. long, very zigzag, flowering from near the base, but usually with a basal leaf-like bract below the inflorescence, the internodes short, flowers 2 together in the terminal involucre and usually 1 in the two to four lateral involucres: hypanthium covering the ovary sharply 6-angled: sepals recurved or recurved-spreading, 6–7 cm. long, the claw white, the veins brownish-olive, the blade lavender to lavender-violet (white in albinos), suborbicular to orbicular-ovate, its base tapering, the crest yellow, often with a small lateral blotch of yellow, but all surrounded by a radial zone of white interveined with pale violet, extending well out nearly to the middle of the blade: petals lavender or lavender-violet, the basal third and half the channel white, scarcely clawed; capsule not seen.—Swamps, marshes, ditches, and stream banks, S cent. La.—Late spr.—This iris is a very free flowering species, but the flowers are half concealed by the taller leaves. Its range is uncertain and it may possibly extend as far east as Ala. A pure white form is known.

91. **I. prismatica** Pursh. Flower-stalk erect, 3–6 dm. tall: flowers borne, usually in pairs in the terminal involucre: hypanthium covering the ovary sharply 3-angled: sepals mainly of a blue ground-color, 3.5–5 cm. long, recurved-spreading, the claw more or less suffused with yellowish-green and lined with magenta near the base, the blade obovate or oval-obovate, with a white back-ground in the middle and yellow-tinged at the base, and veined and flecked with blue which merges about the edges: petals somewhat shorter than the sepals, the claw inrolled, the blade blue: capsule erect, narrowly prismatic-cylindric, 3–5 cm. long, 3-angled, shortly 3-valved at the apex. [*I. virginica* Pursh, not L.]—Marshes, swamps, and ditches, often in acid soils, Coastal Plain and occasionally Piedmont and Blue Ridge, Ga. to N. S.—Spr.—sum.—As

indicated by its rootstocks and its capsule this iris falls in a group of its own within our range.

92. I. versicolor L. Flower-stalk erect, 3–6 dm. tall, often slightly zigzag: flowers scarcely fragrant: hypanthium covering the ovary obtusely 3-angled: sepals 4–6 cm. long, recurved-spreading, the claw suffused with yellowish-green, the blade obovate to suborbicular, of a violet or purple ground-color, except the yellowish-green blotch at the base and surrounding whitish zone: petals very much shorter than the sepals, with a short yellowish-green claw and a violet or purple blade: capsule prismatic-cylindric, or ellipsoid in small specimens, mostly 3.5–5.5 cm. long, somewhat 3-sided.—Marshes, swamps, meadows, and stream-banks, various provinces, Ga. to Miss., Man., Ont., and Newf.—Spr.–sum.—Apparently the most widespread of our species, the more northern plant usually referred here, however, may represent a distinct species.

93. I. Shrevei Small. Flower-stalk erect, up to 1 m. tall, rigid: flowers fragrant: hypanthium covering the ovary bluntly 3-angled: sepals 5–7 cm. long, recurved-spreading, the claw suffused with greenish-yellow, the blade oval or orbicular-oval, of a violet or purple ground-color, except the yellow-green blotch at the base: petals spatulate, somewhat shorter than the sepals, with a long claw suffused with green and an oval or elliptic, violet or purple blade often with a yellowish-green midrib in the base: capsule prismatic-cylindric, 7–11 cm. long, 3-sided.—Meadows, marshes, and swamps, usually in non-acid soils, Coastal Plain and adj. provinces, Ala. (and perhaps further east in the Gulf States) to La., Okla., and Ill.—Spr.—This iris seems to replace *I. versicolor* in the Mississippi Valley. Its perianth indicates relationship to *I. virginica,* while its fruit resembles that of *I. versicolor,* although relatively much longer. A form with rose-lilac flowers has been found in Autauga Co., Ala.

94. I. virginica L. Flower-stalk 3–6 dm. tall, rigid, often somewhat zigzag: flowers slightly fragrant: hypanthium covering the ovary bluntly 3-angled: sepals 6–7.5 cm. long, recurved-spreading, the claw suffused with yellowish-green or bronze, the blade obovate to elliptic or oval, mainly of a light-violet to lavender or whitish ground-color, with a yellow or orange-yellow blotch at the base: petals spatulate, somewhat shorter than the sepals, with a yellowish-green or bronze claw and an obovate blade with the ground-color of the sepal-blade: capsule ellipsoid to ovoid-ellipsoid, 4–7 cm. long, somewhat 3-angled. [*I. carolina* Radius. *I. caroliniana* S. Wats. *I. georgiana* Britton]—Swamps, marshes, meadows, and river-shores, Coastal Plain and adj. provinces, N Fla. to Tex., and Del.—Spr.—This species has recently been considered to represent the Linnaean *I. virginica,* but specimens growing at Gloucester, Va., where the original specimens of *I. virginica* may have been collected, seem to represent *I. versicolor.* This species replaces *I. versicolor,* in the southeastern Coastal Plain, and is the most widely distributed iris there. The capsule resembles that of the Old World *I. Pseudacorus* when it does dehisce, in its recurving valves with shiny inner coat. There is greater variation in color in *I. carolina* than in any of our species. The perianth shows shades varying from dark-violet to pale-pinkish, and a pure white albino has been found in Florida.

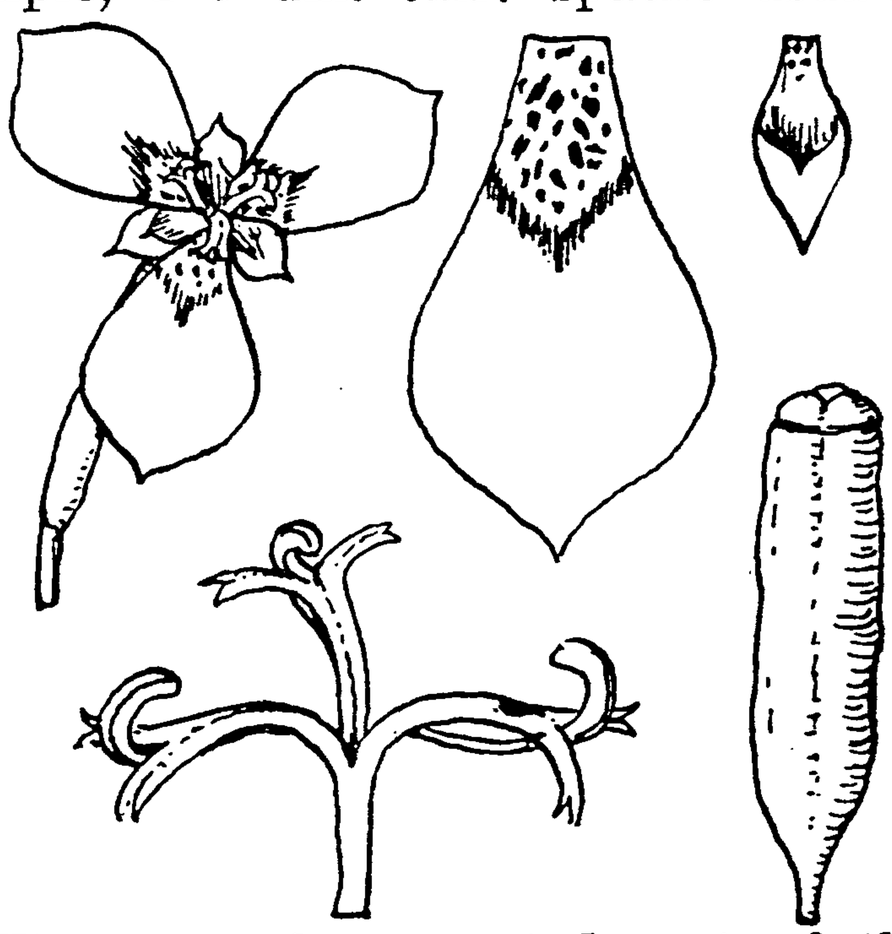
95. I. tripetala Walt. Flower-stalk 2–4 dm. tall, rigid, slender, often slightly zigzag: flowers usually solitary in the terminal involucre and an additional one sometimes in the axil of the narrow bract, fragrant: hypanthium surrounding the ovary bluntly 3-angled: sepals 6–9 cm. long, recurved-spreading or drooping, the claw margined with violet and pale in the middle, the blade suborbicular or oval, with a violet ground-color, or white, except the yellow blotch at the base: petals involute, much shorter than the claw of the sepal, acute or acuminate, violet above the greenish base: capsule ellipsoid, 2.5–3.5 cm. long, somewhat 3-angled.—Low pinelands, bays, and acid swamps, Coastal Plain, N Fla. to N. C.—Late spr.—Like *I. prismatica,* this species is in a group by itself in our range. It, too, is slender throughout, and the cord-like rootstocks are peculiar. The plants from the gulf coast have larger flowers and

longer style-appendages than those from the Atlantic coastal region. A pure white albino has been found.

96. **I. Pseudacorus** L. Flower-stalk 6–10 dm. tall, but sometimes rather weak, and slightly decumbent: flowers slightly fragrant: hypanthium covering the ovary bluntly 3-angled: sepals 5–7.5 cm. long, arching, orbicular-obovate in outline, the claw with a yellow ground-color streaked and flecked with brown, the blade suborbicular, broadly oval, or broadly ovate, with the yellow ground-color faintly lined and flecked with brown at the base or the brown sometimes exaggerated into a blotch: petals somewhat pandurate, 1.5–2.5 cm. long, yellow: capsule cylindric-prismatic, or somewhat ellipsoid, 5–8.5 cm. long, bluntly 3-angled, the 3 valves spreading or recurved-spreading at maturity.—Stream-banks, woods, and waste-places, Ga. to S Can. Nat. of the Old World.—Spr.—The yellow flowers of this immigrant are a welcome addition to our iris flora. The color varies from clear canary yellow to deep cream-color, but always with the irregular brown-black outline to the crest region.

7. **HERBERTIA** Sweet. Scapose herbs with deep-seated bulbs. Leaves with sheathing bases and plicate narrow blades. Scape erect, more or less sheathed by the leaf-bases. Hypanthium-tube very short or wanting. Flower erect. Sepals 3, spreading, crestless. Petals very much smaller than the sepals, spreading. Anthers narrow, lying against the style-branches, curling in at anthesis. Style-branches spreading, each with 2 subulate branches which are toothed at the apex. Capsule erect, thin-walled.

1. **H. caerulea** Herb. Bulb ovoid, brown-coated: leaves 1–3 dm. tall; blades narrowly linear: scape slender, usually simple, 1–3 dm. tall: spathe usually 1- or 2-flowered: flowers long-stalked: sepals cuneate-obovate, 3–4 cm. long, acute, pale-violet or wisteria-color, with a violet band outlining the white base which is violet spotted: petals 1–1.5 cm. long, short-acuminate, the upper part light-violet, the lower more or less channeled, black-violet, and white spotted near the base: capsule erect, cylindric or somewhat clavate, 2–3 cm. long.—Prairies and marshes, Coastal Plain, S La. to Tex.—Spr.



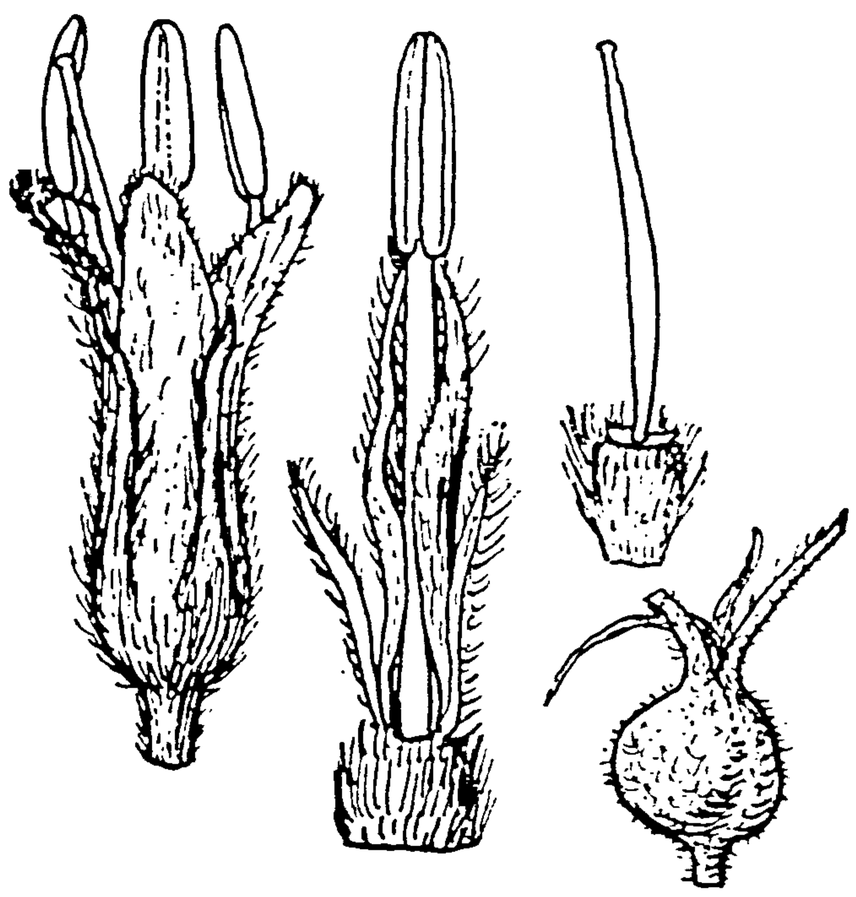
Two species of *Gladiolus* have been found growing as escapes in southern Louisiana west of the Mississippi River. They may be expected east of the river. The genus differs from other members of the iris family in the one-sided inflorescence and the curved and oblique perianth. *G. segetum* Ker–Gawl, native of the Mediterranean region has a rose-magenta perianth; the sepals and petals are clawed, the three upper blades each have a median whitish zone, the three lower blades each with a whitish median line bordered by crimson. *G. hortulanus* Bailey, native of southern Africa, has a scarlet to vermilion perianth; the sepals have a red-brown median line and minute brownish specks near the base, the petals have a median brown line and patches of minute specks and are often minutely pointed, the three lower blades of the perianth are yellow on the basal two-thirds and only scarlet-bordered.

FAMILY 4. **HAEMODORACEAE** — BLOODWORT FAMILY

Perennial caulescent herbs. Leaves alternate, often mainly basal: blades narrow. Flowers perfect, in terminal clusters. Calyx of 3 sepals. Corolla of 3 petals, persistent. Androecium of 3 stamens opposite the petals. Gynoecium of 3 united carpels. Ovary inferior, 3-celled, or rarely 1-celled. Styles united. Fruit a loculicidally 3-valved capsule.—Nine genera and 35 species, most abundant in Africa and Australia.

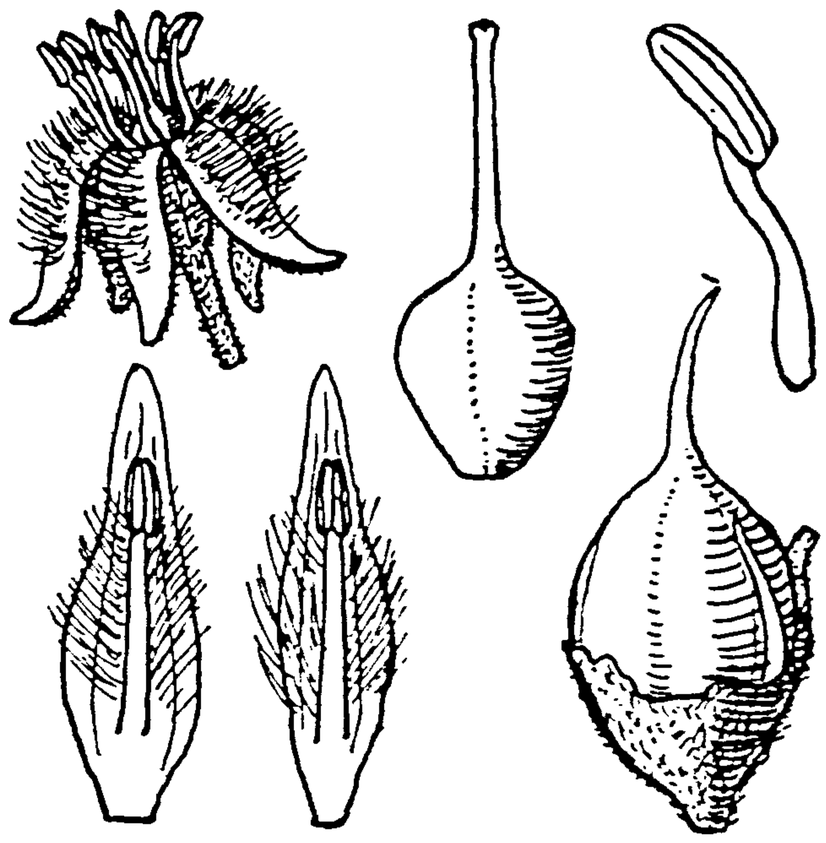
Ovary wholly inferior: stamens 3: style deciduous. 1. GYROTHECA.
Ovary half-inferior: stamens 6: style persistent. 2. LOPHIOLA.

1. GYROTHECA Salisb. Herbs with colored rootstocks. Leaves equitant. Flowers in a terminal cymose corymb. Perianth pubescent without, yellow within. Capsule crowned by the peristent perianth. [*Lachnanthes* Ell.]—One species.



1. G. tinctoria (Walt.) Salisb. Rootstock elongate. Stem 3–12 dm. tall, pubescent above: leaves shorter than the stem, the cauline gradually reduced: sepals and petals nearly linear, the latter 10–12 mm. long: capsule 5–6 mm. in diameter.—(RED-ROOT. PAINT-ROOT. DYE-ROOT.)—Bogs and wet pinelands, often acid, Coastal Plain and New England Coast, Fla. to La. and Mass.—(*W. I.*)—Spr.–fall.—Resembles *Lophiola aurea,* but coarser and more weedy, and the pubescence of the perianth is tawny.

2. LOPHIOLA Ker. Herbs with rootstocks and leafy stems. Basal leaves equitant, upright. Flowers in a dichotomous cyme. Perianth yellow within: lobes much longer than the tube. Filaments adnate to the base of the perianth.—The following is, apparently, the only representative of the genus, although a somewhat divergent form occurs further northward.



1. L. aurea Ker. Stem 5–8 dm. tall, woolly above: leaf-blades linear, shorter than the stem: perianth yellow, pubescent without; lobes linear-lanceolate, 4–5 mm. long: capsule-body about 2 mm. long, long-beaked.—(GOLD-CREST.)—Moist pinelands and acid bogs, Coastal Plain, Fla. to Miss. and N. C.; also N. J.—Spr.–sum.—The golden perianths showing through glistening white wool, form a striking inflorescence.

ORDER 11. **SCITAMINALES**

Large, commonly perennial, herbs with rootstocks or tubers. Leaves alternate, sometimes all basal: blades relatively large, sometimes very large: petioles sheathing at the base. Flowers very irregular. Perianth white or

bright-colored. Androecium very irregular. Gynoecium compound. Ovary inferior. Fruit a capsule, a utricle, or a berry. Endosperm present.

Polleniferous stamens 5 or 6 in each flower. — Fam. 1. MUSACEAE.
Polleniferous stamens 1 in each flower.
  Ovary 3-celled, all 3 carpels fructiferous: ovules numerous in each cavity of the ovary: fruit capsular: embryo straight.
    Sepals distinct: anthers 1-celled. — Fam. 2. CANNACEAE.
    Sepals partially united: anthers 2-celled. — Fam. 3. ALPINIACEAE.
  Ovary 1-celled, or 3-celled, but 2 of the carpels abortive: ovules solitary in each cavity of the ovary: fruit utricular: embryo hooked. — Fam. 4. MARANTACEAE.

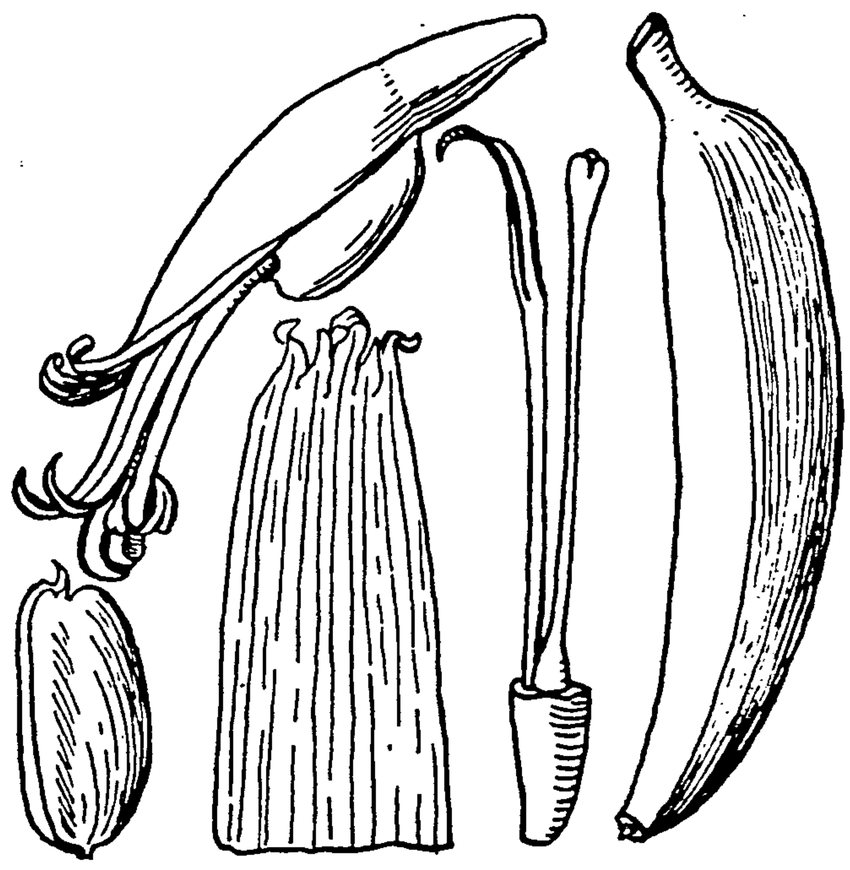
FAMILY 1. **MUSACEAE** — BANANA FAMILY

Caulescent, usually large herbs, or trees. Leaves spiral or distichous: blades usually very large. Flowers perfect or somewhat monoecious. Inflorescence conspicuously bracted. Calyx of 3 distinct sepals, or united into a spathe-like organ. Corolla of 3 distinct petals, or of partially united petals, sometimes partially adnate to the calyx. Androecium of 5 or 6 polleniferous stamens. Gynoecium of 3 united carpels. Fruit baccate or capsular.—Six genera and 70 species of warm regions.

1. MUSA L. Tree-like herbs, the stems sheathed with the thick leaf-bases. Leaves with large prominently feather-veined blades. Inflorescence drooping, with large bracts. Perianth white or pink. Petals shorter than the sepals, 2 of them partly adnate to the calyx-tube, the other free, and often snort, with a bent tip. Berry elongate.—About 20 species, of the warmer parts of the Old World. There are numerous cultivated varieties.—BANANA.—The fruits of several species are foods and fiber is also obtained from some species.

Leaf-blades long-petioled: free petals over ½ as long as the calyx. — 1. *M. sapientum.*
Leaf-blades sessile or nearly so: free petals less than ½ as long as the calyx. — 2. *M. Cavendishii.*

1. M. sapientum L. Plant 6–10 m. tall: leaf-blades broadly elliptic, 1.5–2.5 m. long, rounded or cordate at the base: panicle drooping, 1.5–2 m. long: bracts purplish: calyx about 4 cm. long, the apical appendages minute or obsolete: berry long-elliptic, 8–15 cm. long, bright-yellow, the pulp sweet.—(COMMON-BANANA.)—Hammocks, S pen. Fla. and S La. Nat. of E. I., and cult.—All year.



2. M. Cavendishii Lamb. Plant mostly 1–2.5 m. tall: leaf-blades broadly elliptic mostly about 1 m. long: calyx 3–3.5 cm. long, the appendages minute: tip of the free petal nearly erect: berry mostly 10–15 cm. long, yellowish, the pulp sweet.—(DWARF-BANANA.)—Hammocks and swampy grounds, S pen. Fla. and the Keys. Nat. of China, and cult.—All year.

FAMILY 2. **CANNACEAE** — CANNA FAMILY

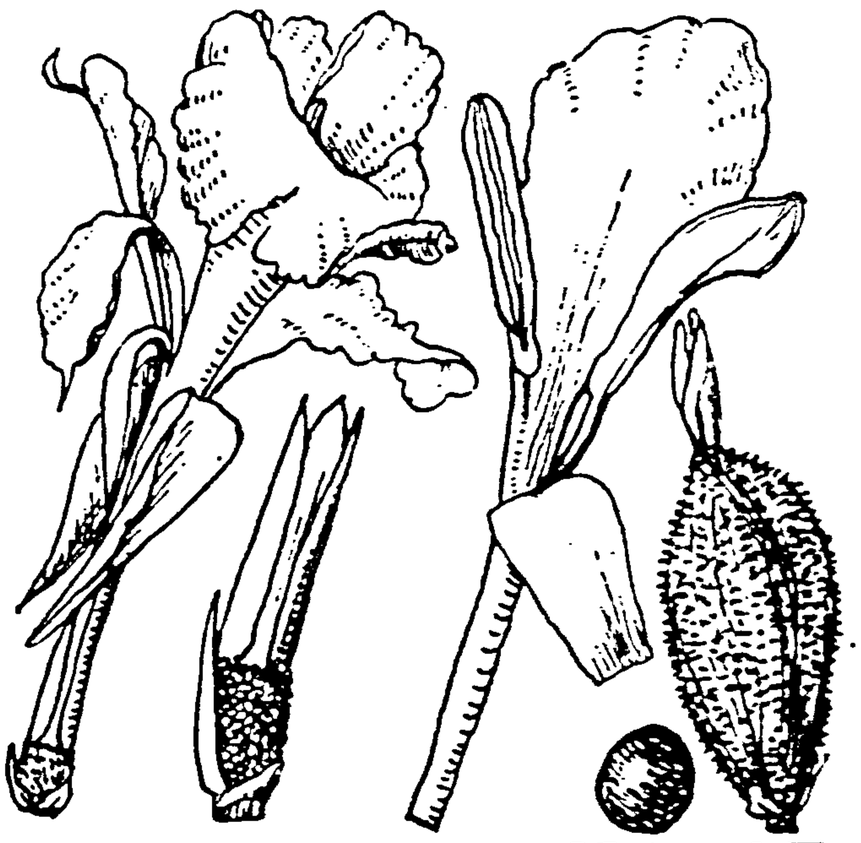
Caulescent herbs. Flowers perfect. Calyx of 3 erect sepals. Corolla of 3 partially united petals. Androecium more or less adnate to the

corolla: one filament anther-bearing, the others petaloid. Ovary 3-celled, the placentae parietal. Style petaloid, the stigma marginal. One genus.

1. CANNA L. Large or tall herbs, with relatively large leaves. Flowers mostly showy, borne in terminal thyrsoid panicles. Perianth variously colored. —About 40 species, mostly American.—INDIAN-SHOTS.—Some species and many hybrids are widely cultivated.

Perianth yellow: sepals 2.5–3 cm. long: perianth-tube much longer than the sepals: lip much dilated. 1. *C. flaccida.*
Perianth red: sepals 1–1.5 cm. long: perianth-tube shorter than the sepals: lip linear-spatulate. 2. *C. indica.*

1. C. flaccida Salisb. Leaf-blades 2.5–5.5 dm. long: flowers very showy: perianth mainly yellow: sepals 2.5–3 cm. cm. long: corolla-lobes 5–6.5 cm. long, about as long as the tube: staminodia dilated, wavy-margined: capsule 4–6 cm. long.—(GOLDEN-CANNA. BANDANA OF THE EVERGLADES.) — Swamps and marshes. Coastal Plain, Fla. to S. C.—Spr.–fall.

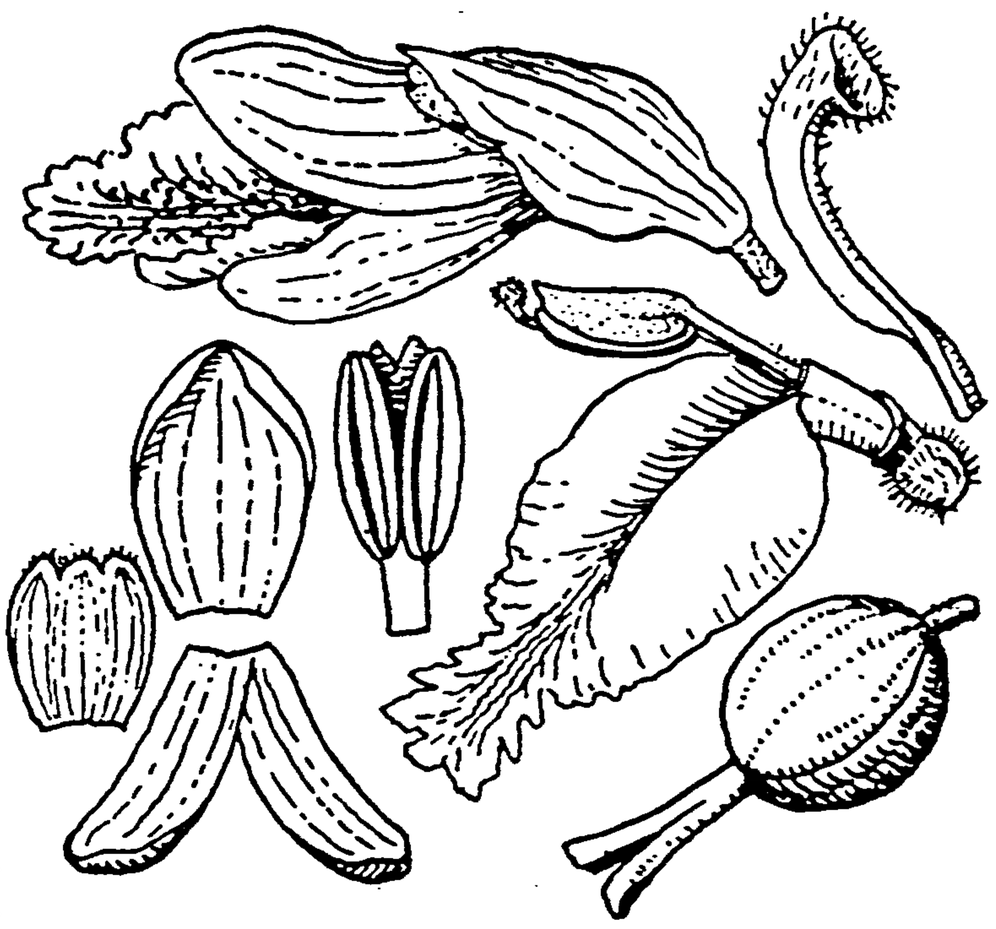


2. C. indica L. Leaf-blades 2–4 dm. long: flowers not showy: perianth mainly red: sepals much longer than the perianth-tube: corolla-lobes 3–3.5 cm. long, much longer than the tube: staminodia linear or narrowly spatulate, flat: capsule 2.5–3.5 cm. long.—Low grounds, Coastal Plain, Fla. to Tex. Nat. of E. I., and cult.—Sum.–fall.

FAMILY 3. ALPINIACEAE — GINGER FAMILY

Caulescent, sometimes large, herbs mostly with horizontal rootstocks. Flowers mostly perfect, borne in spike-like, sometimes cone-like, thyrsoid, or open panicles. Calyx of 3 partially united sepals, sometimes spathe-like. Corolla of 3 petals partially united into a tube. Fruit capsular.—About 25 genera and 200 species, mostly of tropical distribution.

1. LANGUAS Koen. Herbs with horizontal rootstocks and erect stems. Leaves erect. Panicle thyrsoid, terminating a leafy stem, with often imbricate bracts. Calyx 3-lobed. Petals 3, the upper one larger than the others. Lip large and showy. Staminodia minute or wanting. Capsule sometimes baccate.—About 40 species of the warm regions of the Old World.



1. L. speciosa (Wendl.) Small. Plant 1–4 m. tall, the stem sheathed: leaf-blades elliptic to elliptic-lanceolate, 1.5–4 dm. long: flower-stalks drooping from sheaths: calyx 18–23 mm. long: corolla white, tinged with magenta: lip 5–6 cm. long, crisped, yellow, variegated with brown and red.—(SHELL-FLOWER.)—Hammocks, S pen. Fla. Nat. of E. I. and cult.—(*W. I.*)—All year.—A very vigorous garden plant. Aggressive when established. It resembles its relative the true ginger plant in habit.

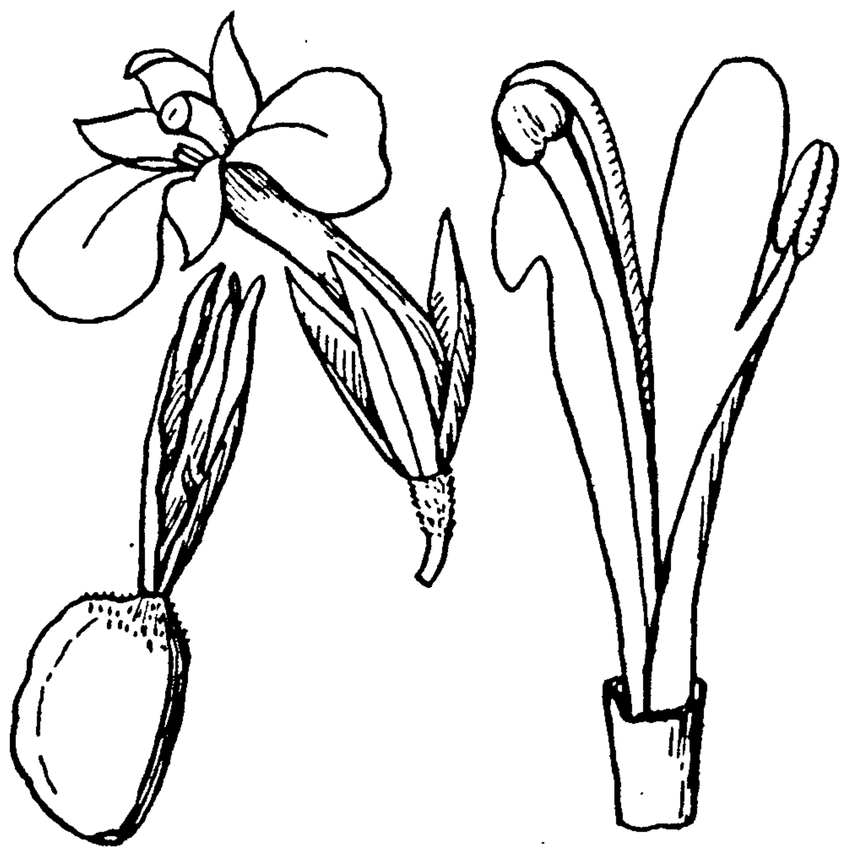
Hedychium coronatum Koenig, GINGER-LILY or BUTTERFLY-LILY, native of the East Indies, is a tall evergreen herb with large lanceolate or elliptic-lanceolate leaf-blades, clavate inflorescence, and large white flowers, the lateral staminodia petal-like, thus differing from *Languas*, has become naturalized in marshes in eastern Ga. and along the Mississippi River below New Orleans, La.

FAMILY 4. MARANTACEAE — ARROWROOT FAMILY

Scapose or caulescent herbs. Flowers perfect or sometimes polygamous. Calyx of 3 distinct or partially united sepals. Corolla of 3 distinct or partially united petals. Androecium partially adnate to the corolla: one filament anther-bearing, the others petaloid. Ovary 1–3-celled. Style thick, the stigma 2-lipped. Fruit utricular, smooth.—About 12 genera and 160 species, mostly tropical.

Petals partially united: lateral staminodia 2. 1. MARANTA.
Petals distinct or nearly so: lateral staminodium 1. 2. THALIA.

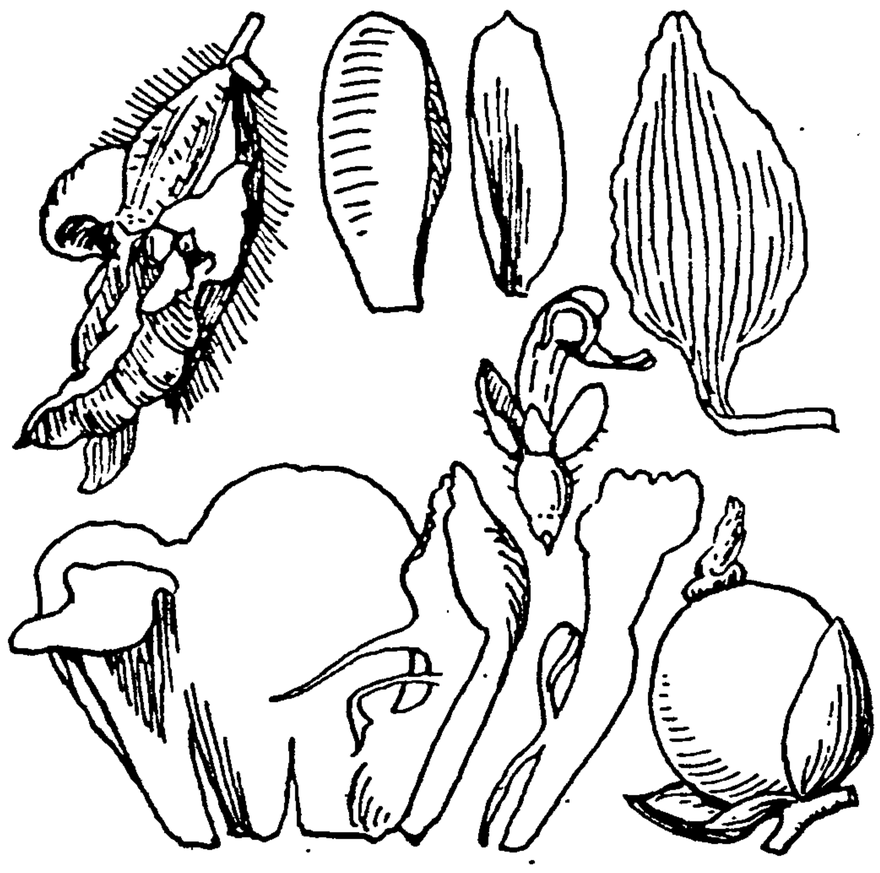
1. MARANTA L. Relatively slender caulescent herbs, not white-powdery. Flowers solitary or few in panicles. Calyx of narrow sepals. Corolla-tube cylindric. Perianth and androecium mainly white.—About 15 species, all of tropical America.



1. M. arundinacea L. Stem 1–2 m. tall, from scaly rootstocks: leaf-blades lanceolate to ovate-lanceolate, 8–25 cm. long: sepals 10–12 mm. long: corolla white, about 2 cm. long: staminodia surpassing the corolla: fruit about 1 cm. long. — (ARROWROOT.) — Hammocks and moist soil, S pen. Fla. Nat. of E. I., and cult.—(*W.I.*)—All year.—The tuberous rootstocks are the source of true arrowroot starch, although this term is often applied also to zamia starch.

2. THALIA L. Relatively stout scapose herbs, white-powdery, at least above. Flowers rather numerous, in panicles. Calyx minute. Corolla-tube wanting or obsolete. Perianth and androecium mainly purple, blue, or violet.—About 7 species, all American.—Spr.–fall.

Flowers closely crowded on the rachis: clusters of bracts and bractlets ovoid: utricle subglobose. 1. *T. dealbata.*
Flowers separated on the rachis: clusters of bracts and bractlets narrowly conic: utricle oval. 2. *T. geniculata.*



1. T. dealbata Roscoe. Plant 1–2 m. tall: leaf-blades ovate, ovate-elliptic, or elliptic-lanceolate, 2–5 dm. long, acute or acuminate at the apex, rounded or cordate at the base: panicle narrowly and stiffly branched, the zigzag internodes short (2–3 mm.), stout: spikes erect or ascending: bracts broad at the apex, the longer ones 1–1.5 cm. long: perianth purple: petals 7–8 mm. long: larger staminodium about 1.5 cm. long: utricle subglobose, 10–13 mm. in diameter. [*T. barbata* Small.]—(POWDERY-THALIA.)—Ponds and swamps, Coastal Plain, Fla. to Tex., Mo., and S. C.

2. T. geniculata L. Plant 2–3.5 m. tall: leaf-blades lanceolate to broadly lanceolate, 2.5–8 dm. long, acuminate at the apex, rounded or truncate at the base: panicle widely and loosely branched, the internodes long (7–11 mm.), slender: spikes nodding or spreading: bracts narrowed at the apex, the larger ones 2–2.5 cm. long: perianth purple: petals 8–9 mm. long: larger staminodium about 2 cm. long: utricle oval, 6–7 mm. in diameter. [*T. divaricata* Chapm.] —(LILIES.)—Pools, ponds, marshes, swamps, and river-shores, Fla.—(*W. I.*)—Our largest-leaved native herb. In colonies usually conspicuous, but not attractive. The tall scapes, irregularly branched, stand at various angles and the large leaf-blades are usually weather-worn.

ORDER 12. **ORCHIDALES** — ORCHIDAL ORDER

Terrestrial, aquatic or epiphytic herbs. Leaves usually fleshy, sometimes scale-like. Flowers mostly perfect and complete, very irregular, except in BURMANNIACEAE. Calyx of 3 sepals. Corolla of 3 petals. Gynoecium compound. Ovary inferior. Seeds numerous. Endosperm wanting.

Flowers regular: stamens and pistil distinct. — Fam. 1. BURMANNIACEAE.
Flowers irregular: stamens and pistil united into a column. — Fam. 2. ORCHIDACEAE.

FAMILY 1. **BURMANNIACEAE** — BURMANNIA FAMILY

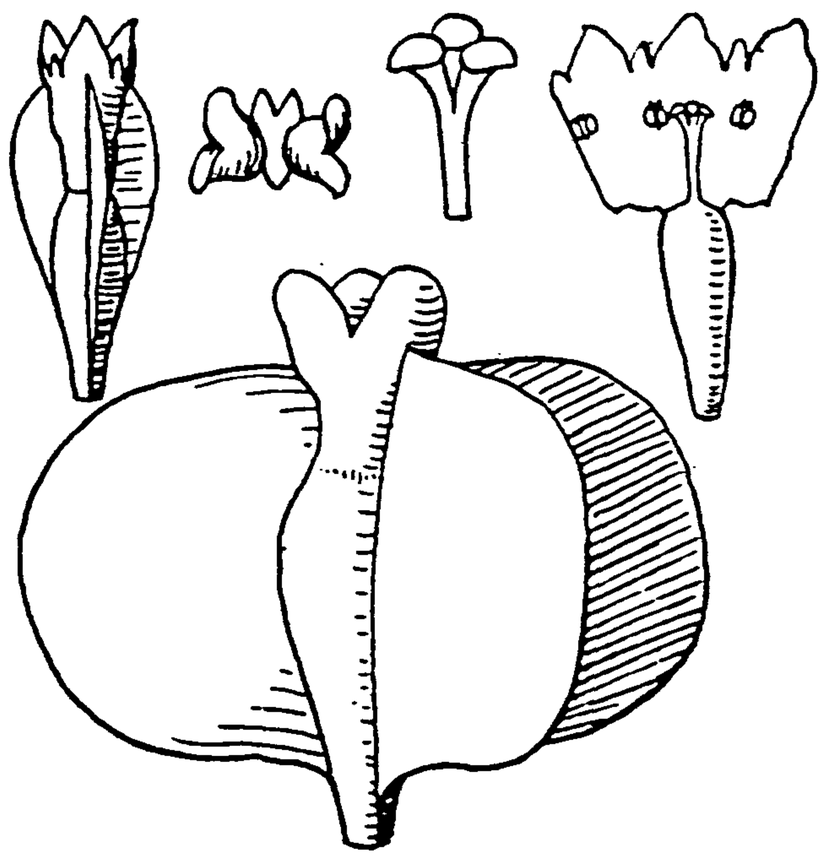
Slight or relatively small herbs. Leaves mainly basal, those on the stem scale-like. Flowers regular. Sepals and petals partially united. Androecium of 3 to 6 stamens: filaments adnate to the perianth-tube. Gynoecium 3-carpellary. Fruit capsular, sometimes angled or winged.—Ten genera and about 60 species, mostly in the tropics.

Hypanthium 3-angled or 3-winged: ovary 3-celled: capsule 3-valved from the apex or irregularly rupturing. — 1. BURMANNIA.
Hypanthium terete: ovary 1-celled: capsule 3-valved from the base. — 2. APTERIA.

1. BURMANNIA L. Annual herbs. Flowers spreading or erect, short-pedicelled, white or blue. Filaments unappendaged; connective prolonged beyond anther-sacs.—Twenty species, in the tropics of the Old World and the New.—Spr.–fall, or all year S.

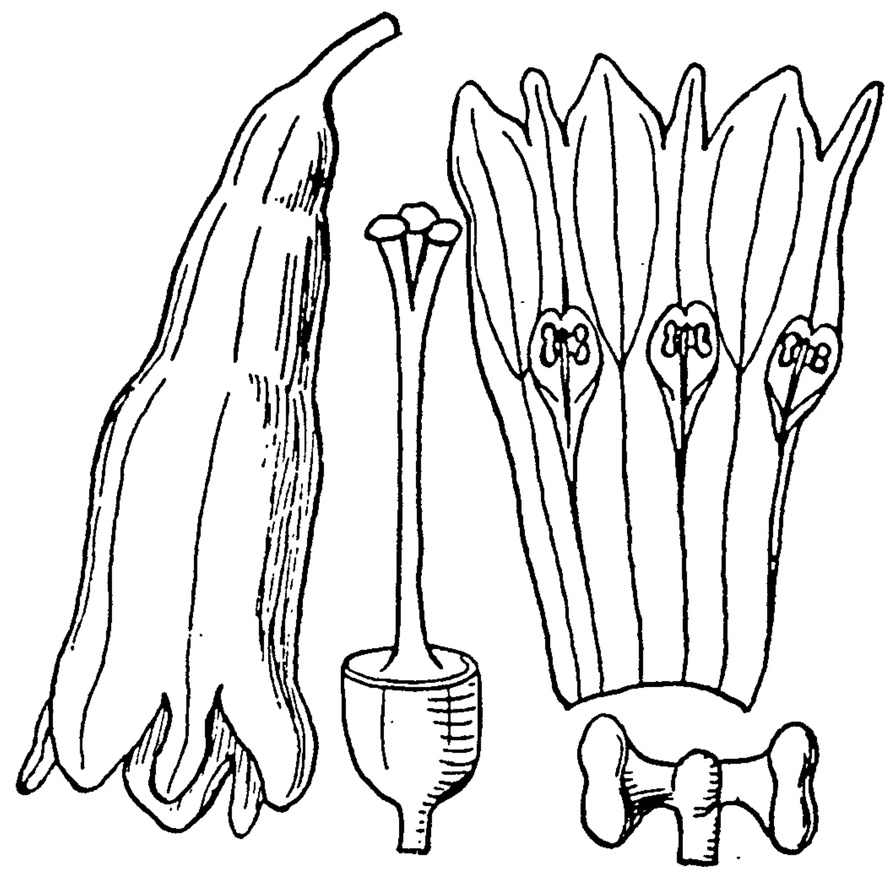
Flowers 1–few, usually 2, in a terminal raceme: hypanthium broadly 3-winged. — 1. *B. biflora.*
Flowers several in a terminal cluster: hypanthium 3-angled. — 2. *B. capitata.*

1. B. biflora L. Stem 5–15 cm. tall: leaf-scales 1–3 mm. long: flowers solitary at the top of the stem or 2–few together: corolla-lobes narrow: capsule 4–5 mm. long.—Low pinelands, often in acid peat, Coastal Plain, Fla. to La. and Va.



2. B. capitata (Walt.) Mart. Stem 5–20 cm. tall: leaf-scales 1–5 mm. long: flowers several or many in a terminal cluster: corolla-lobes obsolete: capsule 2–3 mm. long.—Low pinelands, Coastal Plain, Fla. to La. and N. C.—(*W. I., S. A.*)

2. APTERIA Nutt. Perennial herbs. Flowers nodding, long-pedicelled, white or purple. Filaments with wing-like appendages: connective not prolonged beyond the anther-sacs.—Three species, the following and two in tropical America.



1. A. aphylla (Nutt.) Barnhart. Stem 5–20 cm. long, mostly simple: leaf-scales 1–2 mm. long: flowers 10–15 mm. long: capsule 5–8 mm. long. [*A. setacea* Nutt.] —(NODDING-NIXIE.)—Moist shaded places and acid, swampy woods, Coastal Plain, Fla. to La. and Ga.

FAMILY 2. **ORCHIDACEAE** — ORCHID FAMILY

Perennial herbs, commonly succulent, with tuberous or fibrous roots, corms, bulbs or elongate rootstocks. Stems or scapes usually simple, at least below the inflorescence. Leaves basal or cauline, often reduced to scales, mostly sheathing at the base. Flowers perfect, irregular, solitary or disposed in a simple or compound inflorescence. Perianth inconspicuous or showy, usually of 2 series. Sepals 3, (or 2) nearly alike. Petals 3, of 2 kinds, the 2 lateral ("petals") similar, and the middle one ("lip") usually very different from the other petals, sometimes prolonged below into a spur, often inferior by the torsion of the pedicel or ovary. Androecium irregular, of one or more stamens, adnate to the style, forming an asymmetrical column. Anther 1, or rarely 2 anthers, often 2-celled, containing 2–8 waxy or powdery pollinia; these pollen-masses usually stalked, united by elastic threads and often attached at the base to a viscid gland. Gynoecium of 3 united carpels. Ovary inferior, 1-celled, often twisted. Style commonly terminating in a beak at the base of the anther, or between its sacs. Stigma a viscid surface facing the lip beneath the beak or between the anther-sacs. Fruit a 3-valved capsule. Seeds numerous, very small.—About 450 genera and over 5,000 species of wide geographic distribution, but most abundant in the tropics, where many species are epiphytes.

Polleniferous anthers 2, borne laterally on the column: lip a large inflated sac or pouch, without an apical blade—DIANDRAE. Tribe I. CYPRIPEDIEAE.

Polleniferous anther solitary: lip simple or complex, if saccate bearing an apical blade, or if merely saccate and bladeless, then forming the upper member of the perianth—MONANDRAE.

Anther attached by a broad base, not only persistent, but inarticulate and immobile: pollinia narrowed into tails which emerge from the base of the erect cavities of the anther: lip developed into a spur or a sac at the base. Tribe II. ORCHIDEAE.

Anther terminating the column or posterior, often affixed by a slender filament, often deciduous or coming away with the pollinia, or rarely firmly attached as in *Triphora*: lip rarely produced into a spur or sac.

Pollinia readily disintegrating, granular, mealy, or sectile, when in masses neither hard nor waxy. Tribe III. NEOTTIEAE.

Pollinia waxy, aggregated in masses in which the pollen grains cohere.

Flower-stem terminating a corm, a cluster of rootstocks, or arising from a pseudobulb or a short rootstock. — Tribe IV. EPIDENDREAE.
Flower-stem lateral on a leafy stem or pseudobulb or from an abbreviated leafless stem.
Leafy plants: main stem composed of annual members of which each one terminates the year's growth.
Leaves pliable, not coriaceous, convolute. — Tribe V. BLETIEAE.
Leaves rigid, coriaceous, conduplicate. — Tribe VI. ONCIDIEAE.
Leafless plants with green roots: main stem growing on year after year, not produced into distinct annual members, thus of unlimited growth. — Tribe VII. POLYRRHIZEAE.

I. CYPRIPEDIEAE

Caulescent plants: foliaceous leaves several: lip with a rounded opening: sterile stamen glabrous: stigma broadest at the base. — 1. CYPRIPEDIUM.
Scapose plants: foliaceous leaves 2, basal: lip with a fissure down the front: sterile stamen glandular-pubescent: stigma broadest at the apex. — 2. FISSIPES.

II. ORCHIDEAE

Stigma flat, without appendages.
Glands of the stigma enclosed in a pouch. — 3. GALEORCHIS.
Glands of the stigma naked, or merely surrounded by the appendages of the anther.
Glands covered by a thin membrane, which is deciduous with them. — 4. COELOGLOSSUM.
Glands without a membrane.
Valves of the anther not enclosing the glands below.
Lip entire or shallowly lobed. — 5. LYSIAS.
Lip incised or fringed. — 6. BLEPHARIGLOTTIS.
Valves of the anther enclosing the glands below by infolding of the margins. — 7. PERULARIA.
Stigma with well-developed appendages.
Base of the anther with long slender appendages.
Lip with three narrow lobes: stigma erect. — 8. HABENARIA.
Lip entire or nearly so: stigma drooping. — 9. HABENELLA.
Base of the anther without appendages. — 10. GYMNADENIOPSIS.

III. NEOTTIEAE

Stem climbing: elongate vines. — 11. VANILLA.
Stem not climbing: terrestrial or epiphytic herbs.
Anther terminating the column.
Leaves, or bracts, alternate, sometimes represented by mere scales, or if more than 2, whorled (*Isotria*).
Anther loosely attached, thus mobile.
Pollinia mealy, the grains not connected by elastic threads.
Plant caulescent: bracts, and leaves, alternate.
Lip recurved, the edges of the dilated upper part laciniate-pectinate, the face with a tufted crest: anther hollowed on the back. — 12. POGONIA.
Lip straight, the lobes erose, the face near the apex crested with two short lateral toothed ridges and a long median one: anther flat on the back. — 13. CLEISTES.
Plant scapose: bracts whorled at the top of the scape. — 14. ISOTRIA.
Pollinia attached by elastic threads.
Flowers several: lip with the middle lobe dilated upward, erect. — 15. LIMODORUM.
Flower solitary: lip with the middle lobe rounded, pendent. — 16. ARETHUSA.
Anther immobile, rigidly erect. — 17. TRIPHORA.
Leaf-like bracts opposite. — 18. OPHRYS.

Anther posterior, borne on the back of the column.
Inflorescence simple, the rachis not branched.
Lip posterior, forming the upper member of the perianth.
Lip borne at the base of the column or below it.
Lateral sepals united at the base and adherent to the base of the lip. 19. PRESCOTTIA.
Lateral sepals distinct and free from the lip. 20. CRANICHIS.
Lip borne above the base of the column. 21. PONTHIEVA.
Lip anterior, forming the lower member of the perianth.
Flower-stem arising from a fleshy root or a cluster of fleshy roots: rootstock wanting or not obvious.
Column-foot short or obsolete: lateral sepals borne obliquely on the hypanthium, scarcely, if at all, decurrent.
Anther acute, not lobed: lip with basal callosities.
Stigma 2-cleft: lip free from the column. 22. IBIDIUM.
Stigma entire: lip adnate to the column. 23. CYCLOPOGON.
Anther notched at the apex, thus 2-lobed: lip without callosities. 24. MESADENUS.
Column-foot elongate: lateral sepals decurrent on the hypanthium.
Lateral sepals forming a chin-like spur at the base of the hypanthium. 25. STENORRHYNCHUS.
Lateral sepals forming a slender spur at the base of the hypanthium. 26. PELEXIA.
Flower-stem arising from elongate horizontal rootstocks.
Foliaceous leaves alternate on the flower-stem: lip spurless, or with only a short sac which is surrounded by the lateral sepals. 27. PERAMIUM.
Foliaceous leaves clustered at the base of the flower-stem: lip with an extended spur or sac between the lateral sepals. 28. PHYSURUS.
Inflorescence compound, the rachis branched. 29. TROPIDIA.

IV. EPIDENDREAE

Foliage leaves, when developed, succulent-membranous, represented in *Tipularia* and in *Aplectrum*, at flowering time, by withered fragments or few persistent fibers, or in *Corallorrhiza* and *Hexalectris* all leaves represented by clasping scales: terrestrial herbs.
Roots or rootstocks not coralloid or sometimes with coralloid appendages, especially in young plants of *Tipularia* and *Aplectrum*: some leaves foliaceous.
Foliage leaves always present at flowering time.
Column short: lip 3-lobed at the apex. 30. MALAXIS.
Column elongate: lip dilated at the apex. 31. LIPARIS.
Foliage leaves absent at flowering time, or sometimes represented by mere withered remains.
Lip prolonged posteriorly into an elongate slender spur. 32. TIPULARIA.
Lip not prolonged into a slender spur. 33. APLECTRUM.
Roots or rootstocks coralloid.
Pollinia 8: lip with a crest of about 5 longitudinal ridges. 34. HEXALECTRIS.
Pollinia 4: lip with a callus on each side of the midrib near the base. 35. CORALLORRHIZA.
Foliage leaves coriaceous or firm-fleshy, always present on the flower-stems.
Column without a foot, or with a very short one: lateral sepals various, but not triangular.
Pollinia 2–4: evergreen epiphytes.
Petals scarcely half as long as the sepals. 36. PLEUROTHALLIS.
Petals nearly or quite as long as the sepals.

Lip partly adnate to the column.
Column wholly adnate to the lip: plants without true psudobulbs at the base of the leafy flowering stems.
Lip and column with short stout adnate bases: flowers axillary to spathe-like or scale-like bracts borne along a rachis terminating the leafy stems and branches. 37. SPATHIGER.
Lip and column with elongate, often slender, adnate bases: flowers in an open or congested panicle or raceme which terminates the leafy stem. 38. AMPHIGLOTTIS.
Column partly adnate to the lip: plants with pseudobulbs at the base of the naked or scaly flowering stems.
Lip 3-lobed, shallowly or deeply so, longitudinally crested or appendaged: sepals and petals relatively short, not attenuate.
Column adnate at the base: lip deeply 3-lobed, with a dilated middle lobe and long narrow lateral lobes: pseudobulbs terete: flowering stem not subtended by a foliaceous spathe. 39. ENCYCLIA.
Column adnate to about the middle: lip obscurely 3-lobed, with a minute middle lobe and broad and short lateral lobes: pseudobulbs flattened: flowering stem subtended by a foliaceous spathe. 40. EPICLADIUM.
Lip entire, clamshell-like, neither crested nor appendaged: sepals and petals elongate, attenuate. 41. ANACHEILIUM.
Lip free from the column. 42. HORMIDIUM.
Pollinia 8: terrestrial herb. 43. BASIPHYLLAEA.
Column with a distinct foot: lateral sepals triangular, forming a chin. 44. POLYSTACHYA.

V. BLETIEAE

Lip encompassing the column or growing to it, without a sac: pollinia 4 or 8, with caudiculae, but without stipes. 45. BLETIA.
Lip articulated to the foot of the column, or forming with it a spur: pollinia 2 or 4, without caudiculae but with short stipes.
Lip contracted into a claw: foot of the column slender: plants epiphytic. 46. CYRTOPODIUM.
Lip sessile, the base truncate or cuneate: foot of the column dilated or abruptly narrowed at the base: plants terrestrial.
Lip crestless, deeply 3-lobed, the lateral lobes widely spreading: foot of the column concave and grooved, not dilated, the margins thick. 47. TRIORCHOS.
Lip with a crest of nipple-like papillae, shallowly 3-lobed: foot of the column flat, thin and dilated, the margins thin. 48. PLATYPUS.

VI. ONCIDEAE

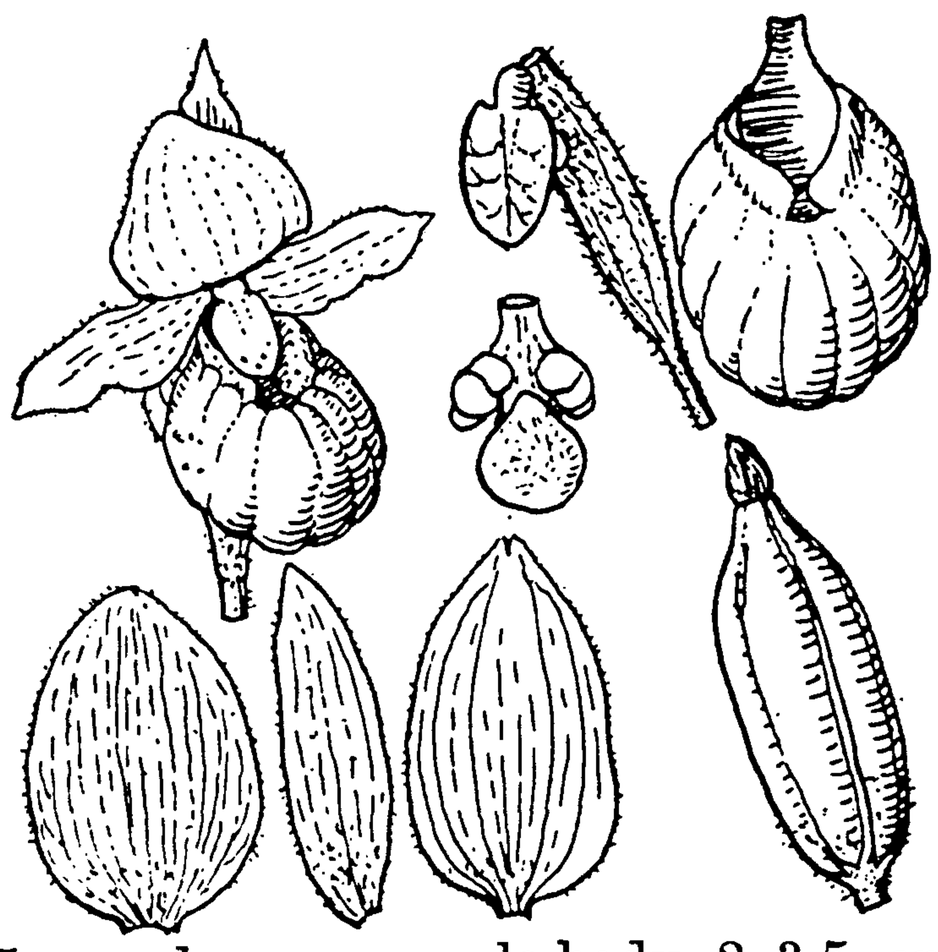
Pseudobulbs 1-leaved. 49. MACRADENIA.
Pseudobulbs at least 3-leaved.
Column simple, neither 2-winged nor 2-auricled near or at the summit.
Sepals and petals not caudate-tipped. 50. IONOPSIS.
Sepals and petals caudate. 51. BRASSIA.
Column 2-winged or 2-auricled at or near the summit. 52. ONCIDIUM.

VII. POLYRRHIZEAE

Pollinia stalked: lip saccate or short-spurred, the apex entire.
Flowers in a lax raceme: lip sessile at the base of the column, with a globular spur: roots fine. 53. HARRISELLA.
Flowers in a stiff spike: lip partially adnate to the column, usually saccate at the base: roots coarse. 54. CAMPYLOCENTRUM.
Pollinia sessile: lip long-spurred, the apex or the middle lobe again lobed. 55. POLYRRHIZA.

1. **CYPRIPEDIUM** L. Caulescent herbs with fibrous roots. Leaves several: blades plaited. Sepals 2. Lip a horizontally suspended sac, yellow or white. Stamens appressed, the free tips directed forward.—About 20 species, natives of north temperate regions.—Our plants prefer calcareous soils.—Spr.—LADIES'-SLIPPERS. MOCCASIN-FLOWERS.

Sterile stamen with the stalk wholly adnate to the column, the blade rounded at the base: column-wings short and broad: lip longer than the sepals and petals. 1. *C. reginae.*
Sterile stamen with the stalk partially adnate to the column, the blade not rounded at the base: column-wings long and narrow: lip shorter than the sepals and petals.
Sterile stamen with a triangular-ovate blade, less than 1 cm. long, obtuse: lip golden-yellow: flowers fragrant. 2. *C. parviflorum.*
Sterile stamen with an oblong-ovate or ovate-lanceolate blade over 1 cm. long, acute: lip yellow: flowers not fragrant. 3. *C. pubescens.*

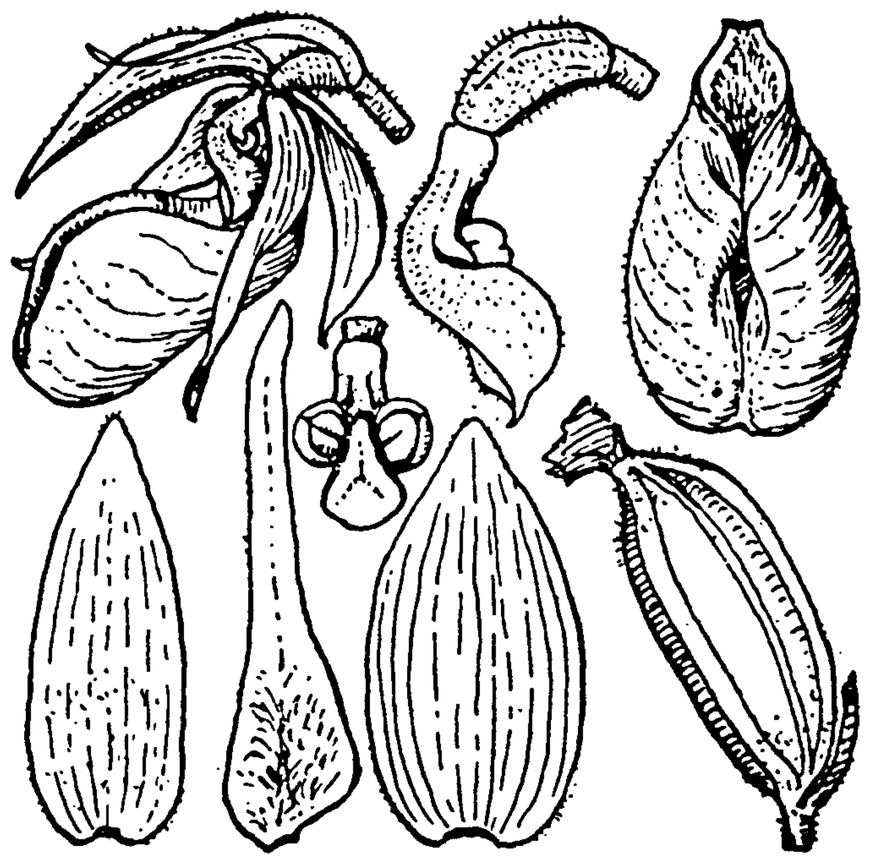


1. C. reginae Walt. Stem 3–6 dm. tall: leaf-blades oval or elliptic, 8–20 cm. long: sepals white, oblong to oval: petals white, lanceolate, barely as long as the sepals: lip about 4 cm. long, with rose and white stripes: capsule-body 3–4 cm. long. [*C. spectabile* Salisb.]—(SILVER-SLIPPER. QUEEN'S-SLIPPER.)—Swamps and low woods, Blue Ridge, Ga. to Va., and various provinces, Md. to Mo., Minn., Ont., and Newf.

2. C. parviflorum Salisb. Stem 3–5 dm. tall: leaf-blades elliptic to oval, 6–12 cm. long: sepals lanceolate to oblong-lanceolate, 2.5–3.5 cm. long: petals longer and narrower than the sepals: lip 1.5–2.5 cm. long: capsule-body 2–3.5 cm. long.—(GOLDEN-SLIPPER.)—Woods and shaded hillsides, various provinces, Ga. to Miss., Mo., Wash., B. C., Sask., Ont., and Newf.

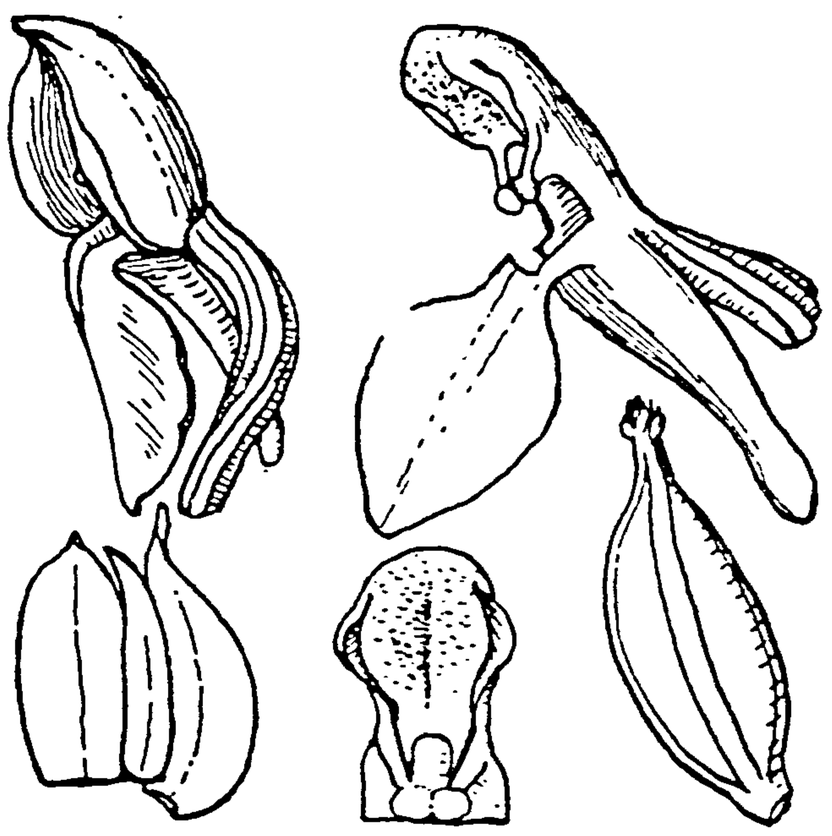
3. C. pubescens Willd. Stem 3–7 dm. tall: leaf-blades oblong or elliptic, 9–15 cm. long: sepals ovate-lanceolate or oblong-ovate: petals linear or attenuate, longer than the sepals: lip 3.5–5 cm. long: capsule-body 3.5–4 cm. long. [*C. hirsutum* (Fl. SE. U. S.)]—(GOLDEN-SLIPPER.)—Rich woods, banks, and thickets, various provinces, rarely Coastal Plain, Ga. to N. M., B. C., Ont., and N. S.

2. **FISSIPES** Small. Acaulescent herbs, with fibrous roots. Leaves mostly 2: blades plaited. Lip a drooping sac. Stamens spreading, the free tips at right angles to the column.—One species.



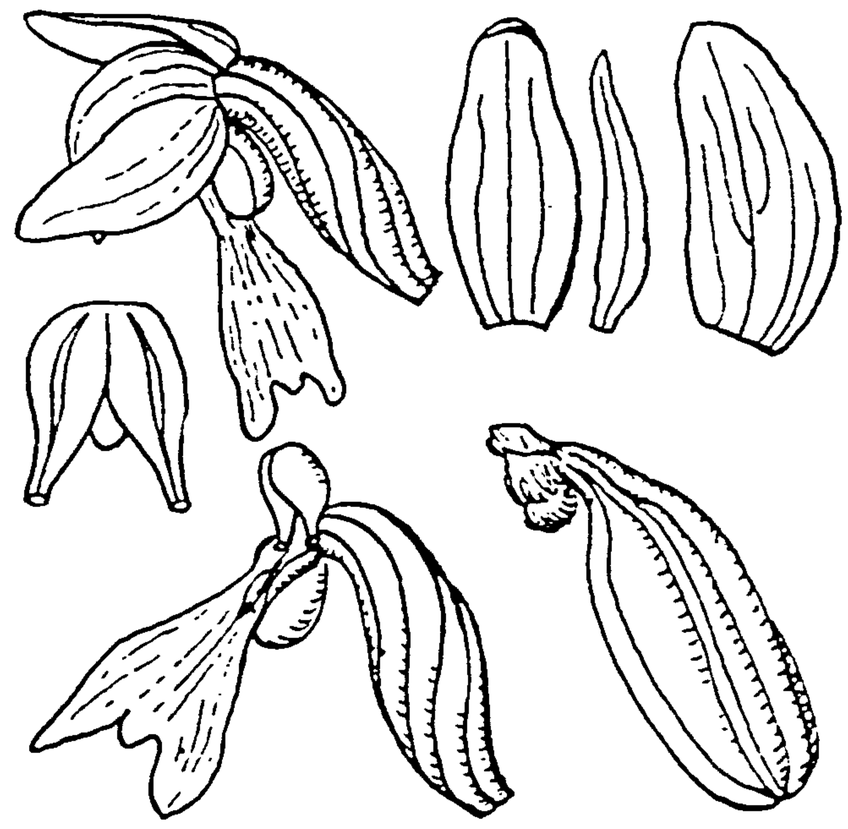
1. F. acaulis (Ait.) Small. Leaves 1–3 dm. long; blades oblong-elliptic or oval: scape 1–5 dm. tall: sepals 2, elliptic to lanceolate, 3–4 cm. long: petals narrower and longer than the sepals: lip pink or rarely white, obovoid, 4–6 cm. long: capsule 3.5–4 cm. long. [*Cypripedium acaule* Ait.]—(MOCCASIN-FLOWER. PURPLE SLIPPER. PINK LADY-SLIPPER. VENUS'-SLIPPER.)—Acid sandy woods and bogs, various provinces, Ala. to Tenn., Man., Ont., and Newf.—Spr.

3. **GALEORCHIS** Rydb. Acaulescent fleshy herbs, with tuberous roots. Flowers in a spike. Perianth ringent. Sepals and petals converging. Lip broad, spurred. Stigma hollow, the glands enclosed in a pouch.—One species.



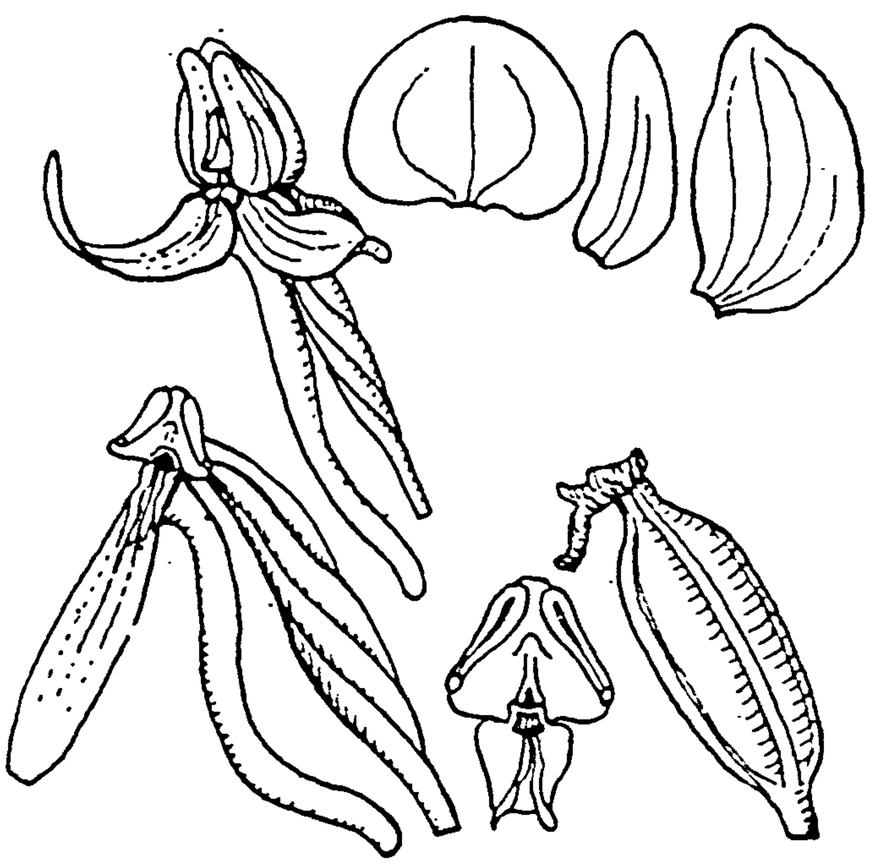
1. G. spectabilis (L.) Rydb. Leaves usually 2; blades oblong-elliptic, elliptic or oval, 6–17 cm. long: scape 1–3 dm. tall, the spike 3–12-flowered: sepals and petals violet-purple, lip white, 10–13 mm. long, slightly shorter than the spur: capsule 2–2.5 cm. long. [*Orchis spectabilis* L.]—(SHOWY-ORCHIS. KIRTLE-PINK. PURPLE-HOODED ORCHIS.)—Rich woods, various provinces, rarely Coastal Plain, Ga. to Ark., Nebr., Minn., Ont., and N. S.—Spr.

4. **COELOGLOSSUM** Hartman. Caulescent herbs, with biennial 2-branched tubers, the stem leafy. Flowers relatively small, in a terminal spike. Perianth green or greenish. Sepals and petals converging, the petals much narrower than the sepals. Lip narrow, 2–3-lobed at the apex, the spur much shorter than the lip. Anthers with narrow valves, the glands surrounded by a thin membrane.—Three species of north temperate regions.



1. C. bracteatum (Willd.) Parl. Stem 2–6 dm. tall: leaf-blades oblong-ovate to oblong-elliptic or oblong-lanceolate, 10–15 cm. long: bracts surpassing the flowers: sepals ovate to ovate-lanceolate, 5–6 mm. long: petals nearly linear or linear-filiform: lip narrow, 6–8 mm. long: capsule 8–10 mm. long. [*Platanthera bracteata* Torr.]—(SATYR-ORCHID.)—Meadows and woods, Blue Ridge and more northern provinces, N. C. to Nebr., Wash., Alas., Ont., and N. B.—(*O. W.*)—Spr.

5. **LYSIAS** Salisb. Caulescent herbs, the stem scape-like, scaly. Flowers in a spike or raceme. Perianth white or greenish. Sepals spreading, relatively broad, the lateral ones longer and narrower than the median one. Petals much smaller than the sepals. Lip narrow, entire, the spur longer than the lip. Anthers with diverging sacs whose beak-like bases project forward—About 6 species of the north temperate zone.



1. L. orbiculata (Pursh) Rydb. Stem 3–9 dm. tall: basal leaves 2, flat on the ground; blades orbicular to oval, 1–3 dm. long: sepals greenish-white, the median one suborbicular or reniform, 5–6 mm. long, the lateral ones ovate, 8–10

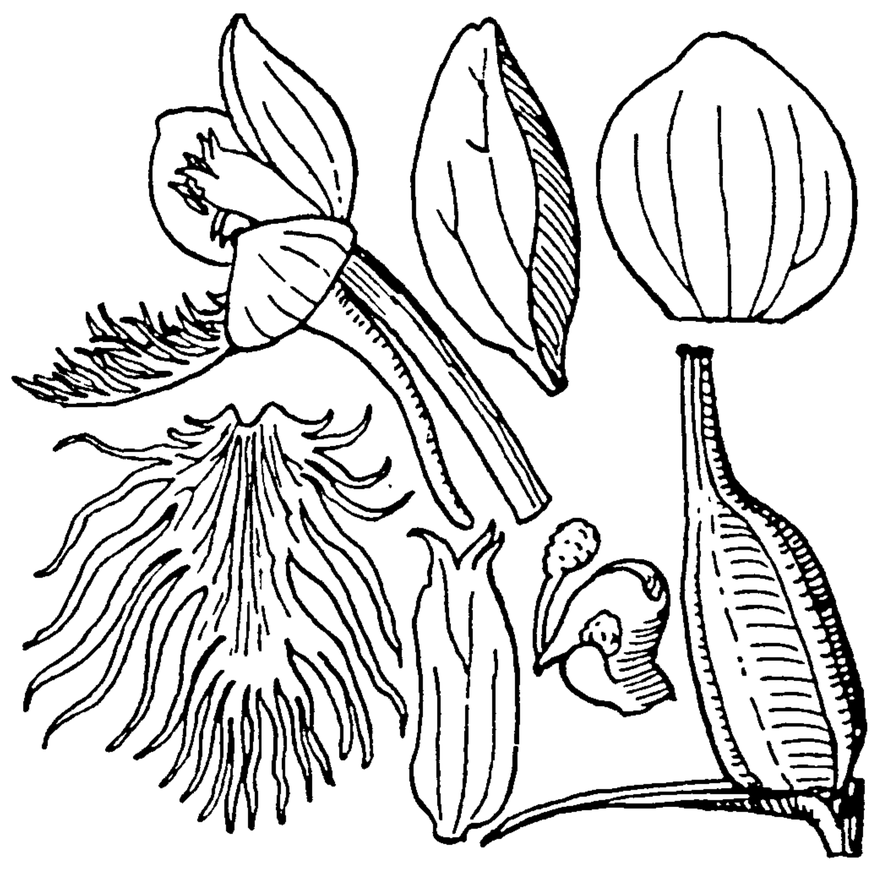
mm. long: petals reflexed, 7–8 mm. long: lip nearly linear, 12–15 mm. long, obtuse, the spur 2.5–4 cm. long: capsule about 1.5 cm. long. [*Platanthera orbiculata* Lindl.]—(MOON-SET. ROUND-LEAF ORCHID.)—Woods, Blue Ridge and more northern provinces, Ga. to Minn., Wash., Alas., Ont., and Newf.—Sum.

6. **BLEPHARIGLOTTIS** Raf. Caulescent herbs, the stem leafy. Flowers in a terminal spike. Perianth white, yellow, orange, purple, or violet-purple. Sepals spreading or reflexed. Petals toothed or lacerate. Lip fringed, or 3-lobed, the lobes toothed or laciniate. Spur often longer than the lip. Anthers with widely separated sacs, their narrow beak-like bases supported on the arms of the stigma, projecting forward and upward. Glands naked.—About 10 species, all North American.—Sum.—FRINGE-ORCHIDS.

Petals fringed at the apex: lip not 3-lobed.
- Lip mostly less than 8 mm. long: petals slightly shorter than the lip. — 1. *B. cristata.*
- Lip mostly over 10 mm. long: petals about ½ as long as the lip.
  - Perianth white.
    - Lip with long fringe: spur about as long as the ovary. — 2. *B. Blephariglottis.*
    - Lip with short fringe: spur about twice as long as the ovary. — 3. *B. conspicua.*
  - Perianth yellow or orange.
    - Petals spatulate: lip fringed all around. — 4. *B. ciliaris.*
    - Petals cuneate: lip with 2 basal tufts and a terminal fringe. — 5. *B. Chapmanii.*

Petals entire, crenulate or merely erose: lip 3-lobed.
- Petals entire, linear: lip with narrow lobes. — 6. *B. lacera.*
- Petals crenulate or erose, dilated upward: lip with dilated lobes.
  - Perianth white: petals with flabellate-dilated blades. — 7. *B. leucophaea.*
  - Perianth lilac or violet-purple (albinos occur): petals not flabellate-dilated.
    - Lobes of the lip fimbriate or fringed: petal-blade toothed on the sides.
      - Lip 14–20 mm. long: lateral sepals 9–11 mm. long: petals 9–12 mm. long. — 8. *B. grandiflora.*
      - Lip 7–10 mm. long: lateral sepals 5–6 mm. long: petals 5–7 mm. long. — 9. *B. psycodes.*
    - Lobes of the lip incised or erose: petal-blade toothed at the tip or entire. — 10. *B. peramoena.*

1. **B. cristata** (Michx.) Raf. Stem 2–6 dm. tall: leaf-blades linear-lanceolate to linear, 5–20 cm. long: perianth orange: lateral sepals orbicular-ovate or broadly ovate, 3–3.5 mm. long: petals cuneate, about 3.5 mm. long, fringed above the middle: lip suborbicular in outline, 5–9 mm. long, deeply fringed: spur 4–6 mm. long. [*Platanthera cristata* Lindl.]—(GOLDEN FRINGE-ORCHID.)—Acid bogs and low pinelands, Coastal Plain and rarely adj. provinces, Fla. to La., Ark., Tenn., and Mass.



2. **B. Blephariglottis** (Willd.) Rydb. Stem 3–9 dm. tall: leaf-blades oblong-lanceolate to linear-oblong, 10–25 cm. long: perianth white: lateral sepals sub-orbicular to orbicular-obovate, 5–7 mm. long: petals linear or linear-cuneate, 5–6 mm. long, fringed at the apex: lip ovate in outline, 8–11 mm. long, rather copiously fringed: spur 10–25 mm. long. [*Platanthera blephariglottis* Hook.]—(WHITE FRINGE-ORCHID. PLUME-OF-

NAVARRE.)—Acid sandy bogs and swamps, various provinces, Fla. to La., Minn., and Newf. Hybrids with the orange-colored species are known.

3. **B. conspicua** (Nash) Small. Stem 4–8 dm. tall: leaf-blades linear-lanceolate to broadly linear, 8–40 cm. long: perianth white: lateral sepals suborbicular, 6–9 mm. long: petals linear or oblanceolate, 5–8 mm. long, erose or toothed at the apex: lip oblong or oblong-lanceolate, 12–16 mm. long, short-fringed: spur 40–50 mm. long.—(SNOWY-ORCHID.)—Bogs, Coastal Plain or rarely adj. provinces, Fla. to La., Ky., and N. C.—The lip is sometimes nearly entire.

4. **B. ciliaris** (L.) Rydb. Stem 3–8 dm. tall: leaf-blades oblong to lanceolate, 8–20 cm. long: perianth orange: lateral sepals orbicular-ovate to orbicular-obovate, 6–8 mm. long: petals linear, oblong-linear or spatulate, 5–7 mm. long, sharply toothed at the apex: lip ovate in outline, copiously fringed: spur 15–25 mm. long. [*Platanthera ciliaris* Lindl.]—(YELLOW-FRINGE-ORCHID. ORANGE PLUME.)—Acid bogs, meadows, and open woods, various provinces, Fla. to Tex., Mich., and Vt.

5. **B. Chapmanii** Small. Stem 6–10 dm. tall: leaf-blades linear-lanceolate to broadly linear, 9–20 cm. long: perianth deep orange: lateral sepals suborbicular to orbicular-ovate, 3.5–4.5 mm. long: petals flabellate or cuneate, 3.5–4 mm. long, pectinate-fringed: lip about 10 mm. long, the linear body with a terminal fringe and 2 basal lateral fringes: spur 16–20 mm. long.—Pinelands, Fla. Perhaps a hybrid between *B. ciliaris* and *B. cristata.*

6. **B. lacera** (Michx.) Rydb. Stem 3–9 dm. tall: leaf-blades oblong to lanceolate, 8–20 cm. long: perianth greenish-white: lateral sepals ovate to orbicular-ovate, 5–6 mm. long: petals linear, 5.5–6 mm. long, entire: lip 12–15 mm. long, each narrow lobe terminating in a fringe of several processes: spur 14–16 mm. long. [*Platanthera lacera* A. Gray]—[GREEN-FRINGED-ORCHID. RAGGED-ORCHID. RUSSET-ORCHID.)—Meadows, swamps, and moist open woods, various provinces, Ga. to Ark., Man., and Newf.

7. **B. leucophaea** (Nutt) Rydb. Stem 3–8 dm. tall: leaf-blades oblong to oblong-lanceolate, 8–20 cm. long: perianth white: lateral sepals broadly ovate or oval, 6–10 mm. long: petals obovate to broadly spatulate 6–9 mm. long, erose: lip 12–16 mm. long, the cuneate lobes long-fringed: spur 25–40 mm. long.—(PRAIRIE-ORCHID.)—Meadows and moist soil, various provinces, La. to Minn. and N. S., rare E of the Appalachians.—The flowers are fragrant.

8. **B. grandiflora** (Bigel.) Rydb. Stem 3–15 dm. tall: leaf-blades oblong-obovate or oblong to lanceolate, 8–30 cm. long: perianth lilac-purple: lateral sepals ovate, 9–11 mm. long: petals with narrow claws: lip with a spur 20–30 mm. long. [*Platanthera fimbriata* Lindl.]—(PLUME-ROYAL. PURPLE-FRINGE-ORCHID.)—Meadows and rich woods, Blue Ridge, N. C. and Tenn. to Md., and various provinces, W. Va. to Ont., Newf., and N. J.

9. **B. psycodes** (L.) Rydb. Stem 3–10 dm. tall: leaf-blades oval, elliptic or oblong-lanceolate, 5–25 cm. long: perianth lilac: lateral sepals ovate, 5–7 mm. long: petals with broad claws: lip with a spur 13–16 mm. long. [*Platanthera psycodes* A. Gray]—(FAIRY-FRINGE.)—Meadows, swamps and open woods, Blue Ridge, N. C. and Tenn. to Md., and various provinces, N. J. and Pa. to Ia., Minn., and Newf.

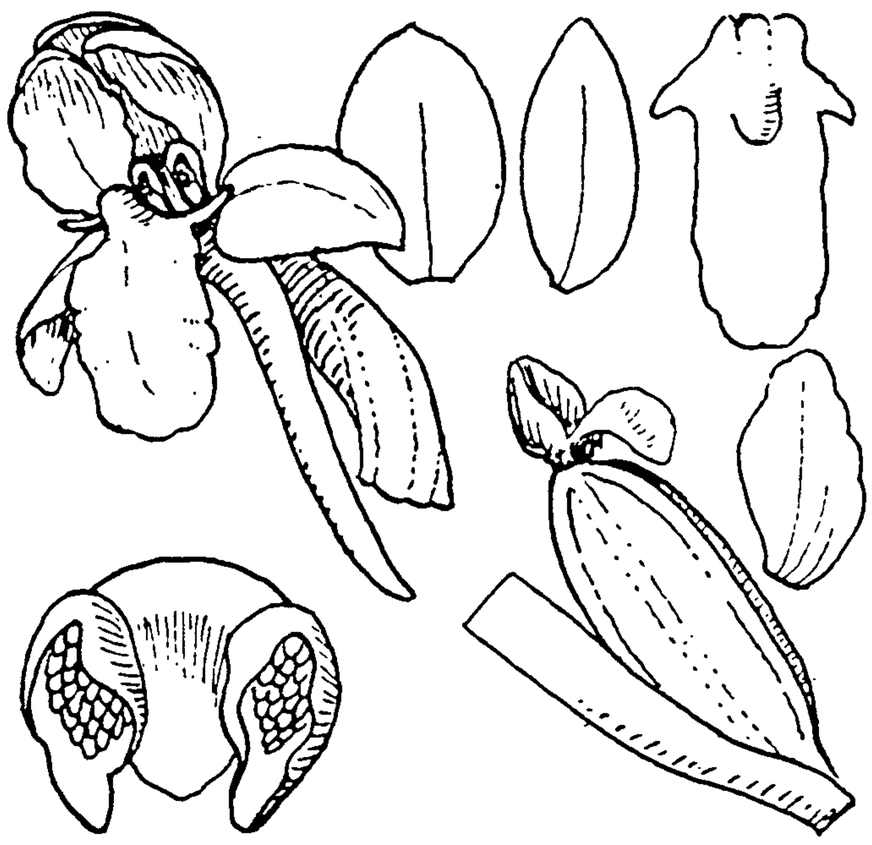
10. **B. peramoena** (A. Gray) Rydb. Stem 3–9 dm. tall: leaf-blades oblong to lanceolate, 8–20 cm. long: perianth rose-purple: lateral sepals broadly ovate to suborbicular, 7–10 mm. long: petals as long as the sepals or nearly

so, spatulate, or the body orbicular-obovate, entire, or erose: lip 14–18 mm. long, the lobes cuneate or flabellate, incised or erose: spur 19–26 mm. long. [*Plantanthera peramoena* A. Gray]—(PRIDE-OF-THE-PEAK. PINK-FRINGE-ORCHID.)—Meadows and stream-banks, Blue Ridge and Appalachian provinces, Ala. to N. C., and various provinces, Tenn. to Ark., Ohio, and N. J.

7. **PERULARIA** Lindl. Caulescent herbs, with thick fibrous roots, the stem leafy. Flowers relatively small, in a terminal spike. Perianth yellowish or greenish. Sepals and petals spreading, all relatively broad. Lip lanceolate to suborbicular, undulate or with a lobe on each side near the base, and a median tubercle, the spur longer than the lip. Anthers with horizontal valves opening upward, dilated at the base, thus forming a cavity enclosing the orbicular gland. About 4 species of the north temperate zone.—Sum.—GYPSY-SPIKES.

Lip decidedly longer than wide: bracts mostly longer than the flowers. 1. *P. flava.*
Lip about as wide as long: bracts mostly shorter than the flowers.
  Lip undulate, suborbicular, oval or ovate-orbicular: petals much longer than wide. 2. *P. scutellata.*
  Lip with 2 lobes at the base of the blade, hastate: petals as wide as long or wider. 3. *P. bidentata.*

1. P. flava (L.) Farwell. Stem 3–6 dm. tall: leaf-blades elliptic, oblong or lanceolate, 0.7–3 dm. long: bracts mostly longer than the flowers: lateral sepals oval to obovate, 3–4 mm. long: petals slightly smaller than the sepals, erose or crenulate: lip hastate, the middle lobe oblong to lanceolate, 4–5.5 mm. long: spur shorter than the ovary. [*Platanthera flava* A. Gray]—Wet woods, various provinces, rarely E of Blue Ridge, La. to Minn., Ont., and N. S.



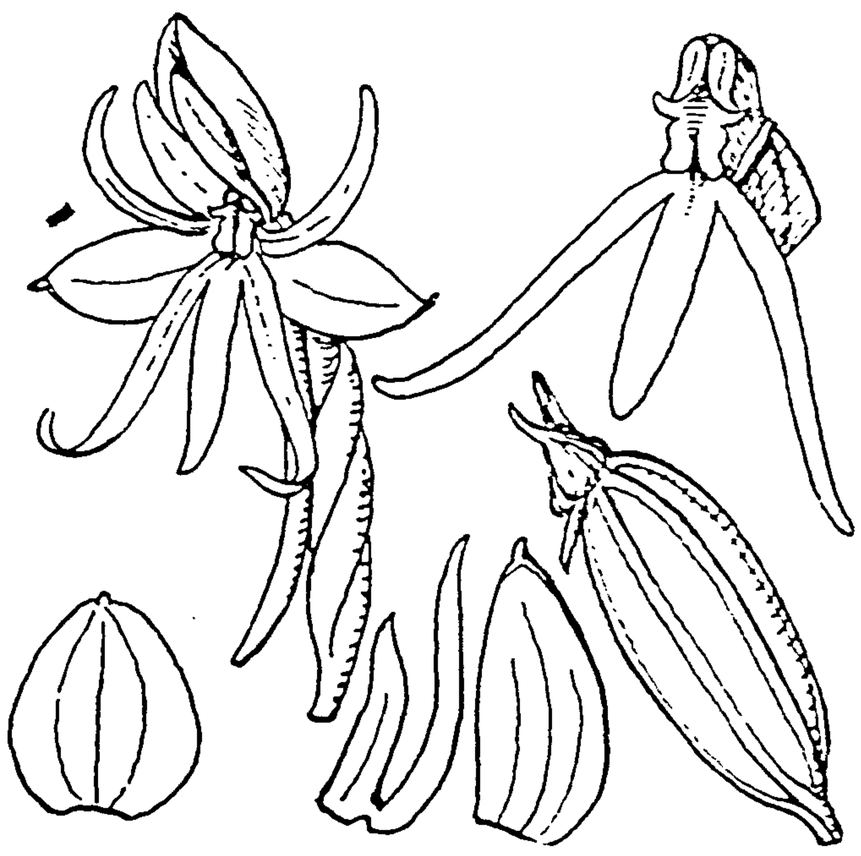
2. P. scutellata (Nutt.) Small. Stem 3–6 dm. tall: leaf-blades oblong-lanceolate or linear-lanceolate, 0.7–2.5 dm. long: bracts shorter than the flowers: lateral sepals ovate to obovate, 2.5–3 mm. long: lip suborbicular or broadly oval in outline, 2.5–4 mm. long: spur about ½ as long as the ovary.—Swamps and shallow water, Coastal Plain and adj. provinces, Fla. to Ark., Ind., and Pa. —Often confused with *P. flava* which has a more N and W range.

3. P. bidentata (Ell.) Small. Similar to the next preceding species in habit: flowers decidedly larger: petals as wide as long or wider: lip ovate in outline, 4–6 mm. long, the tubercle horn-like: spur about as long as the ovary.—Low woods, Coastal Plain, Fla. to Ala. and N. C.

8. **HABENARIA** Willd. Caulescent herbs. Flowers in a terminal spike-like raceme. Perianth white, green, or yellow. Sepals distinct or nearly so, the lateral ones spreading, slightly inequilateral. Petals unequally 2-parted. Lip 3-parted, spurred. Anther-sacs elevated, each with an appendage at the base. Stigma with narrow appendages, the glands naked.—About 50 species, most abundant in the tropics.—LONG-SPUR ORCHIDS.

Spur about as long as the hypanthium or the ovary.
  Spur clavate: stem slender, scape-like, with few remote scale-like leaves: raceme interrupted. 1. *H. distans.*
  Spur filiform, sometimes slightly-thickened at the tip: stem stout, leafy: raceme continuous. 2. *H. repens.*
Spur much longer than the hypanthium or the ovary.
  Spur twice to thrice as long as the hypanthium or the ovary: narrow lobe of the petal less than twice as long as the broad lobe. 3. *H. quinqueseta.*
  Spur four to six times as long as the hypanthium or the ovary: narrow lobe of the petal over twice as long as the broad lobe. 4. *H. Habenaria.*

1. H. distans Griseb. Stem scape-like, 2–3 dm. tall, with the larger leaves near the base, and remote sheathing scales above: leaf-blades elliptic, varying to ovate or obovate, 4–15 cm. long: raceme few-flowered: lateral sepals oval to ovate, 5–6 mm. long: narrow lobe of the petal slightly longer than the broader one: lip 6–9 mm. long.—Low pinelands, pen. Fla.—(*W. I.*)—Spr.–sum.



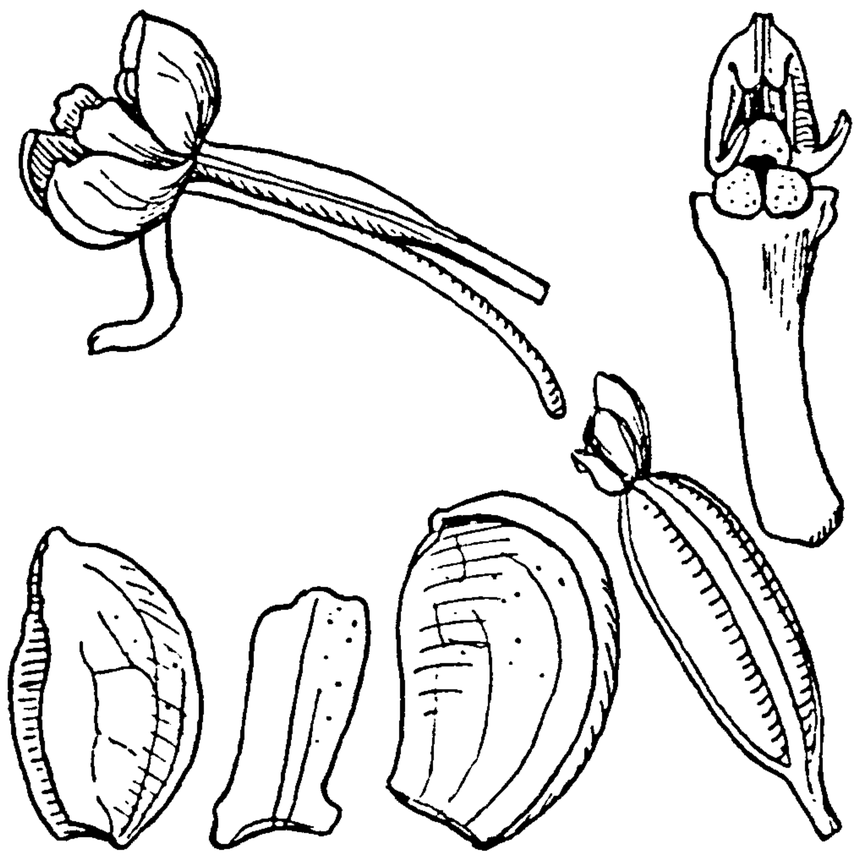
2. H. repens Nutt. Stem 2–6 dm. tall: leaf-blades elliptic-lanceolate or lanceolate to linear-lanceolate, 5–30 cm. long: raceme few- to many-flowered: lateral sepals ovate, about 5 mm. long, obtuse: narrow lobe of the petal longer than the obtuse elliptic broader one: lip 8–9 mm. long, the lateral lobes much longer than the middle one. [*H. Nuttallii* Small]—Ditches, swamps, ponds, streams, and lake-shores, Coastal Plain, Fla. to La. and N. C.—(*W. I., C. A., S. A.*)—Spr.–fall, or all year S.—Erroneously reported from Va. To be found in both terrestrial and aquatic habitats. Often found growing in detached floating clusters of decaying vegetation, water-hyacinths, and water-lettuce.

3. H. quinqueseta (Michx.) Sw. Stem 2–5 dm. tall, evenly leafy: leaf-blades oval, elliptic, or ovate, 3–10 cm. long: bracts lanceolate to ovate lanceolate: lateral sepals elliptic to ovate, 7–10 mm. long: narrow lobe of the petals longer than the narrowly elliptic or linear-elliptic broader one: middle lobe of the lip linear-spatulate to almost linear: capsule short-stalked. [*H. Michauxii* Nutt. *H. Simpsonii* Small]—Pinelands, Coastal Plain, Fla. to Tex. and S. C.—Sum.–fall.

4. H. Habenaria (L.) Small. Stem 3–6 dm. tall, the leaves mainly on the lower part of the stem: leaf-blades elliptic to lanceolate, 5–15 cm. long: lateral sepals elliptic to ovate-elliptic, 12–14 mm. long: narrow lobe of the petals longer than the linear or linear-elliptic broader one: middle lobe of the lip linear: capsule long-stalked. [*H. macroceratitis* Willd.]—Hammocks, pen. Fla.—(*W. I.*)—Sum.—It seems strange that this tropical orchid should not occur in tropical Fla., but it appears to be restricted to hammocks north of the middle of the peninsula. The flowers, with much longer spurs than any of our other species, are very fragrant.

9. HABENELLA Small. Caulescent herbs.. Flowers in a terminal spike. Perianth yellowish, becoming green. Sepals distinct, the lateral ones spreading, very inequilateral. Petals much smaller than the sepals, sinuately lobed at the apex and with a small basal lobe. Lip entire above, with 2 small basal

lobes. Anther-sacs with filiform appendages at the base. Stigma with two short appendages, the glands naked.—One species.



1. H. odontopetala (Reichenb. f.) Small. Stem 3–6 dm. tall: leaf-blade oblong to oblong-lanceolate, 6–10 cm. long, acute: lateral sepals very broad, 5.5–6.5 mm. long: petals about 4 mm. long, sinuately 3-lobed at the apex: lip 6–10 mm. long, broadly linear, obtuse: spur 12–18 mm. long: capsule spreading, the body 9–13 mm. long, longer than the stipe. [*Platanthera Garberi* (Porter) Chapm. *Habenella Garberi* (Porter) Small]—Hammocks, pen. Fla.—(*W. I., Mex., C. A.*)—All year.

10. GYMNADENIOPSIS Rydb. Caulescent herbs. Flowers in a terminal spike. Perianth white, pink, greenish, or orange-yellow. Sepals distinct, the lateral ones slightly inequilateral. Petals mostly smaller than the sepals, undulate, sinuate-lobed or erose. Lip entire, 3-lobed at the apex, or crenulate or erose. Anthers with parallel approximate sacs, and naked contiguous glands. Stigmas with 2 or 3 appendages at the beak.—A genus of eastern North America represented by the following species.—Sum.—REIN-ORCHIDS.

Lip posterior, erect. I. NIVEAE.
Lip anterior, pendent. II. INTEGRAE.

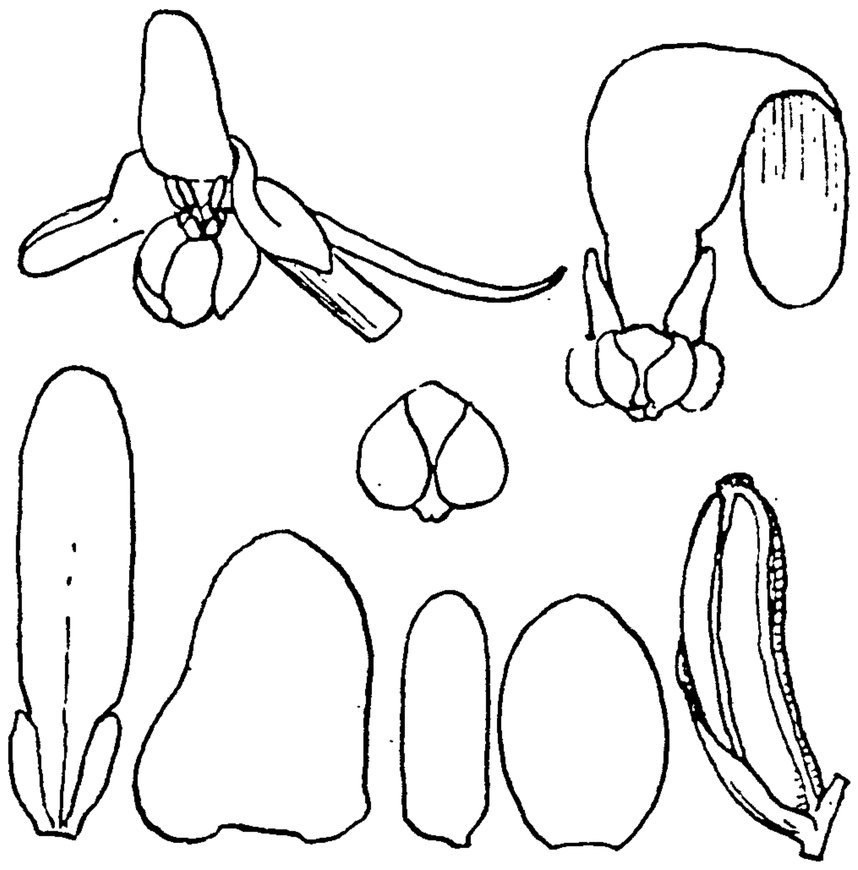
I. NIVEAE

Stem topped by a short stout spike, the hypanthium and perianth white. 1. *G. nivea.*

II. INTEGRAE

Lip erose-crenulate: perianth yellow or orange: spur filiform. 2. *G. integra.*
Lip 3-lobed at the apex: perianth whitish or greenish: spur clavate. 3. *G. clavellata.*

1. G. nivea (Nutt.) Rydb. Stem 2–5 dm. tall: leaves reduced on the upper part of the stem, the lower ones with linear or linear-oblong blades 5–20 cm. long: perianth white or pinkish: lateral sepals ovate or oblong-ovate, 4–6 mm. long: petals 3–4.5 mm. long, curved, the tip oblique: lip linear or linear-lanceolate, 5–7 mm. long, entire, erect: spur about 1 cm. long, curving upward: capsule 9–11 mm. long. [*Gymnadenia nivea* Engelm. and Gray]—(BOG-TORCHES. FROG-SPEAR. WHITE REIN-ORCHID.)—Low pinelands, acid meadows, and moist hillsides, Coastal Plain, Fla. to Tex., Ark., and N. J.—(*W. I.*)



2. G. integra (Nutt.) Rydb. Stem 3–6 dm. tall: leaves much reduced on the upper part of the stem, the lower ones with broadly linear or linear-lanceolate blades 5–20 cm. long: perianth yellow or orange-yellow: lateral sepals ovate to obovate, 3–4 mm. long: petals 3–3.5 mm. long, oblong or nearly so: lip

oblong to ovate-oblong or oval, 4–4.5 mm. long, erose or crenulate, pendent: spur 4–5 mm. long, extending downward: capsule fully 10 mm. long. [*Gymnadenia flava* Lindl.]—(FROG-ARROW. ORANGE REIN-ORCHID.)—Moist pinelands and acid bogs, Coastal Plain and rarely adj. provinces, Fla. to Tex., Tenn., and N. J.

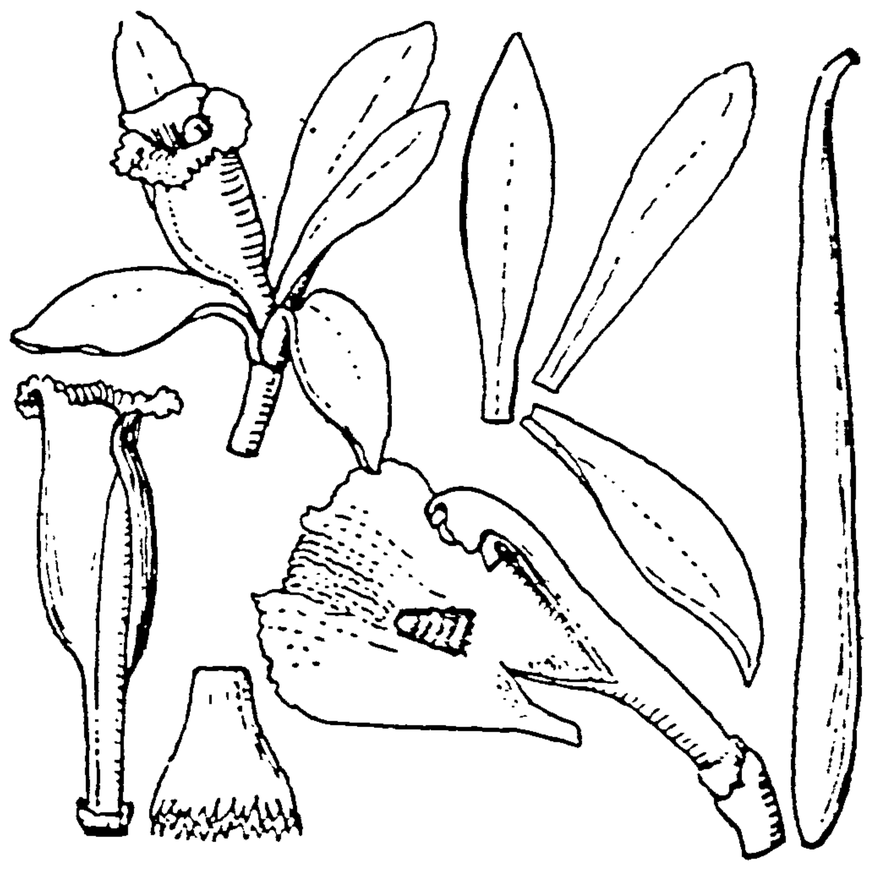
3. **G. clavellata** (Michx.) Rydb. Stem 1–5 dm. tall, rather naked above: leaves scale-like except 1 or 2 near the middle of the stem or below it; blades oblong or oblong-lanceolate, 5–12 cm. long: perianth whitish or greenish: lateral sepals ovate to oval, 2–3.5 mm. long: petals 3–4 mm. long, sinuately 3-lobed: lip slightly dilated upward, 3–5 mm. long: capsule 7–8 mm. long. [*Gymnadenia tridentata* (Willd.) Hook.]—(FROG-SPIKE. GREEN REIN-ORCHID.)—Moist grounds and swamps, various provinces, Fla. to La., Minn., and Newf.

11. VANILLA Sw. Vines with rope-like stems and aerial roots. Leaves remote, often much reduced. Flowers in axillary clusters. Perianth mainly pale, but showy. Lateral sepals narrow, slightly broadened upward. Petals slightly shorter than the sepals. Lip cornucopia-like, involute and adnate to the long column, the free dilated tip fringed or crisped. Capsule elongate.—About 20 species, mostly of tropical regions.—Spr.—VANILLA-ORCHIDS.

Leaves with blades, not recurved: capsule elongate.
- Lip fringed, 40–50 mm. long: sepals and petals less than 60 mm. long. — 1. *V. Vanilla.*
- Lip crisped, 70–80 mm. long: sepals and petals over 70 mm. long. — 2. *V. phaeantha.*

Leaves obsolete, or scale-like, and recurved at the tip: capsule short.
- Lip abruptly pointed at the apex: leaves mere narrow scales near the tips of the branches. — 3. *V. Eggersii.*
- Lip notched at the apex: leaves obsolete. — 4. *V. articulata.*

1. **V. Vanilla** (L.) Britton. Leaf-blades oblong to elliptic, 10–18 cm. long: lateral sepals broadly linear to linear-spatulate, 50–56 mm. long: petals linear or nearly so: lip 45–50 mm. long, the edge fringed. [*V. planifolia* Andr.]—(VANILLA-VINE.)—Hammocks, S pen. Fla. Nat. of Mex.—The cured capsule is the "vanilla-bean" of commerce. Usually merely a waif.

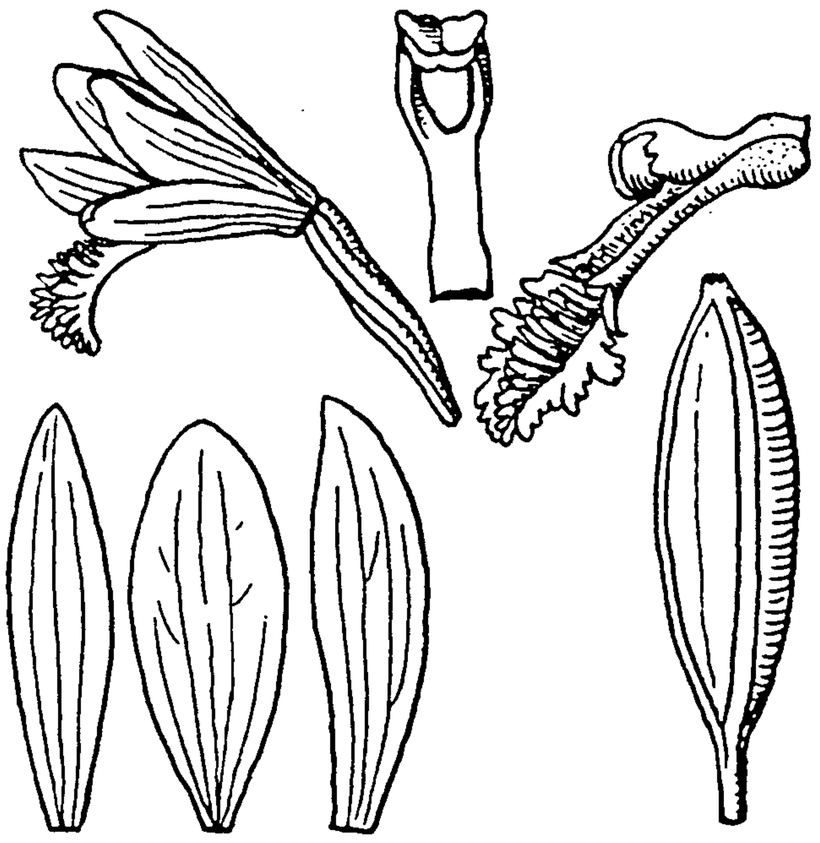


2. **V. phaeantha** Reichenb. Leaf-blades narrowly oblong to oblong-lanceolate, 9–15 cm. long: lateral sepals nearly linear, slightly narrowed to the base and the apex, 65–80 mm. long: petals rather narrower than the lateral sepals: lip 70–80 mm. long, the edge crenulate.—(LEAFY-VANILLA.)—Low hammocks, S pen. Fla.—(*W. I.*)

3. **V. Eggersii** Rolfe. Leaves remote, scale-like, linear to lanceolate, 5–7 cm. long: lateral sepals spatulate, 33–36 mm. long: petals narrowly spatulate: lip 30–36 mm. long, the edge crisped: capsule 5–7 cm. long, slender-clavate.—(LEAFLESS-VANILLA.)—Hammocks, Everglade Keys and Cape Sable region, Fla.—(*W. I.*)—In hammocks which are permanently dry or usually dry.

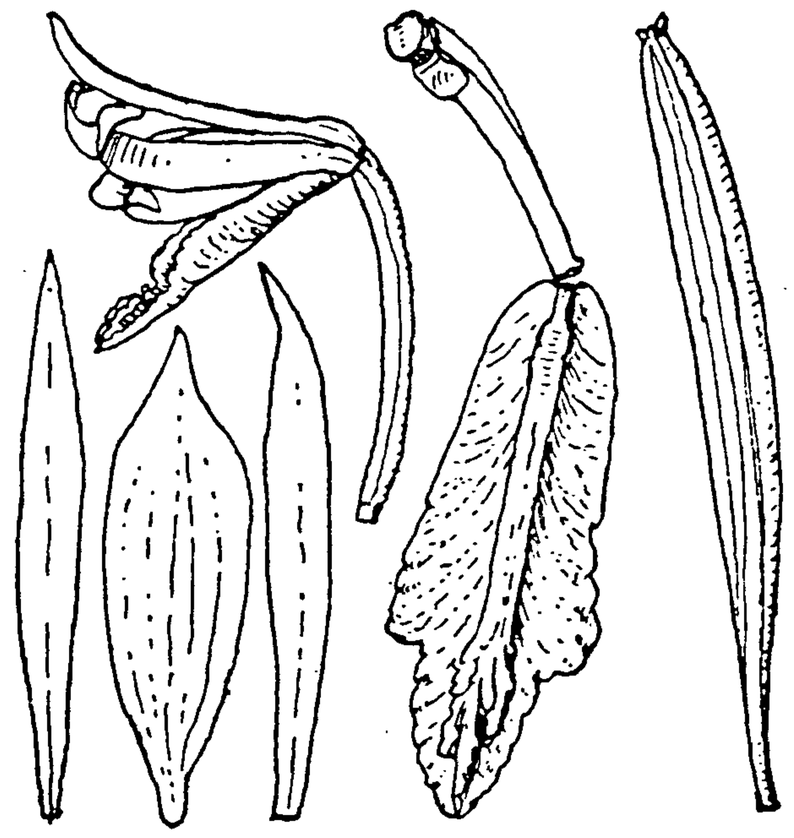
4. **V. articulata** Northrop: Stem and branches very stout: leaves obsolete: lateral sepals narrowly oblong, 28–33 mm. long: petals oblong-spatulate: lip 28–32 mm. long, the edge undulate-crisped: capsule 7–9 cm. long, stout-clavate.—(WORM-VINE.)—Hammock islands, S Everglades and swamps, Cape Sable region, Fla.—(*W. I.*)—In hammocks subject to overflow part of the year.

12. POGONIA Juss. Caulescent herbs, with cord-like roots. Leaves usually solitary or 2 on the stem. Flowers solitary or 2 together. Perianth mainly pink, rose, or lilac. Sepals nearly equal, slightly longer than the petals. Petals broader than the sepals. Lip fringed at the dilated apex, with a papillose crest on the face. Capsule erect.—One species.



1. P. ophioglossoides (L.) Ker. Stem 2–5 dm. tall: blades of the cauline leaves and bracts green, oblong-lanceolate to elliptic, 3–8 cm. long: lateral sepals linear-elliptic or narrowly oblong, 15–20 mm. long, acute: petals elliptic or oblong-cuneate, 14–16 mm. long, obtuse: lip longer than the petals, blunt at the rounded apex.—(ETTERCAP. CRESTED-ETTERCAP. ROSE CRESTED-ORCHID.)—Acid bogs, flat woods, and damp prairies, various provinces, Fla. to Tex., Minn., and Newf.—Spr.

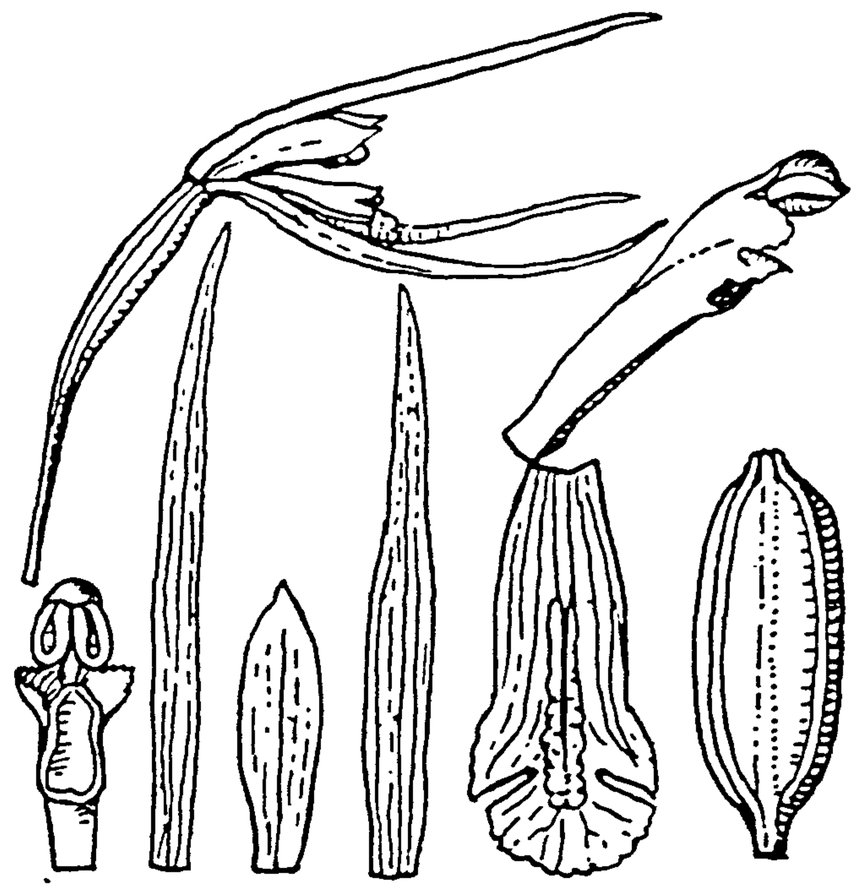
13. CLEISTES L. C. Rich. Caulescent rather succulent herbs, with cord-like roots. Leaves 1 or 2 on the stem, but usually solitary. Flowers mostly 1 or 2, somewhat nodding, the bract or bracts foliaceous. Perianth mainly brown and pink. Sepals various, the lateral ones much narrower than the median. Petals nearly like the lateral sepals. Lip erose on the edges, the apical lobe with a median and 2 lateral ridges. Capsule erect.—One species.



1. C. divaricata (L.) Ames. Stem 2–6 dm. tall: blades of the cauline leaves glaucous, narrowly oblong to oblong-lanceolate, 5–15 cm. long: lateral sepals linear or nearly so, 26–50 mm. long, attenuate, brownish: petals narrowly elliptic to elliptic-oblanceolate, 20–35 mm. long, acuminate, pinkish: lip as long as the petals, acuminate above the middle, erose. [*Pogonia divaricata* R. Br.]—(LADY'S-ETTERCAP. ROSE-ORCHID.)—Acid meadows, prairies, swamps, wooded hillsides, and mountain tops, various provinces, Fla. to Miss., Ky., and N. J.—Spr.–sum.—After the seas which deposited the Coastal Plain strata retreated, this plant spread to the seacoast, but still maintained a foothold in the mountains. In the level lowlands of the coast regions it occurs in such abundance as to form seas of pale rose. There are several forms in the Coastal regions showing much variation in the size of the perianth and of its parts.

14. ISOTRIA Raf. Scapose herbs, with elongated roots. Leaves reduced to scales at the base of the scape. Scape topped by a whorl of 5 or 6 spreading leaf-like bracts. Flowers solitary or 2 together. Perianth purple or greenish. Sepals nearly equal, much longer than the petals. Petals broader than the sepals. Lip 3-lobed at the apex, sessile, crested along the middle. Capsule erect.—Two species, the following and one in the northeastern States.

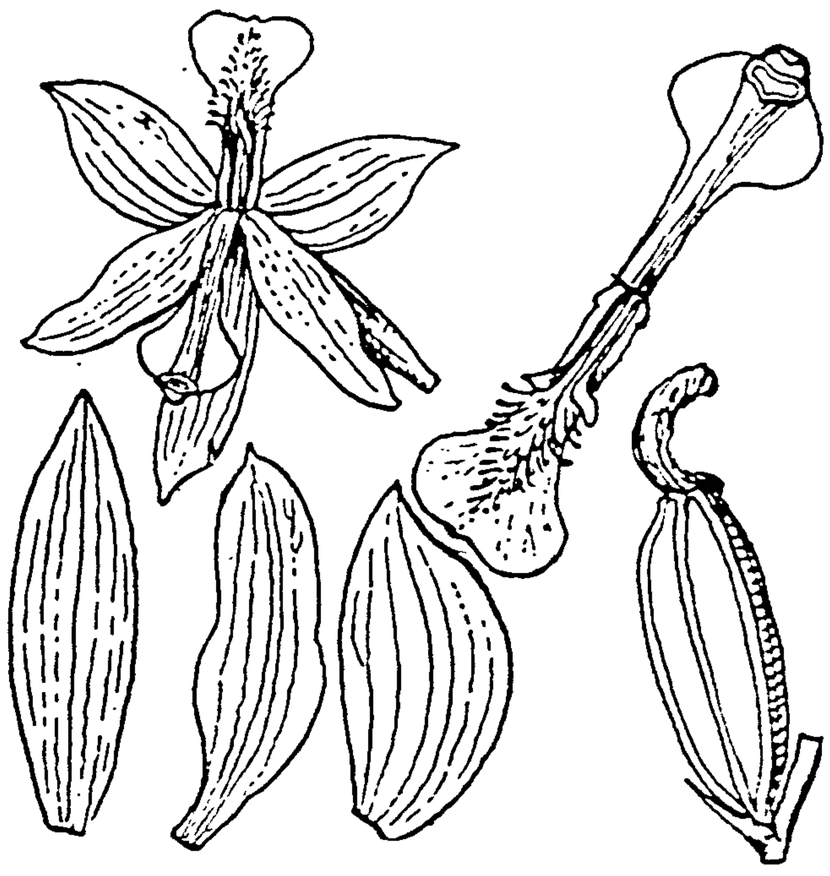
1. I. verticillata (Willd.) Raf. Scapes 2–4.5 dm. tall: blades of the whorled bracts mainly elliptic to oval or obovate, 2.5–8 cm. long: flower long-stalked: lateral sepals purple, narrowly linear, 30–50 mm. long: petals linear, 15–20 mm. long: lip-body green, 10–15 mm. long, terminating in 2 lateral lobes striped with madder-purple and a white, median broad lobe: capsule 2–3 mm. long. [*Pogonia verticillata* Nutt.]—(GREEN ADDERLING. FIVE-LEAF ORCHID.)—Woods, often in acid soil, various provinces, Fla. to La., (Tex.?), Wis., and Me.—Spr.—A related species, *I. affinis* (Aust.) Rydb., with yellowish sessile or nearly sessile flowers, occurs in S Va. and may be expected in N. C.



15. LIMODORUM L. Scapose herbs with corms. Leaves few, consisting of several sheathing scales, and one with an elongate blade. Flowers in a terminal raceme-like spike. Perianth mainly purple, pink-purple, or white. Lateral sepals inequilateral, shorter than the median one. Petals nearly equilateral, somewhat narrowed at the base. Lip erect, with 2 minute lateral lobes and a large dilated middle lobe bearded with clavate hairs. Capsule erect. [*Calopogon* R. Br.]—Represented by the following species.—GRASS-PINKS. ROSE-WINGS.

Dilated portion of the middle lobe of the lip separated from the lateral lobes by a linear stalk-like base.
Lip 15–19 mm. long: column-wing narrowed at the base.
Middle lobe of the lip cuneate-flabellate: mature leaf-blades over 10 mm. wide. 1. *L. tuberosum.*
Middle lobe of the lip obreniform: mature leaf-blades less than 8 mm. wide. 2. *L. Simpsonii.*
Lip 9–10 mm. long: column-wings truncate at the base. 3. *L. pallidum.*
Dilated portion of the middle lobe of the lip narrowed down to the lateral lobes.
Middle lobe of the lip cuneate, the lateral lobes half-orbicular.
Lateral sepals broadly ovate: lip rounded or truncate at the apex; crest extending to the margins. 4. *L. multiflorum.*
Lateral sepals elliptic-ovate: lip deeply 2-lobed at the apex; crest central. 5. *L. pinetorum.*
Middle lobe of the lip rounded at the base, the lateral lobes much wider than long. 6. *L. parviflorum.*

1. L. tuberosum L. Leaf-blade broadly linear to narrowly elliptic, 1–4 dm. long: scape 2–9 dm. tall: perianth pink-purple: lateral sepals half-orbicular, 15–17 mm. long, acute: petals 16–18 mm. long, the blade elliptic to lanceolate: middle lobe of the lip mostly less than 10 mm. wide, flabellate, nearly truncate: column-wings rhombic. [*Calopogon pulchellus* (Salisb.) R. Br.]—Acid bogs and meadows, and rarely gravelly slopes, various provinces, Fla. to Tex., Minn., and Newf.—Spr.–sum.—The flower-color varies from deep-purple to white.



2. L. Simpsonii (Chapm.) Small. Leaf-blade narrowly linear, 3–5 dm. long: scape 5–9 dm. tall: perianth rose-purple or rarely white: lateral sepals half-orbicular, 17–18 mm. long, cuspidate: petals 20–22 mm. long, the blade elliptic-ovate: middle lobe of the lip 8–10 mm.

wide, obreniform, emarginate, mostly over 11 mm. wide: column-wings broadly obovate.—Swamps and prairies, often in calcareous soil, mostly in the Everglades, pen. Fla.—(*W. I.*)—Spr. or all year.

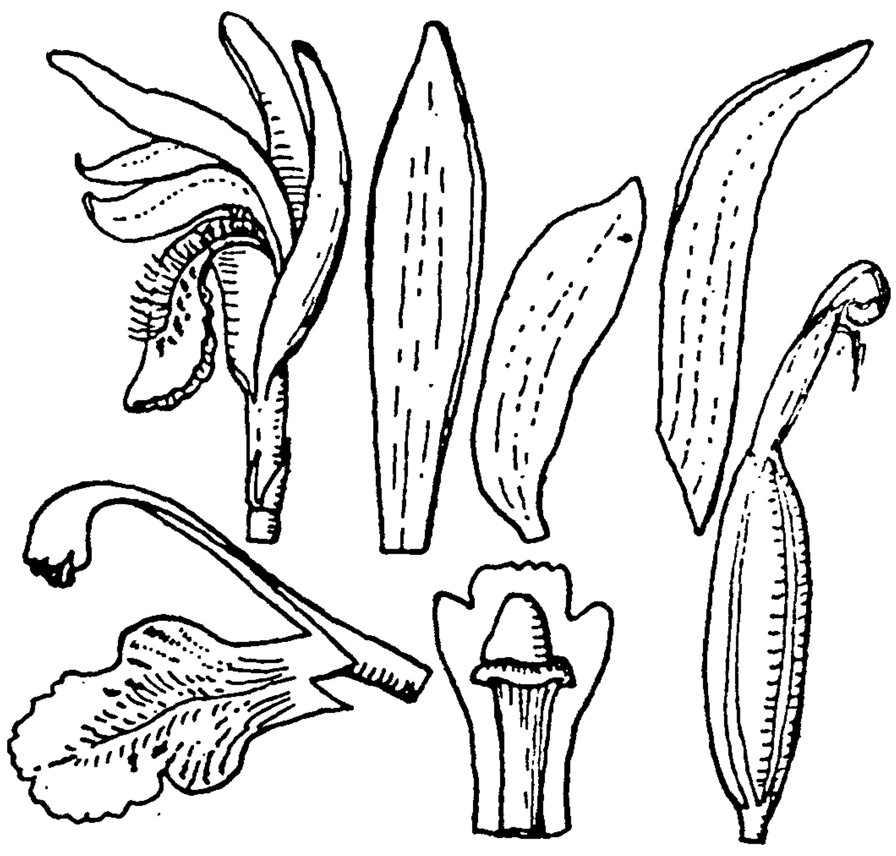
3. **L. pallidum** (Chapm.) C. Mohr. Leaf-blade narrowly linear, 10–30 cm. long: scape 2–5 dm. tall: perianth pale-pink or white tinged with purple: lateral sepals broadly elliptic to obovate, 11–13 mm. long, acute: petals 13–14 mm. long, the blades linear to linear-lanceolate: middle lobe of the lip 5–6 mm. wide, cuneate-flabellate, emarginate: column-wings broadly deltoid.—Wet pinelands, Coastal Plain, Fla. to La. and N. C.—Spr.

4. **L. multiflorum** (Lindl.) C. Mohr. Leaf-blade linear, 8–15 cm. long: scape 2–4 dm. tall: perianth rose-purple: lateral sepals ovate, 10–12 mm. long, acute: petals 12–13 mm. long, the blades ovate or obovate: middle lobe of the lip broadly cuneate, 8–9 mm. wide, truncate or rounded: column-wings rhombic.—Damp pinelands, Coastal Plain, Fla. to Miss.—Spr.

5. **L. pinetorum** Small. Leaf-blade narrowly linear, 0.5–1.5 dm. long: scape 1–2.5 dm. tall: perianth deep-pink: lateral sepals elliptic-ovate, 10.5–11.5 mm. long, acutish: petals 11–12 mm. long, the blade elliptic: middle lobe of the lip cuneate, 6–8 mm. wide, deeply 2-lobed at the apex and mucronate: column-wings half-orbicular.—Dry pinelands, Everglade Keys, Fla.—Spr.

6. **L. parviflorum** (Lindl.) Nash. Leaf-blade narrowly linear, 1–3 dm. long: scape 1.5–4 dm. tall: perianth rose-pink: lateral sepals ovate or elliptic, 11–14 mm. long, abruptly contracted at the apex: petals 13–15 mm. long, the blade elliptic-lanceolate: middle lobe of the lip orbicular-reniform, 9–10 mm. wide, broadly rounded at the apex: column-wings nearly half orbicular. [*L. graminifolium* (Ell.) Small]—Low pinelands, and acid meadows, Coastal Plain, Fla. to La. and N. C.—Spr.

16. **ARETHUSA** L. Scapose herbs, with corms. Leaves elongate sheathing scales, the upper one producing a narrow blade. Flower usually solitary at the top of the scape. Perianth mainly rose-pink. Lateral sepals slightly curved. Petals quite similar to the lateral sepals, but shorter. Lip dilated, recurved, crested. Capsule erect.—Two species, the following and one in Japan.



1. **A. bulbosa** L. Basal leaf with a linear blade 10–15 cm. long: scape 1–3 dm. tall: lateral sepals broadly linear to narrowly oblong, 35–43 mm. long, acute: lip 25–30 mm. long, with 2 shallow lateral lobes and a larger middle lobe, toothed or fringed at the apex: capsule 20–25 mm. long.—(ROSE-LIP. SWAMP ROSE-ORCHID.)—Acid bogs, Blue Ridge, S. C. to Va., and various provinces, Md. to Minn. and Newf.—Spr.—Plant "leafless" during anthesis, but as the flowers wither an elongate blade protrudes from the basal sheaths. Albino forms occur.

17. **TRIPHORA** Nutt. Caulescent herbs, with fleshy tubers. Leaves several, with relatively broad scale-like blades. Flowers nodding, several, axillary to leaf-like bracts. Perianth white or magenta-pink. Sepals nearly equal, about as long as the petals. Petals about as broad as the sepals, but narrower at the base. Lip dilated above the claw, prominently 3-lobed, crestless or with 3 low crests, the middle lobe much larger than the lateral ones. Capsule droop-

ing.—NODDING-CAPS.—About 10 species, natives of tropical and temperate America.—Sum.–fall.

Column 10–12 mm. long: petals spatulate: capsule as long as the stalk or slightly shorter. 1. *T. trianthophora.*
Column 6–7 mm. long: petals linear or nearly so: capsule much shorter than the stalk. 2. *T. cubensis.*

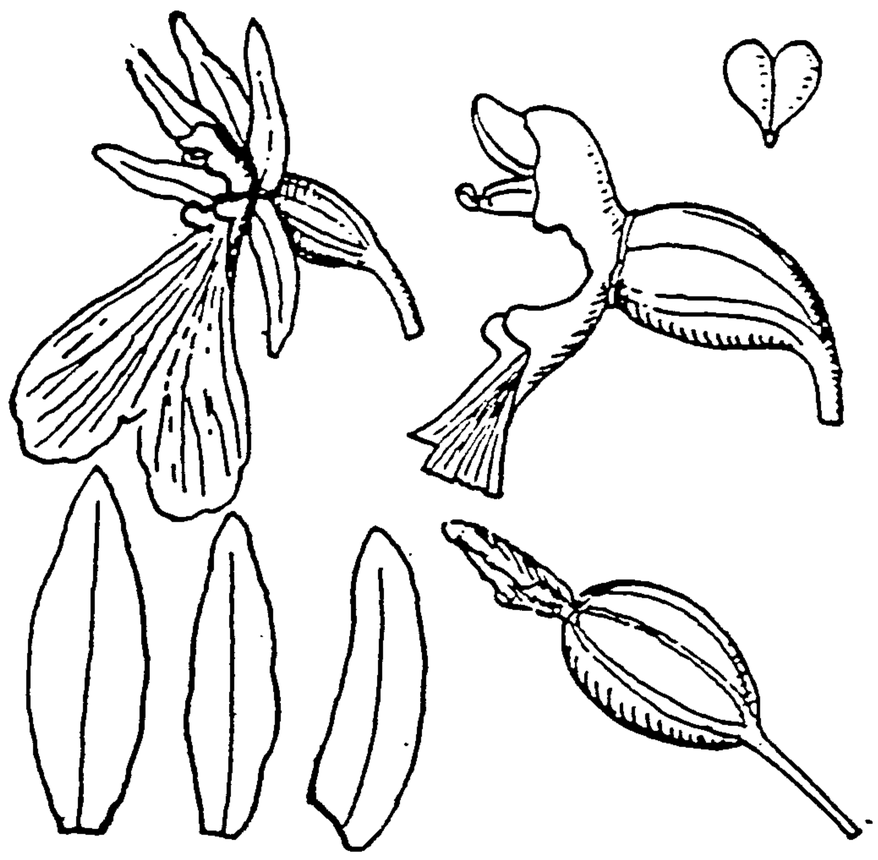
1. T. trianthophora (Sw.) Rydb. Stem 5–30 cm. tall: leaf-blades suborbicular to ovate-orbicular or ovate, 5–20 mm. long, partly clasping, but spreading: flowers nodding, white flushed with pink: lateral sepals linear-spatulate, 12–15 mm. long: petals spatulate: lip 12–15 mm. long, the middle lobe 5 mm. wide or more: capsule 10–14 mm. long. [*Pogonia pendula* (Nutt.) Lindl.]—(NODDING-ETTER-CAP. THREE-BIRDS.)—Rich woods, various provinces, rarely Coastal Plain, Fla. to Kans., Wis., and Me.

2. T. cubensis (Reichenb.) Ames. Stem 10–30 cm. tall: leaf-blades broadly ovate, mostly 10–20 mm. long, clasping the stem and mostly appressed: flowers nodding, magenta: lateral sepals broadly linear, about 8 mm. long: petals linear. lip 8–9 mm. long, the middle lobe 3 mm. wide or less: capsule 12–15 mm. long.—Pinelands, S pen. Fla.—(*W. I.*)—Both species are irregular in their flowering seasons; several years may elapse between them.

18. OPHRYS L. Scapose herbs. Leaves reduced to scales at the base of the scape. Flowers in a raceme subtended by 2 opposite leaf-like bracts. Perianth greenish or brownish purple. Sepals and petals distinct, nearly equal, spreading or reflexed. Lip more or less drooping, 2-lobed at the apex, the lobes sometimes elongate. Stigma-beak rounded. Capsule slender-stipitate. [*Listera* R. Br.]—About 12 species, natives of north temperate and arctic regions.—TWAYBLADES. DOUBLE-LEAF ORCHIDS.

Lip wedge-shaped, about twice as long as the petals, notched at the apex: column 1.5 mm. long. 1. *O. Smallii.*
Lip linear, 6–10 times longer than the petals, 2-parted: column 0.5 mm. long. 2. *O. australis.*

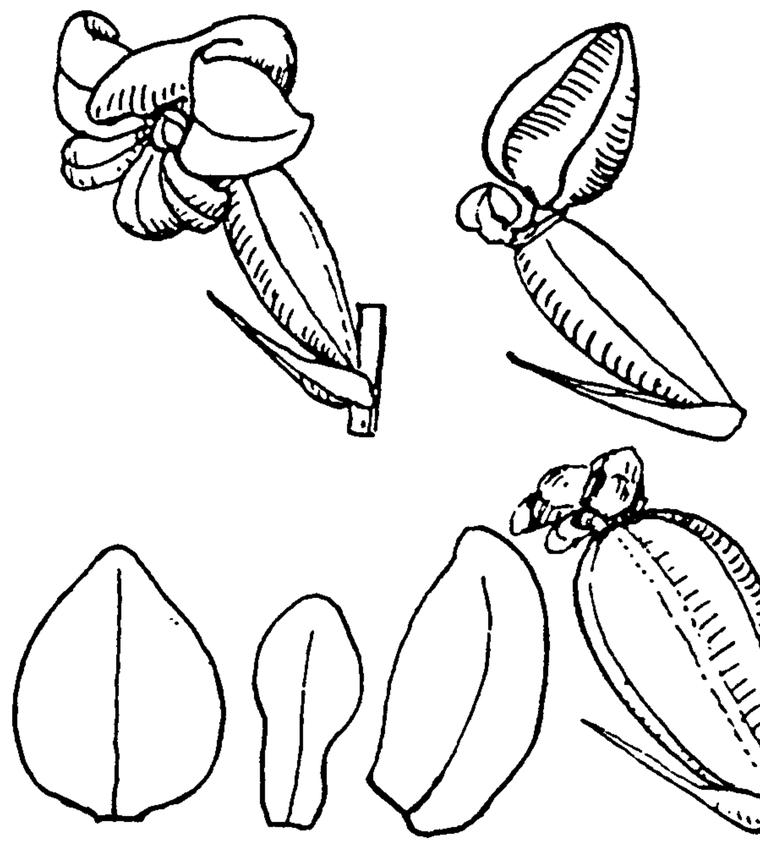
1. O. Smallii (Wiegand) House. Plant 1–3 dm. tall: blades of the bracts reniform or ovate-reniform, 1–3 cm. long: sepals and petals 3.5–4 mm. long, acute or acutish: lip 6–8 mm. long, the lobes rounded. [*Listera convallarioides* (Chapm. Fl.). *L. reniformis* Small]—(GYPSY-WITCH.)—Thickets and wooded hillsides, in acid humus, Blue Ridge and Appalachian Valley, N. C. to Tenn. and Pa.—Spr.–sum.



2. O. australis (Lindl.) House. Plant 1–3 dm. tall: blades of the bracts ovate to triangular-ovate, 1.5–2.5 cm. long: sepals and petals 1.5–2 mm. long: lip 6–12 mm. long, the lobes acute. [*Listera australis* Lindl.]—Wet acid thickets

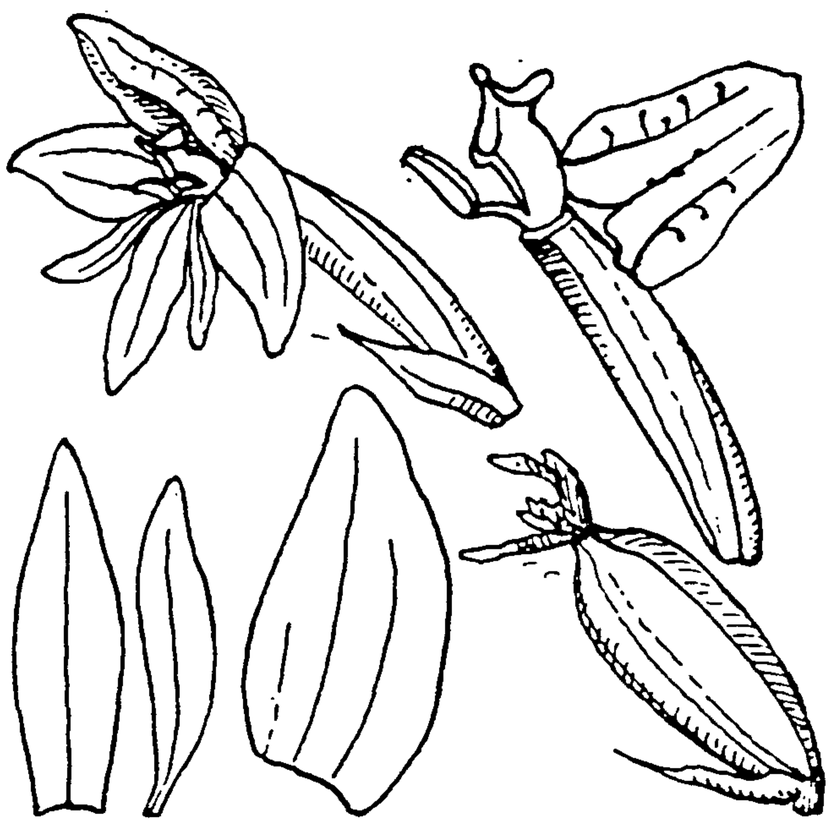
and low woods, Coastal Plain, New England Upland and Great Lake Lowland, Fla. to La., Ont., and Vt.—Spr.

19. **PRESCOTTIA** Lindl. Caulescent herbs, with stout roots. Leaves various, the basal ones with broad blades, the cauline ones reduced to sheathing scales. Flowers minute, in a terminal spike. Perianth white, pink, or greenish. Lateral sepals broad, nearly equilateral. Petals much smaller than the sepals. Lip very broad, the blade auricled at the base. Capsule ascending.—About 30 species of tropical America.



1. **P. oligantha** (Sw.) Lindl. Plant 2–4 dm. tall, the stem with narrow scales: blades of the lower leaves ovate or elliptic to oval, 2–6 cm. long: lateral sepals ovate, about 1.5 mm. long: petals ovate to oblong-ovate, about 1 mm. long: lip 1.2–1.5 mm. long, the blade suborbicular, with minute auricles at the base: capsule-body 4–5 mm. long.—Hammocks. Everglade Keys, Fla.—(*W. I.*)—Wint.

20. **CRANICHIS** Sw. Caulescent succulent herbs, with coarse roots. Leaves various, the lower cauline with mostly long-petioled dilated blades, the upper ones reduced to partially sheathing scales. Flowers in a terminal spike. Perianth white or whitish. Lateral sepals broad, slightly inequilateral. Petals narrow, much smaller than the sepals. Lip longer than the petals, concave. Capsule scarcely stipitate.—About 20 species of tropical America.



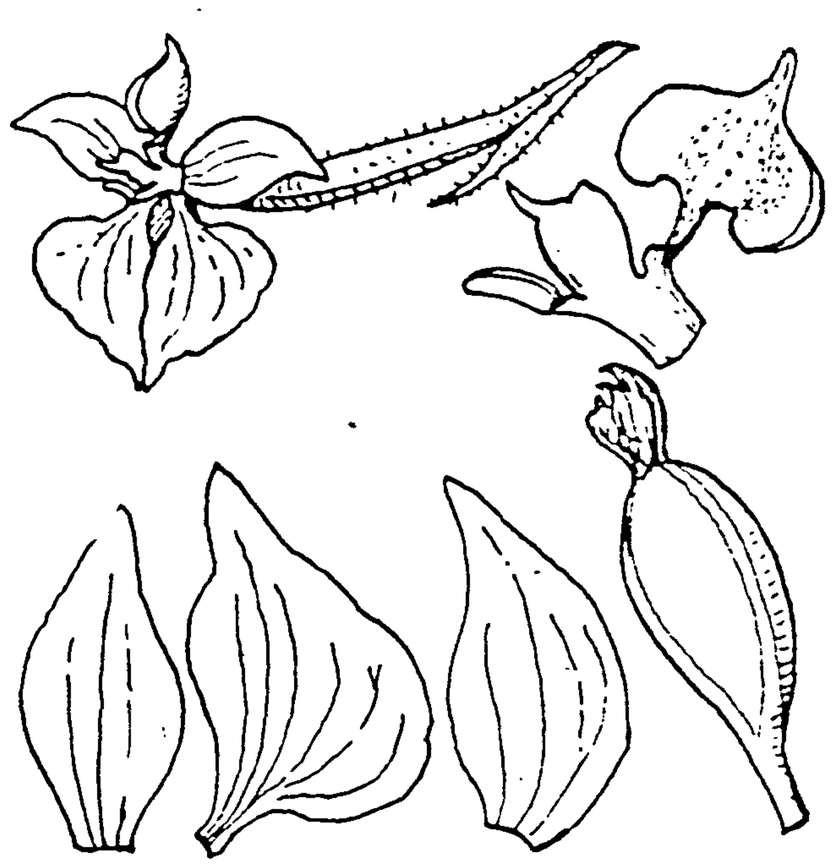
1. **C. muscosa** Sw. Plant 1–3 dm. tall, the stem scaly: leaf-blades oblong-elliptic, oval or ovate, 2.5–7 cm. long: lateral sepals ovate, 3–3.5 mm. long: petals narrowly elliptic to cuneate-spatulate, 2.5–3 mm. long: lip oblong or nearly so, about 3 mm. long, sessile: capsule oval or ellipsoid, 1 cm. long or less.—Hammocks, Everglade Keys, Fla.—(*W. I.*)—Wint.–spr.

21. **PONTHIEVA** R. Br. Caulescent herbs with scape-like stems from clustered roots. Leaves various, the lower cauline with dilated blades, the upper mere scales. Flowers in a lax raceme. Perianth greenish. Lateral sepals broad, slightly inequilateral. Petals drooping, the blade very inequilateral, slender-clawed. Lip relatively small, concave, beaked, short-clawed. Capsule spreading.—About 20 species, natives of the tropical and warm parts of America.—SHADOW-WITCHES.

Petal-blades about as wide as long: lip 4 mm. long or more. 1. *P. racemosa.*
Petal-blades decidedly longer than wide: lip 3.5 mm. long or less. 2. *P. Brittonae.*

1. **P. racemosa** (Walt.) C. Mohr. Plant 2–5 dm. tall, the stem scape-like, with remote sheathing scales: leaves mainly near the base of the stem; blades ellip-

tic or ovate-oval, 4–13 cm. long, or longer: raceme stout, glandular-pubescent, 6–21 cm. long: bracts linear-lanceolate, 5–14 mm. long: median sepal oblong or elliptic-lanceolate, 6–7 mm. long, obtuse; lateral sepals ovate, 5–5.5 mm. long, acutish: petals 5–5.5 mm. long, the blades about as wide as long: lip white with green stripes, 4–4.5 mm. long: anther broadly linear. [*P. glandulosa* (Sims) R. Br.]—Rich woods, Coastal Plain and occasionally adj. provinces, Fla. to Ala. and Va.—Fall.–spr.



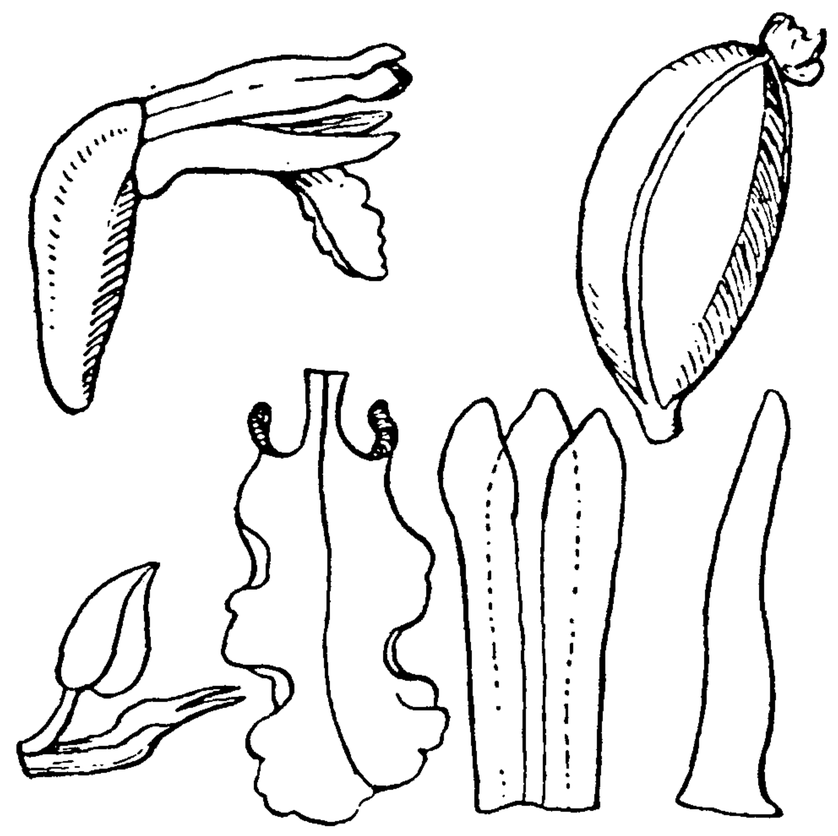
2. P. Brittonae Ames. Plant similar to that of *P. racemosa*, but smaller and with a more slender raceme: leaf-blades elliptic, ovate, or obovate, 3–11 cm. long, acute: raceme 4–16 cm. long: bracts linear-lanceolate, 4–8 cm. long: median sepal elliptic-lanceolate or oblong, 4–4.5 mm. long, obtuse; lateral sepals ovate, 4–4.5 mm. long, acute: petals 4–4.5 mm. long, the blades decidedly longer than wide: lip 3–3.5 mm. long: anther narrowly ellipsoid.—Pinelands and rarely hammocks, Everglade Keys, Fla.—(*W. I.*)—Wint.

22. IBIDIUM Salisb. Caulescent herbs. Leaves various, the basal and lower cauline with usually narrow blades or sometimes with short broad blades, the upper cauline leaves mere sheathing scales. Flowers in a terminal spiral spike. Perianth white, rarely pinkish, yellowish, or greenish. Median sepal and petals coherent: lateral sepals erect. Lip erect, or with a spreading tip, bearing 2 basal callosities, the lower portion folded around the very short column. Stigma with a 2-forked beak. Capsule ascending. [*Spiranthes* L. C. Rich. *Gyrostachys* Pers.]—About 80 species, natives of temperate and tropical America.—LADIES'-TRESSES. PEARL-TWISTS. SPIRAL-ORCHIDS.—A decoction from the roots of some of the species is used by the Seminoles as a blood purifier.

Flowers merely alternate, apparently secund as a result of the twisting of the rachis.
- Stem with sheathing scales: basal leaves with relatively short and broad blades, fugaceous.
  - Spike decidedly spirally twisted: perianth small (2–5 mm. long).
    - Lip white throughout: perianth about 3 mm. long. — 1. *I. Beckii.*
    - Lip medially colored: perianth 4–5 mm. long.
      - Lip medially yellow: flowers opening in spring. — 2. *I. floridanum.*
      - Lip medially green: flowers opening in summer. — 3. *I. gracile.*
  - Spike merely secund, unilateral or slightly spirally twisted: perianth large (7–11 mm. long). — 4. *I. longilabre.*
- Stem more or less leafy below: basal leaves with elongate more or less persistent blades.
  - Blades of the basal leaves elongate-linear or filiform, semiterete and channeled. — 5. *I. tortile.*
  - Blades of the basal leaves narrowly linear, flat.
    - Lip pubescent without.
      - Lip of an elliptic type, usually broadest across the callosities, laciniate at the tip. — 6. *I. laciniatum.*
      - Lip of an ovate type, usually broadest in front of the callosities, not laciniate at the tip. — 7. *I. vernale.*
    - Lip glabrous without. — 8. *I. praecox.*

Flowers 2–several ranked, borne in an elongate, often dense spike, the rachis not conspicuously twisted.
- Lip white, pubescent, the callosities prominently exserted and more or less hooked.
  - Perianth over 8 mm. long, not conspicuously ringent, the parts not slender-tipped. — 9. *I. cernuum.*
  - Perianth less than 4 mm. long, conspicuously ringent, the parts with conspicuously slender tips. — 10. *I. ovale.*
- Lip yellow, glabrous, the callosities imbedded in the base of the blade. — 11. *I. plantagineum.*

1. I. Beckii (Lindl.) House. Stem 1–3 dm. tall, from a single root (the preceding season's root sometimes persisting): blades of the basal leaves ovate to elliptic, 1–3 cm. long: spike very slender, relatively few-flowered: perianth white: lateral sepals lanceolate, about 3 mm. long: petals spatulate to elliptic-spatulate: lip ovate to orbicular-ovate, 2.5–3 mm. long. [*Spiranthes simplex* A. Gray]—Dry acid soil, often in open woods, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and Mass.—Sum.



2. I. floridanum Wherry. Stem 1.5–4 dm. tall, from a cluster of fleshy roots: blades of the basal leaves elliptic or essentially so, 1–4 cm. long: spike slender, 3–10 cm. long: perianth whitish or cream-colored, with a bright yellow stripe down the middle of the lip: lateral sepals lanceolate, 4–5 mm. long: petals linear: lip elliptic-oblong, about as long as the sepals.—Moist, strongly acid pinelands and boggy meadows, Coastal Plain, Fla. to E Tex. and S. C.—Spr.

3. I. gracile (Bigel.) House. Stem 2–8 dm. tall, from a cluster of short roots: blades of the basal leaves elliptic or ovate-lanceolate, 1.5–5 cm. long: spike slender, 5–12 cm. long: perianth white, with a bright green stripe down the middle of the lip: lateral sepals lanceolate, 4–4.5 mm. long: petals linear: lip elliptic-oblong, slightly longer than the sepals.—Dry, moderately acid grassy fields and open woods, various provinces, Ga. to Tex., Man., and N. S.—Sum.

4. I. longilabre (Lindl.) House. Stem 2–5 dm. tall, from usually 3 fleshy roots: blades of the basal leaves lanceolate to elliptic-lanceolate, 2–5 cm. long: spike stout: perianth mainly white: lateral sepals lanceolate or linear-lanceolate from a dilated base: petals broadly linear or nearly so: lip ovate to elliptic-ovate, 7–9 mm. long, much crisped above the base, recurved near the apex. [*Spiranthes brevifolia* Chapm.]—Moist grassy pinelands, Coastal Plain, Fla. to La.—Fall.

5. I. tortile (Sw.) House. Stem 2–4.5 dm. tall, from a cluster of long roots: blades of the basal and lower cauline leaves elongate-linear or filiform-linear, very thick, mostly 8–30 cm. long: spike relatively slender: perianth mainly white: lateral sepals broadly lanceolate, 4.5–5.5 mm. long: petals narrowly elliptic: lip ovate, 4–6 mm. long.—Marshes and moist pinelands, Coastal Plain, Fla. to La.—(*W. I.*)—Spr.–fall.

6. I. laciniatum (Small) House. Stem 2–6 dm. tall, from a cluster of coarse elongate roots, more or less pubescent: blades of the basal and lower cauline leaves narrowly linear and often long-tapering, up to 40 cm. long: spike slender, elongate: perianth white or nearly so, 7–9 mm. long: lateral sepals linear-lanceolate, mostly 6–9 mm. long: petals linear: lip elliptic-ovate, finely laciniate near the apex.—Wet sandy soil, marshes, ponds, and lake shores, often in acid soil, Coastal Plain, Fla. to Tex. and S. C.—Spr.–sum.

7. I. vernale (Engelm. & Gray) House. Stem 1.5–6.5 dm. tall, from elongate-fusiform roots, copiously pubescent above: blades of the basal and lower cauline leaves linear, tapering to both ends, or sometimes phyllode-like and without a dilated blade, 7–15 cm. long: spike elongate: perianth yellowish: lateral sepals lanceolate, 6–10 mm. long: petals linear or elliptic-linear: lip ovate, sometimes rhombic-ovate. [*I. xyridifolium* Small]—Sandy or gravelly soil, meadows, fields, and open woods, various provinces, Fla. to N. M., Kans., and Mass.—(*W. I.*)—Spr.–fall. Hybridizes with *I. gracile*, yielding × *I. intermedium*.

8. I. praecox (Walt.) House. Stem 2–8 dm. tall, from clustered elongate roots, sparingly pubescent above: blades of the basal and lower cauline leaves linear, often narrowly so, 8–25 cm. long: spike elongate, slender, not very dense: perianth

mainly white with the parts sometimes veined with green, 4–5 mm. long: lateral sepals lanceolate to linear-lanceolate, 5–6 mm. long (rarely longer): petals linear: lip elliptic.—Wet grassy places, Coastal Plain, Fla. to Tex. and N. J.—Spr.–sum.

9. I. cernuum (L.) House. Stem 1–4 dm. tall or up to 1 m., from coarse cord-like roots: blades of the basal and lower cauline leaves linear, sometimes broadly so, varying to linear-oblanceolate or linear-lanceolate, up to 25 or 40 cm. long, sometimes with elongate petiole-like bases: spike dense, 3–15 cm. long, stout: flowers more or less fragrant: perianth white or creamy, 7–11 mm. long: petals lanceolate: lip ovate-elliptic, somewhat rhombic, or dilated at the base, more or less erose or crisped near the apex. [*I. trilobum* Small]—Bogs, swamps, wet woods, river-banks, usually in acid soil, various provinces, Fla. to Tex., N. M., S. D., and Newf.—Sum.–fall, or all year S.—A form with cream-colored spikes, growing in non-acid soil and often drier places, has been described as *I. ochroleucum* (Rydb.) House, while a vigorous variant, growing mostly in rich swamps of moderate acidity, in the southern Coastal Plain, has been described as *I. odoratum* (Nutt.) House.

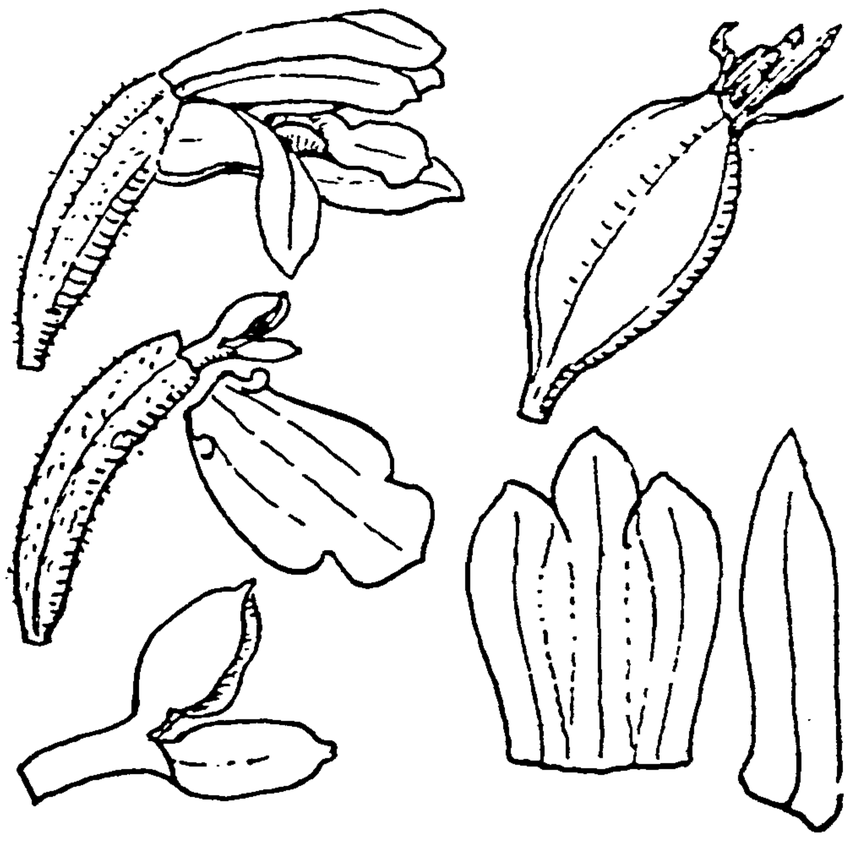
10. I. ovale (Lindl.) House. Stem 2–4 dm. tall, from a cluster of elongate roots: blades of the basal and lower cauline leaves broadly linear to linear-elliptic, 4–16 cm. long: spike slender, tapering, closely flowered but not very dense: perianth white, 4–5 mm. long: lateral sepals broadly lanceolate: petals broadly linear or linear-lanceolate: lip ovate to elliptic-ovate, narrowed at the apex. [*Spiranthes cernua parviflora* Chapm.]—Moist woods, swamps, and hillsides, various provinces, Ga. to La. (Tex.?), Mo., and Ohio.—Fall.

11. I. plantagineum (Raf.) House. Stem 1–4 dm. tall, from a cluster of thick roots: blades of the basal and lower cauline leaves broadly linear to linear-elliptic, or broadest slightly above the middle or below it: spike stout, not tapering, rather loosely flowered: perianth, except the lip, white or nearly so, 5–7 mm. long: lateral sepals narrowly lanceolate: petals linear: lip quadrate-elliptic, yellow, broad at the apex.—Moist woods and grassy banks, various provinces, rarely Coastal Plain, N. C. to Minn. and N. S.—Spr.–sum.

23. CYCLOPOGON Presl. Caulescent herbs. Leaves various, the basal and lower cauline with wide blades, the upper cauline mere sheathing scales. Flowers in a terminal spike. Perianth whitish. Median sepal and petals coherent; lateral sepals erect. Lip with a large body completely involute about the long column and a short nearly erect tip, the basal callosities commonly minute or obscure. Stigma-beak not forked.—About 30 species in tropical America.

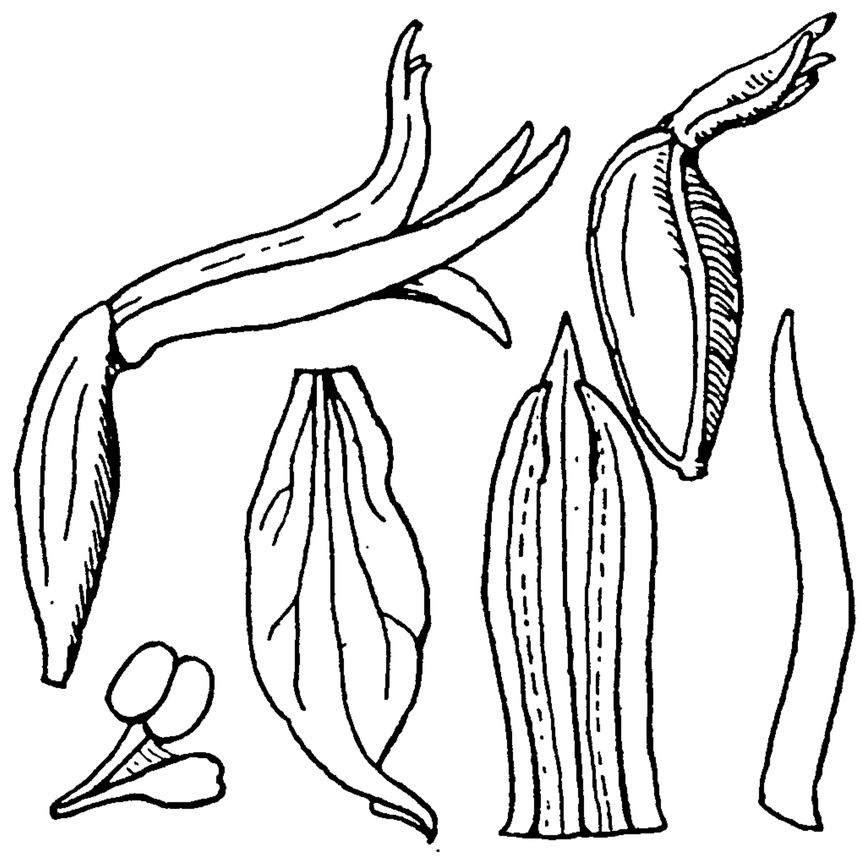
Column and androecium nearly equalling the lip: apical lobe of the lip rhombic, much narrower than the body of the lip. 1. *C. cranichoides.*
Column and androecium about half as long as the lip: apical lobe of the lip reniform or flabellate, nearly or quite as wide as the body of the lip. 2. *C. elata.*

1. C. cranichoides (Giseb.) Schltr. Plant 1–3 dm. tall: blades of the basal leaves ovate to oval, often oblique, 2–3.5 cm. long, usually acute: flowers spreading: lateral sepals linear-lanceolate, about 5 mm. long, obtuse: petals spatulate: lip about 5 mm. long, the body obovate or broadly cuneate when spread out, much wider than the small rhombic terminal lobe: column longer than the anther: capsule obovoid-ellipsoid, 7–9 mm. long. [*Spiranthes Storeri* Chapm. *Beadlea Storeri* Small]—Hammocks, pen. Fla. and the Keys.—(*W. I.*)—Wint.–spr.



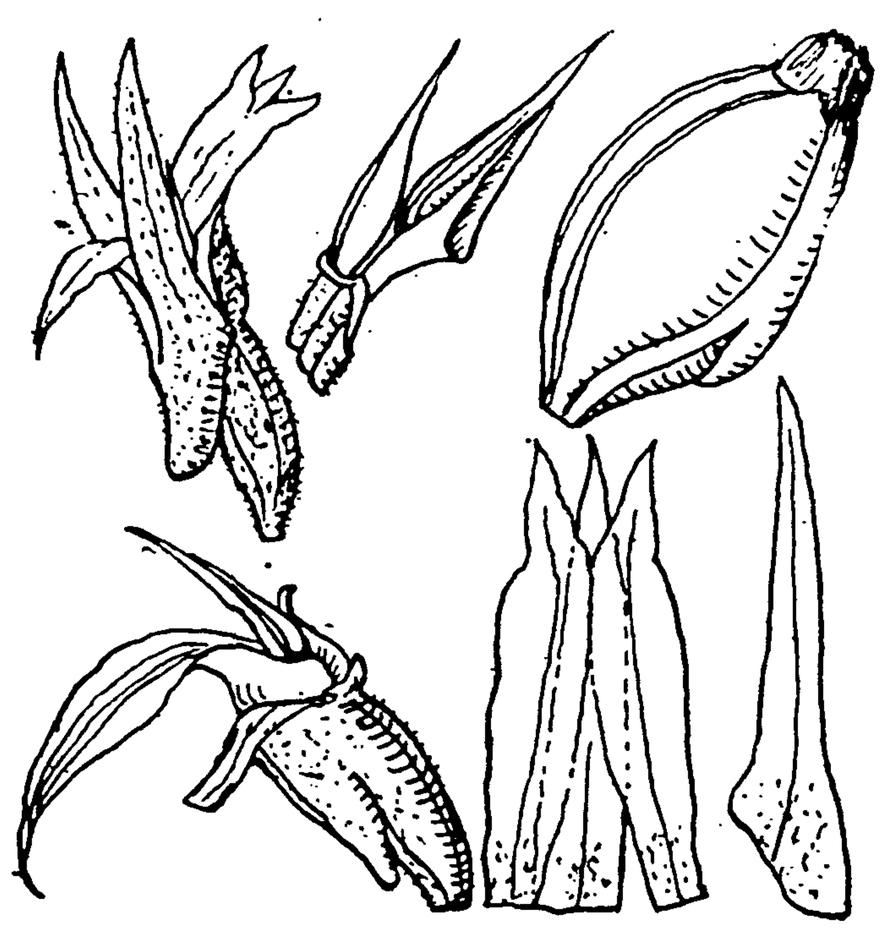
2. B. elatum (Sw.) Schltr. Plant similar to that of the preceeding species, but usually larger, up to 6 dm. tall: blades of the basal leaves elliptic or oval, varying to broadest above the middle or below it, 15 cm. long or less, acute or short-acuminate, often with a long petiole-like base: lateral sepals lanceolate, about 6 mm. long: petals linear-elliptic, about 5 mm. long: lip about 6 mm. long, the body ovate, when spread out, about as wide as the reniform or flabellate terminal lobe or narrower: column shorter than the anther: capsule ellipsoid, 10–12 mm. long.—Hammocks, Brooksville hammock region, Fla.—(*W. I., S. A.*)—Spr.

24. MESADENUS Schlechter. Caulescent herbs with stout tuberous roots. Leaves various, the basal with broad short blades, those of the stem mere sheathing scales. Spike erect, slender, sometimes elongate, with short bracts. Flowers arcuate, the perianth ringent, horizontal or somewhat nodding, greenish-purple. Median sepal and petals coherent, recurved. Lateral sepals free, somewhat recurved. Lip similar to the lateral sepals but slightly wider and shorter, recurved near the tip, sessile, without callosities at the base. Column long, but less than half as long as the lip. Anther didymous, extending beyond the truncate or emarginate stigma. Capsule sessile.—Five species in tropical America.



1. M. lucayanus (Britton) Schlechter. Stem 2–7 dm. tall, glabrous, from a cluster of roots: blades of the basal leaves narrowly or broadly elliptic to ovate, 2.5–11 cm. long, acute, narrowed into petiole-like bases: petals narrowly linear-lanceolate, 4.5–5 mm. long, acute, curved: lip lanceolate, faintly veined: column about 2 mm. long: anther as wide as long: capsule oval or obovoid, 4–6 mm. long, ribbed.—Hammocks, Florida Keys.—(*W. I.*)—Wint.–spr.

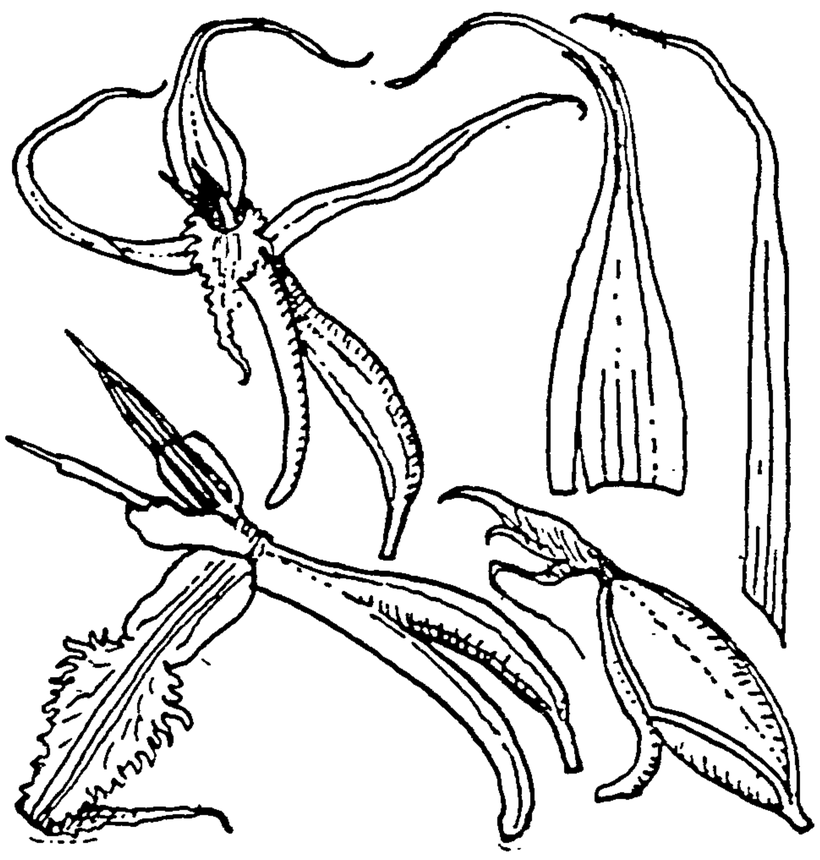
25. STENORRHYNCHUS L. C. Rich. Caulescent highly colored succulent herbs. Leaves various, the basal with more or less elongate blades, early decaying, upper cauline leaves sheathing scales. Flowers in a conspicuous spike. Perianth reddish, yellowish, or white. Lateral sepals narrow, decurrent together with the base of the lip as a spur adnate to the hypanthium. Petals shorter than the lateral sepals. Lip entire, scarcely as long as the lateral sepals, the blade lanceolate, the claw ciliate and with thickened margins, destitute of callosities. Stigma-beak subulate.—About 25 species, natives of tropical and subtropical America.



1. S. orchioides L. C. Rich. Stem 3–7 dm. tall, stout: spike conspicuous: lateral sepals linear-lanceolate, 20–27 mm. long: petals lanceolate, 15–20 mm. long, slightly curved: lip slightly shorter than the lateral sepals, with a lanceolate body and a stout claw with lateral ridges and cilia: capsule body 1–1.5 cm.

long. [*Spiranthes jaliscana* S. Wats.]—Hammocks, pen. Fla.—(*W. I., Mex., C. A., S. A.*)

26. **PELEXIA** Poit. Caulescent herbs, with scape-like stems. Leaves various, the lower cauline with dilated long-petioled blades, the upper cauline mere sheathing scales. Flowers in a spike. Perianth greenish. Lateral sepals united at the base and produced into a spur. Petals adnate to the narrow elongated median sepal. Lip elongated, the upper part of the narrow blade crisped: callosities wanting.—About 20 species, of tropical and subtropical America.

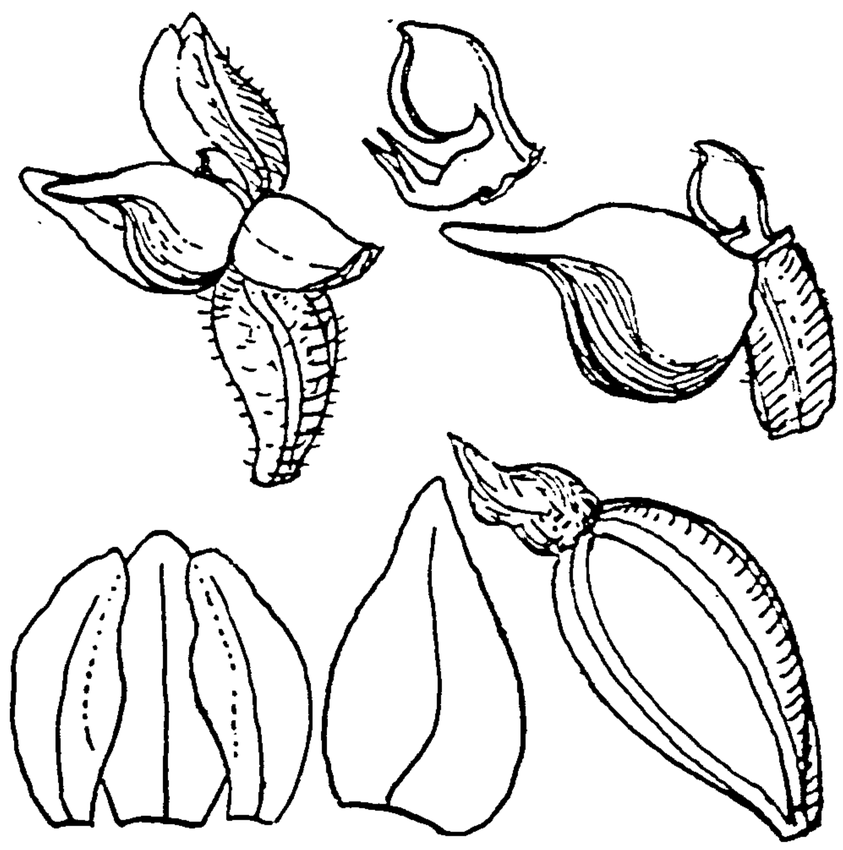


1. **P. setacea** Lindl. Plant 3–6 dm. tall: blades of the lower cauline leaves oblong to elliptic, 4–10 cm. long: lateral sepals linear-filiform, 15–17 mm. long, exclusive of spur: lip 30–37 mm. long, the body narrowly elliptic or linear-elliptic with a slender tip: capsule 14–17 mm. long.—Hammocks, Everglade Keys, Fla.—(*W. I., S. A.*)—Wint.–spr.

27. **PERAMIUM** Salisb. Caulescent herbs, with scape-like stems. Leaves narrow, those near the base of the stem with dilated blotched blades, those higher up mere sheathing scales. Flowers in a spike. Perianth white or pink. Lateral sepals of an ovate type. Petals very inequilateral. Lip sessile, sac-like, *i. e.* with a small blade and a large saccate base. Capsules erect. [*Goodyera* R. Br.].—About 25 species, widely distributed in temperate and tropical regions.—Sum.—RATTLESNAKE-PLANTAINS. LATTICE-LEAVES.

Spike 1-sided: petals 3–3.5 mm. long: lip-sac with a broad border. 1. *P. ophioides.*
Spike cylindric: petals 4.5 5.5 mm. long: lip-sac with a narrow border. 2. *P. pubescens.*

1. **P. ophioides** (Fernald) Rydb. Plant 1–2.5 dm. tall: blades of the lower cauline leaves ovate to lanceolate-ovate, 1–2 cm. long: lateral sepals about 4 mm. long: petals shorter than the sepals, erose, acute: lip 4 mm. long, the edge even, the tip triangular.—Moist cool woods, Blue Ridge and more northern provinces, N. C. to N. M., B. C., Alas.?, Ont., and Newf. —*Peramium repens* (L.) Salisb., in which the above species was formerly included, is an Old World plant.

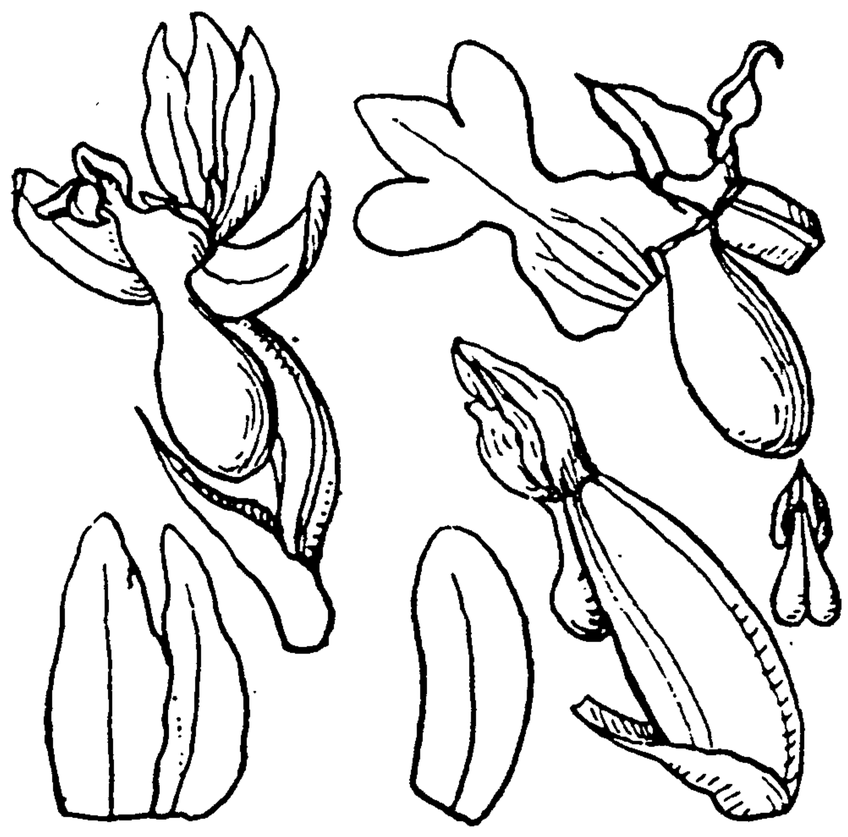


2. **P. pubescens** (Willd.) MacM. Plant 1.5–5 dm. tall: blades of the lower cauline leaves oblong, elliptic or ovate, 2–5 cm. long: lateral sepals about 5 mm. long: petals about as long as the sepals, not erose, obtuse: lip 4 mm. long, the edge undulate, the tip reniform or nearly so.—Woods, usually in dry soil, various provinces, Ala. to Minn., Newf., and N. C.

28. **PHYSURUS** L. C. Rich. Caulescent herbs, the stems leafy. Leaves with wide blades. Flowers in a spike or spike-like raceme. Perianth whitish or greenish. Lateral sepals relatively broad, decurrent together with the base of the lip as a spur partially adnate to the hypanthium. Petals mostly smaller than the sepals. Lip 3-lobed, the terminal lobe quite as large as the body of the lateral lobes, with a reflexed tip, the broad claw-like base forming part of the spur; callosities wanting. Capsule spreading.—About 65 species, natives of tropical and subtropical regions.

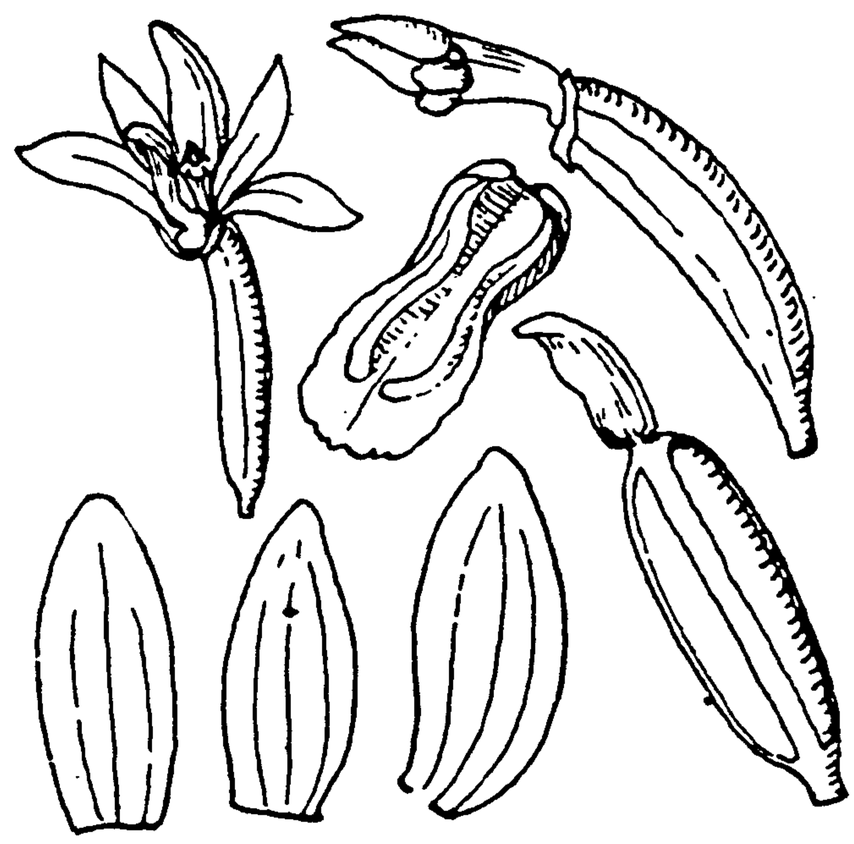
Lateral sepals broadly linear: lateral lobes of the terminal lip-lobe ovate, directed forward: leaf-blades acuminate. 1. *P. Sagraeanus.*
Lateral sepals ovate: lateral lobes of the terminal lip-lobe semi-orbicular, directed outward: leaf-blades acute. 2. *P. querceticola.*

1. P. Sagraeanus A. Rich. Plant 2–4 dm. tall, the stem simple: leaf blades lanceolate to ovate-lanceolate, the upper ones 4–8 cm. long: median sepal lanceolate, 4 mm. long: petals slightly inequilateral: lip, with spur, about 6 mm. long, the middle lobe broadly cuneate at the base when spread out: capsule 6.5–7 mm. long, rather faintly ribbed.—Hammocks, S pen. Fla.—(*W. I.*)—Fall–spr.



2. P. querceticola Lindl. Plant 0.5–1.5 dm. tall, the stem simple: leaf-blades ovate, often broadly so, the upper ones 1.5–5 cm. long: median sepal ovate to ovate-lanceolate, about 3 mm. long: petals very inequilateral: lip, with spur, about 5 mm. long, the middle lobe subcordate at the base when spread out: capsule 5.5–6 mm. long, prominently ribbed.—Low woods and hammocks, Coastal Plain, N pen. Fla. to La. and Tex.—Sum.

29. **TROPIDIA** Lindl. Caulescent somewhat woody herbs with fibrous roots. Leaves with plicate blades terminating long sheathing bases. Panicle stalked. Perianth greenish-white. Lateral sepals nearly equilateral. Petals somewhat smaller than the sepals, slightly curved. Lip shorter than the petals, with a saccate base and a slightly curved blade. Capsule spreading.—About 5 species, widely distributed in the tropics.

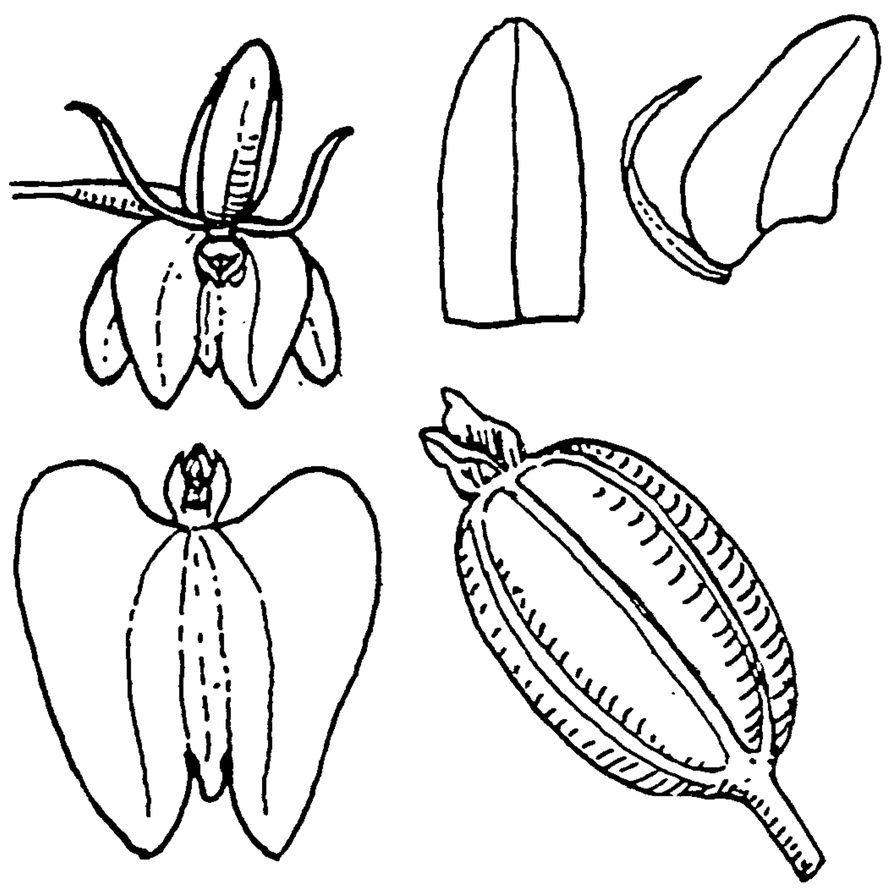


1. T. polystachya (Sw.) O. Ames. Stem 3–5 dm. tall, branched: leaf-blades elliptic to elliptic-lanceolate, 5–20 cm. long, persistent: lateral sepals elliptic or nearly so, 6–7 mm. long: petals 5–6 mm. long: lip 4–4.5 mm. long, constricted about the middle: capsule-body 9–14 mm. long. [*Corymbis polystachya* Benth.]—Hammocks, Everglade Keys, Fla.—(*W. I.*)—Spr.–sum.

30. **MALAXIS** Soland. Scapose herbs, with corms. Leaves mainly elongate sheaths, the upper 1 or 2 bearing a dilated blade at the top. Flowers in a terminal raceme. Perianth white or greenish. Lateral sepals slightly inequilateral. Petals linear-filiform or filiform, shorter than the sepals. Lip broad, cordate at the base, sometimes lobed at the apex. Capsule short. [*Achroanthes* Raf.]—About 140 species of wide geographic distribution.—Sum.–fall. —ADDERS-MOUTHS.

Lip with basal auricles: lateral sepals obtuse.
  Lip with 2 lateral lobes projecting far beyond the minute middle one: lateral sepals much shorter than the lip. 1. *M. unifolia.*
  Lip with 2 broadly rounded lateral lobes shorter than the middle one but broader: lateral sepal nearly as long as the lip. 2. *M. spicata.*
Lip without basal auricles: lateral sepals acuminate. 3. *M. brachypoda.*

1. **M. unifolia** Michx. Leaf usually solitary; blade elliptic, ovate or oval, 2–6 cm. long: scape 1–3 dm. tall: raceme stout: lateral sepals ovate or elliptic-ovate, 1–1.5 mm. long, obtuse: lip green, about 2.5 mm. long, the 2 lateral lobes much larger than the middle one: capsule 5–6 mm. long. [*Microstylis ophioglossoides* Nutt.]—Acid woods, various provinces, Ga. to La., Man., and Newf. —(*W.I., Mex.*)



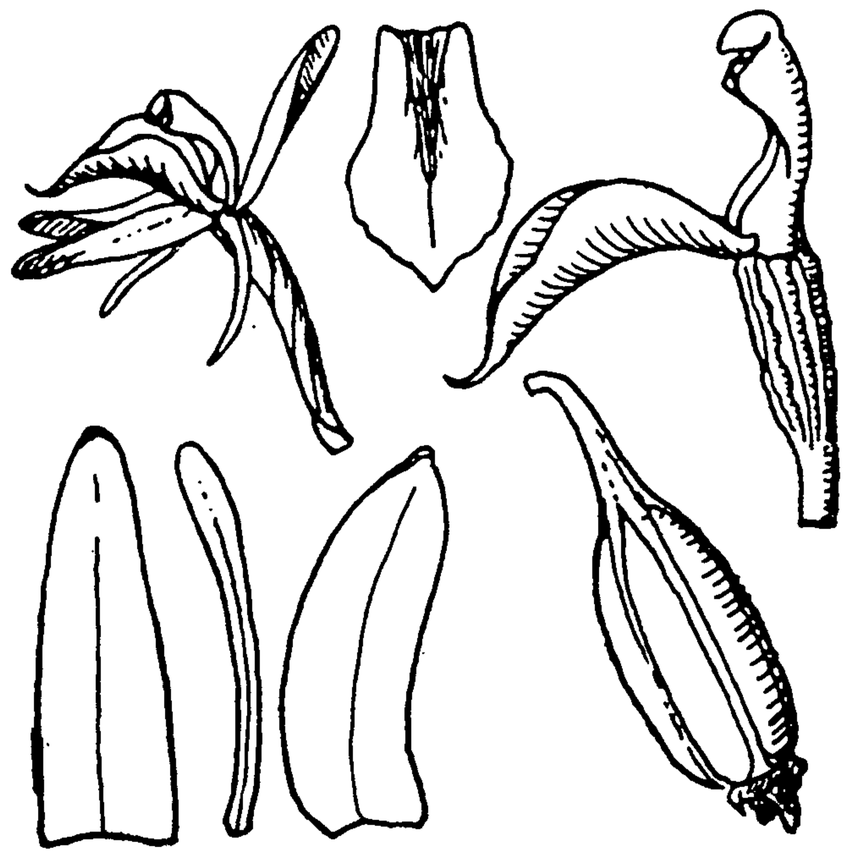
2. **M. spicata** Sw. Leaves normally 2; blades ovate to elliptic-ovate, 3–10 cm. long: scape 1–3 dm. tall: raceme stoutish: lateral sepals elliptic or nearly so, about 3 mm. long, obtuse: lip brownish-green, about 3.5 mm. long, prominently auricled at the base, with a broad blunt tip: capsule 6–7 mm. long. [*Microstylis floridana* Chapm. *Malaxis floridana* Small]—Low or wet hammocks, and stream-banks, often in calcareous soil, Coastal Plain, Fla. to Va.—(*W. I.*)

3. **M. brachypoda** (A. Gray) Fernald. Leaf solitary; blade elliptic to oval, 3–7 cm. long: scape 1–2 dm. tall: raceme slender: lateral sepals lanceolate, about 2.5 mm. long, acuminate: lip 2–2.5 mm. long, greenish-white, not auricled at the base, with a reniform base and an acuminate tip: capsule 4–5 mm. long. —Woods and swamps, various provinces, Tenn. to Tex., Minn., Que., and Pa.—(Eurasia.)

31. **LIPARIS** L. C. Rich. Scapose green herbs, with corms. Leaves 2 or more at the base of the scape, with wide blades, accompanied by several scales. Flowers in a terminal raceme. Perianth greenish. Lateral sepals narrow, nearly equilateral. Petals linear, elongate-linear or filiform, longer than the sepals. Lip free, dilated, undulate or erose, sometimes with tubercles at the base. Capsule erect. [*Leptorchis* Thouars.]—About 100 species, widely distributed in temperate and tropical regions.—TWAYBLADES.

Lip rounded at the apex and abruptly pointed: petals narrowly linear to linear-filiform.
  Lip with an undulate blade 2.5–3.5 mm. wide: petals narrowly linear. 1. *L. Loeselii.*
  Lip with an erose blade 12–13 mm. wide: petals linear-filiform. 2. *L. liliifolia.*
Lip cuneately dilated at the apex and notched: petals broadly linear. 3. *L. elata.*

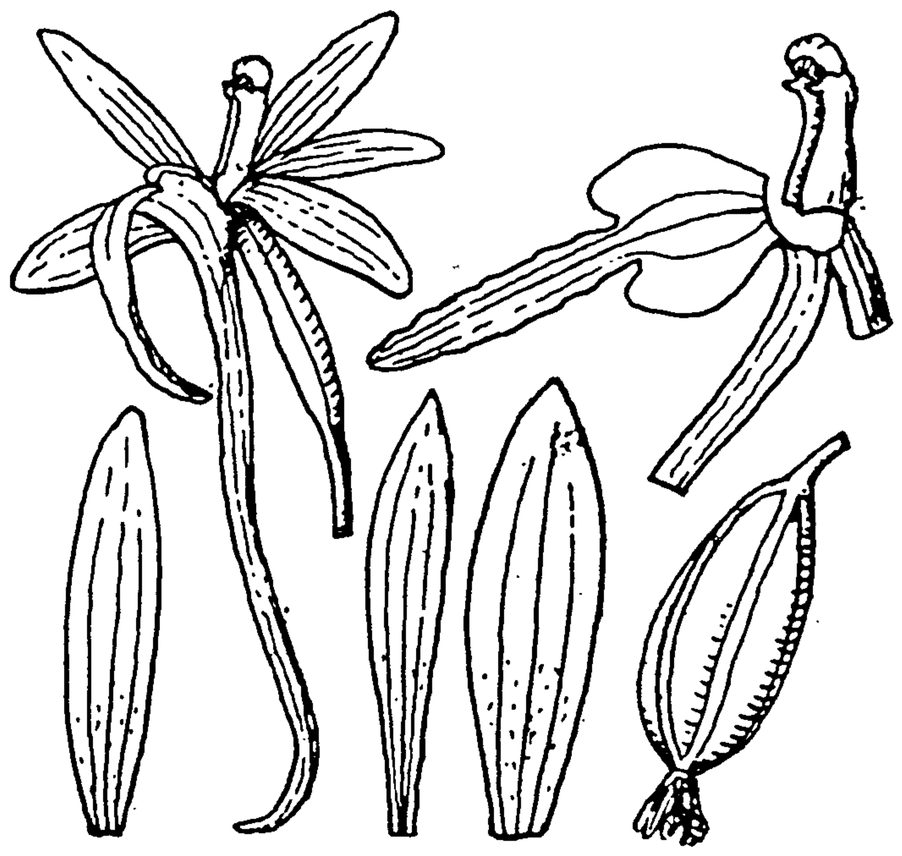
1. L. Loeselii (L.) L. C. Rich. Leaf-blades elliptic to elliptic-lanceolate, 5–17 cm. long: scape 0.5–2 dm. tall: lateral sepals lanceolate, about 4 mm. long: petals 6–7 mm. long: lip yellowish-green, about 4 mm. long, the blade suborbicular, abruptly pointed: capsule ellipsoid, 10–14 mm. long.—Wet rocky soil, swamps, moist thickets, and cliffs, various provinces, rarely Coastal Plain, Ala. to Mo., Sask., Ont., and N. S.—Spr.



2. L. liliifolia (L.) L. C. Rich. Leaf-blades ovate to oval or elliptic-ovate, 5–15 cm. long: scape 1–3 dm. tall: lateral sepals linear-lanceolate or nearly linear, about 11 mm. long: petals 11–13 mm. long: lip russet or brown-purple, 11–13 mm. long, the blade obovate-cuneate to suborbicular, erose, abruptly pointed: capsule clavate-ellipsoid, 12–18 mm. long.—(RUSSET-WITCH.)—Rocky woods and thickets, various provinces, Ga. to Ala., Mo., Minn., and Me.—Spr.-sum.

3. L. elata Lindl. Leaf-blades few, broad, elliptic, elliptic-ovate, 6–18 cm. long: scape 15–43 cm. tall: lateral sepals ovate-oval, about 5 mm. long: petals broadly linear, about 5.5 mm. long: lip dark-green or brownish, about 4 mm. long, the blade broadly cuneate, notched at the apex: capsule clavate-ellipsoid or clavate-oval, 16–21 mm. long.—Hammocks, S pen. Fla.—(*W. I., C. A., S. A.*)—All year.

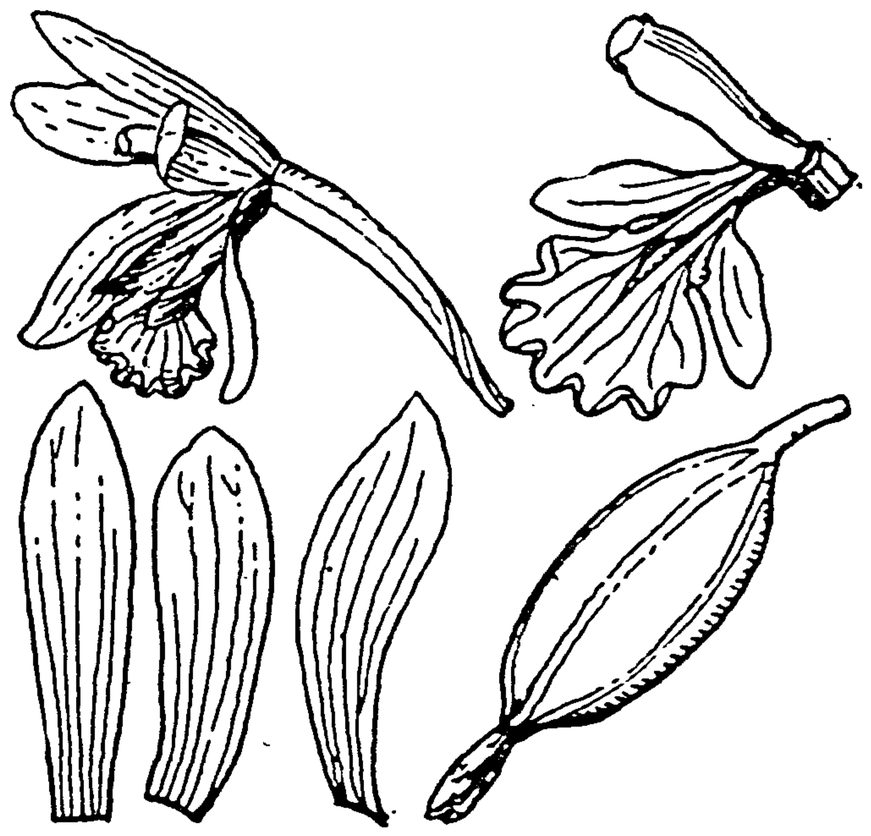
32. TIPULARIA Nutt. Caulescent herbs, with grouped corms. Leaf solitary, terminating the corm, decaying before the lateral scaly stem arises. Flowers numerous, in a terminal raceme. Perianth brownish. Lateral sepals nearly equilateral. Petals shorter and narrower than the sepals. Lip free, with 2 broad basal lobes and a narrow terminal lobe, long-spurred. Capsule nodding.—Two species, the following and one in the Himalayas.



1. T. unifolia (Muhl.) B. S. P. Leaf solitary, autumnal; blade ovate or ovate-lanceolate, 4–9 cm. long, purple beneath: flower-stalk 3–6 dm. tall: raceme loosely flowered: lateral sepals broadly linear or elliptic-linear, 6–8 mm. long: petals broadly linear: lip about 7 mm. long, the lateral lobes broad, toothed, the terminal lobe linear: spur slender: capsule 10–12 mm. long. [*T. discolor* Nutt.]—(ELFIN-SPUR. CRANEFLY-ORCHID.)—Woods, shaded banks, and hammocks, in acid soil, Coastal Plain and occasionally other provinces, Fla. to Tex., Ind., N. Y., and N. J.—Sum.—The leaves last through the winter.

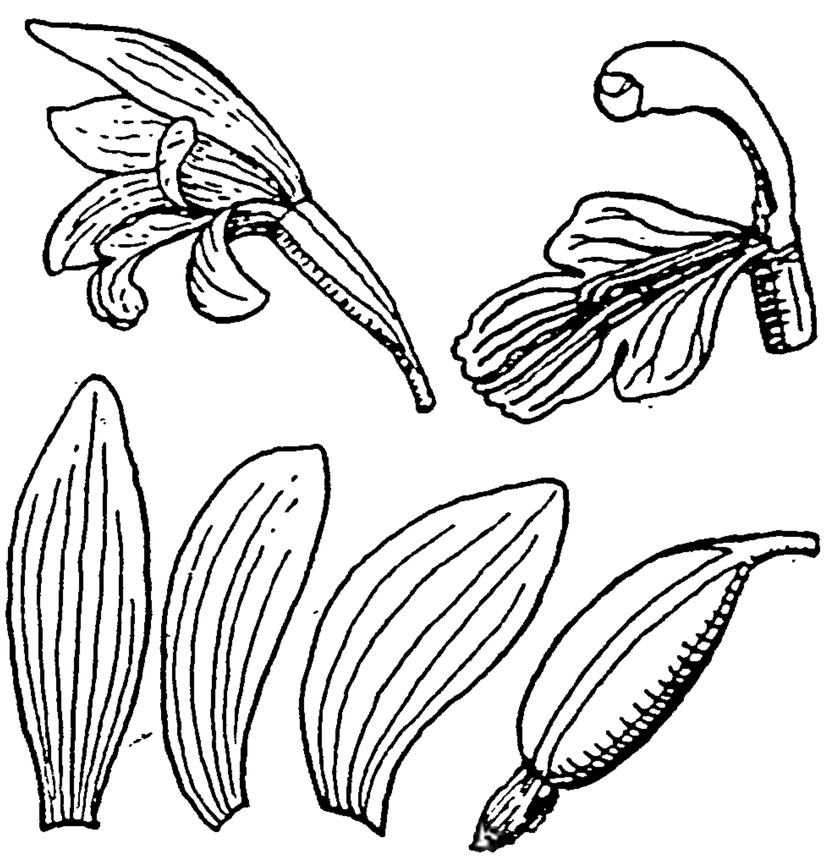
33. APLECTRUM Nutt. Caulescent herbs with a chain of corms. Leaf solitary, terminating the corm, decaying before the lateral scaly stem arises.

Flowers few in a terminal raceme. Perianth brownish-yellow, striped with purple. Lateral sepals narrow, slightly curved. Petals slightly longer than the sepals. Lip dilated, 3-lobed, 3-ridged above the claw, spurless. Capsule drooping.—One species.



1. A. hyemale (Muhl.) Torr. Leaf autumnal, or slightly earlier; blade elliptic, 4–20 cm. long: flower-stalk vernal, 2–6 dm. tall: lateral sepals linear-spatulate, 10–13 mm. long: petals spatulate: lip 11–12 mm. long, the blade with 2 oblong-ovate lateral lobes and a suborbicular crenulate middle lobe: capsule 2–2.5 cm. long.—(ADAM-AND-EVE. PUTTY-ROOT.)—Woods, various provinces, rarely Coastal Plain, Ga. to Ark., Calif., Sask., Ont., and Vt.—Spr.

34. HEXALECTRIS Raf. Caulescent herbs, with coral-like rootstocks. Leaves scale-like. Flowers in a terminal raceme. Perianth brownish-yellow striped with light purple. Lateral sepals inequilateral, shorter than the median one. Petals curved, longer than the lateral sepals. Lip 3-lobed, with a crest of several ridges, spurless. Capsule drooping.—Two species, the following and one in Mexico.



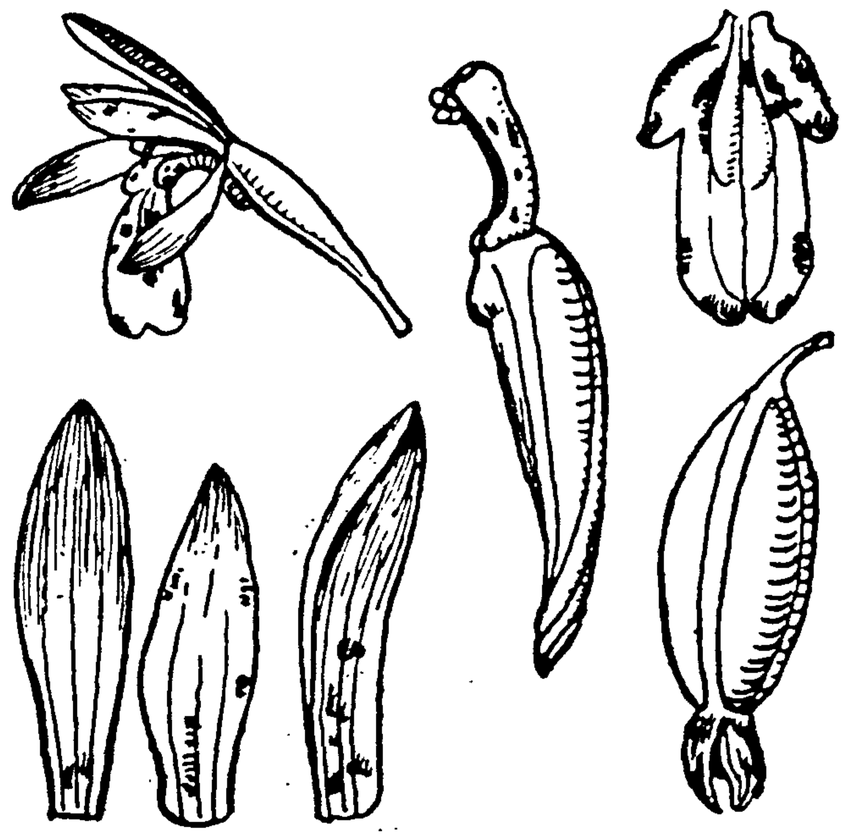
1. H. spicata (Walt.) Barnhart. Stem 1–5 dm. tall, scaly: raceme loosely-flowered: lateral sepals half-ovate, 16–20 mm. long: petals elliptic-spatulate: lip 16–18 mm. long, with a narrow base, wide lateral lobes and a crisped middle lobe: capsule 2–2.5 cm. long. [*H. aphylla* (Nutt.) Raf.]—(BRUNETTA.)—Rich woods, Coastal Plain and occasionally other provinces, Fla. to Tex., Ariz., Mo., Ind., and Md.—(*Mex.*)—Sum.—The plant is devoid of roots and of chlorophyll. The stem and leaves are brown.

35. CORALLORRHIZA R. Br. Caulescent succulent purplish, brownish or reddish herbs, with coral-like root-stocks. Leaves reduced to scales. Flowers in a terminal raceme. Perianth white or yellow. Lateral sepals slightly inequilateral, often curved. Petals rather smaller than the sepals, somewhat narrowed at the base. Lip dilated, the blade undulate or lobed. Capsule nodding.—About 15 species, widely distributed in the north temperate zone.—CORAL-ROOTS. CORAL-ORCHIDS.

Lip 3-lobed, the lateral lobes spreading or directed forward.
- Lip deeply 3-lobed: spur prominent. — 1. *C. maculata.*
- Lip shallowly 3-lobed: spur obsolete. — 2. *C. Corallorrhiza.*

Lip not lobed, often erose or crisped.
- Lip 4–8 mm. long, the blade obovate to suborbicular.
  - Lip long-clawed or clawless, the blade notched: column broadly winged. — 3. *C. Wisteriana.*
  - Lip short-clawed or clawless, the blade short-tipped: column narrowly winged. — 4. *C. odontorrhiza.*
- Lip 3–3.5 mm. long, the blade elliptic, obtuse. — 5. *C. micrantha.*

1. C. maculata Raf. Stem 2–5 dm. tall: raceme 5–20 cm. long: lateral sepals linear to linear-oblong, 6–9 mm. long: petals elliptic to elliptic-spatulate: lip white with purple spots, 6–8 mm. long, the blade with 2 prominent lateral lobes and a suborbicular middle lobe: capsule 12–20 mm. long. [*C. multiflora* Nutt.] —Woods, various provinces, rarely Coastal Plain, Fla. to Tex., Calif., B. C., Ont., and Newf.—Sum.



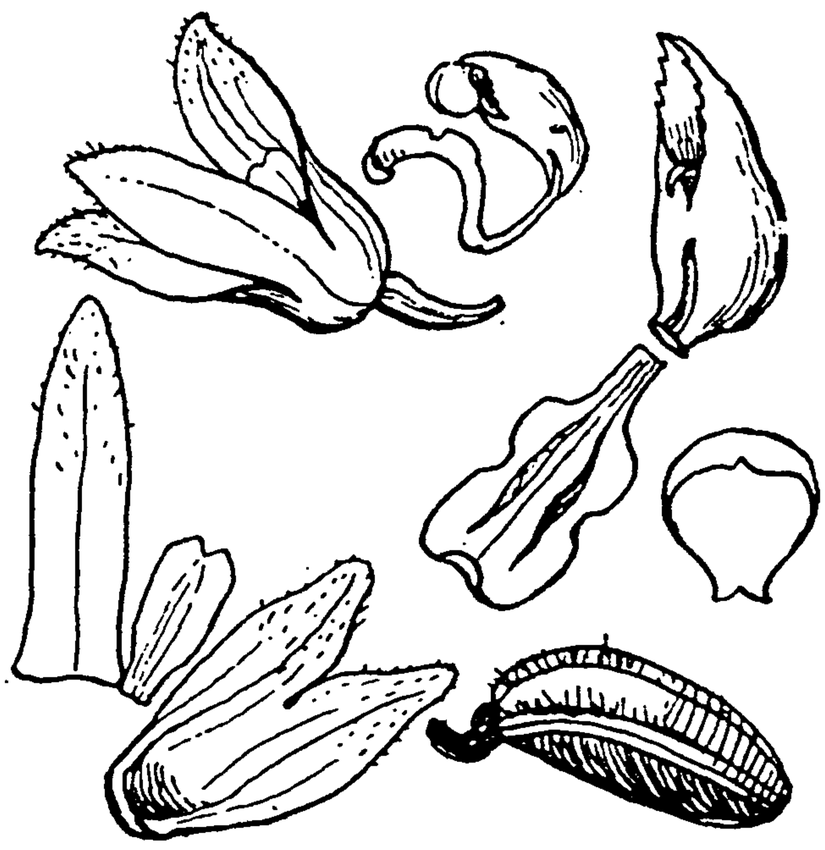
2. C. Corallorrhiza (L.) Karst. Stem 1–3 dm. tall: raceme 2–10 cm. long: lateral sepals linear to linear-spatulate, 3–4 mm. long: petals mostly spatulate: lip white, 3–4 mm. long, the blade with 2 shallow lateral lobes below the middle and an ovate middle lobe: capsule 8–10 mm. long. [*C. innata* R. Br.]—Woods, Blue Ridge, Ga. to Md., and various provinces, Pa. to Wash., Alas., Ont., and Newf.—(*Eurasia.*)—Spr.

3. C. Wisteriana Conrad. Stem 2–3.5 dm. tall: raceme 3–10 cm. long: lateral sepals linear to linear-lanceolate, 6–8 mm. long: petals elliptic-spatulate: lip white with purple spots, 8–10 mm. long, the blade broadly oval to broadly obovate, notched at the apex: capsule 9–11 mm. long.—Rich woods, various provinces, Fla. to Tex., Mo., Ind., and Pa. (or Mass.?).—Wint.–sum.

4. C. odontorrhiza (Willd.) Nutt. Stem 1–3 dm. tall: raceme 4–10 cm. long: lateral sepals linear or nearly so, 3–4 mm. long: lip white with purple streaks, 4–4.5 mm. long, the blade suborbicular, with erose-crisped margins and an abrupt-acute tip: capsule 6–7 mm. long.—Woods, various provinces, Fla. to Tex., Mich., and Me.—Spr.–sum.

5. C. micrantha Chapm. Stem 8–15 cm. tall: raceme 2–4 cm. long: lateral sepals broadly linear to linear-elliptic, 2–3 mm. long: lip whitish, 3–3.5 mm. long, the blade elliptic, with erose sides and a rounded apex: capsule 6–7 mm. long.—Woods, Coastal Plain, N Fla. and Ga.—Sum.–fall.

36. PLEUROTHALLIS R. Br. Epiphytic herbs. Leaves usually solitary: blades thick. Flowers in elongate spike-like racemes, or in clusters. Perianth usually pale, often white or green. Sepals converging or nearly erect, distinct, or the lateral ones partly united. Petals mostly shorter than the sepals. Lip usually pandurate, smaller than the petals. Column short. Capsule erect or nodding.—About 400 species of tropical America.

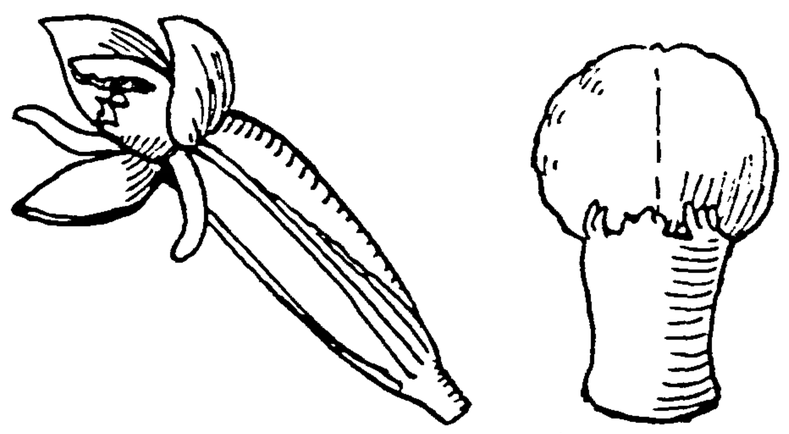


1. P. gelida Lindl. Plant 1–3 dm. tall: leaf-blades elliptic to elliptic-lanceolate, 8–16 cm. long: flower-stalks 1–3, arising from the axil of a bract, 1–2 cm. long: perianth yellowish: lateral sepals nearly linear, 5–5.5 mm. long: petals broadened upward, 3.5–4 mm. long: lip about 2 mm. long: capsule short-stalked, the body ellipsoid, 9–11 mm. long.—Hammocks, SW pen. Fla.—(*W. I.*)

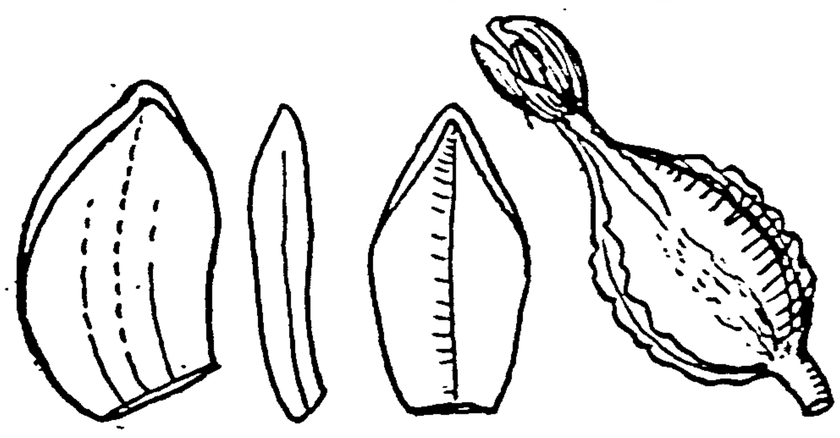
37. **SPATHIGER** Small. Epiphytic herbs with stiff, creeping stems and branches. Leaves mostly ascending or spreading, with rather narrow blades, and sheathing bases. Flowers in the axils of clasping bracts. Perianth small and inconspicuous. Lateral sepals broad, often wider than the median one. Petals rather broad, scarcely dilated upward. Lip concave; blade ovate, suborbicular, or reniform. Column short, wholly adnate to the lip. Capsule erect. —About 10 species, of tropical America.

Spike with the bracts separated: lip rounded at the apex: capsule ovoid, long-beaked, subtended by the bract. 1. *S. rigidus.*
Spike with the bracts imbricate: lip acute or acuminate: capsule globose-ovoid, short-beaked, invested by the bract. 2. *S. strobiliferus.*

1. S. rigidus (Jacq.) Small. Plant with creeping stem and branches 1–5 dm. long: leaf-blades elliptic, sometimes narrowly so, 4–8 cm. long: perianth greenish: lateral sepals ovate or elliptic-ovate, 5–7 mm. long: petals broadly linear to elliptic spatulate: lip green; blade 2–3 mm. long, triangular-reniform to suborbicular, bearing callosities near the base: capsule 15–18 mm. long. [*Epidendrum rigidum* Jacq.]—Hammocks, S pen. Fla. —(*W. I., Mex., C. A., S. A.*)—Spr.



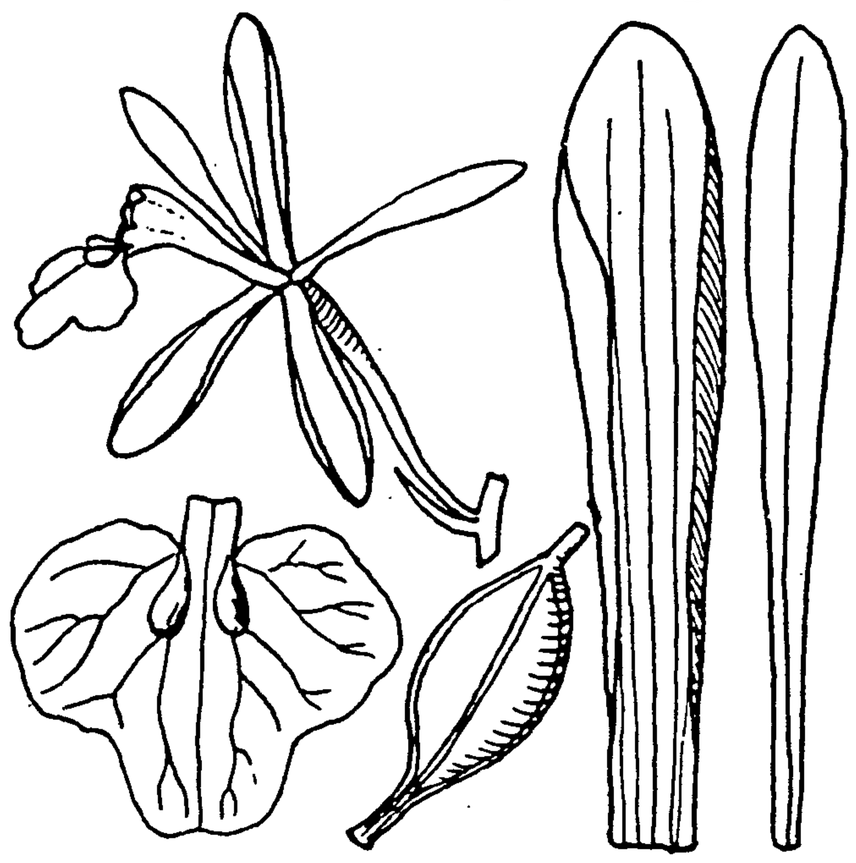
2. S. strobiliferus (Reichenb. f.) Small. Plant with creeping stem and branches 0.5–3 dm. long: leaf-blades elliptic to broadly linear or elliptic-lanceolate, 1–2.5 cm. long: perianth mainly or wholly white: lateral sepals obliquely ovate to obliquely-lanceolate, 3–4.5 mm. long: petals linear or somewhat constricted near the base: lip white or whitish; blade 2–3 mm. long, ovate-cordate, unappendaged: capsule 5–7 mm. long. [*Epidendrum strobiliferum* Reichenb. f.]—Hammocks, S pen. Fla.—(*W. I., C. A., S. A.*)—Spr.



38. **AMPHIGLOTTIS** Salisb. Epiphytic herbs with erect or ascending, often tufted, stems. Leaves ascending or spreading, with broad or narrow blades, and sheathing bases, the lower portion of the stem often merely scaly and sometimes thickened after the manner of an elongate pseudobulb. Flowers in a terminal open or contracted raceme or panicle, usually long-pedicelled. Perianth rather large, often showy. Lateral sepals obtuse, acute, or attenuate, often elongate. Petals spatulate or slender and attenuate. Lip relatively large, entire or fimbriate, the middle lobe wanting, minute or elongate. Column elongate, wholly adnate to the lip-base. Capsule drooping.—About 80 species of tropical America.

Lip with 2 spreading lateral lobes and a broad middle lobe.
  Blade of the lip about as broad as long, the middle lobe about as large as the lateral ones.
    Sepals not ribbed, the lateral ones spatulate: lip with 2 appendages at the base: column slender. 1. *A. conopsea.*
    Sepals ribbed, the lateral ones falcate-obovate: lip unappendaged: column stout. 2. *A. anceps.*
  Blade of the lip much broader than long, the middle lobe much smaller than the lateral ones. 3. *A. difformis.*
Lip with 2 lateral lobes directed forward and a slender elongate middle lobe. 4. *A. nocturna.*

1. A. conopsea (Ait.) Small. Plant 0.5–2 dm. tall: leaf-blades oblong to elliptic-lanceolate, 3–8 cm. long: flower-stalk slender: flowers fragrant: perianth green and often purple-tinged: lateral sepals spatulate, 8–10 mm. long: petals linear-spatulate, 8–10 mm. long: lip green; blade 5–6 mm. long, with 2 broad lateral lobes and a slightly narrower middle lobe: capsule-body 15–20 mm. long. [*Epidendrum conopseum* Ait.]—(GREEN-FLY ORCHID.)—Hammocks and river swamps, mostly on live-oaks and magnolias, or rarely on rocks, Coastal Plain, Fla. to La. and N. C.—Sum.

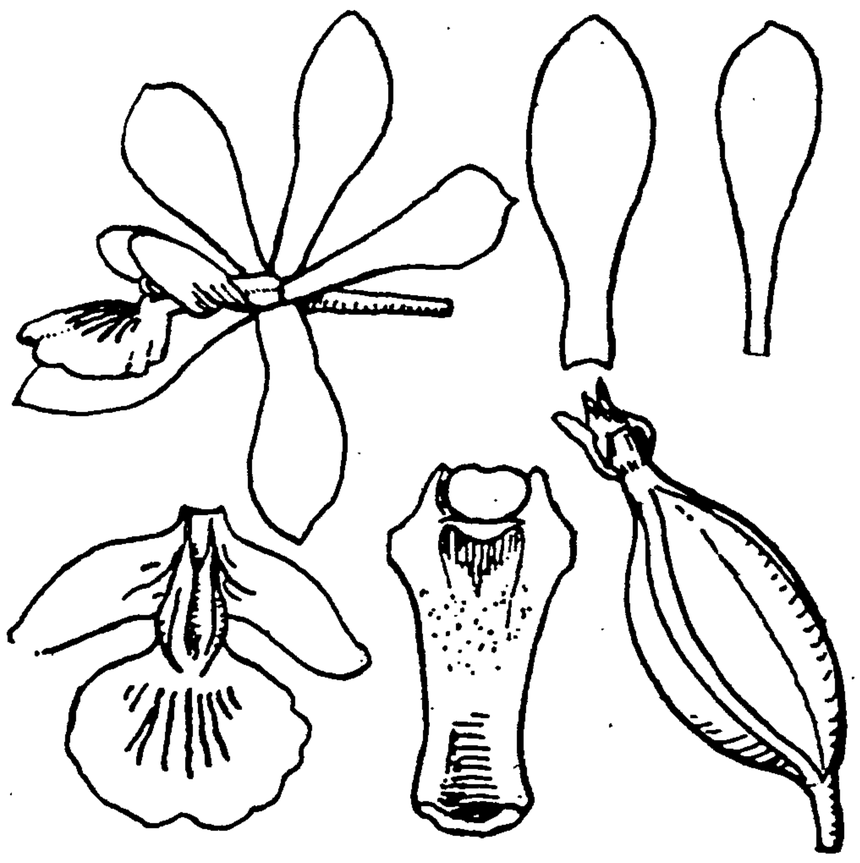


2. A. anceps (Jacq.) Britton. Plant 1.5 dm. tall: leaf-blades mainly elliptic to elliptic-lanceolate, 5–18 cm. long: flower-stalk stoutish: perianth greenish or purple-green: lateral sepals slightly oblique and obliquely truncate at the apex, 6–7 mm. long: petals spatulate, often broadly so, 5.5–6.5 mm. long: lip mostly green; blade 5–6 mm. long, with 2 broad rounded lateral lobes and a middle notched lobe: capsule-body 13–15 mm. long. [*Epidendrum anceps* Jacq.]—Hammocks, S pen. Fla.—(*W. I.*)—All year.

3. A. difformis (Jacq.) Britton. Plant 1–3.5 dm. tall: leaf-blades elliptic or nearly so, 4–8 cm. long: perianth green: lateral sepals more or less oblique, sometimes broadly scimitar-shaped, 12–15 mm. long: lip green; blade 7–8 mm. long, reniform to orbicular-reniform, with broad rounded lateral lobes and a short notched middle lobe: capsule-body 13–16 mm. long. [*Epidendrum difforme* Jacq. *E. umbellatum* Sw.]—Hammocks, S pen. Fla.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.

4. A. nocturna (L.) Britton. Plant 3–11 dm. tall: leaf-blades elliptic to broadly linear, 8–16 cm. long: perianth showy: lateral sepals linear-attenuate, 40–60 mm. long, green: petals narrower than the sepals: lip white; blade with 2 ovate or elliptic-ovate lateral lobes directed forward and a linear-setaceous middle lobe 35–50 mm. long: capsule-body 3–5 cm. long. [*Epidendrum nocturnum* L.]—Hammocks, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.—The flowers are fragrant, especially at night.

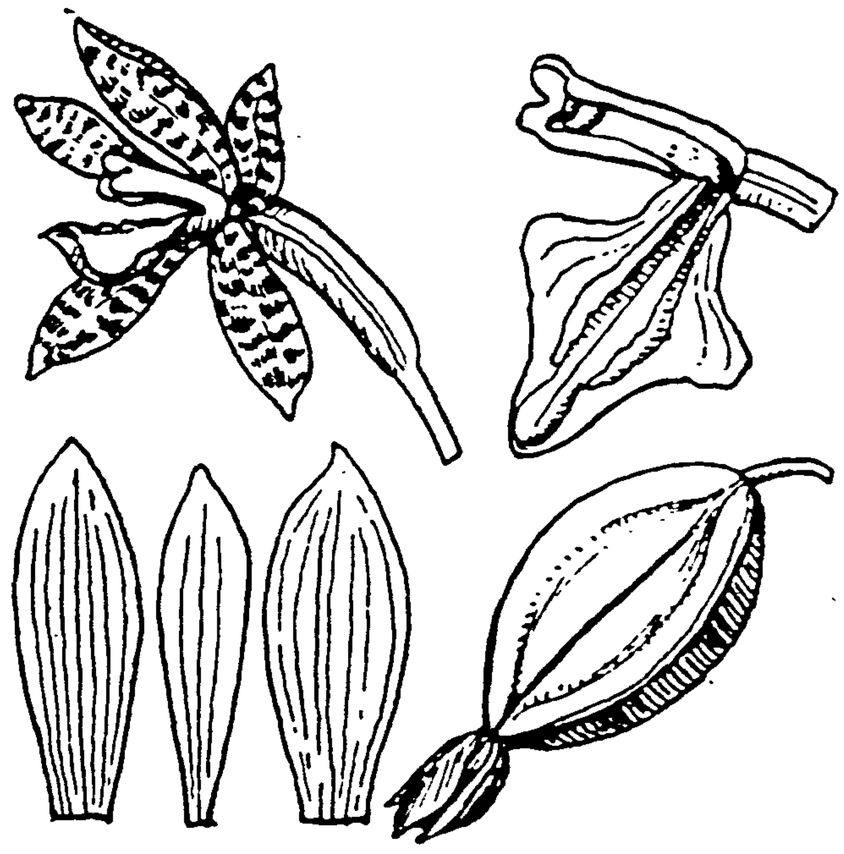
39. ENCYCLIA Hook. Epiphytic herbs with terete pseudobulbs which bear several erect or arching elongate leaves and a scaly elongate branched flowering stem at the apex. Flowers nodding, subtended by small bracts. Perianth often conspicuous. Lateral sepals rather broad, usually about as wide as the median one. Petals usually of a spatulate type. Lip 3-lobed, the middle lobe much broader than the lateral ones. Column slightly adnate to the lip. Capsule drooping, ribbed.—About 75 species, of tropical and subtropical America.



1. E. tampensis (Lindl.) Small. Plant 1.5–6 dm. tall: leaf-blades linear to narrowly linear-lanceolate, 8–20 cm. long: flower-stem typically branched: lateral sepals 17–20 mm. long, slightly broadened upward, green, tinged with brown: petals spatulate, deeper brown-shaded than the sepals: lip white, with 3 purple or magenta spots;

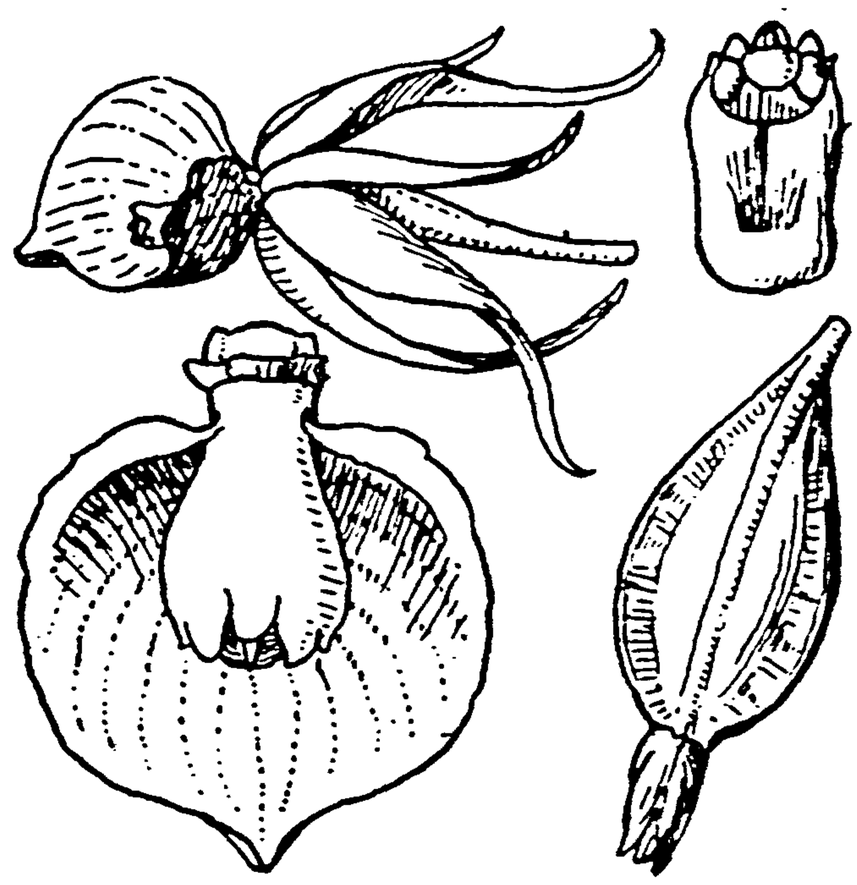
blade 15–17 mm. long, the lateral lobes oblong-lanceolate, the middle lobe orbicular or reniform-orbicular: capsule-body 25–30 mm. long. [*Epidendrum tampense* Lindl.]—Hammocks, pen. Fla. and the Keys.—Spr.–sum.

40. EPICLADIUM Small. Epiphytic herbs with short flattened pseudobulbs which bear several short erect leaves and a relatively short mostly simple flowering stem which is subtended by a long foliaceous spathe. Flowers erect or ascending, subtended by minute bracts. Perianth small, but showy. Lateral sepals rather short, about as wide as the median one. Petals nearly resembling the lateral sepals or more dilated upward. Lip shorter than the sepals and petals, the blade usually rhombic. Column partly adnate to the lip. Capsule nodding, winged.—One species.



1. E. Boothianum (Lindl.) Small. Plant 1–2 dm. tall, with flattened suborbicular pseudobulbs: leaf-blades spatulate, 6–12 cm. long: flower-stem simple: lateral sepals 11–13 mm. long, elliptic or slightly broadened upward: petals broadly spatulate, brown-spotted like the sepals: lip yellow or mainly so; blade rhombic, 4–6 mm. long, the broad lateral lobes spreading; capsule-body 25–30 mm. long. [*Epidendrum Boothianum* Lindl.]—Hammocks, S pen. Fla. and the Keys.—(*W. I.*)—Fall.

41. ANACHEILIUM Hoffmg. Epiphytic herbs with elongate flattened pseudobulbs which bear several elongate erect leaves and a simple flowering stem at the apex. Flowers nodding, subtended by often lanceolate bracts. Perianth usually showy. Lateral sepals narrow and elongate, usually attenuate, resembling the median one. Petals usually slightly shorter than the sepals. Lip much shorter than the sepals and petals; blade very broad, concave and clamshell-like, entire. Column partly adnate to the lip. Capsule drooping, wing-angled.—One species.



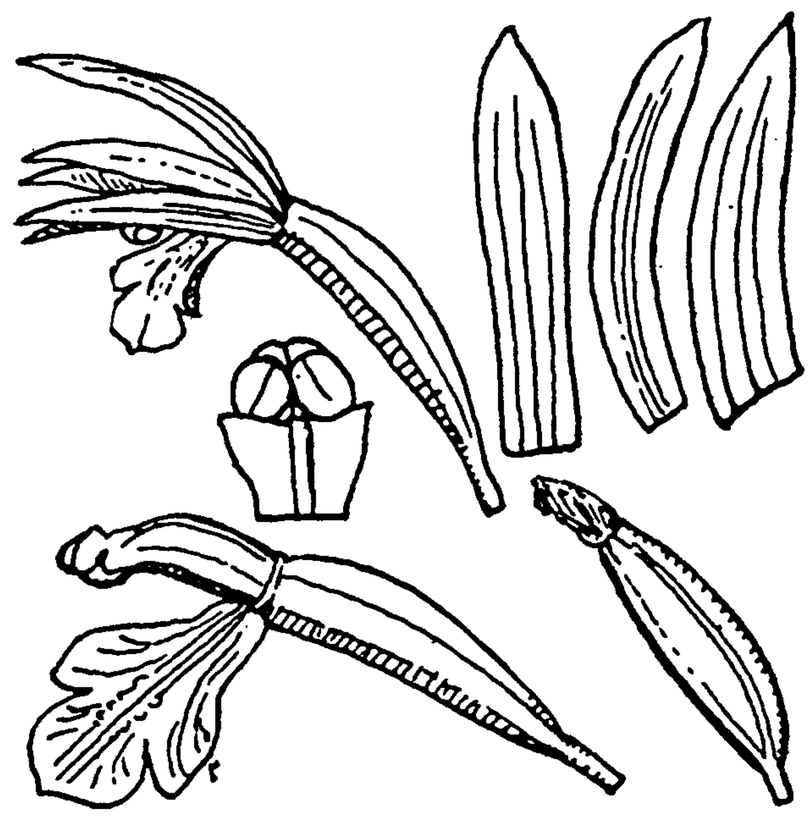
1. A. cochleatum (L.) Hoffmg. Plant 2–5 dm. tall: leaf-blades linear or nearly so, 1.5–4 dm. long: flower-stem simple: lateral sepals 25–30 mm. long. linear-lanceolate and attenuate: lip brown or purplish; blade orbicular-reniform, 16–20 mm. long, entire, abruptly pointed: capsule-body 20–30 mm. long. [*Epidendrum cochleatum* L.]—(CLAMSHELL-ORCHID.)—Hammocks, pen. Fla. and the Keys.—(*W. I.*)—Fall–spr. or all year.—In the Florida plant the column bears three anthers instead of two as found in the West Indian plant. It has been named *A. cochleatum triandrum.*

42. HORMIDIUM Lindl. Epiphytic herbs with creeping stems. Leaves spreading, the blades relatively narrow. Flowers in terminal clusters which are subtended by an involucre of leaf-like bracts. Perianth inconspicuous.

Lateral sepals mostly narrow and shorter than the median one. Petals much smaller than the sepals. Lip relatively small, with 2 large lateral lobes and a very small middle lobe. Capsule nodding.—Seven species, in tropical America.

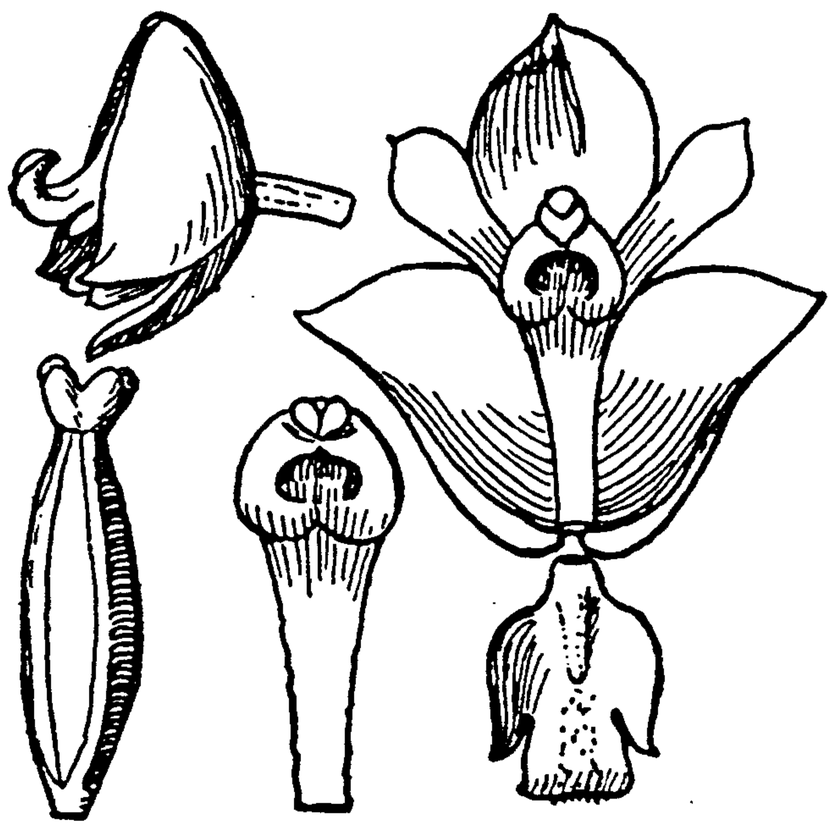
1. H. pygmaeum (Hook.) Benth. & Hook. Stems scaly with old leaf-bases: leaf-blades elliptic or nearly so, 2.5–7.5 cm. long: perianth, except the lip, green: sepals acuminate, the lateral ones 5–5.5 mm. long: petals linear, 4–4.5 mm. long: lip 4.5–5 mm. wide, white, tipped and tinged with rose, the lateral lobes ovate or oval: capsule-body 12–15 mm. long, winged. [*H. tripterum* (Brongn.) Cong.]—Hammocks, S pen. Fla.—(*W. I., Mex., C. A., S. A.*)

43. **BASIPHYLLAEA** Schlechter. Caulescent herbs, with clustered fleshy tubers. Leaves various, the basal ones with firm narrow plicate blades, the cauline mere sheathing scales. Flowers erect, several, axillary to scale-like bracts. Perianth mainly rose-purple. Sepals nearly equal, longer than the petals. Petals decidedly narrower than the sepals. Lip short, sessile, slightly 3-lobed at the apex, with 5 longitudinal crests. Capsule erect. [*Carteria* Small, not Franzé]—Two species in Florida and the West Indies.



1. B. corallicola (Small) Ames. Stem 2–3.5 dm. tall: basal leaves 2–7 cm. long; blades nearly linear, narrowed at both ends: flowers erect: lateral sepals linear-lanceolate to broadly linear, 6.5–7.5 mm. long: lip oval to orbicular-oval, 6–7 mm. long, the middle lobe much larger than the lateral ones: capsule not seen mature. [*C. corallicola* Small]—Rocky pinelands, Everglade Keys, Fla.—(*W. I.*)—Wint.—Although the plants are apparently perennial, they bloom only at intervals of several years.

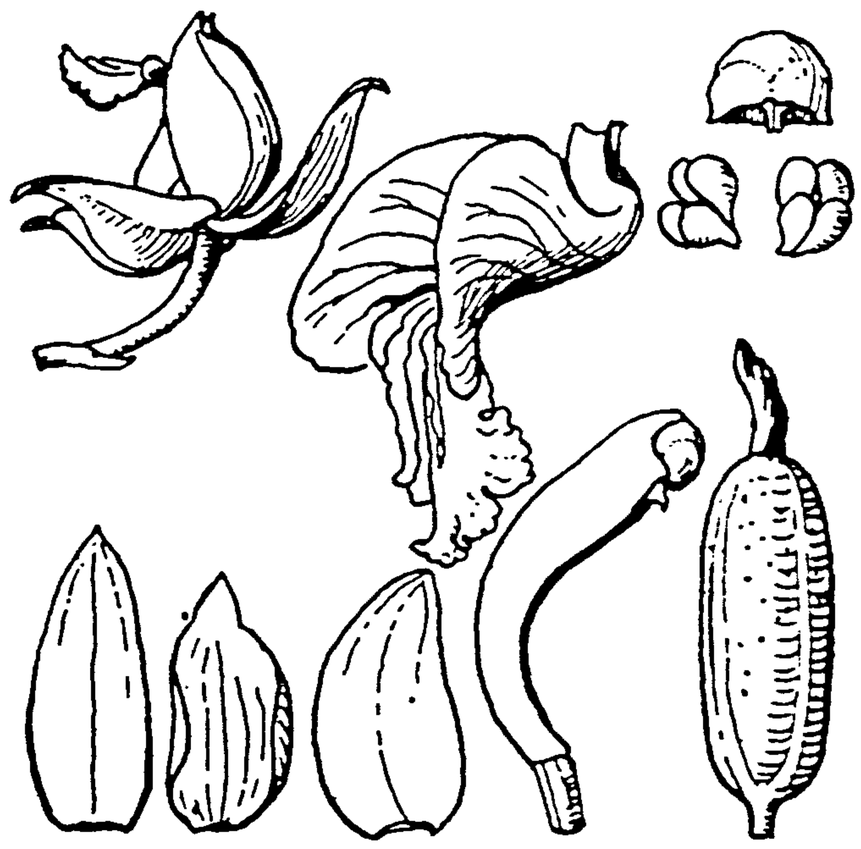
44. **POLYSTACHYA** Hook. Epiphytic herbs. Leaves several, approximate at the base of the flower-stalk. Flowers in a terminal panicle. Perianth mainly yellow. Lateral sepals broad, adnate to the long column-foot. Petals narrow. Lip dilated, 3-lobed, jointed to the column-foot, folded up against the edges of the lateral sepals. Capsule nodding.—About 170 species, mostly of tropical regions.



1. P. minuta (Aubl.) Britton. Stem 1–6 dm. tall: blades of the lower cauline leaves elliptic to broadly linear, 1–3 dm. long: lateral sepals triangular, 5–6 mm. long, acute: petals spatulate or linear-cuneate, 3–3.5 mm. long, obtuse: lip 5–6 mm. long, the lateral lobes directed forward and nearly equalling the broad middle lobe: capsule 9–11 mm. long. [*P. luteola* Hook.]—

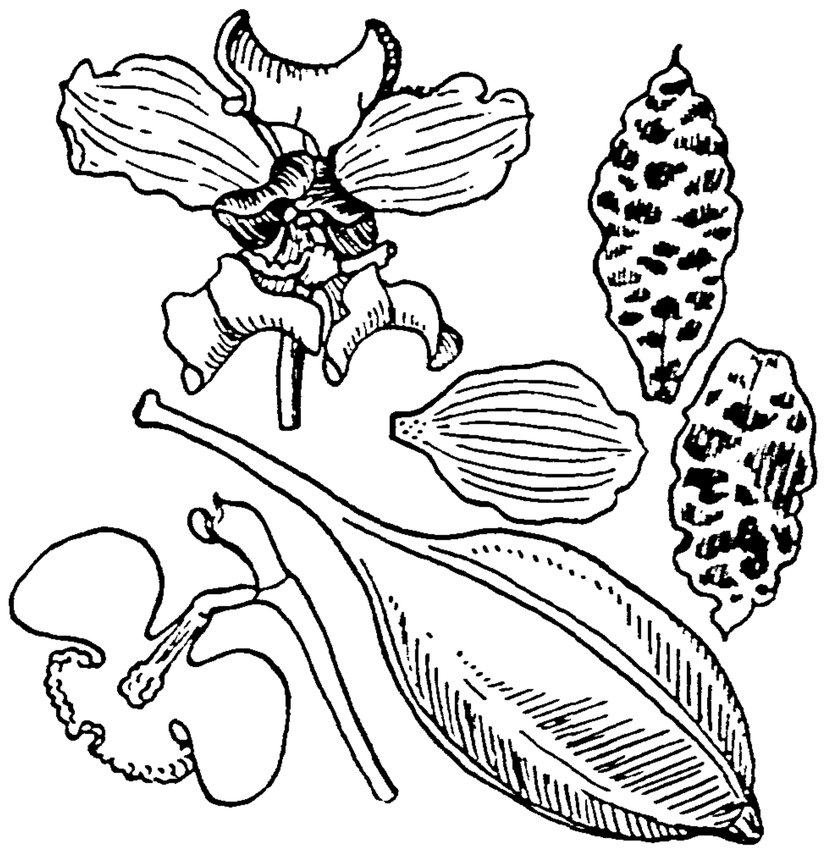
Hammocks, S pen. Fla. and the Keys.—(*W. I.*, *Mex. C. A.*, *S. A.*)—All year.

45. BLETIA R. & P. Caulescent herbs with corms. Leaves several from the top of the corm, mostly persisting until after the lateral flower-stem arises. Flowers in a terminal raceme with minute bracts. Perianth mainly pink or purplish. Lateral sepals slightly inequilateral. Petals quite similar to the lateral sepals. Lip wide, crested, 3-lobed, the middle lobe crisped. Capsule mostly erect.—About 45 species, mostly of tropical America.



1. B. purpurea (Lam.) DC. Leaf-blades broadly linear to linear-elliptic, 1.5–3.5 dm. long, attenuate: flower-stalk 3–11 dm. tall: lateral sepals elliptic-ovate to broadly elliptic, 11–16 mm. long, abruptly acuminate: petals oval or ovate-oval, barely as long as the sepals and like them rose-purple: lip 11–15 mm. long, with a broad base, ear-like lateral lobes and a crisped and crested middle lobe: capsule 3–4 cm. long. [*B. verecunda* R. Br.]—Pinelands, pen. Fla. and the Keys.—(*W. I.*, *C. A.*)—All year. An epiphytic form growing on the bases of cypress trunks, stumps, and "knees" in the Big Cypress Swamp, has apparently cleistogamous flowers with the lip nearly similar to the two lateral petals.

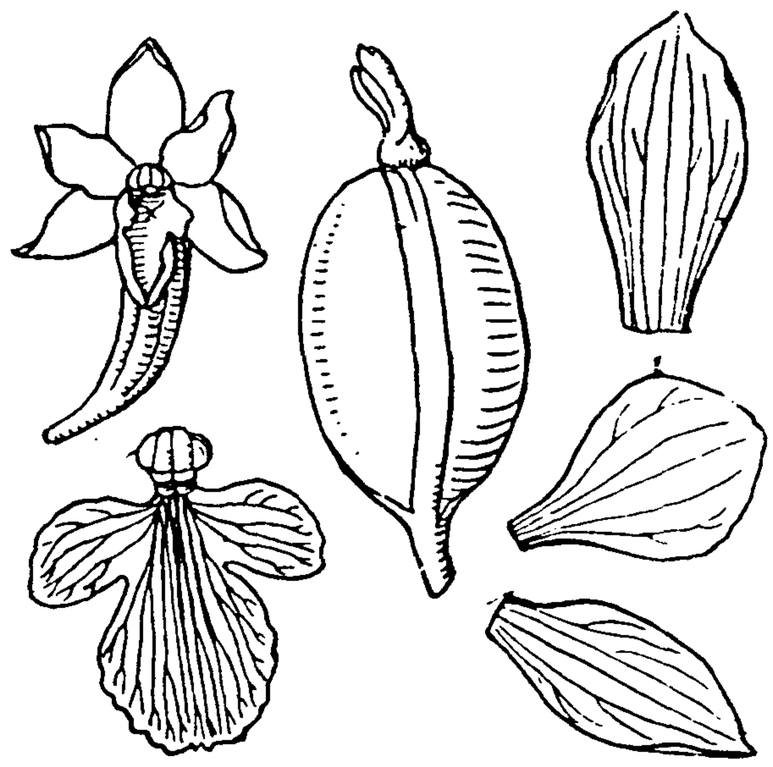
46. CYRTOPODIUM R. Br. Epiphytic herbs. Leaves borne on a short club-like pseudobulb, from the base of which arises the lateral flower-stalk. Flowers in a terminal panicle. Perianth mainly brown or yellowish. Lateral sepals relatively broad. Petals longer than the sepals. Lip wider than long, the lateral lobes larger than the middle one, the claw jointed to the slender column-foot. Capsule drooping.—Three species, natives of tropical America.



1. C. punctatum (L.) Lindl. Pseudobulbs 1.5–4 dm. long: leaf-blades broadly linear-attenuate, 3–7 dm. long: flower-stalks 8–15 dm. long: perianth yellowish-green, brown-spotted: lateral sepals oval or obovate, 14–16 mm. long: petals elliptic, 18–21 mm. long: lip butterfly-like, 21–24 mm. wide, the middle lobe reniform, with a beaded margin, the lateral lobes larger than the middle one: capsule-body 6–10 cm. long.—(COWHORN-ORCHID. BUTTERFLY-ORCHID.)—Hammocks, S pen. Fla. and the Keys.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)—Spr.—In massiveness second only to *Oncidium undulatum*. Plants with as many as 200 pseudobulbs have been found. Specimens are occasional on sand-dunes and kitchen-middens half way up the eastern coast of Fla.

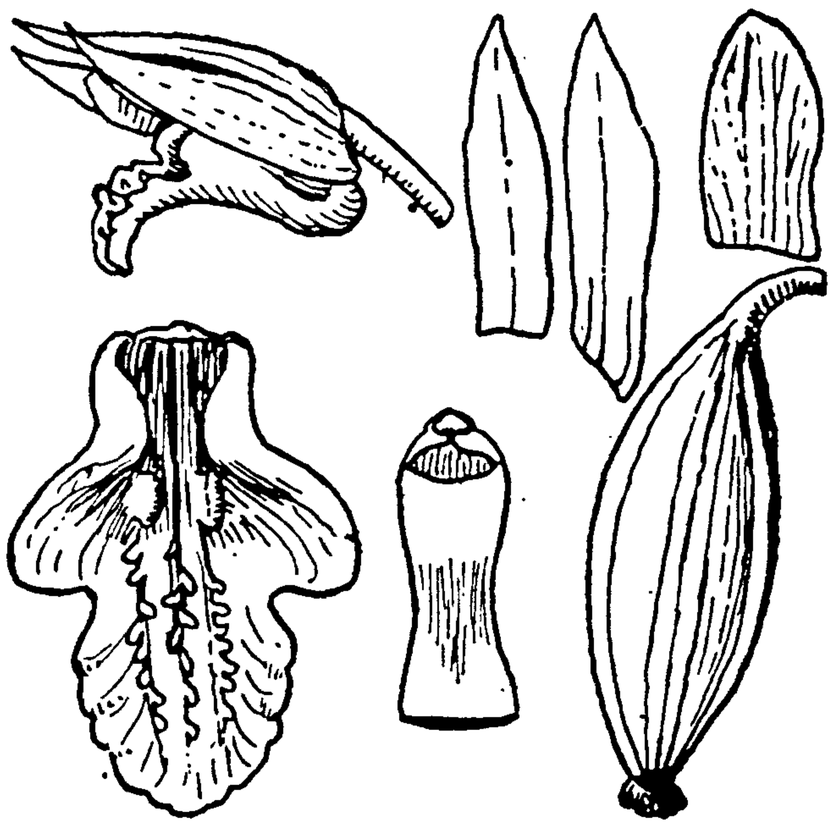
47. TRIORCHOS Small & Nash. Caulescent herbs with corms. Leaves several, arising from the corm before the lateral flower-stalk. Flowers in a terminal raceme with elongate bracts. Perianth mainly brown. Lateral sepals curved, slightly adnate to the column-foot. Petals nearly equilateral, shorter

than the lateral sepals. Lip fully as wide as long, crestless, 3-lobed, the lateral lobes spreading. Capsule erect.—Only the following species:



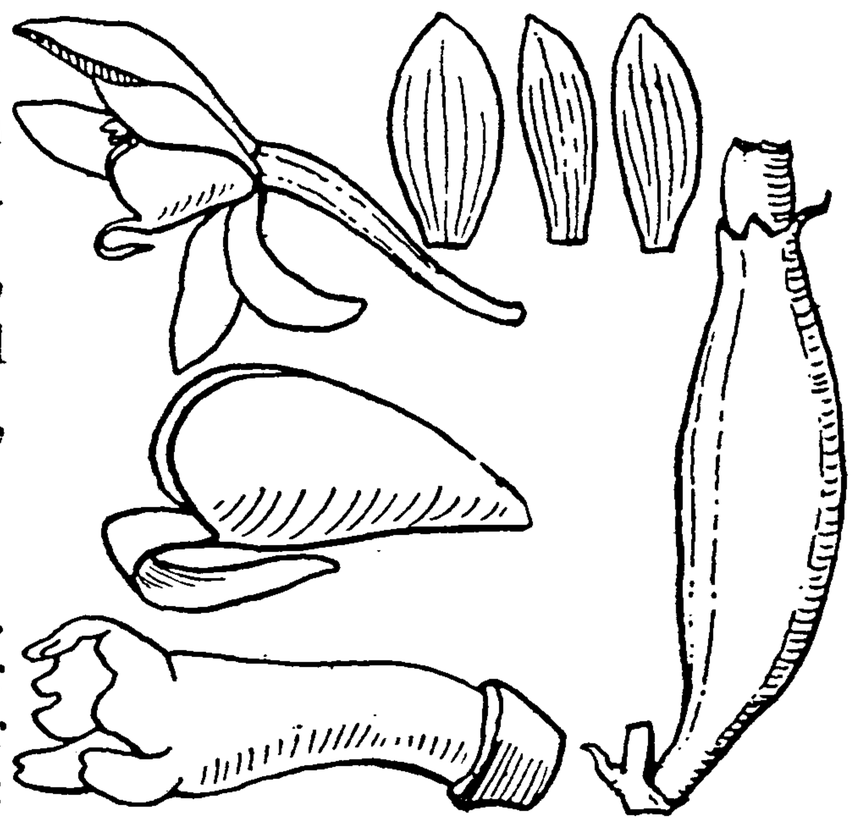
1. T. ecristatus (Fernald) Small. Leaf-blades linear to narrowly linear-elliptic, 2–5 dm. long: flower-stalk virgate, 4–21 dm. tall: lateral sepals elliptic to elliptic-lanceolate, 8–9 mm. long: petals usually elliptic-lanceolate, 7–8 mm. long: lip 7–8 mm. long, the middle lobe much longer than the lateral lobes: capsule oval, about 2 cm. long. [*Cyrtopodium Woodfordii* (Chapm. Fl.) *C. ecristatum* Fernald]—Pinelands and scrub, pen. Fla.—(*W. I.*)—Sum.

48. PLATYPUS Small & Nash. Caulescent herbs with corms. Leaves several from the top of the corm, persisting until the lateral flower-stalk arises. Flowers in a terminal raceme with small bracts. Perianth mainly brown and purple. Lateral sepals slightly dilated upward, broader than the median one, decurrent to the base of the forked column-foot. Petals shorter than the lateral sepals, less decurrent. Lip concave at the base, papillose-crested, shallowly 3-lobed, the middle lobe drooping. Capsule mostly drooping.—One species.



1. P. altus (L.) Small. Leaf-blades narrowly linear-elliptic to almost linear, 2–8 dm. long: flower-stem 5–19 dm. tall: lateral sepals elliptic or nearly so, 14–16 mm. long: petals broader than the lateral sepals: lip 16–18 mm. long, the middle lobe 8–10 mm. wide, papillose-crested: capsule-ellipsoid, 3–4 cm. long. [*P. papilliferus* Small & Nash]—Moist sand and rich soil, borders of the Everglades and Big Cypress Swamps, Fla.—(*W. I., C. A., S. A.*)—Fall–wint.

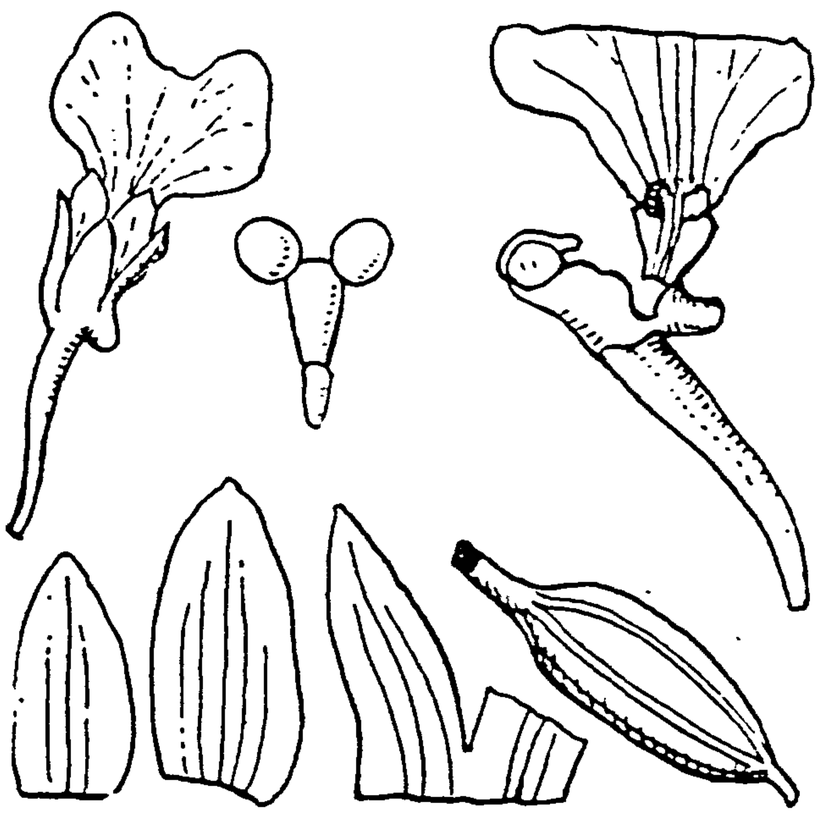
49. MACRADENIA R. Br. Epiphytic caulescent herbs, with pseudobulbs. Leaves terminating the pseudobulb from the base of which arises the often drooping flower-stalk. Flowers in lax racemes, small and rather inconspicuous. Perianth mainly yellowish or salmon-colored. Median sepal boat-shaped. Lateral sepals slightly inequilateral. Petals nearly like the lateral sepals, slightly smaller. Lip sessile, with 2 broad basal lobes and 1 narrow middle lobe.—Five species, of tropical America.



1. M. lutescens R. Br. Pseudobulb ·2–4 cm. long: leaf-blades broadly linear to elliptic-linear 8–16 cm. long: flower-stalk mostly shorter than the leaves, drooping: perianth yellowish: lateral sepals elliptic-lanceolate, 8–9.5 mm. long: lip 8–10 mm. long, the lateral lobes forming a reniform body terminated with

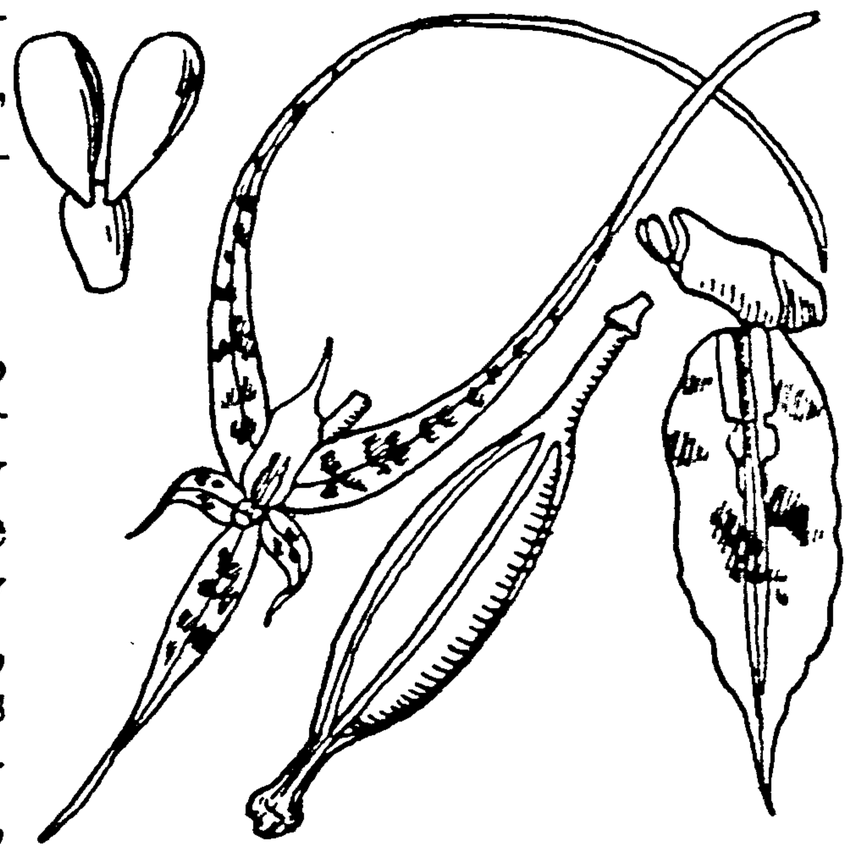
the linear-lanceolate middle lobe: capsule-body ellipsoid, 2–2.5 cm. long.—Hammocks, Everglade Keys, Fla.—(*W. I., S. A.*)—Wint.—Most abundant in Royal Palm Hammock; it also occurs in neighboring hammocks.

50. **IONOPSIS** H. B. K. Epiphytic caulescent herbs. Leaves approximate at the base of the terminal flower-stalk. Flowers in a terminal panicle. Perianth mainly white, pink, or lavender. Lateral sepals united at the base and produced into a short spur. Petals larger than the lateral sepals. Lip relatively large, with 2 small lateral lobes and a dilated notched middle lobe with 2 tubercles at its base. Capsule drooping.—Nine species, of tropical America.



1. **I. utricularioides** Lindl. Plant 1.5–6 dm. tall: blades of the lower cauline leaves linear or nearly so, 5–16 cm. long, very thick: panicle many-flowered: lateral sepals lanceolate, 5–6 mm. long: petals elliptic, 6–7 mm. long: lip 11–13 mm. long, the middle lobe nearly as wide: capsule 2–3 cm. long, beaked.—Hammocks, S pen. Fla.—(*W. I., Mex., C. A., S. A.*)—Spr.—Restricted mostly to low hammocks in the Big Cypress Swamp. The perianth is typically lilac; but white forms sometimes occur.

51. **BRASSIA** Lindl. Epiphytic caulescent herbs with flat pseudobulbs which arise from several imbricate scales. Leaves terminating the pseudobulbs from the base of which arise ascending or assurgent flower-stalks. Flowers in lax raceme-like spikes. Perianth large and showy, the yellow parts more or less mottled. Lateral sepals greatly elongate, caudate-acuminate, nearly equilateral, spreading, longer than the median one. Petals nearly similar to the sepals or much shorter and relatively wider. Lip much shorter than the sepals, with a rather broad body and a narrow tip. Columns very short. Capsule drooping, stipitate, the body 3-sided, 3-ribbed, beaked.—About 30 species, natives of tropical America.



1. **B. caudata** (L.) Lindl. Plant usually tufted, the pseudobulbs elliptic to lanceolate, mostly 6–14 cm. long: leaves 2 together; blades broadly linear to linear-spatulate, 2–4 dm. long: spike lax, the flowers remote, the parts light-yellow spotted with brown: lateral sepals 6–14 cm. long, caudate-attenuate from a lanceolate base: petals lanceolate, acuminate: lip 2.5–3 cm. long, acuminate at the tip, sessile: capsule 5.5–8 cm. long, the body narrowly ellipsoid or prismatic-ellipsoid, with a slender stipe-like base and a shorter and stouter beak.—(SPIDER-ORCHID.)—Hammocks, Everglade Keys, Fla.—(*W. I., Mex., C. A., S. A.*)—Spr.—Rare in a few hammocks on the Biscayne pineland and Long Key pineland; often growing with *Anacheilium*, which it resembles in habit.

52. **ONCIDIUM** Sw. Epiphytic or sometimes terrestrial herbs, with pseudobulbs. Leaves with broad or narrow and elongate blades, terminating

the pseudobulb, from the base of which arises the flower-stalk. Flowers in a raceme or panicle. Perianth mostly showy, the parts often mottled. Lateral sepals slightly inequilateral, reflexed or spreading. Petals often quite similar to the sepals. Lip crested, clawless or short-clawed, 3-lobed, the middle lobe larger than the lateral ones. Capsule nodding.—Fully 400 species, natives of tropical and subtropical America.—Spr.

Leaf-blades flat or nearly so, the faces not united: lateral sepals separate. I. UNDULATA.
Leaf-blades equitant, the faces united: lateral sepals coherent. II. VARIEGATA.

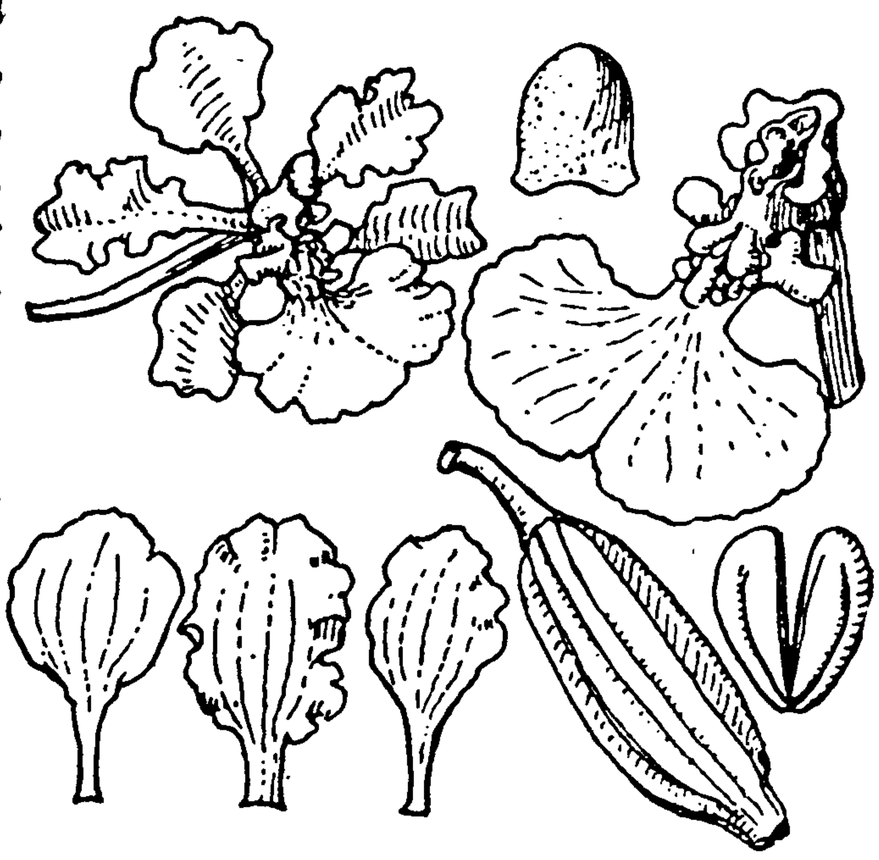
I. UNDULATA

Leaf-blades short and wide, thick-coriaceous and stiff: sepals and petals obtuse or notched: pseudobulbs very small or obsolete.
  Median sepal cuneate: lateral lobes of the lip knob-like. 1. *O. undulatum.*
  Median sepal with a reniform, orbicular, or ovate blade: lateral lobes of the lip broad and flat. 2. *O. carthaginense.*
Leaf-blades greatly elongate, thin-coriaceous and pliable: sepals and petals acute or acuminate: pseudobulb large. 3. *O. floridanum.*

II. VARIEGATA

Tufted plant with curved keeled leaves and a slender flower-stalk. 4. *O. variegatum.*

1. O. undulatum (Sw.) Salisb. Pseudobulb 1–2 cm. long: leaf-blades elliptic-lanceolate, 25–60 cm. long: flower-stalk 110–220 cm. long: perianth mainly orange mottled with red-brown: lateral sepals 16–19 mm. long, the blades oval to obovate, crisped: petals rather shorter than the sepals, the blades obovate to cuneate: lip 18–20 mm. wide: capsule-body 5–8 cm. long, ellipsoid or nearly so. [*O. guttatum* Reichenb. f.]—Hammocks, S pen. Fla.—(*W. I., Mex., C. A., S. A.*)

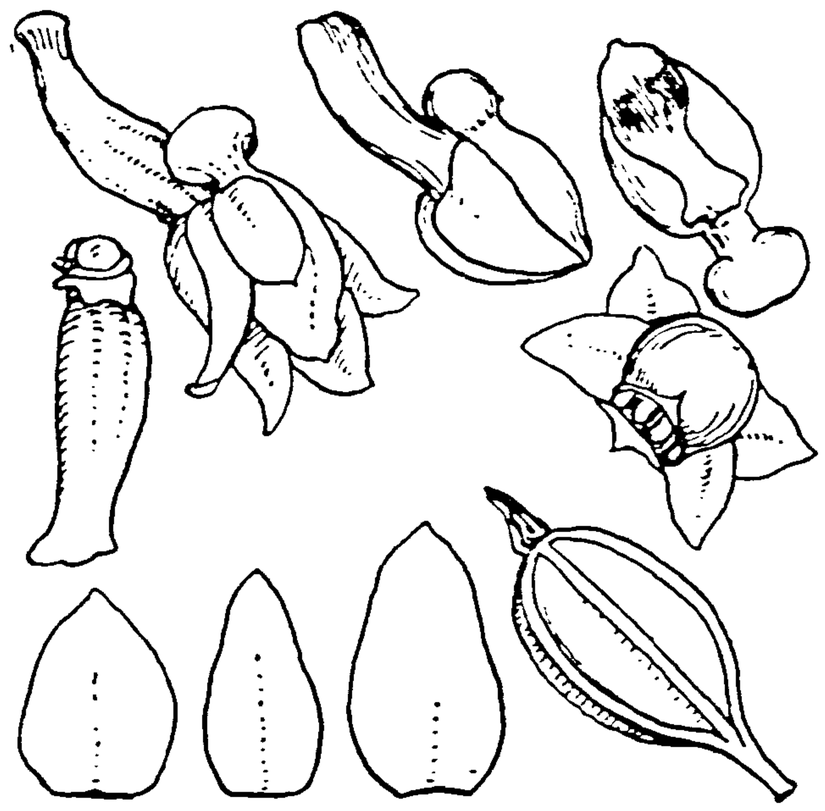


2. O. carthaginense Sw. Pseudobulb very small: leaf-blades narrowly elliptic, 9–30 cm. long, or the outer ones mere scales: flower-stalk 50–150 cm. long: perianth mainly pink, mottled with magenta: lateral sepals 9–11 mm. long, the blades spatulate, crisped: petals about as long as the sepals, the blades ovate: lip fully 11–12 mm. long, the middle lobe mostly 7–9 mm. wide: capsule-body 4–7 cm. long.—(SPREAD-EAGLE ORCHID.)—Hammocks, Cape Sable region, Fla.—(*W. I., Mex., C. A., S. A.*)

3. O. floridanum Ames. Pseudobulbs ovoid, 8–12 cm. long: leaf-blades linear, 25–110 cm. long: flower-stalk 85–210 cm. long: perianth mainly yellow mottled with brown: lateral sepals 15–16 mm. long, the blades elliptic-lanceolate: petals shorter than the sepals, the blades ovate-lanceolate or ovate: lip 13–15 mm. long, the middle lobe 11–13 mm. wide: capsule-body 2–3 cm. long, ellipsoid. [*O. sphacelatum* Fl. SE. U. S.]—Hammocks and rarely pinelands, Everglade Keys and Cape Sable region, Fla.—(*W. I., Mex., C. A., S. A.*)—Typically an epiphytic hammock plant. Rarely a terrestrial in pinelands on areas where at no remote date hammocks existed. The hammock plants have relatively larger leaves, but the flowers from the two habitats are identical in structure.

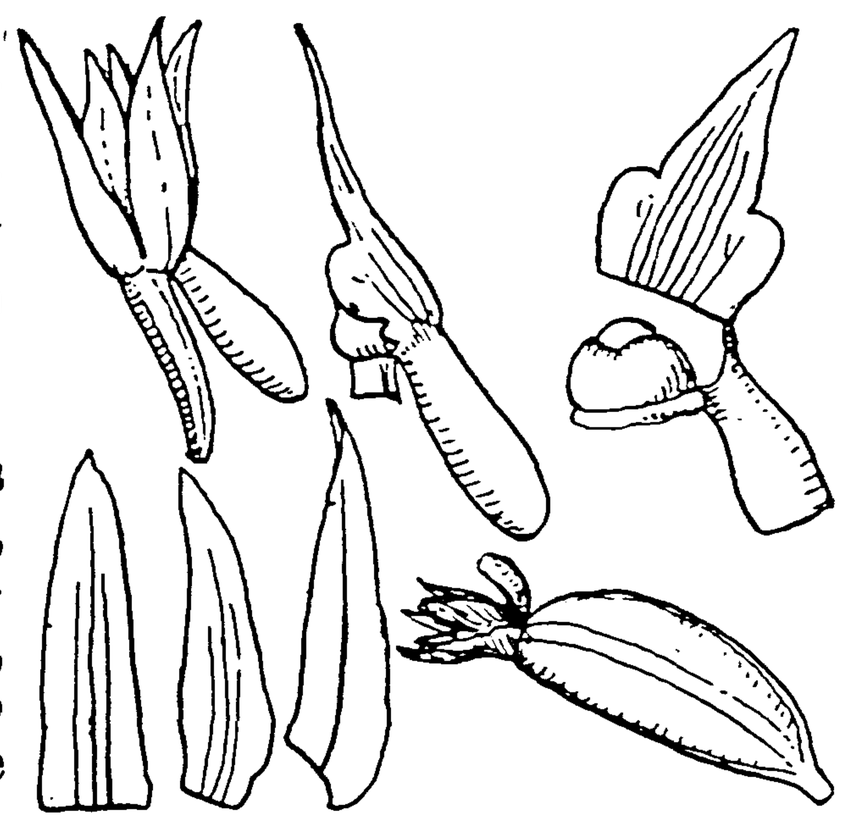
4. O. variegatum (Sw.) Willd. Pseudobulb minute or slender: leaf-blades curved, 3–7 cm. long, 2-keeled above: flower-stalk 9–35 cm. long: perianth mainly white and greenish marked with purple and brown: lateral sepals about 6 mm. long, the blades spatulate: petals about 8 mm. long, the blades orbicular or orbicular-obovate: lip 10–12 mm. long, the middle lobe 15–21 mm. wide: capsule-body ellipsoid, 1.5–2 cm. long.—Hammocks, S pen. Fla.—(*W. I.*)

53. **HARRISELLA** Fawcett & Rendle. Epiphytic herbs consisting chiefly of roots. Leaves minute scales or obsolete. Flowers borne in lax slender stalked racemes. Perianth minute and inconspicuous. Lateral sepals nearly equilateral. Petals narrower and rather longer than the lateral sepals. Lip sessile at the base of the column, with a globular spur. Capsule stipitate.—Four species, natives of tropical America.



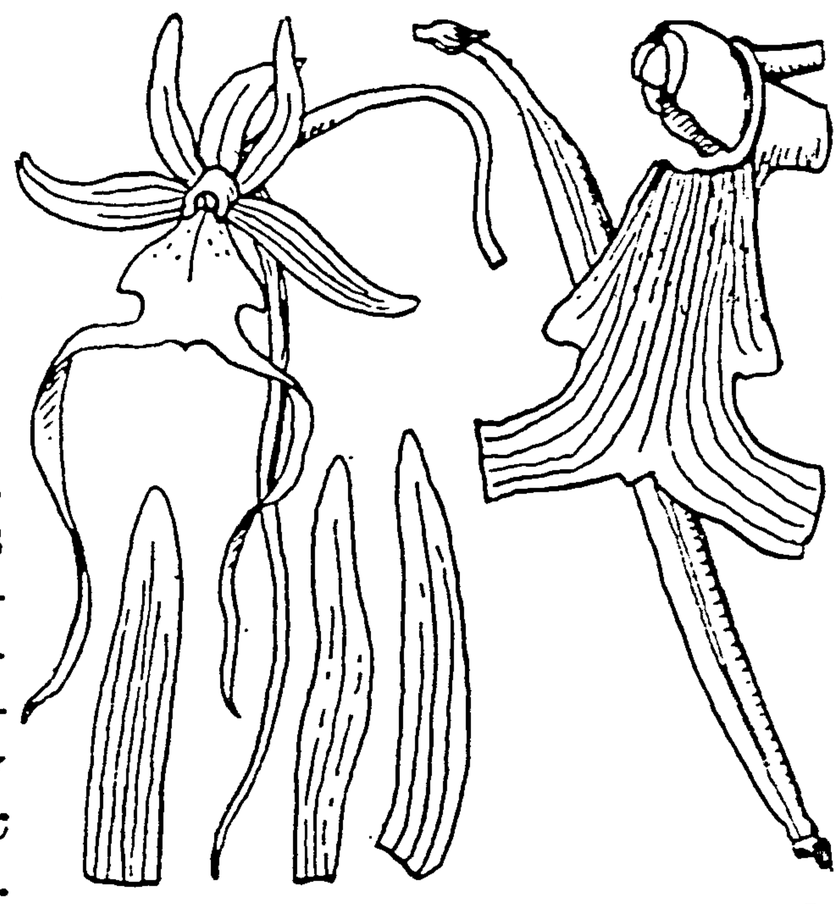
1. **H. porrecta** (Reichenb. f.) Fawcett & Rendle. Roots matted, about 1 mm. thick: flower-stalk very slender, the bracts remote and inconspicuous: perianth yellowish-green: lateral sepals ovate, about 2.5 mm. long: blade of the lip suborbicular when flattened out: capsule-body oval, 4.5–6 mm. long. [*Harrisella Amesiana* Cong.]—Hammocks and cypress-heads, S pen. Fla.—(*W. I., Mex., C. A.*)—Spr.—Often on the trunk of conifers, *Sabina* and *Taxodium*, as well as on various angiospermous trees.

54. **CAMPYLOCENTRUM** Benth. Epiphytic herbs consisting chiefly of roots. Leaves with thick blades or mere minute scales. Flowers borne in a stiff spike. Perianth minute or inconspicuous. Lateral sepals nearly equilateral. Petals similar to the lateral sepals, but smaller, usually narrow. Lip partially adnate to the column-foot, usually saccate at the base. Capsule sessile.—About 20 species, natives of tropical America.



1. **C. pachyrrhizum** (Reichenb. f.) Rolfe. Roots several mm. thick: flower-stalk relatively stout, the bracts approximate and conspicuous: perianth yellow-green: lateral sepals lanceolate, about 4.5 mm. long: blade of the lip elliptic to elliptic-lanceolate when flattened out: capsule ellipsoid, 7.5–9 mm. long.—Hammocks, SW pen. Fla.—(*W. I., S. A.*)—Spr.—Usually on angiospermous trees.

55. **POLYRRHIZA** Pfitz. Epiphytic herbs with clusters of roots. Leaves scale-like or obsolete. Flowers solitary or few terminating the short scape. Perianth showy, often white. Lateral sepals curved. Petals nearly like the sepals or broader. Lip sessile, 3-lobed, the middle lobe again 3-lobed, the lateral lobes angular: spur elongate. Capsule linear-cylindric.—Four species, wholly West Indian, except the following.



1. **P. Lindenii** (Lindl.) Cong. Stem 4–12 cm. long, scaly: perianth conspicuous: lateral sepals linear or linear-lanceolate, 2.5–5 cm. long: lip 3–5 cm. long, the middle lobe with 2 linear-lanceolate spreading segments 5–10 cm. long; spur 10–15 cm. long: capsule spreading; body narrowly linear, 5–8 cm. long, ribbed. [*Dendrophylax Lindenii* Benth.]—(WHITE BUTTERFLY-ORCHID. PALM-POLLY.)—On tree-trunks, S pen. Fla.—(*W. I.*)—Spr.—Restricted mostly

to the Big Cypress Swamp. Most abundant in the royal-palm hammocks where it occurs on various rough-barked trees, as well as on the trunks of the royal-palms. The elongate flattened worm-like roots are supplied with chlorophyll and function as leaves.

A species of the genus *Lepanthes* has recently been found growing on trees in the Big Cypress Swamp. This genus is related to *Pleurothallis*, but differs in the perianth in which the claws of the petals and lip are adnate to the base of the column. The plants are small, 3–5 cm. tall, cespitose, the stems pubescent, each with cornucopia-like, ciliate sheaths and one leaf: leaf-blade elliptic to oval, 1.5–2 cm. long, with a callous margin and a minute callous tip.

Subclass 2. **DICOTYLEDONES** — Dicotyles

Stems exogenous, consisting of pith, wood, and bark (endogenous in rare cases): pith of parenchymatous cells: wood in one or several layers surrounding the pith, traversed by medullary rays: bark covering the wood. Leaves various: blades mostly pinnately or palmately veined, their bases, or the bases of the petioles articulated. Perianth and essential parts of the flower rarely in threes or sixes. Embryo with two cotyledons. The first leaves (cotyledons) are opposite.

Series 1. **CHORIPETALAE**

Petals separate and distinct from each other, or wanting. The series embraces most of the families formerly included in the Apetalae and the Polypetalae.

Order **PIPERALES** — Piperal Order

Herbs of wet or moist places, or hammocks, usually with rootstocks, or shrubs or trees. Leaves with simple blades. Flowers perfect or unisexual. Perianth wanting. Androecium of several stamens. Gynoecium of 1, or of several distinct or united carpels. Fruit baccate, drupaceous, capsular, or nut-like.

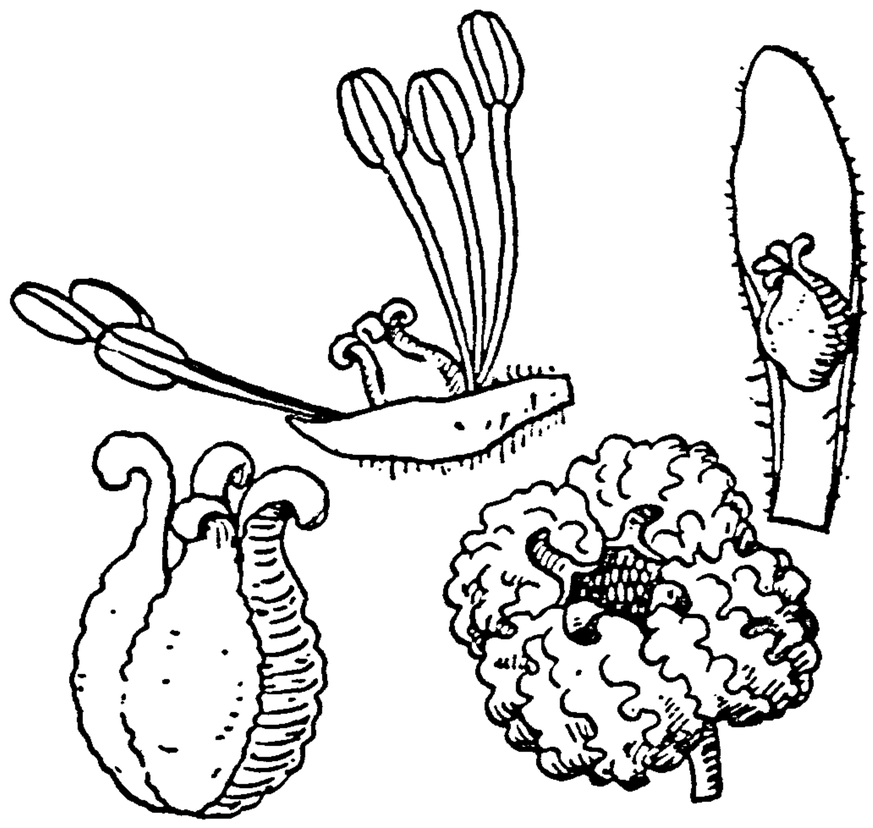
Carpels distinct or nearly so, 3–4: ovules 2–8 in each cavity. Fam. 1. Saururaceae.
Carpels united to form a single pistil: ovule 1 in each cavity. Fam. 2. Piperaceae.

Family 1. **SAURURACEAE** — Lizard's-tail Family

Perennial herbs with rootstocks. Leaves alternate, sometimes basal. Flowers spicate or racemose. Androecium of 3–8 stamens. Gynoecium of 3 or 4 distinct or nearly distinct carpels. Stigmas simple. Fruit capsular.—Three genera and 4 species, natives of North America and Asia.

1. SAURURUS L. Aquatic or marsh herbs. Leaf-blades thick-membranous, cordate. Raceme with a drooping tip, the bractlets adnate to the pedicels or ovaries. Pistils 3 or 4. Mature carpels veiny, opening introrsely. —Two species, the following and one in Asia.

1. S. cernuus L. Stems 3–12 dm. tall: leaf-blades ovate to ovate-lanceolate, cordate at the base, 8–15 cm. long, acuminate, petioled: racemes 1–2 dm. long: filaments clavate, about 4 mm. long: fruit depressed, the carpels about 2 mm. high.—(LIZARD'S-TAIL.)—Swamps, wet woods, streams, and ditches, various provinces, Fla. to Tex., Minn., Ont., and R. I.—Spr.–Sum.—The inflorescence is white or creamy-white. The flowers are fragrant. The rootstocks are very aromatic.



FAMILY 2. **PIPERACEAE** — PEPPER FAMILY

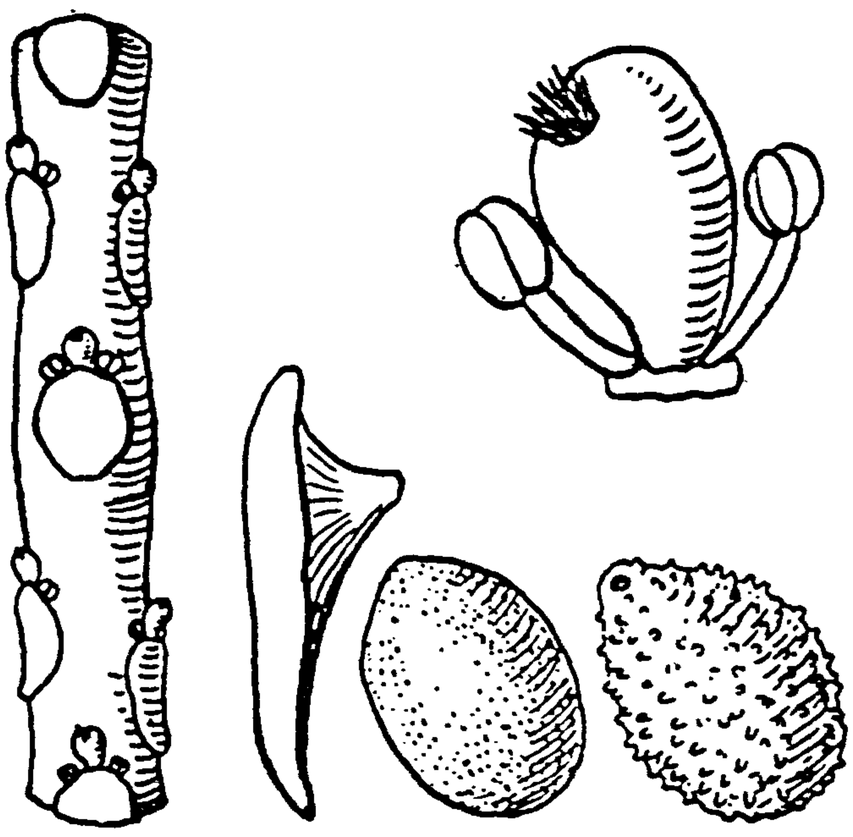
Herbs, shrubs, or trees. Leaf-blades mostly fleshy or leathery. Spikes, or rarely racemes, simple or compound, the bractlets cup-like or peltate. Androecium of 2–6 or rarely 8–10 stamens. Gynoecium of 3 or rarely more united carpels, the ovary 1-celled. Fruit drupaceous.—About 6 genera and over 1000 species, mostly in the tropics.

Flowers and scales (bracts) separated on the rachis: berries distant, beakless.	1. MICROPIPER.
Flowers and scales (bracts) contiguous on the rachis: berries crowded into a solid mass on the rachis, beaked.	2. RYNCHOPHORUM.

1. MICROPIPER Miq. Herbaceous succulents with annual erect stems from horizontal stoloniferous rootstocks. Leaves mostly opposite, deciduous: blades soft-fleshy and rather thin, pubescent. Spikes loosely-flowered. Rachis not honeycombed. Flowers and fruits sessile on the rachis. Ovary rounded at the apex, topped by the tufted stigma. Bracts peltate, scale-like. Stamens 2. Berry beakless, not immersed in the rachis, very viscid.—About 60 species, mostly in tropical regions.—WILD-PEPPERS. PEPEROMIAS.—The inflorescence is green.

Blades of the upper leaves oval, varying to ovate, or obovate: bractlets crenulate.	1. *M. leptostachyon.*
Blades of the upper leaves elliptic, varying to elliptic-ovate or elliptic-obovate: bractlets even-edged.	2. *M. humile.*

1. M. leptostachyon (Nutt.) Small. Terrestrial, the stems mostly 1–2 dm. tall: blades of the lower cauline leaves obdeltoid to broadly cuneate, 3–6 cm. long, rounded, truncate, or emarginate, shining above: spikes about 1 mm. thick, mostly 2–8 cm. long: bracts fully 0.5 mm. long: berry obovoid. [*Piper leptostachyon* Nutt. *Peperomia leptostachya* Chapm. *P. cumulicola* Small]—Kitchenmiddens and aboriginal village sites, eastern coast and fern grottoes along the Withlacoochee River, Fla.—Wint.—Abundant only on the well drained shell-mounds, and thrives only on a light humus.



2. M. humile (Vahl) Small. Terrestrial, the stems mostly 2–7 dm. tall: blades of the lower cauline leaves elliptic, varying to broader above the middle or below it, or individually obovate, 1–5 cm. long, rounded,

obtuse, or acutish, dull above: spikes about 2 mm. thick, mostly 5–12 cm. long: bracts less than 1 mm. long: berrry oval or ovoid. [*Peperomia humilis* Vahl]—Hammocks, pen. Fla.—(*W. I.*)—Wint.—Thrives equally well in the marl of the Cape Sable region which is flooded about half of each year and on the sand-dunes of the eastern coast which are dry except for the rain that falls there.

2. **RHYNCHOPHORUM** (Miq.) Small. Coriaceous perennials with diffusely creeping stems, sometimes vine-like. Leaves alternate, persistent: blades firm-succulent and thick, glábrous. Spikes closely and densely-flowered. Rachis honeycombed. Flowers and fruits partly imbedded in deep pits of the rachis. Bracts peltate. Stamens 2. Ovary narrowed at the apex, terminated by a long beak which has a minute stigma near its base. Berry beaked, partly immersed in the rachis, not viscid or only slightly so.—About 60 species, widely distributed in the tropics.—PEPEROMIAS.—The inflorescence is green.

Leaf-blades obovate, varying to oval, ovate, or suborbicular, or cuneate-obovate: spikes stout, stiffly erect, mostly simple: berry with a body of a cylindric type. I. OBTUSIFOLIA.

Leaf-blades narrowly cuneate to spatulate: spikes slender, nodding, mostly branched: berry with a body of an ovoid or an oval type. II. SPATHULIFOLIA.

I. OBTUSIFOLIA

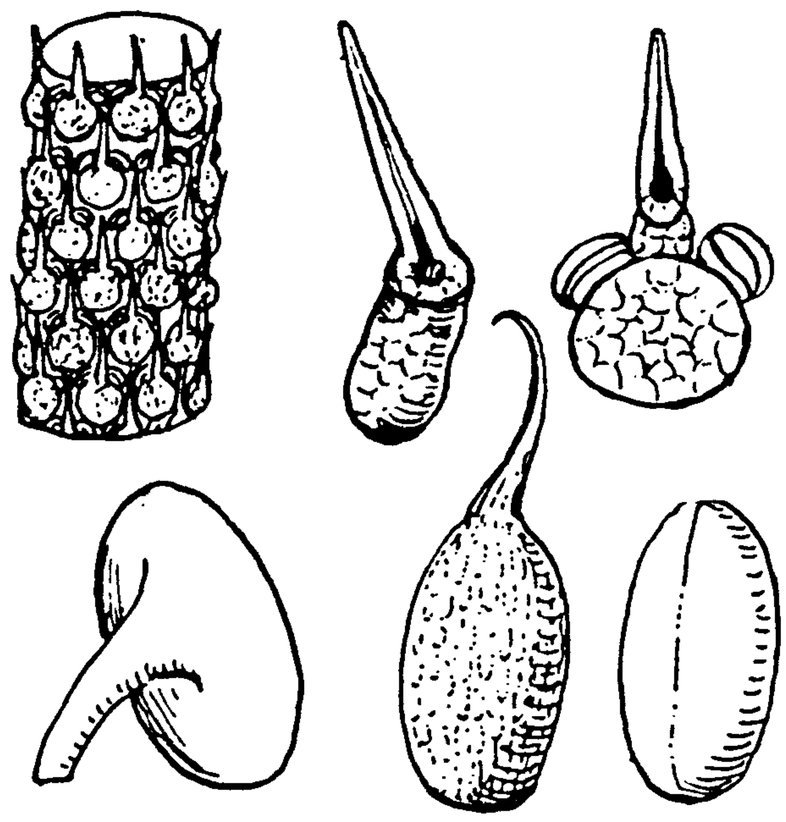
Leaf-blades typically cuneate-obovate, averaging about 1 dm. long or more. 1. *R. obtusifolium.*

Leaf-blades typically oval to suborbicular, varying to broadest above the middle or below it, less than 1 dm. long. 2. *R. floridanum.*

II. SPATHULIFOLIA

Terrestrial humus-herbs with cuneate to spatulate leaf-blades and branching nodding pale spikes. 3. *R. spathulifolium.*

1. R. obtusifolium (L.) Small. Epiphytic, the stems very stout, the branches often elongate and vine-like: leaf-blades spatulate-obovate or broadly cuneate, tapering to the long petiole-like base, 9–15 cm. long; inflorescence rather long-stalked, with a single erect stout spike 7–12 cm. long, or with 2 spikes, the rachis 4 mm. thick or less: berry cylindric-ellipsoid, about 1 mm. long, the beak shorter than the body, hooked. [*Peperomia obtusifolia* A. Dietr.]—Low hammocks, on tree-trunks or rotten logs, Cape Sable and Cape Romano Regions, Fla.—(*W. I.*)—All year.—The largest and most robust of our species. Plants somewhat aromatic in drying. Occurs only in the marl regions, and grows luxuriantly only in low situations that are flooded part of each year.



2. R. floridanum Small. Epiphytic, the stems stout, the branches often matted, elongate, sometimes vine-like: leaf-blades ovate to suborbicular, broadest above the middle or below it, 4–9 cm. long, abruptly or rather gradually narrowed to the petiole-like base: inflorescence with a short stout stalk, with usually a single stiffly erect stout spike less than 1 dm. long, the rachis 5 mm. thick or less: berry cylindric-ovoid or cylindric, about 1 mm. long, the beak slightly shorter than the body, hooked. [*Peperomia magnoliaefolia*

(Chapm. Fl.) *P. floridana* Small]—High limestone hammocks, on tree-trunks and rotten logs, S pen. Fla., and the Keys.—All year.—Like the preceding somewhat aromatic in drying. Occurs only in the oölitic limestone region, and grows luxuriantly only in the dry hammocks.

3. R. spathulifolium Small. Terrestrial, but growing in humus, the stems rather stout, the branches elongate, often 1–2 m. long, creeping and assurgent: leaf-blades narrowly cuneate to spatulate, 6–11 cm. long, bright-green: inflorescence with a slender, often elongate stalk: spikes slender, 1–2 dm. long, 2–5 together, nodding, the rachis less than 2–5 mm. thick: berry turgid, the body ovoid or oval, nearly 1 mm. long, the beak strongly curved or hooked. [*Peperomia spathulifolia* Small]—Hammocks, in humus or limestone, Everglade Keys, Fla.—(*W. I.*)—All year.—Our rarest species and the plants most aromatic in drying.

Order **CASUARINALES** — Casuarinal Order

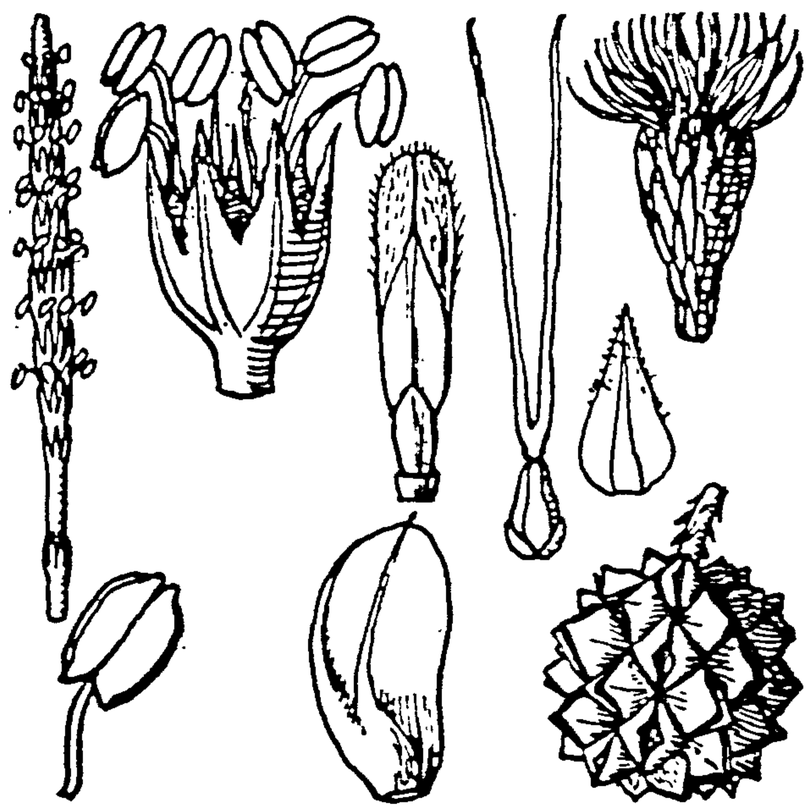
Shrubs or trees, with loosely jointed branches, resembling stems of *Equisetum*. Leaves scale-like, whorled at the nodes and decurrent on the internodes. Flowers monoecious, the staminate in slender terminal spikes with imbricate bracts, often with a posterior and anterior perianth-member, and 1 stamen. Pistillate flowers in dense cones or spikes, the perianth wanting. Ovary 1-celled. Style-branches slender. Fruit an aggregate of winged achenes.

Family 1. **CASUARINACEAE** — Beefwood Family

Stems with more or less whorled branches. Staminate spikes long-stalked. Pistillate spikes short-stalked. Gynoecium 2-carpellary.—The following is the only genus; the 25 species are most abundant in Australasia.

1. CASUARINA Adans. Stem clothed with a smooth or smoothish bark, except when very old. Stamens with long filaments and short anthers. Stigmas elongate. Fruiting spike compact.

1. C. equisetifolia Forst. Tree often 10 m. tall, with many slender branches: leaves (scales) 1–3 mm. long, 6–8 in each whorl: staminate spikes 1–4 cm. long: pistillate spikes globular, becoming 1–2 cm. in diameter in fruit: seed-wing nearly thrice as long as the body. (Beefwood. Australian-pine. Horsetail-tree.)—Sandy shores, pinelands, everglades and hammocks, S pen. Fla., particularly S of Miami, and the Keys. Nat. of Oceanica.—(*W. I., Mex., C. A., S. A.*)—Established in quite out of the way places through the agencies of wind and water. The wind blowing through the numerous slender branchlets produces a rushing sound as in the case of the pine. The tree grows rapidly, but produces a very hard wood.



ORDER **JUGLANDALES** — JUGLANDAL ORDER

Trees. Leaves alternate: blades pinnate. Flowers monoecious, the staminate in lateral aments on the twigs of the preceding year, with a 2–6 lobed calyx bearing several rows of stamens, or the calyx obsolete. Pistillate flowers terminal, consisting of an involucrate 2–4-carpellary gynoecium: calyx partially adnate to the gynoecium. Fruit drupe-like, the nut enclosed in an indehiscent or a dehiscent involucre. Seed oily.—Seven genera and about 40 species, mostly in the north temperate zone.

FAMILY 1. **JUGLANDACEAE** — WALNUT FAMILY

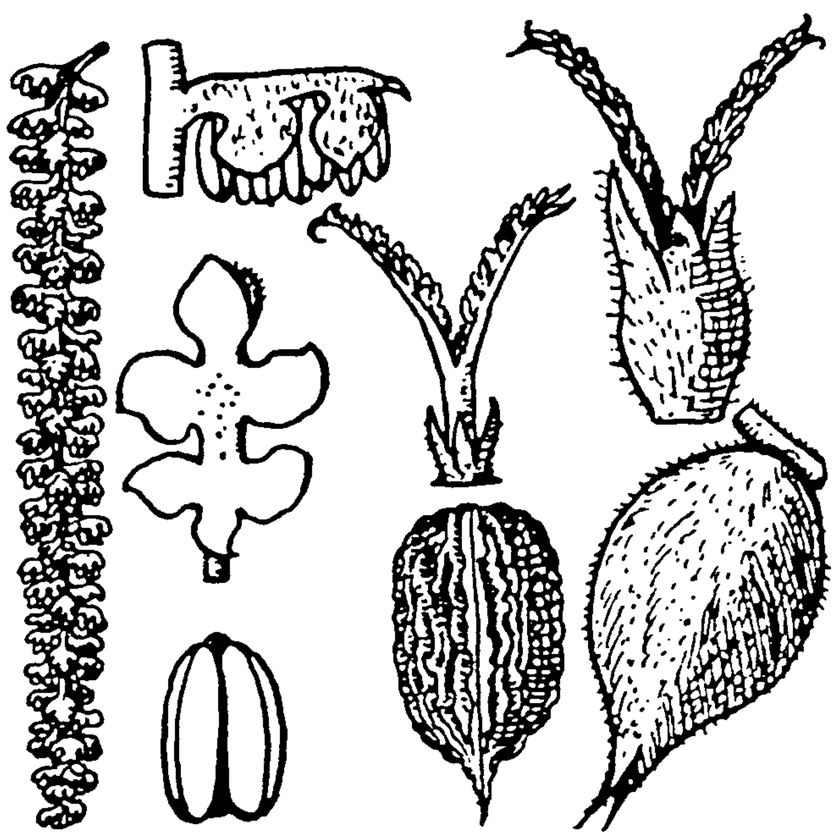
Aromatic trees, with hard wood. Leaves with unequally pinnate blades. Staminate aments solitary or clustered. Involucre of the fruits dry or juicy.—The wood of many of the species is used in cabinet-work, construction, and implements.

Staminate aments stout, simple, sessile or short-stalked: husk indehiscent: nut sculptured. 1. WALLIA.
Staminate aments slender, branched, long-stalked: husk dehiscent: nut not sculptured. 2. HICORIA.

1. WALLIA Alef. Bark furrowed. Pith in plates. Leaflets conduplicate in vernation. Staminate aments simple. Anther-connective conspicuous.—About 8 species, natives of North America, West Indies, and the Andes of South America.—Spr.—WALNUTS.—The genus *Juglans* to which the American walnut and the butternut are usually referred is typified by *J. regia* L. which is generically distinct.

Anther-connective a rounded tip; fruit elongate, viscid-pubescent: nut 4-angled. 1. *W. cinerea.*
Anther-connective crown-like: fruit not elongate, glabrous: nut not angled. 2. *W. nigra.*

1. W. cinerea (L.) Alef. Tree becoming 30 m. tall, the heartwood pale: leaflets 11–17, the blades lanceolate to elliptic-lanceolate or elliptic, 6–8 cm. long (rarely larger): staminate aments 6–15 cm. long: fruit 8–12 cm. long, usually acute: nut 2-celled below the middle, the ridges thin and brittle. [*Juglans cinerea* L.]—(BUTTERNUT. WHITE-WALNUT. OIL-NUT.)—Rich woods, various provinces, N of the Coastal Plain, Ga. to Ark., N. Dak., and N. B.—A valuable tree for nuts and wood.



2. W. nigra (L.) Alef. Tree becoming 50 m. tall, the heart-wood dark-brown: leaflets 15–23, the blades 8–10 cm. long, rounded or subcordate at the base: staminate aments 5–10 cm. long: fruit 5–8 cm. in diameter: nut 4-celled below the middle, sculptured, the ridges thick, firm. [*Juglans nigra* L.]—(BLACK-WALNUT.)—Rich soil, mostly in woods, various provinces, N Fla. to Tex., Minn., Ont., and Mass.—A very valuable tree, both for nuts and wood.

2. **HICORIA** Raf. Bark close or scaly. Pith solid. Leaflets involute in vernation. Staminate aments branched. Anther-connective inconspicuous. [*Carya* Nutt.]—About 18 species, natives of eastern North America and Mexico.—Many of the hickories furnish a very hard and tough valuable wood. The fruits furnished a valuable food supply for the aborigines and are extensively used by the white-man. The bark is used medicinally, and it furnishes the flavoring substance, "mapleine," and a yellow dye.—Spr.—HICKORIES.

Cotyledons entire or merely notched at the apex: nut terete or slightly flattened, 2-celled below, the shell smooth and even. (Subgenus I. PECAN.) — I. PECANES.
Cotyledons deeply 2-lobed: nut markedly flattened, 4-celled below, the shell uneven or slightly corrugated. (Subgenus II. EUHICORIA.)
  Bud-scales valvate: blades of the lateral leaflets narrow and falcate, except in *H. cordiformis latifolia* where they may be broadly ovate. — II. AQUATICAE.
  Bud-scales imbricate: blades of the lateral leaflets broad, not falcate.
    Husk of the fruit (involucre) splitting freely and promptly to the base, the valves mostly woody or corky. — III. OVATAE.
    Husk of the fruit (involucre) splitting rather tardily to about the middle, the valves firm-leathery. — IV. GLABRAE.

I. PECANES

Leaflets 5–9; blades of the lateral ones not falcate: nut with an exceedingly thick shell: staminate aments usually in 3's on a slender peduncle. — 1. *H. myristicaeformis.*
Leaflets usually more than 9; blades of the lateral ones falcate: nut with a thin shell: staminate aments fascicled.
  Lateral leaflets with manifestly stalked blades: nut terete: seed sweet. — 2. *H. Pecan.*
  Lateral leaflets with sessile or nearly sessile blades: nut somewhat flattened: seed bitter. — 3. *H. texana.*

II. AQUATICAE

Leaflets mostly more than 9; blades glabrous: nuts corrugated: bark of trunk flaky. — 4. *H. aquatica.*
Leaflets mostly fewer than 9: blades pubescent beneath-nuts smooth: bark of trunk close. — 5. *H. cordiformis.*

III. OVATAE

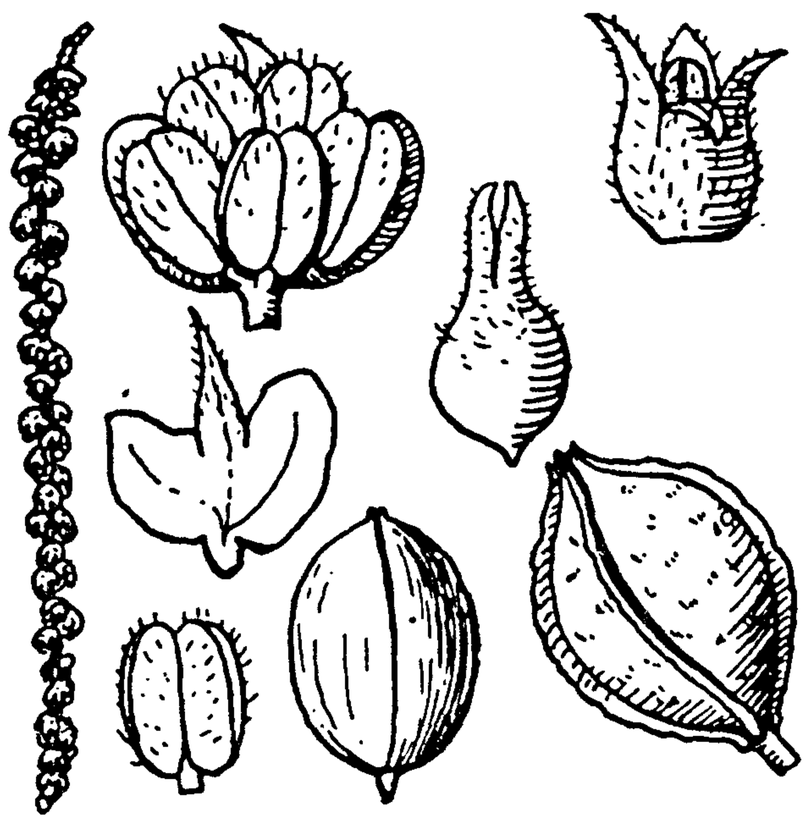
Bark of the trunk rough, but close or with thin flaky plates.
  Leaves permanently more or less pubescent; leaflets 7–9: fruit over 3 cm. in diameter. — 6. *H. alba.*
  Leaves glabrous; leaflets 5–7: fruit less than 3 cm. in diameter. — 7. *H. microcarpa.*
Bark of the trunk shaggy, separating in long flat plates.
  Leaflets 7–9, or individually 5: twigs pale-orange: fruit 7–9 cm. in diameter. — 8. *H. laciniosa.*
  Leaflets 3–5, or individually 7: twigs red-brown: fruit 4–6 cm. in diameter.
    Anthers pubescent: blades of the lower pair of leaflets ovate to elliptic-lanceolate, acute or short-acuminate. — 9. *H. ovata.*
    Anthers glabrous: blades of the lower pair of leaflets narrowly lanceolate to linear-lanceolate, long-acuminate. — 10. *H. carolinae-septentrionalis.*

IV. GLABRAE

Fruit large, 3–4 cm. in diameter.
  Leaf-rachis and leaflets glabrous: blades of the leaflets shining above: inner bud-scales densely pubescent. — 11. *H. austrina.*
  Leaf-rachis or leaflets, or both, pubescent: blades of the leaflets dull above: inner bud-scales puberulent. — 12. *H. pallida.*

Fruit small, 2–2.5 cm. in diameter.
Young leaflets rusty-pubescent: winter-buds with copiously pubescent scales. 13. *H. floridana.*
Young leaflets not rusty pubescent: winter-buds with puberulent scales. 14. *H. glabra.*

1. H. myristicaeformis (Michx. f.) Britton. Tree becoming 35 m. tall, the bark scaly: leaflets 5–9; blades of the lateral ones elliptic or oval, varying to ovate, ovate-lanceolate, or narrowly obovate, thinnish, finely and sharply serrate, pale or silvery beneath, with a metallic luster: fruits ellipsoid to ellipsoid-obovoid or obovoid, 2.5–3.5 cm. long, narrowly wing-angled: nut ellipsoid, acute at both ends.—(NUTMEG-HICKORY. BITTER-WATERNUT.)—Woods, hillsides, and low grounds, Coastal Plain, Ala. to Tex., Ark., and S. C.—(*Mex.*)



2. H. Pecan (Marsh) Britton. Tree becoming 50 m. tall, the bark somewhat roughened: leaflets 11–17; blades of the lateral ones lanceolate, elliptic-lanceolate, or ovate-lanceolate, shallowly and rather coarsely toothed, falcate: fruits usually clustered, ellipsoid, 3.5–6 cm. long, prominently winged: nut ellipsoid or ovoid-ellipsoid, acute, at least at the apex.—(PECAN.)—Woods and river-bottoms, various provinces, Ala. to Tex., Kans., Ia., and Ind. Also cult. in Fla., Ga., and S. C., for the production of nuts on a large commercial scale.—(*Mex.*)

3. H. texana Le Conte. Tree becoming 30 m. tall, the bark rough: leaflets 7–13; blades of the lateral ones lanceolate, elliptic-lanceolate, or ovate, shallowly toothed, falcate: fruits often clustered, ellipsoid or obovoid-ellipsoid, 3–5 cm. long, slightly winged: nut ellipsoid or nearly so, usually acute at both ends.—(BITTER-PECAN.)—Woods, low grounds and river-swamps, Coastal Plain, Miss. to Tex. and Ark.—(*Mex.*)

4. H. aquatica (Michx. f.) Britton. Tree becoming 30 m. tall, the bark flaky: leaflets 9–15; blades of the lateral ones lanceolate, linear-lanceolate, or elliptic-lanceolate, falcate, shallowly toothed: fruits often clustered, subglobose, ellipsoid, or obovoid, 2.5–3 cm. long, narrowly winged to the base, the thin husk tardily dehiscent: nut obovoid, corrugated, thin-shelled, the seed very bitter.—(WATER-HICKORY. SWAMP-HICKORY. BITTER-PECAN. WATER-BITTERNUT.)—River-swamps, river-bottoms, and moist or wet woods, Coastal Plain, Fla. to Tex., Mo., Ill., and Va.

5. H. cordiformis (Wang.) Britton. Tree becoming 30 m. tall, the bark close, with shallow furrows and flat ridges: leaflets 7–11, or individually 5; blades of the lateral ones lanceolate, elliptic-lanceolate, elliptic, or ovate, (sometimes broadly ovate in *H. cordiformis latifolia*), finely serrate, slightly or decidedly falcate: fruits sometimes clustered, subglobose, or obovoid, 2.5–3 cm. long narrowly winged especially above the middle, the thin husk tardily dehiscent: nut uneven, thin-walled, the seed bitter. [*Carya amara* Nutt. *Hicoria minima* (Marsh.) Britton]—(SWAMP-HICKORY. BITTER-NUT. WHITE-HICKORY. PIGNUT.)—River-banks, rocky hillsides, swamps, and low woods, various provinces, Fla. to Tex., Minn., and Que.

6. H. alba (L.) Britton. Tree becoming 30 m. tall, the bark with flat ridges but close: leaflets 7–9; blades of the lateral ones elliptic, varying to elliptic-

lanceolate, or ovate, or sometimes broadened upward, rather coarsely serrate: fruits globose or globose-obovoid, 4–6 cm. long, often prominently lobed above, the very thick husk readily dehiscent: nut globular or globose-oval, brownish, somewhat angled, very thick-shelled: seed sweet. [*Carya tomentosa* (Lam.) Nutt.]—(MOCKERNUT. WHITE-HEART HICKORY. BULLNUT. BLACK-HICKORY. WHITE-HICKORY. RED-HICKORY.)—Rocky woods and rich dry soil, various provinces, Fla. to Tex., Ont., and Mass.

7. **H. microcarpa** (Nutt.) Britton. Tree becoming 25 m. tall, the bark separating in thin plates: leaflets 5–7; blades of the lateral ones ovate, oval, elliptic, or ovate-lanceolate, varying to broadest above the middle, serrate: fruits subglobose or depressed, 2–2.5 cm. long, slightly winged, the husk thin, freely dehiscent to the base: nut about as wide as long, abruptly pointed at the apex or sometimes depressed, whitish, barely angled, thin-shelled: seed sweet.—(SMALL-PIGNUT. LITTLE SHAG-BARK.)—Rich, sometimes rocky, woods, various provinces, rarely Coastal Plain, Ga. to Mo., Mich., and Mass.

8. **H. laciniosa** (Michx.) Sarg. Tree becoming 40 m. tall, the bark separating in narrow plates: leaflets 7–9, or individually 5; blades of the lateral ones elliptic, lanceolate, elliptic-lanceolate, elliptic-ovate, or ovate, or rarely broadened upward, rather finely serrate: fruit broadly ellipsoid to subglobose, 6–9 cm. long, slightly lobed above, the thick husk readily dehiscent: nut broadly ellipsoid, slightly obovoid or wider than long, white or yellowish, ridged, thick-shelled: seed sweet.—(KING-NUT. BIG SHAG-BARK. BIG SHELL-BARK. THICK SHELL-BARK.)—Rich soil, especially in river bottoms, various provinces, Tenn. to Okla., Ia., and N. Y.

9. **H. ovata** (Mill.) Britton. Tree becoming 40 m. tall, the bark separating in large plates: leaflets 3–5, or rarely 7; blades of the lateral ones oval or elliptic, varying to ovate or obovate, or broadly elliptic-lanceolate, rather coarsely serrate: fruits oval to subglobose, 3–5 cm. thick, somewhat lobed, the husk thick, freely splitting to the base: nut often wider than long, white or whitish, slightly angled, thin-shelled: seed sweet. [*Carya alba* Nutt. *H. carolinae-septentrionalis australis* Ashe]—(SHAG-BARK HICKORY. SHAG-BARK. SCALY-BARK HICKORY. WHITE-HICKORY.)—Rich soil and woods, various provinces, Fla. to Tex., Minn., and Que.—A related tree, *Carya leiodermis* Sarg., native of E Tex., Ark., and La., is said to grow in Miss. It may be distinguished from *H. ovata* by the slightly ridged bark, the dominant 7 leaflets, and the thick-shelled nut.—The fruits of *H. ovata* are distinguished for the thinness of the shell and the good flavor of the kernel. They are extensively collected for the market.

10. **H. carolinae-septentrionalis** Ashe. Tree becoming 40 m. tall, the bark separating in large and very long plates: leaflets 3–5; blades of the lateral ones lanceolate, linear-lanceolate, narrowly elliptic-lanceolate, or narrowly elliptic, or individually ovate-lanceolate, rather finely serrate with somewhat cartilaginous hairy-tufted teeth: fruits subglobose, 2.5–3.5 cm. long, slightly lobed, the husk thick, readily dehiscent: nuts about as wide as long, whitish, angled, thin-shelled: seed sweet.—(SHAG-BARK. BOTTOM-HICKORY.)—Sandy or rocky woods and rich bottom-lands, various provinces, Ga. to Ala., Ky., and Del.

11. **H. austrina** Small. Tree becoming 18 m. tall or less, the bark rough, but close: leaflets 5–7; blades of the lateral ones ovate, elliptic, elliptic-lanceolate or ovate-lanceolate, serrate, often coarsely so, glabrous at least at maturity: fruit subglobose, 3–4 cm. long, rounded at the base, rather prominently ridged, the thick husk tardily dehiscent: nut pale-brown, subglobose,

slightly roughened, thick-shelled: seed sweet. [*Carya megacarpa* Sarg. in part.]—Hammocks, upper pen. and N Fla.

12. H. pallida Ashe. Tree becoming 35 m. tall, the bark very rough: leaflets 7–9; blades of the lateral ones lanceolate, elliptic-lanceolate, elliptic, or ovate, finely serrate: fruit subglobose, oval, or obovoid-pyriform, 3–4.5 cm. long, often slightly ridged, the thickish husk dehiscent; nut whitish, subglobose or slightly elongate, smooth or nearly so, thick-shelled: seed sweet.—(PALE-HICKORY.)—Dry woods, Coastal Plain, and adj. provinces, Fla. to Tenn., and Va.

13. H. floridana (Sarg.) Small. Shrub or tree becoming 25 m. tall, the bark close, slightly ridged: leaflets 3–5 or rarely 7; blades of the lateral ones lanceolate, elliptic-lanceolate, or elliptic, scarcely falcate, rather remotely cartilaginous toothed: fruit obovoid or subglobose, 2–2.5 cm. long, wingless, sometimes slightly ridged, the thin husk tardily and irregularly dehiscent: nut uneven, rather thick-shelled. [*Carya floridana* Sarg.]—(SCRUB-HICKORY.)—Sandy ridges and scrub, pen. Fla.—Considerable instability in the morphologic characters has been attributed to the species of *Hicoria*, perhaps, however, chiefly as a result of our rather incomplete knowledge of the genus and limited field-study. However, *H. floridana*, which occupies one of our very late and unstable physiographic areas, shows great variation in the shape and size of the fruits. These, on adjacent trees range from subglobose to narrowly pyriform, often with a stipe-like base in addition. The fruits are quite uniform on a given tree.

14. H. glabra (Mill.) Britton. Tree becoming 40 m. tall, or rarely larger, the bark ridged, but close: leaflets 5–7, or 3; blades of the lateral ones lanceolate, ovate-lanceolate, elliptic, or sometimes broadened upward, serrate, glabrous or nearly so (or more or less hirsute in *H. glabra hirsuta*): fruit obovoid or pyriform, 1.5–3 cm. long, often with a prominent stipe-like base, even or nearly so, the thinnish husk tardily dehiscent: nut brownish, obovoid to subglobose, thick-shelled, even or slightly angled: seed sweet. [*Carya porcina* Nutt.]—(PIGNUT. BLACK HICKORY. BROOM-HICKORY. BROWN-HICKORY. SWITCH-BUD HICKORY.)—Dry woods and open hillsides, often in acid soil, various provinces, Fla. to La., Minn., and Me.

ORDER **LEITNERIALES** — LEITNERIAL ORDER

Shrubs or trees, with exceedingly light wood. Leaves alternate. Flowers dioecious, in aments appearing before the leaves, the staminate flowers borne on the base of each bract: perianth wanting: androecium of 3–12 stamens: pistillate flowers each with a minute perianth: gynoecium a single carpel, the stigma introse. Ovule solitary. Fruit a collection of drupes each subtended by a bract.

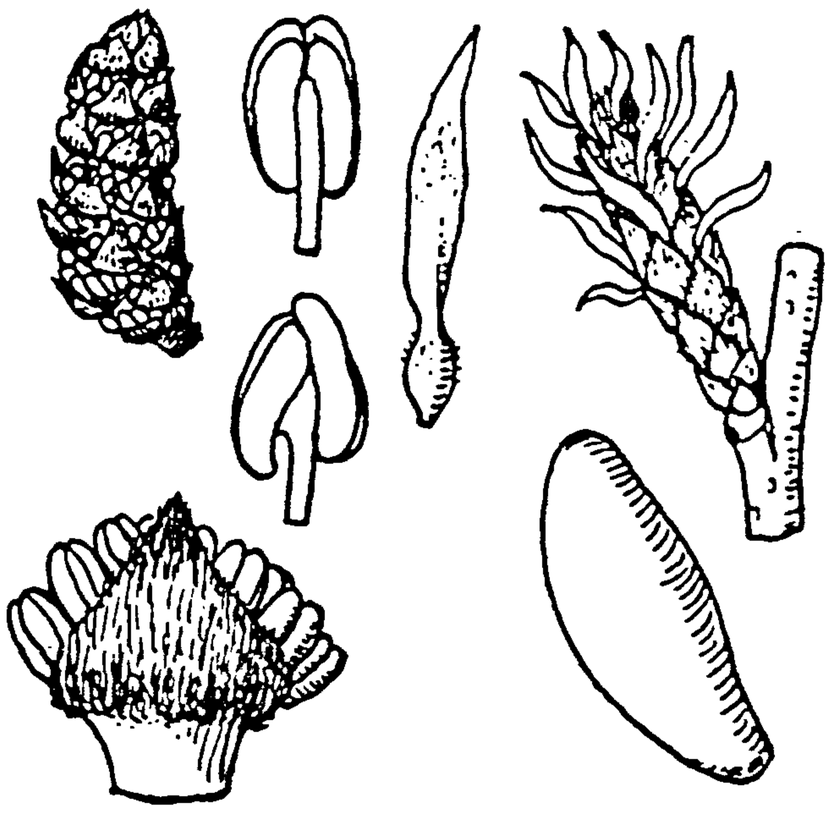
FAMILY 1. **LEITNERIACEAE** — CORKWOOD FAMILY

Bark smooth, brown. Leaf-blades entire. Stipules wanting. Aments from the axils of last year's leaves. Staminate aments many-flowered: filaments short: anthers 2-celled. Pistillate aments few–many-flowered: ovary sessile: stigma elongate. Drupes elongate.—Represented by the following genus and species only:

1. LEITNERIA Chapm. Leaves scattered: blades shining above, petioled. Staminate aments conspicuously bracted: filaments distinct. Pis-

tillate aments inconspicuously bracted: ovary shorter than the stigma. Drupe glabrous, the flesh leathery.

1. L. floridana Chapm. Shrub, or tree becoming 7 m. tall, with wood lighter than cork: leaf-blades narrowly elliptic, or elliptic-lanceolate, or rarely oval, 10–20 cm. long, pubescent beneath: staminate aments 3–4 cm. long, the bracts acuminate: pistillate aments with acute bracts: drupe elliptic, 15–17 mm. long.—(Corkwood.)—Swamps, brackish, fresh, or alluvial, Coastal Plain, N Fla. to Tex., Mo., and Ga.—Spr.—The wood is lighter than cork, and is occasionally used for floats and stoppers.



Order **MYRICALES** — Myrical Order

Shrubs or small trees, usually aromatic. Leaves alternate: blades simple, sometimes toothed or pinnatifid. Flowers dioecious or monoecious; the staminate in long aments, each flower consisting of an androecium of 2–8 stamens; the pistillate in short aments, each flower consisting of a gynoecium of 2 united carpels on a bract subtended by 2 bractlets and surrounded by 2–8 scales. Stigmas 2. Ovules solitary. Fruit a nut, the epicarp often waxy.

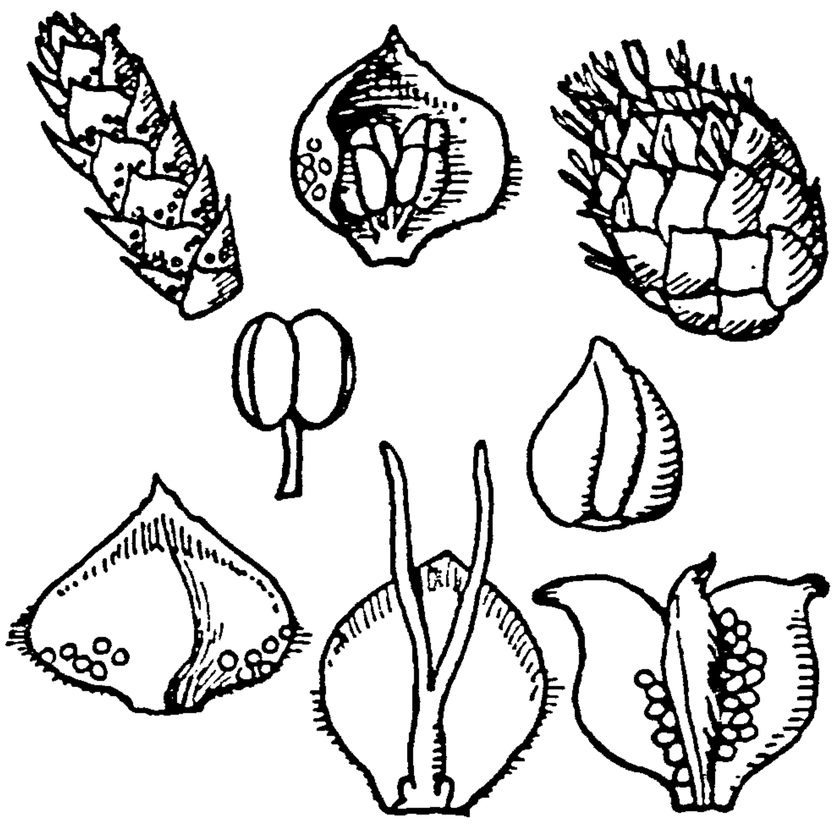
Family 1. **MYRICACEAE** — Bayberry Family

Shrubs or trees. Leaves resinous-dotted. Aments scaly-bracted. Perianth wanting. Ovary 1–celled. Nut short and thick. Three genera and about 35 species of wide geographic distribution.

Leaves without stipules; blades entire or toothed: fruit not in a bristly involucre.
- Bractlets of the pistillate flowers persistent: fruits winged by the clasping bractlets; fruiting spikes bracted. — 1. Myrica.
- Bractlets of the pistillate flowers deciduous: fruits wingless, very waxy: fruiting spikes cluster-like, bractless. — 2. Cerothamnus.

Leaves stipulate; blades pinnatifid: fruit in a bristly involucre. — 3. Comptonia.

1. MYRICA L. Dioecious shrubs. Leaf-blades entire or toothed above the middle. Aments appearing before the leaves. Staminate aments with closely imbricate bracts: flowers with 4 stamens, without bractlets. Pistillate aments not bristly: flowers with a gynoecium subtended by 2 lateral bractlets which later develop into wings. Fruit nut-like, flattened, 2-winged, crowded in spikes with the persistent bracts.—Represented by the following species only:



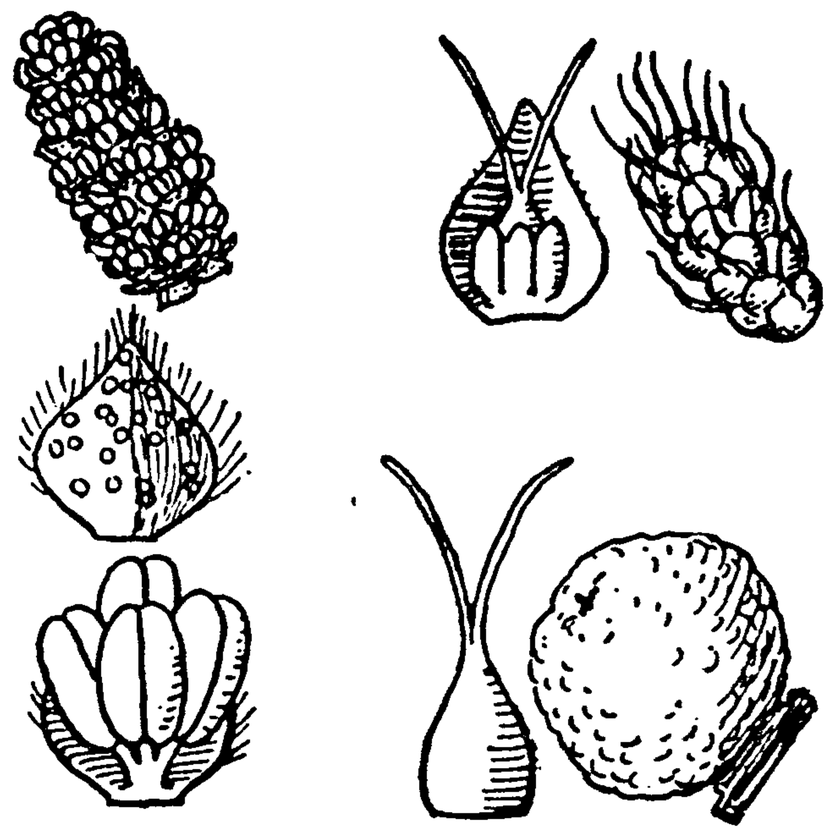
1. M. Gale L. Shrub 1.5 m. tall or less, with dark twigs: leaf-blades thick, spatulate to oblanceolate or oblong-cuneate, mostly 1.5–5 cm. long, serrate near the apex, often minutely pubescent: mature

pistillate aments cylindric, dense, becoming 1–1.5 cm. long: nut 2–2.5 mm. long, the wings somewhat prolonged at the top.—(SWEET-GALE. BOG-MYRTLE.) In swamps and on borders of ponds, often in acid soil, Blue Ridge and more northern provinces, N. C. to Minn., Ore., Alas., Ont., and Newf.—Spr.

2. **CEROTHAMNUS** Tidestrom. Dioecious shrubs or trees. Leaves evergreen in our range: blades entire or merely toothed. Aments appearing after the leaves. Staminate aments with loosely imbricate bracts: flowers with 2–16 stamens which are often subtended by bractlets. Pistillate aments not bristly: flowers with a gynoecium subtended by 2–4, or more, bractlets which are not accrescent. Fruit globular, drupe-like, in cluster-like spikes without bracts, the epicarp very waxy. [*Morella* (Fl. SE U. S.)]—About 9 species, mostly North American.—The bark is astringent and wax is obtained from the exudations of the fruits.—Wint.–spr.—BAYBERRIES. WAX-MYRTLES. WAX-BERRIES. TALLOW-SHRUBS. CANDLE-BERRIES.

Low shrub, less than 1 m. tall, with horizontal subterranean stems (rootstocks), the erect branches often forming large patches. 1. *C. pumilus.*
Tall shrubs or small trees, without rootstocks.
  Leaf-blades toothed or individually entire: stamens about 4: twigs pubescent.
    Drupe 2–3 mm. in diameter: leaf-blades of a narrow type, long-attenuate to the base. 2. *C. ceriferus.*
    Drupe 4–5 mm. in diameter: leaf-blades of a broad type, usually not long-attenuate to the base. 3. *C. carolinensis.*
  Leaf-blades entire: stamens about 10: twigs glabrous. 4. *C. inodorus.*

1. C. pumilus (Michx.) Small. Shrub 2–6 dm. tall, gregarious from horizontal rootstocks: leaf-blades obovate to linear-spatulate, cuneate at the base, 1.5–3 cm. long or rarely larger, commonly 5–8 mm. long: nut 3.5–4 mm. in diameter.—(DWARF WAX-MYRTLE. DWARF-CANDLEBERRY.)—Sandy acid pinelands, Coastal Plain, Fla. to La. and N. C.



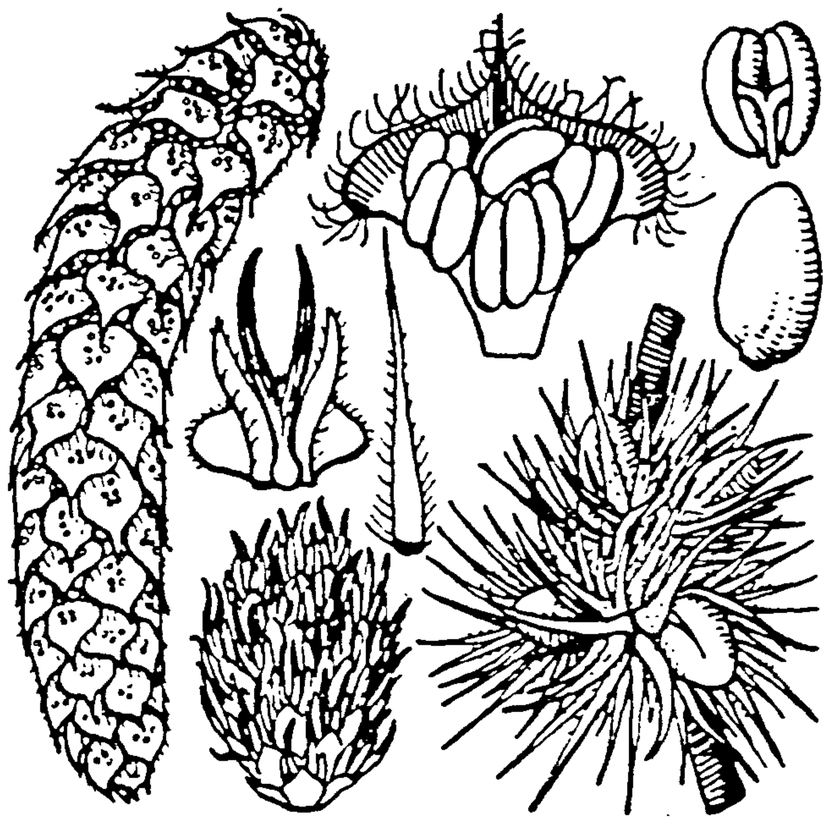
2. C. ceriferus (L.) Small. Shrub, or tree becoming 12 m. tall: leaves much reduced toward the tips of the branches and often yellowish; blades oblanceolate to elliptic-oblanceolate, 3–10 cm. long, toothed or individually entire: staminate aments 1–1.5 cm. long: nut 2–3 mm. in diameter.—(WAXBERRY. WAX-MYRTLE. SPICE-BUSH. CANDLEBERRY.)—Hammocks, and swamps, protected from fire, often in acid soil, Coastal Plain, Fla. to Tex., Ark., and S N. J.

3. C. carolinensis (Mill.) Tidestrom. Shrub 1–3 m. tall: leaves not conspicuously reduced toward the tips of the branches; blades elliptic, oblanceolate or obovate, 2–10 cm. long, shallowly toothed toward the apex: staminate aments 1–1.5 cm. long: nut 4–5 mm. in diameter.—(BAYBERRY. NORTHERN. BAYBERRY. SWAMP-CANDLEBERRY.)—Low or wet acid pinelands, edges of hammocks, dunes, and stream-banks, various provinces, Fla. to Ala., La., (?), Ind., and N. S.

4. C. inodorus (Bart.) Small. Shrub, or tree 6 m. tall: leaf-blades elliptic-obovate or sometimes spatulate, 4–8 cm. long, entire: staminate aments 1–1.5 cm. long: nut 5–7 mm. in diameter.—(ODORLESS WAX-MYRTLE.)—Edges of

pineland swamps and Titi bays, Coastal Plain, N. Fla. to Miss.—Remarkable for the lack of fragrance in the foliage. The leaves are smooth, while in the preceding species they are scurfy.

3. **COMPTONIA** Banks. Monoecious shrubs. Leaves deciduous; blades pinnatifid. Pistillate aments bristly. Fruit not drupe-like, surrounded by a bur-like involucre.—One species:



1. **C. peregrina** (L.) Coulter. Shrub 3–10 dm. tall: leaf-blades linear-elliptic to linear-lanceolate, 4–11 cm. long, the segments obtuse: staminate aments 1–3 cm. long, the bracts 3–4 mm. long: pistillate aments bur-like: nut ovoid, 5 mm. long, shining.—(SWEET-FERN. FERN-BUSH. SWEET-BUSH.)—Dry sterile soil, various provinces, N Ga. and Tenn. to Man. and N. S.—Spr.—The pleasant fragrance of the foliage may often be discerned distant from the plant. A characteristic plant of poor soil, often making very dense colonies, almost excluding other growth.

ORDER **SALICALES** — SALICAL ORDER

Shrubs or trees. Leaves alternate: blades simple, entire or toothed. Flowers dioecious in aments, the staminate consisting of an androecium of 2 or more stamens, the pistillate consisting of a gynoecium of 2 or 4 united carpels. Ovules numerous. Fruit capsular.

FAMILY 1. **SALICACEAE** — WILLOW FAMILY

Shrubs or trees with soft wood. Leaf-blades very narrow to very wide. Aments erect or drooping, the bracts mostly ciliate or toothed. Capsule narrowed to the apex. Seed usually with a tuft of hairs.—Two genera, the following, and more than 250 species, widely distributed in temperate and arctic regions.

Bracts incised: disk cup-like: stamens usually 10 or more, rarely 6–8: stigmas elongate and expanded: winter buds with several scales. 1. POPULUS.
Bracts entire: disk merely 1 or more axillary glands: stamens less than 10: stigmas short, not expanded: winter buds with 1 scale each. 2. SALIX.

1. **POPULUS** [Tourn.] L. Trees, the buds with several scales. Leaf-blades palmately veined, relatively long-petioled. Stamens more than 10, or rarely 6 or 8: anthers purple or red. Ovary sessile. Stigmas dilated.—About 30 species, natives of the Northern Hemisphere.—The wood is used in construction and for making paper pulp.—Spr.—POPLARS. COTTONWOODS.

Stigmas with slender lobes: terminal buds small, short, not glutinous, or only slightly so.
  Capsule slender, of a conic type: bracts of the aments lobed, the lobes narrow: leaf-blades glabrous or nearly so at maturity. I. GRANDIDENTATAE.
  Capsule stout, of an ovoid type: bracts of the aments crenate: leaf-blades persistently white-tomentose. II. ALBAE.
Stigmas with broad lobes: terminal buds large, long, very glutinous.

Petioles laterally flattened.	III. DELTOIDES.
Petioles terete or channeled.	IV. HETEROPHYLLAE.

I. GRANDIDENTATAE

Leaf-blades finely crenate-serrate: bud-scales glabrous or merely ciliate.	1. *P. tremuloides.*
Leaf-blades coarsely sinuate-dentate: bud-scales tomentulose.	2. *P. grandidentata.*

II. ALBAE

Leaf-blades very broad, several-lobed and few toothed, the pubescence on the lower surface often felt-like.	3. *P. alba.*

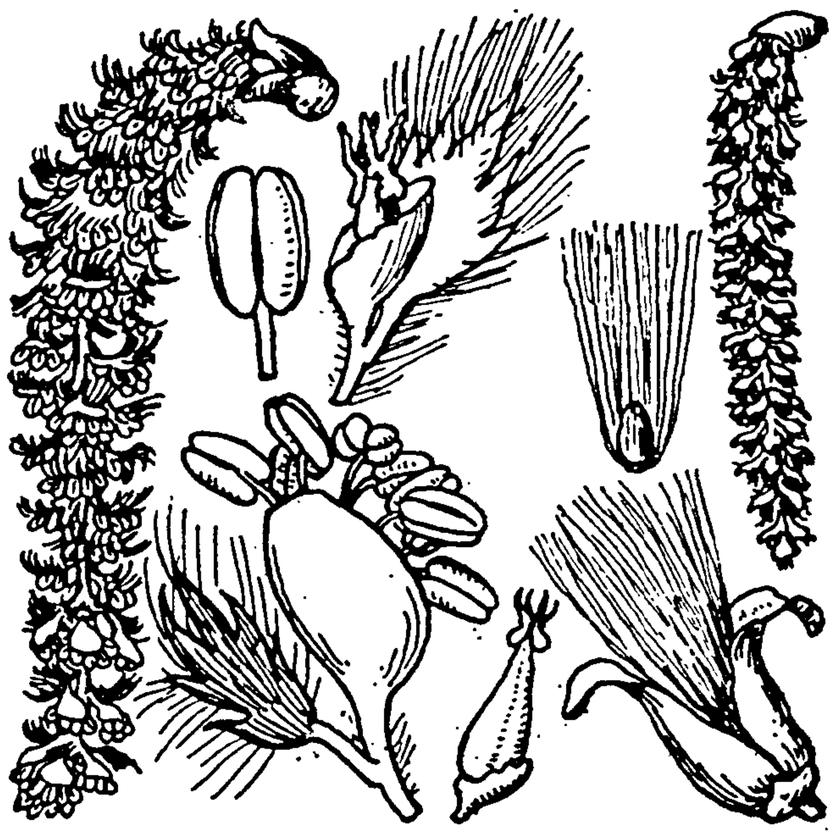
III. DELTOIDES

Stamens 6–8: tree-trunk fastigiately branched.	4. *P. italica.*
Stamens 5 or more: tree-trunk widely branched.	5. *P. balsamifera.*

IV. HETEROPHYLLAE

Anthers ellipsoid: pistillate aments loosely flowered: capsule slender-pedicelled: young leaves white-tomentose.	6. *P. heterophylla.*
Anthers globose-oval: pistillate aments densely flowered: capsule stout-pedicelled: young leaves not white-tomentose.	7. *P. candicans.*

1. P. tremuloides Michx. Tree becoming 15 m. tall (rarely taller), the bark smooth or smoothish, greenish-white: leaf-blades ovate to orbicular-ovate, or orbicular-reniform, 3–8 cm. long, abruptly pointed, nearly or quite regularly crenate-serrate, becoming glabrous: ament-bracts with 3 or 4 coarse lobes: capsule 5–8 mm. long.—(AMERICAN ASPEN. QUIVER-LEAF. QUAKING-ASPEN. TREMBLING-POPLAR.)—Woods and thickets, various provinces, Tenn. to Calif., Alas., Ont., N. S., and Newf.



2. P. grandidentata Michx. Tree becoming 25 m. tall, the bark fissured, gray: leaf-blades ovate to orbicular-ovate, 6–10 cm. long, acute, unevenly sinuate-dentate, becoming glabrous: ament-bracts with 5 or 6 fine lobes: capsule 4–7 mm. long.—(GREAT-ASPEN. LARGE-TOOTHED ASPEN.)—Woods, stream-borders, usually in burns and clearings, and various provinces, N. C. to Minn., and N. S.

3. P. alba L. Tree becoming 35 m. tall, the bark pale, except when old and rough: leaf-blades ovate or orbicular in outline, or somewhat rhombic, 5–10 cm. long, sinuate or somewhat lobed, white-tomentose beneath: ament-bracts crenate: capsule ovoid, 2.5–3 mm. long.—(WHITE-POPLAR. SILVER-LEAVED POPLAR. SILVER-POPLAR. DUTCH-BEECH.)—Cult. grounds, roadsides, and fields, locally through our range, and in other parts of the U. S. and S Can. Nat. of Eurasia.

4. P. italica Moench. Tree with fastigiately branched trunk, becoming 25 m. tall: leaf-blades deltoid, subrhomboidal, or somewhat reinform, mostly 5–8 cm. long, crenate or crenate-serrate: staminate aments 2–5 cm. long: stamens few: capsule ovoid, 6–8 mm. long. [*P. dilatata* Ait.]—(LOMBARDY-POPLAR. WATER-POPLAR.)—Roadsides, fields, meadows, and pastures, locally in our range. Nat. of Eu.

5. P. balsamifera L. Tree with widely branched trunk, becoming 40 m. tall, the twigs dark: leaf-blades deltoid to ovate-deltoid, 8–15 cm. long, or longer, acute or short-acuminate, serrate or crenate-serrate, nearly or quite to the petiole, usually with two prominent basal-glands: staminate aments 8–12 cm.

long: stamens numerous: capsule ovoid, 8–10 mm. long. [*P. deltoides* Marsh.] —(NECKLACE-POPLAR. CAROLINA-POPLAR. RIVER-POPLAR. COTTONWOOD.)—Moist soil, mostly along streams, various provinces, Fla. to La., Man., and Que.

6. P. heterophylla L. Tree becoming 30 m. tall, the bark flaky: leaf-blades broadly ovate, 8–15 cm. long, or longer, obtuse or acutish, crenate or serrate-crenate: pistillate aments short, the flowers long-pedicelled: capsule ovoid, 9–12 mm. long.—(SWAMP-COTTONWOOD. BLACK-COTTONWOOD. DOWNY-POPLAR.) —Swamps and river-banks, various provinces, except Appalachians, N Fla. to La., Ark., Ind., and Conn.

7. P. candicans Ait. Tree becoming 30 m. tall, the bark ridged: leaf-blades broadly ovate or orbicular-ovate, 6–16 cm. long, acuminate, crenate: pistillate aments elongate, the flowers short-pedicelled: capsule ovoid, 8–11 mm. long.—(BALM-OF-GILEAD.)—Roadsides, fields, and cult. grounds, various provinces, N. C. to N Dak., Alas., Ont., and Newf. Nat. of Eurasia, and perhaps also of N N. A.

2. SALIX [Tourn.] L. Shrubs or trees, the buds with a single scale. Leaf-blades pinnately veined, relatively short-petioled. Stamens 2, or rarely 1–7: anthers yellow or reddish. Ovary stipitate: stigmas not dilated.—About 200 species widely distributed in north temperate and arctic regions; few in the south temperate zone.—The wood is used to make fine grades of charcoal, the bark yields tannic acid and the branchlets are used in making baskets. Some species are used in ornamental horticulture.—Wint.–Spr.—WILLOWS. OSIERS. WITHYS.

Aments borne on lateral leafy branchlets, their scales of one color, usually yellowish, deciduous: filaments distinct, pubescent below.
- Stamens 3–7. — I. NIGRAE.
- Stamens 2.
  - Leaf-blades closely serrate, long-acuminate. — II. ALBAE.
  - Leaf-blades entire or remotely denticulate or dentate. — III. LONGIFOLIAE.

Aments borne laterally, or terminal, their bracts discolored, colored at the tips, persistent: filaments distinct and glabrous, except in *S. purpurea.*
- Filaments glabrous, distinct.
  - Capsule glabrous. — IV. CORDATAE.
  - Capsule pubescent.
    - Leaf-blades serrate. — V. SERICEAE.
    - Leaf-blades undulate, crenate, or undulate-crenate. — VI. DISCOLORES.
- Filaments pubescent, united. — VII. PURPUREAE.

I. NIGRAE

Leaf-blades green on both sides, sometimes paler beneath.
- Capsule conic or ovoid-conic, the lower part more or less swollen, the base not broadly rounded: pedicels less than one-half as long as the capsules. — 1. *S. nigra.*
- Capsule ovoid, the lower part conspicuously turgid, the base broadly rounded: pedicels one-half as long as the capsules or more. — 2. *S. marginata.*

Leaf-blades glaucous or silvery-white pubescent beneath.
- Capsule conic, the valves veiny: fruiting aments short. — 3. *S. amphibia.*
- Capsule ovoid, the valves not veiny: fruiting aments elongate. — 4. *S. longipes.*

II. ALBAE

- Capsule distinctly pedicelled, conic-subulate or conic. — 5. *S. fragilis.*
- Capsule sessile or nearly so, ovoid or conic-ovoid.
  - Capsule 4–5 mm. long: pistillate aments 4 cm. long or more. — 6. *S. alba.*
  - Capsule 2–3 mm. long: pistillate aments 3 cm. long or less. — 7. *S. babylonica.*

III. LONGIFOLIAE

Leaf-blades of a narrowly linear type: capsule with a broad base abruptly narrowed into the beak. — 8. *S. interior.*

IV. CORDATAE

Capsule mostly less than 7 mm. long: twigs greenish, more or less grayish-pubescent. 9. *S. cordata.*
Capsule mostly over 7 mm. long: twigs purple. 10. *S. Chapmanii.*

V. SERICEAE

Leaf-blades glabrous in maturity: capsule 5–8 mm. long. 11. *S. petiolaris.*
Leaf-blades persistently sericeous: capsule 3–4 mm. long. 12. *S. sericea.*

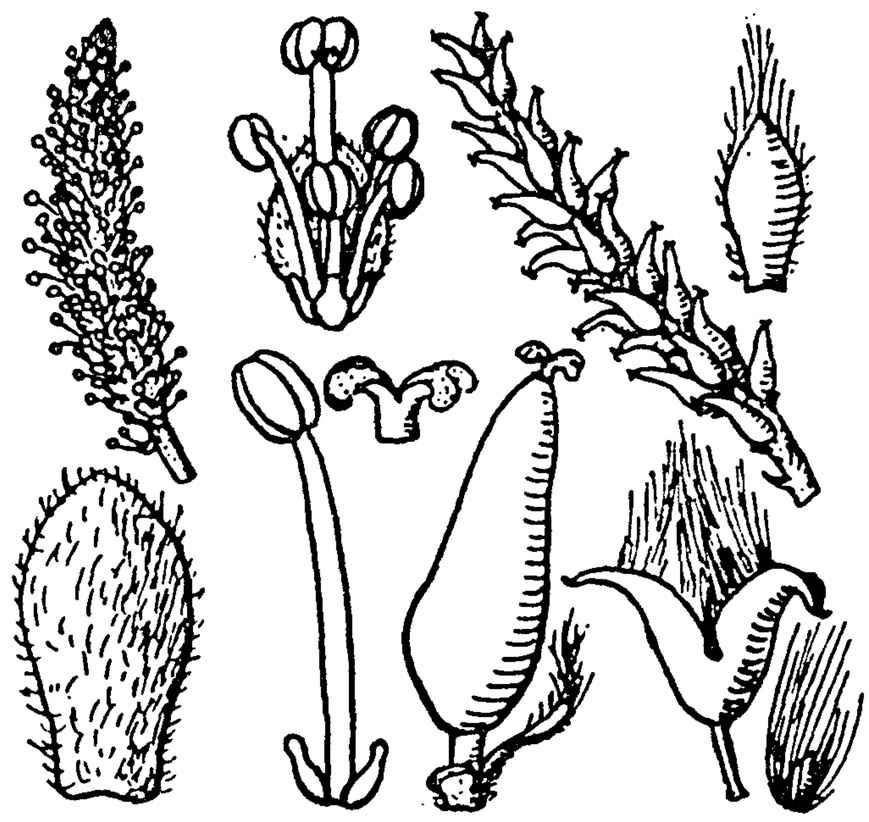
VI. DISCOLORES

Leaf-blades glabrous, at least at maturity slender-petioled. 13. *S. discolor.*
Leaf-blades persistently pubescent, at least beneath, distinctly petioled, or very short-petioled.
Mature pistillate aments 2–4 cm. long: capsule 7–9 mm. long. 14. *S. humilis.*
Mature pistillate aments 1–1.5 cm. long: capsule 5–6 mm. long. 15. *S. tristis.*

VII. PURPUREAE

Filaments pubescent, united. 16. *S. purpurea.*

1. S. nigra Marsh. Shrub or small tree, the twigs brown: leaf-blades narrowly lanceolate to linear-lanceolate, 6–12 cm. long, acute at both ends, or acuminate from the roundish base, green on both sides, and glabrous at least in maturity, closely serrate: bracts of the staminate aments obtuse: capsules 3–5 mm. long, somewhat swollen below, but not broadly rounded at the base.—(BLACK-WILLOW. SWAMP-WILLOW.)—Low grounds, swamps, and river-banks, various provinces, Fla. to Tex., N. D., and N. B.



2. S. marginata Wimm. Shrub or small tree, the twigs reddish: leaf-blades ovate, elliptic, or lanceolate, 2–5 cm. long, obtuse, acute, or slightly acuminate, green on both sides, but often slightly paler beneath, finely serrate, ultimately glabrous or nearly so: bracts of the staminate aments acute or acutish: capsule 4–6 mm. long, turgid below and with a broadly rounded base.—(GULF-WILLOW.)—River-banks and swamps, Coastal Plain, Fla. to La.—Specimens commonly referred to this and the preceding species, with fragile branchlets, have been described as *S. Harbisonii* C. Schneider.

3. S. amphibia Small. Shrub or small tree, the twigs purple or purplish: leaf-blades linear-lanceolate, lanceolate, or elliptic, 3–13 cm. long, acute or acuminate, glabrous or pubescent when young, glaucous beneath, finely serrate: bracts of the staminate aments usually acute or acutish: capsule conic, 6–8 mm. long, long-beaked.—Borders of lakes, swamps, and hammocks, pen. Fla.

4. S. longipes Anders. Shrub or small tree, the twigs gray or gray-brown: leaf-blades lanceolate, ovate-lanceolate or narrowly elliptic, or rarely somewhat broadened upward, 7–15 cm. long, acute or acuminate, finely serrate, glaucous and veiny, and often finely pubescent beneath, stout-petioled: stipules large, persistent: capsule ovoid, 4–6 mm. long, short-beaked. [*S. floridana* Chapm.]—Rocky and gravelly shores and stream-beds, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Md.

5. S. fragilis L. Tree becoming 25 m. tall, the twigs brown: leaf-blades green, or pale beneath, lanceolate to elliptic-lanceolate, 8–15 cm. long, glabrous: capsule conic-subulate or conic, 4.5–5 mm. long.—(CRACK-WILLOW. BRITTLE-

WILLOW. SNAP-WILLOW.)—Roadsides, fields, and meadows, locally nat. in the E U. S. Nat. of Eu.

6. **S. alba** L. Tree becoming 30 m. tall, the twigs greenish (yellow or reddish and with glabrous leaves in *S. alba vitellina;* olive green or bluish in *S. alba coerulea*): leaf-blades pale, or white beneath, lanceolate or elliptic, 5–12 cm. long, permanently sericeous in the typical tree: capsule ovoid, 3–5 mm. long.—(WHITE WILLOW.)—Stream-banks, meadows, and roadsides, locally nat. in temp. N. A. Nat. of Eu.

7. **S. babylonica** L. Tree becoming 20 m. tall, the twigs greenish: leaf-blades narrowly lanceolate to linear-lanceolate, 5–12 cm. long, sericeous at first, becoming glabrous, pale beneath, finely serrate: capsule ovoid-conic, 2–3 mm. long or rarely smaller.—(WEEPING-WILLOW. DROOPING-WILLOW.) Stream-banks, roadsides, and about dwellings, locally nat. in E N. A. Nat. of Eu.

8. **S. interior** Rowlee. Shrub or small tree, the twigs red or reddish: leaf-blades linear, varying to broadest below the middle or above it, remotely dentate, glabrous or nearly so, or sericeous when young: capsule ovoid-conic, the base broadly ovoid, rather abruptly narrowed into a long beak, 5–8 mm. long, glabrous, at least in maturity. [*S. longifolia* Muhl.]—(SANDBAR-WILLOW. RIVER-BANK WILLOW.)—Alluvial soil, river-banks, and islands, various provinces, Tenn. to La., Man., Que., and Del.

9. **S. cordata** Muhl. Shrub sometimes 5 m. tall, the twigs greenish, more or less grayish-pubescent: leaf-blades elliptic-lancceolate or narrowly elliptic (linear-lancceolate in *S. cordata angustata*), 5–11 cm. long or larger on shoots, acuminate, serrate, somewhat sericeous when young, green, pale or somewhat glaucous beneath: capsule ovoid-conic, 5–7 mm. long, slender-beaked, abruptly narrowed or somewhat rounded at the base, short-pedicelled. [*S. missouriensis* Bebb.]—(HEART-LEAVED WILLOW.)—Wet soil and damp banks, Ala. to Okla., Calif., B. C., Ont., and N. B.

10. **S. Chapmanii** Small. Shrub or small tree, the twigs purple, sometimes sparingly pubescent: leaf-blades elliptic or elliptic-lanceolate or ovate-lanceolate, 5–8 cm. long or larger, on twigs, acute serrate, very glaucous beneath: capsule conic, 7–9 mm. long, stout-beaked, truncate at the turgid base.—River-banks and wet woods, Coastal Plain, N Fla. and S Ga.

11. **S. petiolaris** J. E. Smith. Shrub often 4 m. tall, the twigs purplish: leaf-blades lanceolate, narrowly elliptic, or linear-elliptic, 4–7 cm. long, acuminate at both ends, finely serrate, sparingly sericeous when young: capsule slender-conic, or ovoid-ellipsoid below the beak, 5–8 mm. long, or rarely smaller, pubescent.—(ROSEMARY-WILLOW.)—Swamps and low grounds, various provinces, Tenn. to Mass. and N. B.

12. **S. sericea** Marsh. Shrub sometimes becoming 4 m. tall, the twigs purple or purplish, finely pubescent: leaf-blades lanceolate, often narrowly so, narrowly elliptic, or broadly linear, 5–10 cm. long, acute or acuminate, finely serrate, copiously sericeous especially when young: capsule short-conic, ovoid-conic, or ovoid-oblong, 3–4 mm. long, pubescent.—(SILKY-WILLOW.)—Wet hillsides, swamps, and stream-banks, various provinces, N. C. to Mich. and N. B.

13. **S. discolor** Muhl. Shrub or small tree, the twigs purple or grayish and slightly pubescent when young: leaf-blades elliptic, elliptic-lanceolate, or ovate-lanceolate, or obovate, 5–10 cm. long, or larger on shoots, glabrous, at

least in maturity, glaucous beneath, irregularly crenate-serrate: capsule slender-conic, 5–10 mm. long, slender-beaked, pubescent.—(GLAUCOUS-WILLOW. BOG-WILLOW. SILVER-WILLOW. WILD PUSSY-WILLOW.)—Swamps, meadows, and moist hillsides, various provinces, N. C. to Mo., Man., and N. S.

14. S. humilis Marsh. Shrub 3 m. tall or less, the twigs purplish or grayish, closely pubescent: leaf-blades elliptic, or oblanceolate, 5–10 cm. long or longer, becoming glabrous or nearly so above, glaucous, veiny, and more or less pubescent beneath, entire or nearly so, undulate-revolute, distinctly petioled: staminate aments over 1 cm. long: capsule 7–9 mm. long, the narrowly ovoid base rather slender-beaked, thinly fine-pubescent.—(PRAIRIE-WILLOW.)—Dry banks, rocky slopes, and moist thickets, various provinces, N. C. to Tex., Kans., Minn., and Newf.

15. S. tristis Ait. Shrub usually less than 1 m. tall, the twigs brownish or grayish, closely pubescent: leaf-blades oblanceolate to linear-elliptic, or broadly linear, 2–5 cm. long, persistently hoary-pubescent, but more densely so beneath than above, undulate-revolute, very short-petioled: staminate aments less than 1 cm. long: capsule 5–6 mm. long, the broadly ovoid base rather stout-beaked, copiously fine-pubescent.—(DWARF GRAY-WILLOW. SAGE-WILLOW. DWARF PUSSY-WILLOW.)—Dry open woods, thickets, and hillsides, various provinces, Fla. to Nebr., Minn., and Me.—Usually in acid soil.

16. S. purpurea L. Shrub or small tree, the twigs brownish: leaf-blades oblong, broadly linear, oblanceolate, or spatulate, 4–7 cm. long, serrulate near the apex, pale beneath, short-petioled: staminate aments 2–3 cm. long: capsule ovoid-conic or ovoid, 3–4 mm. long or rarely 5 mm. long, tomentose.—(PURPLE-WILLOW. PURPLE-OSIER. BITTER-WILLOW. BASKET-WILLOW.)—Low ground, swamps, and roadsides, E U. S. Nat. of Eu.

ORDER **FAGALES** — FAGAL ORDER

Shrubs or trees. Leaves alternate: blades simple. Flowers monoecious or rarely dioecious, at least the staminate borne in aments, the pistillate sometimes with an involucre which becomes a bur or cup in fruit. Calyx usually present. Corolla wanting. Fruit a nut or rarely a samara.

Staminate and pistillate flowers in aments: fruit not with a bur or a cup.
  Staminate flowers solitary in the axil of each bract, without a calyx: pistillate flowers with a calyx. — Fam. 1. CORYLACEAE.
  Staminate flowers 2–3 together in the axil of each bract, each with a calyx: pistillate flowers without a calyx. — Fam. 2. BETULACEAE.
Staminate flowers in aments: pistillate often solitary, the involucre becoming a bur or cup. — Fam. 3. FAGACEAE.

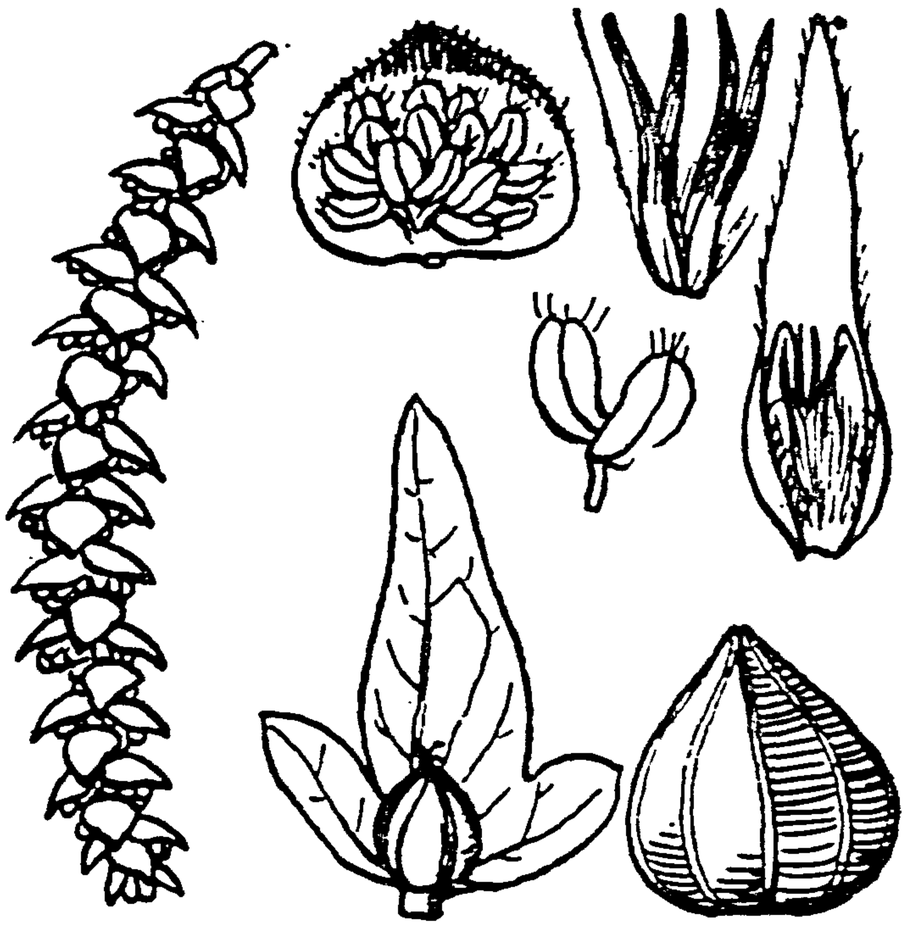
FAMILY 1. **CORYLACEAE** — HAZEL-NUT FAMILY

Shrubs or trees, the wood close-grained. Leaves deciduous: blades mostly doubly toothed. Staminate aments drooping, with each bract subtending one flower, the calyx wanting. Pistillate aments not drooping, each bract bearing 2 or 3 pistils, the involucre of a bract and 2 scales. Fruit consisting of one or more accrescent bracts each subtending or inclosing 1, 2 or 3 nuts.—Four genera and 20 species, most abundant in the Northern Hemisphere.

Staminate flowers without bractlets: pistillate flowers numerous, in elongate aments: nut small, subtended by or inclosed in a bract: stamens many.
  Fruiting bracts flat, 3-lobed, the terminal lobe toothed. — 1. CARPINUS.
  Fruiting bracts bladder-like. — 2. OSTRYA.

Staminate flowers with bractlets: pistillate flowers few, in heads: nut large, in a leaf-like involucre: stamens few. 3. CORYLUS.

1. CARPINUS [Tourn.] L. Trees or shrubs, the bark smooth. Staminate aments usually solitary, with separated spreading bracts. Pistillate aments with 3-lobed bracts at maturity.—About 12 species, only the following American:



1. C. caroliniana Walt. Shrub, or small tree becoming 13 m. tall, the trunk fluted, smooth, gray: leaf-blades elliptic, varying mainly to ovate or ovate-lanceolate, 3–14 cm. long, glabrous above: staminate aments 2–5 cm. long: mature bracts of the pistillate aments hastate, 2–3 cm. long: nut 5–6 mm. long.—(HORNBEAM. BLUE-BEECH. WATER-BEECH. IRONWOOD.)—Moist woods, swampy places, and along streams, various provinces, Fla. to Tex., Minn., and N. S.—Spr.—The wood is used for tool-handles and other small articles.

2. OSTRYA [Mich.] Scop. Shrubs or trees, the bark scaly. Staminate aments usually clustered, with close imbricate bracts. Pistillate aments with lobeless bracts. Six species, 3 American, 3 in the Old World.

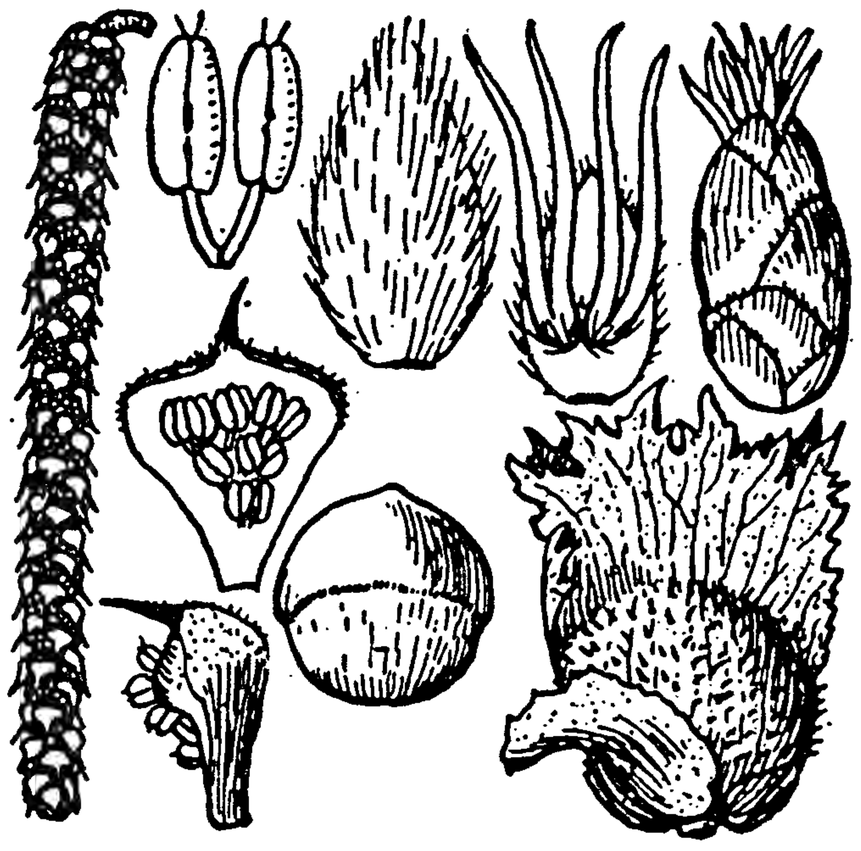
1. O. virginiana (Mill.) Willd. Shrub, or tree becoming 18 m. tall, the bark rough, finely furrowed, brown: leaf-blades mainly elliptic, or oval, 3–13 cm. long, slightly pubescent or glabrate above: staminate aments 3–8 cm. long: mature bracts of the pistillate aments oblong to ovate, 1.5–2 cm. long: not 6–7 mm. long.—(HOP-HORNBEAM. DEER-WOOD. IRONWOOD. LEVERWOOD. BLACK-HAZEL.)—Rich, often dry or rocky, woods, hammocks, and bluffs, various provinces, Fla. to Tex., Man., and N. S.—Spr.—The wood is used mostly for mallets and tool-handles.

3. CORYLUS [Tourn.] L. Shrubs or trees, the bark smoothish. Staminate aments with acuminate bracts. Pistillate aments with foliaceous bractlets at maturity, these are dilated, or sometimes formed into a beaked involucre.—Seven species, 3 American, 4 in the Old World.—Spr.—HAZELNUTS. FILBERTS.

Mature bractlets distinct, leaf-like, incised. 1. *C. americana.*
Mature bractlets united, prolonged into a narrow beak. 2. *C. cornuta.*

1. C. americana Walt. Shrub 1–4 m. tall: leaf-blades thickish, oval or suborbicular, varying to ovate or obovate, 5–15 cm. long: staminate aments 6–10

cm. long, the bracts broadly oval or nearly so, acuminate: each bractlet of the pistillate aments becoming foliaceous and lobed. —(AMERICAN-HAZELNUT.)—Low thickets or hillsides, often in rather rich soil, various provinces, Ga. to Kans., Sask., and Me.



2. **C. cornuta** Marsh. Shrub 1–2 m. tall: leaf-blades thinnish, oblong or oval, varying to obovate, 4–12 cm. long, coarsely serrate and sharply serrulate: staminate aments 2–5 cm. long, the bracts rhomboid-obovate, apiculate: each bractlet of the pistillate aments developing a beaked tubular involucre. [*C. rostrata* Ait.]—(BEAKED-HAZELNUT.)—Stony, often acid soil along streams and in thickets, and in open woods, Piedmont and more northern provinces, Ga. to Kans., Sask., Que., and N. S.

FAMILY 2. **BETULACEAE** — BIRCH FAMILY

Shrubs or trees, the wood close-grained. Leaves deciduous: blades with 2–several series of teeth. Staminate aments drooping, with each bract subtending 2 or 3 flowers, the calyx present. Pistillate aments seldom drooping, the bracts thickened and woody, each one bearing 2 or 3 pistils, the calyx wanting. Fruit a cone-like aggregate of the accrescent bracts, each of which subtends a nut.—Two genera and about 45 species, most abundant in the Northern Hemisphere.

Stamens 2: bracts of the mature pistillate aments membranous, 3-lobed, deciduous with the nuts. 1. BETULA.
Stamens 4 (3–6): bracts of the mature pistillate aments thickened and woody, persistent. 2. ALNUS.

1. **BETULA** [Tourn.] L. Shrubs or trees, the bark often aromatic. Staminate flowers with 2 stamens, the anther-sacs separated. Bracts of the pistillate aments 3-lobed, thin and appressed or ascending at maturity.—About 35 species, natives of the north temperate and arctic zones.—The wood is valuable for cabinet work and for small articles used in various manufactories. The bark, which is impervious to water, is used for canoes, boxes, and shoes. It peels naturally in horizontal strips.—Spr.—BIRCHES.

Fruiting ament peduncled: samara wider than long. I. NIGRAE.
Fruiting ament sessile at the end of a short branch: samara longer than wide. II. LENTAE.

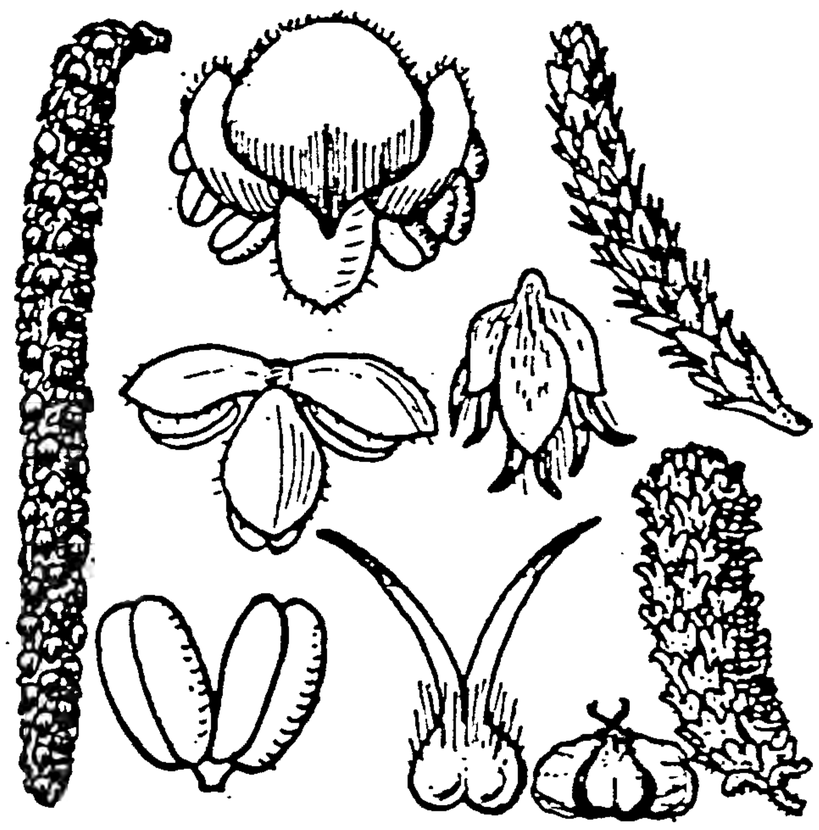
I. NIGRAE

Fruiting aments ellipsoid, erect; scales tomentose: leaf-blades broadly cuneate at the base. 1. *B. nigra.*
Fruiting aments narrowly cylindric, nodding; scales not tomentose: leaf-blades cordate at the base. 2. *B. cordifolia.*

II. LENTAE

Leaf-blades shining above: mature pistillate bracts with two short broad diverging lateral lobes: samara with triangular-obovate or cuneate wings: bark brown. 3. *B. lenta.*
Leaf-blades dull above: mature pistillate bracts with two ascending lateral lobes: samara with orbicular-obovate wings: bark yellowish or silvery. 4. *B. alleghenienses.*

1. B. nigra L. Tree becoming 30 m. tall, the younger bark silvery or yellow: leaf-blades rhombic-ovate, 3–6 cm, long, broadly cuneate at the base, more or less tomentose beneath except in age: staminate aments with suborbicular bracts: mature pistillate aments 3–4 cm. long, less than 1 cm. thick, the bracts 6–7 mm. long, tomentulose: wing of the fruit reniform, ciliate.—(RIVER-BIRCH. RED-BIRCH. WATER-BIRCH.)—Swamps and stream-banks, various provinces, except Blue Ridge, N Fla. to Tex., Minn., and Mass.



2. B. cordifolia Regel. Tree 10 m. tall or less, the young bark white or whitish: leaf-blades ovate to triangular-ovate, 4–8 cm. long, acute or short-acuminate, doubly serrate, cordate at the base, with scattered hairs beneath on the veins: staminate aments with broadly ovate bracts: mature pistillate aments 2.5–5 cm. long, slender-peduncled, the bracts 5.5–6.5 mm. long, glabrous or obscurely pubescent: wing of the fruit subreniform, eciliate.—Cool woods, Blue Ridge, N. C., and various provinces, N N. Y. to Minn. and Newf.

3. B. lenta L. Tree becoming 25 m. tall, the bark blackish: leaf-blades ovate, elliptic-ovate, or elliptic-lanceolate, 4–12 cm. long, rounded or cordate at the base, silky on the nerves beneath: staminate aments with ovate bracts: mature pistillate aments 1.5–3 cm. long, over 1 cm. thick, the bracts 5–6 mm. long and quite or nearly as wide, usually glabrous: wing of the fruit triangular-obovate or cuneate, not ciliate.—(SWEET-BIRCH. CHERRY-BIRCH. BLACK-BIRCH. SPICE-BIRCH. MAHOGANY-BIRCH.)—Woods and hillsides, various provinces, in Coastal Plain only N, Ga. to Ala., Minn., and Newf.—The bark contains an essential oil similar to that of wintergreen, and is distilled with steam in order to secure it on a commercial scale.

4. B. allegheniensis Britton. Tree becoming 30 m. tall, the bark yellowish or silvery: leaf-blades ovate to elliptic-ovate, 5–10 cm. long, rounded or cordate at the base, pubescent on the nerves beneath: staminate aments with ovate or oval-ovate bracts: mature pistillate aments 1.5–2.5 cm. long, very stout, the bracts 7–9 mm. long, quite or fully as wide, ciliate: wing of the fruit orbicular-obovate. [*B. lutea* (Fl. SE. U. S.)]—(SOUTHERN YELLOW-BIRCH. GRAY-BIRCH.)—Rich, often rocky woods, Blue Ridge and more northern provinces, Ga. to Man. and Newf.

2. ALNUS [Tourn.] L. Shrubs or trees, the bark astringent. Staminate flowers with 3–6 stamens, the anther-sacs connected. Bracts of the pistillate aments not lobed, woody and spreading at maturity.—About 15 species, natives of the Northern Hemisphere and the Andes. The bark yields tannic acid.—ALDERS.

Aments flowering before or after the leaves develop: nut wingless, merely margined. 1. *A. rugosa.*
Aments flowering as the leaves develop: nut winged. 2. *A. Alnobetula.*

1. A. rugosa (Du Roi) Spreng. Shrub or tree, becoming 13 m. tall: leaf-blades thickish, obovate or oval, 4–10 cm. long: mature pistillate aments

oblong or oval, 1.5–2 cm. long, the bracts 3-lobed: nut 1.5–2.5 mm. long, sharp-margined.—(SMOOTH-ALDER. GREEN-ALDER. TAG-ALDER. RED-ALDER. SPECKLED-ALDER. HAZEL-ALDER.) —Low woods, thickets, swamps, and stream-banks, various provinces, except Blue Ridge and Adirondacks, Fla. to Tex., Minn., and Me.—Spr.

2. A. Alnobetula (Ehrh.) K. Koch. Shrub becoming 3 m. tall: leaf-blades oval or ovate, 3–9 dm. long: mature pistillate aments 1–2 cm. long, the bracts undulately lobed: nut 2–3 mm. long, winged.—(MOUNTAIN-ALDER. GREEN-ALDER. RUSSET-ALDER.) —Stony often acid soil, Blue Ridge and more northern provinces, N. C. and Tenn. to Man., N. Y., and Lab.—Spr.—(Eurasia.)

FAMILY 3. FAGACEAE — OAK FAMILY

Shrubs or trees, the wood coarse-grained. Leaves sometimes persistent: blades simple, entire, toothed, or lobed. Staminate aments elongate or globular, the calyx of 4–7 partially united sepals. Pistillate flowers solitary or several together, each subtended by a bristly involucre, the sepals thick. Fruit a bur-like, cup-like, or saucer-like involucre enclosing or subtending 1 or more nuts.—About 6 genera and 400 species of wide geographical distribution.

Staminate aments globose, drooping on slender bracted peduncles: nut 3-angled or 3-winged. 1. FAGUS.
Staminate aments elongate, slender.
  Staminate aments erect or ascending: nuts 1–3, included in a very spiny involucre. 2. CASTANEA.
  Staminate aments drooping: nut seated in an involucre of imbricate scales. 3. QUERCUS.

1. FAGUS [Tourn.] L. Shrubs or trees, with close-grained wood. Leaf-blades toothed. Staminate aments globular, pendulous: calyx 4–7-lobed: stamens 8–16. Pistillate flowers 2–4 together: calyx 4–5-lobed. Staminodia wanting. Ovary 3-celled: stigmas 3, filiform. Mature involucre with fleshy spines, enclosing the nuts. Nuts 2–4, 3-angled or 3-winged. About 4 species of the Northern Hemisphere. The tree more common in the southern Coastal Plain, with the leaf-blades rounded or cordate at the base, has been described as *F. grandifolia caroliniana* (Loud.) Fernald & Rehder.

1. F. grandifolia Ehrh. Tree becoming 40 m. tall, the bark smooth, pale: leaf-blades ovate or elliptic-ovate, 5–14 cm. long: staminate aments 1–1.5 cm. in diameter, long-peduncled: ripe involucre ovoid, 1.5–2 cm. long, short-peduncled: nut ovoid, narrowly winged, edible.

[*F. americana* Sweet]—(BEECH. RIDGE-BEECH. RED-BEECH. WHITE-BEECH. BEECH-NUT TREE.)—Rich or low woods and stream-banks, various provinces, N Fla. to Tex., Minn., Ont., and N. S.—Spr.—The wood is used for furniture and various small articles. The nuts are edible.

2. **CASTANEA** [Tourn.] Hill. Shrubs or trees, with porous wood. Leaf-blades toothed, the teeth slender-tipped. Staminate aments elongate, spreading: calyx 6–lobed: stamens 10–20, the filaments greatly elongate. Pistillate flowers several: calyx 6-lobed. Staminodia present. Ovary imperfectly 6–celled. Stigmas 6, slender. Mature involucre with rigid often branching spines, including the nuts. Nuts 2 or 3, or sometimes solitary.—Spr.—CHESTNUTS. CHINQUAPINS. About 11 species, natives of the Northern Hemisphere. The wood is used in construction and for interior finish. The seeds are edible.

Leaf-blades glabrous, green on both sides: nuts usually 2 or 3 in an involucre, or rarely more, flattened, at least on one side. I. DENTATAE.
Leaf-blades permanently pubescent beneath, except in *C. floridana*, the pubescence tawny or pale: nuts solitary, not flattened. II. PUMILAE.

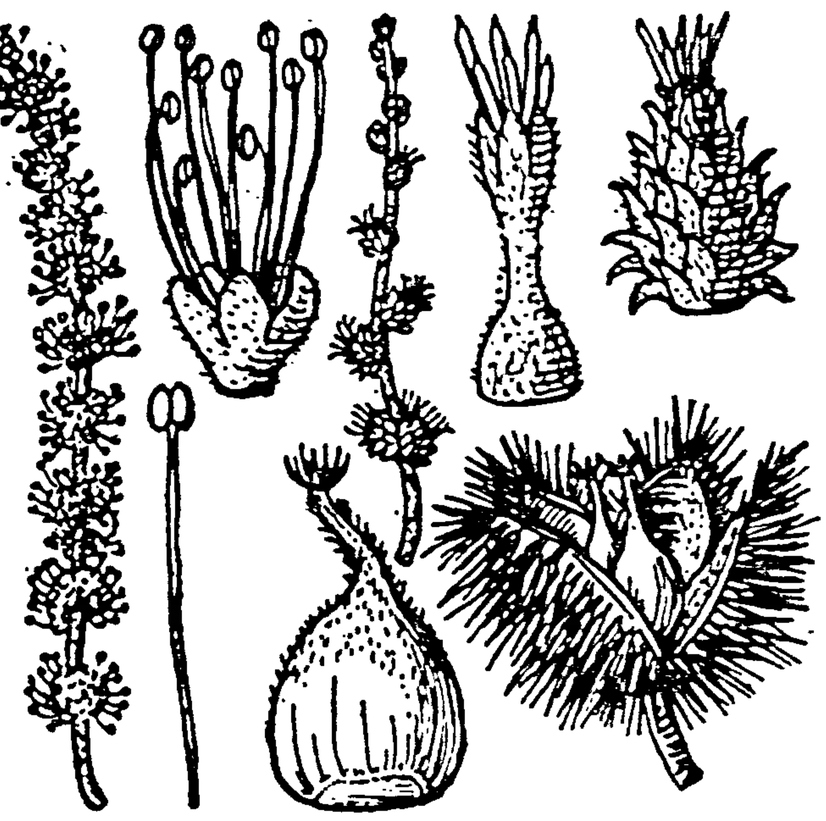
I. DENTATAE

Large tree with long coarsely sharp-toothed, decidedly acuminate leaf-blades. 1. *C. dentata.*

II. PUMILAE

Shrub without rootstocks, or more or less arborescent, or a tree: ripe involucre with a single nut or rarely with 2.
  Leaf-blades densely and permanently pubescent beneath.
    Shrub or shrub-like tree: leaves small; blades mostly 7–15 cm. long, with relatively small acute teeth.
      Spines of the ripe involucre comparatively slender and long, glabrate or sparingly pubescent: leaf-blades velvety-pubescent beneath. 2. *C. pumila.*
      Spines of the ripe involucre comparatively stout and short, rather canescent well to the tips: leaf-blades felt-like beneath. 3. *C. Ashei.*
    Large tree: leaves large; blades mostly 15–25 cm. long, with coarse, salient, bristle-tipped teeth. 4. *C. ozarkensis.*
  Leaf-blades glabrous or nearly so beneath at maturity.
    Tree with large leaves; blades 11–20 cm. long, somewhat glaucous beneath at maturity. 5. *C. alabamensis.*
    Shrub or small tree with small leaves; blades 7–11 cm. long, somewhat lustrous beneath at maturity. 6. *C. floridana.*
Shrub with elongate rootstocks, the branches erect, gregarious, often forming large colonies. 7. *C. alnifolia.*

1. C. dentata (Marsh.) Borkh. Tree becoming 30 m. tall, the bark furrowed: leaf-blades narrowly elliptic or elliptic-lanceolate, 10–30 cm. long, acuminate at the apex, glabrous: neck of the hypanthium longer than the body: ripe involucre 5–10 cm. in diameter: nuts mostly 2, 3 or 5 together, 2–2.5 cm. long.—(CHESTNUT. PRICKLY-BUR.)—Rocky woods and hillsides, various provinces, Ga. to Ala., Ont., and Me.—Late spr.–early sum.—The species seems to be on a fair way to become extinct through the ravages of the chestnut-blight since about 1905.—*C. neglecta* Dode, described as a hybrid between *C. dentata* and *C. pumila* is reported from N. C.



2. C. pumila (L.) Mill. Shrub or small tree up to 9 m. tall, the bark smooth: leaf-

blades obovate, oval, or elliptic, 7–14 cm. long, acute or slightly acuminate, the lateral veins rather few and distant: ripe involucres with long slender spines: nut 1–1.5 cm. long.—Dry sandy soil, woods and thickets, various provinces, Fla. to Tex., Ind., and N. J.—Spr.

3. **C. Ashei** Sudw. Shrub or tree up to 10 m. tall, the bark smooth: leaf-blades elliptic or oval varying to obovate, cuneate, or oblanceolate, usually smaller and narrower than in *C. pumila,* mostly rounded or acute, or sometimes acuminate, the lateral veins rather numerous and closely placed: ripe involucres with short stubby spines.—Dry sandy soil, woods, hammocks, Coastal Plain, Fla. to Tex. and Va.—Spr.—The form with acuminate leaf-blades has been described as *C. Margaretta* Ashe.

4. **C. ozarkensis** Ashe. Tree up to 20 m. tall, sometimes with several stems from a common base, the trunk sometimes 1 m. in diameter, the bark furrowed: leaf-blades elliptic-obovate to broadly lanceolate-elliptic, 15–25 cm. long, more or less acuminate, with coarse salient bristle-tipped teeth, permanently finely brown- or pale-pubescent beneath: ripe involucre 2.5–3.5 cm. in diameter, the spines finely and densely pubescent. [*C. arkansana* Ashe]—(CHINQUAPIN.)—Woods, rocky slopes, and stream-banks, Ozark-Ouachita Plateau and adj. Coastal Plain, Miss. to La., Okla., and S Mo.—Spr.

5. **C. alabamensis** Ashe. Tree up to 10 m. tall, with a somewhat furrowed bark: leaf-blades elliptic varying to elliptic-lanceolate, elliptic-oblanceolate, or elliptic-obovate, 11–20 cm. long, rather coarsely dentate with bristle-tipped teeth, somewhat glaucous beneath, often with scattered hairs on the veins beneath: ripe involucre 2.5–3.5 cm. in diameter, the spines coarsely and sparsely pubescent.—(CHINQUAPIN.)—Hillsides and creek-banks, Ala.—Spr.

6. **C. floridana** (Sarg.) Ashe. Arborescent shrub with several or numerous stems from a common base, up to 18 m. tall, the stems rarely over 2–3 dm. in diameter: leaf-blades elliptic, varying to broadest above the middle or below it, 6–13 cm. long, minutely pubescent beneath when young, glabrous and somewhat shining at maturity, shallowly, but usually rather sharply toothed, the teeth bristle-tipped: ripe involucre 2–2.5 cm. in diameter. [*C. alnifolia floridana* Sarg.]—(CHINQUAPIN.)—Woods and stream-banks, Coastal Plain, Fla. to E Tex. and S Ark.—Spr.

7. **C. alnifolia** Nutt. Shrub with underground stems (rootstocks) and erect branches 2–5 dm. tall: leaf-blades cuneate to lanceolate with a cuneate base, 5–15 cm. long, obtuse or apiculate at the apex, with tawny or dirty-white tomentum beneath, the lateral ribs in 12–14 pairs: ripe involucres 1.5–2 cm. in diameter: nut solitary, 1.5–2 cm. long. [*C. nana* Muhl.]—(CHINQUAPIN. DOWNY-CHINQUAPIN.)—Pinelands and sandhills, Coastal Plain, Fla. to La. and N. C.—Spr.

3. **QUERCUS** [Tourn.] L. Shrubs or trees, with coarse-grained wood. Leaf-blades entire, toothed, or lobed. Staminate aments drooping: calyx 4–7-lobed: stamens 6–12, the filaments relatively short. Pistillate flowers solitary or several: ovary usually 3-celled: stigmas 3, dilated. Mature involucre (cup) saucer-like or deeper, subtending the nut, or rarely enclosing it.—About 240 species, natives of the Northern Hemisphere.—The wood is extensively used in construction work, cabinet-work, and for tools and utensils. The fruits furnished an important food supply for the Indian. The white-oaks and live-oaks are the more valuable kinds.—Spr., or wint. S.—OAKS.

Fruit maturing the first year: nut-shell glabrous within: seeds with the abortive ovules at the base: leaf-blades with blunt, or merely acute or mucronate teeth or lobes.
  Leaves deciduous; blades toothed or lobed:—**White-oaks.** I. ALBAE.
  Leaves evergreen; blades entire, except sometimes on shoots and in *Q. minima*:—**Live-oaks.** II. VIRGINIANAE.
Fruit maturing the second year: nut-shell pubescent within: seed with the abortive ovules at or near the apex: leaf-blades with bristle-tipped lobes or teeth.
  Leaf-blades entire (or undulately lobed on young shoots) or in Nos. 22 and 23 with a more or less lobed terminal dilation: acorn-nut of a globose type, small:—**Laurel-oaks.** III. LAURIFOLIAE.
  Leaf-blades prominently lobed, except sometimes in *Q. marilandica* and *Q. arkansana*: acorn-nut of an ovoid type:—**Red-oaks.** IV. RUBRAE.

I. ALBAE

Leaf-blades lyrate or sinuate-pinnatifid.
  Leaf-blades glabrous beneath: acorn-cup with tubercled scales. 1. *Q. alba.*
  Leaf-blades pubescent beneath or sometimes glabrous in *Q. lyrata:* acorn-cup with flat or slightly thickened scales.
    Upper scales of the cup not awn-tipped.
      Acorns sessile or nearly so: nut not depressed, much protruding from the close-scaly cup.
        Leaf-blades obovate in outline, gray or yellowish beneath, the 3–5 ample lobes often broad and dilated.
          Leaf-blades with truncate or emarginate upper lobes: acorn-cup mostly over 15 mm. wide: nut more than half protruding from the cup. 2. *Q. stellata.*
          Leaf-blades with rounded upper lobes: acorn-cup mostly less than 15 mm. wide: nut less than half protruding from the cup. 3. *Q. Margaretta.*
        Leaf-blades cuneate in outline, brown or yellowish beneath, the 3–7 lobes low and rounded. 4. *Q. Boyntonii.*
      Acorns peduncled: nut depressed, nearly or quite included in the loose-scaly cup. 5. *Q. lyrata.*
    Upper scales of the cup awn-tipped, thus forming a fringe around the nut. 6. *Q. macrocarpa.*
Leaf-blades undulate, sinuate-lobed, or coarsely toothed.
  Leaf-blades coarsely toothed.
    Acorns manifestly peduncled, the peduncle shorter or longer than the petiole.
      Peduncles much longer than the petioles: upper scales of the cup mostly awn-tipped, sometimes forming a fringe. 7. *Q. bicolor.*
      Peduncles about as long as the petioles or shorter: upper scales of the cup not awn-tipped, consequently no fringe around the nut.
        Bark of trunk white or whitish, flaky: leaf-blades glabrous or white-pubescent beneath, with acute or mucronate teeth.
          Acorn over 2.5 cm. long: cup 2.5 cm. wide or more, the scales free to the base. 8. *Q. Prinus.*
          Acorn less than 2 cm. long: cup 1.5 cm. wide or less, the scales free at the tip. 9. *Q. Muhlenbergii.*
        Bark of the trunk dark-gray, furrowed: leaf-blades gray-pubescent beneath, with rounded or obtuse teeth. 10. *Q. montana.*
    Acorns sessile: leaf-blades typically of an obovate type, with few teeth: shrub or small tree. 11. *Q. prinoides.*
  Leaf-blades sinuate-lobed, merely undulate, or entire.
    Leaf-blades glabrous, at least when fully grown, green beneath: acorn-cup hemispheric, sometimes slightly constricted at the base. 12. *Q. austrina.*
    Leaf-blades persistently pubescent and white beneath: acorn-cup very shallow, saucer-shaped or almost disk-like. 13. *Q. Durandii.*

II. VIRGINIANAE

Stem (rootstocks) underground, the branches erect, low: plants with narrow and broad leaf-blades, the broad ones prominently sinuate or pinnately lobed. 14. *Q. minima.*

Stem erect, developing into tall shrubs or trees: plants with nearly or quite uniform leaf-blades.
Leaf-blades prominently rugose-reticulate: cup of the acorn turbinate. 15. *Q. geminata.*
Leaf-blades not rugose-reticulate: cup of the acorn hemispheric or saucer-shaped.
Cup of the acorn hemispheric or funnelform: leaves not succulent: nut ⅓–½ included at the base.
Leaf-blades various, entire, not lobed, except sometimes on vigorous shoots, not of a cuneate type. 16. *Q. virginiana.*
Leaf-blades of a cuneate type, more or less prominently 3-lobed at the apex, or those on shoots sinuate.
Cup of acorn hemispheric, about as deep as wide: nut ovoid or oval-ovoid, less than twice as long as thick. 17. *Q. Chapmanii.*
Cup of acorn deeper than wide, somewhat funnel-form: nut ellipsoid, twice as long as thick. 18. *Q. Rolfsii.*
Cup of acorn saucer-shaped, nut very slightly included at the base. 19. *Q. succulenta.*

III. Laurifoliae

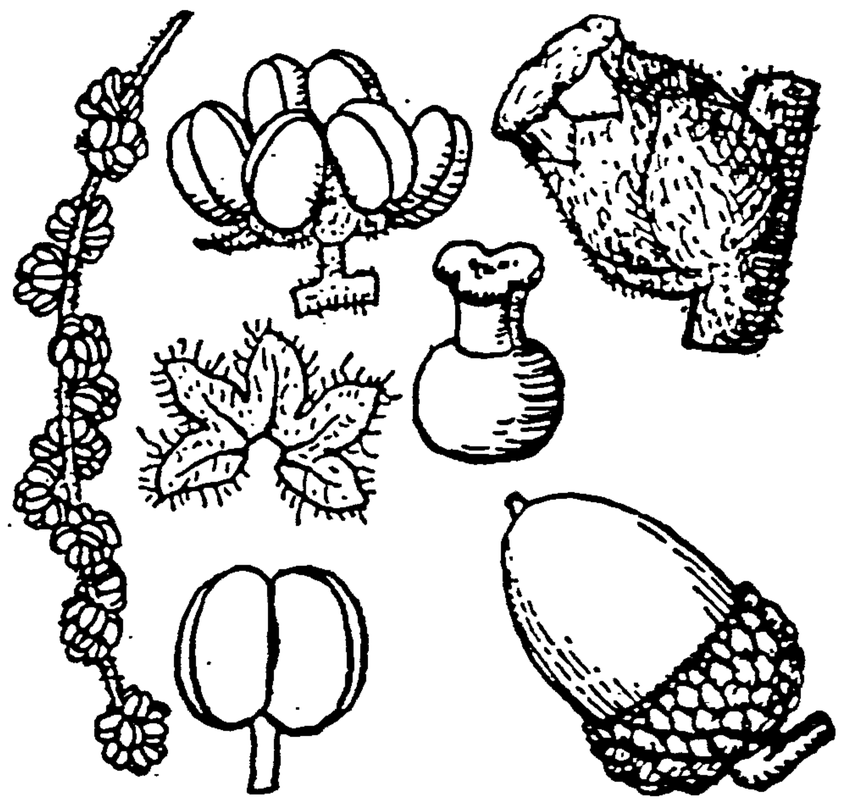
Stems underground, the branches erect, usually low. 20. *Q. pumila.*
Stems erect, developing into tall shrubs or trees.
Leaf-blades glabrous beneath.
Leaf-blades obovate, the margins more or less revolute. 21. *Q. myrtifolia.*
Leaf-blades linear, elliptic, or broadest above the middle, the margins flat.
Leaf-blades broadened upward and 3-lobed near the apex.
Acorn-cup hemispheric: nut less than 1 cm. long. 22. *Q. microcarya.*
Acorn-cup saucer-shaped: nut 1 cm. long or more. 23. *Q. nigra.*
Leaf-blades linear or elliptic, or somewhat cuneate, not 3-lobed at the apex.
Acorn-cup hemispheric: leaves evergreen, flat in bud. 24. *Q. laurifolia.*
Acorn-cup saucer-shaped: leaves deciduous.
Leaf-blades narrow, linear to linear-elliptic, varying to lanceolate or oblanceolate, revolute in the bud. 25. *Q. Phellos.*
Leaf-blades broad, elliptic to cuneate, flat in the bud. 26. *Q. obtusa.*
Leaf-blades pubescent beneath.
Leaf-blades gray-tomentose beneath: acorn-cup very shallow, saucer-shaped. 27. *Q. cinerea.*
Leaf-blades brown-tomentose beneath: acorn-cup deep, usually hemispheric. 28. *Q. imbricaria.*

IV. Rubrae

Leaf-blades green and glabrous, or merely with tufts of hair in the vein-axils beneath.
Acorn-cup saucer-shaped, flat or slightly rounded at the base.
Cup with gray scales, small, mostly less than 1.5 cm. wide.
Leaf-lobes mostly toothed: acorn-cup flat at the base. 29. *Q. palustris.*
Leaf-lobes mostly entire: acorn-cup slightly rounded at the base. 30. *Q. georgiana.*
Cup with brown scales, large, mostly over 2 cm. wide.
Larger lobes of the leaf about equalling the body of the blade: buds red-brown. 31. *Q. maxima.*
Larger lobes of the leaf much longer than the body of the blade: buds stramineous. 32. *Q. Shumardii.*
Acorn-cup turbinate or hemispheric, more or less constricted at the base.
Cup with small closely appressed scales: buds glabrous.
Leaf-lobes more or less dilated and lobed at the apex: buds stramineous. 33. *Q. Schneckii.*
Leaf-lobes narrowed at the apex and coarsely toothed: buds red-brown. 34. *Q. borealis.*

Cup with coarse loosely appressed scales: buds pubescent.
Leaf-blades broad-based, long-petioled; lobes nearly or quite regular, not falcate. 35. *Q. coccinea.*
Leaf-blades narrow-based, short-petioled; lobes irregular, falcate. 36. *Q. laevis.*
Leaf-blades persistently pubescent beneath.
Leaf-blades broadly cuneate in outline, more or less flabellately dilated.
Acorn-cup hemispheric-turbinate, mostly over 1.5 cm. wide, the tips of several rows of the inner scales pubescent, forming a kind of fringe. 37. *Q. marilandica.*
Acorn-cup saucer-shaped, mostly less than 1.5 cm. wide, the tips of the inner row of scales merely puberulent, not forming a fringe. 38. *Q. arkansana.*
Leaf-blades pinnatifid, or sometimes 3-lobed in *Q. rubra*, the form known as *Q. triloba.*
Acorn-cup of large, coarse, somewhat lax scales. 39. *Q. velutina.*
Acorn-cup of small closely appressed scales.
Larger leaf-lobes lanceolate, often falcate.
Leaf-blades rounded or obtuse at the base, the 3–5 lobes ascending. 40. *Q. rubra.*
Leaf-blades broadly cuneate or truncate at the base, the 5–13 lobes spreading. 41. *Q. Pagoda.*
Larger leaf-lobes triangular or deltoid. 42. *Q. ilicifolia.*

1. Q. alba L. Tree becoming 45 m. tall, the bark light-gray, sometimes tinged with red or brown, or nearly white, with thin appressed scales: leaf-blades obovate or oval in outline, 10–20 cm. long, bright-green and smooth above, glaucous and finally glabrous beneath, pinnatifid into 3–9, usually 7, ascending narrow usually entire lobes: acorns short-stalked; cup saucer-shaped or shallow-hemispheric, with the scales woody-tuberculate, 15–20 mm. wide; nut ellipsoid-ovoid, 15–25 mm. long.—(WHITE-OAK. STAVE-OAK.)—Woods and hillsides, various provinces, N Fla. to Tex., Minn., Ont., and Me.—Hybridizes with *Q. Prinus* = x *Q. Beadlei;* with *Q. stellata* = x *Q. Fernowi.*



2. Q. stellata Wang. Tree becoming 30 m. tall, the bark reddish and usually brown-tinged, with broad ridges and deep fissures: leaf-blades broadly obovate in outline, 10–20 cm. long, dark-green and rough above, finely tomentose beneath with gray or yellowish hairs, pinnatifid into usually broad diverging often undulate notched lobes: acorns often clustered; cup hemispheric and contracted at the base, 15–20 mm. wide; nut ovoid, 15–20 mm. long. [*Q. minor* (Marsh.) Sarg.]—(POST-OAK. IRON-OAK.)—Dry sandy, usually sterile and acid, soil, various provinces, N Fla. to Tex., Nebr., and Mass.—Hybridizes with *Q. montana* = x *Q. bernardiensis.*

3. Q. Margaretta Ashe. Shrub, or tree sometimes 10 m. tall, the bark brown or reddish, ridged and fissured: leaf-blades oval or obovate in outline, 6–9 cm. long, more or less pubescent about the veins beneath, sinuate or shallowly 3–5 lobed: acorn sessile or short-stalked; cup turbinate-hemispheric, 11–14 mm. wide; nut ellipsoid to ovoid-ellipsoid, 12–14 mm. long.—(SMALL POST-OAK.)—Sandhills and dry pinelands, Coastal Plain, Fla. to Ala. and Va.—Hybridizes with *Q. geminata* = x *Q. Harbisonii.*

4. Q. Boyntonii Beadle. Shrub 1–5 m. tall, the bark gray, often tinged with brown or black, broken into broad irregular appressed scales: leaf-blades cuneate in outline, often narrowly so, 5–9 cm. long, with 3–7 small

obtuse lobes above the middle or near the apex, tomentose beneath: acorn sessile or nearly so; cup turbinate, 9–12 mm. wide; nut oval or ovoid, 12–15 mm. long.—Rocky soil, forming thickets, on ridges, Appalachian Valley, Ga. and Ala.

5. **Q. lyrata** Walt. Tree becoming 35 m. tall, the bark gray, often red-tinged, broken into thick plates: leaf-blades obovate or spatulate in outline, 9–17 cm. long, white-tomentose beneath or glabrate and green, lyrate-pinnatifid, with 7–9 lobes: acorn short-stalked; cup hemispheric or depressed-globose, 20–40 mm. wide; nut ovoid and slightly exserted or spheroidal and nearly or wholly included in the cup.—(OVERCUP-OAK. SWAMP WHITE-OAK. WATER WHITE-OAK. SWAMP POST-OAK.)—Swamps, usually along rivers, Coastal Plain and adj. provinces, Fla. to Tex., Mo., (Ia.?) Ind., and N. J.—Hybridizes with *Q. virginiana* = x *Q. Comptonae.*

6. **Q. macrocarpa** Michx. Tree becoming 55 m. tall, the bark brown and often red-tinged, broken into irregular plates: leaf-blades obovate to spatulate in outline, 10–30 cm. long, finely tomentose beneath the pinnate lobes, spreading, the terminal lobe largest and usually coarsely crenate: acorns long-stalked; cup deep-hemispheric or globular, 20–40 mm. wide, the upper scales with filiform tips; nut subglobose or broadly ellipsoid, 30–50 mm. long.—(OVERCUP-OAK. MOSSY-CUP OAK. BUR-OAK.)—Rich woods, Piedmont and more northern provinces, Ga. to Tex., Man., and N. S.—Supposed to hybridize with *Q. Prinus* = x *Q. Byarsi.*

7. **Q. bicolor** Willd. Tree sometimes becoming 36 m. tall, the bark gray-brown and often red-tinged, broken in broad ridges by more or less irregular fissures: leaf-blades obovate to elliptic-obovate, 5–20 cm. long, coarsely toothed, usually cuneate at the base, densely white-tomentose beneath: acorns long-stalked; cup saucer-shaped or depressed-hemispheric, 20–25 mm. wide, with some of the bracts prolonged; nut ellipsoid or ellipsoid-ovoid, 20–25 mm. long or slightly longer. [*Q. platanoides* (Lam.) Sudw.]—(SWAMP WHITE-OAK.)—Swamps, meadows, and stream-banks, various provinces in Coastal Plain only N, Ga. to Ark., Minn., and Me.

8. **Q. Prinus** L. Tree becoming 35 m. tall, the bark silvery white or gray, and often red-tinged, broken into thin appressed scales: leaf-blades obovate, varying to elliptic, 8–16 cm. long, coarsely crenate-serrate, finely tomentose beneath: acorn sessile; cup deeply saucer-shaped or shallow-hemispheric, 25–35 mm. wide; nut ellipsoid or ellipsoid-ovoid, 30–35 mm. long. [*Q. Michauxii* Nutt.]—(COW-OAK. BASKET-OAK. SWAMP WHITE-OAK. SWAMP CHESTNUT-OAK.)—Swamps, bottoms, and calcareous hammocks, Coastal Plain and occasionally adj. provinces, Fla. to Tex., Mo., and N. J.—Hybridizes with *Q. alba* = x *Q. Beadlei;* there is a supposed hybrid with *Q. macrocarpa* = x *Q. Byarsi.*

9. **Q. Muhlenbergii** Engelm. Tree becoming 50 m. tall, the bark silvery white and often tinged with brown, broken into loose scales: leaf-blades lanceolate to elliptic-lanceolate, 5–20 cm. long, coarsely serrate, with usually somewhat flaring teeth, minutely pubescent beneath or glabrate: acorns sessile, or nearly so; cup hemispheric, 12–17 mm. wide; nut ovoid, 15–20 mm. long. [*Q. acuminata* (Michx.) Houba]—(CHINQUAPIN-OAK. YELLOW-OAK.)—Calcareous bottoms and hillsides, various provinces, W Fla. to Tex., Minn., Ont., and Vt.

10. **Q. montana** Willd. Tree becoming 30 m. tall, the bark reddish-brown or almost black, broken into broad rounded ridges and deep furrows: leaf-blades elliptic fo oval, varying to broadest slightly above or below the

middle, 15–20 cm. long, coarsely crenate-serrate, gray-tomentulose beneath: acorns short-peduncled; cup hemispheric, 12–35 mm. wide; nut ovoid or ellipsoid-ovoid, 25–35 mm. long. [*Q. Prinus* Du Roi not L.]—(CHESTNUT-OAK. TANBARK-OAK.)—Rocky hillsides and dry woods, various provinces, Ga. to Miss., Ont., and Me.—Hybridizes with *Q. stellata* = x *Q. bernardiensis.*

11. Q. prinoides Willd. Shrub or tree becoming 6 m. tall, the bark brown, with flat ridges and shallow furrows: leaf-blades obovate or oblanceolate, or rarely nearly elliptic, 5–15 cm. long, coarsely toothed, cuneate or rarely rounded at the base, finely gray-tomentose beneath: acorns sessile or nearly so; cup hemispheric, 13–18 mm. wide; nut ellipsoid-ovoid, 15–25 mm. long.—(SCRUB CHESTNUT-OAK. DWARF CHINQUAPIN-OAK.)—Dry sandy or rocky, often acid, soil, various provinces, N. C. to Tex., Minn., and Me.

12. Q. austrina Small. Tree becoming 25 m. tall, the bark gray or brownish-gray, more or less scaly and broken into wide ridges; leaf-blades cuneate to elliptic-cuneate, 5–15 cm. long, with 3–5 blunt lobes, ascending, white-tomentose beneath but soon glabrous, bright-green above: acorns sessile or short-stalked; cup hemispheric, 12–16 mm. wide; nut ovoid, 15–20 mm. long. [*Q. sinuata* Walt.?]—Rich woods, often on river-bluffs, Coastal Plain, Fla. to Miss. and S. C.

13. Q. Durandii Buckl. Tree becoming 16 m. tall, light-gray or nearly white, broken into thin loosely appressed scales: leaf-blades narrowly elliptic, varying to broadest above or below the middle, 4–10 cm. long, entire or slightly 5-lobed near the apex, pale- or whitish-tomentose beneath, pale-green above: acorns nearly sessile; cup very shallow, 10–14 mm. wide, thin-scaly; nut ovoid or somewhat depressed, about 10 mm. long.—(BASTARD WHITE-OAK. PIN-OAK. WHITE-OAK.)—Hills and stream-banks, mostly calcareous, Coastal Plain, Ga. to Tex. and Ark.

14. Q. minima (Sarg.) Small. Shrub, with underground stems, the branches less than 1 m. tall, the bark brown, either pale or dark: leaf-blades obovate or sometimes elliptic or oblanceolate in outline, 3–10 cm. long, glabrous or finely pubescent beneath, repand-toothed or those of the upper leaves sometimes entire: acorns solitary or several on a peduncle; cup hemispheric, about 15 mm. wide; nut ovoid or ellipsoid, 15–18 mm. long. [*Q. virens dentata* Chapm. *Q. virginiana minima* Sarg. *Q. virginiana dentata* Sarg.]—(SCRUB-OAK. DWARF-LIVE-OAK.)—Flat pinelands, Coastal Plain, Fla. to S Ala. and Ga.

15. Q. geminata Small. Shrub, or tree 10 m. tall with trunk usually curved: leaf-blades narrowly elliptic, elliptic, or elliptic-oblanceolate, 3–6 cm. long, entire, revolute, very stiff, rugose-reticulate, finely tomentose beneath: acorns usually 2 at the end of a stalk; cup turbinate, about 10 mm. wide; nut ovoid or narrowly oval, 10–17 mm. long. [*Q. virens maritima* Chapm.]—(TWIN LIVE-OAK. SCRUB LIVE-OAK.)—Sandy hammocks, scrub, and sand-ridges, Coastal Plain, Fla. to Miss. and N. C.—Hybridizes with *Q. Margaretta* = x *Q. Harbisonii.*

16. Q. virginiana Mill. Tree with erect trunk and wide-spreading branches, becoming 30 m. tall, the bark brown or gray, broken into irregular ridges by shallow furrows: leaf-blades oval or elliptic, varying to obovate or oblanceolate, 3–12 cm. long, entire, except sometimes on shoots, slightly revolute, smooth above, pale beneath: acorns solitary, or spicate on peduncles; cup hemispheric, 15–20 mm. wide; nut ovoid or ellipsoid-ovoid, 20–25 mm. long, more than twice as long as the cup. [*Q. virens* Ait.]—(LIVE-OAK.)—Woods and hammocks, Coastal Plain, Fla. to Tex. and Va.—(*W. I., Mex.*)—Hy-

bridizes with *Q. lyrata* = x *Q. Comptonae*.—*Q. Andromeda* Ridd. differs in its smooth leaf-blades which are veinless on both sides.—The rough bark furnishes a favorite anchorage for "air-plants" and many species of them may be found on it in the more southern latitudes. The spread of the branches is, often, much greater than the height of the tree.

17. Q. Chapmanii Sarg. Shrub, or tree becoming 15 m. tall, the bark brown, sometimes rather pale, broken into irregular plates: leaf-blades obovate or elliptic, or somewhat cuneate, 5–10 cm. long, sinuately 3-lobed near the apex, or merely undulate, sparingly pubescent beneath, lustrous above: acorn sessile or nearly so; cup depressed-hemispheric, 15–20 mm. wide; nut ovoid or oval ovoid, 1.5–2.5 cm. long. [*Q. stellata parvifolia* Chapm.]—(CHAPMAN'S-OAK. SCRUB-OAK.)—Sandy hammocks and scrub, Coastal Plain, Fla. to S. C.—A scrub-oak growing on the sand ridges about Fort Bassenger, Florida, resembles *Q. Chapmanii*, but it has thick-edged acorn-cups. It may represent another species.

18. Q. Rolfsii Small. Shrub, or small tree 7 m. tall, with hard rigid branches, the bark brown, scaly: leaf-blades cuneate, 2.5–6 cm. long, mostly 3-lobed at the apex, or sometimes 5-lobed, bright-green, glabrous and finely reticulate above, pale and thinly stellate-pubescent beneath: acorns usually in pairs at the ends of short peduncles: cup hemispheric above a stout base, about 1.5 cm. broad; nut ellipsoid, or slightly broadest below the middle, 2–2.5 cm. long, about ½ included in the cup.—(ROLFS'-OAK. SCRUB-OAK.)—Hammocks, and scrub, lower E coast, Fla.

19. Q. succulenta Small. Shrub, mostly about 1 m. tall, with soft, partly fleshy, spreading branches, the bark brownish, slightly scaly: leaf-blades linear to cuneate, fleshy-coriaceous, 2–4.5 cm. long, entire or with 3–5 slightly spinescent lobe-like teeth, smooth and glabrous above, tomentulose beneath: acorns peduncled; cup saucer-shaped, 3–4 mm. high, 5–6 mm. broad; nut ellipsoid-conic, 1–1.5 cm. long, only the very base included in the cup.—Pinelands, S pen. Fla.

20. Q. pumila Walt. Shrub with underground stems, the branches 3–6 dm. tall, or sometimes taller: leaf-blades deciduous, narrowly elliptic, varying to lanceolate or oblanceolate, 5–12 cm. long, more or less finely tomentose beneath, entire, sometimes slightly crisped: acorns sessile or nearly so; cup saucer-shaped, sometimes deeply so, 12–15 mm. wide; nut ovoid, 10–15 mm. long.—(RUNNING-OAK.)—Pinelands, Coastal Plain, Fla. to Miss. and N. C.

21. Q. myrtifolia Willd. Shrub, or tree becoming 6 m. tall, the bark brown, smooth or somewhat furrowed: leaf-blades obovate or oval, 2–5 cm. long, entire, evergreen, shiny above, dull beneath: acorn sessile or nearly so; cup hemispheric, sometimes deeply so, 10–13 mm. wide; nut ovoid or ellipsoid-ovoid, 10–14 mm. long. [*Q. Phellos arenaria* Chapm.]—(SCRUB-OAK.)—Sandy hammocks, scrub, and sand-ridges, Coastal Plain, Fla. to La. and S. C.—Supposed to hybridize with *Q. cinerea* = x *Q. oviedoensis*.—An apparent form of this species from the lake region of Florida, with larger and broader-based leaf-blades, has been described as *Q. inopina* Ashe.

22. Q. microcarya Small. Shrub, or tree becoming 5 m. tall, the bark brown, often slightly fissured and scaly: leaves deciduous; blades broadly spatulate in outline, 5–10 cm. long, undulate or shallowly lobed, tufted in the vein-axils beneath: acorns sessile; cup deep saucer-shaped, 6–7 mm. wide; nut globose-ovoid, 8–9 mm. long, nearly ½ in the cup.—Granite rocks along streams or gullies, Little Stone Mt. on the Piedmont, Ga.

23. Q. nigra L. Tree becoming 30 m. tall, the bark gray or blackish, or tinged with red, broken into appressed scales: leaves deciduous northward, partly evergreen southward; blades oblanceolate to spatulate or rhombic in outline, 5–15 cm. long, entire and sometimes with a dilated terminal lobe, or 3-lobed at the apex, glabrous beneath or sometimes sparingly tomentose: acorn sessile or short-peduncled; cup saucer-shaped, 12–15 mm. wide; nut subglobose, 10–13 mm. long. [*Q. aquatica* Walt.]—(WATER-OAK. PIN-OAK. SPOTTED-OAK. DUCK-OAK. POSSUM-OAK.)—Sandy soil, swamps, and river-swamps, Coastal Plain and rarely adj. provinces, Fla. to Tex., Mo., Ill., and S N. J.—Hybridizes with *Q. cinerea* = x *Q. caduca;* with *Q. laevis* = x *Q. Walteriana.*

24. Q. laurifolia Michx. Tree becoming 30 m. tall, the bark dark-brown or nearly black, with flat ridges and deep furrows: leaves evergreen or partly deciduous northward; blades flat in bud, elliptic, varying to oval or obovate, 4–13 cm. long, entire, deep-green, glabrous: acorn short-stalked or nearly sessile; cup hemispheric, 10–15 mm. wide; nut ovoid or globose-ovoid, 10–15 mm. long. [*Q. Phellos laurifolia* Chapm.]—(LAUREL-OAK. WATER-OAK. WILLOW-OAK. LIVE-OAK.)—Sandy hammocks and river-bluffs, Coastal Plain and rarely Piedmont, Fla. to La. and Va.—Supposed to hybridize with *Q. laevis* = x *Q. Mellichampi;* with *Q. cinerea* = x *Q. sublaurifolia* (? *Q. atlantica* Ashe).

25. Q. Phellos L. Tree becoming 25 m. tall, the bark brown or reddish-brown, ultimately with irregular scaly plates and shallow fissures: leaves all deciduous, turning yellow in fall; blades revolute and almost filiform in bud, linear or linear-elliptic to lanceolate or oblanceolate, 4–10 cm. long, shining and glabrous at maturity, entire: acorns sessile or nearly so; cup saucer-shaped, 10–15 mm. wide; nut subglobose, often depressed or globose-ovoid, about 1 cm. long.—(WILLOW-OAK.)—Swamps, stream-banks, and sandy bottoms, Coastal Plain and rarely adj. provinces, Fla. to Tex., Mo., and N. Y.—Hybridizes with *Q. marilandica* = x *Q. Rudkinii;* with *Q. velutina* = x *Q. dubia;* with *Q. rubra* = x *Q. subfalcata.*

26. Q. obtusa (Willd.) Pursh. Tree becoming 25 m. tall, the bark brown, ultimately shallowly fissured and ridged: leaves somewhat persistent, but not wholly evergreen; blades elliptic-cuneate, to cuneate, or elliptic-obovate, 6–12 cm. long, rounded at the apex, dark-green: acorn sessile; cup saucer-shaped, very flat, 9–12 mm. wide; nut subglobose or ovoid-globose, 7–9 mm. long. [*Q. hybrida* (Michx.) Small]—River banks and bottoms, mostly calcareous, Coastal Plain, Fla. to Miss. and Ga.

27. Q. cinerea Michx. Small tree, the bark gray, dark-brown, or blackish, broken into squarish plates: leaves deciduous; blades elliptic, varying to lanceolate or oblanceolate, 5–12 cm. long, mainly entire, pale-green, gray-tomentose beneath: acorn nearly sessile; cup saucer-shaped, 10–15 mm. wide; nut ellipsoid or subglobose, about 15 mm. long.—(TURKEY-OAK. UPLAND WILLOW-OAK. BLUE-JACK. HIGH-GROUND WILLOW-OAK. SAND-JACK. CINNAMON-OAK.)—Sand-ridges, dry woods, and pinelands, Coastal Plain, Fla. to Tex., Okla., and N. C.—Hybridizes with *Q. laevis* = x *Q. Ashei;* with *Q. laurifolia* = x *Q. sublaurifolia* (? *Q. atlantica* Ashe.); with *Q. marilandica* = x *Q. carolinensis;* with *Q. nigra* = x *Q. caduca;* with ? *Q. velutina* = x *Q. podophylla* (*Q. petiolaris* Ashe); with *Q. rubra* = x *Q. subintegra;* with *Q. myrtifolia* = x *Q. oviedoensis.*

28. Q. imbricaria Michx. Tree becoming 30 m. tall, the bark brown and often red-tinged, broken into broad scaly ridges: leaves deciduous; blades elliptic, varying to lanceolate or oblanceolate, 6–20 cm. long, mainly entire, softly brown-

tomentose beneath: acorns short-talked; cup nearly hemispheric, 15–20 mm. wide; nut ovoid or subglobose, 10–15 mm. long.—(SHINGLE-OAK.)—Dry rich woods, various provinces, N of Coastal Plain, Ga. to Ark., Nebr., and Pa.; also SE N. Y. and E Mass.—Hybridizes with *Q. marilandica* = x *Q. tridentata*.

29. **Q. palustris** Du Roi. Tree becoming 6 m. tall, the lower branches reflexed, the bark grayish-brown or light-brown, rather smooth except for small scales: leaf-blades broadly oval, varying to ovate or obovate in outline, 6–15 cm. long, merely pubescent in the vein-axils beneath, deeply pinnatifid, the lobes oblong, lanceolate, or triangular: acorns short-stalked; cup saucer-shaped, 10–14 mm. wide; nut globose-ovoid, 10–15 mm. long.—(SWAMP SPANISH-OAK. PIN-OAK. WATER SPANISH-OAK.)—Woods and swamps, various provinces, rare in Appalachians, Tenn. to Okla., Kans., Mich., Pa., and Mass.

30. **Q. georgiana** M. A. Curtis. Shrub, or tree becoming 8 m. tall, the bark brown, scaly: leaf-blades obovate or elliptic in outline, 5–12 cm. long, glabrous, or the vein-axils pubescent beneath, pinnatifid, the lobes triangular or ovate: acorns sessile or short-stalked; cup saucer-shaped, 12–16 mm. wide; nut ovoid or subglobose, 10–14 mm. long.—(GEORGIA-OAK. STONE MOUNTAIN-OAK.)—Granite and sandstone ridges, Piedmont, Ga. and Ala.—Hybridizes with *Q. marilandica* = x *Q. Smallii*.

31. **Q. maxima** (Marsh.) Ashe. Tree becoming 50 m. tall, the lower branches spreading, the bark brown ultimately with rounded ridges with small scaly plates: leaf-blades oval, varying from ovate to obovate in outline, 10–20 cm. long, with tufts of hairs in the vein-axils beneath, pinnately 5–7-lobed, dark-red in fall, the lobes ascending, the sinuses rounded: acorns short-stalked; cup saucer-shaped, 25–35 mm. wide; nut ovoid, 25–30 mm. long. [*Q. rubra* Du Roi]—(RED-OAK.)—Woods and bluffs, various provinces, N Fla. to Okla., and Minn., and N. S.

32. **Q. Shumardii** Buckl. Tree becoming 65 m. tall, the bark reddish-brown, irregularly ridged and somewhat scaly: leaf-blades oval, varying to obovate in outline, 6–20 cm. long, with tufts of hairs in the vein-axils beneath, pinnately 5–7-lobed, the lobes ascending, elliptic or triangular, the sinuses rounded: acorn short-stalked or nearly sessile; cup saucer-shaped, 20–30 mm. wide, the scales thick or tuberculate; nut ovoid to ellipsoid-ovoid, 12–25 mm. long.—(LEOPARD-OAK. SPANISH-OAK.)—Woods, bottoms, and river-bluffs, often calcareous, Coastal Plain and adj. provinces, N Fla. to Tex. and Ia.

33. **Q. Schneckii** Britton. Tree nearly similar to *Q. Shumardii* in habit and foliage: acorn sessile or slightly stalked, especially by the constricted base of the cup; cup turbinate or hemispheric, 20–30 mm. wide, the scales thin or thinnish, appressed; nut ovoid, 20–30 mm. long.—Woods, stream-banks, and hillsides, Coastal Plain and adj. provinces, Ala. to Tex., Okla., and Ohio.

34. **Q. borealis** Michx. f. Tree becoming 25 m. tall, the bark brown, often red-tinged, with thick scaly plates: leaf-blades mainly oval to elliptic in outline, mostly 15–20 cm. long, glabrous, pinnately 7–13-lobed, the lobes as long as the body or longer: acorns short-stalked; cup turbinate, 14–18 mm. wide; nut ovoid, commonly 18–23 mm. long.—(GRAY-OAK.)—Woods and hillsides, Blue Ridge and more northern provinces, N. C. to Ont., Que., and N. S. Has been reported from Ark.

35. **Q. coccinea** Wang. Tree becoming 50 m. tall, the bark brown, with irregular fissures and scaly ridges: leaf-blades oval, varying to elliptic or obovate in outline, 10–20 cm. long, glabrous, except the tufted vein-axils

beneath, or with these sometimes nearly or quite hairless, bright-red in fall, pinnately 5–7-lobed, the lobes usually toothed: acorn sessile or short-stalked; cup broadly or shallowly turbinate, 15–20 mm. wide, more or less constricted at the base; nut ovoid or ellipsoid-ovoid, mostly 10–20 mm. long.—(SCARLET-OAK. SPANISH-OAK. RED-OAK.)—Dry woods and hillsides, various provinces, Ga. to Nebr., Ont., and Me.

36. **Q. laevis** Walt. Tree becoming 20 m. tall, the bark gray or bluish-gray, prominently ridged and broken into thick scales or blocks: leaf-blades elliptic to ovate in outline, 9–20 cm. long, glabrous, except the tufted vein-axils beneath, coriaceous, veiny, green both sides, deeply pinnate-lobed, red in fall, the lobes elliptic, ovate, or usually lanceolate, often curved: acorn short-stalked; cup broadly turbinate, sometimes rather flat, 25–30 mm. wide with incurved scales; nut ovoid, 20–25 mm. long. [*Q. Catesbaei* Michx.]—(SAND BLACK-JACK. TURKEY-OAK. FORKED-LEAF. SCRUB-OAK.)—Dry pinelands and acid sand-ridges, Coastal Plain and rarely Piedmont, Fla. to La. and Va.—Hybridizes with *Q. cinerea* = x *Q. Ashei;* with *Q. rubra* = x *Q. bluffstonensis;* with *Q. laurifolia* = x *Q. Mellichampi;* with *Q. nigra* = x *Q. Walteriana.*

37. **Q. marilandica** Muench. Tree becoming 20 m. tall, the bark dark-brown or nearly black, broken into irregular plates or blocks, very rough: leaf-blades broadly or narrowly obovate in outline, 8–17 cm. long, 3–5-lobed or with a single dilated terminal lobe, brownish-pubescent beneath: acorns sessile or short-stalked; cup turbinate or hemispheric-turbinate, 16–20 mm. wide; nut subglobose or ovoid, 10–20 mm. long. [*Q. nigra* L.]—(BLACK-JACK. BARREN-OAK. IRON-OAK. SCRUB-OAK.)—Dry clayey or rocky soil, various provinces, except Blue Ridge, N Fla. to Tex., Minn., and S N. Y.—Hybridizes with *Q. cinerea* = x *Q. carolinensis;* with *Q. georgiana* = x *Q. Smallii;* with *Q. imbricaria* = x *Q. tridentata;* with *Q. velutina* = x *Q. Bushii;* with *Q. Phellos* = x *Q. Rudkinii.*

38. **Q. arkansana** Sarg. Tree sometimes with crooked trunk becoming 15 m. tall, the bark gray, brown, or nearly black, with long narrow scaly ridges: leaf-blades broadly rhombic-cuneate or rhombic-obovate, 6–15 cm. long, broadly 3-lobed near the apex, deep-green above, slightly paler beneath, glabrous at maturity, except the tufted vein-axils beneath, rather slender-petioled: acorns sessile or nearly so; cup saucer-shaped, 12–14 mm. wide; nut ovoid, 10–15 mm. long. [*Q. caput-rivuli* Ashe]—Sandy river banks, bluffs and hammocks, Coastal Plain, W Fla. to Ark.

39. **Q. velutina** Lam. Tree becoming 50 m. tall, the bark dark-brown or nearly black, the broad ridges with plate-like scales: leaf-blades oval or obovate in outline, 10–30 cm. long, usually rusty-pubescent beneath, pinnately lobed, the lobes coarsely bristle-toothed: acorn sessile or nearly so; cup turbinate or hemispheric-turbinate, 20–25 mm. long. [*Q. tinctoria* Bartr. *Q. coccinea tinctoria* A. Gray]—(BLACK-OAK. YELLOW-BARKED OAK. QUERCITRON.)—Dry, usually sandy or rocky soil, various provinces, N Fla. to E Tex., Minn., Ont., and Me.—Hybridizes with *Q. Phellos* = x *Q. dubia;* with *Q. cinerea* = x *Q. podophylla* (*Q. petiolaris* Ashe); with *Q. marilandica* = x *Q. Bushii.*

40. **Q. rubra** L. Tree becoming 40 m. tall, the bark blackish with broad scaly ridges: leaf-blades ovate or oval in outline, finely tomentose with yellowish-gray hairs beneath, pinnatifid above a rounded base into 3–5 flaring or scythe-shaped lobes, (cuneate and 3-lobed at the apex in *Q. rubra triloba*), turning brown in fall: acorn short-stalked; cup flat-turbinate or saucer-shaped above the turbinate base, 15–18 mm. wide; nut subglobose, 10–15 mm. long. [*Q. falcata* Michx. *Q. triloba* Michx. *Q. digitata* (Marsh.) Sudw.]—(RED-OAK. SPANISH-OAK.)—Dry woods, often in acid soil, Coastal Plain and occasionally

adj. provinces, C Fla. to Tex., Mo., Ind., and N. J.—Hybridizes with *Q. laevis* = x *Q. blufftonensis;* with *Q. Phellos* = x *Q. subfalcata;* with *Q. cinerea* = x *Q. subintegra.*

41. Q. Pagoda Raf. Tree becoming 32 m. tall, the bark blackish or gray-brown, roughened with plate-like scales: leaf-blades oval to elliptic in outline, 15–30 cm. long, persistently white-tomentose, pinnatifid above a cuneate or truncate base into 5–13 lanceolate or narrowly triangular lobes: acorn sessile or nearly so; cup shallow-turbinate, or saucer-shaped above the turbinate base, 12–14 mm. wide; nut subglobose, about 10 mm. long. [*Q. pagodaefolia* (Ell.) Ashe]—(SPANISH-OAK. SWAMP SPANISH-OAK.)—Woods, river bottoms, and river-banks, Coastal Plain and rarely Piedmont, Fla. to Ark., Mo., and Va.

42. Q. ilicifolia Wang. Shrub rather intricately branched, or tree becoming 7 m. tall, the bark brown, smooth except for small scales: leaf-blades obovate or oval in outline, 6–12 cm. long, with white or pale-gray tomentum beneath, pinnatifid into 3–5 triangular or deltoid lobes: acorns short-stalked or nearly sessile; cup saucer-shaped, flat at the base or sometimes constricted, 14–18 mm. wide; nut ovoid-globose or depressed, 10–15 mm. long. [*Q. nana* (Marsh.) Sarg.]—(BEAR-OAK. BLACK SCRUB-OAK.)—Acid sandy or rocky soil, especially in pine-barrens and on bare rocky mountain tops, various provinces, S. C. to Ky., Ohio, and Me.

ORDER **URTICALES** — URTICAL ORDER

Shrubs or trees, or herbs. Leaves alternate, or in the case of herbs often opposite: blades simple, entire, toothed, or divided. Flowers various, not in aments. Calyx present. Corolla wanting. Androecium often of as many stamens as there are sepals. Gynoecium of a single carpel or of 2 united carpels. Fruit an achene, a samara, a drupe, a syncarp, or a syconium.

Fruit an achene, the achenes sometimes in the accrescent sepals and forming a syncarp.	
Flowers not on a receptacle: fruit not a syncarp: sepals neither thick and juicy nor enveloping achene.	
Style or stigma 1: the latter sometimes tufted: ovule erect: filaments inflexed in the bud.	Fam. 1. URTICACEAE.
Styles or stigmas 2: ovule pendulous: filaments erect in the bud.	Fam. 2. CANNABINACEAE.
Flowers on the outside or inside of a receptacle: fruit a syncarp or syconium: sepals accrescent, enveloping the achene.	Fam. 3. ARTOCARPACEAE.
Fruit a samara or a drupe, sometimes nut-like.	Fam. 4. ULMACEAE.

FAMILY 1. **URTICACEAE** — NETTLE FAMILY

Herbs or shrubby plants, often with stinging hairs. Leaf-blades entire, toothed, or rarely lobed. Flowers dioecious, monoecious, or polygamous, cymose. Calyx of 2–5 distinct or partially united sepals. Androecium of 2–5 stamens. Gynoecium a single carpel. Fruit an achene.—About 40 genera and 550 species of wide geographic distribution.—Our species have greenish or greenish-white, inconspicuous flowers.

Sepals of the pistillate flowers distinct or slightly united: achene not invested by the calyx.	
Flowers not involucrate.	
Pistillate flowers with a calyx of 4 or 5 sepals.	Tribe I. UREREAE.
Pistillate flowers with a calyx of 3 sepals.	Tribe II. PILEAE.
Flowers or flower-clusters involucrate.	Tribe III. PARIETARIEAE.

Sepals of the pistillate flowers united: calyx-tube investing the achene. — Tribe IV. BOEHMERIEAE.

I. UREREAE

Stigma subulate, not tufted: ovary and achene oblique. — 1. URTICASTRUM.
Stigma tufted: ovary and achene equilateral. — 2. URTICA.

II. PILEAE

Sepals of the pistillate flowers nearly equal, all slightly broadened or hooded at the apex. — 3. ADICEA.
Sepals of the pistillate flowers very unequal, the larger one helmet-like. — 4. PILEA.

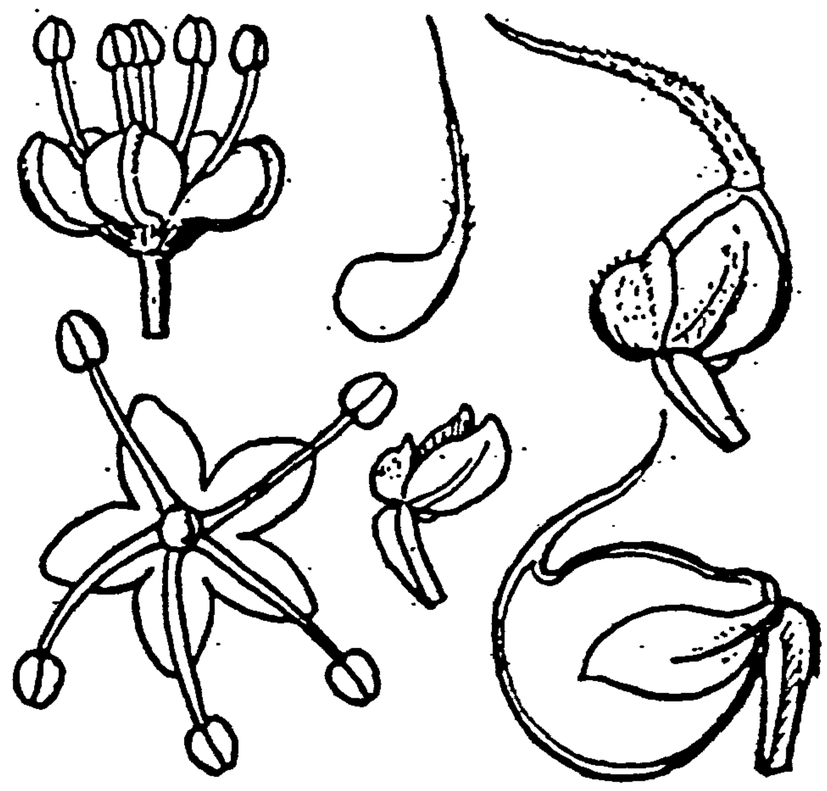
III. PARIETARIEAE

Diffuse flimsy herbs with soft watery stems and leaves. — 5. PARIETARIA.

IV. BOEHMERIEAE

Flowers monoecious, in glomerules on branches: leaves opposite. — 6. BOEHMERIA.
Flowers dioecious, in axillary or lateral compound clusters: leaves alternate. — 7. RAMIUM.

1. **URTICASTRUM** Fabr. Perennial herbs with stinging hairs. Leaves alternate: blades toothed. Pistillate flowers with a calyx of 5 sepals and an oblique ovary.—About 25 species mostly of tropical regions.



1. U. divaricatum (L.) Kuntze. Stem 2–12 dm. tall: leaf-blades ovate, ovate-orbicular, or elliptic, 5–20 cm. long, long-petioled: panicles spreading, the lower staminate, the upper pistillate: sepals oblong, or broader in the pistillate flowers: achene oblique, about 3 mm. in diameter, exserted.—(WOOD-NETTLE. CANADA-NETTLE. NETTLE-PATCH.)—Rich woods and bottoms, various provinces, Fla. to Kans., Minn., and N. S.—Sum.

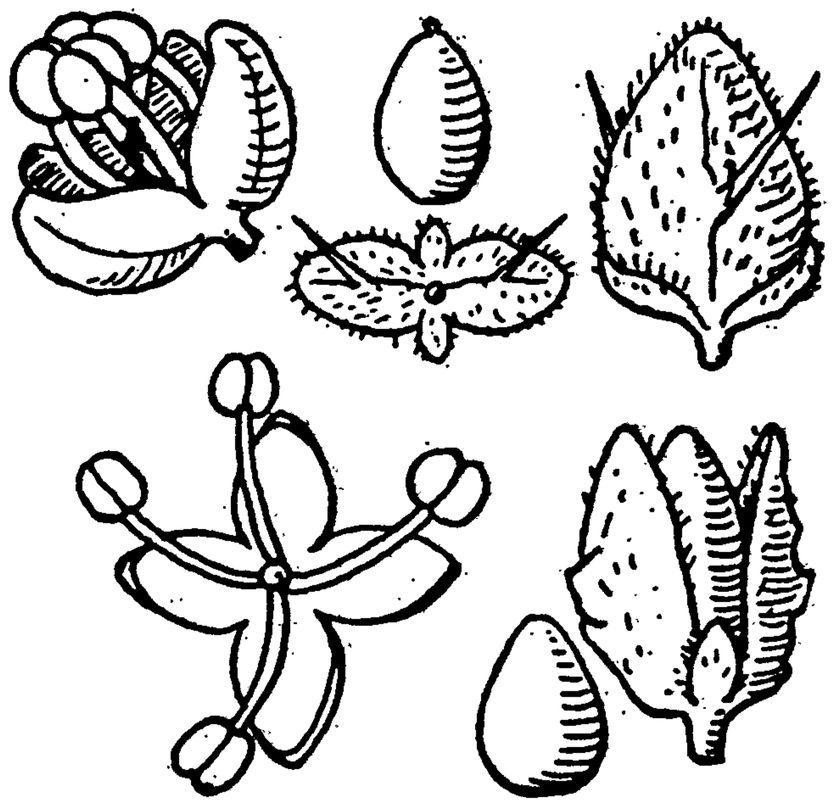
2. **URTICA** [Tourn.] L. Annual or perennial often coarse herbs with stinging hairs. Leaves opposite: blades toothed or incised-lobed. Pistillate flowers with a calyx of 4 distinct sepals and an equilateral ovary.—About 30 species of wide geographic distribution.—NETTLES.

Annual: flower-clusters simple.
- Leaf-blades incised-toothed, the upper ones but little reduced. — 1. *U. urens.*
- Leaf-blades crenate-dentate, the upper ones much reduced. — 2. *U. chamaedryoides.*

Perennial: flower-clusters compound.
- Stems sparingly bristly: petioles more than half the breadth of the leaf-blades. — 3. *U. gracilis.*
- Stems densely bristly: petioles less than half the breadth of the leaf-blades. — 4. *U. dioica.*

1. U. urens L. Stem and branches 1–4 dm. tall: leaf-blades oval, elliptic, or ovate, 1–4 cm. long, rounded or broadly cuneate at the base, incised, the teeth

acute; petioles ½ as long as the blades, or more: achene about 2 mm. long.—(DWARF-NETTLE. SMALL-NETTLE.) — Waste-places, various provinces, Fla. to Calif., N. Y., and Newf.—Nat. of Eu.—(*W. I.*)—Spr.–fall.

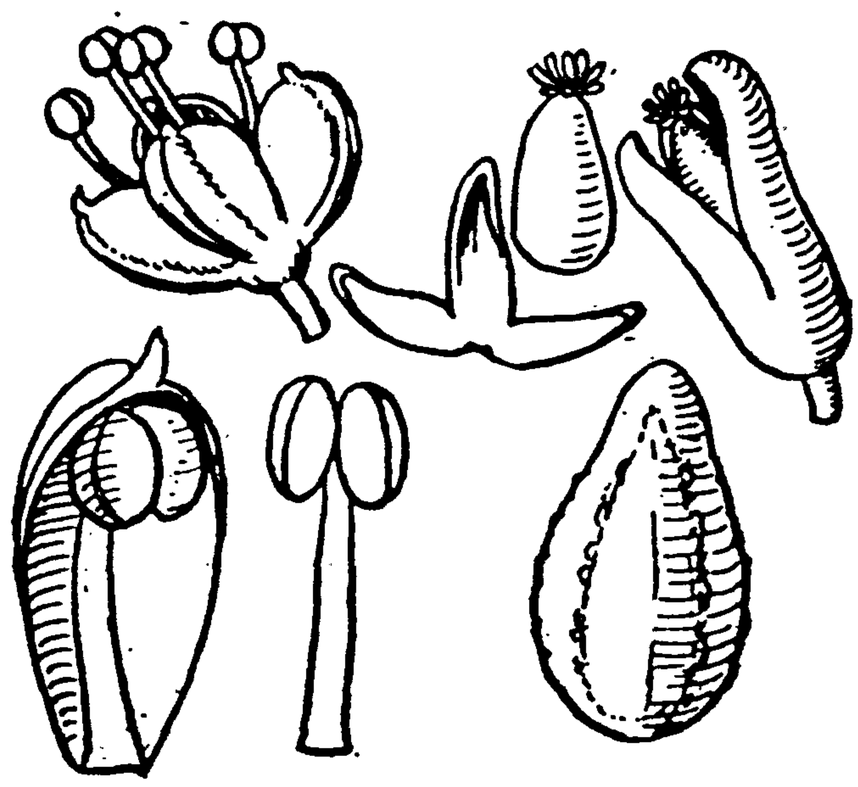


2. U. chamaedryoides Pursh. Stem and branches 1–10 dm. tall: leaf-blades ovate-reniform, ovate, or deltoid, 1–4 cm. long, cordate or truncate at the base, crenate-dentate, the teeth obtuse; petioles ½ as long as the blades or less: achene fully 1 mm. long.—Thickets, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and Ky.—Spr.–sum.

3. U. gracilis Ait. Stem 6–28 dm. tall: leaf-blades lanceolate, occasionally broadly so, 6–15 cm. long, acuminate, serrate: sepals hispidulous: achene fully 1 mm. long.—(TALL WILD-NETTLE.) —Fence-rows and river-banks, various provinces, N. C. to La., B. C., Ont., and N. S.—Sum.–fall.

4. U. dioica L. Stem 6–13 dm. tall: leaf-blades ovate to ovate-lanceolate, 3–12 cm. long, prominently incised-serrate, cordate, sometimes deeply so: sepals soft-hispidulous: achene fully 1 mm. long.—(STINGING-NETTLE.)—Waste-places and roadsides, various provinces, S. C. to Mo., Minn., and N. S.—Nat. of Eu.—Sum.–fall.

3. ADICEA Raf. Annual or perennial erect succulent herbs. Leaves mainly opposite: blades toothed, 3-ribbed. Flowers dioecious. Sepals of the pistillate flowers 3, nearly equal, slightly broader and more or less hooded at the apex, not enclosing the achene, each accompanied by a staminodium. Stigma tufted.—One species in the United States, perhaps others in tropical America.



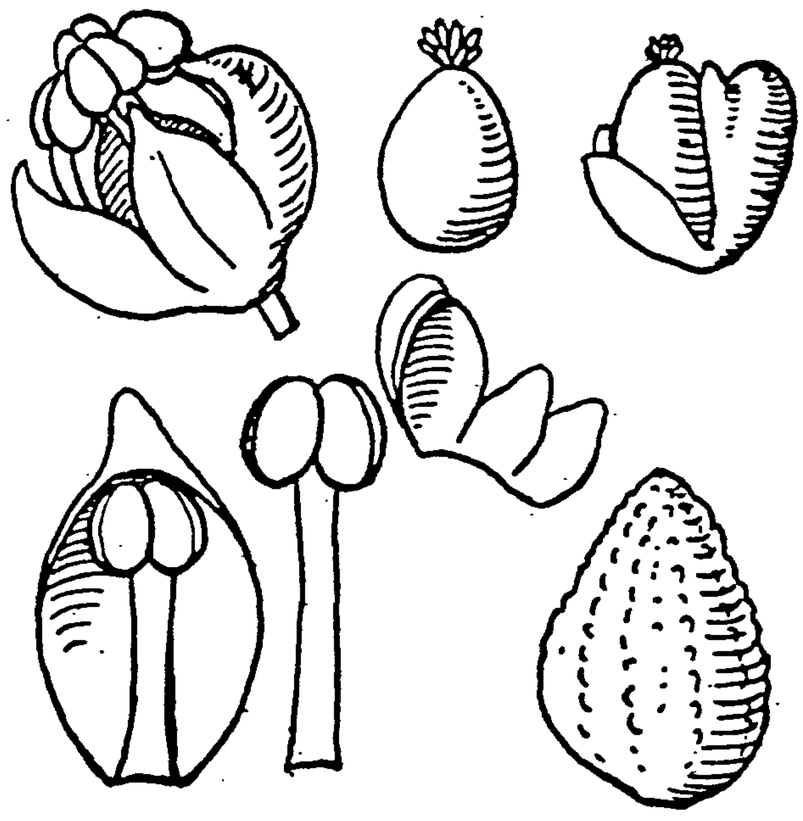
1. A. pumila (L.) Raf. Stem 1–7 dm. tall, translucent, watery: leaf-blades ovate to elliptic, 3–10 cm. long, coarsely crenate-serrate, long-petioled: sepals lanceolate: achene ovoid, about 2 mm. long.—(CLEARWEED. RICHWEED. CHURLE-HEMP. NOSTING. COOLWEED.)—Moist banks and cool shaded places, various provinces, Fla. to La., Minn., and N. H.—Sum.–fall.

4. PILEA Lindl. Depressed, often creeping, succulent herbs. Leaves mainly alternate: blades entire, 1-ribbed. Flowers monoecious. Sepals of the pistillate flowers 3, very unequal, 2 of them flat, the third one much larger, helmet-like, often enclosing the achene. Stigma tufted.—About 200 species, mostly tropical.

Flower-clusters sessile in the leaf-axils or nearly so, very short: plants mostly monoecious.
- Leaf-blades suborbicular to oval-orbicular or reniform-orbicular, less than twice as long as wide, long-petioled. 1. *P. herniarioides.*
- Leaf-blades elliptic, oblanceolate, or obovate, over twice as long as wide, short-petioled. 2. *P. microphylla.*

Flower-clusters stalked and elongate, becoming as long as the leaves or nearly so: plants mostly dioecious. 3. *P. serpyllifolia.*

1. P. herniarioides (Sw.) Lindl. Stem and branches filiform, prostrate or decumbent, 3–10 cm. long: leaf-blades 2–4 mm. long, obtuse at the apex, very thin at least when dry, transversely wrinkled: smaller sepals mostly oblong: achene oblong-ovoid, 0.3–0.4 mm. long.—Hammocks, S pen. Fla. and Florida Keys.—(*W. I.*)



2. P. microphylla (L.) Liebm. Stem and branches spreading or creeping, 2–15 cm. long: leaves, and flower-clusters not crowded; blades 2–6 mm. long, acute or acutish: smaller sepals mostly ovate, greenish or pink: achene 0.5–0.6 mm. long.—Pinelands and hammocks, pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)

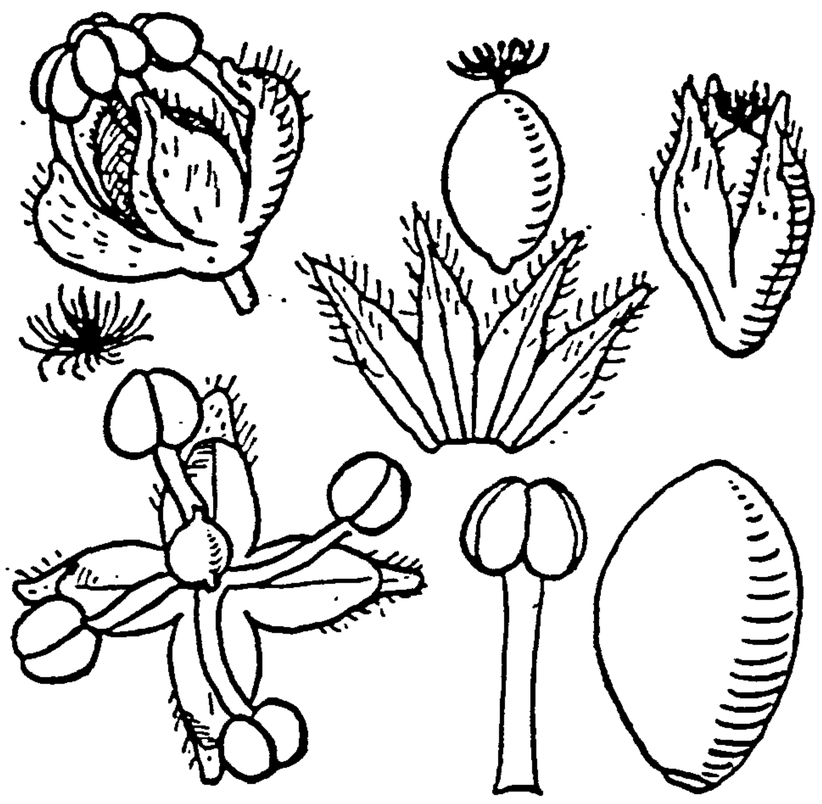
3. P. serpyllifolia (Poir.) Wedd. Stem and branches erect, becoming diffuse, 3 dm. long or less, thick and succulent: leaves, and flower-clusters, crowded; blades obovate to elliptic-obovate or cuneate, 3–8 mm. long or more, thick and firm even when dry: smaller sepals ovate, greenish: achene about 0.5 mm. long.—(ARTILLERY-PLANT.)—Pinelands and waste-places, pen. Fla. and coastal La.—Nat. of Mex.—(*W. I., Mex., C. A., S. A.*)

5. PARIETARIA [Tourn.] L. Annual or perennial flimsy succulent herbs. Leaves alternate: blades entire. Flowers polygamous, in clustered involucrate axillary cymes, the involucres of 2–6 more or less united bracts. Stigma tufted.—About 7 species, widely distributed.—PELLITORIES.

Plant annual, with fibrous roots: stem and branches finely or minutely pubescent.
- Leaf-blades manifestly longer than wide, mostly 1–6 cm. long: achene over 1 mm. long.
  - Leaf-blades of an ovate or elliptic type, relatively long-petioled. 1. *P. floridana.*
  - Leaf-blades of a lanceolate type, relatively short-petioled. 2. *P. pennsylvanica.*
- Leaf-blades mostly as wide as long or wider, mostly 0.5 cm. wide: achene less than 1 mm. wide. 3. *P. nummularia.*

Plant perennial, with long woody roots, and with somewhat creeping stems: stem and branches coarsely pubescent. 4. *P. officinalis.*

1. P. floridana Nutt. Stems 1–5 dm. long, usually puberulent, often much branched: leaf-blades ovate to subrhombic, 0.5–5 cm. long: sepals acute: achene ovoid, 1 mm. long.—Hammocks and damp shaded places, Coastal Plain, Fla. to Tex. and N. C.—(*W. I.*)



2. P. pennsylvanica Muhl. Stems 1–4 dm. sepals and 4 stamens. Pistillate spikes leaf-blades lanceolate to elliptic or sometimes broader, 1–6 cm. long, acute or acuminate at the base: sepals acute: achene oval, fully 1 mm. long.—(HAMMERWORT. PELLITORY.)—Dry, often rocky banks, or woods, various provinces, Fla. to Tex., Minn., Ont., and Me.

3. P. nummularia Small. Stem usually branched at base, the branches becoming assurgent or prostrate, mostly 1–3 dm. long:

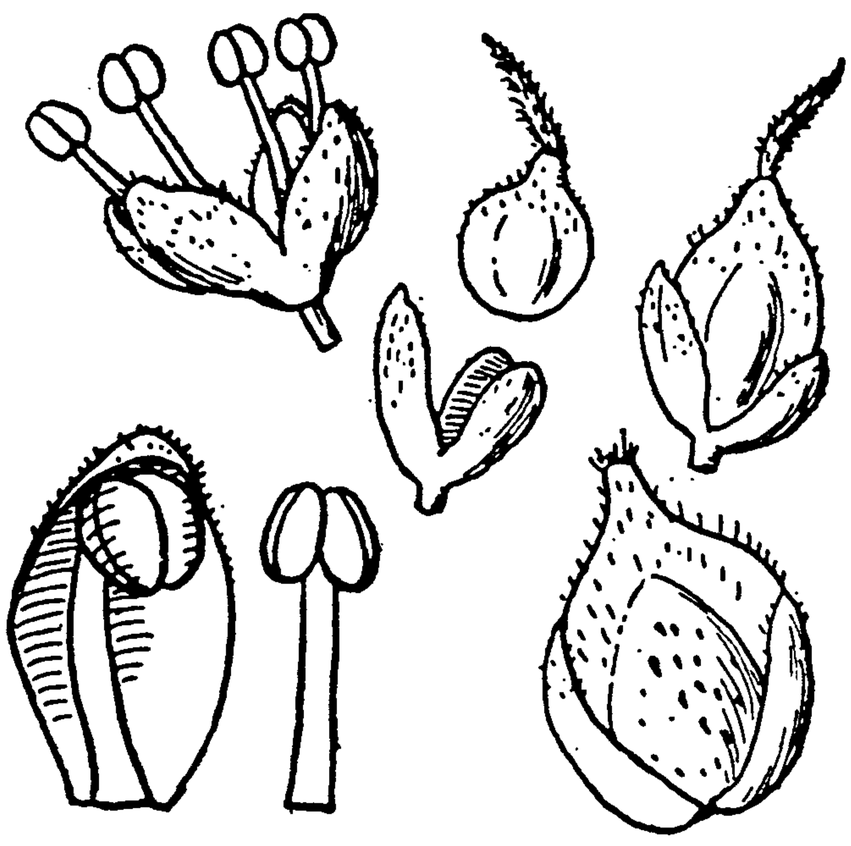
leaf-blades reniform, to rhombic-orbicular or orbicular-ovate, obtuse, relatively long-petioled: sepals abruptly pointed: achene ellipsoid, less than 1 mm. long.—Wet sandy soil, often in hammocks, E and pen. Fla.—The numerous very small leaves gives this plant the aspect of a small-leaved *Pilea*. Specimens of this species and those of *P. floridana* have erroneously been referred to the New Zealand *P. debilis*.

4. P. officinalis L. Stem usually branched at the base, hirsute: leaf-blades ovate, sometimes narrowly so, 1.5–3 cm. long, more or less acuminate at the apex, petioled: sepals with acute tips: achene ovoid, fully 1 mm. long.—Sandy pinelands, old fields, and roadsides, pen. Fla. Nat. of Eu.

6. BOEHMERIA Jacq. Perennial herbs. Leaves opposite: blades toothed, often 3-ribbed. Flowers monoecious, in clusters on branches, the pistillate with 4 united sepals surrounding the ovary. Stigma elongate. Achene included in the horseshoe-like accrescent calyx.—About 50 species mostly in tropical regions.—The plants produce a fiber valuable for weaving into cloth.—Sum.–fall.—FALSE-NETTLES.

Leaf-blades leathery, finely serrate; petioles much shorter than the blades. 1. *B. Drummondiana.*
Leaf-blades relatively thin, coarsely serrate; petioles as long as the blades or little shorter.
  Main pair of lateral nerves arising at the base of the leaf-blade. 2. *B. cylindrica.*
  Main pair of lateral nerves arising some distance above the base of the leaf-blade. 3. *B. decurrens.*

1. B. Drummondiana Wedd. Stems 2–12 dm. tall, typically rough-pubescent: leaf-blades firm, ovate to elliptic-ovate, or the lower ones orbicular to reniform, 2–5 cm. long, or rarely larger, short-petioled: flower-clusters mostly contiguous: inflorescence-branches short: achene mostly about 1.5 mm. wide. [*B. scabra* (Porter) Small] — (BOG-HEMP.) — Swamps, low grounds and hammocks, various provinces, Fla. to Tex., Kans., Mich., and Conn.

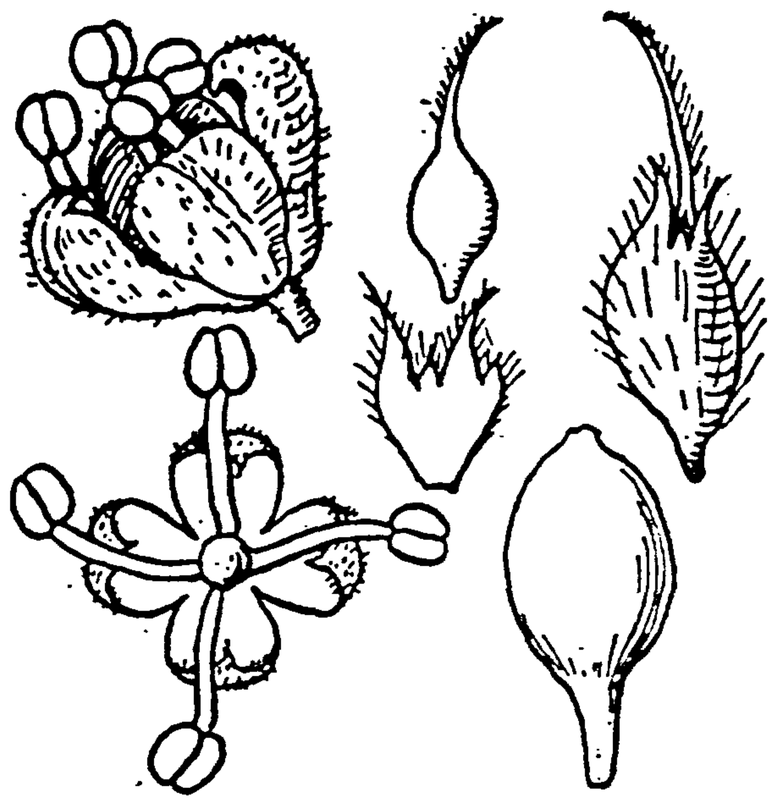


2. B. cylindrica (L.) Willd. Stems 2–13 dm. tall, typically smooth and glabrous: leaf-blades pliable, ovate to lanceolate, 3–12 cm. long, long-petioled: flower-clusters mostly separate: inflorescence-branches elongate: achene mostly about 1 mm. wide. — (BUTTON-HEMP.) — Woods and moist shaded places, various provinces, Fla. to Tex., Minn., Que., and Me.—Although closely resembling some of our stinging-nettles in habit, this plant is devoid of stinging-hairs.

3. B. decurrens Small. Stem 7–12 dm. tall, typically smooth and glabrous: leaf-blades lanceolate to ovate-lanceolate, 10–18 cm. long, sparsely pubescent beneath; petioles relatively slender: flower-clusters mainly contiguous: achenes fully 1.5 mm. wide.—Sandy, usually low or moist places, N Fla.

7. RAMIUM Rumph. Perennial shrubby plants. Leaves alternate: blades toothed. Flowers dioecious, in axillary or lateral compound clusters with slender branches, the pistillate with 4 united sepals enclosing the ovary.

Stigma elongate. Achene included in the little changed calyx.—Few species, mostly Asiatic.



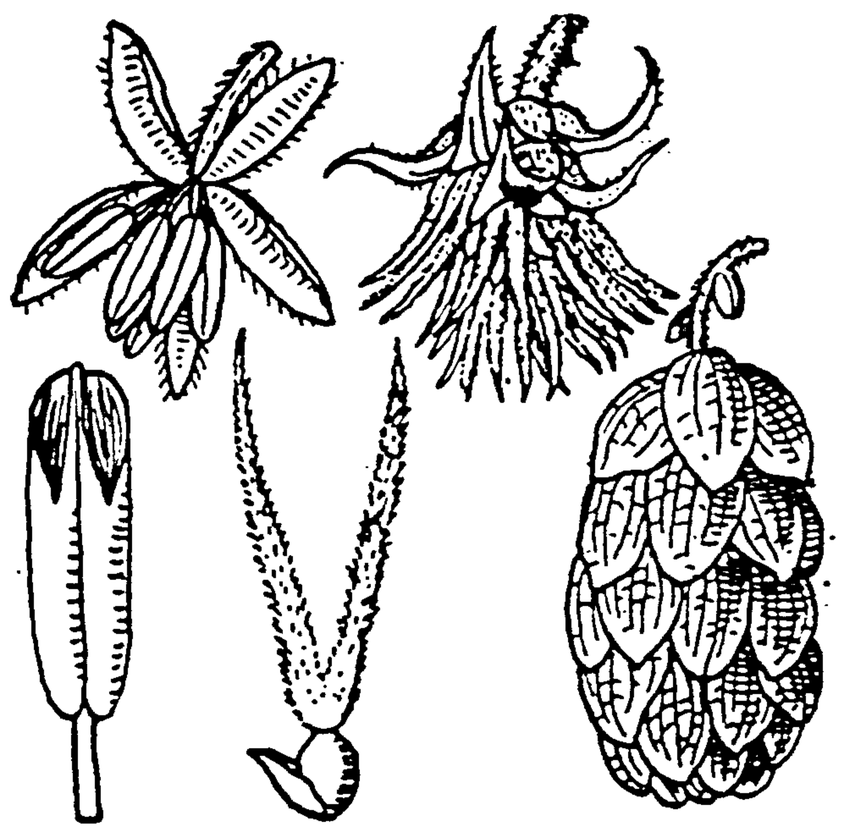
1. R. niveum (L.) Small. Stem and branches more or less woody, 1–3 m. tall: leaf-blades broadly ovate, 8–30 cm. long, dentate, the upper surface rough, the lower densely white-pubescent: achene about 1 mm. long. [*Boehmeria nivea* (L.) Gaud.] —(RAMIE.)—Waste places, cult. grounds and roadsides, Coastal Plain, Fla. to Tex. and S. C. Nat. of Asia.

FAMILY 2. CANNABINACEAE — HEMP FAMILY

Annual or perennial, often coarsely pubescent herbs. Leaves opposite or sometimes alternate: blades toothed, lobed, or divided. Flowers dioecious, the pistillate in bracted spikes, with an entire perianth, and a gynoecium of 2 united carpels, the ovary 1-celled. Fruit an achene.—Two genera and about 4 species of the Northern Hemisphere.

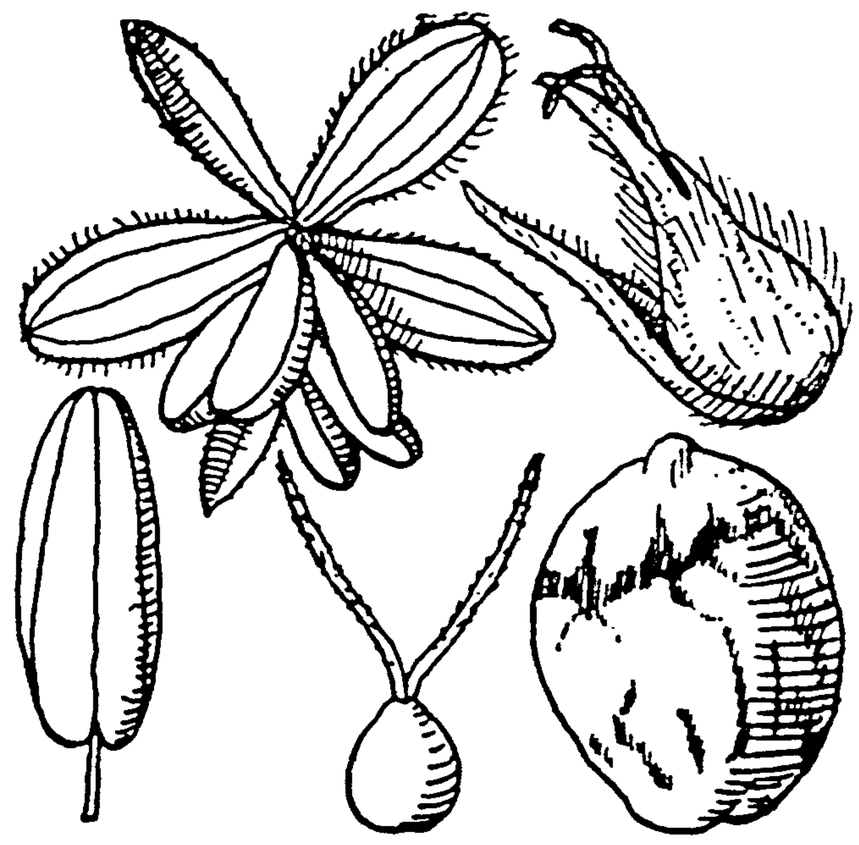
Stem twining: leaf-blades usually 3-lobed : fruit a drooping cone. 1. HUMULUS.
Stems erect: leaf-blades 3–7-parted: fruit spicate on stiff branches. 2. CANNABIS.

1. HUMULUS L. Perennial vines. Leaves opposite: blades serrate or lobed. Pistillate flowers 2 together in drooping spikes which become cone-like at maturity. —Two or 3 species widely distributed in the north temperate zone.—HOPS.



1. H. Lupulus L. Stem and branches pubescent with recurved hairs: leaf-blades orbicular or ovate in outline, 3–15 cm. in diameter, 3–6-lobed and serrate, or merely serrate: mature pistillate spikes 3–8 cm. long, ovoid or cylindric: achene subglobose, 2–3 mm. in diameter.—(HOP.)—Grown for the bitter hops—the fruits—which are used in brewing.—Thickets, fence-rows, and waste-places, various provinces, Fla. to Ariz., Wis., and N. S. Nat. of Eurasia.—Sum.

2. CANNABIS [Tourn.] L. Annual coarse herbs. Leaves opposite or alternate: blades digitately divided. Pistillate flowers solitary, bracted, spicate at maturity.—Represented by the following species only.—HEMPS.



1. C. sativa L. Stem 1–4 m. tall, rough-pubescent, the inner bark tough: leaf-blades 4–15 cm. long, the divisions 5–11, linear or linear-lanceolate, serrate, acuminate: mature pistillate spikes leafy-bracted: achene oval, 4–5 mm. long. (HEMP. HANGMAN'S-HEMP.)—Waste-places and fence-rows, various provinces, Ga. to Tenn., Kans., Minn., and N. B. Nat. of Asia.—Sum.—Hemp is cultivated both for

its fiber which is made into cloth and cordage, and as a source of a narcotic drug—hashish.

FAMILY 3. ARTOCARPACEAE — MULBERRY FAMILY

Shrubs or trees, the sap milky. Leaves mostly alternate: blades equilateral, entire, toothed, or lobed. Flowers monoecious or dioecious, in ament-like spikes or enclosed in a receptacle, the staminate with 3 or 4 stamens, the pistillate with a calyx of 3–5 sepals which greatly enlarge and subtend or envelop the achene: gynoecium of 1 or 2 united carpels; styles or stigmas 1 or 2. Fruit a syncarp or syconium.—About 55 genera and 1000 species, natives of tropical and temperate regions.—Our species have flowers with a green or greenish calyx.

Staminate and pistillate flowers on the outside of a receptacle: style or stigma terminal.
- Stigmas 2, short: pistillate spike cylindric. — Tribe I. MOREAE.
- Stigma solitary, elongate: pistillate spike globose. — Tribe II. PAPYRIEAE.

Staminate and pistillate flowers on the inside of a receptacle: style lateral. — Tribe III. FICEAE.

I. MOREAE

Widely branched shrubs and trees, the pistillate spikes becoming succulent, white, pink, purple, or nearly black. — 1. MORUS.

II. PAPYRIEAE

Staminate spikes cylindric: achene protruding: leaf-blades toothed or lobed. — 2. PAPYRIUS.

Staminate spikes globose: achene deeply imbedded: leaf-blades entire. — 3. TOXYLON.

III. FICEAE

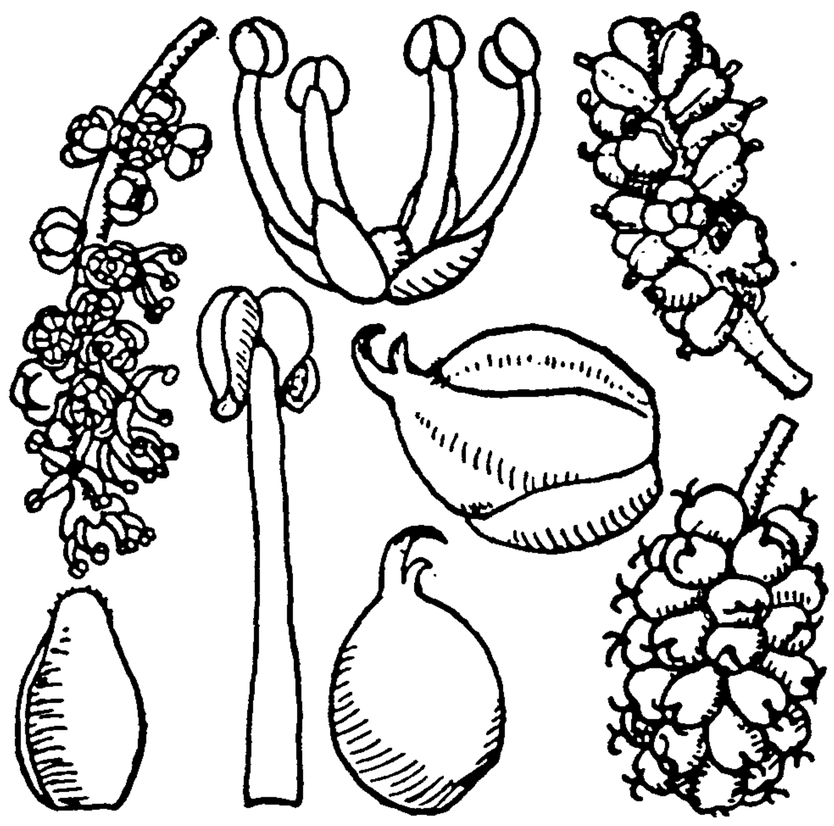
Shrubs and trees with milky sap, often producing copious aerial roots. — 4. FICUS.

1. MORUS [Tourn.] L. Shrubs or trees, with scaly bark. Leaves deciduous: blades commonly serrate, sometimes lobed. Staminate flowers in cylindric spikes, with 4 sepals and 4 stamens. Pistillate spikes cylindric: sepals 4, the lateral ones larger than the others: stigmas 2, short. Fruit cylindric, the achenes included in the calyx.—About 10 species, natives of the northern hemisphere.—The inner bark furnishes a fiber that has been used from prehistoric times.—MULBERRIES.

Leaf-blades glabrous beneath or sparingly pubescent on the nerves.
- Syncarp white or pinkish. — 1. *M. alba.*
- Syncarp black at maturity. — 2. *M. nigra.*

Leaf-blades softly pubescent beneath. — 3. *M. rubra.*

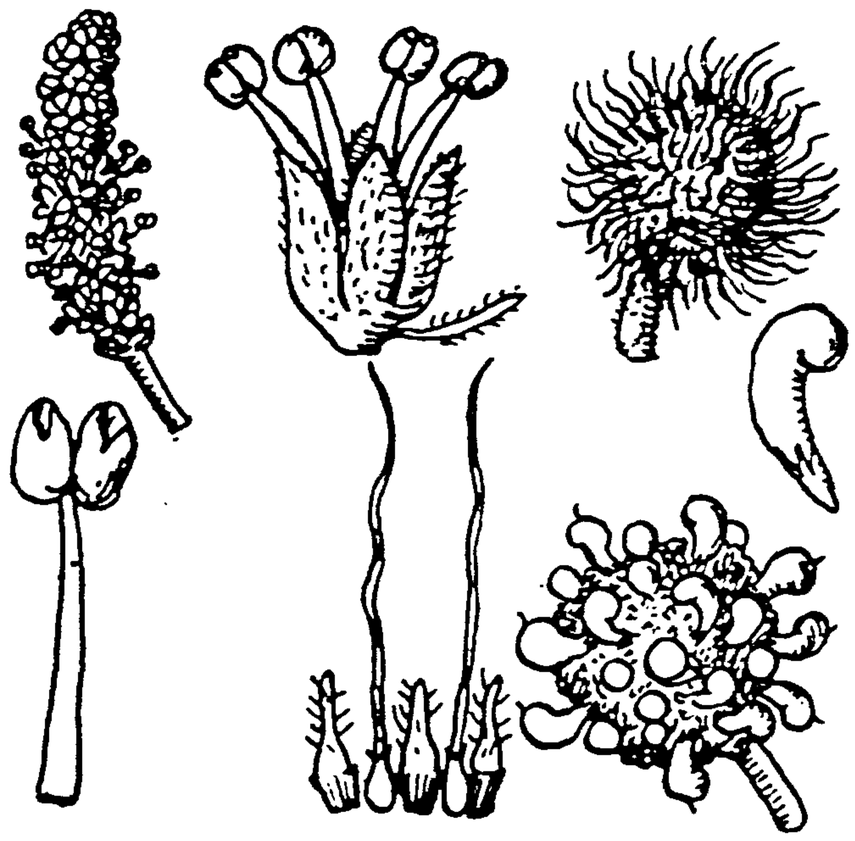
1. M. alba L. Tree 5–12 m. tall, with sparingly pubescent twigs: leaf-blades ovate to oval or oval-ovate, 6–20 cm. long, becoming glabrous beneath: staminate spikes 1–2 cm. long: fruit subglobose to oval-oblong, 1–2 cm. long, white or pinkish. — (WHITE-MULBERRY.) — Roadsides, fields and thickets, various provinces, Ga. to Tex., Minn., and Me. Nat. of Eu.—Spr.–sum.



2. M. nigra L. Shrub, or tree sometimes becoming 8 m. tall, with pubescent twigs: leaf-blades ovate, 4–15 cm. long, abruptly short-pointed, becoming glabrous, but usually rough above: staminate spikes 1–2 cm. long: fruits oval-oblong, 1–2 cm. long, black. — (BLACK-MULBERRY.) — Fencerows, roadsides and waste grounds, various provinces, Fla. to Tex. and N. Y. Nat. of Eurasia.—Spr.

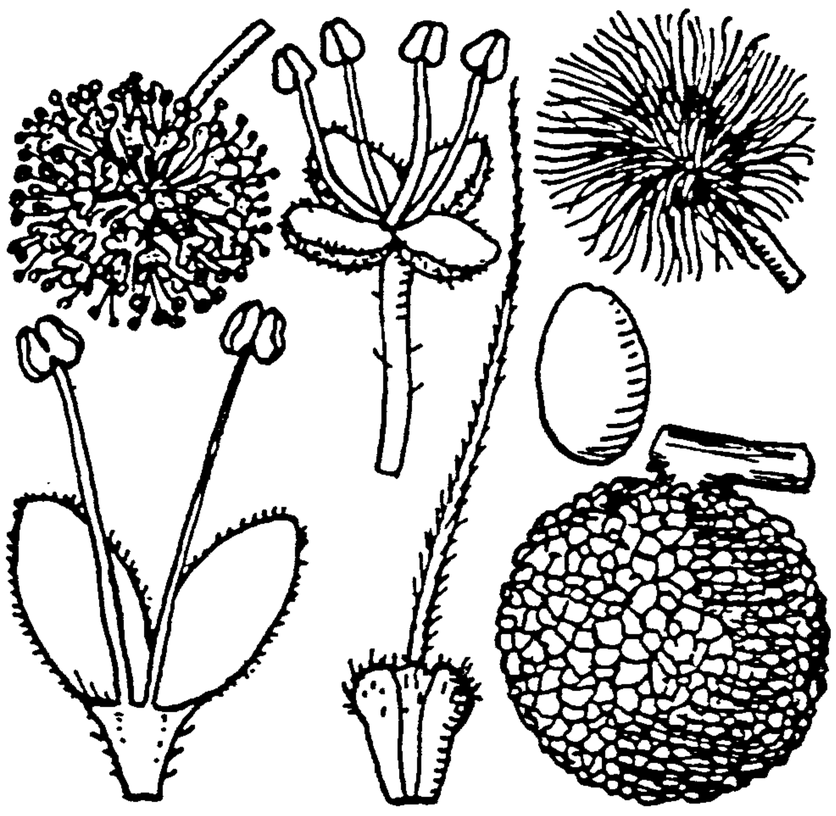
3. M. rubra L. Tree becoming 20 m. tall, with early glabrous twigs: leaf-blades ovate to oval or oval-ovate, 6–20 cm. long, softly pubescent beneath: staminate spikes 4–8 cm. long: fruit cylindric, 3–6 cm. long, deep-red or purplish.—(RED-MULBERRY.)—Rich woods and bottoms, various provinces, Fla. to Tex., S. D., Ont., and Vt.—Spr.—Perhaps two species are involved in *M. rubra* as now interpreted. The plants of Florida, especially those from the southern part of the State, have thicker, more copiously veiny, and more densely pubescent leaf-blades than in the more northern plants. The fruit, too, is drier, more compact, and more spicy in flavor than that of the northern plant. In Florida the mulberry is largely confined to the sites of aboriginal activity. Trees extend well to the Cape Sable region. They are always deciduous, while the host of associates are evergreen. The fibrous inner bark was used by the aborigines for clothing and for making other objects.

2. PAPYRIUS Lam. Trees with smooth bark. Leaves deciduous: blades serrate, often lobed. Staminate flowers in cylindric spikes, with 4 sepals and 4 stamens. Pistillate spikes globose: calyx 4-lobed: stigma 1, elongate. Fruit globular, each achene protruding from the persistent calyx.—Four species, Asiatic.



1. P. papyrifera (L.) Kuntze. Tree resembling the red-mulberry in habit, sometimes 15 m. tall, with hirsute-tomentose twigs: leaf-blades ovate, 8–16 cm. long, scabrous pubescent: fruits globular, 2–3 cm. in diameter, the protruding achenes reddish or orange. [*Broussonetia papyrifera* (L.) Vent.]—(PAPER-MULBERRY.)—Roadsides and about dwellings, various provinces, Fla. to Mo. and N. Y. Nat. of Asia.—Spr.—The inner bark furnishes both paper and cloth.

3. TOXYLON Raf. Shrubs or trees, with furrowed bark. Leaves deciduous: blades entire. Staminate flowers in globose raceme-like spikes, with 4 sepals and 4 stamens. Pistillate spikes globose: sepals 4, the lateral ones broader than the others: stigma 1, elongate. Fruit globose, the achenes deeply imbedded.—Represented by the following species only:



1. T. pomiferum Raf. Shrub, or tree becoming 20 m. tall: leaf-blades ovate, ovate-lanceolate, or oblong-lanceolate, 4–30 cm. long, acuminate, dark-green and lustrous above: calyx-lobes ovate: stamens long-exserted: fruit globose, 5–15 cm. in diameter, golden-yellow. [*Maclura aurantiaca* Nutt.] — (OSAGE-ORANGE, MOCK-ORANGE. BOW-WOOD.)—Woods, fields and thickets, Coastal Plain and adj. provinces, Ga. to Tex. and Mo.; also nat. in Atlantic States.—Readily forming thickets which the dense growth and thorns make almost impenetrable.—The strong flexible orange-colored or brown wood was formerly used by some Indian tribes for making bows. It is now used for objects where strength and durability are needed. The bark of the roots yields a yellow dye.—Late spr.–sum.

4. FICUS [Tourn.] L. Shrubs, trees, or vines, with smoothish bark. Leaves mainly persistent: blades entire, toothed, or lobed. Flowers in hollow receptacles, the staminate with a calyx of 2–6 sepals, or these obsolete, and 1–2 or rarely 3 stamens. Pistillate flowers numerous: style rather long: stigma clavate, peltate, or 2–lobed. Fruit depressed-globular or elongate, the achenes included.—About 600 species, natives of tropical and warm regions.—FIGS.

Leaf-blades entire, smooth and glabrous: fruit glabrous, 1–2.5 cm. long. I. AUREAE.
Leaf-blades lobed, very scabrous-pubescent: fruit pubescent, 4–8 cm. long. II. CARICAE.

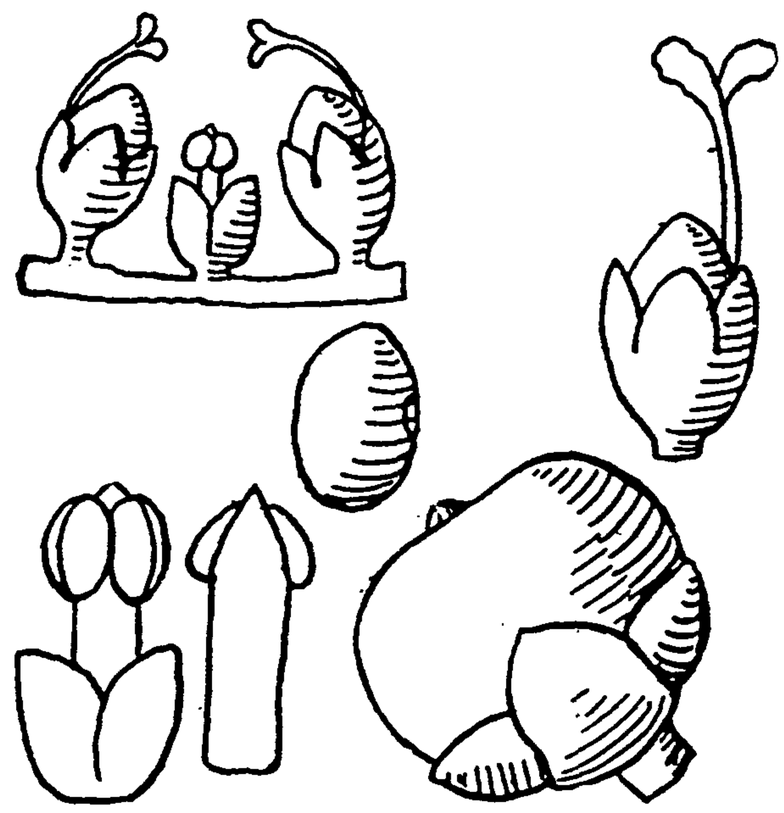
I. AUREAE

Fruit globose, spheroidal or obovoid: lateral veins of the leaf-blades few and separated.
Fruits sessile: leaf-blades usually narrow-based. 1. *F. aurea.*
Fruits peduncled: leaf-blades usually broad-based. 2. *F. brevifolia.*
Fruit oblong: lateral veins of the leaf-blades very numerous and close together. 3. *F. elastica.*

II. CARICAE

Shrub with many stems or a small tree, with coarsely pubescent foliage. 4. *F. Carica.*

1. F. aurea Nutt. Shrub, often starting as a vine, or tree becoming 20 m. tall, with glabrous twigs: leaf-blades elliptic, or oval, 3–10 cm. long, acute or short-acuminate at the base: fruits spheroidal or obovoid, about 2 cm. in diameter. — (GOLDEN-FIG. STRANGLER-FIG.) — Hammocks, S pen. Fla. and Florida Keys. —(*W. I.*)—Seedling plants are epiphytic. They emit aerial roots which coalesce and finally "strangle" the host. The roots and branches finally form a terrestrial forest tree which may in turn "strangle" itself.



2. F. brevifolia Nutt. Shrub, or tree sometimes 15 m. tall, with glabrous twigs: leaf-blades ovate-oval or rarely obovate, 3–10 cm. long, mainly rounded or cordate at the base: fruit subglobose, 2–2.5 cm. in diameter. [*F. populnea* Willd.]—(WILD-FIG. WILD-BANYAN.) — Hammocks and rarely in pinelands, Everglade Keys, pen. Fla. and Florida Keys.—(*W. I.*)—The seedlings of this fig are also epiphytic. The aerial roots may coalesce to form a stout trunk, usually without strangling the host. If the roots fail to coalesce they may spread out forming a structure like the banyan.

3. F. elastica Roxb. Tree with glabrous twigs: leaf-blades elliptic, often broadly so, 9–30 cm. long, abruptly blunt- or acute-tipped, glabrous, shining, short-petioled: fruit oblong, 1–1.5 cm. long, greenish-yellow, smooth, sessile.—(RUBBER-PLANT. INDIA-RUBBER PLANT.)—Pinelands and roadsides, S pen. Fla. Nat. of trop. Asia.

4. F. Carica L. Shrub, or tree 2–5 m. tall, with pubescent twigs: leaf-blades palmately 5–7-lobed; petioles pubescent: fruit obovoid, 4–8 cm. long.—(COMMON-FIG.)—Fields, roadsides, and cult. grounds, Coastal Plain and adj. provinces, Fla. to Tex., Tenn., and Va. Nat. of Asia.

Family 4. ULMACEAE — Elm Family

Shrubs or trees, the sap watery. Leaves alternate: blades inequilateral, commonly toothed. Flowers perfect, polygamous or monoecious, variously disposed. Calyx of 4 or 5, or rarely 3–9 partially united sepals. Androecium of usually as many stamens as there are sepals. Gynoecium of 2 united carpels. Fruit a samara or a drupe, or nut-like.—About 13 genera and 140 species, widely distributed.—Ours have greenish flowers.

Fruit dry, a samara, or nut-like: anthers introrse: embryo straight. — Tribe I. Ulmeae.
Fruit a drupe: anthers extrorse: embryo with conduplicate cotyledons. — Tribe II. Celtideae.

I. Ulmeae

Flowers perfect: fruit a samara. — 1. Ulmus.
Flowers polygamo-monoecious: fruit nut-like, tubercled. — 2. Planera.

II. Celtideae

Flowers solitary or merely clustered: drupe solitary. — 3. Celtis.
Flowers in dichotomous cymes: drupes in cymes.
  Stigmas entire: staminate flowers with valvate calyx-lobes. — 4. Trema.
  Stigmas 2-cleft: staminate flowers with imbricate calyx-lobes. — 5. Momisia.

1. ULMUS [Tourn.] L. Shrubs or trees, with furrowed bark and sometimes winged branches. Leaves deciduous: blades toothed. Calyx campanulate. Ovary sessile or nearly so, smooth, but sometimes pubescent. Samara orbicular to oblong. About 16 species, natives of the Northern Hemisphere.—The inner bark of some species is used for making ropes and coarse cloth. Some species are extensively used for shade trees.—Elms.

Flowers and fruits autumnal: flower-clusters in the leaf-axils. — I. Serotinae.
Flowers and fruits vernal: flower-clusters on naked branches. — II. Americanae.

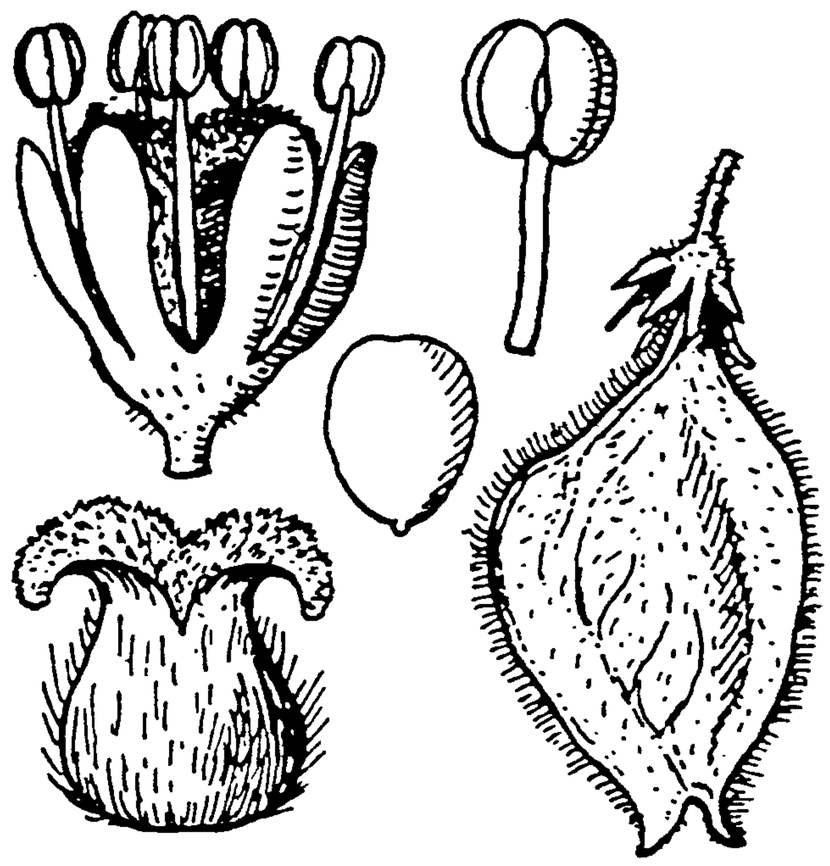
I. Serotinae

Leaf-blades obtuse: samaras ciliolate. — 1. *U. crassifolia.*
Leaf-blades acute or short-acuminate: samaras ciliate. — 2. *U. serotina.*

II. Americanae

Flower-clusters long: pedicels longer than the calyx: samara deeply notched.
  Samara over twice as long as wide: branches corky winged. — 3. *U. alata.*
  Samara less than twice as long as wide: branches wingless.
    Samara ovate, the tips erect or nearly so: leaf-twigs mainly glabrous. — 4. *U. floridana.*
    Samara oval or obovate, the tips converging: leaf-twigs mainly pubescent. — 5. *U. americana.*
Flower-clusters dense: pedicel shorter than the calyx: samara not notched. — 6. *U. fulva.*

1. U. crassifolia Nutt. Tree becoming 30 m. tall, the branches often corky-winged, the twigs pubescent: leaf-blades elliptic, varying to broadly elliptic or ovate, 1.5–4 cm. long, obtuse, finely serrate, rough above; petioles 1–2 mm. long: calyx about 1.5 mm. long: samara oval, 8–10 mm. long, ciliolate.—(Cedar-elm.)—Woods and river-bottoms, Coastal Plain and adj. provinces, Miss. to Tex. and Ark.—(*Mex.*)—Late sum.–fall.



2. U. serotina Sarg. Tree becoming 16 m. tall, the branches often corky-winged, the twigs glabrous, at least at maturity: leaf-blades elliptic to oval, or broadest above the middle, 5–8 cm. long, short-acuminate, coarsely serrate, smooth above; petioles 4–5 mm. long: calyx 2.5–3 mm. long: samara oblong-elliptic, 10–12 mm. long, ciliate.—

(SEPTEMBER-ELM.)—Rich ravines and bluffs, Appalachian and Interior Low plateau provinces, Ga. to Ala. and Tenn.—Fall.

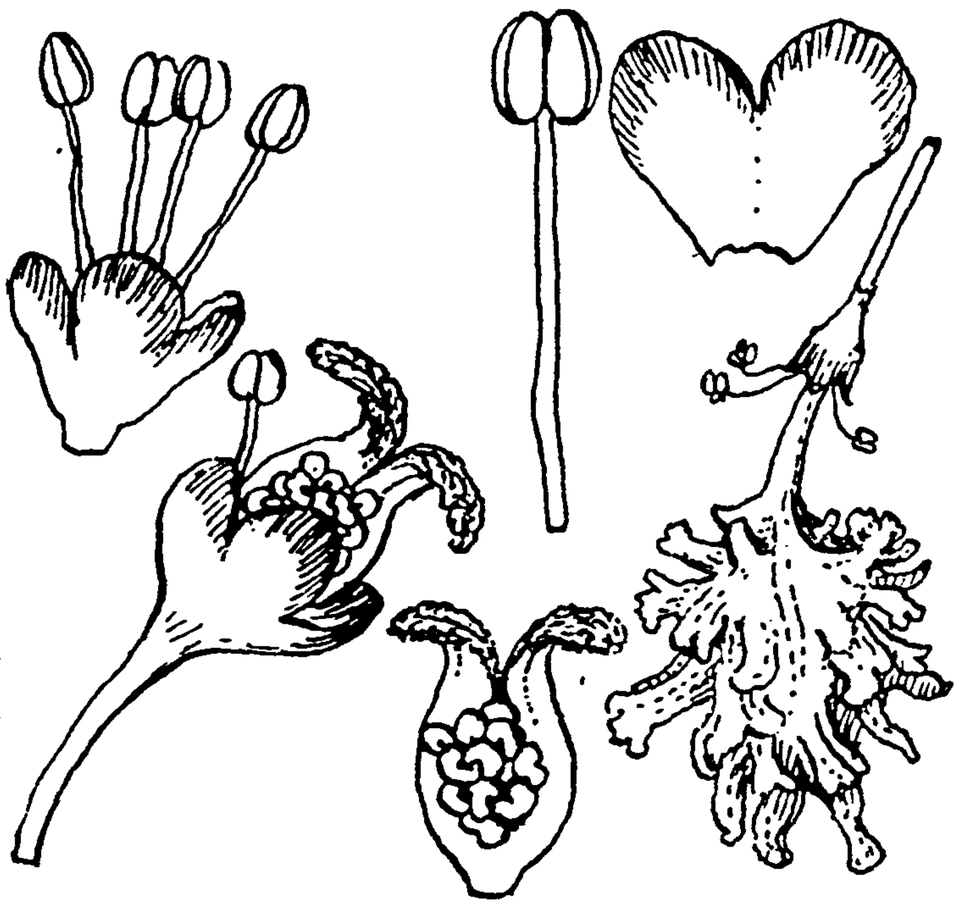
3. **U. alata** Michx. Tree becoming 20 m. tall, the branches often corky-winged: leaf-blades narrowly elliptic or broadly elliptic, or rarely broader, 2–10 cm. long, typically smooth above; petioles 1.5–3 mm. long: calyx deeply lobed: samara elliptic, 6–8 mm. long, long-stipitate, the wings pubescent and long-ciliate.—(WINGED-ELM. WAHOO. RED-ELM. WATER-ELM. CORK-ELM.)—River banks, swamps and woods, Coastal Plain and adj. provinces, Fla. to Tex., Kans., Ind., and Va.—Spr.

4. **U. floridana** Chapm. Tree becoming 20 m. tall, the branches not corky-winged, the twigs glabrous: leaf-blades mainly elliptic, oval, or ovate, 3–12 cm. long, mostly smooth above; petioles 6–10 mm. long: calyx shallowly lobed: samara ovate, 11–13 mm. long, short-stipitate, the wings merely long-ciliate.—(FLORIDA-ELM.)—Swamps and low hammocks, Coastal Plain, Fla. to N. C.—Spr.

5. **U. americana** L. Tree becoming 40 m. tall, the branches not corky-winged, the twigs typically pubescent: leaf-blades oval to ovate, 5–10 cm. long, sometimes rough-pubescent above; petioles 4–7.5 mm. long: flower-clusters lax: calyx shallowly lobed: samara oval or obovate, 10–12 mm. long, the wings merely long-ciliate.—(WHITE-ELM. AMERICAN-ELM. COMMON-ELM. ROCK-ELM.)—Moist woods, river-banks, and low grounds, often calcareous, various provinces, N Fla. to Tex., Sask., Ont., and Newf.—Early spr.

6. **U. fulva** Michx. Tree becoming 25 m. tall, the twigs densely pubescent, the inner bark mucilaginous: leaf-blades ovate-oval or obovate, 8–19 cm. long, rough-pubescent on both sides: flower-clusters dense: samara suborbicular, 14–17 mm. in diameter, finely pubescent, ciliate.—(SLIPPERY-ELM. RED-ELM. SWEET-ELM. ROCK-ELM. INDIAN-ELM.)—Rich, often rocky woods and banks, various provinces, W Fla. to Tex., N. D., and Que.—Early spr.—The fragrant mucilaginous inner bark is used in medicine.

2. **PLANERA** J. F. Gmel. Trees, with scaly bark. Leaves deciduous: blades toothed. Calyx campanulate. Ovary short-stipitate, tubercular. Nut-like fruit irregularly warty. One species.



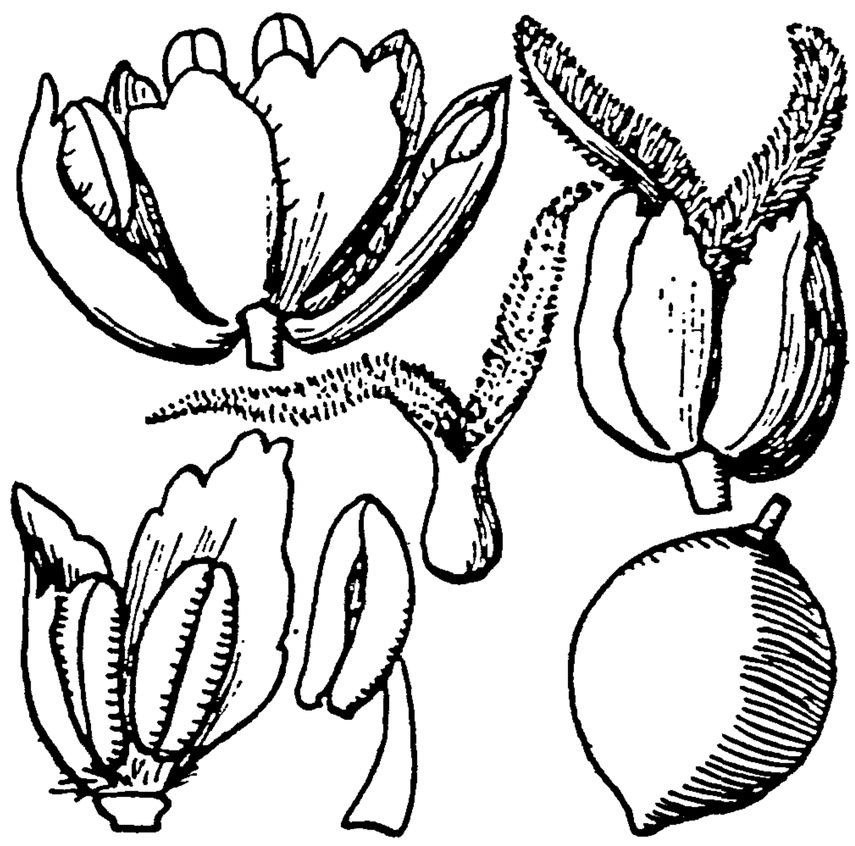
1. **P. aquatica** (Walt.) J. F. Gmel. Tree becoming 12 m. tall: leaf-blades ovate or elliptic-ovate, 3–8 cm. long, serrate or crenulate-serrate, short-petioled: calyx lobes ovate, obtuse: fruit ovoid, about 1 cm. long, short-stalked, the processes soft.—(WATER-ELM. HORNBEAM.)—Swamps and river-banks subject to considerable fluctuation of water, Coastal Plain, N Fla. to Tex., S Ill., and N. C.—Spr.—The favorite habitat in the southeastern coastal regions is deep swamps which are covered with water during several months of each year. However, its greatest development is in the higher lands of western Louisiana and southern Arkansas.

3. **CELTIS** [Tourn.] L. Unarmed shrubs or trees, the bark often warty. Leaves deciduous: blades entire or toothed, very inequilateral. Calyx rotate, the lobes much longer than the tube. Stigmas 2, entire. Drupe subglobose.—

About 60 species of tropical and temperate regions. The wood is used in the manufacture of furniture.—Spr.—HACKBERRIES. NETTLE-TREES. SUGAR-BERRIES.

Leaf-blades of an ovate type.
  Mature drupe 7–10 mm. in diameter. 1. *C. occidentalis.*
  Mature drupe 5–7 mm. in diameter. 2. *C. georgiana.*
Leaf-blades of a lanceolate type.
  Leaf-blades entire or nearly so. 3. *C. mississippiensis.*
  Leaf-blades sharply serrate. 4. *C. Smallii.*

1. C. occidentalis L. Tree becoming 40 m. tall, the twigs glabrous (or pubescent, and leaf-blades rough above in *C. crassifolia* which now appears not to be specifically distinct): leaf-blades ovate or rarely elliptic-ovate, 5–15 cm. long, smooth or nearly so above: drupe oval, globose or subglobose, 7–10 mm. in diameter, orange, purple or nearly black.—(BEAVER-WOOD. BASTARD-ELM. ONE-BERRY.)—Woods and river-banks, various provinces, rarely Coastal Plain, S. C. to Ala., Okla., Man., and Que.



2. C. georgiana Small. Shrub, or tree becoming 8 m. tall, the twigs pubescent: leaf-blades deep-green, ovate, 2–5 cm. long, rough and sometimes sparingly pubescent above, entire or sharply serrate: drupe globose or nearly so, 5–7 mm. in diameter, red-purple or tan-colored.—(GEORGIA-HACKBERRY.)—Rocky places and stream-banks, Coastal Plain and adj. provinces, Fla. to Ala., Mo., and N. J.

3. C. mississippiensis Bosc. Tree becoming 30 m. tall, the twigs sometimes pubescent: leaf-blades lanceolate varying to ovate-lanceolate or elliptic-lanceolate (relatively broader, often ovate, in *C. Berlandieri*), 6–12 cm. long, long-acuminate, entire or nearly so: drupe globose or ovoid-globose, 5–7 mm. in diameter, dark-purple or orange-red.—Rich woods, river-bottoms, and hammocks, Coastal Plain and adj. provinces, Fla. to Tex., Mo., Ind., and D. C.—(*W. I., Mex.*)

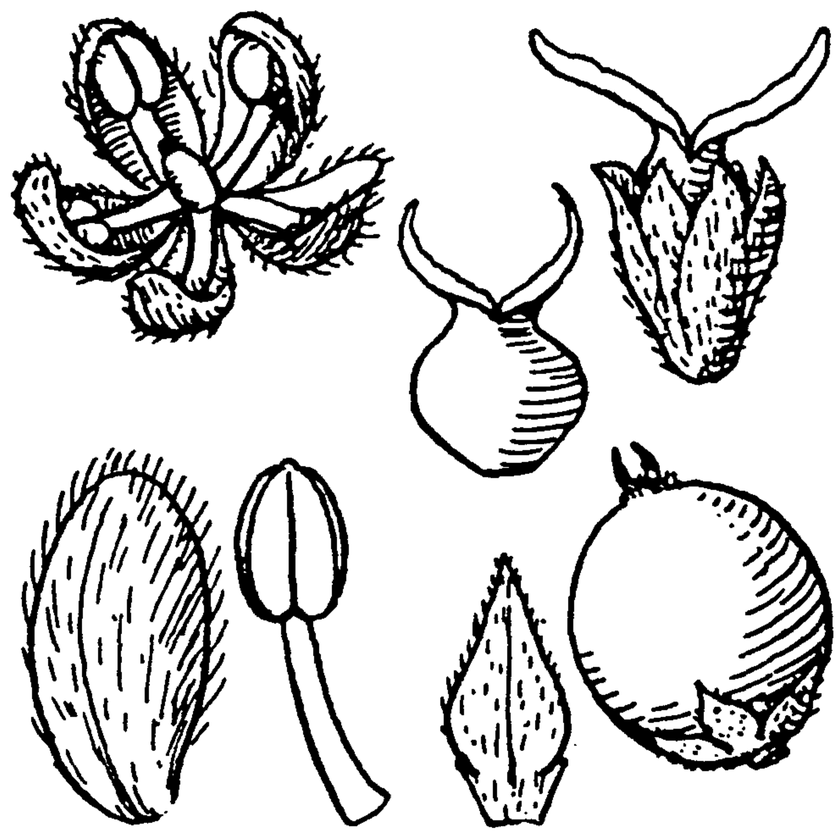
4. C. Smallii Beadle. Tree usually smaller than *C. mississippiensis:* leaf-blades thin, lanceolate or elliptic-lanceolate, 5–10 cm. long, acuminate, with the tips sometimes elongate, sharply and irregularly serrate: drupe subglobose, 5–7 mm. in diameter.—Sandy or rocky woods and river-banks, Coastal Plain and adj. provinces, Fla. to Ala., Mo., Ky., and N. C.

4. TREMA Lour. Unarmed shrubs or trees, the bark smoothish: leaves persistent: blades toothed, more or less inequilateral. Calyx rotate, the lobes much longer than the tube. Stigmas 2, entire. Drupe ovoid or globose.—About 30 species of tropical regions.—In Florida the fruits are a favorite bird-food.—NETTLE-TREES.

Leaf-blades cordate at the base: anthers over 1 mm. long: drupe yellow or orange. 1. *T. floridana.*
Leaf-blades obtuse or rounded at the base: anthers less than 1 mm. long: drupe pink. 2. *T. Lamarckiana.*

1. T. floridana Britton. Shrub, or tree 6 m. tall, with copiously pubescent foliage: leaf-blades ovate, elliptic-ovate or lanceolate, 4–10 cm. long, softly

pubescent beneath: calyx greenish: drupe subglobose, 2.5–3.5 mm. in diameter, yellow or orange.—(FLORIDA-TREMA.)—Hammocks, particularly where burned or cleared, S pen. Fla. and the Keys.—Often a roadside weed.



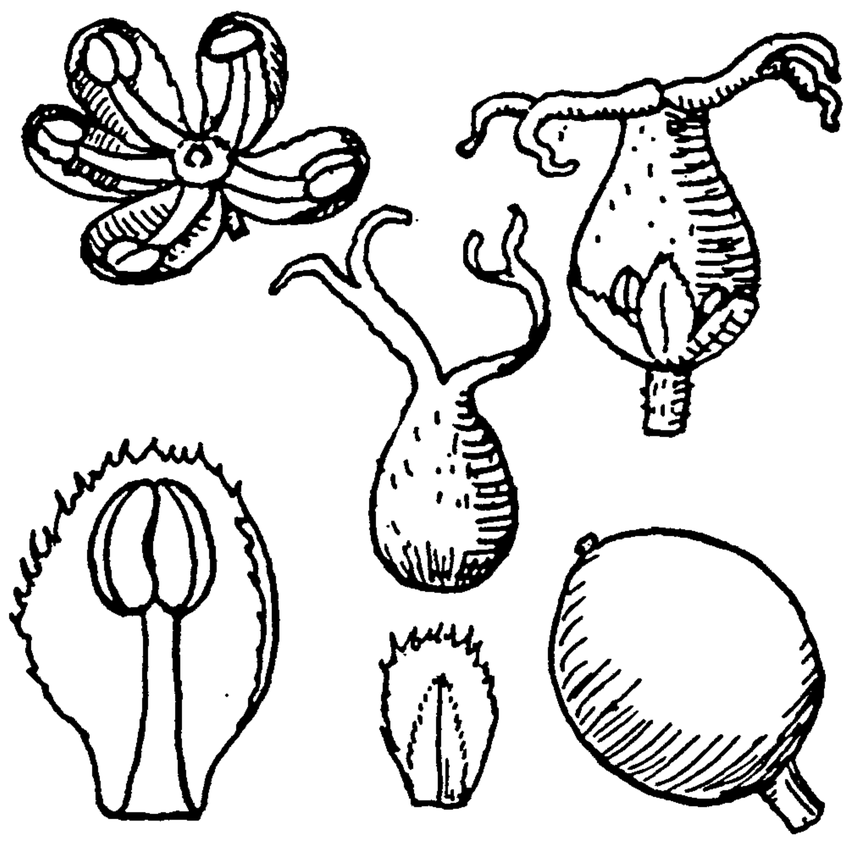
2. T. Lamarckiana (R. & S.) Blume. Small tree or shrub, with finely hirsute or velvety twigs: leaf-blades elliptic, lanceolate, or narrowly ovate, mostly 1–3 cm. long, finely serrate, scabrous above, veiny-reticulate beneath, obtuse or rounded at the base: calyx whitish or pinkish: drupe ovoid or globose-ovoid, 2–2.5 mm. in diameter, pink.—(WEST-INDIAN TREMA.)—Hammocks and prairies, S pen. Fla. and the Keys.—(*W. I.*)

5. **MOMISIA** F. G. Dietr. Spine-armed shrubs or trees, the bark relatively smooth. Leaves deciduous: blades toothed, slightly inequilateral. Calyx rotate, the lobes much longer than the tube. Stigmas 2, each 2-cleft. Drupe oblong, ovoid, or globose.—Spr.—CHAPARRAL-SHRUBS.

Leaf-blades nearly smooth: drupe 8–12 mm. in diameter: stone with warty faces. 1. *M. Iguanaea.*

Leaf-blades very scabrous: drupe 5–8 mm. in diameter: stone with reticulate faces. 2. *M. pallida.*

1. M. Iguanaea (L.) Rose & Standley. Stem and branches spreading or climbing, 1–3 m. long, the branches with recurved spines, glabrous: leaf-blades ovate, oval or elliptic-ovate, 4–12 cm. long, often coarsely toothed, nearly smooth: drupe globose-ovoid. [*M. aculeata* (Sw.) Kl.]—Hammocks, kitchenmiddens W coast of Fla. and Coastal Plain Tex.—(*W. I., Mex., C. A., S. A.*)



2. M. pallida (Torr.) Planch. Stem and branches spreading, 2–4 mm. long, the branches puberulent, with straight spines: leaf-blades ovate to elliptic, 2–3.5 cm. long, often coarsely toothed, rough: drupe subglobose.—Hammocks, kitchenmiddens, SW coast of Fla. and Coastal Plain Tex.—(*Mex.*)

ORDER **POLYGONALES** — POLYGONAL ORDER

Herbs, shrubs, trees, or vines. Leaves alternate, or sometimes opposite or whorled: blades mostly entire: stipules present, usually as a sheath, rarely obsolete. Flowers perfect, monoecious, dioecious, or polygamous, variously disposed. Hypanthium long or short. Calyx of 2–6 sepals, which sometimes develop keels or wings. Corolla wanting. Androecium of 2–9 stamens. Gynoecium of 2 or 3 united carpels, the ovary superior. Fruit an achene.

FAMILY 1. **POLYGONACEAE** — BUCKWHEAT FAMILY

Plants various in habit. Leaves with manifest, usually sheathing, stipules (ocreae) and inflorescence not involucrate, or the stipules sometimes obsolete and the inflorescence involucrate.—About 40 genera and 800 species, widely distributed.—Some plants furnish food, others are used in ornamental gardening. Many species are weeds.

Flowers, or flower-clusters subtended by involucres: stamens 9: no sheaths (ocreae) at the nodes of the stem and the branches. Tribe I. ERIOGONEAE.
Flowers, or flower-clusters, not involucrate, but subtended by sheathing bracts (ocreolae) at the nodes of the inflorescence: stamens 4–8: sheaths (ocreae) surrounding the stem and the branches above each node, except in *Brunnichia*.
  Hypanthium slightly developed, except often as a stipe-like more or less elongate base.
    Stigmas tufted or fimbriate-pinnatifid. Tribe II. RUMICEAE.
    Stigmas not tufted.
      Stamens distinct: herbs or vines without tendrils. Tribe III. POLYGONEAE.
      Stamens with the filaments united into a tube at the base: vines with tendrils. Tribe IV. ANTIGONONES.
  Hypanthium well-developed, enclosing the achene. Tribe V. COCCOLOBEAE.

I. ERIOGONEAE

Annual or perennial plants with alternate or whorled leaves and bracts: involucres lobed, sessile or peduncled, each with few or many exserted flowers: achene often swollen at the base. 1. ERIOGONUM.

II. RUMICEAE

Sepals of pistillate flower distinct, neither indurated nor with spreading horn-like spines.
  Inner sepals not developing wings: achene partly exposed, granular. 2. ACETOSELLA.
  Inner sepals developing wings: achene included, smooth. 3. RUMEX.
Sepals of the pistillate flower partly united into an indurated urceolate perianth, the tips of the three outer developing into spreading horn-like spines. 4. EMEX.

III. POLYGONEAE

Internodes of the stem and the branches partly adnate.
  Inner sepals not fimbriate, often conspicuously accrescent.
    Inner sepals accrescent, wing-like: achene included.
      Anthers alike or nearly so: outer sepals reflexed. 5. POLYGONELLA.
      Anthers various, those of the filaments with dilated bases very small and imperfect: outer sepals appressed. 6. DENTOCERAS.
    Inner sepals not accrescent: achene partly exposed. 7. DELOPYRUM.
  Inner sepals fimbriate, somewhat accrescent. 8. THYSANELLA.
Internodes of the stem and the branches not adnate.
  Leaf-blades jointed at the base: ocreae 2-lobed, becoming lacerate: filaments, at least the inner, dilated. 9. POLYGONUM.
  Leaf-blades not jointed at the base: ocreae various, not 2-lobed: filaments slender.
    Ocreae cylindric, truncate, sometimes fringed.
      Sepals 4: calyx curved: stamens 4 or 5. 10. TOVARA.
      Sepals 5, or if fewer, the stamens more than 5: calyx not curved. 11. PERSICARIA.
    Ocreae oblique, more or less open on the side facing the leaf.
      Sepals neither keeled on the back nor winged: erect or reclining herbs.
        Racemes collected into terminal corymbs: embryo dividing the endosperm by an S-shaped curve: plants smooth. 12. FAGOPYRUM.
        Racemes not in terminal corymbs: embryo slender, at one side of the endosperm: plants prickle-armed. 13. TRACAULON.
      Sepals, at least the outer ones, keeled or winged: vines with twining stems and branches or large herbs with numerous hollow stems arising from extensively branching rootstocks.

Stigmas capitate. styles short, erect, or none: stems slender, twining. 14. BILDERDYKIA.
Stigmas dilated, toothed: styles divaricate: stems stout, erect. 15. PLEUROPTERUS.

IV. ANTIGONONES

Vine with broad leaves, and racemes of pink or red flowers, terminating in tendrils. 16. CORCULUM.

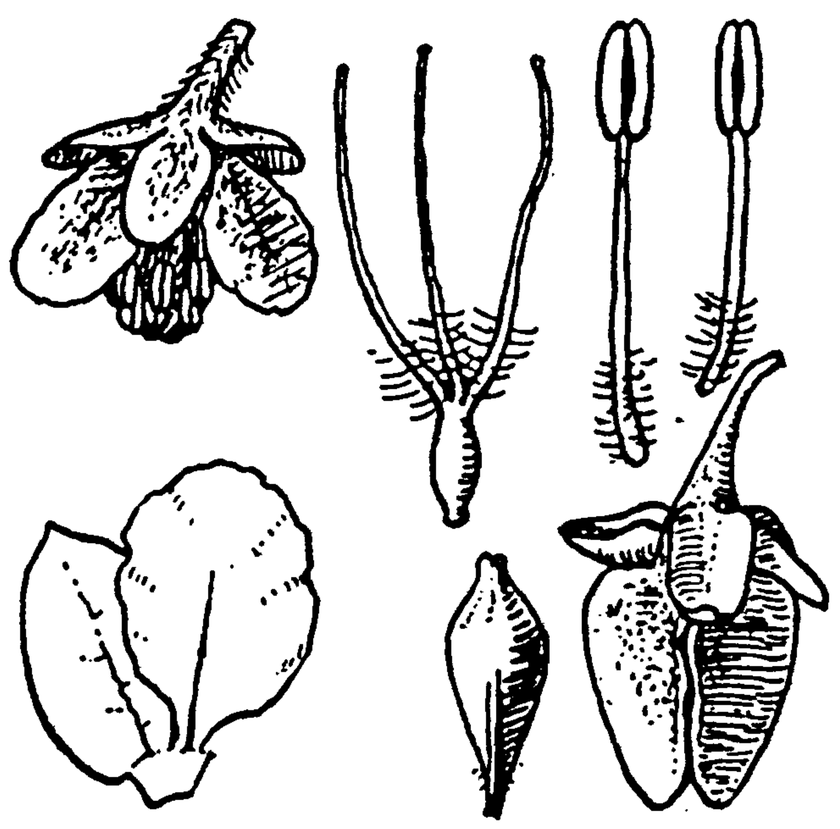
V. COCCOLOBEAE

Vine with tendrils: hypanthium developing into a samara-like fruit with a wing extending the length of the elongate pedicel-like base: stigmas 2-cleft. 17. BRUNNICHIA.
Shrubs or trees: hypanthium developing into a drupe-like fruit: stigmas not 2-cleft. 18. COCCOLOBIS.

1. ERIOGONUM Michx. Herbs, partially woody plants, or shrubs. Leaves mainly alternate, without ocreae, the stipules scale-like. Flowering-stems or branches with alternate or whorled bracts. Flowers involucrate. Hypanthium jointed to a pedicel which is subtended by a minute bractlet. Sepals 6, often unequal. Stamens 9. Gynoecium 3-carpellary: stigmas capitate.—About 250 species, North American, mostly in the western United States—WILD-BUCKWHEATS. UMBRELLA-PLANTS.

Flowering stem with whorled leaves, the blades relatively wide: inflorescence with leaf-like bracts: sepals broad, flat or crisped: filaments pubescent below. 1. *E. tomentosum.*
Flowering stem with alternate leaves, the blades relatively narrow: inflorescence with minute bracts: sepals narrow, involute: filaments glabrous. 2. *E. floridanum.*

1. E. tomentosum Michx. Basal leaves evergreen, 5–18 cm. long; blades oblong to spatulate: flowering-stem 4–12 dm. tall, the leaves in whorls of 3–5; blades ovate to obovate or oblanceolate: involucres about 4 mm. long: sepals white, the inner ones becoming ovate to suborbicular, 6–8 mm. long, broadly cuneate to truncate at the base, tomentulose without: achenes about 5 mm. long.—(DOG-TONGUE. WILD-BUCKWHEAT.)—Dry pinelands and sandhills, Coastal Plain, Fla. to Ala. and S. C.—Sum.–fall or all year S.



2. E. floridanum Small. Basal leaves somewhat persistent, 8–20 cm. long; blades long; blades broadly or narrowly linear: flowering stem 6–10 dm. tall, the leaves alternate; blades linear to linear-lanceolate: involucres 6–7 mm. long: involute sepals slender-subulate, becoming 5–6 mm. long, long-silky: achenes about 6 mm. long, pubescent, the beak nearly as long as the body. [*E. longifolium* (Chapm. Fl.)]—Dry sandy pinelands and scrub, C Fla.—Spr.–fall.

2. ACETOSELLA Raf. Perennial herbs. Leaves alternate, with very thin ocreae. Flowers dioecious, in panicles, the hypanthium base conspicuously jointed to the curved pedicel. Sepals 6, essentially unchanged in fruit, without

callosities. Stamens 6. Stigmas peltate, tufted. Achene exserted, granular, the angles not margined. One species in many forms.

1. A. Acetosella (L.) Small. Plant glabrous, 1–6 dm. tall: blades of the lower leaves 2.5–15 cm. long, hastate, the auricles entire or toothed: sepals green, or reddish, those of the pistillate flowers becoming 1 mm. long: achene ovoid, 3-angled, 1.5 mm. long. [*Rumex Acetosella* L.]—(SHEEP-SORREL. FIELD-SORREL. COW-SORREL. HORSE-SORREL. SOUR-GRASS. SOUR-DOCK.)—Sterile soil, roadsides, fields, meadows, pastures, and waste-places, throughout U. S. and Can., except the extreme N and S. Nat. of Eu.—(Almost cosmop.)—Spr.–fall.

3. RUMEX L. Annual or perennial fleshy herbs. Leaves alternate, with brittle ocreae. Flowers in panicles, perfect, polygamous, or dioecious, the hypanthium-base conspicuously jointed to the pedicel. Sepals green, 6, unequal or the 3 inner developing wings, one or all of which usually bear a callosity or tubercle. Stamens 6. Stigmas peltate, tufted. Achene exserted or included, smooth or granular, usually more or less margined.—About 140 species, of wide geographic distribution.—The foliage of some species is eaten as "greens."—DOCKS.

Flowers dioecious: lower leaves with hastate blades: plants acid. — I. HASTATULI.
Flowers perfect or andro-polygamous: leaf-blades not hastate: plants not acid.
  Mature inner sepals (wings) entire, undulate or toothed, not spinulose-margined.
    Sepal-wings broad, ovate, deltoid, or somewhat reniform or hastate. — II. CRISPI.
    Sepal-wings narrow, elliptic to pandurate, or elliptic-ovate. — III. SANGUINEI.
  Mature inner sepals (wings) spinulose-margined. — IV. OBTUSIFOLII.

I. HASTATULI

Perennial dioecious plant with horizontal rootstocks: panicle naked. — 1. *R. hastatulus.*

II. CRISPI

Pedicel-like hypanthium-base short, usually about as long as the sepal-wings or shorter, spreading or recurved.
  Only one sepal-wing bearing a tubercle. — 2. *R. altissimus.*
  All three sepal-wings bearing tubercles.
    Leaf-blades flat, the edges not crisped. — 3. *R. Berlandieri.*
    Leaf-blades crisped.
      Sepal-wings deltoid, ovate-deltoid or hastate.
      Sepal-wings round-ovate. — 4. *R. crispus.*
Pedicel-like hypanthium-base elongate, much longer than the sepal-wings, deflexed.
  Leaf-blades broad, short, broadly rounded or cordate at the base: sepal-wings denticulate. — 5. *R. fascicularis.*
  Leaf-blades narrow, elongate, acutely narrowed at the base: sepal-wings undulate.
    Sepal-wings reniform. — 6. *R. floridanus.*
    Sepal-wings ovate, hastate, or reniform-hastate. — 7. *R. verticillatus.*

III. SANGUINEI

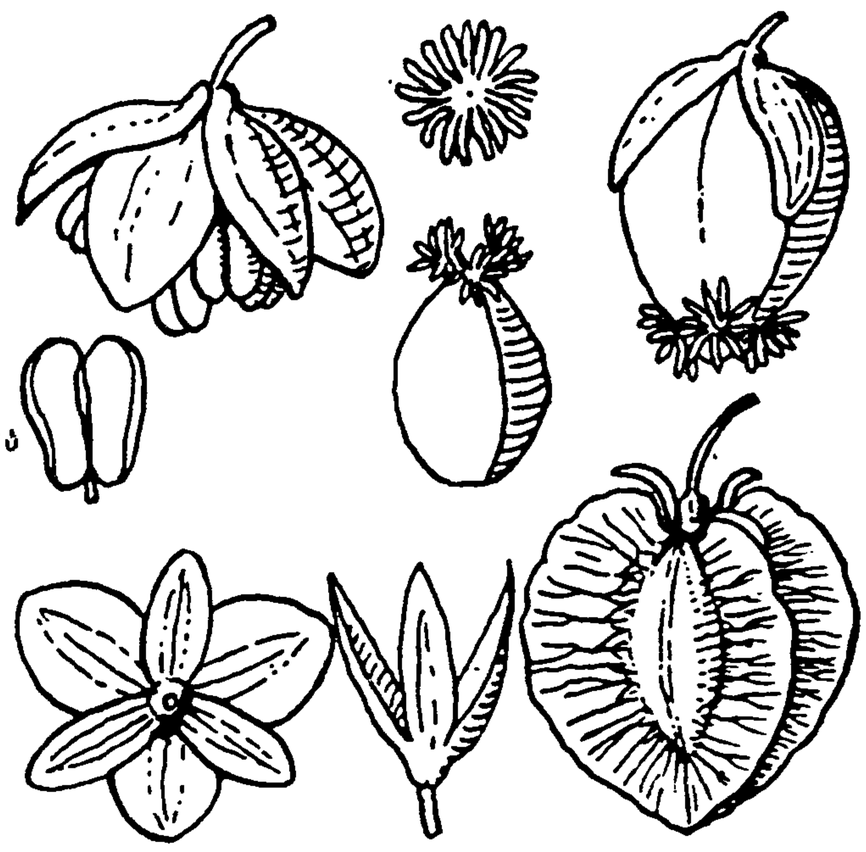
Only one sepal developing a tubercle: whorls of the inflorescence not leafy-bracted. — 8. *R. sanguineus.*

All three sepals developing tubercles: whorls of the inflorescence, at least the lower ones, leafy-bracted.
Mature sepal-wings about 3 mm. long: achene less than 2 mm. long. 9. *R. conglomeratus.*
Mature sepal-wings 5–6 mm. long: achene 2.5–3 mm. long. 10. *R. cuneifolius.*

IV. OBTUSIFOLII

Blades of the lower leaves cordate or truncate at the base: tall perennial plants.
Stipe-like base of the hypanthium much shorter than the sepal-wings: two sepal-wings with callosities. 11. *R. pulcher.*
Stipe-like base of the hypanthium mostly longer than the sepal-wings: one sepal-wing with a callosity. 12. *R. obtusifolius.*
Blades of the lower leaves gradually or abruptly narrowed at the base: low annual plants. 13. *R. persicarioides.*

1. R. hastatulus Baldw. Plant 1.5–13 dm. tall: basal and lower stem-leaves 5–15 cm. long; blades with 2 spreading auricles at the base or sometimes merely undulate: sepal-wings reniform to ovate-reniform, 3.5–4 mm. wide: achene nearly 1.5 mm. long.—Sandy soil, roadsides, fields, and woods, Coastal Plain and adj. provinces, Fla. to Tex., Kans., Ill., and Mass.—Spr.



2. R. altissimus Wood. Plant 6–20 dm. tall, the panicle-branches ascending: lower stem-leaves 1–3 dm. long; blades lanceolate to elliptic-lanceolate, scarcely crisped: sepal-wings triangular-ovate, 4–5 mm. long, longer than wide, slightly cordate: achene about 3 mm. long.—(PALE-DOCK. PEACH-LEAVED DOCK.)—River-banks, ditches, and low woods, various provinces, rarely Coastal Plain, Ga. to Tex., Nebr., and Mass.—Spr.–sum.

3. R. Berlandieri Meisn. Pant 5–7 dm. tall, the panicle-branches loosely flowered: lower stem-leaves 8–17 cm. long; blades elliptic: often narrowly so, flat or nearly so: whorls of the inflorescence often separated: sepal-wings deltoid, about 4 mm. long, leathery; achene fully 2.5 mm. long. [*R. Langloisii* Small]—Low grounds, prairies, and ditches, Coastal Plain, La. and Tex.—(*Mex.*)—Spr.–fall.

4. R. crispus L. Plant 3–11 dm. tall, the panicle-branches rather closely flowered: lower stem-leaves 15–30 cm. long; blades elliptic to elliptic-lanceolate, much crisped: flower-clusters contiguous: sepal-wings orbicular-ovate, 4–5 mm. long, undulate: achene 2.5–3 mm. long.—(CURLED-DOCK. YELLOW-DOCK. NARROW-DOCK.)—Fields and waste-places, throughout the U. S. and S Can. Nat. of Eu.—(*W. I., Mex.*)—Sum.

5. R. fascicularis Small. Plant 5–15 dm. tall, the panicle-branches rather lax: lower stem-leaves 1–2 dm. long; blades ovate to broadly elliptic, rounded or cordate at the base: sepal-wings deltoid-reniform or reniform, 5–5.5 mm. wide: achene about 3 mm. long.—Ponds and lake-shores, pen. Fla.—Spr.–sum.

6. R. floridanus Meisn. Plant 4–11 dm. tall, the panicle-branches often fastigiate: lower stem-leaves 1–4 dm. long; blades broadly linear to linear-lanceolate: flower-clusters rather dense: sepal-wings reniform, 5–6.5 mm. wide: stipe-like base of the hypanthium mostly less than 1 cm. long: achene 3–3.5 mm. long.—Wet grounds, ditches, and river-swamps, Coastal Plain, Fla. to La.—Spr.–fall.

7. R. verticillatus L. Plant 9–15 dm. tall, the panicle-branches lax: lower stem-leaves 1.5–4.5 dm. long; blades linear-elliptic to linear-lanceolate: flower-clusters rather loose: sepal-wings ovate, hastate, reniform-hastate, 4.5–5.5 mm. wide: pedicel-like base of the hypanthium mostly over 1 cm. long, gradually tapering: achene about 2.5–3 mm. long.—(SWAMP-DOCK.)—Swamps and ditches, various provinces, Fla. to Tex., Ia., and Que.—Spr.–sum.

8. R. sanguineus L. Plant 3–11 dm. tall, the stems erect, the panicle-branches rather loosely-flowered and loosely-fruited: lower stem-leaves 9–16 cm. long; blades elliptic to elliptic-lanceolate, somewhat crisped: flower-clusters not very dense: sepal-wings oblong, 2.5–3 mm. long, somewhat unequal, entire, the callosity globular: achene fully 1.5 mm. long.—(BLOODY-DOCK. RED-VEINED DOCK. BLOODWORT.)—Waste-places, various provinces, Ala. to La., N. Y., and Va. Nat. of Eu.—Spr.–sum.

9. R. conglomeratus Murray. Plant 3–12 dm. tall, the stems erect, the panicle-branches rather densely flowered: lower stem-leaves 8–17 cm. long; blades ovate, lanceolate, or elliptic, somewhat crisped: flower-clusters dense: sepal-wings oblong to pandurate, 2.5–3 mm. long, entire or nearly so, the callosities oblong: achene about 2 mm. long.—(CLUSTERED-DOCK.)—Waste places, Coastal Plain, S. C. to Va.; also Calif. Nat. of Eu.—(*W. I., Mex.*)—Spr.–sum.

10. R. cuneifolius Campd. Plant 4 dm. tall or less, the stems assurgent, the panicles dense: lower stem-leaves mostly 1 dm. long or less; blades cuneate to elliptic-obovate, finely crisped, usually rounded or retuse at the apex: flower-clusters dense, contiguous: sepal-wings oblong-ovate, 5–6 mm. long, undulate, coarsely-reticulate: achene fully 2.5 mm. long.—Waste-places, W. Fla. Nat. of S. A.—Spr.–fall.

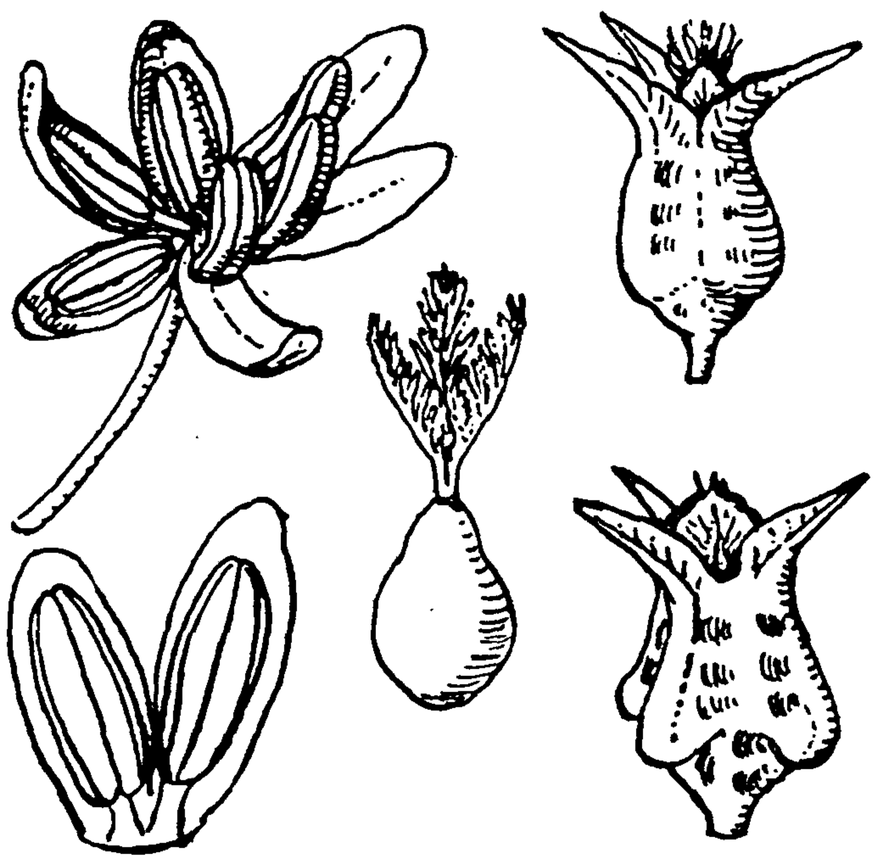
11. R. pulcher L. Plant 3–9 dm. tall, the panicle-branches spreading: lower stem-leaves 0.8–1.7 dm. long; blades elliptic or elliptic-pandurate, truncate or shallowly cordate, crisped: flower-clusters separated, leafy-bracted: sepal-wings ovate-deltoid, about 4 mm. long, with 5–10 teeth: achene fully 2 mm. long.—(FIDDLE-DOCK.)—Low woods, roadsides, and waste grounds, various provinces, Fla. to Tex., Calif., Ark., and Va. Nat. of Eu.—(*W. I., Mex.*)—Spr.–fall.

12. R. obtusifolius L. Plant 6–12 dm. tall, the panicle-branches nearly erect: lower stem-leaves 3–5.5 dm. long; blades elliptic to broadly lanceolate, deeply cordate, somewhat crisped: flower-clusters mostly contiguous, not leafy-bracted: sepal-wings ovate-hastate, 3.5–5 mm. long, with 3–5 teeth: achene 2–2.5 mm. long.—(BITTER-DOCK. BROAD-DOCK. BUTTER-DOCK.)—Wet woods, cultivated grounds, roadsides, ditches, fields, and waste-places, throughout the U. S. and S Can. Nat. of Eu.—(*W. I., Mex.*)—Sum.–fall.

13. R. persicarioides L. Plant 1–6 dm. tall, the panicle densely-flowered and densely-fruited: leaves 2.5–30 cm. long; blades lanceolate, narrowly elliptic, crisped, the lower ones abruptly narrowed at the base: flower-clusters densely many-flowered: stipe-like base of the hypanthium not involute: sepal-wings 2–2.5 mm. long, each with an oblong or ovate-oblong body and 3–6 slender teeth: achene about 1.5 mm. long.—(GOLDEN-DOCK.)—Shores or sandy banks, various provinces, coast of N. C. to N. B., also in saline places inland—Mo. to Ont., and coast of Calif. to B. C.—(*Mex.*)—Spr.–fall.—Admitted on the basis of old records.

4. EMEX Neck. Annual somewhat succulent herbs. Leaves alternate, with oblique ocreae. Flowers in axillary, often dense clusters or in panicles, monoecious; the staminate ones long-pedicelled, with 5 or 6 nearly equal sepals; the

pistillate sessile, the short hypanthium and the 6 partly united sepals in two series forming an urceolate perianth, the outer sepals developing spreading spine-like tips. Stamens 6. Stigmas 3, fimbriate-pinnatifid. Achene included, 3-angled.—Two species, natives of the Old World.



1. **E. spinosa** Campd. Stem more or less diffusely branched, glabrous: leaf-blades ovate, narrowly or broadly so, 2–8 cm. long, or smaller, acute or rounded at the apex and minutely pointed, undulate, truncate to cordate at the more or less auricled base, long-petioled: sepals of the staminate flowers elliptic, about 2 cm. long, those of the pistillate firm, the inner with erect firm tips, the outer with spreading subulate rigid tips: achene ovoid, 2.5–3 mm. long.—Waste grounds, W. Fla.—Nat. of the Mediterranean region.—Spr.–fall.

5. **POLYGONELLA** Michx. Perennial or biennial branched woody plants. Leaves numerous, rather persistent. Flowers white or pink, in spreading panicles, the pedicels exserted at anthesis. Inner sepals accrescent, not spreading, developing into wing-like structures wholly covering the achene, with lateral wrinkles. Achene stout, sometimes very broad.—Represented by the following species.—JOINTWEEDS.

Leaf-blades decidedly dilated, spatulate, obovate, or cuneate.	I. POLYGAMAE.
Leaf-blades not dilated, clavate to almost filiform.	II. AMERICANAE.

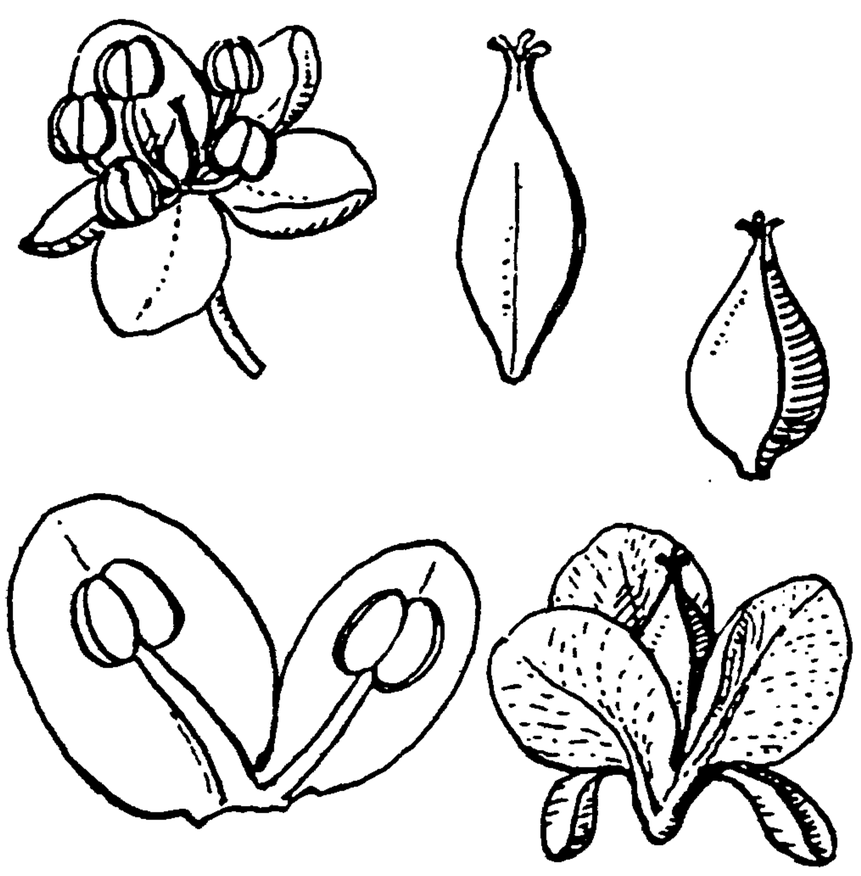
I. POLYGAMAE

Inner sepals becoming 2–2.5 mm. long: achene 1.5–2 mm. long.	1. *P. polygama.*
Inner sepals becoming 4–5 mm. long: achene 3.5–4 mm. long.	2. *P. macrophylla.*

II. AMERICANAE

Inner sepals becoming about 2 mm. long: stipe-like base of the hypanthium barely 1 mm. long.	
Lateral racemes of the panicles mostly less than 1 cm. long: sepals 1.5 mm. long in anthesis.	3. *P. brachystachya.*
Lateral racemes of the panicles mostly over 1 cm. long: sepals 1 mm. long in anthesis.	4. *P. Croomii.*
Inner sepals becoming about 2 mm. long: stipe-like base of the hypanthium fully 1.5 mm. long.	5. *P. americana.*

1. **P. polygama** (Vent.) A. Gray. Plant slender, 3–6 dm. tall, usually copiously branched: lower leaves 1–3 cm. long; blades spatulate to cuneate, 3-ribbed: stipe-like base of the hypanthium about 1 mm. long: inner sepals becoming ovate: achene barely 1 mm. wide. [*P. parvifolia* Michx.]—(OCTOBER-FLOWER.)—Sandy soil, pinelands, and scrub, Coastal Plain, Fla. to N. C., and perhaps to Miss.—Sum.–fall.



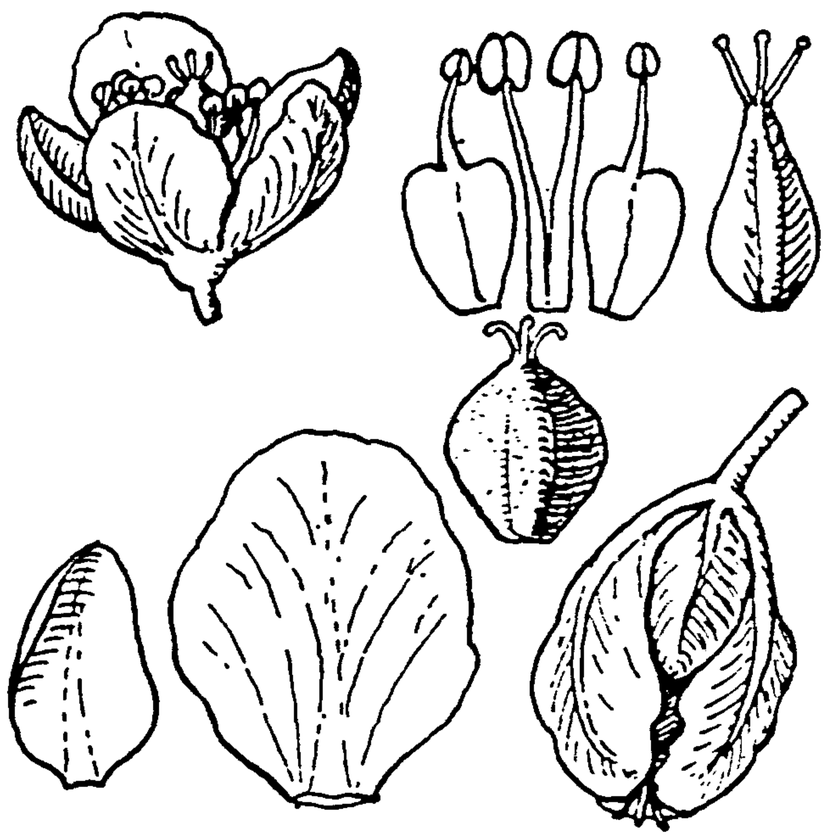
2. **P. macrophylla** Small. Plant stout, 8–11 dm. tall, sparingly branched: lower leaves 4–6.5 cm. long; blades spatulate-obovate, or cuneate-obovate, 5–9-ribbed: stipe-like base of the hypanthium about 3 mm. long: inner sepals becoming oval or suborbicular: filaments fully 2.5 mm. long, alternately slender subulate and narrowly lanceolate: achene fully 1.5 mm. wide.—Sandhills, near the coast, M and W Fla.—Fall.

3. **P. brachystachya** Meisn. Plant slender, 2–6 dm. tall, copiously branched: leaves 5–13 mm. long, bright-green, rather persistent: racemes short and relatively stout: ocreolae closely imbricate, very oblique: inner sepals becoming orbicular-ovate to subreniform, over 2 mm. long: achene broadly rhombic-ovoid, 1.5 mm. long.—Pinelands, S pen. Fla.—Sum.–fall.

4. **P. Croomii** Chapm. Plant very slender, 2–5 dm. tall, copiously branched: leaves 9–21 mm. long, glaucous, fugaceous: racemes relatively long and very slender: ocreolae scarcely imbricate, slightly oblique: inner sepals ovate to oval: achene narrowly rhombic-ovoid, about 1.5 mm. long.—Sandhills, Coastal Plain, N Fla. to S. C.—Sum.–fall.

5. **P. americana** (F. & M.) Small. Plant stout, 5–12 dm. tall, somewhat branched: leaves numerous, 1–3 cm. long, persistent: racemes stout: inner sepals becoming orbicular to oval-orbicular: achene rhombic-ovoid, about 3 mm. long. [*Gonopyrum americanum* F. & M. *P. Meisneriana* Shuttlw.]—Sandy soil, sandhills, and hillsides, Coastal Plain and adj. provinces, S. C. to Tex. and Mo.—Sum.–fall.

6. **DENTOCERAS** Small. Depressed, copiously branched shrub. Leaves exceedingly numerous, crowded on the branchlets, narrow, persistent. Flowers white, in short strobiliform racemes, rather long-stalked, the pedicels long-exserted from the ocreolae at anthesis, accompanied by a second bractlet within the ocreolae which forms a circular hollow from which the pedicel protrudes. Sepals accrescent for almost their entire length, the outer folded up over and partly covering the inner. Achene very broad, included.—One species.



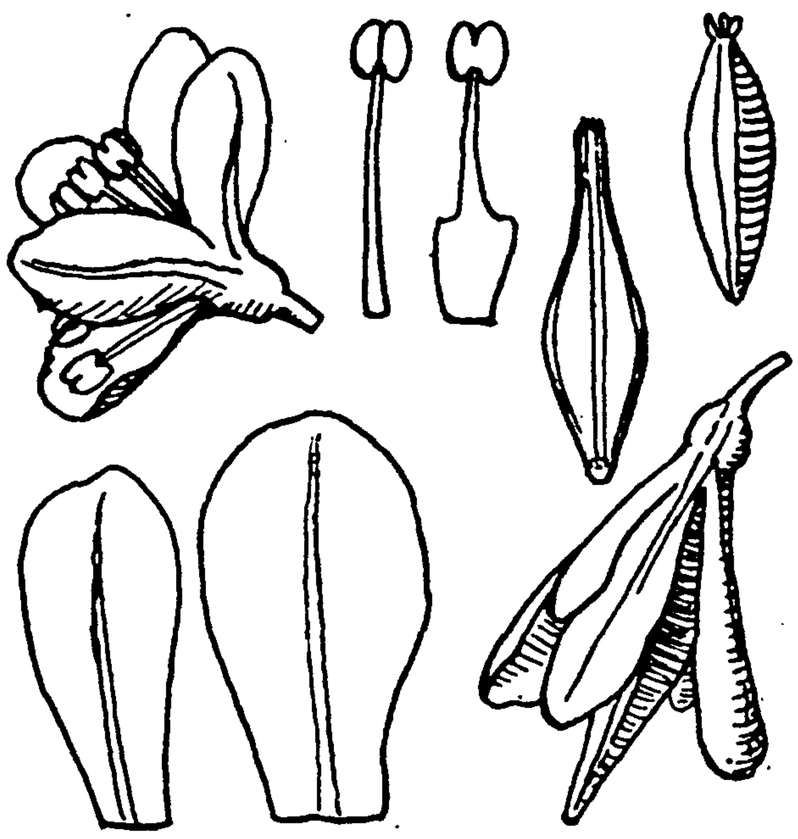
1. **D. myriophylla** Small. Branches radially prostrate, 2–25 dm. long, copiously branched, the branchlets often short: leaf-blades clavate, somewhat fleshy, 3–12 mm. long: racemes short-talked, often in small panicles: flowers crowded: outer sepals ovate, appressed: inner sepals ultimately much longer than outer, oval, orbicular-ovate, or slightly obovate, 2.5–3 mm. long: achene broadly ovoid, about 3 mm. long.—(Woody wireweed.)—Scrub on sandhills, S part of Lake Legion, Fla.—All year.—Conspicuous on account of the numerous branches with myriad leaves, disposed in large green mats on the white sand.

7. **DELOPYRUM** Small. Annual loosely branched firm-herbaceous plants. Leaves few, remote, early deciduous. Flowers white or pink-tinged, in erect lax racemes, short-stalked, the pedicel slightly if at all exserted from the ocreolae in anthesis. Inner sepals accrescent only at the base, thence spreading and exposing the achene, merely elongating, smooth, not wrinkled. Achene slender, sometimes subulate. [*Polygonella* Michx. in part.]—Represented by the following species only.—Jointweeds. Wireweeds.—The leaves are early deciduous.

Inner sepals becoming longer than the outer: achene acuminate, the tip much exserted from the calyx: stipe-like base of the hypanthium very short.
Inner sepals (pistillate) linear, linear-spatulate, or linear-oblong at maturity: ocreae ciliate.

Achene ellipsoid-ovoid; hypanthium-base obconic; upper ocreae leaf-bearing; fruiting calyx persistent.	1. *D. ciliatum.*
Achene subulate; hypanthium-base clavate; upper ocreae leafless: fruiting calyx deciduous.	2. *D. basiramia.*
Inner sepals (pistillate) elliptic or elliptic-obovate at maturity: ocreae eciliate.	
Inflorescence rachis with separated ocreolae: stem-leaves with filiform blades.	3. *D. filiforme.*
Inflorescence rachis with contiguous ocreolae: stem-leaves with elliptic, spatulate or linear-spatulate blades.	4. *D. gracile.*
Inner and outer sepals about equal in length at maturity: achene acute, the tip barely exserted from the calyx: stipe-like base of the hypanthium filiform or filiform-clavate.	5. *D. articulatum.*

1. D. ciliatum (Meisn.) Small. Stem 6–17 dm. tall: stem-leaves with stiff filiform or linear-filiform blades 2–4 cm. long: ocreolae acuminate: hypanthium-base turbinate, less than 1 mm. long: sepals (staminate) oblong or nearly so: inner sepals (pistillate) becoming 1.5 mm. long, much longer than the outer: achene about 2 mm. long, slightly exceeding the calyx.—Pinelands, pen. Fla.—Sum.–fall.



2. D. basiramia Small. Stems and branches few or many (10–70) from the top of a woody tap-root, slender wiry-filiform in the inflorescence: stem-leaves slenderly linear, mostly 1–2.5 cm. long, acute, revolute: hypanthium-base clavate, nearly 1 mm. long at maturity: sepals of the pistillate flowers spatulate to linear, the inner about 2 mm. long, much exceeding the outer: achene subulate, fully 2.5 mm. long, thrice as long as thick, much exceeding the loosely investing calyx.—Inland sand-dunes and scrub, S end of the lake region, Fla.—All year.

3. D. filiforme Small. Stem 9–16 dm. tall: stem-leaves with pliable filiform blades 4–9 cm. long: flowers smaller than in *D. gracile*: hypanthium-base turbinate, very short: sepals (staminate) oval, varying to ovate or obovate; inner sepals (pistillate) oblong or oblong-obovate, slightly longer than the outer, becoming 1.5 mm. long: achene 2–2.5 mm. long, the tip much exceeding the calyx.—Sandhills and pinelands, Coastal Plain, E pen. Fla. to Ga.—Sum.–fall.

4. D. gracile (Nutt.) Small. Stem 3–17 dm. tall: stem-leaves with oblong, spatulate, or linear-spatulate blades 1–2.5 cm. long: hypanthium-base turbinate, very short: sepals (staminate) obovate; inner sepals (pistillate) becoming 2 mm. long, decidedly longer than the outer: achene about 2.5 mm. long, slightly exceeding the calyx.—Dry pinelands and sandhills, Coastal Plain, Fla. to La. and S. C.—Sum.–fall.

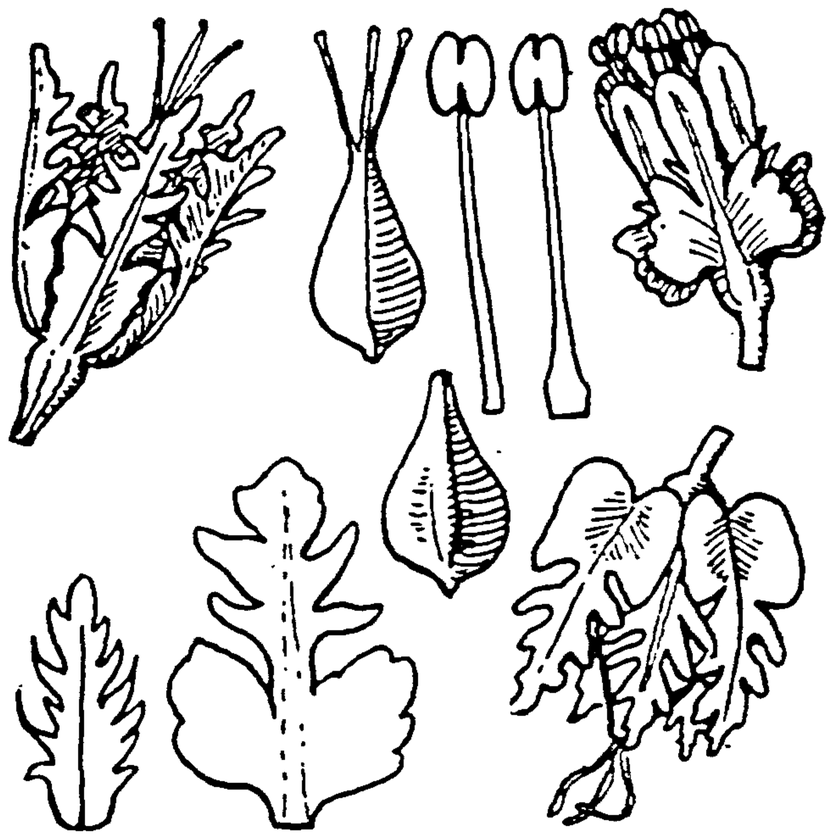
5. D. articulatum (L.) Small. Stem 1–4.5 dm. tall: stem-leaves with narrowly linear or linear-subulate blades 1–2.5 cm. long: stipe-like base of the hypanthium slender, about 1.5 mm. long: inner sepals (pistillate) becoming 2 mm. long, obovate or orbicular-obovate: achene rhombic-ovoid, about 2 mm. long.—(JOINTWEED.)—Acid sandy and open woods, Coastal Plain and New England Coast, Ga. (or Fla.) to Me.; also Great Lake Lowland, Ill. to N. Y.—Sum.–fall.

8. THYSANELLA A. Gray. Woody annual herbs. Leaves alternate, jointed near the top of the fringed firm ocreae. Flowers polygamo-monoecious, those of the upper racemes mostly fruit-producing. Sepals white or pink, not

accrescent into wings, the 2 outer ones auriculate-cordate at the base, the 3 inner at least pectinate-fimbriate. Stamens 8: filaments slender-filiform. Achene 3-angled, included in the calyx, short-stipitate.—Following are the only known species.

Outer sepals becoming 2–2.5 mm. long: achene less than 2 mm. long, broadly ovoid. 1. *T. fimbriata.*
Outer sepals becoming 3.5–4 mm. long: achene over 2 mm. long, narrowly ovoid. 2. *T. robusta.*

1. T. fimbriata (Ell.) A. Gray. Stem slender, 1.5–6 dm. tall, simple at the base: leaf-blades narrowly linear, 1–3 cm. long, mostly less than 1.5 mm. wide, few-striate: ocreae sparingly fringed: racemes 1–2.5 cm. long: outer sepals (pistillate) incised or incised-fimbriate, slightly exceeding the achene: filaments about 2 mm. long: achene barely 1 mm. wide, short-beaked.—Sandhills, Coastal Plain, NE Fla. to Ala. and Ga.—Sum.–fall.



2. T. robusta Small. Stem much stouter than those of *T. fimbriata*, mainly 6–9 dm. tall, usually branched at the base: leaf-blades linear, 2–6 cm. long, mostly over 2.5 mm. wide, many-striate: ocreae copiously fringed, the bristles sometimes deciduous: racemes mainly 4–7 cm. long: outer-sepals (pistillate) undulate or erose, much exceeding the achene: filaments about 4 mm. long: achene fully 1 mm. wide, long-beaked.—Pinelands and scrub, pen. Fla.—All year.

9. POLYGONUM [Tourn.] L. Annual or perennial, erect or prostrate herbs. Leaves alternate, jointed near the top of the ultimately lacerate ocreae. Flowers in axillary clusters which are sometimes aggregated near the ends of the branches. Sepals green to pink or white, or green with pale edges or yellow, the outer ones sometimes corrugated or veiny in age. Stamens 3–8, often 5–6. Stigmas 3. Achene 3-angled.—Sum.–fall, or all year southward.—About 100 species of wide geographic distribution.—KNOTWEEDS. DOORWEEDS. KNOTGRASSES.

Flower-clusters separated, scattered more or less throughout the plant: stem and branches not sharply angled: leaf-blades without impressions beside the midrib, not plicate. I. AVICULARIA.
Flower-clusters approximate on the upper part of the branches, thus forming long raceme-like panicles: stem sharply angled: leaf-blades with impressions on either side of the midrib, thus plicate. II. TENUIA.

I. AVICULARIA

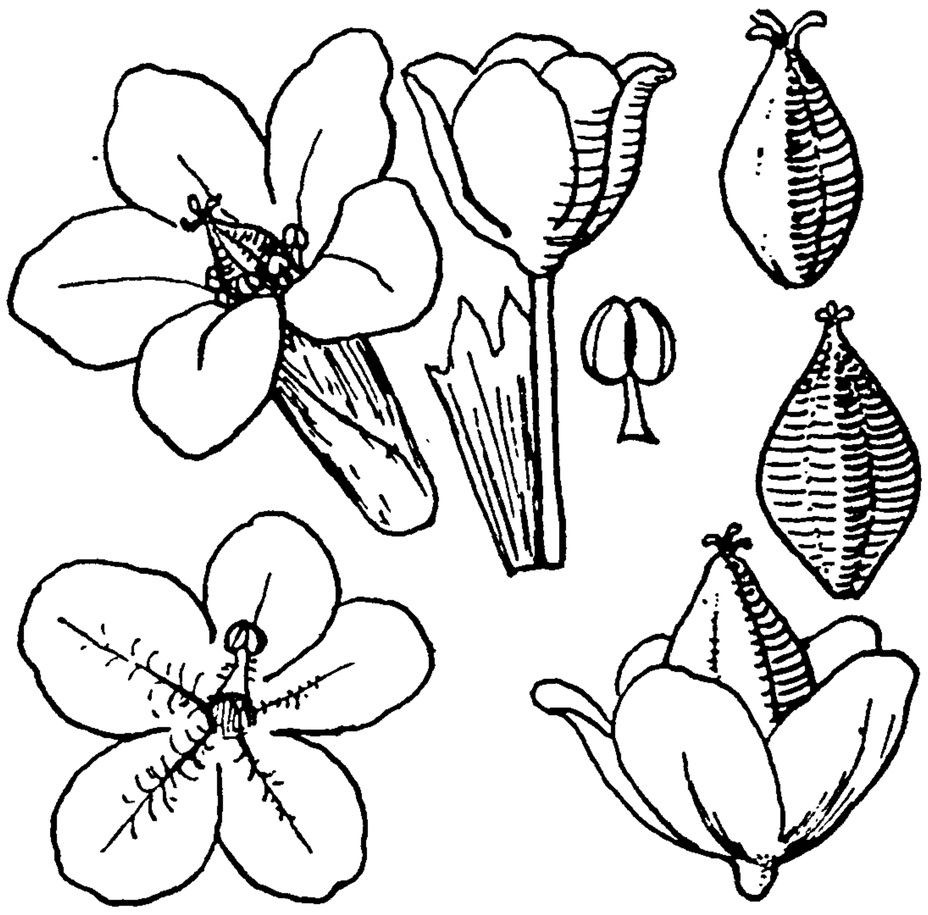
Calyx green, or sepals with white, pink, or purplish margins.
  Plants copiously leafy throughout, the upper leaves only slightly reduced in size.
    Achene prominently exserted from the calyx: sepals rather petaloid. 1. *P. glaucum.*
    Achene included in the calyx or the mere tip exposed: sepals not petaloid.
      Achene with striate faces.
        Mature perianth 3–4 mm. long: achene 3–4 mm. long. 2. *P. aviculare.*
        Mature perianth 1.5–2 mm. long: achene 1.5–2 mm. long. 3. *P. neglectum.*
      Achene with granular or nearly smooth faces. 4. *P. buxiforme.*

Plants with the upper leaves scattered and reduced in size.	5. *P. camporum.*
Calyx, at least the inner sepals, yellow or yellow-green.	
Leaf-blades broad: achene dull.	6. *P. erectum.*
Leaf-blades narrow: achene shining.	7. *P. ramosissimum.*

II. TENUIA

Annual with erect wiry stems and very slender panicles, the clusters often reduced to a single flower each.	8. *P. tenue.*

1. **P. glaucum** Nutt. Plant glaucous, sometimes nearly white, the branches mainly prostrate or assurgent, 2–7 dm. long: leaf-blades fleshy, generally longer than the internodes, the larger ones 4–8 mm. wide: ocreae silvery and very conspicuous: perianth becoming 3–4 mm. long; sepals with white or pink margins, lax at maturity: achene chestnut-brown, 3.5–4 mm. long, lustrous. [*P. maritimum* (Fl. SE. U. S.)]—Coastal sands, Fla. to Ala. and Me.—(*Eu.*)



2. **P. aviculare** L. Plant bright-green, the branches ultimately procumbent or prostrate, 1–6 dm. long: leaf-blades thin or thinnish, commonly 4–8 mm. wide: ocreae very thin: perianth becoming 3–4 mm. long; sepals with white, pink, or purplish borders; achene 3–4 mm. long, dull, granular-striate.—(BIRD-KNOTGRASS.)—Fields, roads, and waste places, various provinces, Fla. to La., Calif., and C Can.—(*Eurasia.*)

3. **P. neglectum** Besser. Plant bright-green or bluish-green, the branches ultimately prostrate or procumbent, 1–6 dm. long: leaf-blades thin, narrowly elliptic, elliptic-lanceolate, or linear, commonly 2–3 mm. wide, acute or acuminate: ocreae very thin: perianth becoming 1.5–2 mm. long; sepals with pale-pink or purplish-red borders: achene 1.5–2 mm. long, dull, granular-striate.—Common, about dwellings, and on roadsides and in waste places, various provinces, Fla. to Tex., Calif., and S Can.—(*Eurasia.*)

4. **P. buxiforme** Small. Plant bright-green or pale-green, the branches stout, diffuse or prostrate, 2–8 dm. long: leaf-blades thick, mainly 4–10 mm. wide: ocreae conspicuous: perianth becoming 2–3 mm. long; sepals with pale or carmine borders: achene 2–2.5 mm. long, often granular.—Roadsides, fields, and waste places, various provinces, N. C. to Tex., N. M., B. C., Ont., and N. B.

5. **P. camporum** Meisn. Plant pale-green, 3–12 dm. tall: leaf-blades narrowly oblong or elliptic to linear, varying to oblanceolate or lanceolate, 1–3 mm. long: perianth becoming about 2 mm. long; sepals veiny in age: achene broadly ovoid, 2 mm. long or nearly so, thinning, acute.—Low grounds, Coastal Plain, La. and Tex. Nat. in Ala.—(*Mex.*)

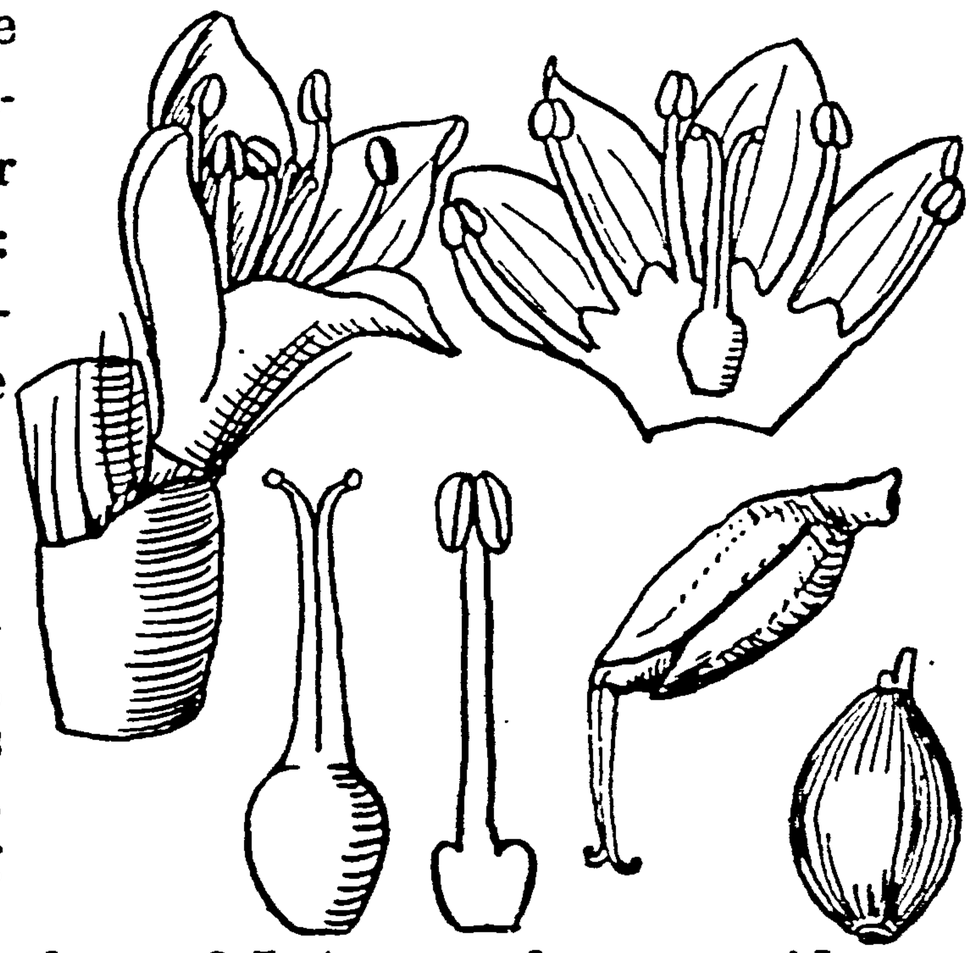
6. **P. erectum** L. Plant yellowish-green, the lower branches spreading or decumbent, 1–12 dm. long: leaf-blades much larger than in any of the preceding species, mainly 2–6 cm. long, elliptic, oval, or somewhat broadened upward: ocreae rather sordid: perianth becoming 3.5 mm. long; sepals often veiny in age: achene 3 mm. long, striate, dull.—Yards, waste places, and moist banks, various provinces, Ga. to Ark., Man., Ont., and Me.

7. **P. ramosissimum** Michx. Plant yellow-green, 2.5–13 dm. tall, usually sparingly branched above: leaf-blades mainly 2–5 cm. long: ocreae conspicuous: perianth becoming 2.5–3 mm. long; sepals usually veiny at maturity: achene

3–3.5 mm. long, smooth and shining.—Dry, often saline soil, various provinces, Tenn. to N. M., Wash., Sask., and Minn.

8. **P. tenue** Michx. Plant 1–4 dm. tall, the branches wiry: leaf-blades linear to linear-lanceolate, 0.5–3 cm. long, each with 2 lateral impressions on either side of the midrib: flowers short-pedicelled; perianth becoming 2.5–3 mm. long: achene ovoid, 2.5–3 mm. long.—Dry sandy or rocky soil, various provinces, Ga. to Tex., Nebr., Minn., and Ont.

10. **TOVARA** Adans. Perennial erect herbs. Leaves alternate, not jointed at the fringed ocreae. Flowers in lax remote clusters borne on virgate branches. Sepals more or less colored, 4, unequal, the 2 lateral ones overlapping the others. Stamens 4, and alternating with the sepals, or 5, the fifth one opposite the lower sepal: filaments slender. Stigmas 2. Achene lenticular.—Two species, the following and one Japanese.



1. **T. virginiana** (L.) Adans. Stem strigose, at least below the nodes, 3–14 dm. tall, virgately branched or simple: leaf-blades ovate or elliptic to ovate-lanceolate, 3–16 cm. long: pedicels flattened: perianth becoming 3.5–4 mm. long; sepals longitudinally ribbed: styles bent at an angle to the achene: achene 3.5–4 mm. long, ovoid or ovoid-oblong, invested in the nodding calyx.—(JUMP-SEED.)—Rich woods and thickets, various provinces, Fla. to Tex., Minn., Ont., and N. S.—Sum.–fall.—The common name refers to the surprising distance the ripe achenes fly when pressed under the thumb nail. In the case of this genus and of the following generic segregates from the composite genus *Polygonum*, the species recorded in Chapman's "Flora" will be found under the same specific names, unless otherwise mentioned.

11. **PERSICARIA** [Tourn.] Adans. Annual or perennial, erect or spreading herbs. Leaves alternate, not jointed at the cylindric naked or fringed ocreae: blades narrowed at the base or rarely cordate. Flowers borne in spike-like panicles. Sepals white or colored, mostly 5, neither winged nor keeled. Stamens 4–8: filaments slender. Stigmas 2 or sometimes 3. Achene lenticular or 3-angled, included or the tip merely exposed.—About 125 species, widely distributed.—Spr.–fall, or all year southward.—SMARTWEEDS. GANDER-GRASSES.

Panicle, or pair of panicles, terminal only: mature perianth much longer than the achene. — I. AMPHIBIAE.
Panicles axillary as well as terminal, often numerous: mature perianth reaching to about the tip of the achene or merely covering it.
  Ocreae with erect edges: leaf-blades of a narrow type: stigmas minute: cotyledons accumbent. — II. LAPATHIFOLIAE.
  Ocreae with spreading collar-like edges: leaf-blades of a broad type: stigmas large: cotyledons incumbent. — III. ORIENTALES.

I. AMPHIBIAE

Coarse perennial with diffuse and widely creeping stems and branches. — 1. *P. Muhlenbergii.*

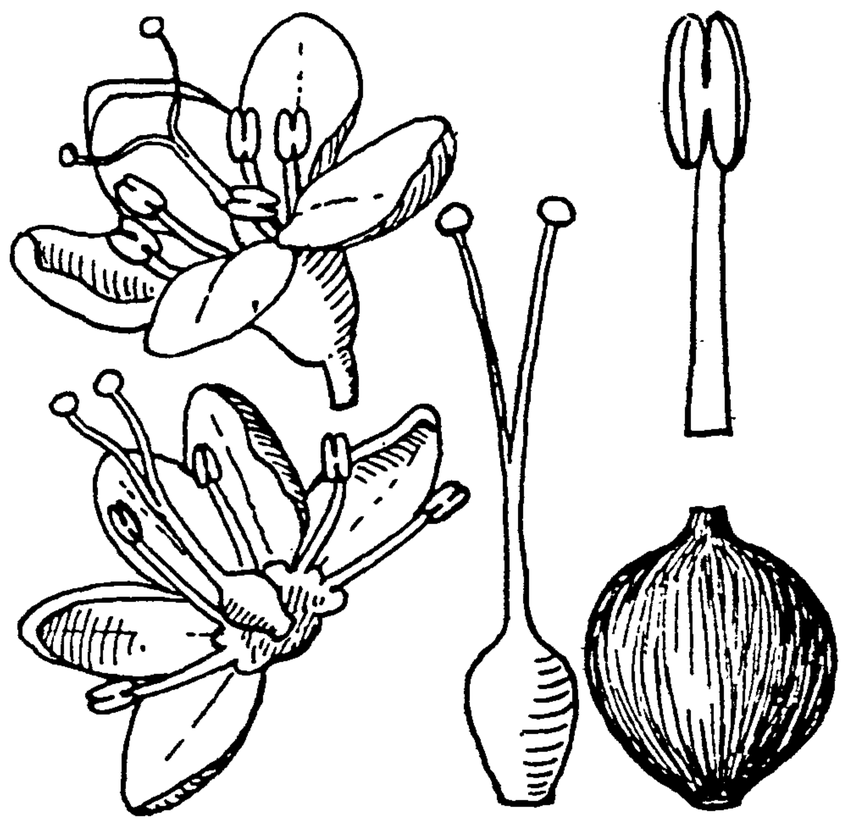
II. LAPATHIFOLIAE

Ocreae not fringed with bristles, rarely inconspicuously ciliate when young.
  Panicle strictly erect, stout.
    Achene turgid-lenticular: plant perennial. 2. *P. portoricensis.*
    Achene flat, the faces concave or merely umbonate: plant annual.
      Flowers on different plants with much variation in the style lengths, the styles in the long-styled forms, conspicuously exserted: achene ovate, the faces more or less umbonate.
        Plant annual, sometimes with creeping woody branches: achene shining. 3. *P. longistyla.*
        Plant perennial: achene dull. 3a. *P. mississippiensis.*
      Flowers with slight variation in the style-lengths, the styles not conspicuously exserted: achene nearly orbicular, the faces flat or concave. 4. *P. pennsylvanica.*
  Panicle nodding, rather slender. 5. *P. lapathifolia.*
Ocreae fringed with bristles.
  Stem, branches, and peduncles hispid and more or less glandular. 6. *P. Careyi.*
  Stem, branches, and peduncles not hispid.
    Sepals not pustulate-punctate.
      Panicle short, stout, compact. 7. *P. Persicaria.*
      Panicle slender and elongate, lax or interrupted.
        Leaf-blades narrowed at the base, manifestly petioled: stem and ocreae glabrous or appressed-pubescent.
          Ocreolae ciliate.
            Ocreae strigillose, with marginal cilia: leaf-blades glabrous or sparingly strigillose.
              Calyx greenish-white: achene nearly as wide as long, the tip protruding beyond the calyx. 8. *P. opelousana.*
              Calyx white, pink, or purplish-pink: achene manifestly longer than wide, the tip covered over. 9. *P. hydropiperoides.*
            Ocreae loosely strigose, with long, coarse marginal cilia: leaf-blades copiously loosely strigose. 10. *P. setacea.*
          Ocreolae eciliate. 11. *P. paludicola.*
        Leaf-blades cordate or subcordate at the base, sessile or nearly so: stem, at least below the nodes, and ocreae hirsute. 12. *P. hirsuta.*
    Sepals pustulate-punctate.
      Achene granular, dull: panicle nodding. 13. *P. Hydropiper.*
      Achene smooth, shining: panicle erect. 14. *P. punctata.*

III. ORIENTALES

Tall rather coarse annual with usually numerous dense cylindric nodding panicles of rose-colored flowers. 15. *P. orientalis.*

1. P. Muhlenbergii (Meisn.) Small. Perennial, generally strigose, creeping: leaf-blades lanceolate to elliptic-lanceolate, 5–20 cm. long, rounded or cordate at the base: ocreae strigose: panicles compact, 3–10 cm. long: perianth becoming 4–5 mm. long; sepals rose-colored, not punctate: achene lenticular, 2.5–3 mm. long. [*P. emersa* (Michx.) Small]—(RED-CARELESS.)—Muddy shores, swamps, and ditches, various provinces, Fla. to Tex., Calif., B. C., Ont., and Que.—(*Mex.*)



2. P. portoricensis (Bertero) Small. Perennial, generally glabrous: leaf-blades lanceolate, usually narrowly so, 3–25 cm. long, acuminate: ocreae very thin: panicles lax, but often copiously-flowered: ocreolae eciliate: perianth becoming 3.5–4 mm. long; sepals white or whitish, punctate: achene

turgid-lenticular, 2.5 mm. long, or less. [*Polygonum densiflorum* Meisn.]—Swamps, ponds, lake-borders, and ditches, Coastal Plain, Fla. to Tex., Mo., and N. J.—(*W. I., Mex., S. A.*)

3. **P. longistyla** Small.[1] Annual, sometimes with creeping woody branches, more or less glandular-pubescent above: leaf-blades lanceolate, 3–12 cm. long, somewhat attenuate: peduncles glandular-pubescent: panicles often plume-like on account of the exserted stamens and style: ocreolae ciliate: perianth bright-pink: sepals not punctate: achene ovate or orbicular-ovate, 2.5–3 mm. long, rather sharply pointed.—Low grounds, wet woods, and waste-places, Miss. to Tex., Okla., and Mo.

3a. **P. mississippiensis** (Stanford) Small. Plant perennial, quite woody below, glabrous up to the inflorescence: leaf-blades lanceolate, 5–10 cm. long, strigillose on both sides, long-attenuate: peduncles more or less strigose: panicles often slightly plume-like: perianth pink: sepals not punctate: achene narrowly ovoid, 2–2.5 mm. long, decidedly pointed. [*Polygonum mississippiense* Stanford]—Low grounds, fields, and ditches, Miss. to Tex.

4. **P. pennsylvanica** (L.) Small. Annual, the upper branches finely glandular-pubescent: leaf-blades lanceolate, 4–22 cm. long: ocreae eciliate: panicles stout, erect: ocreolae eciliate or nearly so: perianth becoming 3.5–4 mm. long; sepals pink or light-purple, not punctate: stamens and style short: achene flat-lenticular, 3–3.5 mm. long, shining, short-beaked.—(PINKWEED.)—Waste-places, roadsides, and cult. grounds, various provinces, Fla. to Tex., Minn., and N. S.—(*Mex.*)

5. **P. lapathifolia** (L.) S. F. Gray. Annual, glabrous or nearly so: leaf-blades lanceolate, sometimes narrowly so, 5–20 cm. long: ocreae eciliate: panicles slender, nodding: ocreolae eciliate, acuminate: perianth becoming 2.5–3 mm. long; sepals whitish to rose-colored: achene flat-lenticular, 2–2.5 mm. long. [*Polygonum incarnatum* Ell.]—(PALE-PERSICARIA.)—River banks, and wet grounds, various provinces, Fla. to Tex., Calif., and Can.—(*W. I., Mex., C. A., O. W.*)

6. **P. Careyi** (Olney) Greene. Annual, hispid and more or less glandular: leaf-blades elliptic-lanceolate to linear-lanceolate or almost linear on the upper part of the plant, 5–16 cm. long: ocreae bristle-fringed: panicles slender, loosely-flowered, nodding: ocreolae ciliate, rounded: perianth becoming 2.5–3 mm. long; sepals purplish: achene turgid-lenticular, 2–2.5 mm. long, smooth and shining.—Swamps, marshes, and clearings, various provinces, Fla. (perhaps introd.), N. J. to Ont. and Me.

7. **P. Persicaria** (L.) Small. Annual, glabrous or partly pubescent: leaf-blades lanceolate to linear-lanceolate, 2–18 cm. long, often with a central blotch: ocreae fringed: panicles stout: ocreolae ciliate: perianth becoming 3 mm. long or nearly so; sepals pink, purple, green, or reddish, not punctate: achene turgid-lenticular or 3-angled, 2–2.5 mm. long, shining.—(LADY'S-THUMB. HEARTWEED.)—Cult. grounds, waste-places, and roadsides, various provinces, Fla. to Tex., Calif., and S Can. Nat. of Eu.

8. **P. opelousana** (Ridd.) Small. Perennial, more or less strigillose: leaf-blades linear to linear-lanceolate, 3–11 cm. long: ocreae long-fringed: panicles slender, erect: ocreolae long-fringed: perianth becoming 2–2.5 mm. long; sepals greenish-white, not punctate: achene 3-angled, 2 mm. long or nearly so, shin-

[1] The related species, *P. mexicana* Small and *P. segetum* (H. B. K.) Small, seem not to be definitely known from our range; the former is to be expected in S Tex., the latter in S Fla.

ing, tip usually protruding from the calyx.—Swamps, ditches and wet grounds, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Mass.—(*W. I., Mex.*)

9. P. hydropiperoides (Michx.) Small. Perennial, strigillose in parts: leaf-blades lanceolate, varying to elliptic-lanceolate or linear-lanceolate, 4–13 cm. long: ocreae long-fringed, sparingly strigose: panicles slender, erect: ocreolae fringed: perianth becoming 3–3.5 mm. long; sepals pink, purplish or white, not punctate: achene 3-angled, 2–2.5 mm. long, shining, the tip covered by the calyx.—(MILD WATER-PEPPER.)—Swamps, wet soil, and low woods, various provinces, Fla. to Tex., Wash., Ont., and N. B.—(*Mex.*)

10. P. setacea (Baldw.) Small. Perennial, more or less strigose: leaf-blades elliptic-lanceolate to narrowly lanceolate, 4–18 cm. long, narrowed at the base: ocreae long-fringed, coarsely-strigose: panicles slender, erect: ocreolae long-fringed: perianth becoming 2.5–3 mm. long; sepals white or pink, not punctate: achene 3-angled, 2–2.5 mm. long, shining.—Swamps, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Mass.

11. P. paludicola Small. Perennial, glabrous or nearly so: leaf-blades oval, elliptic, or elliptic-lanceolate, 1.5–8 cm. long: ocreae bristle-fringed, glabrous or sparingly pubescent: panicles slender, erect: ocreolae glabrous and eciliate: perianth becoming 2.5–3 mm. long; sepals greenish, not punctate: achene 3-angled, broadly obovoid, about 2.5 mm. long, shining, the apex protruding from the calyx.—Everglades, Fla.

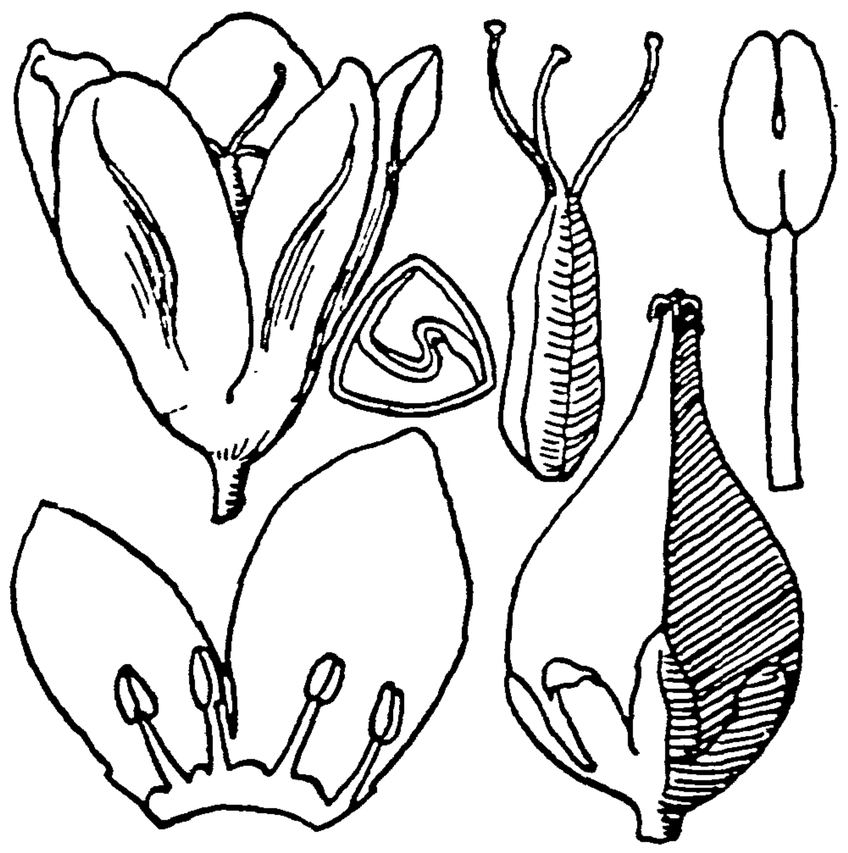
12. P. hirsuta (Walt.) Small. Perennial, hirsute, up to the inflorescence (glabrous or glabrate, the internodes merely strigillose in *P. hirsuta glabrescens*): leaf-blades lanceolate, 3–10 cm. long, cordate or subcordate at the base: ocreae hirsute and fringed: panicles slender, erect: ocreolae usually sparingly fringed, the cilia usually deciduous: perianth becoming 2.5–3 mm. long; sepals white or pinkish, not punctate: achene 2–2.5 mm. long, shining.—Swamps and wet soil, Coastal Plain, Fla. and Ga.—(*W. I.*)

13. P. Hydropiper (L.) Opiz. Annual, glabrous or nearly so: leaf-blades narrowly ovate to elliptic-lanceolate or lanceolate, 1.5–9 cm. long: ocreae short-fringed: panicles stoutish, nodding: ocreolae short-fringed: perianth becoming 3–3.5 mm. long; sepals greenish, pustulate-punctate: achene turgid-lenticular or 3-angled, dull, 2.5–3 mm. long.—(WATER-PEPPER. COMMON-SMARTWEED.)—Moist soil and wet banks, various provinces, Fla. to Tex. and S Can. Nat. of Eu.

14. P. punctata (Ell.) Small. Perennial, usually nearly glabrous: leaf-blades lanceolate to elliptic-lanceolate, 2–11 cm. long: ocreae long-fringed: panicles slender, mostly continuous during anthesis (very slender and with remote ocreolae and achenes 2 mm. long in *P. punctata leptostachya*): ocreolae more or less fringed: perianth becoming 3–4.5 mm. long; sepals whitish or green, pustulate-punctate: achene mostly 3-angled, about 2.5 mm. long, shining. [*Polygonum acre* H.B.K.]—(WATER-SMARTWEED. DOTTED-SMARTWEED.)—Low grounds and swamps, various provinces, Fla. to Tex., Calif. and S Can.—(*W. I., Mex., C. A., S. A.*)

15. P. orientalis (L.) Spach. Annual, tall, more or less hirsute: leaf-blades ovate to broadly elliptic, 6–25 cm. long: ocreae spreading and ciliate at the top: panicles stout, nodding: ocreolae pubescent and ciliate: perianth becoming 4–4.5 mm. long; sepals dark rose-colored, not punctate: achene lenticular, orbicular, 3–3.5 mm. long.—(PRINCE'S-FEATHER. PRINCE'S-PLUME.)—Roadsides, waste grounds, and about dwellings, various provinces, E U. S. Nat. of Asia.

12. FAGOPYRUM [Tourn.] Gaertn. Annual erect smooth herbs, the stems terete. Leaves alternate, not jointed at the oblique ocreae: blades hastate or cordate at the base. Flowers borne in branching raceme-like panicles. Sepals white, 5, almost unchanged at maturity. Stamens 5–8: filaments filiform. Stigmas 3. Achene 3-angled, exserted.—About 6 species, Eurasian.

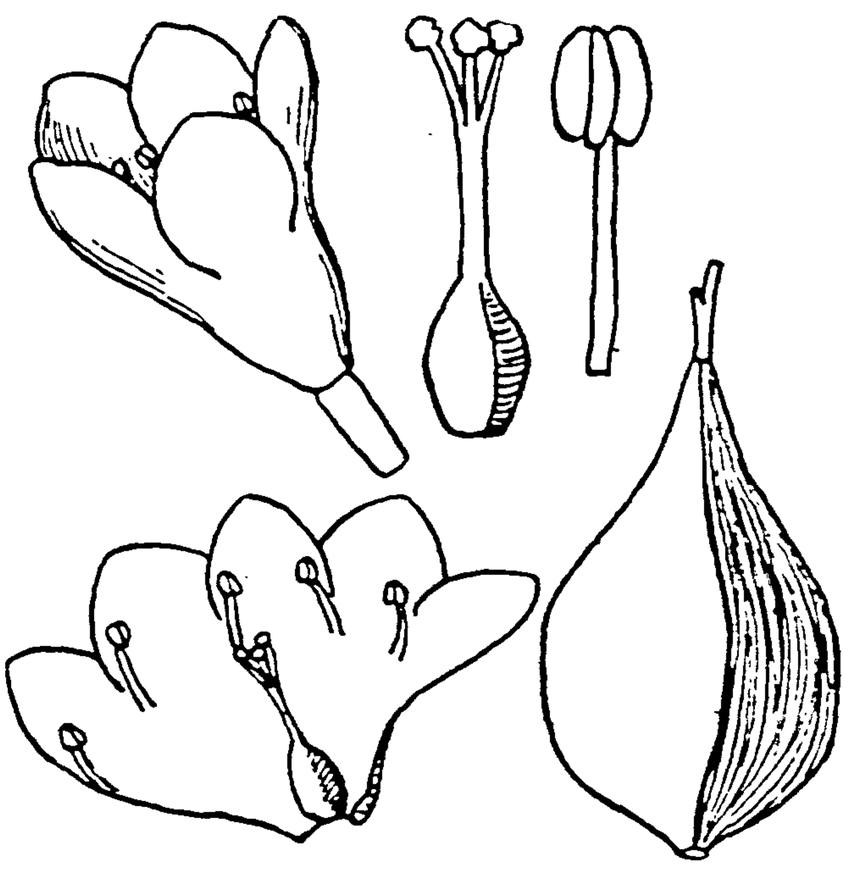


1. F. Fagopyrum (L.) Karst. Stem 1–9 dm. tall, slightly pubescent about the nodes: leaf-blades hastate, 2.5-8 cm. long: panicles persistently flowering: perianth becoming 2.5–3.5 mm. long: achene 5–6 mm. long.—(BUCKWHEAT.)—Fields, roadsides and waste-places, U. S. and S Can. Nat. of Eu.—(*W. I.*)—Sum.

13. TRACAULON Raf. Annual or perennial, prickle-armed, with the prickles reflexed, reclining-climbing herbs. Leaves alternate, not jointed at the oblique ocreae. Flowers borne in spike-like or capitate panicles. Sepals often slightly colored, 5 or 4, neither keeled nor winged. Stamens 5–8: filaments slender. Stigmas 2 or 3. Achene lenticular or 3-angled, included.—About 18 species North American and Asiatic.—TEARTHUMBS. RAKESTRAWS.

Leaf-blades sagittate: achenes 3-angled. 1. *T. sagittatum.*
Leaf-blades hastate: achenes lenticular. 2. *T. arifolium.*

1. T. sagittatum (L.) Small. Leaf-blades lanceolate-sagittate to elliptic-sagittate, 1–12 cm. long, the basal lobes acute: ocreolae 3–5 mm. long: perianth becoming 4 mm. long: stamens 8: achene 3–3.5 mm. long.—(ARROW-VINE.)—Wet places and meadows, various provinces, Fla. to Tex., Sask., Ont., and Newf.—Sum.–fall.

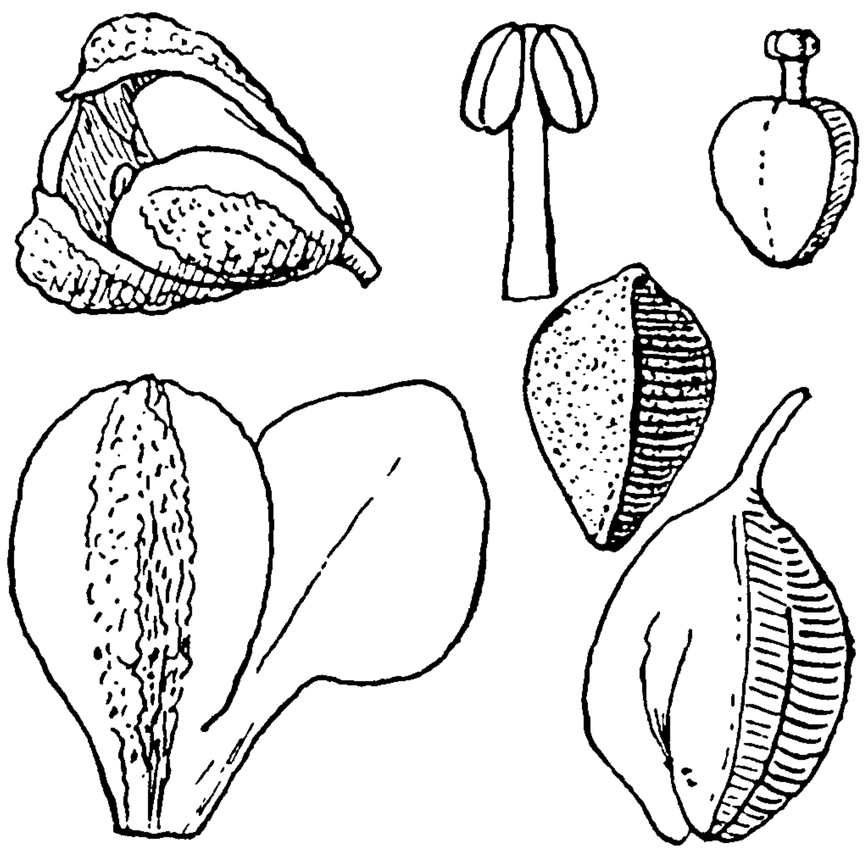


2. T. arifolium (L.) Raf. Leaf-blades hastate, 2–18 cm. long, the basal lobes spreading, acuminate: ocreolae 2–3 mm. long: perianth becoming 4–5 mm. long: stamens 6: achene 4 mm. long.—(SCRATCH-GRASS.)—Wet thickets and meadows, various provinces, Ga. to Minn. and N. B.—Sum.–fall.—The calyx in both species ranges from white to greenish or red-tinged.

14. BILDERDYKIA Dum. Annual or perennial, unarmed twining vines. Leaves alternate, not jointed at the oblique ocreae. Flowers borne in branching raceme-like panicles or in axillary clusters. Sepals white or yellowish, 5, the outer ones keeled or winged at maturity. Stamens 8: filaments slender. Stigmas 3. Achene 3-angled, included. [*Tiniaria* Webb & Moq.]—About 8 species, North American and Asiatic.—Sum.–fall.—NIMBLE-WILLS.

Outer sepals unchanged or merely keeled at maturity.
  Achene granular, dull: inflorescence of axillary and terminal clusters and simple racemes. 1. *B. Convolvulus.*
  Achene smooth, shining: inflorescence of axillary and terminal panicled racemes. 2. *B. cilinodis.*
Outer sepals developing conspicuous wings.
  Sepal-wings not incised.
    Mature perianth 6–8 mm. long, wings flat. 3. *B. dumetorum.*
    Mature perianth 10–15 mm. long, wings crisped. 4. *B. scandens.*
  Sepal-wings incised. 5. *B. cristata.*

1. B. Convolvulus (L.) Dum. Stem and branches trailing or twining, green or purple-tinged: leaf-blades ovate to ovate-sagittate, or those of the upper ones sagittate, 1.5–6 cm. long: ocreae rough-edged: perianth becoming about 4 mm. long; sepals mealy-granular, the outer becoming longer than the inner: achene 3–3.5 mm. long.—(BLACK-BINDWEED. CLIMBING-BUCKWHEAT.)—Cult. grounds, waste-places, and fields, various provinces, Fla. to Tex., Calif., and S Can. Nat of Eu.—(*W. I., Mex.*)



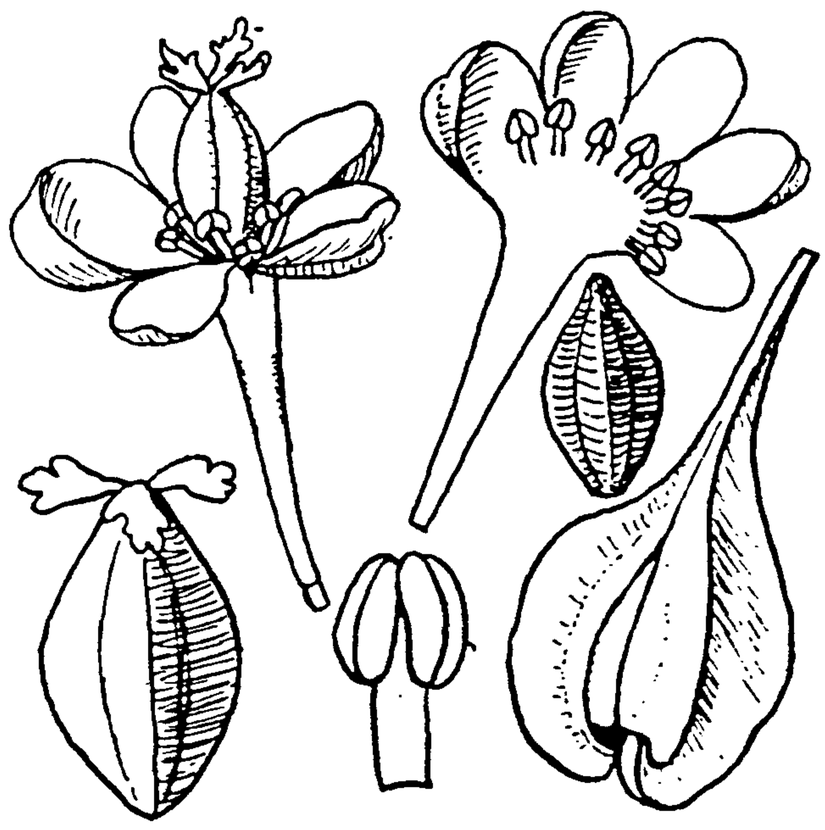
2. B. cilinodis (Michx.) Greene. Stem prostrate or twining, purple: leaf-blades ovate, 2–8 cm. long, cordate and sometimes hastate at the base: ocreae with reflexed hairs at the base: perianth becoming about 4 mm. long; sepals smooth or nearly so, the outer shorter than the inner: achene about 3 mm. long.—Rocky places and thickets, Blue Ridge and more northern provinces, N. C. to Athabasca and N. S.

3. B. dumetorum (L.) Dum. Stem twining, purple-tinged: leaf-blades ovate to ovate-hastate, 2–7 cm. long: ocreae glabrous: perianth becoming 6–8 mm. long: achene about 3 mm. long.—(FALSE-BUCKWHEAT.)—Thickets, various provinces, locally in the E U. S. Nat. of Eu.

4. B. scandens (L.) Greene. Stem and branches twining, purplish: leaf-blades ovate to elliptic-ovate, 4–12 cm. long: ocreae with rough ridges: perianth becoming 10–15 mm. long: achene 4–4.5 mm. long.—(HEDGE-BUCKWHEAT. FALSE-BUCKWHEAT.)—Thickets and fence-rows, various provinces, Fla. to Tex. and S Can.

5. B. cristata (Engelm. & Gray) Greene. Stem and branches twining, green or purplish: leaf-blades ovate to triangular, 1–6 cm. long: perianth becoming 6.5-7.5 mm. long: achene 3 mm. long.—Thickets, fence-rows, and river banks, various provinces, Fla. to Tex., Okla., and Mass.

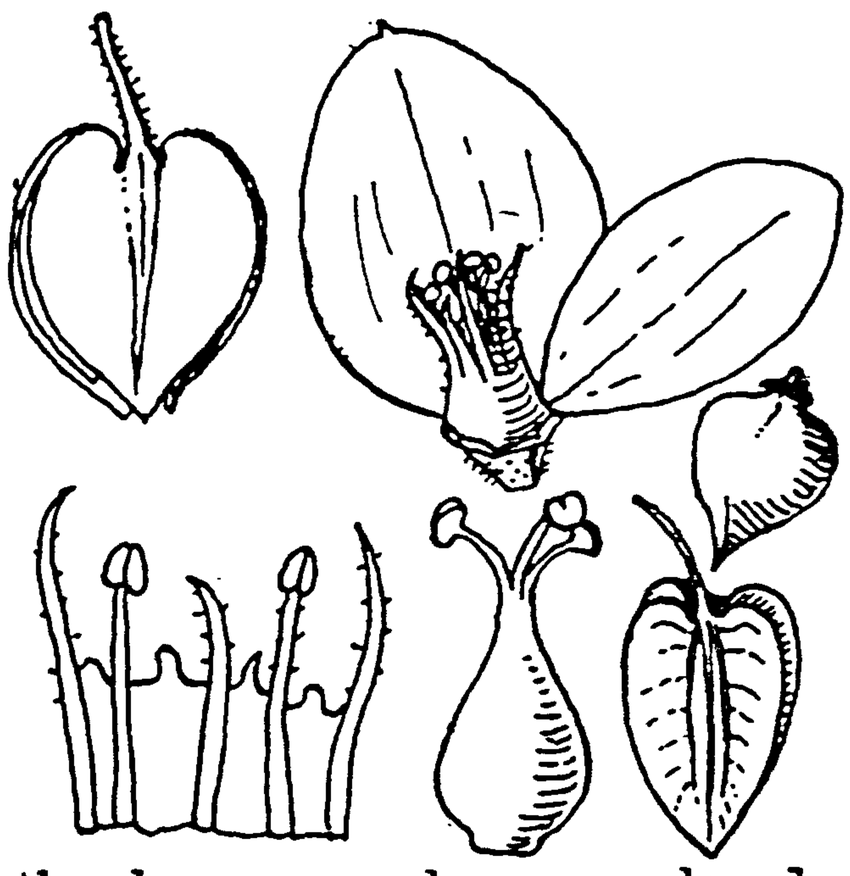
15. PLEUROPTERUS Turcz. Perennial, often large many-stemmed herbs with extensively spreading rootstocks. Leaves alternate: blades broad, commonly large, mostly truncate or cordate at the base and abruptly pointed at the apex. Flowers numerous, borne in short axillary clustered or branching panicles. Sepals mostly 5, the 3 outer ones developed into firm wings at maturity. Stamens 6–8: filaments united at the base. Stigmas 3, short-fimbriate. Achene 3-angled, included.—About 4 species, Asiatic.



1. P. Zuccarinii Small. Large nearly glabrous herb with hollow stems 1–3 m. tall:

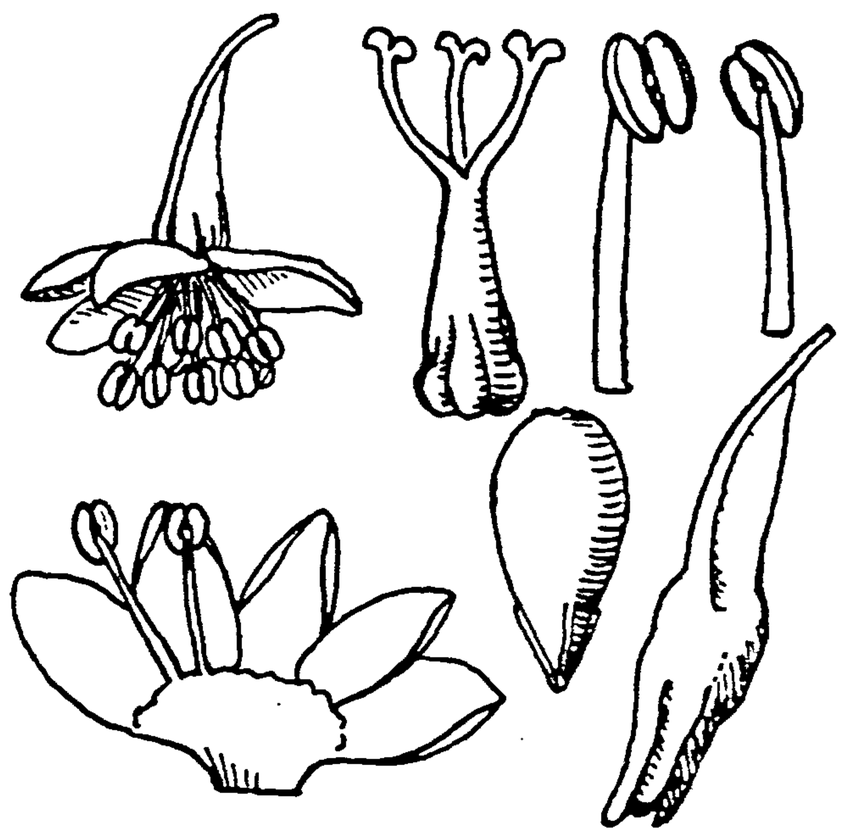
leaf-blades broadly ovate, varying to elliptic-ovate, deltoid-ovate, or hastate-ovate, 5–15 cm. long, finely reticulate, usually truncate at the base: panicles 2–11 cm. long, the branches finely pubescent: stipe-like base of the hypanthium longer than the pedicel: calyx white or red: sepals oval and 1.5 mm. long at anthesis: achene ellipsoid, narrowed to both ends, about 2.5 mm. long, black, shining.—(JAPANESE-KNOTWEED. ITADORI.)—Waste-places, woods, and fence-rows, various provinces, locally escaped from cult. in the E U. S. from N. C. N. Nat. of Japan.—Sum.–fall.—A very persistent as well as a vigorous plant. It rapidly forms large colonies by the widely branched rootstocks.

16. CORCULUM Stuntz. Perennial vines with partly woody stems. Leaves alternate: blades ovate to hastate. Flowers borne in spreading or diffuse panicles whose branches terminate in tendrils. Sepals 5 or 6, the 3 outer ones conspicuously accrescent, ultimately enveloping the fruit as 3 broad wings. Stamens 7–9; filaments united at the base, alternating with small staminodia. Stigmas 3, capitate. Achenes 3-angled, included in the sepal-wings.—About 4 species, natives of Mex. and C. A.



1. C. leptopus (H. & A.) Stuntz. Leaf-blades ovate in outline, more or less hastate, the larger ones 10–15 cm. long, acuminate, somewhat crisped and undulate, cordate at the base: sepals rose-colored or purplish, the outer ones ovate, cordate at the base, becoming 15–18 mm. long: achene 8–9 mm. long, the body terete, the beak 3-angled.—(MOUNTAIN-ROSE. ROSA-DE-MONTANA. CORAL-VINE. PINK-VINE. TALLAHASSEE-VINE.)—Hammocks, roadsides, and waste-places, pen. Fla. to Ga. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A.*)—All year.—Widely grown as an ornamental vine.

17. BRUNNICHIA Banks. Woody tendril-bearing vines. Leaves alternate, the ocreae obsolete. Flowers borne in branching panicles. Sepals 5, surmounting the hypanthium which enlarges and develops a wing which is decurrent on its pedicel-like base. Stamens usually 8. Stigmas 3, each 2-cleft. Achene 3-angled, included in the dry hypanthium.—Two known species, the following and one in Africa.



1. B. cirrhosa Banks. Stems high-climbing, much-branched, sometimes 2 cm. thick: leaves deciduous; blades ovate to ovate-lanceolate, 3–15 cm. long: perianth becoming 3–3.5 cm. long, the sepals oblong, about 5 mm. long: hypanthium, both tube and pedicel-like base, greatly elongated, the wing 2.5–3.5 mm. wide: achene 7–10 mm. long.—(EARDROP. BUCKWHEAT-VINE. BUCK-VINE.)—Mostly on river-banks, Coastal Plain and occasionally adj. provinces, Fla. to Tex., Mo., Ill., and S. C.—Spr.–sum.

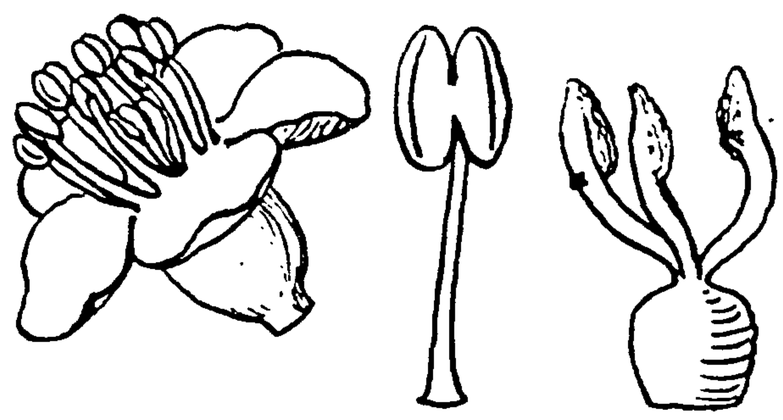
18. COCCOLOBIS P. Br. Evergreen shrubs or trees. Leaves alternate, the ocreae cylindric or funnelform. Flowers borne in spikes or racemes. Sepals

5, surmounting the accrescent hypanthium. Stamens 8. Stigmas 3, entire. Achene 3-angled, included in the juicy hypanthium.—About 130 species, of tropical America.—The hard close-grained wood is used in cabinet-work.—The flowers are green or greenish-yellow.

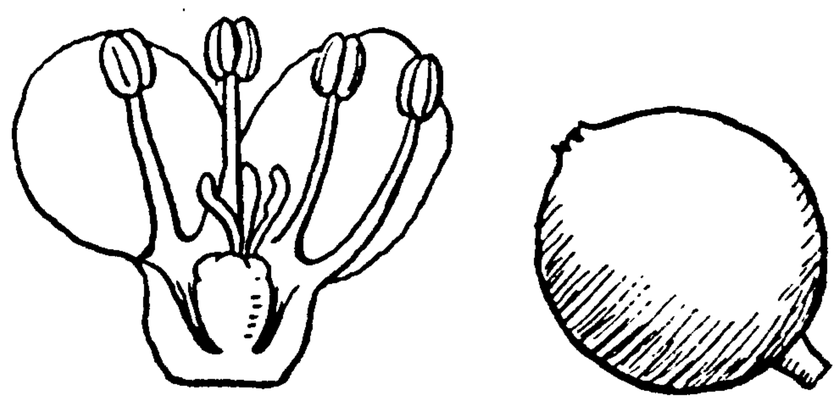
Leaf-blades longer than wide, narrowed at the base: fruit about 1 cm. thick. 1. *C. laurifolia.*

Leaf-blades wider than long, cordate at the base: fruit 1.5–2 cm. thick. 2. *C. uvifera.*

1. C. laurifolia Jacq. Shrub or tree: leaf-blades ovate to obovate, 5–10 cm. long, narrowed or rounded at the base: panicles less than 1 dm. long in anthesis, the lower flower-clusters usually with 3 or 4 pedicels: sepals 2.5–3.5 mm. long: hypanthium-margin even between the filaments or with tooth-like staminodia: fruit black, in lax clusters. [*C. floridana* Meisn.] —(PIGEON-PLUM.)—Hammocks on or near the coast, E pen. Fla. and the Keys.—(*S. A.*) —The fruits are a favorite bird-food.



2. C. uvifera (L.) Jacq. Shrub or small tree: leaf-blades suborbicular, 4–20 cm. wide, cordate at the base: panicles over 1 dm. long in anthesis, dense: sepals 2–3 mm. long: fruit reddish, borne in dense grape-like clusters. — (SEA-GRAPE. GRAPE-TREE. PLATTER-LEAF.) — Coastal hammocks and dunes, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—The fruits are used to make jelly.



ORDER **CHENOPODIALES** — CHENOPODIAL ORDER

Herbs, often partially woody, or shrubs or trees. Leaves alternate or opposite, occasionally scale-like. Flowers mostly perfect, sometimes monoecious or dioecious. Calyx usually present, the sepals mainly separate. Corolla wanting, or present and of minute or large petals. Androecium of 1–several stamens. Gynoecium of a single carpel or of several united carpels, the ovary mostly superior. Fruit various.

Fruit a utricle, achene, or berry, sometimes an anthocarp, not valvate, or merely circumscissile.
  Fruit various, not an anthocarp.
    Fruit utricular.
      Bracts not scarious: stipules wanting.
        Erect or diffuse plants.
          Stamens inserted at the base of the ovary or in the margin of a short hypanthium. Fam. 1. CHENOPODIACEAE.
          Stamens inserted on the margin of a hypanthium which ultimately exceeds the sepals in length. Fam. 2. SCLERANTHACEAE.
        Climbing vines. Fam. 3. BASELLACEAE.
      Bracts or stipules scarious.
        Stipules wanting: sepals scarious. Fam. 4. AMARANTHACEAE.
        Stipules present: sepals herbaceous or scarious-margined. Fam. 5. CORRIGIOLACEAE.
  Fruit baccate or an achene, or aggregate.
    Hypanthium wanting: stamens borne below the ovary: stigmas not penicellate. Fam. 6. PHYTOLACCACEAE.
    Hypanthium present: stamens borne on the edge of the hypanthium: stigma penicellate.

Fruit an achene: flowers perfect, not in cones. Fam. 7. PETIVERIACEAE.
Fruit aggregate: flowers dioecious, in axillary cones. Fam. 8. BATIDACEAE.
Fruit an anthocarp, the achene surrounded by the calyx-tube.
Herbs: seed with a hooked embryo. Fam. 9. ALLIONIACEAE.
Shrubs or trees: seed with a straight embryo. Fam. 10. PISONIACEAE.
Fruit a capsule dehiscent by apical or longitudinal valves (a pyxis in *Portulaca*).
Ovary several-celled: corolla wanting. Fam. 11. TETRAGONIACEAE.
Ovary 1-celled: corolla mostly present.
Sepals 2: leaves mostly alternate. Fam. 12. PORTULACACEAE.
Sepals 4 or 5: leaves mostly opposite.
Sepals distinct: ovary sessile: petals not clawed. Fam. 13. ALSINACEAE.
Sepals united: ovary stipitate: petals clawed. Fam. 14. CARYOPHYLLACEAE.

FAMILY 1. CHENOPODIACEAE—GOOSEFOOT FAMILY

Herbs or woody plants. Leaves alternate or opposite: blades simple. Flowers perfect, polygamous, monoecious, or dioecious, mostly in congested spikes. Calyx of 1, 2, 3, 4, or 5 persistent sepals. Corolla wanting. Androecium of as many stamens as there are sepals. Gynoecium of 2 or more united carpels. Ovary 1-celled. Fruit a utricle, sometimes achene-like.—About 75 genera and 550 species of wide geographic distribution, many of them becoming weeds.

Plant not succulent: the stems not conspicuously jointed: leaves alternate, not scale-like.
Embryo annular, conduplicate, or semi-annular: endosperm surrounded by the embryo.
Fruit opening at maturity, or at germination, by a lid: flowers perfect. Tribe I. BETEAE.
Fruit indehiscent.
Flowers mostly perfect, ebracteolate. Tribe II. CHENOPODIEAE.
Flowers usually unisexual, the pistillate bibracteolate. Tribe III. SPINACIEAE.
Embryo spirally coiled: endosperm wanting or present and divided by the embryo.
Leaves and bracts succulent: calyx wingless. Tribe IV. DONDIEAE.
Leaves, and bracts spinescent: calyx horizontally winged at maturity. Tribe V. SALSOLEAE.
Plant succulent, the stems conspicuously jointed: leaves scale-like, opposite. Tribe VI. SALICORNIEAE.

I. BETEAE.

Herbs with fleshy roots, crisped leaf-blades, and the fruit enclosed in the hardened base of the perianth. 1. BETA.

II. CHENOPODIEAE.

Calyx horizontally winged in fruit. 2. CYCLOLOMA.
Calyx not winged.
Calyx becoming saccate and reticulate, slightly lobed. 3. ROUBIEVA.
Calyx neither saccate nor veiny, deeply lobed.
Embryo annular, encircling the endosperm. 4. CHENOPODIUM.
Embryo horseshoe-shaped, not encircling the endosperm.
Pericarp not gland-dotted: inflorescence a dichotomous cyme. 5. BOTRYDIUM.
Pericarp gland-dotted: inflorescence spicate or paniculate. 6. AMBRINA.

III. SPINACIEAE.

Stigmas 4 or 5: bracts united to the apex: foliage glabrous. 7. SPINACIA.
Stigmas 2 or 3: bracts distinct, at least at the apex: foliage with inflated hairs, at least when young. 8. ATRIPLEX.

IV. DONDIEAE.

Plants with nearly terete leaves, the mature calyx wingless. 9. DONDIA.

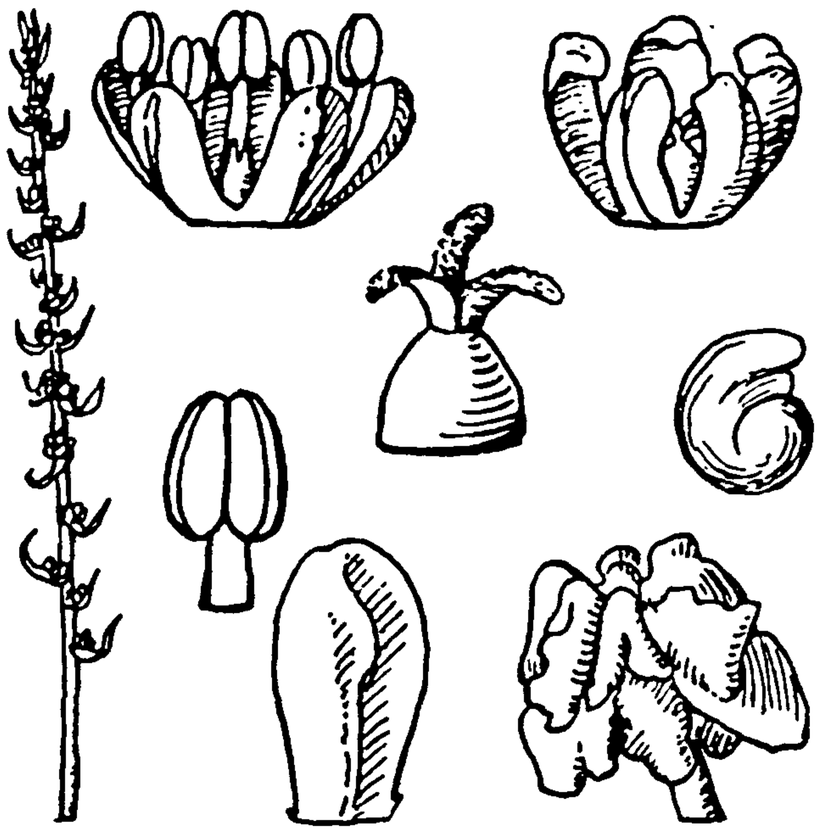
V. SALSOLEAE.

Plants with spinescent leaves, the mature calyx winged. 10. SALSOLA.

VI. SALICORNIEAE.

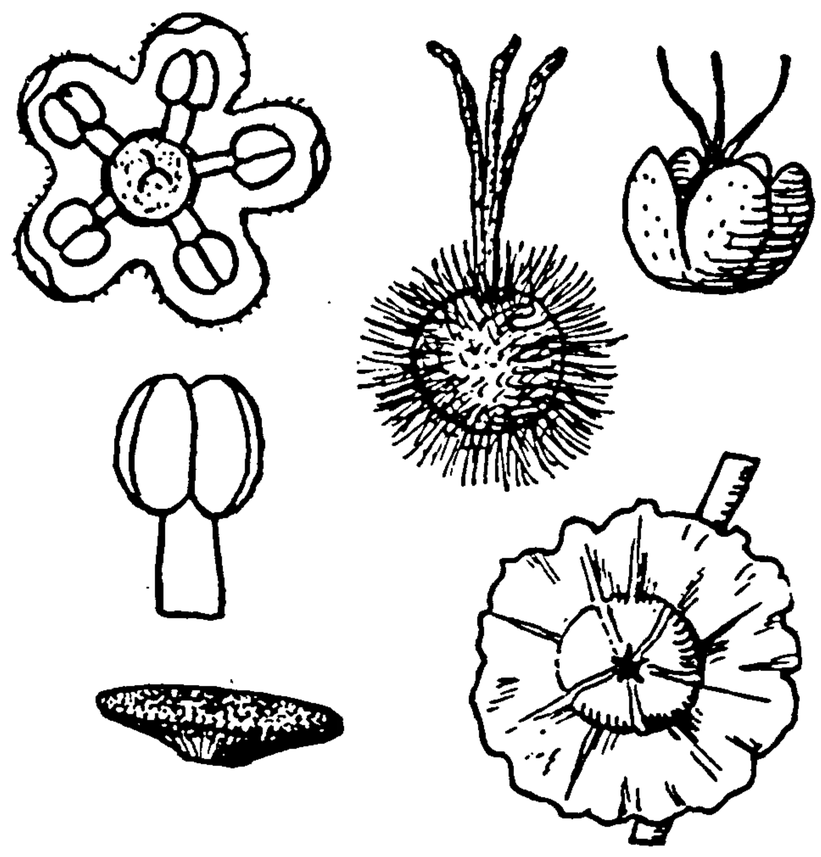
Green or red succulents, with the flowers sunken in excavations of the internodes. 11. SALICORNIA.

1. BETA L. Fleshy edible herbs. Leaves alternate: blades soft, more or less crisped. Flowers perfect, clustered and coherent by their bases. Calyx herbaceous, hardened and closed in fruit. Stigmas introrse. Utricle enclosed, achene-like.—About 14 species, Eurasian.



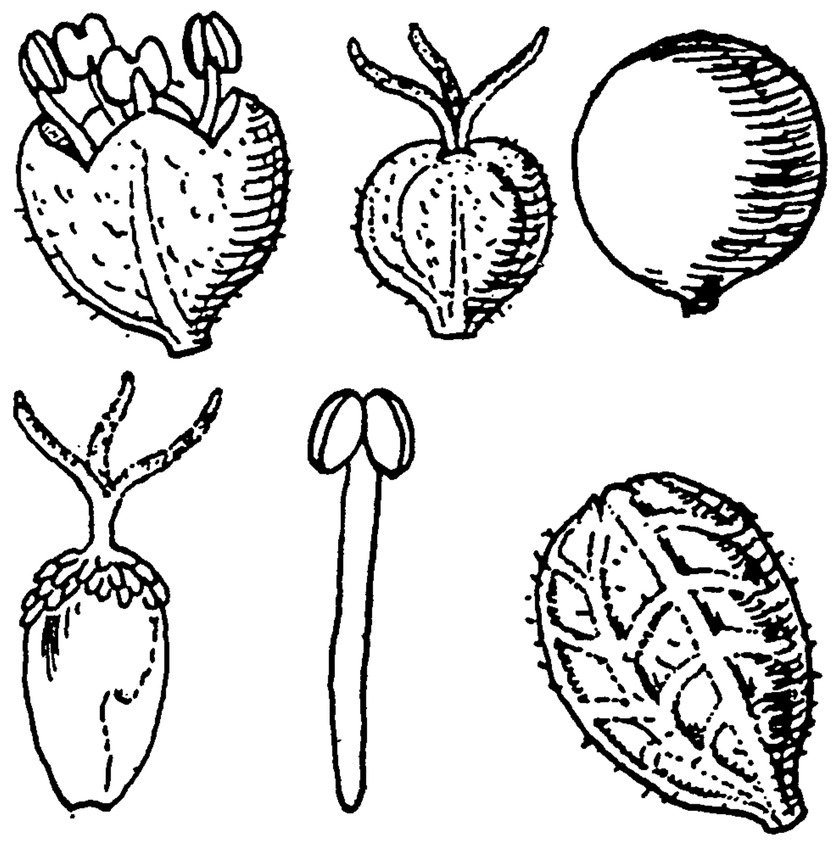
1. B. vulgaris L. Annual or biennial, with a conic or pyriform root, commonly purplish: stem 3–7 dm. tall: leaf-blades ovate to elliptic-ovate, 0.5–1.5 dm. long: sepals oblong, becoming linear, 2.5–3 mm. long, keeled: fruit 4–5 mm. long.—(BEET.)—Cult. grounds, various provinces, U. S. Nat. of Eu. and cult.—(*Mex.*)—Sum.–fall.—The plant has been used as a table vegetable from prehistoric times. The root of one variety is an important source of sugar.—The flowers are greenish or reddish.

2. CYCLOLOMA Moq. Coarse erect or spreading scurfy-pubescent herbs. Leaves alternate: blades irregularly toothed. Flowers mostly perfect, or sometimes pistillate. Calyx with triangular-ovate lobes, developing a horizontal wing below the lobes. Utricle depressed-globose, nearly enclosed.—One species.



1. C. atriplicifolium (Spreng.) Coulter. Annual, 1.5–8 dm. tall: leaf-blades lanceolate to elliptic, 2–8 cm. long, sinuate-dentate: sepals pubescent, red or purple in age: utricle 2–3 mm. wide, the surrounding wing 4–5 mm. in diameter: seed about 1.5 mm. wide.—(WINGED-PIGWEED.)—Sandhills, sandy fields, and banks, various provinces, Miss. to Tex., Ariz., Man., and Mass.—Sum.

3. ROUBIEVA Moq. Strong-scented prostrate or procumbent pubescent herbs. Leaves alternate: blades sinuate-dentate or pinnatifid. Flowers perfect, or by abortion, pistillate, solitary or clustered in the axils. Calyx with rounded lobes, saccate and reticulate in age. Utricle compressed-globose, enclosed.—One species.



1. R. multifida (L.) Moq. Perennial, the branches 1.5–7 dm. long: leaf-blades elliptic in outline or narrower, 1–4.5 cm. long, deeply pinnatifid or merely coarsely lobed near the base of the stem; sepals 3–5: utricle glandular-dotted, in the obovoid-calyx; seed about 1 mm. in diameter.—Waste-places and cult. grounds, Coastal Plain and occasionally adj. provinces, Fla. to Ala. and N. Y. Nat. of S. A.—Sum.–fall.—The flowers are greenish.

4. **CHENOPODIUM** [Tourn.] L. Odorless or heavy-scented non-glandular herbs, ours annuals. Leaves alternate: blades entire to coarsely toothed, often mealy-coated. Sepals hooded. Anther-sacs commonly separate. Ovary often depressed.—About 50 species of wide geographic distribution.—The seeds of some species are used by primitive people as a source of flour.—GOOSEFOOTS. PIGWEEDS.—The flowers are greenish or sometimes tinged with red.

Leaf-blades smooth and shining above. — I. URBICA.
Leaf-blades dull above.
  Seed free from the pericarp, or if adherent, blades of the lower leaves entire.
    Plants not strong-scented: seed and pericarp free. — II. BOSCIANA.
    Plants strong-scented: seed and pericarp adherent. — III. VULVARIAE.
  Seed adherent to the pericarp: blades of the lower leaves sinuate-dentate. — IV. ALBA.

I. URBICA

Plant irregularly branched: leaf-blades irregularly toothed. — 1. *C. murale.*

II. BOSCIANA

Erect plant with the blades of the upper leaves narrow and entire. — 2. *C. Boscianum.*

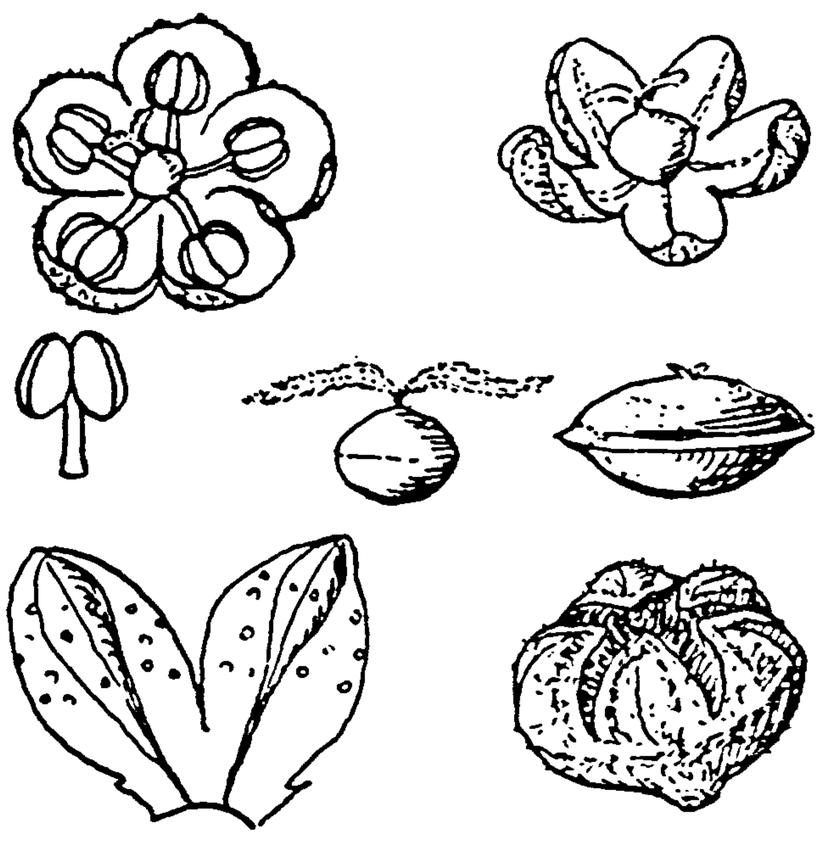
III. VULVARIAE

Diffuse plant with squarish-rhombic leaf-blades. — 3. *C. Vulvaria.*

IV. ALBA

Blades of the lower leaves about as wide as long. — 4. *C. amaranticolor.*
Blades of the lower leaves decidedly longer than wide.
  Leaf-blades, except the lower ones, entire, lanceolate or oblong-lanceolate. — 5. *C. lanceolatum.*
  Leaf-blades, toothed or lobed, broader than lanceolate.
    Seeds over 1 mm. wide: plant not strong-scented.
      Plants bright-green: inflorescence loose and open. — 6. *C. paganum.*
      Plants copiously farinose: inflorescence dense. — 7. *C. album.*
    Seeds 1 mm. wide or less: plant strong-scented. — 8. *C. Berlandieri.*

1. **C. murale** L. Plant deep-green, somewhat mealy, 1–6 dm. tall: leaf-blades ovate to rhombic-ovate, 2–8 cm. long, coarsely, sharply, and irregularly toothed: panicles terminal and lateral, the small flower-clusters naked, numerous and close: seed barely 1.5 mm. wide, dull, acute-margined. — (NETTLE-LEAVED GOOSEFOOT.) — Waste-places and roadsides, various provinces, Fla. to Tex. and S Can. Nat. of Eu.—(*W. I.*, *Mex.*, *C. A.*)—Sum.



2. **C. Boscianum** Moq. Plant light-green, often minutely mealy when young, 3–9 dm. tall: leaf-blades ovate, elliptic-ovate, or lanceolate, 1–6 cm. long, thin, the lower ones often sinuate: panicle-branches very slender, spreading, the flower-clusters scattered, relatively small: seed 1.5 mm. wide, shining, obtuse-margined.—Woods, thickets, and waste-places, various provinces, rarely Coastal Plain, Ga. to Tex., Minn., and Me.—Sum.

3. **C. Vulvaria** L. Plant white mealy, much-branched, the branches procumbent: leaf-blades thickish, ovate, deltoid, or suborbicular, 0.5–2.5 cm. long, acute or acutish, entire, relatively long-petioled: flower-clusters simple or branched: seed about 1 mm. wide, dull, obtuse-margined.—(STINKING-GOOSE-

FOOT.)—Waste-grounds, various provinces, Fla. to Tex., Wis., Ont., and Que. Nat. of Eu.—The odor, very penetrating, may be carried long distances by the wind.

4. **C. amaranticolor** Coste & Reyn. Plant 1–3 m. tall, the stout branches ascending or erect from a spreading base, sharp-angled, bright-green striped with red, sparsely and finely farinose: leaf-blades broadly rhombic, 6–14 cm. long, obtuse, usually shallowly 3-lobed and finely and irregularly sinuate-dentate, finely farinose beneath when young: bracts rhombic-ovate to oblong or elliptic, usually toothed, bright red, at least when young: inflorescence rather diffuse, the flowers in small glomerules which are borne in dense spikes: sepals slightly keeled, copiously farinose and usually reddish.—Fields and waste-places, Coastal Plain, N Fla. and Ga. Nat. of Eu.—(*W. I.*)—Spr.–fall.

5. **C. lanceolatum** Muhl. Plant 0.5–1.5 m. tall, the slender branches ascending, obtuse-angled, green and striate, glabrous or nearly so: leaf-blades lanceolate, elliptic-lanceolate or elliptic, or rarely broader, 2–5 cm. long, obtuse or acutish and mucronulate, entire or the lower ones with few broad teeth, sparsely and finely farinose beneath: bracts little if at all reduced, narrowly elliptic to lanceolate; inflorescence more or less diffuse, the flowers in small glomerules which are borne in usually slender interrupted spikes: sepals obtuse-keeled, sparsely farinose, green with white margins: seed 1–1.2 mm. wide, shining, obtuse-margined.—Waste-places and cult. grounds, various provinces, Fla. to Okla., Wash., and Ont.—(*Eurasia.*)—Sum.–fall.

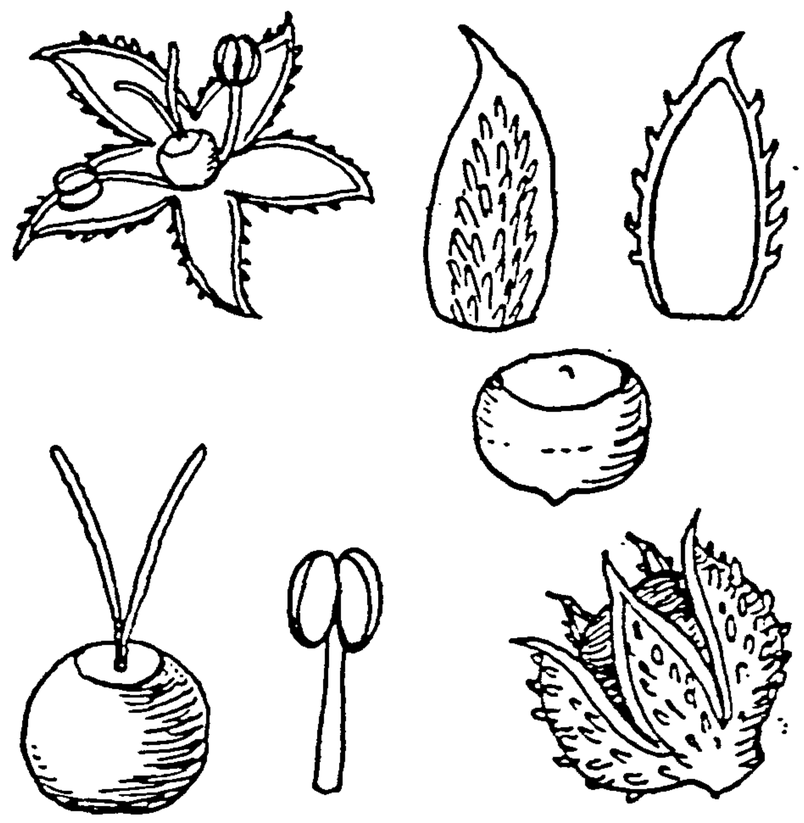
6. **C. paganum** Reichenb. Plant 0.4–1.5 m. tall, the branches stout or slender, ascending, obtuse-angled, bright-green, striate, glabrous or nearly so: leaf-blades rhombic-ovate, rhombic, or ovate-elliptic, 4–8 cm. long, obtuse, coarsely and irregularly sinuate, sometimes shallowly 3-lobed or entire, bright-green nad glabrous or sparsely and minutely farinose beneath: bracts ovate to lanceolate, often cuspidate, usually entire: inflorescence usually broad and lax, the flowers in large glomerules which are borne in slender interrupted spikes: sepals sharp-keeled, sparsely farinose: seed 1.3–2 mm. wide, shining, obtuse-margined.—Fields and waste-places, various provinces, Fla. to Tex., Calif., and Ont. Nat. of Eu.

7. **C. album** L. Plant 0.3–2 m. tall, the branches slender or stout, ascending, obtuse-angled, pale-green, striate, mostly glabrous: leaf-blades rhombic-ovate, or rarely ovate or lanceolate, 2.5–8 cm. long, obtuse and apiculate, often shallowly 3-lobed, irregularly sinuate or rarely nearly entire, finely and commonly densely farinose beneath: bracts ovate to lanceolate, usually entire: inflorescence usually narrow and compact, the flowers in large glomerules which are borne in dense stout spikes: sepals sharply carinate, farinose: seed 1.3–1.5 mm. wide, shining, obtuse-margined.—(LAMB'S-QUARTER'S. PIGWEED.)—Waste-places and cult. grounds, various provinces, Fla. to Tex., Calif., B. C., Ont., and N. S. Nat. of Eu.—(*Mex.*)—Sum.–fall.—Plants cooked before they have flowered make excellent "greens."

8. **C. Berlandieri** Moq. Plant 0.4–1.5 m. tall, the slender or stout branches ascending, obtuse-angled, striate, glabrate: leaf-blades rhombic-ovate, oval, or elliptic, 1.2–3 cm. long or larger, acute or obtuse and mucronulate, sinuate or entire, often densely farinose when young: bracts much reduced, ovate to linear-lanceolate, often entire: inflorescence-branches slender: sepals sharply-keeled, densely farinose: seed 1 mm. wide or less, shining, obtuse-margined.—Dry soil, Coastal Plain and occasionally other provinces, Fla. to Tex. and N. C.; also adv. N E.—(*Mex.*)—Sum.–fall.

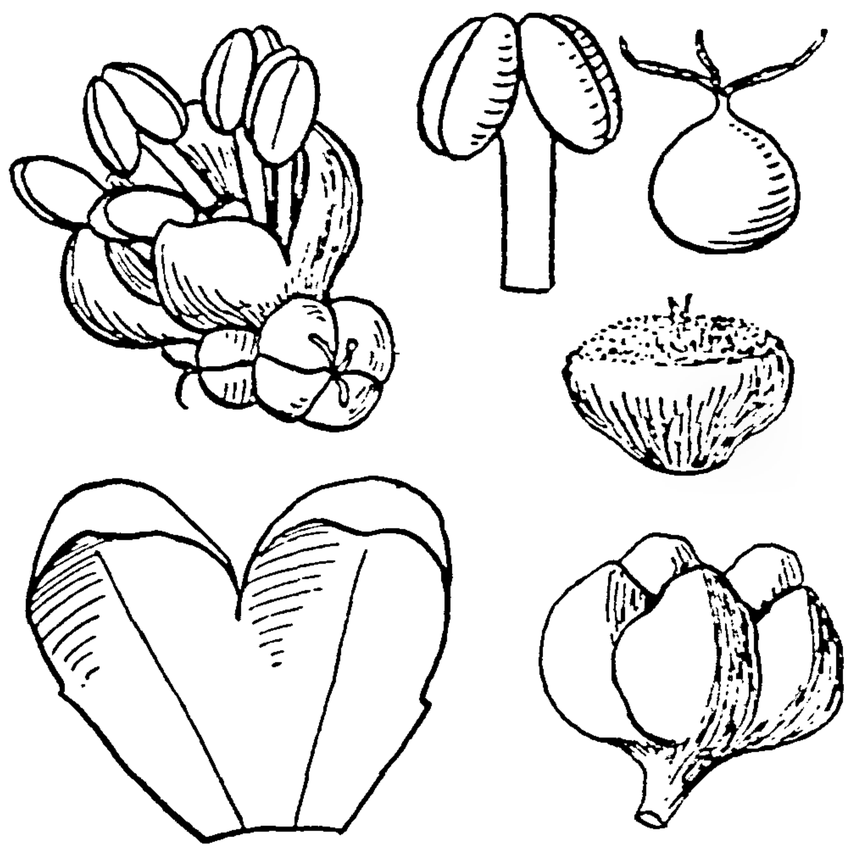
5. **BOTRYDIUM** Spach. Low sweet-scented glandular-pubescent herbs, ours annual. Leaves alternate: blades pinnatifid or toothed. Flowers sessile

or pedicelled, in loosely dichotomous cymes. Sepals keeled. Ovary usually depressed. Seed adherent to the pericarp, horizontal. —About 6 species of wide geographic distribution.—The flowers are yellowish-green.



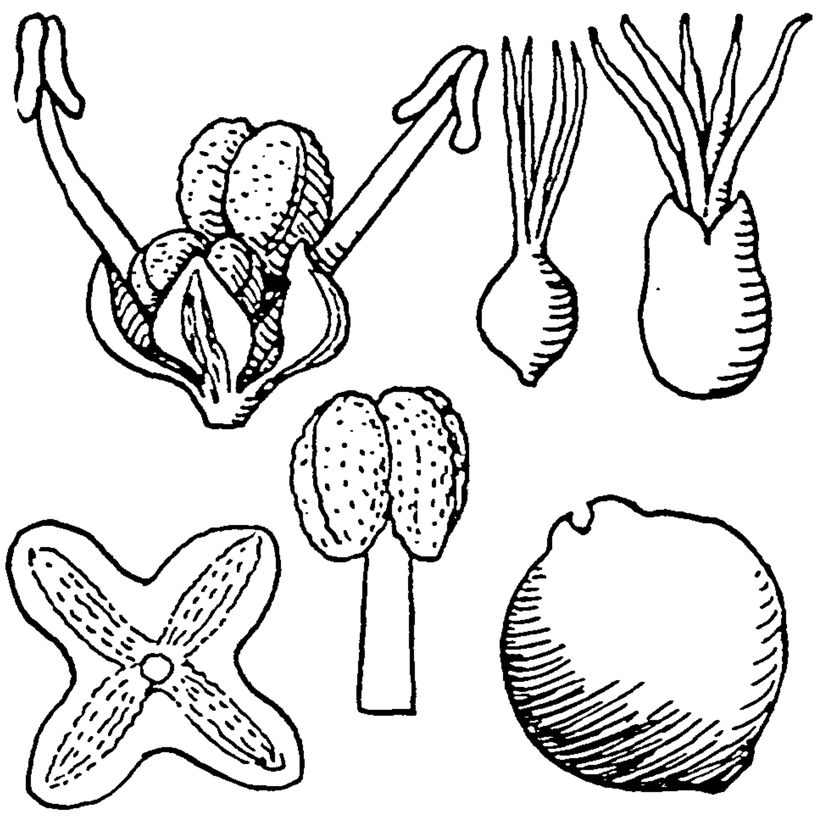
1. B. Botrys (L.) Small. Stem 1–6 dm. tall, the branches erect or spreading: leaf-blades elliptic to ovate, 1–5 cm. long, the lobes entire or toothed: panicle-branches cymose: utricle partially enclosed: seed less than 1 mm. wide. [*Chenopodium Botrys* L.]—(JERUSALEM-OAK. TURNPIKE-GERANIUM. FEATHER-GERANIUM.) —Roadsides and waste-places, various provinces, rarely Coastal Plain, Ga. to Tex., Calif., and S Can. Nat. of Eu. (*Mex.*, *E. A.*)—Sum.–fall.—The foliage is aromatic.

6. AMBRINA Spach. Erect or diffuse annual or perennial aromatic herbs, with yellow glands, and sometimes pubescent. Leaves alternate: blades coarsely toothed or pinnatifid. Flowers sessile, spicate. Sepals rounded, not keeled. Seeds horizontal or vertical.—Three or four species, natives of America.—The flowers are white or yellowish-green.



1. A. ambrosioides (L.) Spach. Stem 5–8 dm. tall, the branches sometimes decumbent: leaf-blades elliptic to elliptic-lanceolate or ovate-lanceolate, those of the stem-leaves 3–15 cm. long, undulate to repand-dentate: panicle-branches spike-like: utricle wholly enclosed: seed 0.7–0.8 mm. wide. [*Chenopodium ambrosioides* L.]—(MEXICAN-TEA. WORMSEED. STINKWEED.) — Waste-places, cult. grounds, and shores, various provinces, Fla. to Tex., Calif., Ont., and Me. Nat. of trop. Am.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*, *O. W.*)—Sum.–fall.—The foliage and oil give off a disagreeable odor.

7. SPINACIA L. Fleshy edible herbs. Leaves alternate: blades often hastate. Flowers dioecious or rarely perfect, in compact glomerules. Calyx herbaceous, that of the staminate flower 4–5-lobed; pistillate borne in 2 united bracts, which in the fruit, surround the utricle and develop spine-tips, or unappendaged. Utricle enclosed, achene-like.—About 4 species, natives of the Orient.



1. S. oleracea L. Annual or biennial: stem 3–10 dm. tall: leaf-blades ovate to deltoid in outline, more or less hastate, 0.5–2 dm. long: fruit 4–5 mm. long, the spreading spines as long as the fruit-body or longer.—(SPINACH. SPINAGE.)—Cult. grounds and fields generally. Nat. of the O. W. and cult.

—Spr.–fall.—The foliage has been used as a table vegetable from prehistoric times.

7. **ATRIPLEX** [Tourn.] L. Scaly herbs or shrubs. Leaves alternate or sometimes opposite: blades often angulate or toothed. Flowers monoecious or dioecious, the staminate bractless, the pistillate bracted. Calyx herbaceous. Utricle wholly or partially surrounded by the crested, tubercled, or winged accrescent bracts.—About 135 species of wide geographic distribution.—The flowers are greenish or red-tinged. The foliage of some species is boiled and eaten.—ORACHES. SALT-BUSHES.

Fruiting bracts united only at the base.
  Leaves, at least the lower ones, opposite; blades usually hastate or subhastate, some of the lower ones sometimes toothed: foliage bright green and glabrous. I. HASTATAE.
  Leaves alternate; blades usually toothed: foliage furfuraceous. II. ROSEAE.
Fruiting bracts united above the base, usually up to the middle. III. ARENARIAE.

I. HASTATAE

Bracts rhombic-oval, cuneate or rounded at the base. 1. *A. patula.*
Bracts orbicular-deltoid or ovate-deltoid, truncate or broadly rounded at the base. 2. *A. hastata.*

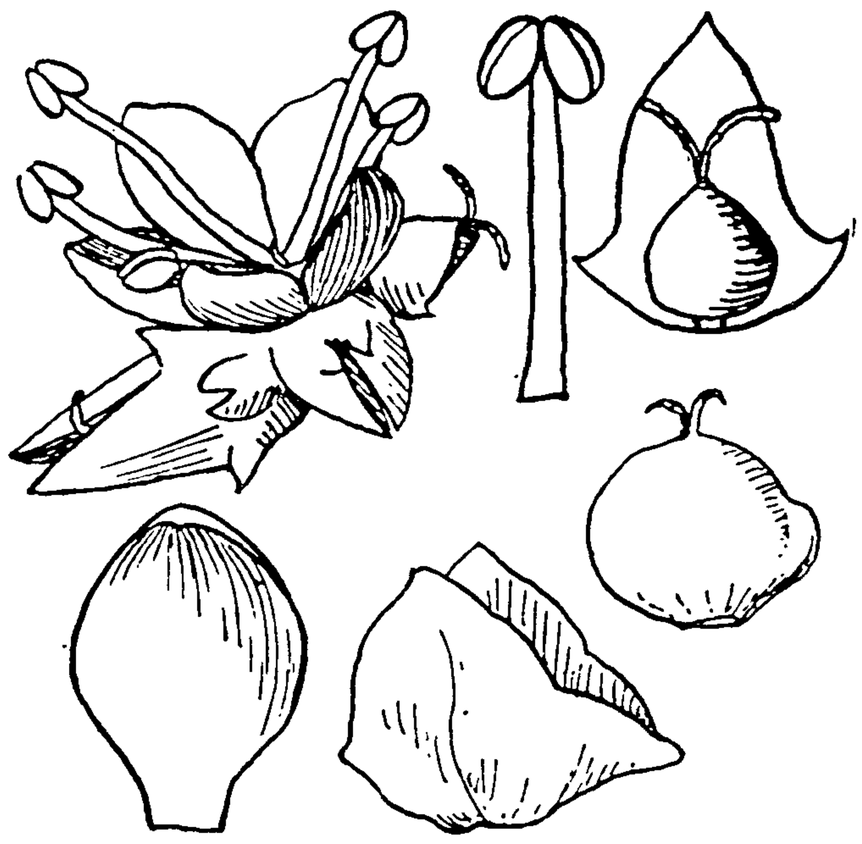
II. ROSEAE

Stem freely branching: flowers staminate and pistillate, mixed in axillary clusters. 3. *A. rosea.*

III. ARENARIAE

Leaf-blades toothed.
  Staminate glomerules in elongate, usually branched spikes. 4. *A. Lampa.*
  Staminate glomerules axillary or in short simple spikes. 5. *A. pentandra.*
Leaf-blades entire. 6. *A. arenaria.*

1. A. patula L. Stem and branches 2–9 dm. long, green: blades of the lower leaves hastate and sinuate, or usually entire, the lobes ascending, those of the upper leaves rhombic-lanceolate, lanceolate, elliptic or narrowly elliptic-lanceolate, 2.5–8 cm. long: fruiting bracts rhombic-oval, often subhastate, 2–6 mm. long, rounded or broadly cuneate at the base, usually denticulate: seed yellowish or black, 1.5–2.5 mm. wide.—(ORACH.)—Coastal salt-marshes, Fla. to N. B., and Calif. to B. C.; also in calcareous bogs in Ill. and other inland regions.—(*Eurasia.*)—Spr.–fall.



2. A. hastata L. Stem and branches 3–9 dm. long, green or straw-yellow; blades of the lower leaves triangular-hastate to orbicular-deltoid, entire, sinuate or repand, truncate or subcordate at the base, the lobes spreading or reflexed, those of the upper leaves oblong-hastate, lanceolate-hastate, oblong or lanceolate, 2–6 cm. long: fruiting bracts orbicular-deltoid or ovate-deltoid, 3–7 mm. long, truncate or rounded at the base, denticulate or rarely entire: seed nearly black, 1.5–2.5 mm. wide.—Saline and calcareous marshes, and waste-places, N. C. to Newf., and Tex. to Calif., Ore. and Ind.—(*Eurasia.*)—Spr.–fall.

3. A. rosea L. Stem 2–10 dm. tall, much-branched, yellowish or whitish: leaves numerous, alternate; blades ovate, rhombic-ovate, or oval, 2–8 cm. long, sinuate, broadly cuneate or rounded at the base: flowers in axillary glomerules and also usually in terminal interrupted spikes: fruiting bracts rhombic to cuneate-orbicular, 4–5 mm. long or rarely longer, toothed at least near the base: seed

dark-brown, 1.5–2 mm. wide.—Alkaline soil, and waste-places, various provinces, Fla. to N. Y.; also W U. S.—(*Mex., O. W.*)—Spr.–fall.

4. **A. Lampa** (Moq.) Gillies. Annual, pale-scurfy: stems mostly 1 m. tall or less, sometimes prostrate, often widely branched, the branches slender: leaf-blades hastate, or those of the upper leaves elliptic-lanceolate to linear, mostly 2–8 cm. long, the terminal lobe often toothed: spikes or panicles elongate, glomerate-interrupted: fruiting bracts reniform or ovate-rhombic, 5–6 mm. broad, shallowly toothed, the faces veiny: seed brown.—Waste-places and cult. grounds, Coastal Plain, N Fla. and Ala. Nat. of S. A.—Sum.–fall.

5. **A. pentandra** (Jacq.) Standley. Annual or perennial, green, 3–6 dm. tall: leaf-blades elliptic to elliptic-ovate, or oblong-lanceolate, 1.5–3 cm. long, repand or sinuate, or entire above: fruiting bracts flabellate, 2–3 mm. wide, sharply toothed, the faces with 2–4 tubercles: seed brown. [*Obione cristata* H. & B.] —Coastal sand-dunes and shores, S Fla.—(*W. I., S. A.*)—All year.

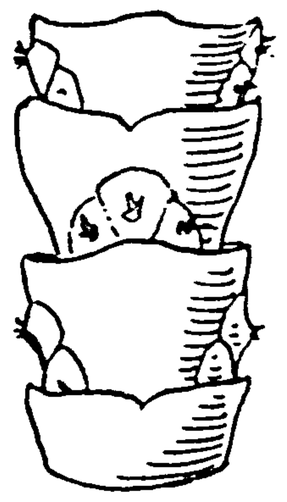
6. **A. arenaria** Nutt. Annual, pale or silvery, 1–5 dm. tall: leaf-blades oblong to oval, obovate or narrowly elliptic, 1–4 cm. long: fruiting bracts 3–5 mm. wide, flabellate, 3–5-toothed, the faces tuberculate or spiny: seed reddish-brown. [*Obione arenaria* Moq.]—(BEACH-ORACH.)—Sea beaches, Fla. to Tex., and N. S. —(*W. I.*)—Sum.–fall.

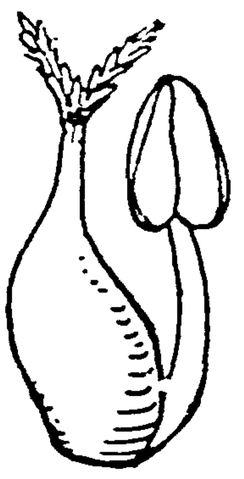
8. **SALICORNIA** Tourn. L. Fleshy herbs or shrubs. Leaves opposite, mere scales. Flowers perfect or polygamous, in cavities at the rachis-nodes. Calyx fleshy. Utricle included in the spongy perianth.—About 10 species, widely distributed in saline regions.—The popular name "glasswort" originated from the crunching sound the plants make under foot.—GLASSWORTS. SAMPHIRES.

Plant perennial: central flower extending but little higher than the lateral ones. 1. *S. perennis.*

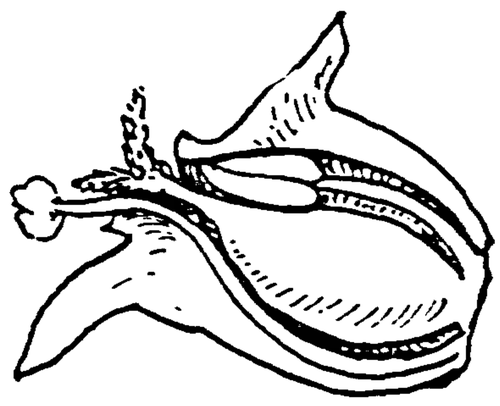
Plant annual: central flower extending much higher than the lateral ones.
- Scales mucronate: spike 4–6 mm. thick. 2. *S. Bigelovii.*
- Scales obtuse or merely acutish: spike 2–3 mm. thick. 3. *S. europaea.*

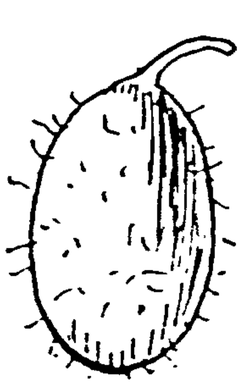
1. **S. perennis** Mill. Perennial, the decumbent or trailing stems and branches 1–7 dm. long, often in mats: internodes of the inflorescence 3–4 mm. thick and about as long: seed about 1.2 mm. long, pubescent with slender curved hairs. [*S. ambigua* Michx.]—(WOODY GLASSWORT.)—Sea-beaches and coastal salt-marshes, Fla. to Miss. and N. H.—(*W. I., O. W.*)—Sum.–fall, or all year S.





2. **S. Bigelovii** Torr. Annual, stout, 1–6 dm. tall, green: internodes of the inflorescence about as long as thick; seed nearly black, 1.5–2 mm. long, with short curved hairs. [*S. mucronata* Bigel. not Lag.]—Salt marshes, along the coast, Fla. to Tex., and N. S.; also Calif.—(*W. I., Mex.*)—Sum.

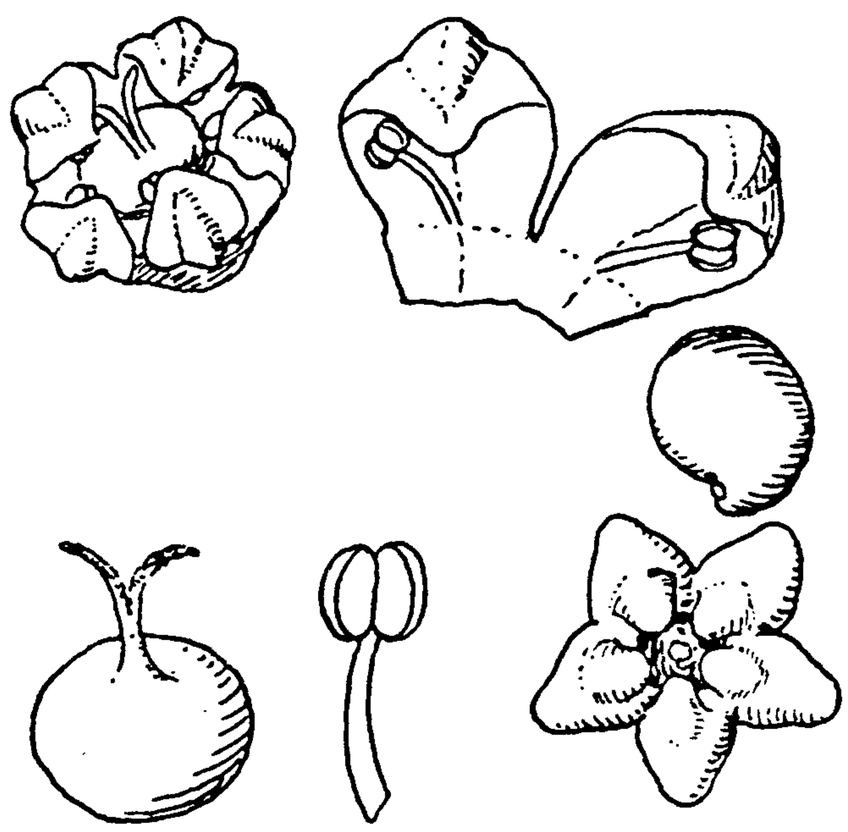




3. **S. europaea** L. Annual, relatively slender, 1–6 dm. tall, often red or reddish: internodes of the inflorescence 2–4 times longer than thick: seed brown, 1.5–2 mm. long, with short curved hairs. [*S. herbacea* L.]—Salt marshes, along the coast, Ga. to Anticosti and occasionally in saline soil in various interior provinces;

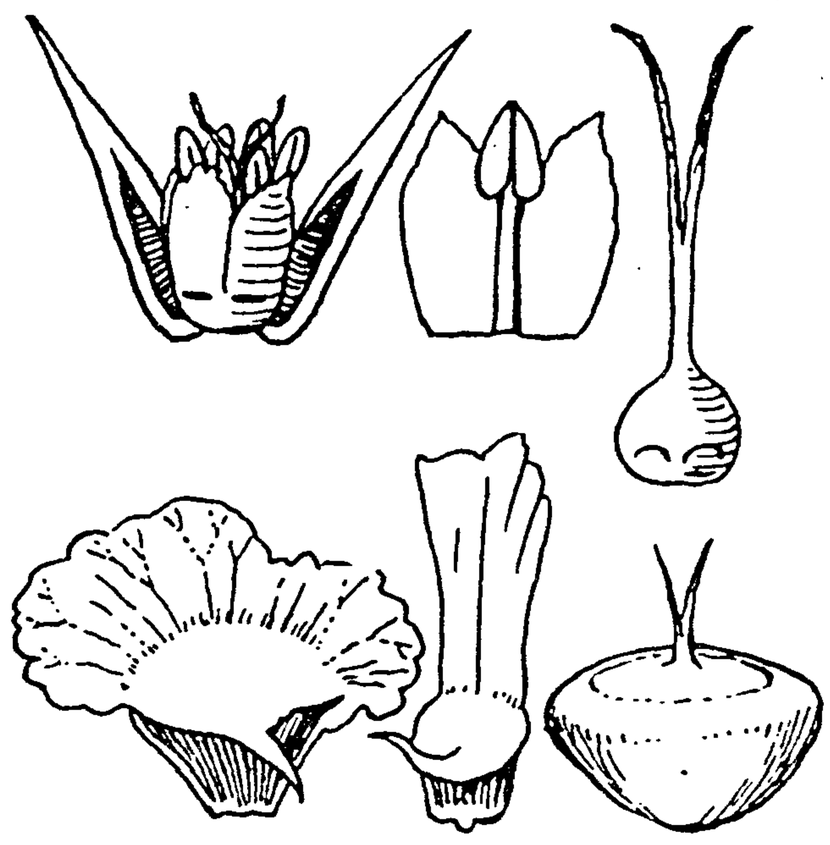
also Pacif. coast.—(*W. I., O. W.*)—Sum.–fall.—This unusual plant often forms extensive beds, and crunches under foot, like thin glass. Often brilliant red in fall.

9. **DONDIA** Adans. Fleshy leafy herbs. Leaves alternate: blades thick or terete, entire. Flowers perfect or polygamous. Sepals hooded, keeled at maturity. Filaments very short.—About 50 species, widely distributed.—SEA-BLITE.



1. D. linearis (Ell.) Millsp. Plants glabrous, 1–9 dm. tall, diffusely branched: leaf-blades nearly terete, linear, 1–5 cm. long, acute: sepals equally cucullate-carinate: seed about 1.5 mm. wide, smooth and shining. [*Suaeda linearis* Moq.]—(SEA-BLITE.)—Sandy shores and salt-marshes, Coastal Plain, Fla. to Tex., and Me.—(*W. I.*) — Spr.–fall. — **Dondia maritima** (L.) Druce, which differs from *D. linearis* in the seed being 2 mm. broad, the calyx-lobes rounded or obscurely carinate on the back, and the plant glaucous, is naturalized in the NE U. S. from Europe, reported, but apparently unconfirmed from our area.

10. **SALSOLA** L. Coarse herbs or woody plants. Leaves mostly alternate: blades narrow, firm, entire. Flowers perfect. Sepals flat, developing horizontal wings. Filaments elongate. —About 50 species widely distributed, especially in saline regions.

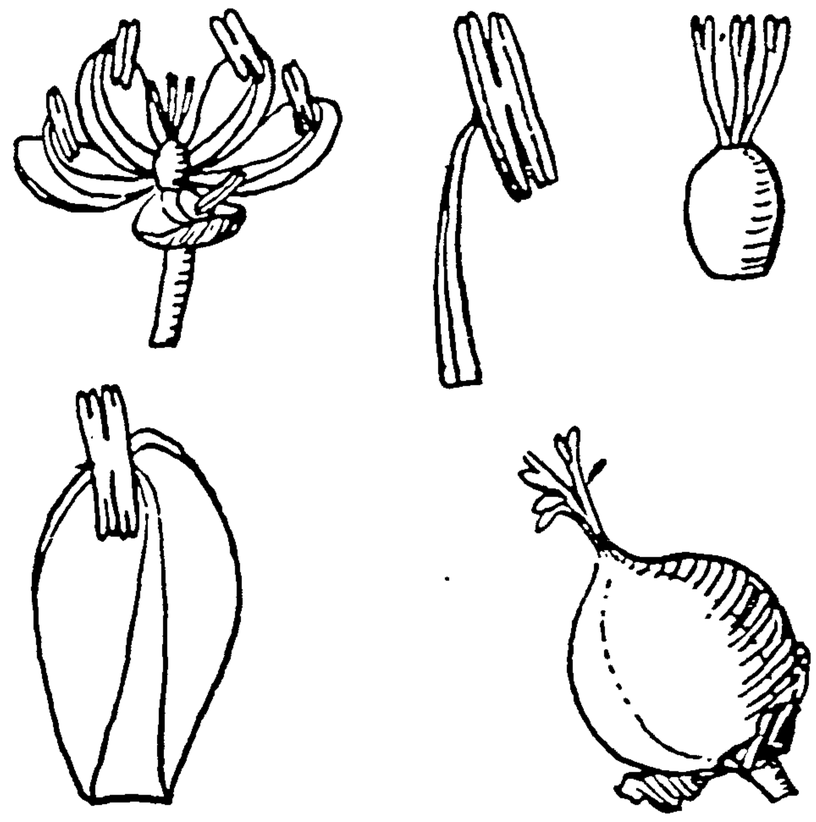


1. S. Kali L. Annual, 2–6 dm. tall: leaf-blades subulate-lanceolate, 6–20 mm. long, the midrib prolonged into a spine: calyx leathery, the wings 4–8 mm. in diameter, erose or lacerate: seed shining, 2–3 mm. thick.—(SALTWORT.)—Sea beaches, Fla. to Miss. and Newf.—(*Eurasia*)—Sum.–fall.—**Salsola Pestifer** A. Nelson, which differs from *S. Kali* in the almost filiform leaves 3–6 cm. long, and a fruiting calyx 3–6 mm. broad, is occasional in the E U. S. It has become thoroughly naturalized in the W U. S. and has proved to be a most pernicious and troublesome weed as it is not confined to saline soil for its habitat.—Commonly known as RUSSIAN-THISTLE, a name sometimes also applied to the other species.—Nat. of Eurasia.—The flowers of both species are green, but the mature calyx becomes more or less tinged with pink.

FAMILY 2. **BASELLACEAE** — MADEIRA-VINE FAMILY

Somewhat succulent vines, with tuber-bearing rootstocks. Leaves alternate: blades relatively broad, entire. Flowers perfect in spike-like racemes. Calyx of 2 sepals, sometimes winged in fruit. Corolla of 5 often somewhat colored petals. Androecium of 5 stamens borne opposite the petals. Gynoecium 3-carpellary. Ovary superior, 1-celled. Fruit utricular.—Five genera and about 15 species, mostly natives of the tropics.

1. BOUSSINGAULTIA H.B.K. Vines. Leaf-blades of an ovate type, rather fleshy. Racemes axillary and terminal. Sepals 2, nearly flat, not winged. Petals 5, longer than the sepals. Stigmas cleft.—Ten species, natives of tropical America.—MADEIRA-VINE.

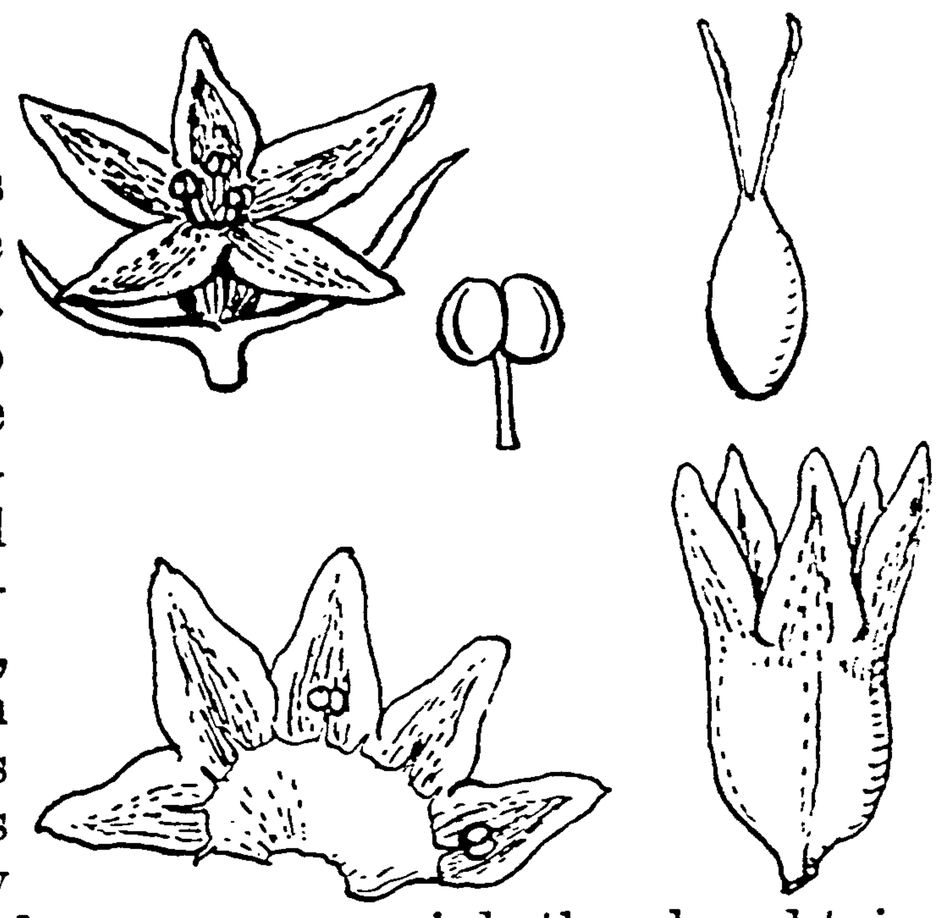


1. B. leptostachya Moq. Glabrous vine with slender stems and branches: leaf-blades ovate to elliptic, 2–7 cm. long, acute or slightly acuminate, thickish, gradually or abruptly narrowed at the base, short-petioled: racemes slender, elongate: bractlets acuminate: sepals ovate to elliptic, 1–1.5 mm. long: petals elliptic to oval.—Roadsides, pinelands, and hammocks, S Fla.—(*W. I., Mex., C. A., S. A.*) —Widely cultivated for its bright-green foliage and very fragrant flowers.

FAMILY 3. SCLERANTHACEAE — KNAWEL FAMILY

Annual or biennial herbs. Leaves opposite, without stipules: blades narrow. Flowers perfect, in clustered cymes. Calyx of 4 or 5 persistent sepals which are commonly shorter than the hypanthium. Corolla wanting. Androecium of 5 or 10 stamens borne on the margin of the hypanthium. Gynoecium 2-carpellary. Ovary 1-celled. Fruit a utricle.—About 3 genera and few species, widely distributed in the Old World.

1. SCLERANTHUS L. Herbs, usually branched at the base. Leaves stiff. Sepals slightly hyaline-margined, like the hypanthium indurated in age. Utricle included.



1. S. annuus L. Plant diffuse, the branches 0.5–3 dm. long, pubescent and viscid on one side: leaf-blades linear-filiform, 0.5–1.5 cm. long: flowers greenish: sepals lanceolate to ovate-lanceolate, 1–1.5 mm. long: utricle 1.5 mm. long.—(KNAWEL. GERMAN-KNOTGRASS.)—Roadsides, waste-places, and old fields, E U. S., and S Can. Nat. of Eu.—Spr.–sum.—An extremely persistent weed, as it seeds rather rapidly and flowers when very young; and not easily eradicated, as trampling upon it merely strengthens its growth and a fragment may start a new plant; also it often does not winterkill, but becomes perennial, thereby obtaining an earlier blooming and fruiting season.

FAMILY 4. AMARANTHACEAE — AMARANTH FAMILY

Herbs, shrubs, or trees. Leaves alternate or opposite, estipulate: blades entire or nearly so. Flowers perfect, polygamous, or dioecious, in spikes or panicles with scarious or colored bracts. Calyx of 2–5 mostly distinct sepals. Corolla wanting. Androecium of 5, or fewer, distinct or monadelphous stamens. Gynoecium of 2 or more united carpels. Ovary

1-celled. Fruit a utricle or pyxidium, or rarely baccate.—About 40 genera and 475 species, widely distributed.

Anthers 4-celled.	
Leaves alternate.	
Fruit several-seeded.	Tribe I. CELOSIEAE.
Fruit 1-seeded.	Tribe II. AMARANTHEAE.
Leaves opposite.	Tribe III. CENTROSTACHYDEAE.
Anthers 2-celled.	
Sepals distinct or nearly so, unchanged at maturity.	Tribe IV. GOMPHRENEAE.
Sepals partly united, the tube indurate at maturity and variously appendaged.	Tribe V. FROELICHIEAE.

I. CELOSIEAE

Woody plant with spreading or vine-like branches.	1. CELOSIA.

II. AMARANTHEAE

Perianth present in the pistillate flowers.	2. AMARANTHUS.
Perianth wanting in the pistillate flowers.	3. ACNIDA.

III. CENTROSTACHYDEAE

Firm-herbaceous or partly woody plants with elongate spikes, the flowers and fruits deflexed.	4. CENTROSTACHYS.

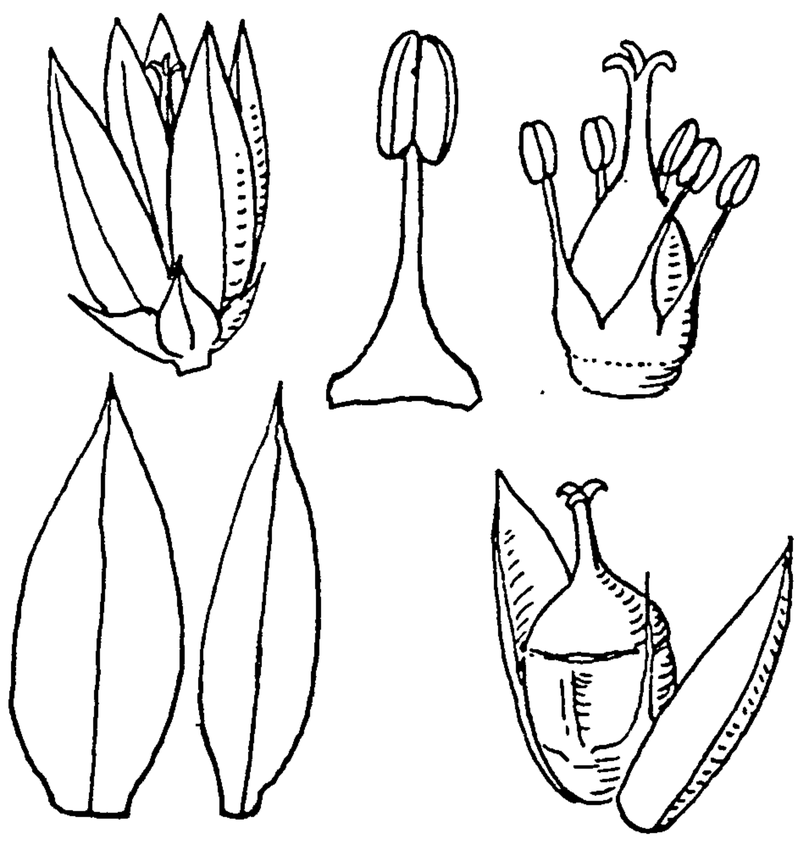
IV. GOMPHRENEAE

Stigma capitate.	5. ACHYRANTHES.
Stigma with slender lobes.	
Stamen-tube with broad lobed, toothed, or laciniate segments, without pseudostaminodia.	6. GOMPHRENA.
Stamen-tube with entire segments, and often with pseudostaminodia.	
Flowers not compressed, borne in panicled spikes.	7. IRESINE.
Flowers strongly compressed, borne in dense head-like spikes.	8. PHILOXERUS.

V. FROELICHIEAE

Herbs with virgate flowering stems.	9. FROELICHIA.

1. CELOSIA L. Herbs or shrubs. Leaves alternate: blades mainly entire. Flowers perfect, spicate: sepals 5, scarious. Filaments partially united. Styles united. Ovules 2–8. Utricle circumscissile.—About 40 species, natives of tropical and subtropical regions.—Forms with fasciated inflorescence are favorite garden plants.—COCK'S-COMBS.—The flowers are white or greenish white.



1. C. nitida Vahl. Perennial, glabrous, 1 m. long or more: leaf-blades ovate, deltoid-ovate, or ovate-lanceolate, 1.5–7 cm. long: spikes 1–3 cm. long: sepals oblong, 3.5–4 mm. long: utricle included: seed about 1 mm. long. [*C. paniculata* (Chapm. Fl.)]—Coastal sand-dunes and hammocks near the seashore S Fla.; also S Tex.—(*W. I. Mex., C. A., S. A.*)—All year.

2. AMARANTHUS [Tourn.] L. Herbs. Leaves alternate: blades entire. Flowers polygamous, monoecious, or dioecious, densely spicate or clustered, each subtended by mostly 3 bracts. Sepals 2–5. Filaments distinct. Stigmas 2 or 3, distinct. Ovule solitary. Utricle circumscissile, irregularly opening or inde-

hiscent.—About 60 species widely distributed in temperate and tropical regions. —Mostly weeds, but some species are cultivated for their colored inflorescences. —The flowers are green or red.—AMARANTHS. PIGWEEDS. TUMBLEWEEDS.

Sepals of the pistillate flowers spatulate, clawed: flowers all axillary. I. CRASSIPES.

Sepals of the pistillate flowers not spatulate: staminate flowers in terminal spikes or all flowers in axillary clusters in *A. blitoides* and *A. graecizans*. II. PANICULATI.

I. CRASSIPES

Bracts and pedicels much thickened and indurate: utricle indehiscent. 1. *A. crassipes.*

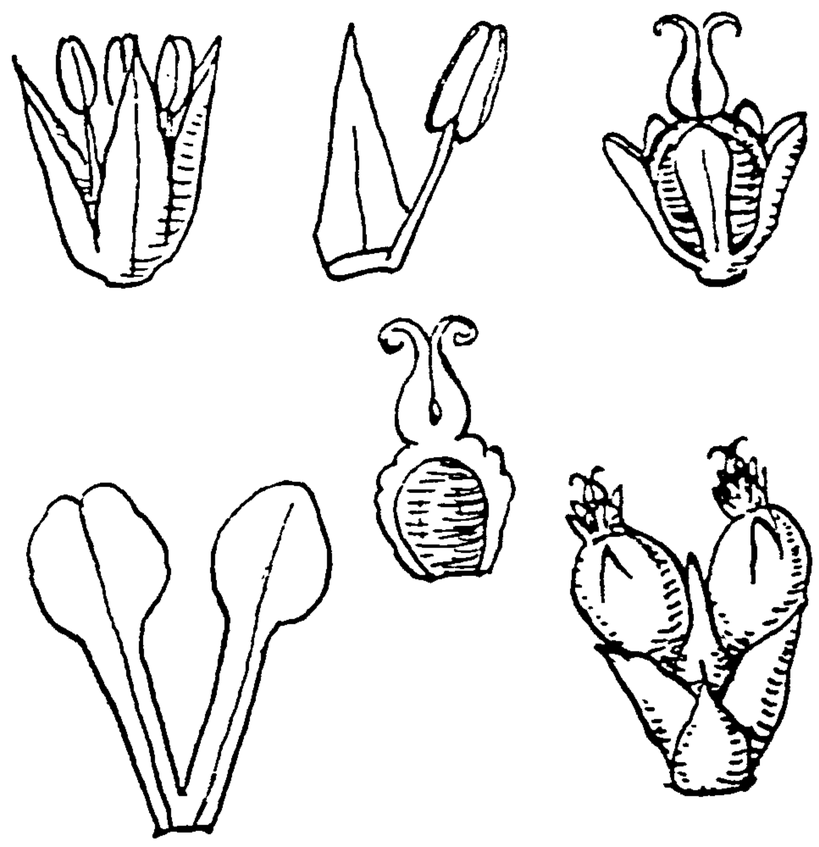
Bracts and pedicels not thickened nor indurate: utricle circumscissile. 2. *A. polygonoides.*

II. PANICULATI

Utricle dehiscent.
- Inflorescence of terminal or axillary simple or compound spikes, and with clusters of flowers often present in the leaf-axils.
  - Utricle regularly dehiscent: leaf axils without spines.
    - Sepals shorter than the utricle, or, if longer, acute or acuminate.
      - Bracts obtuse or merely acutish, about equalling the sepals or somewhat longer, usually red or purple. 3. *A. cruentus.*
      - Bracts acute or acuminate, usually twice as long as the sepals, usually green or pink. 4. *A. hybridus.*
    - Sepals mostly longer than the utricle, obtuse or truncate. 5. *A. retroflexus.*
  - Utricle irregularly and imperfectly dehiscent: leaf axils with rigid spines. 6. *A. spinosus.*
- Inflorescence wholly of axillary clusters.
  - Sepals 4 or 5: stem and branches prostrate. 7. *A. blitoides.*
  - Sepals 3: stem erect. 8. *A. graecizans.*

Utricle indehiscent.
- Utricle rugose.
  - Flowers borne in axillary clusters: leaf-blades crisped. 9. *A. crispus.*
  - Flowers borne in terminal and axillary spikes: leaf-blades flat.
    - Leaf-blades narrow, linear to elliptic-linear: sepals 5. 10. *A. muricatus.*
    - Leaf-blades broad, ovate to rhombic-ovate: sepals 3. 11. *A. gracilis.*
- Utricle smooth.
  - Leaf-blades membranous: flowers partly in terminal spikes: seeds about 1 mm. in diameter. 12. *A. deflexus.*
  - Leaf-blades thick and fleshy: flowers all in axillary clusters: seeds 2–2.5 mm. in diameter. 13. *A. pumilus.*

1. A. crassipes Schlecht. Stem and branches 1–6 dm. long, stout: leaf-blades spatulate to ovate, 1–2.5 cm. long: staminate calyx 1.9–2.2 mm. long: pistillate calyx 1.7–2 mm. long; sepals spatulate, abruptly pointed: ovary tuberculate. [*Scleropus crassipes* Moq.]—Hammocks and waste-places, Coastal Plain, pen. Fla. to Ala.—(*W. I., S. A.*)—All year.



2. A. polygonoides L. Stem and branches 1–5 dm. long: leaf-blades rhombic, ovate or oval, 1–2 cm. long: staminate calyx 0.9–1 mm. long: pistillate calyx 2.2–2.4 mm. long; sepals narrowly cuneate. [*Amblogyna polygonoides* Raf.]—Hammocks and open sandy places, Coastal Plain, Fla. and Tex.—(*W. I., Mex., C. A., S. A.*)

3. A. cruentus L. Stem 5–20 dm. tall, smooth: leaf-blades elliptic, ovate-lanceolate,

or rhombic-ovate, 3.5–30 cm. long: staminate calyx 1–1.5 mm. long: pistillate calyx about 1.5 mm. long; sepals elliptic, often narrowly so: utricle exceeding the sepals.—(BLOOD-RED PRINCE'S-FEATHER. PILEWORT.)—Waste-places and gardens, various provinces, U. S. generally, except the extreme west. Nat. of Asia.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.

4. A. hybridus L. Stem 5–25 dm. tall, not spiny: leaf-blades lanceolate or ovate to ovate-lanceolate or elliptic, 3–15 cm. long: staminate calyx 1.7–1.9 mm. long: pistillate calyx 1.7–2 mm. long; sepals narrowly oblong to oblong-lanceolate: utricle equalling the sepals or shorter. [*A. chlorostachys* Willd.]—(PIGWEED. AMARANTH.)—Waste-places and cult. grounds, nearly throughout the U. S. and S Can.—(*W. I., Mex., C. A., S. A., O. W.*)—Sum.–fall.

5. A. retroflexus L. Stem 3–30 dm. tall: leaf-blades ovate to ovate-lanceolate or lanceolate above, 5–15 cm. long: staminate calyx 3.4–3.6 mm. long: pistillate calyx 3.5–4 mm. long; sepals linear-oblong to linear-cuneate: utricle shorter than the sepals.—(GREEN-AMARANTH.)—Cult. grounds and waste-places, nearly throughout the U. S. and S Can.—(*Mex., O. W.*)—Spr.–fall.

6. A. spinosus L. Stem 2–12 dm. tall, spiny: leaf-blades ovate, rhombic-ovate, or lanceolate, 1.5–8 cm. long: staminate calyx 2–2.7 mm. long: pistillate calyx 2–2.5 mm. long; sepals broadened upward, abruptly pointed: utricle about equalling the sepals.—(THORNY-AMARANTH.)—Roadsides, waste-places, and fields, Fla. to Tex., Minn., Ont., and Me. Nat. of India.—(*W. I., Mex., C. A., S. A., O. W.*)—Sum.–fall.

7. A. blitoides S. Wats. Stem 1.5–6 dm. long, prostrate: leaf-blades obovate, to spatulate, oval, or elliptic, 0.8–4 cm. long: staminate calyx about 2 mm. long: pistillate calyx 2.5–3 mm. long; sepals elliptic, acuminate.—(SPREADING-PIGWEED.)—Waste-places, fields, and roadsides, nearly throughout the U. S. and S Can. Nat., perhaps, of Eu.—Sum.–fall.

8. A. graecizans L. Stem 1–6 dm. tall, erect: leaf-blades spatulate, obovate, or elliptic, 1–3 cm. long: staminate calyx 1.4–1.6 mm. long: pistillate calyx 1.8–2.2 mm. long; sepals lanceolate, long-acuminate. [*A. albus* L.]—(TUMBLE-WEED.)—Roadsides, fields, and waste-places, throughout the U. S. and S Can.—(*Mex., S. A., O. W.*)—Sum.–fall.

9. A. crispus (Lesp. & Thév.) A. Br. Stem much branched, the branches forming large mats: leaf-blades rhombic-ovate to elliptic, 0.6–2.5 cm. long: staminate calyx about 1.5 mm. long: pistillate calyx about 1.5 mm. long; sepals 5, elliptic to oblanceolate, rounded and abruptly pointed. [*Euxolus deflexus* (Chapm. Fl.)]—Waste-places and cult. grounds, Coastal Plain and occasionally other provinces, La., N. C., and N. Y. Nat. of Eu.—(*S. A.*)—Sum.–fall.

10. A. muricatus (Moq.) Gillies. Stem 3–7 dm. tall: leaf-blades linear to elliptic-linear, 2–8 cm. long: staminate calyx fully 1.5 mm. long: pistillate calyx 1.5–1.7 mm. long; sepals 5, elliptic, abruptly pointed.—Waste-places, Coastal Plain, Ala. Nat. of S. A.—(*O. W.*)—All year.

11. A. gracilis Desf. Stems 2–9 dm. tall, erect: leaf-blades ovate or rhombic, 2–8 cm. long: staminate calyx 1.3–1.5 mm. long: pistillate calyx 1.4–1.6 mm. long; sepals 3, broadened upward, and mucronate. [*Euxolus lividus* Chapm. not Moq.]—Hammocks and cult. grounds, Fla. to Ala., and N. C. Nat. of Afr. —(*W. I., Mex., C. A., S. A.,*)—Spr.–fall.

12. A. deflexus L. Stem 1.5–6 dm. long, sometimes decumbent: leaf-blades broadly ovate, rhombic-ovate, oval, or lanceolate, 2–7.5 cm. long: staminate

calyx 1–1.5 mm. long: pistillate calyx 1.5–2 mm. long; sepals often 3. [*Euxolus deflexus* Raf.]—Waste-places, Coastal Plain and New England Coast, Fla. to Ala., and Mass.; also in Calif. Nativity not known.—(*Mex., S. A., O. W.*)

13. **A. pumilus** Raf. Stem 0.5–3 dm. tall, fleshy: leaf-blades suborbicular, obovate, rhombic, or ovate, 1–2 cm. long: staminate calyx 1.7–2.2 mm. long: pistillate calyx 3–4 mm. long; sepals 5, elliptic to linear-cuneate, abruptly pointed. [*Euxolus pumilus* Raf.]—(DWARF-AMARANTH.)—Sea beaches, N. C. to R. I.—Spr.–fall.

3. **ACNIDA** L. Herbs, mostly annuals and large. Leaves alternate: blades entire. Flowers dioecious, the spike sometimes interrupted, the staminate with 5 sepals and 5 distinct filaments, the pistillate flowers without a perianth.—About 6 species, native of eastern North America and the West Indies.—The flowers are green or greenish.

Utricle fleshy, 3–5-angled. I. CANNABINAE.
Utricle membranous, not angled. II. TAMARICINAE.

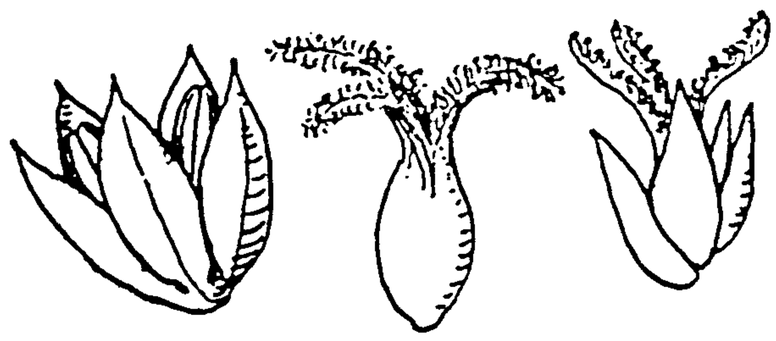
I. CANNABINAE

Seed much flattened.
  Inflorescence leafy: bracts much shorter than the utricle: seed about 2 mm. in diameter. 1. *A. cannabina.*
  Inflorescence nearly or quite leafless: bracts equalling the utricle or longer: seed about 1 mm. in diameter. 2. *A. cuspidata.*
Seed turgid, lenticular.
  Leaf-blades narrow: pistillate flowers few in a cluster: utricle less than 1.5 mm. long. 3. *A. floridana.*
  Leaf-blades broad: pistillate flowers many in a cluster: utricle 1.5 mm. long or more.
    Sepals mucronate: pistillate inflorescence of few, usually distant, large (8–18 mm.) glomerules. 4. *A. concatenata.*
    Sepals obtuse: pistillate inflorescence of many crowded small (4–10 mm.) glomerules. 5. *A. alabamensis.*

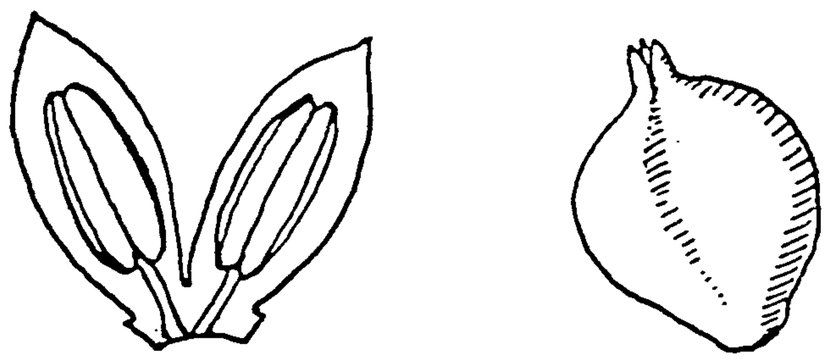
II. TAMARICINAE

Utricle indehiscent or irregularly dehiscent. 6. *A. subnuda.*
Utricle circumscissile. 7. *A. tamariscina.*

1. **A. cannabina** L. Stem 0.5–4 m. tall, branched above: leaf-blades ovate to lanceolate, or linear above, 5–15 cm. long: staminate calyx about 3 mm. long: sepals lanceolate to elliptic-lanceolate: pistillate calyx 1–1.5 mm. long; sepals ovate to ovate-lanceolate: utricle 2.5–3.5 mm. long. [*A. rusocarpa* Michx.] — (WATER-HEMP. WATER-LEAF.)—Tidal marshes, and river-shores, Coastal Plain and adj. provinces, Fla. to N. H.—Sum.–fall.



2. **A. cuspidata** Bertero. Stem stout, 1.5–7 m. tall, widely branched: leaf-blades lanceolate to elliptic-lanceolate, 10–30 cm. long: staminate calyx about 2 mm. long; sepals elliptic to elliptic-ovate, mostly obtuse: pistillate calyx 1.7–2 mm. long; sepals lanceolate: utricle 1–1.5 mm. long or sometimes longer. —(CARELESS.)—Low hammocks, marshes, and swamps, cult. grounds, usually remote from saline situations, Coastal Plain, Fla. to La.—(*W. I., Mex.*)—All year.—Our largest herb, the stem often becoming a foot in diameter near the base. The Florida plant has been known as *A. australis.*



3. A. floridana S. Wats. Stem slender, 4–15 dm. tall, simple, or branched at the base: leaf-blades linear, elliptic-linear, or narrowly elliptic, 0.8–11 cm. long: staminate calyx 1.5–2.5 mm. long; sepals ovate to elliptic-ovate: pistillate calyx 1–1.5 mm. long: sepals lanceolate, acuminate: utricle about 1 mm. long.—Swamps and marshes, Fla.—All year.

4. A. concatenata Moq. Stem stout, 0.5–2 m. tall, usually much-branched: leaf-blades elliptic to lanceolate, 2.5–8 cm. long: staminate calyx about 2 mm. long; sepals lanceolate to elliptic-lanceolate: pistillate calyx 1–1.5 mm. long; sepals subulate-lanceolate: utricle about 1 mm. long.—Sandy banks and dunes, Coastal Plain, Miss. to La.—Sum.–fall.

5. A. alabamensis Standley. Stem stout, 1.5–2 m. tall, branched above: leaf-blades narrowly ovate to elliptic-ovate or elliptic-lanceolate, 4–9 m. long: staminate calyx about 2 mm. long; sepals elliptic to elliptic-lanceolate: pistillate calyx 1–1.5 mm. long; sepals lanceolate: utricle about 1.5 mm. long.—Brackish marshes along the coast, Ala. to La.—Sum.–fall.

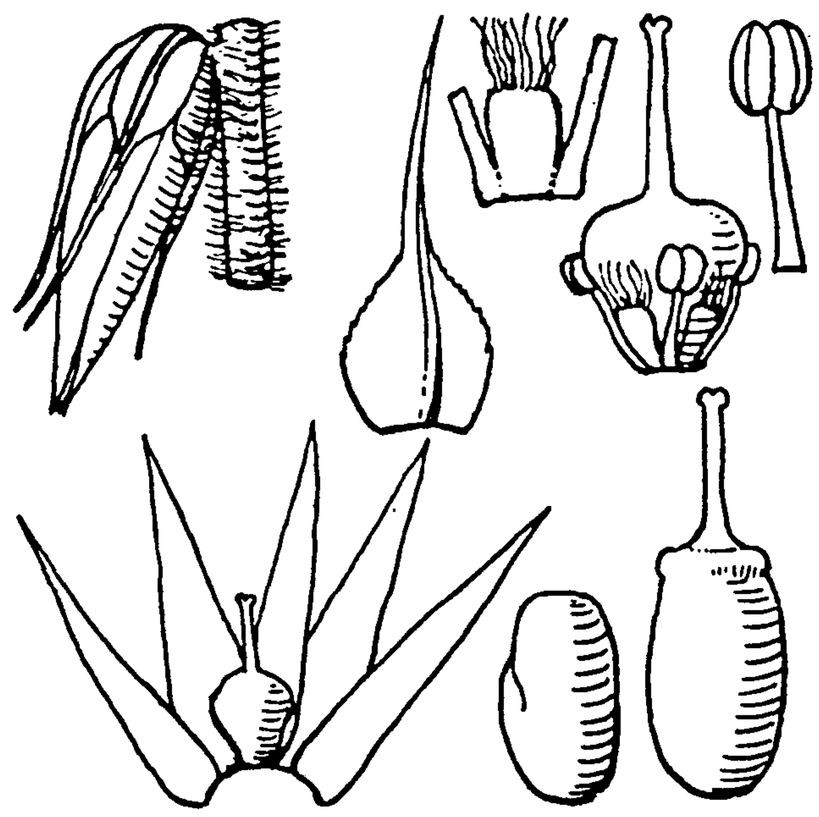
6. A. subnuda (S. Wats.) Standley. Stem slender, 0.1–0.4 m. long, prostrate and ascending, much-branched in the pistillate plants: leaf-blades broadly obovate, spatulate, elliptic, or lanceolate, 0.7–7 cm. long: staminate calyx about 2.5 mm. long; sepals elliptic: pistillate calyx 1–2 mm. long; sepals lanceolate to ovate-lanceolate: utricle about 1.5 mm. long.—Muddy or sandy stream banks, Interior Lowland provinces, Tenn. to Mo., S. D., and Ont.—Sum.–fall.

7. A. tamariscina (Nutt.) Wood. Stem stout, 0.5–2 m. tall, more or less branched: leaf-blades ovate-lanceolate to lanceolate or elliptic, 2–11 cm. long: staminate calyx 2.5–3 mm. long; sepals elliptic-lanceolate to ovate-lanceolate: pistillate calyx 1–2 mm. long; sepals lanceolate to lanceolate-subulate: utricle 1.5 mm. long.—Swamps, fields, and stream-banks, various provinces, Tenn. to Tex., N. M., S. D., and Ky.; adv. E.—Sum.–fall.

4. CENTROSTACHYS Wall. Herbs or woody plants. Leaves opposite: blades entire. Flowers perfect, in slender elongate spikes, commonly deflexed. Sepals 4 or 5, becoming firm. Stamens 5 or rarely fewer. Styles united.—About 12 species, natives of tropical and warm regions.

Leaf-blades abruptly pointed: sepals less than 5 mm. long: utricles less than 2.5 mm. long. 1. *C. indica.*
Leaf-blades acuminate: sepals over 5 mm. long: utricles over 2.5 mm. long. 2. *C. aspera.*

1. C. indica (L.) Standley. Plants 4–12 dm. tall, finely pubescent: leaf-blades broadly rhombic-ovate to obovate or cuneate, 1–3 cm. long, truncate or retuse at the apex, and abruptly tipped: bracts 2.5–3 mm. long, long-acuminate: sepals lanceolate, 3–4 mm. long: utricle with a sharp rim at the top, about 2 mm. long. [*Achyranthes obtusifolia* Lam.]—Cultivated grounds and waste places, Coastal Plain, Fla. to Ala. Nat. of Asia.—(*W. I., Mex., C. A., S. A.*)



2. C. aspera (L.) Standley. Plants 6–14 dm. tall, copiously pubescent: leaf-blades elliptic or nearly so, 7–16 cm. long, acuminate: bracts 4–4.5 mm. long, abruptly long-aristate: sepals linear-lanceolate, 6–7 mm. long: utricle about 3 mm. long. [*Achyranthes aspera* L.]—Hammocks, S Fla. Nat. of trop. Am.—(*W. I., Mex., C. A.*)

5. ACHYRANTHES L. Herbs (ours perennial). Leaves opposite: blades entire or nearly so. Flowers perfect, in head-like spikes. Sepals 5, unequal; white or greenish. Filaments united at the base. Staminodia mostly shorter than the anthers. Styles united. [*Alternanthera* Forsk.]—About 45 species, most numerous in the tropics.—CHAFF-FLOWERS.

Spikes sessile, axillary. I. REPENTES.
Spikes terminating elongate peduncles. II. RAMOSISSIMAE.

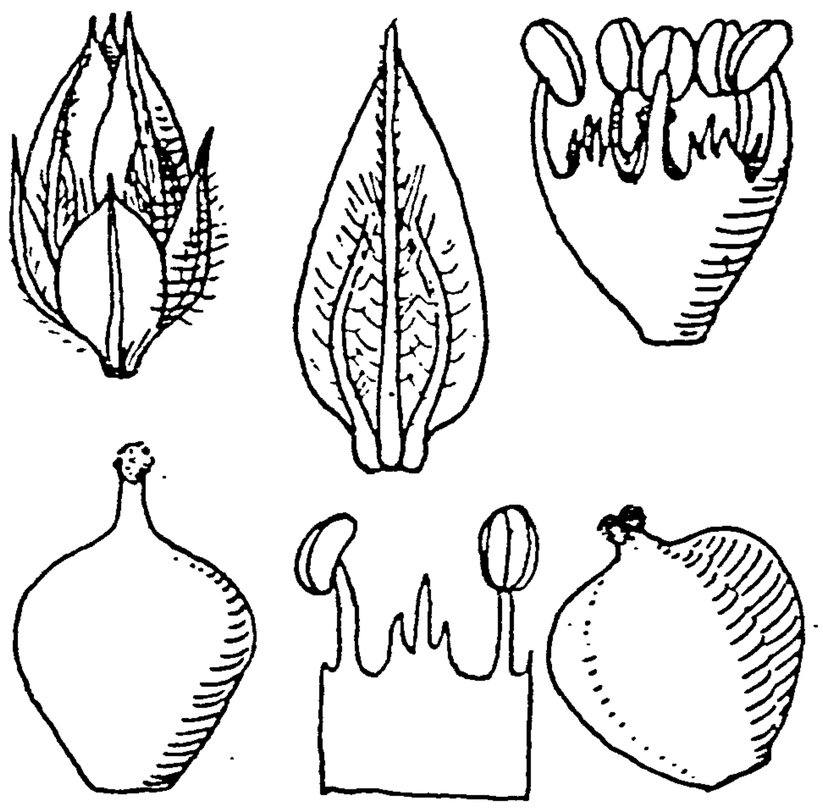
I. REPENTES

Stamen-tube very short, the staminodia shorter than the filaments, entire or merely toothed.
Sepals rigidly spine-tipped.
Sepals 6 mm. long or more: staminodia toothed: leaf-blades usually as broad as long. 1. *A. leiantha.*
Sepals 5 mm. long or less: staminodia entire: leaf-blades longer than broad. 2. *A. repens.*
Sepals merely acute, not rigid-tipped. 3. *A. polygonoides.*
Stamen-tube elongate: staminodia equalling the filaments or much longer, laciniate. 4. *A. maritima.*

II. RAMOSISSIMAE

Flowers sessile in the bractlets: leaf-blades narrow, linear or narrowly elliptic to oblanceolate, not acuminate. 5. *A. philoxeroides.*
Flowers stalked, the stalk articulate, 5-grooved: leaf-blades broad, ovate or elliptic, varying to broadest above the middle or below it, more or less acuminate. 6. *A. ramosissima.*

1. A. leiantha (Seub.) Standley. Branches prostrate, mostly less than 1 m. long, short-villous: leaf-blades suborbicular, or broadly oval, varying to ovate or obovate, 1.3–5 cm. long, abruptly short-pointed, glabrous except the midrib and veins, stout-petioled: sepals lanceolate to elliptic-lanceolate, the larger ones becoming 4.5–5 mm. long, or rarely longer, prominently subulate-tipped, the inner smaller, minutely-tipped with dorsal crests of glochidiate hairs: filaments subulate, alternating with lanceolate staminodia: utricle less than 2 mm. in diameter.—Waste grounds and roadsides, Coastal Plain, Fla. to Ala. Nat. of S. A.—(*W. I., Mex., C. A.*)



2. A. repens L. Stem and branches prostrate and often creeping, 1–5 dm. long, copiously pubescent with white hairs: leaf-blades broadly spatulate, oval, or ovate, 8–20 cm. long, usually abruptly pointed: sepals lanceolate to ovate-lanceolate, abruptly pointed: utricle ovoid-globose. [*Alternanthera Achyrantha* R. Br. *Alternanthera repens* (L.) Kuntze]—Waste-places, cult. grounds, and sidewalks, Coastal Plain and southwestern provinces, Fla. to Tex., Calif., and S. C. Nat. of Asia.—(*W. I., Mex., C. A.,*)—All year.

3. A. polygonoides (L.) Lam. Plant similar to that of *A. repens,* but less pubescent or glabrate: leaf-blades narrowly spatulate to elliptic, 5–20 mm. long, obtuse or acute: sepals elliptic, acute, the larger ones becoming about 5 mm. long: utricle globular or globular-obovoid. [*Alternanthera paronychioides* St. Hil. *Telanthera polygonoides* Moq.]—Cult. grounds and roadsides, Fla. to La., and N. C. Nat. of Trop. Am.—(*W. I., Mex., C. A., S. A.*)—All year.

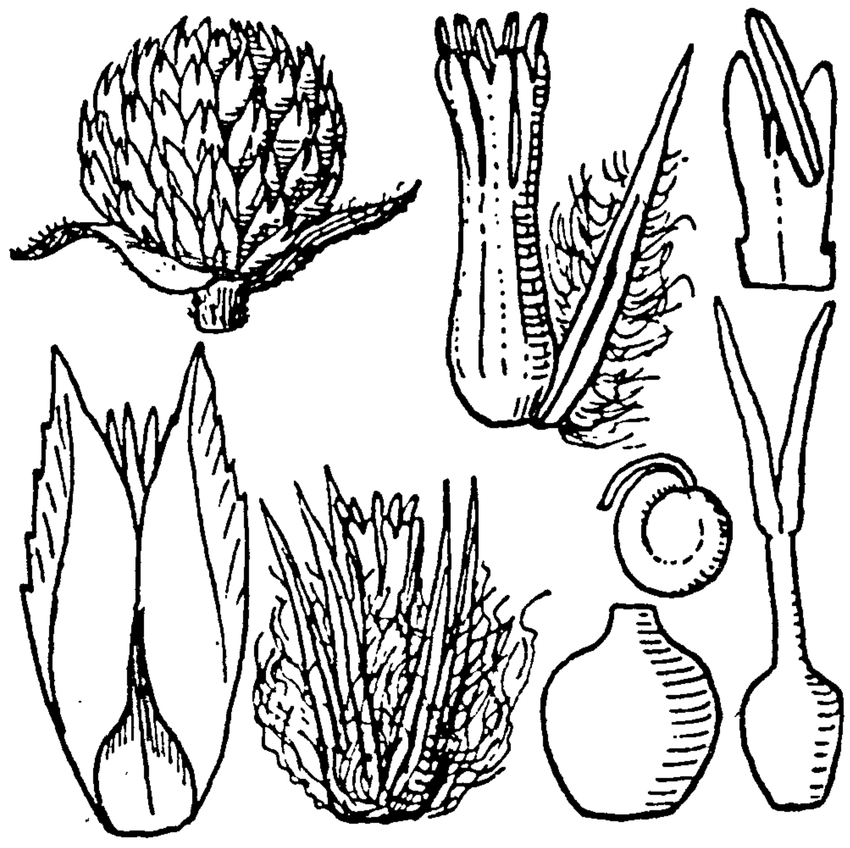
4. A. maritima (Mart.) Standley. Stem and branches procumbent or prostrate and creeping, 3–21 dm. long, glabrous, except at the leaf-axils: leaf-blades

cuneate, obovate or elliptic, 1.5–6 cm. long, rounded at the apex or acutish: sepals ovate to ovate-lanceolate, the outer ones becoming 4–5 mm. long, the acuminate apex rigid: utricle obovoid. [*Alternanthera maritima* St. Hil. *Telanthera maritima* Moq.]—Sand-dunes and hammocks, coastal and interior, pen. Fla and the Keys.—(*W. I., S. A.*)—All year.

5. **A. philoxeroides** (Mart.) Standley. Stem and branches decumbent or prostrate, stout, often fistulous, 3–15 cm. long, glabrous, except at the leaf-axils, and sometimes near the tips: leaf-blades 3–11 cm. long, acute or obtuse: sepals lanceolate, elliptic, or ovate-elliptic, becoming 6 mm. long. [*Alternanthera philoxeroides* Griseb.]—Low waste-places, ponds, ditches, bayous, and slow streams, Coastal Plain, Fla. to La. and N. C. Nat. of S. A.—All year.—In southern Louisiana this plant is as much of a pest as water hyacinth, often filling up ditches and bayous with a floating mass of growth, usually choking out other plants.

6. **A. ramosissima** (Mart.) Standley. Stem usually much-branched, the branches diffusely spreading, reclining, or even vine-like, 5–400 cm. long, more or less strigose, sometimes geniculate: leaf-blades elliptic or oval, varying to broadest above the middle or below it, acuminate, mostly 2–9 cm. long: sepals lanceolate to elliptic-lanceolate, becoming 4–5 mm. long. [*Telanthera floridana* Chapm. *T. brasiliana* (Chapm. Fl.). *Alternanthera brasiliana* Uline & Bray *Alternanthera floridana* Small *Alternanthera Moquinii* Small not Webb.]—Hammocks, S Fla.—(*W. I., S. A.*)—All year.

6. **GOMPHRENA** L. Herbs (ours mostly perennials). Leaves opposite: blades entire. Flowers perfect, usually in terminal head-like spikes. Sepals 5, mostly acute. Filaments united in a tube. Staminodia present. Stigmas terminating a short style.—About 90 species, widely distributed, but most abundant in South America.

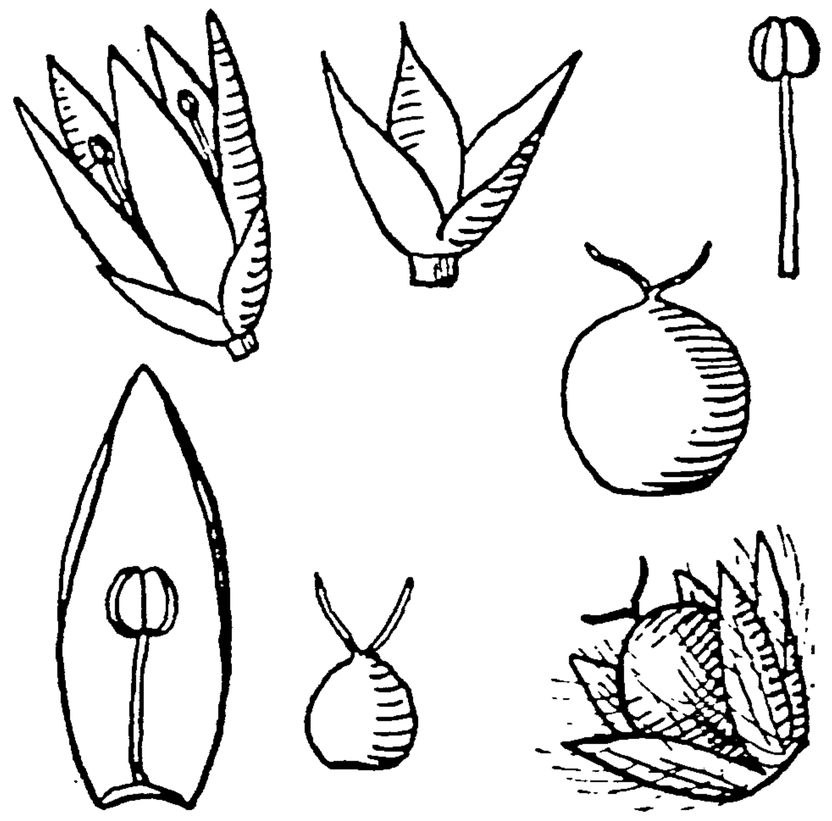


1. **G. dispersa** Standley. Stem and branches diffuse or decumbent, somewhat appressed-pubescent: leaf-blades spatulate, elliptic-spatulate, or elliptic, 2–5 cm. long: bractlets becoming 5–6 mm. long, white or purplish-red: sepals linear-elliptic or somewhat lanceolate, lanate: filament-tube about 3 mm. long: seed 1.5 mm. long. [*G. decumbens* Moq.] — (GLOBE-AMARANTH. BACHELOR'S-BUTTON.)—Waste places and roadsides, Coastal Plain, Fla. to Tex. Nat. of trop. Am.—(*W. I., Mex., C. A.*)—A favorite plant in old fashioned gardens.—The flowers are white, yellow, purple, or red.

7. **IRESINE** R. Br. Herbs with erect or diffuse stems. Leaves opposite: blades broad. Flowers dioecious, paniculate. Sepals 5, equal, obtuse, acute, or acuminate. Filaments united at the base. Staminodia wanting. Stigmas sessile.—About 20 species, natives of temperate and tropical regions.—The flowers are white, pink or greenish.

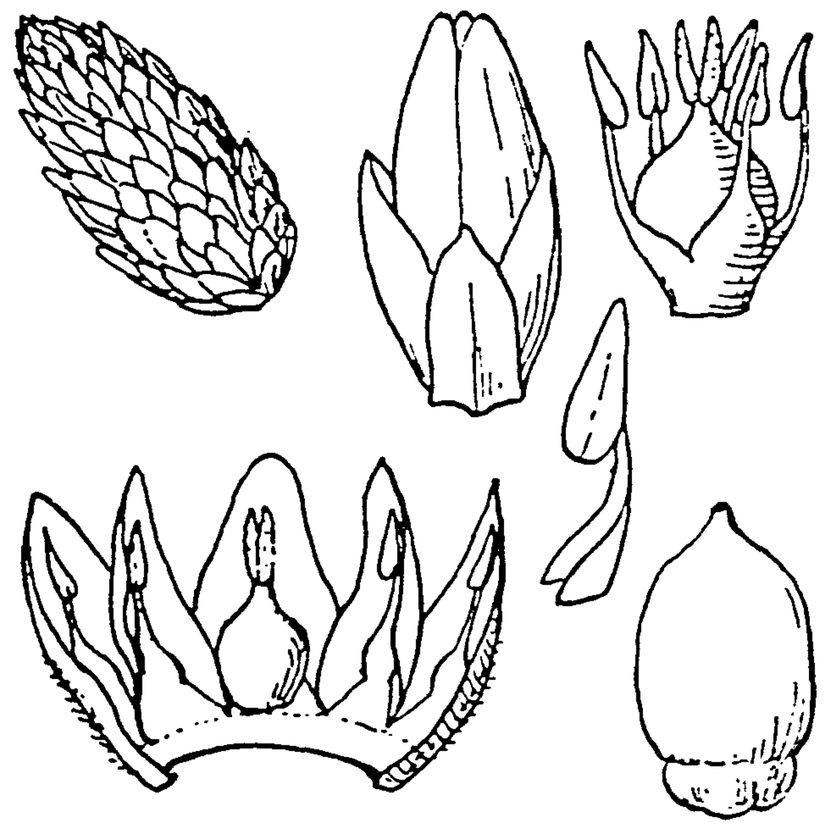
Plant annual, but sometimes persistent for more than a year from a stout taproot: sepals of the pistillate flowers 3-veined, obtuse. 1. *I. Celosia.*
Plant perennial from elongate rootstocks: sepals of the pistillate flowers faintly 1-veined, acute. 2. *I. rhizomatosa.*

1. I. Celosia L. Annual, but sometimes persistent from a stout taproot, mostly 1–3 m. tall, erect or clambering: leaf-blades ovate, rhombic, or lanceolate, 3–14 cm. long, obtuse, acute, or short-acuminate, sometimes soft-pubescent: panicles much-branched, the pistillate ones with fluffy wool at the base of the flowers: sepals elliptic, 1–1.5 mm. long, obtuse: utricle shorter than the calyx. [*I. celosioides* L. *I. paniculata* (L.) Kuntze]—Hammocks, marshes and old fields, Coastal Plain, Fla. to La. and N. C.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall or all year S.



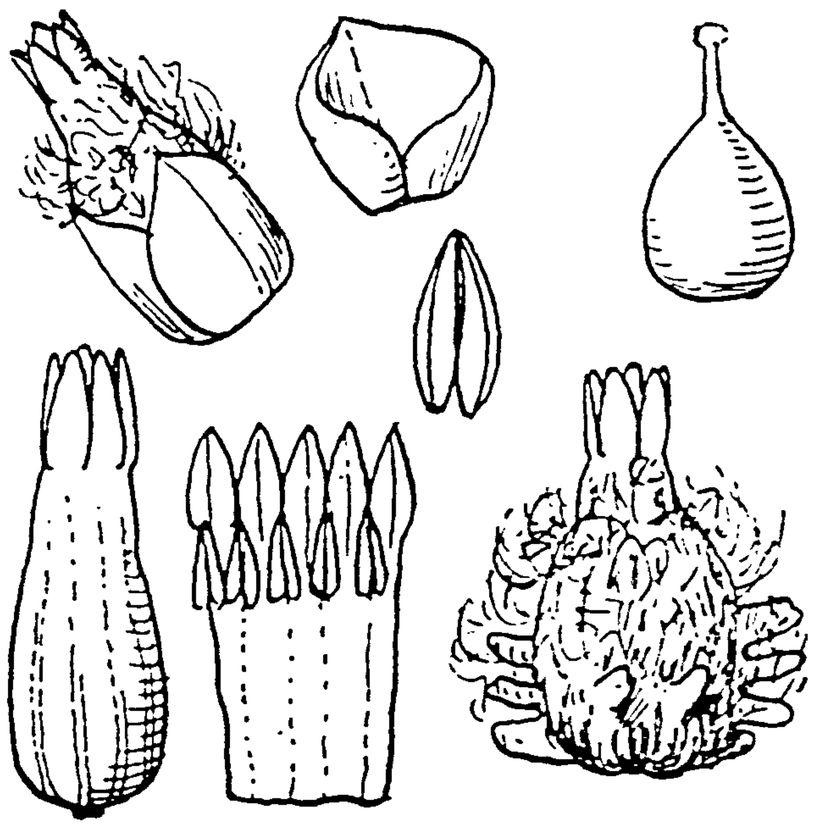
2. I. rhizomatosa Standley. Perennial from slender horizontal rootstocks, mostly 0.5–1.5 m. tall, erect or reclining: leaf-blades ovate, varying to deltoid or elliptic, 6–15 cm. long, glabrous, or with few short soft hairs, especially beneath: sepals ovate-elliptic or elliptic, 1–1.3 mm. long, acute or acuminate: utricle equalling the calyx or longer. —River-banks, bottoms, meadows, and woods, various provinces, N of Coastal Plain, Ala. to Tex., Kans., and Md.—Sum.–fall.

8. PHILOXERUS R. Br. Herbs with prostrate or creeping branches. Leaves opposite: blades narrow. Flowers perfect, in dense head-like spikes. Sepals 5, very unequal, the outer ones, at least, obtuse. Filaments united at the base. Staminodia wanting.—About 10 species, widely distributed in warm coastal regions.



1. P. vermicularis (L.) R. Br. Plant somewhat succulent, the branches 2–18 dm. long: leaf-blades half-terete, linear to clavate, 1–3.5 cm. long: spikes 1–2.5 cm. long, silvery-white: sepals 3.5–4 mm. long, the outer oblong, the inner lanceolate. [*Iresine vermicularis* (L.) Moq. *Lithophila vermicularis* Uline]—Coastal sand-dunes, damp shores, and waste places, Coastal Plain, Fla. to Tex. —(*W. I., Mex., C. A., S. A., O. W.*)—All year.

9. FROELICHIA Moench. Herbs (ours annual or biennial). Leaves opposite: blades entire. Flowers perfect, in dense spikes on long peduncles. Calyx crested or tubercled at maturity. Filaments united into a long tube.—About 12 species, American.



1. F. floridana (Nutt.) Moq. Plants rather slender: stem 4–18 dm. tall, sometimes branched at the base, puberulent: leaves few, conspicuously remote; blades linear or slightly broadest above or below the middle, 3–12 cm. long, acute, appressed pubescent beneath or occasionally slightly woolly: spikes 1–6 cm. long: calyx-tube with prominently toothed crests and 1 or 2 tubercle-like or spiny ridges on one or each face at

maturity.—(COTTONWEED.)—Pinelands, sandhills, and sandy old fields, Coastal Plain, Fla. to Miss. and Ga.; adv. in Del.—All year S.

FAMILY 5. CORRIGIOLACEAE — WHITLOW-WORT FAMILY

Herbs, but often firm or woody at the base. Leaves opposite, stipulate: blades entire. Flowers perfect, cymose. Calyx of 4 or 5 sepals, which are sometimes awned or cuspidate at the apex. Corolla wanting. Androecium of 4 or 5 stamens borne on the margin of the minute or long hypanthium. Gynoecium mostly 2-carpellary. Ovary 1-celled. Fruit a utricle or an achene. Seed solitary.—About 20 genera and 100 species of wide geographic distribution.

Hypanthium very small: stamens borne on its edge under the ovary. — Tribe I. PARONYCHIEAE.

Hypanthium well-developed, nearly or quite as long as the calyx: stamens borne high up on its edge. — Tribe II. SIPHONYCHIEAE.

I. PARONYCHIEAE

Sepals with slender awns on the back of the hood. — 1. PARONYCHIA.
Sepals with a cusp or mucro on the back of the hood.
  Style elongate, slender.
    Calyx turgid at the base: sepals narrow, elongate: anther-sacs narrow. — 2. GASTRONYCHIA.
    Calyx not turgid at the base; sepals broad: anther-sacs broad. — 3. ANYCHIASTRUM.
  Style wanting or very short.
    Sepals mucronate. — 4. ANYCHIA.
    Sepals umbonate at the apex. — 5. NYACHIA.

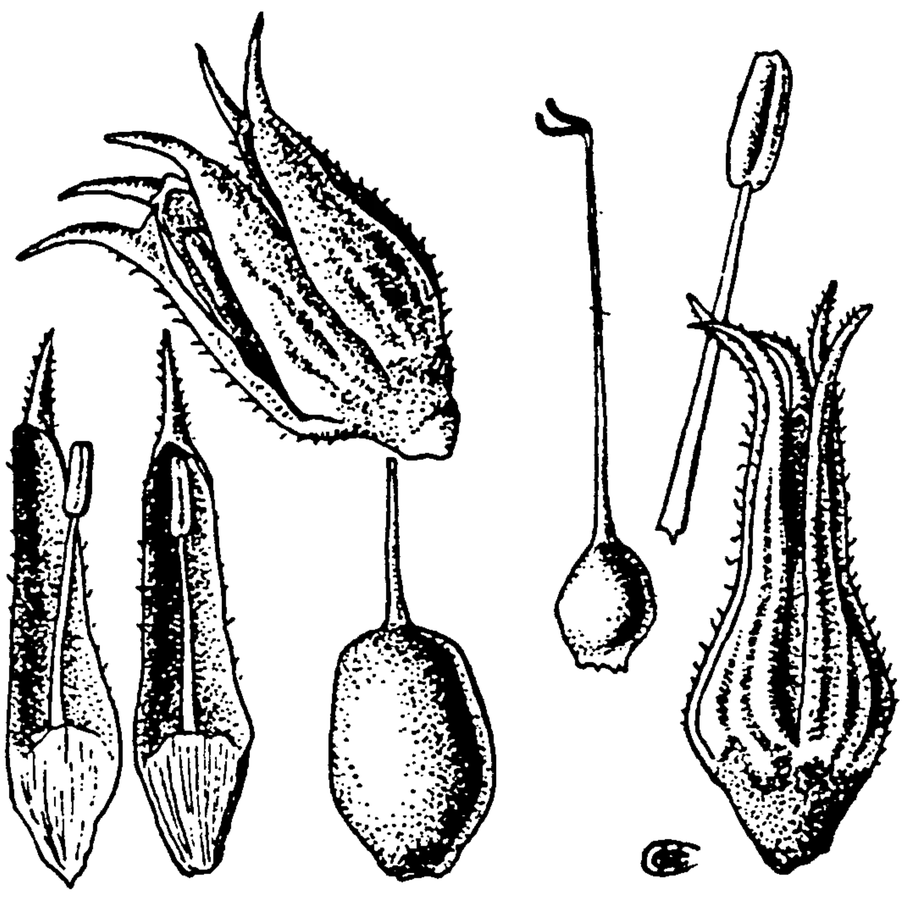
II. SIPHONYCHIEAE

Flowers subtended by herbaceous bracts at maturity.
  Sepals short and broad, with a mucro: flower urceolate. — 6. SIPHONYCHIA.
  Sepals long and narrow, without a mucro: flower subulate or narrowly campanulate. — 7. ODONTONYCHIA.
Flowers subtended by indurated bracts at maturity. — 8. GIBBESIA.

1. PARONYCHIA [Tourn.] Adans. Annual or perennial herbs, with short tufted or matted branches and longer, often erect flower-stems. Leaves with narrow, often bristle-like blades. Cymes compact or congested. Sepals narrow, hooded at the apex, and terminating in a cusp or awn, sometimes alternating with small bristles or tooth-like lobes. Utricle included.—About 50 species, natives of warm regions.—Sum.–fall.—WHITLOW-WORTS. NAILWORTS.

Cymes nearly naked: calyx glabrous: bracts bristle-like. — 1. *P. dichotoma.*
Cymes densely silvery bracted: calyx pubescent: bracts linear. — 2. *P. argyrocoma.*

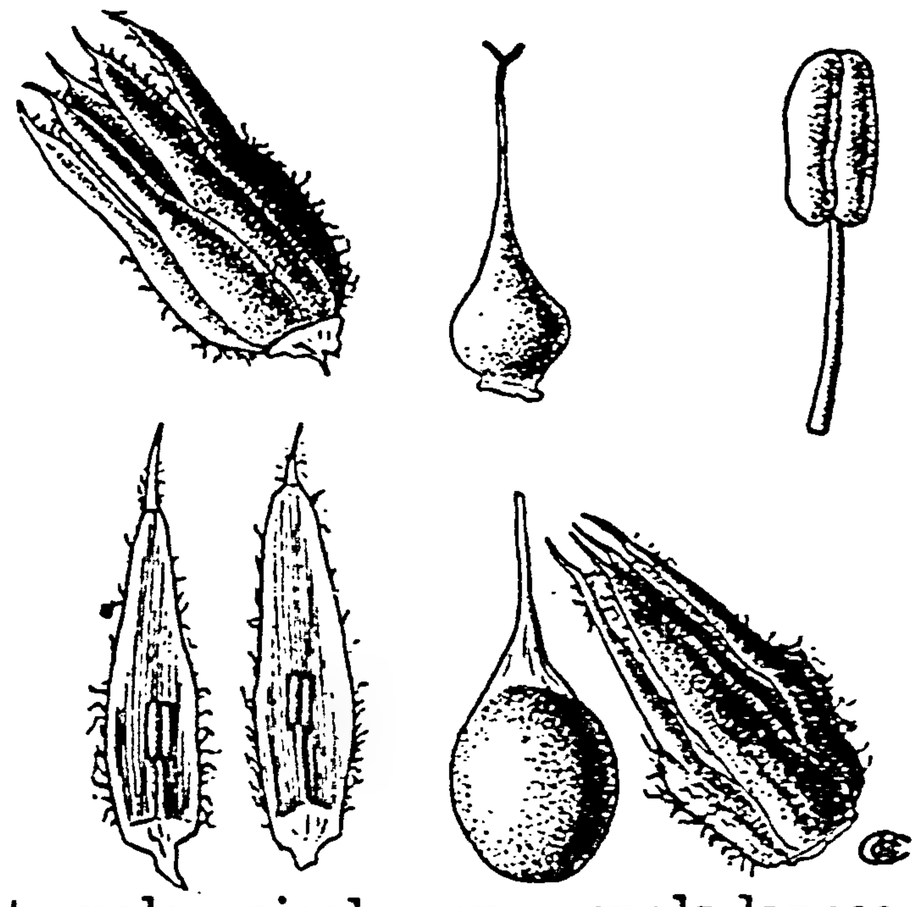
1. P. dichotoma (L.) Nutt. Plants in tufts: leaf-blades bristle-like, 1–3.5 cm. long, often obscurely pubescent: flowering stems 1–4 dm. tall, glabrous or nearly so: sepals becoming 3.5 mm. long, the awn short, green, glabrous.—(NAILWORT.)—Rocks and rocky banks, various provinces N of Coastal Plain, N. C. to Ark., Tex., W. Va. and Md.



2. P. argyrocoma (Michx.) Nutt. Plants in mats: leaf-blades linear or nearly so, flat, 1–3 cm. long, silky: flowering stems 0.5–3 dm. tall, closely pubescent: sepals becoming about 5 mm. long, the awns slender, white, pubescent. — (SILVER-CHICKWEED. SILVER-HEAD. SILVER-WORT.)—Stony mt. tops, cliffs, and rocky slopes, often in acid soil, Blue Ridge and adj. provinces, Ga. to Tenn. and Va.—Carpets of this plant on the rocky

peaks of the southern Alleghenies are striking as a result of the silvery stipules, hence the name SILVERLING.

2. **GASTRONYCHIA** Small. Annual herbs with radially branched stems, at maturity usually in cushion-like tufts. Leaves with rather broad blades. Cymes effuse, the cymules borne in small leafy clusters. Calyx swollen near the base. Sepals narrow, with slender tips with a minute hood at the apex and a slender spine-like cusp. Anthers narrow. Styles elongate, united, sometimes separating in age and partly deciduous. Utricle included in the swollen bottom of the calyx.—One species.

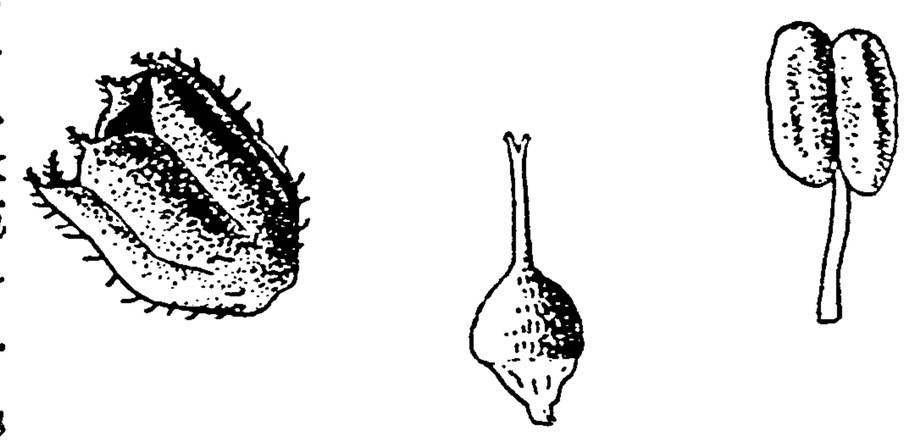


1. **G. herniarioides** (Michx.) Small. Plant in a depressed mat, finely somewhat rough-pubescent, the branches 0.5–2 dm. long: leaf-blades elliptic to oval, or those of the basal leaves spatulate, 3–10 cm. long, with a minute pale apical cusp: sepals lanceolate, about 1.5 mm. long, rarely larger, closely pubescent, the swollen basal part and the tip about equal in length: utricle about half as long as the calyx. [*Paronychia herniarioides* Nutt. *Anychiastrum herniarioides* Small.]—Sand-hills and scrub, Coastal Plain, Fla. to N. C.—Spr.–fall.

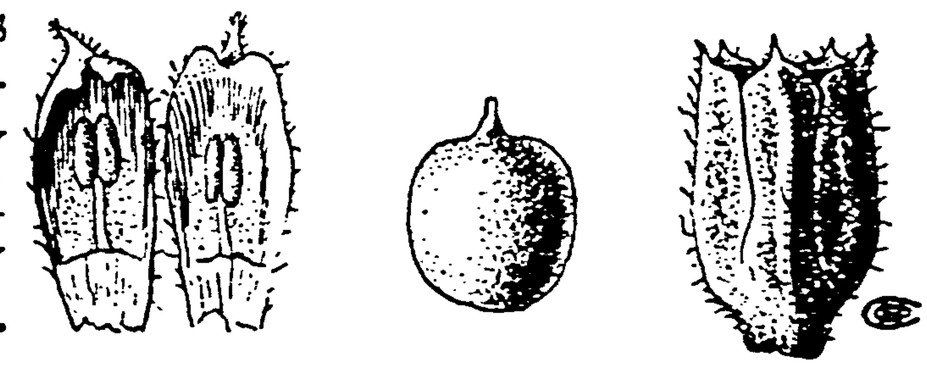
3. **ANYCHIASTRUM** Small. Annual or rarely perennial herbs with radially spreading, usually prostrate branches. Leaves with narrow blades. Cymes effusely branched, the cymules usually lax. Calyx not swollen near the base. Sepals broad, with a wide hood at the apex and a short stubby mucro. Anthers broad. Styles elongate, united, separating and partly deciduous in age. Utricle reaching the top of the calyx or exserted.—Three species in the SE U. S.—Sum.–fall.

Annual or biennial plants, the stems pubescent.
  Calyx pubescent: leaf-blades ciliate. 1. *A. Baldwinii.*
  Calyx glabrous: leaf-blades not ciliate. 2. *A. montana.*
Perennial plants, the stems glabrous. 3. *A. riparia.*

1. **A. Baldwinii** (T. & G.) Small. Stem and branches minutely pubescent, the main ones 1–4 dm. long, usually with many short-lateral branchlets: leaf-blades narrowly elliptic to linear-elliptic, 8–20 mm. long, minutely pubescent, sometimes obscurely so: sepals oval to ovate, about 1 mm. long, pubescent: utricle equalling the calyx or slightly longer. [*Paronychia Baldwinii* Chapm.]—Dry sandy soil, often on sand-dunes, Coastal Plain, Fla. to La. and N. C.



2. **A. montanum** Small. Stems and branches diffuse and often effusely branched, minutely pubescent, rather uniformly dichotomous throughout: leaf-blades spatulate to elliptic-spatulate, 4–11 mm. long, glabrous or nearly so: sepals ovate to elliptic-ovate, about 1 mm. long, glabrous: utricle included.—Dry woods, Blue Ridge and adj. provinces, Ga. to Pa.



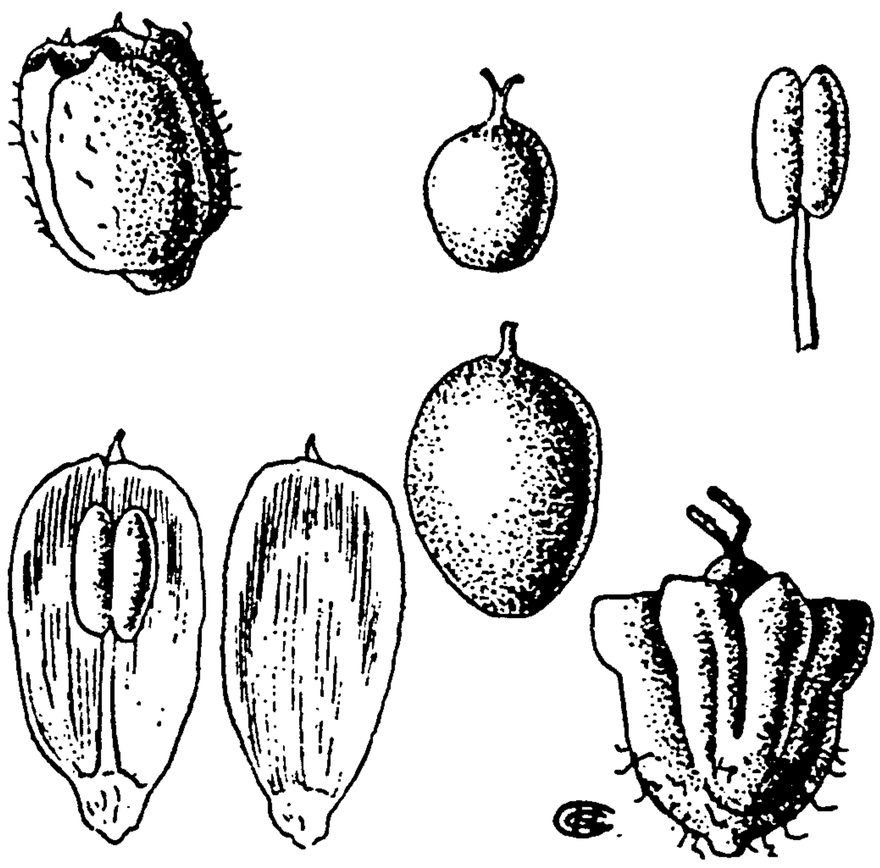
3. **A. riparium** (Chapm.) Small. Stem and branches prostrate, glabrous, 2–12 dm. long, with slender elongate lateral branchlets: leaf-blades elliptic to linear-elliptic, 5–12 mm. long, glabrous: sepals ovate or oval-ovate, about 1 mm. long: utricle about as long as the calyx. [*Paronychia riparia* Chapm.]—Dry sandy soil, river-banks and sandhills, Coastal Plain, N Fla. to Ala. and N. C.

4. **ANYCHIA** Michx. Annual herbs with forking stems. Leaves herbaceous, with narrow or rather broad flat blades. Stipules lacerate. Cymes terminating the branches, the cymules open or clustered. Sepals with narrow margins, hooded and mucronate. Anthers usually borne about half way up on the inner face of the sepal. Styles short, united.—Represented by the following two species.—Sum.–fall.—FORKED-CHICKWEEDS.

Leaves glabrous: sepals flat at maturity: utricle much exceeding the calyx. 1. *A. canadensis.*

Leaves pubescent: sepals ridged at maturity: utricle about as long as the calyx. 2. *A. polygonoides.*

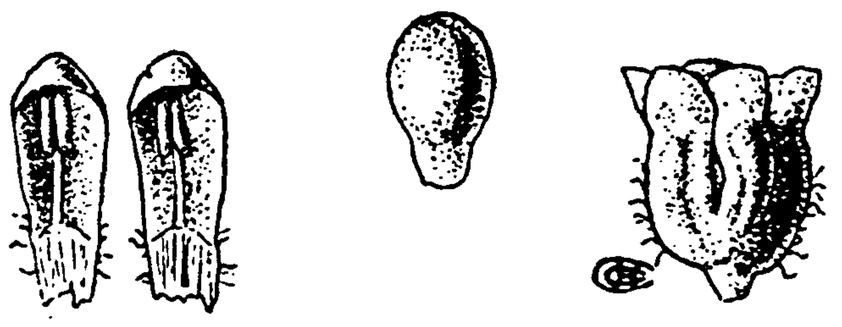
1. **A. canadensis** (L.) B. S. P. Stem 0.5–4 dm. tall, the branches very slender, often almost capillary, long-jointed, glabrous: leaf-blades thin, elliptic to oval, 0.5–2 cm. long, deep-green, typically obtuse, petioled: cymes open: bracts broad, obtuse: sepals obtuse, with wide scarious margins. [*A. dichotoma capillacea* (Nutt.) Torr.]—Dry woods and shaded hillsides, various provinces, Ga. to Ark., Minn., Ont., and Mass.



2. **A. polygonoides** Raf. Stem 0.5–3 dm. tall, the branches slender, short-jointed, pubescent: leaf-blades thick, oblanceolate to linear-elliptic, 0.5–1.5 cm. long, pale-green, typically acute, sessile or nearly so: cymes compact: bracts narrow, slender-tipped: sepals acute, with very narrow or obscure margins. [*A. dichotoma* (Fl. SE. U. S.)]—Rocky woods, hillsides and dry open slopes, various provinces, Fla. to Tex., Minn., and Me.

5. **NYACHIA** Small. Annual copiously branched partly fleshy herbs. Leaves chartaceous, with broad, but revolute blades. Stipules pectinate fimbriate. Cymes much branched, the cymules borne all along the branches. Sepals with broad wing-margins, hooded and with a thick umbo. Anthers relatively large, borne in the sepal-hood. Styles very short, distinct.—One species.

1. **N. pulvinata** Small. Stem branched at the base, the branches radially spreading and repeatedly dichotomous, 5–20 cm. long, wiry: leaf-blades ovate to triangular-ovate, 1.5–3 mm. long, strongly revolute, sessile: calyx about 0.5 mm. long, its sepal hoods blunt, pale, minutely pitted: utricle oval or ellipsoid, about 0.4 mm. long.—Sand-dunes, S end of lake region, Fla.—Spr.–sum.

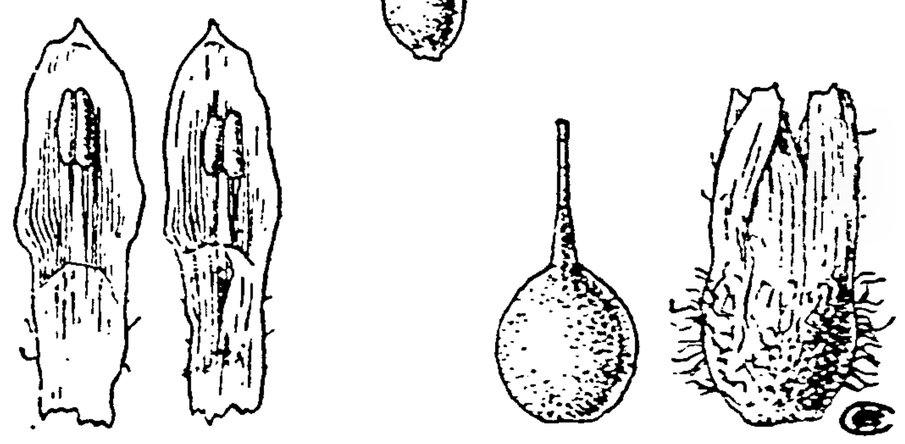


6. **SIPHONYCHIA** T. & G. Annual or biennial herbs with radially prostrate stems and branches. Leaves with narrow, somewhat fleshy, often curved blades. Cymes several- to many-flowered, usually densely glomerulate in age. Sepals broad, narrowly or widely hooded at the apex and minutely or obscurely cuspidate, pale or pale-margined, longer or shorter than the hypanthium. Utricle included.—Following are the only known species.—Spr.–fall.

Sepals narrowed at the tip, with an evident but minute cusp, longer than the hypanthium. 1. *S. diffusa.*
Sepals broadened at the tip, with an obscure cusp, shorter than the hypanthium.
  Cymes many-flowered: cymes with minute bracts. 2. *S. americana.*
  Cymes few-flowered: cymes with foliaceous bracts. 3. *S. pauciflora.*

1. **S. diffusa** Chapm. Stem and branches 1–6 dm. long, minutely pale-pubescent: blades of the cauline leaves oblanceolate, linear-oblanceolate, or linear-spatulate to almost linear, 0.5–2.5 cm. long, hirsutulous: cymes ultimately dense, glomerulate: flowers over 1.5 mm. long: sepals ovate to lanceolate, as long as the hypanthium or slightly longer, with a narrow hood at the erect apex and a minute cusp.—Dry pinelands, oak-woods, sandhills, and scrub, Coastal Plain, Fla. to La. and Ga.

2. **S. americana** (Nutt) T. & G. Stem and branches 2–8 dm. long, minutely retrorse-pubescent when young, obscurely pubescent or glabrous in age: blades of the cauline leaves linear-oblanceolate to spatulate, 0.5–2 cm. long, minutely pubescent and with the usually pale margins ciliate: flowers scarcely 1.5 mm. long: sepals obovate, as long as the hypanthium or shorter, with a broad dilated hood at the inflexed apex and an obscure cusp.—Sandhills, dry pinelands, and old fields, Coastal Plain, Fla. to S. C.



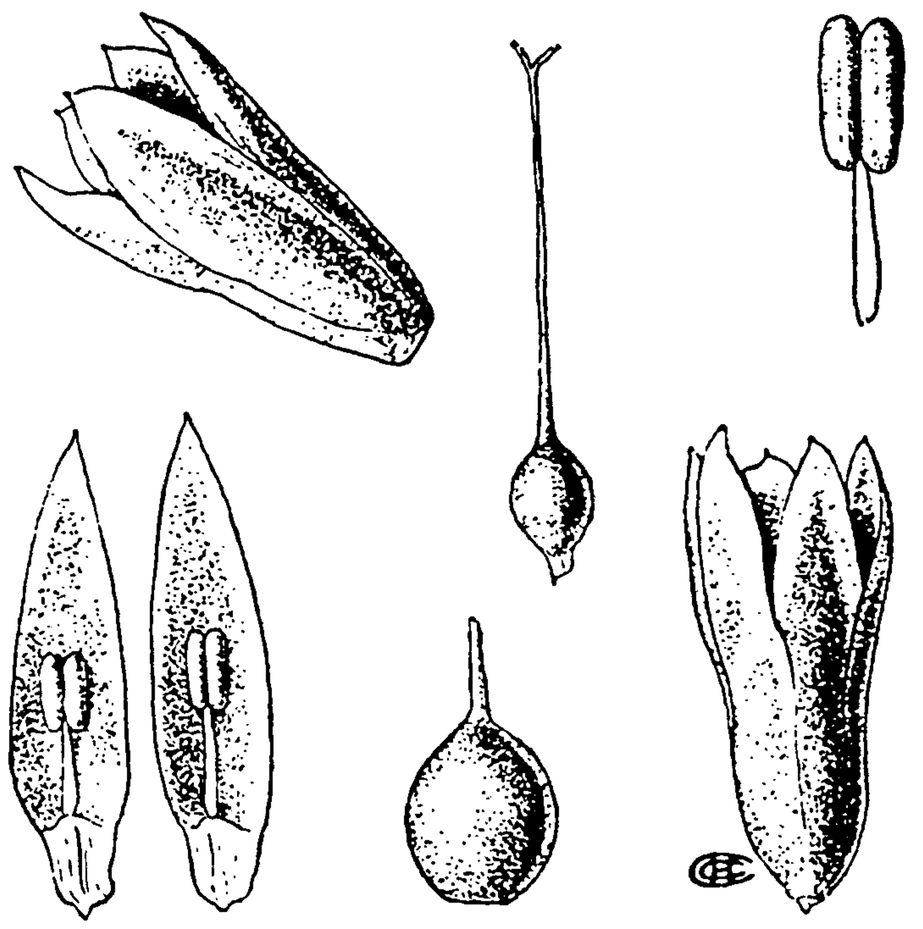
3. **S. pauciflora** Small. Stem and branches 1–6 dm. long, obscurely pubescent or glabrous in age: leaves similar to those of *S. americana,* but usually larger and less pubescent: flowers about 1.5 mm. long: sepals obovate-cuneate, rather shorter than the hypanthium, with a broad dilated hood at the inflexed apex and an obscure cusp.—Sandhills, dry woods, and pinelands, Coastal Plain, Fla. and Ga.

7. **ODONTONYCHIA** Small. Annual or perennial herbs, with erect or diffuse stems and branches. Leaves somewhat fleshy, the blades narrow, entire. Cymes corymbose, compact or open, the cymules congested. Sepals concave, sometimes with a mere indication of a blunt or acute mucro. Utricle included.—Only the following species known.—Spr.–fall.

Stem and branches glabrous: hypanthium glaucous. 1. *O. erecta.*
Stem and branches pubescent: hypanthium pubescent.
  Sepals lanceolate when flattened: hypanthium bristly pubescent. 2. *O. interior.*
  Sepals ovate when flattened: hypanthium minutely pubescent. 3. *O. corymbosa.*

1. **O. erecta** (Chapm.) Small. Plant glaucous, the branches erect, 1–4 dm. tall: leaf-blades mainly spatulate, linear-oblanceolate or linear, 0.5–3 cm. long,

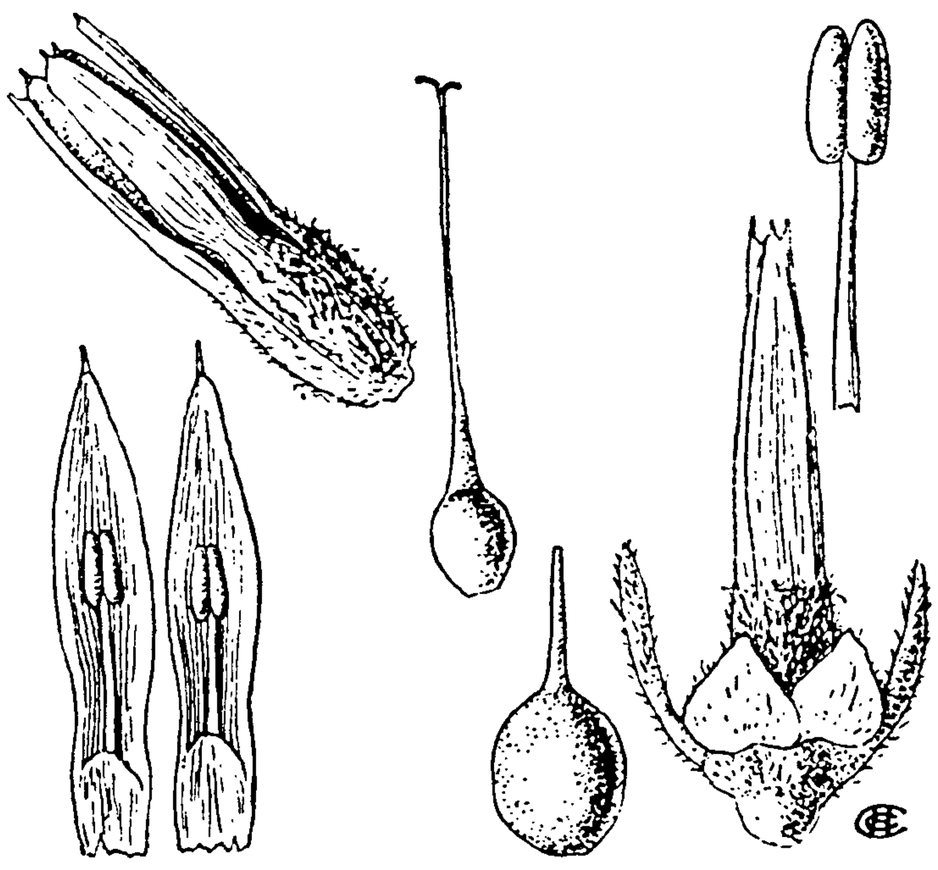
the silvery stipules very conspicuous against the stem and leaves: flowers becoming nearly or quite 3 mm. long: sepals lanceolate, much longer than the hypanthium: utricle about 1 mm. long. [*Siphonychia erecta* Chapm.]—Coastal sand-dunes, N Fla. and Ala.



2. **O. interior** Small. Plant closely brown-pubescent and often somewhat viscid, the branches spreading, 1–4 dm. long: leaf-blades spatulate to linear, 0.5–2.5 cm. long, relatively coarse-pubescent: cymes open, diffuse: flowers becoming 2.5 mm. long: sepals lanceolate, acute, much longer than the hypanthium: utricle less than 1 mm. long.—Scrub. N Fla.

3. **O. corymbosa** Small. Plant minutely grayish, pubescent, the branches erect, 1–3 dm. tall: leaf-blades oblanceolate to elliptic or linear, 0.5–1.5 cm. long, minutely pubescent: cymes aggregated in a compact terminal corymb: flowers scarcely 2.5 mm. long: sepals ovate, obtuse, slightly longer than the hypanthium: utricle about 1 mm. in diameter.—Coastal sand-dunes, N Fla. to Miss.

8. **GIBBESIA** Small. Annual or biennial herbs with erect stems. Leaves with narrow blades. Cymes several to many-flowered, dichotomous, the cymules often compact, but not glomerulate. Sepals narrow, pale, minutely hooded and cuspidate at the apex, longer than the hypanthium. Utricle included.—One species.



1. **G. Rugelii** (Chapm.) Small. Stem 1–5 dm. tall, rather closely, pale-pubescent, ultimately effusely branched: leaf-blades narrowly oblanceolate, linear-oblanceolate, or nearly linear, 1–3 cm. long, slightly more coarsely pubescent than the stem: sepals lanceolate-subulate, about 2 mm. long, the cusp acute. [*Paronychia Rugelii* Shuttlw.]—Sandhills, pinelands, and old fields, Coastal Plain, N Fla. to Ala. and Ga.—Sum.–fall.

Family 6. **PHYTOLACCACEAE** — Pokeweed Family

Herbs, shrubs, or trees. Leaves alternate: blades entire, sometimes fleshy. Flowers perfect or dioecious, in racemes or panicles. Calyx of 4 or 5 sepals. Corolla wanting. Androecium of 4–8 stamens, or more, borne below the ovary. Gynoecium 1–many-carpellary. Fruit baccate.—About 22 genera and 110 species, mostly natives of the tropics.

Hypanthium wanting: ovary superior.
- Gynoecium 1-carpellary: style single: fruit laterally flattened. — Tribe I. Rivineae.
- Gynoecium 2–many-carpellary: styles 2–many: fruit vertically flattened. — Tribe II. Phytolacceae.

Hypanthium present: ovary inferior. — Tribe III. Agdestideae.

I. RIVINEAE

Stamens 4: style elongate: stigma capitate. 1. RIVINA.
Stamens 8–16: style wanting: stigma penicillate. 2. TRICHOSTIGMA.

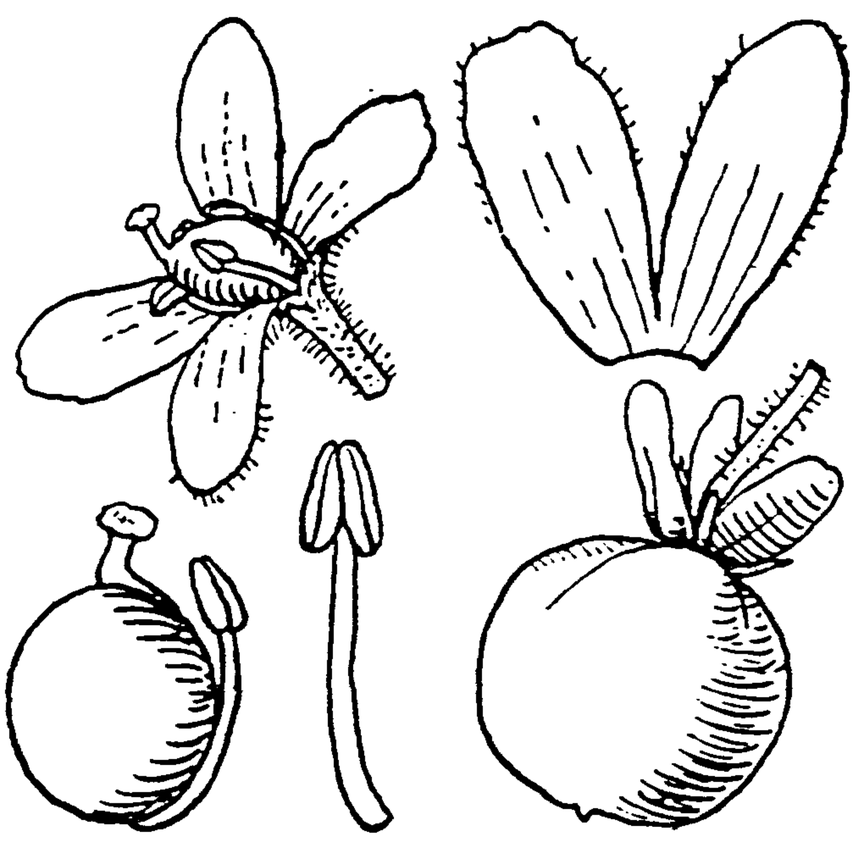
II. PHYTOLACCEAE

Large perennial herbs, with the raceme-like panicles ultimately opposite the leaves. 3. PHYTOLACCA.

III. AGDESTIDEAE

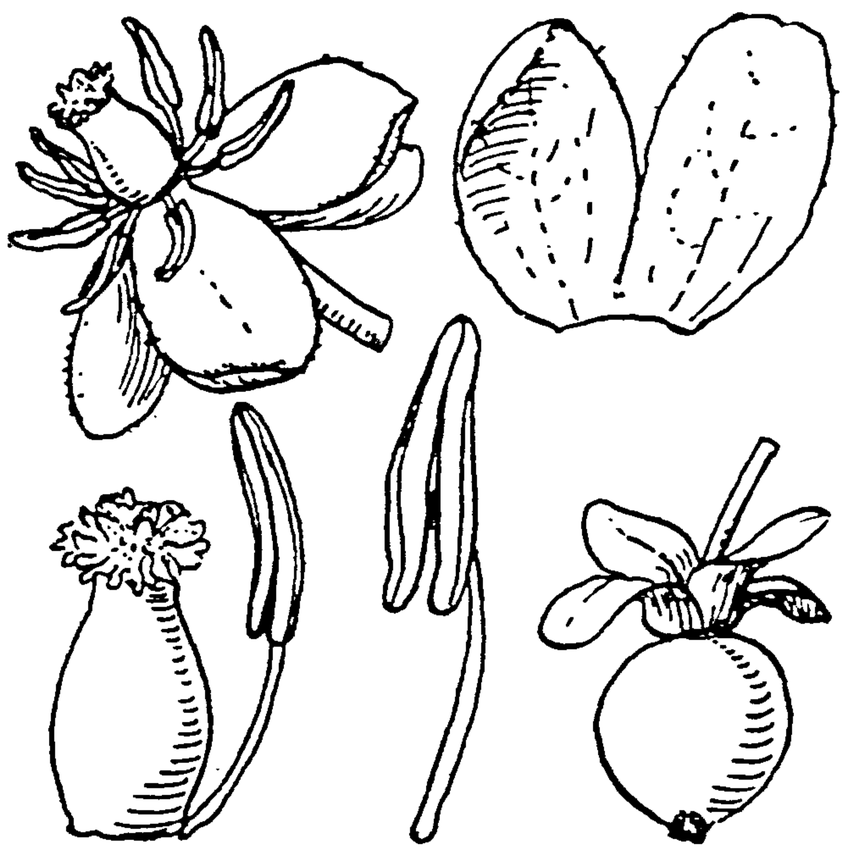
Vines with much-branched stems, broad leaf-blades, and many-flowered panicles. 4. AGDESTIS.

1. RIVINA [Plum.] L. Relatively small often partially woody plants. Fowers racemose. Sepals narrow, partly enclosing the simple fruit or reflexed at maturity. Stamens 4: anthers ovoid. Style eccentric, stout: stigma capitate. Berry red, purple orange or yellow.—Four or 5 species of tropical and warm-temperate regions.



1. R. humilis L. Plants 3–7 dm. tall, or with elongate vine-like stems: leaf-blades ovate, lanceolate, or elliptic, 3–15 cm. long, undulate: sepals cuneate to linear-oblong, 2–2.5 mm. long: berry 2–3.5 mm. long.—(ROUGE-PLANT. BABY-PEPPER.)—Hammocks, sand-dunes, and thickets, Coastal Plain, Fla. to Tex. and Ark.—(*W. I., Mex., C. A., S. A.*)—All year S.—Sometimes known as blood-berry.

2. TRICHOSTIGMA A. Rich. Shrubs with trailing, diffuse, reclining, or climbing stems and branches. Leaf-blades broad, entire. Flowers borne in raceme-like panicles, each flower-stalk with a minute persistent bract near the middle. Sepals 4, broad, persistent, the inner ones often much shorter than the outer. Stamens 8–16: anthers sagittate, extrorse. Style wanting. Stigma tufted. Berry dark-colored.—About 4 species of tropical America.



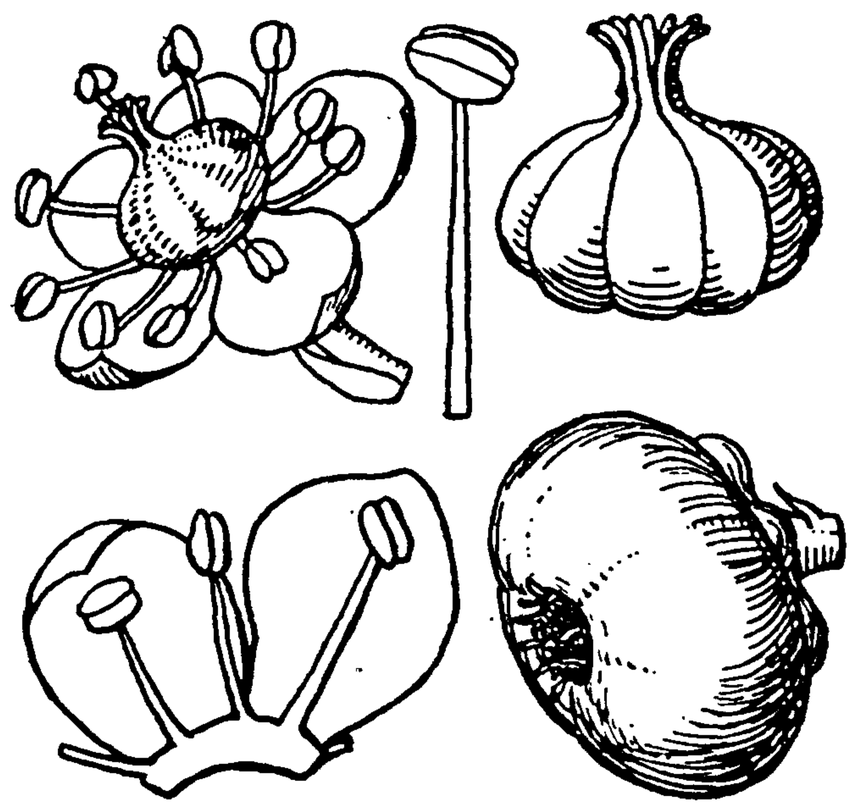
1. T. octandrum (L.) H. Walt. Shrub with diffuse, reclining, or climbing branches often 10 m. long: leaf-blades ovate, elliptic, or oval, mostly 4–9 cm. long, usually short-acuminate, rather long-petioled: panicles narrow, the flower-stalks 4–6 mm. long: sepals oval or obovate, 4–6 mm. long, early reflexed: anthers 2–2.5 mm. long: berry globular or oval, 4–5 mm. long, purplish-black.—Hammocks, coastal region, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)

3. PHYTOLACCA [Tourn.] L. Relatively large or stout plants. Flowers paniculate, the panicles often raceme-like. Sepals broad, spreading under the compound fruit. Stamens 5–25: anthers short, often ovoid or globose. Styles 5–12.—About 24 species mostly tropical.—The fruits are a favorite bird-

food. The young shoots are sometimes used as a substitute for asparagus or cooked as greens. The roots contain a deadly poison.—POKES. INKBERRIES. SCOKES. PIGEON-BERRIES.

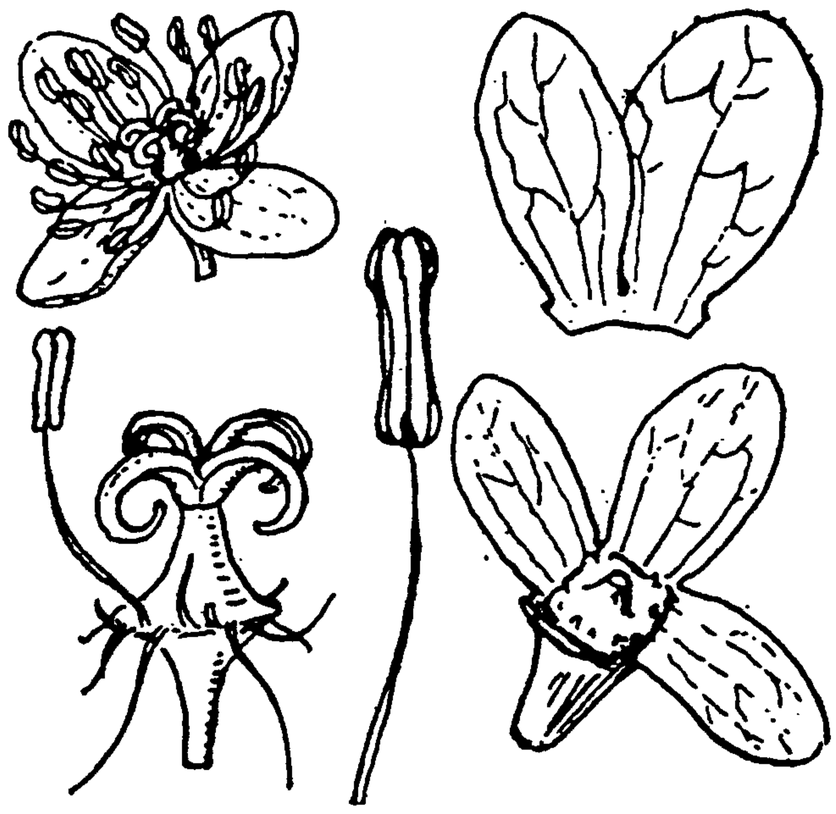
Panicles nodding in fruit: berry shorter than its stalk. 1. *P. americana.*
Panicles permanently erect: berry longer than its stalk. 2. *P. rigida.*

1. P. americana L. Plants 1–3 m. tall, the branches green, magenta, or purple: leaf-blades mainly ovate-lanceolate to ovate, 9–30 cm. long: calyx 5–6 mm. wide: berry 7–10 mm. wide, its length less than the length of its stalks: seed about 3 mm. long. [*P. decandra* L.]—Waste places, cultivated grounds, and rich soil generally, various provinces, Fla. to Tex., Minn., and Me.—Spr.–fall.—The flowers of this and the following species are white often sordid or flushed with purple. The berries are often used to make a red ink.



2. P. rigida Small. Plants 1–3 m. tall, or sometimes arborescent and becoming 6 or 7 m. tall, the branches greenish-purple: leaf-blades lanceolate to oblong-lanceolate, 7–34 cm. long: berry 10–12 mm. wide.—Hammocks and cult. grounds, Coastal Plain, Fla. to Tex.—All year.

4. AGDESTIS Moc. & Sessé. Vines with turnip-like roots and copiously branched stems. Leaf-blades very broad. Flowers perfect, borne in panicles. Sepals 4, or rarely 5, spreading, persistent. Stamens numerous: filaments slender: anthers narrow. Ovary inferior: style short: stigmas narrow, introrse. Achene 4–5-winged.—The flowers are white or greenish-white.

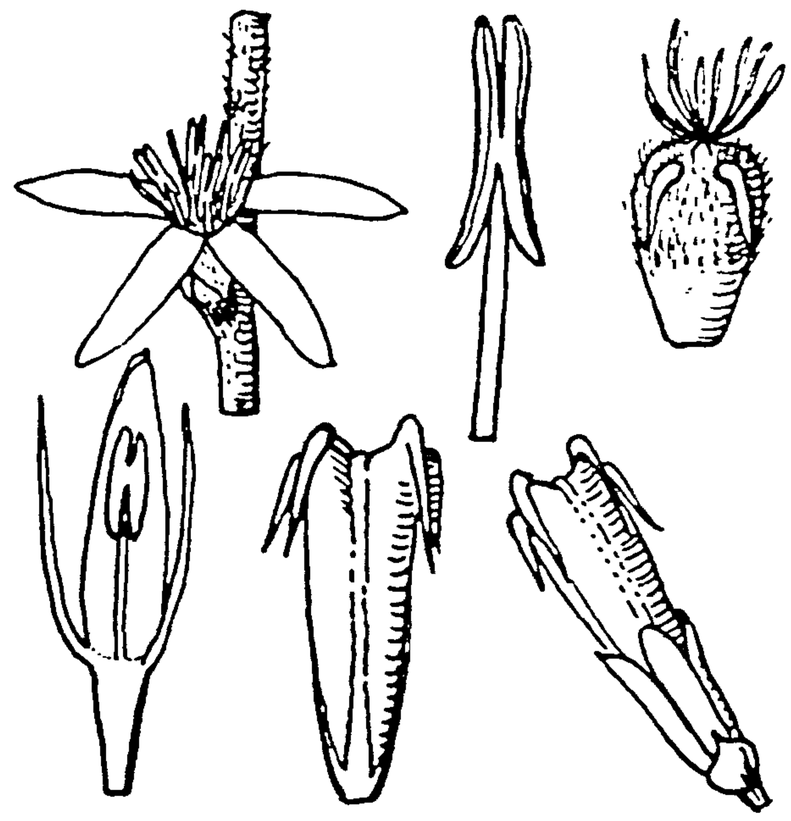


1. A. clematidea Moc. & Sessé. Vine with much branched stems: leaf-blades ovate to reniform, 3–9 cm. long, obtuse at the apex, broadly cordate or truncate at the base, long-petioled: panicles many-flowered, mostly 1–1.5 dm. long: sepals mainly oblong or oval, 4–6 mm. long: achene turbinate, the wings 11–13 mm. broad from tip to tip.—Hammocks and waste-places, S pen. Fla. and Tex.—Nat. of Mex. and cult.—All year.—Extensively grown in S Fla. as an ornamental vine.

FAMILY 7. PETIVERIACEAE — PETIVERIA FAMILY

Woody plants, usually strong-scented. Leaves alternate: blades firm, entire. Flowers perfect, in virgate spikes. Hypanthium present. Calyx of 4 nearly equal sepals. Corolla wanting. Androecium of 4–8 stamens, borne like the calyx on the long hypanthium. Gynoecium a single carpel borne in the hypanthium. Fruit an achene with reflexed spines at the top. —Consists of the following genus and species.

1. PETIVERIA [Plum.] L. Shrubs with extensively creeping or horizontal rootstocks. Leaves with narrow stipules. Anthers sagittate, forked at the apex. Style wanting. Stigma lateral, penicellate. Achene appressed to the spike-rachis.

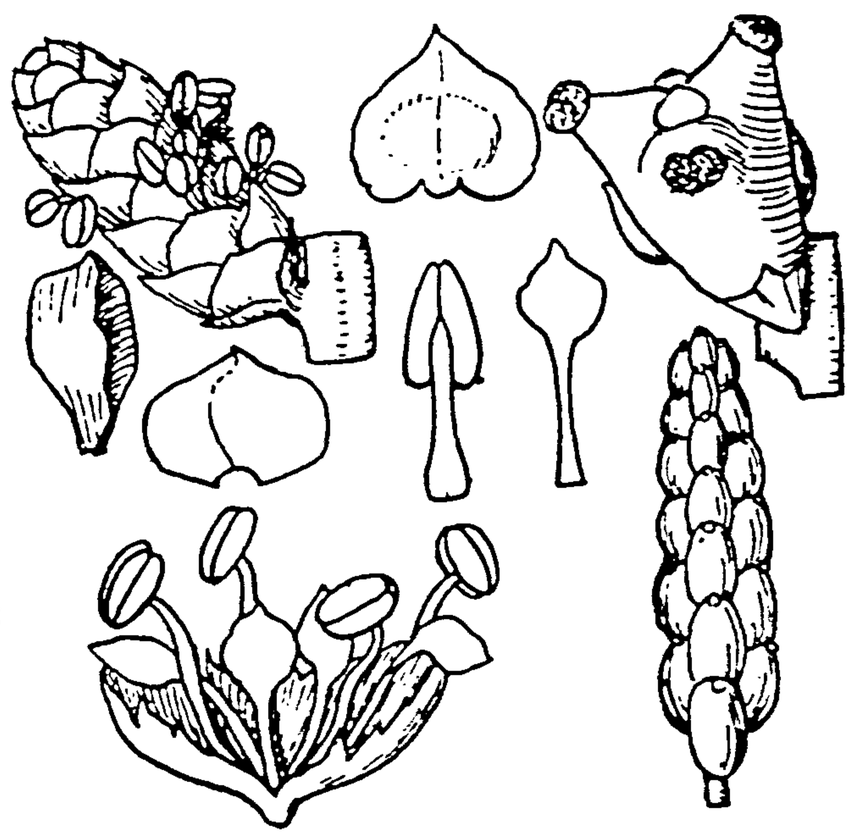


1. P. alliacea L. Stems 3–12 dm. tall, often with virgate branches: leaf-blades obovate, elliptic-obovate, or elliptic, 4–12 cm. long: spikes 1–3 dm. long, interrupted: sepals linear to linear-lanceolate, 3–4 mm. long, about as long as the hypanthium: achene linear-cuneate, 6–10 mm. long, the spines one-half as long as the body or less.—(GUINEA-HEN WEED.)—Hammocks, pen. Fla. and the Keys; also S Tex.—(*W. I., Mex., C. A., S. A.*)—When crushed, this plant emits a disagreeable skunk-like odor. The flowers are white or greenish, often ivory-white.

FAMILY 8. BATIDACEAE — SALTWORT FAMILY

Maritime partially succulent shrubs. Leaves opposite, fleshy, half-terete, linear or clavate, entire. Flowers small, dioecious, in axillary cone-like spikes. Staminate cones with persistent imbricate scales each subtending a flower: calyx cup-shaped, 2-lobed: stamens 4–5, inserted at the base of the calyx: filaments thick, alternating with staminodia. Pistillate cones peduncled, 4–12-flowered, the scales deciduous: the flowers each consisting of merely a 4-celled ovary with a sessile stigma. Ovule 1 in each cavity. Fruit a fleshy cone.—Represented by the following genus and species.

1. BATIS P. Br. Plants with smooth and glabrous foliage. Leaves without stipules.



1. B. maritima L. A glabrous pale-green strong-scented shrub, with spreading or prostrate, often creeping, stems 0.5–1.5 m. long: leaves curved, 1–2.5 cm. long: cones 5–10 mm. long, ovoid; pistillate on peduncles 2–5 mm. long: bracts reniform or suborbicular, often apiculate: fruit oblong or obovoid, 1–2 cm. long, short-stalked, drooping.—(SALTWORT. BEACHWORT.)—Low sandy or rocky places, usually in salt marshes and low muddy shores, Coastal Plain, Fla. to Tex. and N. C.—(*W. I., Mex., C. A., S. A.*)—The stems and branches often recurve and root at the tip.—In its typical habitat the saltwort occupies the ground exclusively. The peculiar pale-green of the foliage is striking. It crunches under foot after the manner of samphire.

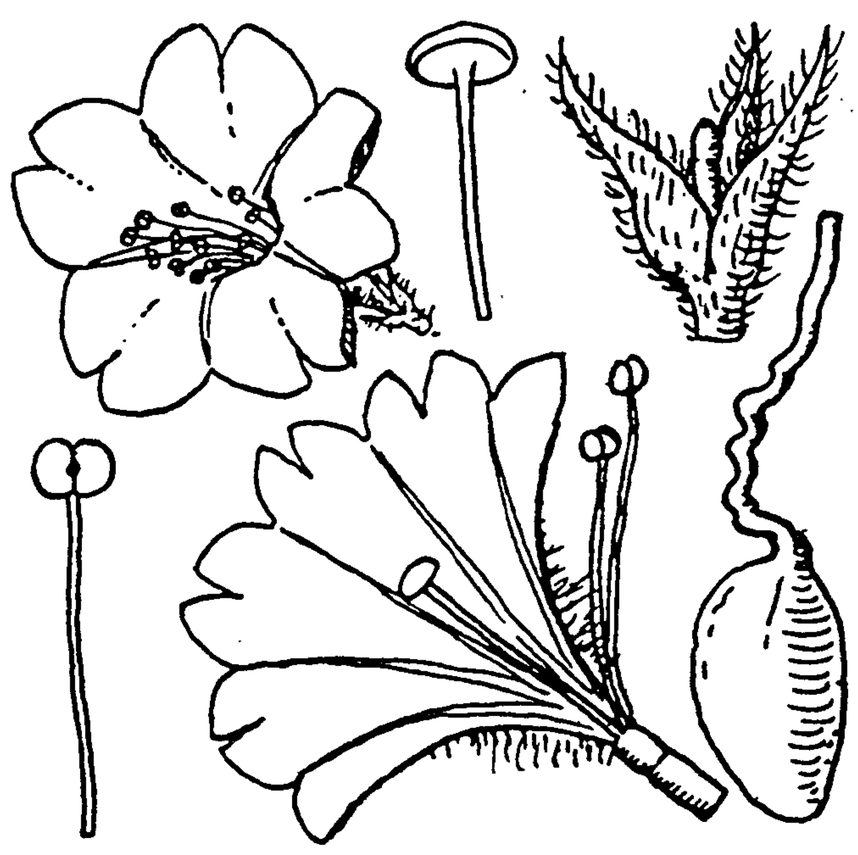
FAMILY 9. **ALLIONIACEAE** — FOUR-O'CLOCK FAMILY

Herbs with dichotomous stems or shrubs or trees. Leaves opposite: blades entire or nearly so. Flowers mostly perfect, 1 or more in an involucre. Calyx of several united sepals, usually corolloid, deciduous above the ovary. Corolla wanting. Androecium of 1–many stamens, borne below the ovary. Gynoecium a single pistil. Fruit an anthocarp.—About 25 genera and 350 species, most abundant in America.—The plants are easily grown, and some with showy flowers are widely cultivated.

Flower, or flower-head, subtended by an involucre: fruit not clavate or obpyramidal.
- Bracts of the involucre distinct: stamens 10–18: fruit subterranean. — 1. OKENIA.
- Bracts of the involucre united: stamens 3–6: fruit not subterranean.
  - Calyx long-salverform: fruit obtusely- or obscurely-angled: involucre unchanged in fruit. — 2. MIRABILIS.
  - Calyx campanulate or short-funnel form: fruit grooved: involucre accrescent. — 3. ALLIONIA.

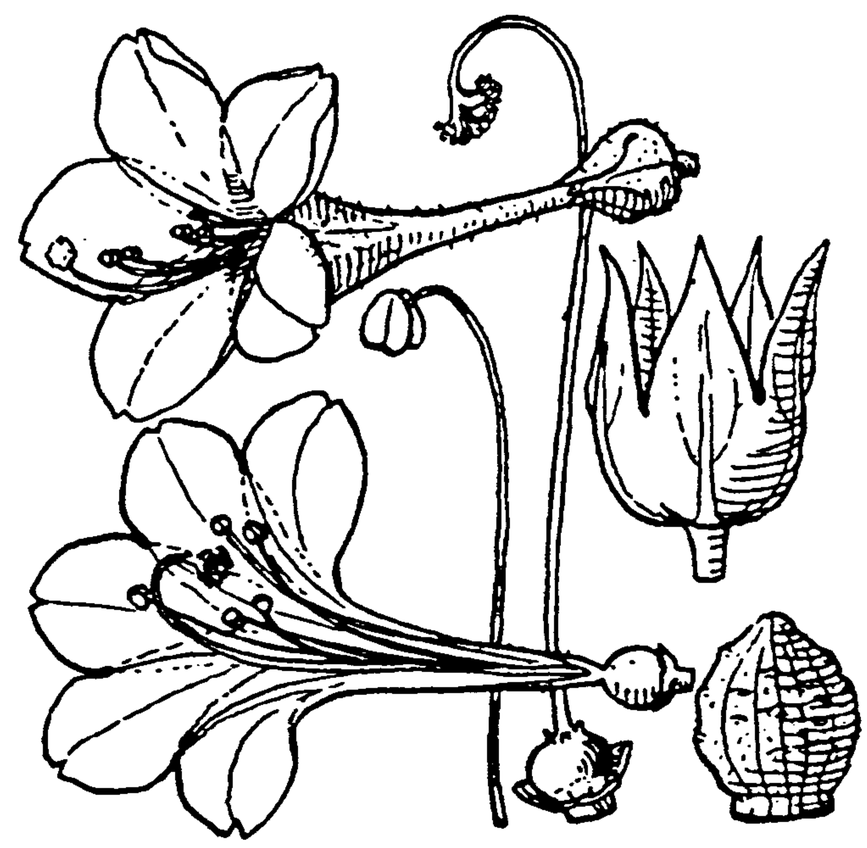
Flower not subtended by an involucre: fruit obpyramidal or clavate or obovoid. — 4. BOERHAAVIA.

1. OKENIA Schlecht. & Cham. Annual prostrate herbs. Leaves opposite: blades inequilateral. Flowers solitary in the 3-bracted involucres. Calyx short-funnelform, the lobes emarginate. Stamens 14–18: filaments united at the base. Fruit somewhat elongate, bent, 1-striate and transversely wrinkled, subterranean.—One species.



1. O. hypogaea Schlecht. & Cham. Stem and branches creeping, densely viscid-pubescent, 2–11 dm. long: leaf-blades fleshy, ovate to elliptic-ovate, 2.5–4 cm. long, obtuse at the apex, truncate or cordate at the base, stout-petioled: calyx of the conspicuous infertile flowers deep-violet or rose-purple, 3–4 cm. wide on young plants, 6–8 cm. on old ones, that of the cleistogamous flowers inconspicuous: fruits ellipsoid or oval, 1–2 cm. long.—Coastal dunes and hammocks, S Fla.—(*Mex.*)—All year.

2. MIRABILIS L. Perennial herbs. Leaves opposite. Flowers typically 1 in an involucre. Calyx salverform, the limb large. Stamens 3–6; filaments united at the base. Fruit of an ovoid type, constricted near the base.—About 25 species natives of America.

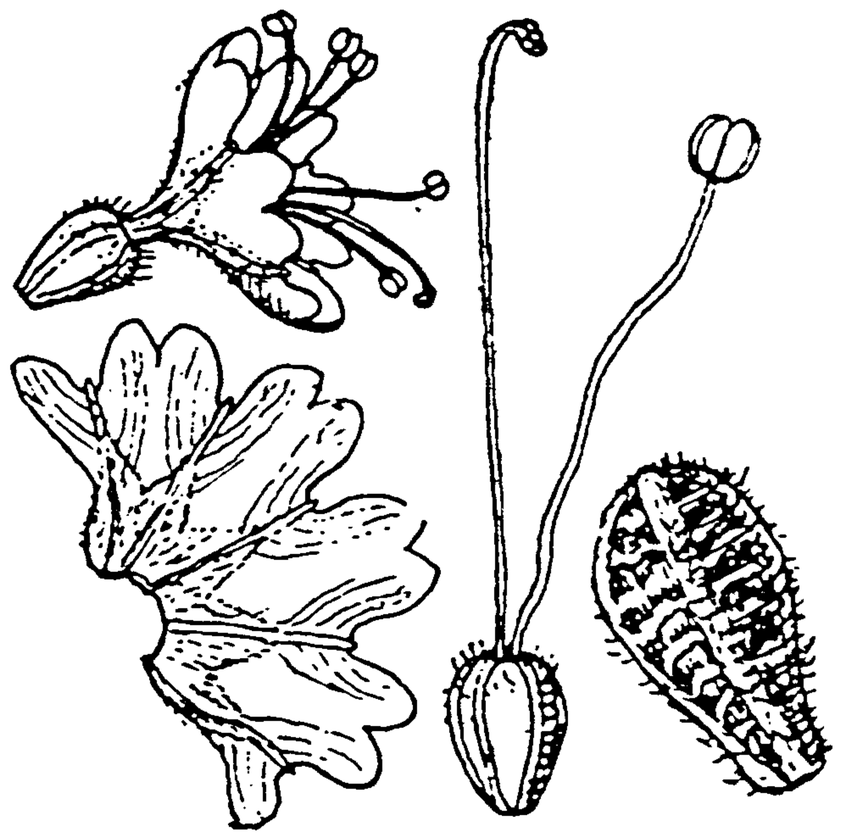


1. M. Jalapa L. Plants glabrous, except the young parts: leaf-blades ovate, sometimes broadly so, 3–12 cm. long : involucres 7–8 mm. long; lobes acute: calyx deep-red to purple, yellow, pink, or white and variously variegated: fruit broadly ovoid.—(FOUR-O'CLOCK. MARVEL-OF-PERU.)—Waste places, cult. grounds, and roadsides, S Fla. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A.*)—All year.—A favorite old-fashioned garden plant, sometimes escaped.

3. **ALLIONIA** Loefl. Perennial herbs. Leaves opposite: blades equilateral or nearly so. Flowers 1–5 in each involucre. Calyx campanulate or short-funnelform. Stamens 2–5, unequal. Fruit obovoid, slightly 5-angled or 5-grooved. [*Oxybaphus* L'Her.]—About 40 species, with one exception American.—Spr.–sum.—UMBRELLA-WORTS.

Leaf-blades narrow, gradually narrowed at the base	1. *A. albida.*
Leaf-blades, except in the uppermost leaves, broad, cordate at the base.	2. *A. nyctaginea.*

1. A. albida Walt. Stem up to 2 m. tall: leaf-blades lanceolate, narrowly elliptic, or linear-lanceolate, 3–15 cm. long, sessile or nearly so: involucres becoming 1.5–2 cm. wide: calyx white or pale-pink: fruit 4.5–5 mm. long, the angles, and the faces, coarsely tuberculate. [*Oxybaphus albidus* Choisy]—Dry soil on hillsides or meadows, various provinces, rarely Coastal Plain, S. C. to Tex., Kans., and Tenn.

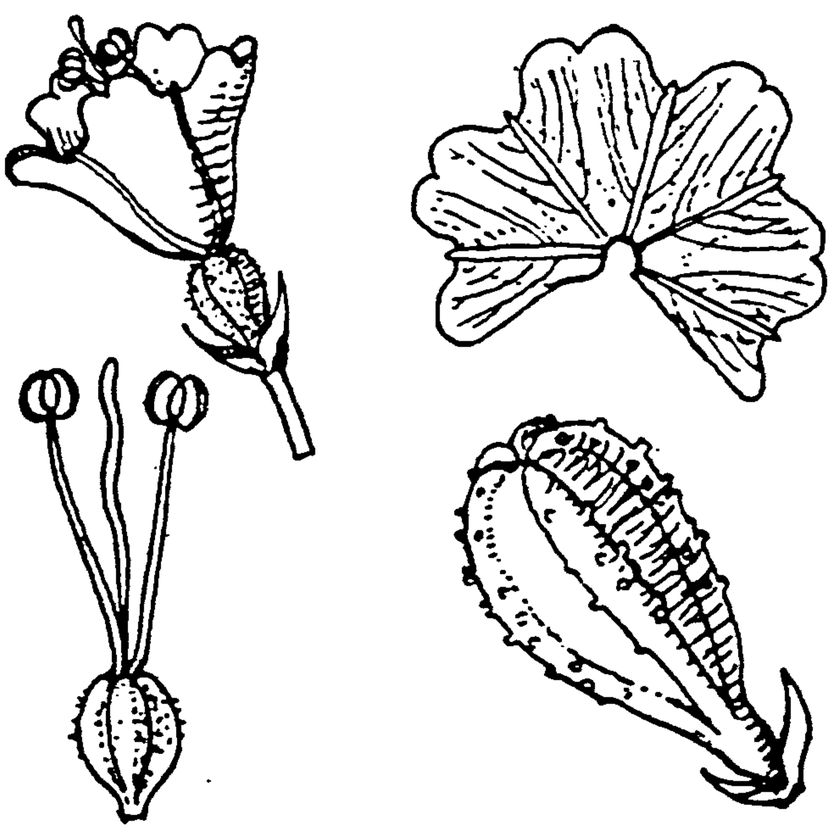


2. A. nyctaginea Michx. Stem up to 1 m. tall: leaf-blades broadly ovate, or triangular-ovate, or broadly lanceolate, 2–11 cm. long, petioled: involucres becoming 2 cm. wide: calyx red or pink: fruit about 5 mm. long, the angles rugulose, the faces rugulose or finely tuberculate. [*Oxybaphus nyctagineus* Sweet]—(WILD FOUR-O'CLOCK. UMBRELLA-WORT.)—Dry soil, various provinces, rarely Coastal Plain, Ala. to Tex., Mont., and Wis.—(*Mex.*)

4. **BOERHAAVIA** [Vaill.] L. Annual or perennial usually diffuse herbs. Leaves opposite: blades often undulate. Flowers subtended by minute bracts. Calyx-tube not prolonged beyond the ovary, the limb campanulate to rotate. Fruit clavate to obovoid, 5–10 ribbed.—About 50 species, natives of the Old World and the New.—SPIDERLINGS.

Fruits glandular, rounded at the apex: plants perennial.	1. *B. coccinea.*
Fruits glabrous, flat at the apex: plants annual.	2. *B. erecta.*

1. B. coccinea Mill. Stem branched at the base, the branches diffusely spreading, 6–12 dm. long: leaf-blades ovate to elliptic-ovate, 2–8 cm. long, both surfaces of almost the same color: calyx pink or purplish; tube glandular-pubescent; limb campanulate, 1.5 mm. high, glabrous or sparingly pubescent: fruit ob-pyramidal, 3 mm. long, the ribs glandular, the top rounded.—[*B. hirsuta* Willd., *B. paniculata* Rich., *B. decumbens* Vahl. *B. viscosa* Lag. & Rodr. Small Fl.]—Roadsides, waste places, and hammocks, pen. Fla.; adv. in N. C.; also Tex. to Calif.—(*W. I., Mex., C. A., S. A., O. W.*)



2. B. erecta L. Stem simple below, erect or branched at the base, the branches decumbent or spreading, 3–12 dm. long: leaf-blades ovate to deltoid-ovate, 2–8 cm. long,

minutely black-dotted on the lower whitish surface: calyx white or purple; tube glabrous; limb campanulate, 1–1.5 mm. long, sparingly pubescent: fruit obpyramidal, 3.5–4 mm. long, 5-angled, the grooves transversely wrinkled, the top flat.—Waste places, fields, roadsides, and hammocks, Coastal Plain and occasionally adjoining provinces, Fla. to Tex., Ariz., Ark., and S. C.—(*W. I., Mex., C. A., S. A.*)

Family 10. **PISONIACEAE** — Pisonia Family

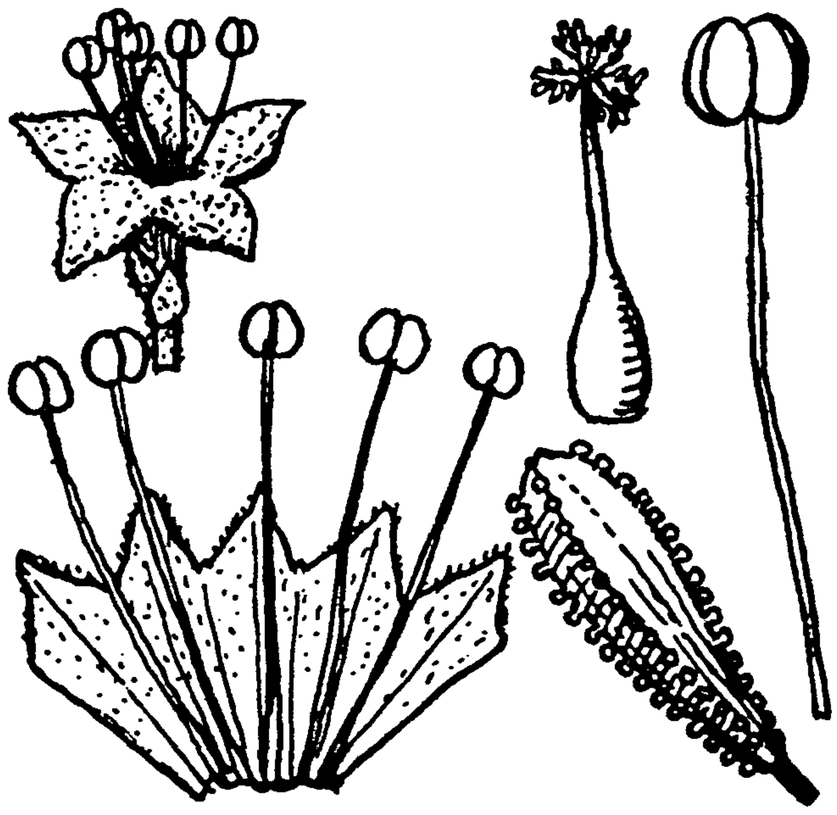
Shrubs, trees, or vines. Leaves opposite or alternate: blades simple. Flowers perfect, dioecious or rarely monoecious, cymose. Calyx of 5 united sepals, campanulate, tubular, or funnelform. Corolla wanting. Androecium of 5–30 stamens. Gynoecium 1-carpellary. Ovary 1-celled: style terminal. Fruit an anthocarp.—Three genera and about 40 species, mostly tropical.

Fruit angular, with rows of glands: calyx broad. 1. Pisonia.
Fruit terete, glandless: calyx narrow. 2. Torrubia.

1. PISONIA [Plum.] L. Armed woody vines, or shrubs or trees. Leaves opposite: blades entire. Flowers in compound cymes. Calyx broadly funnelform or rotate, with a thin undulate recurved edge. Fruit dry, with rows of glands.—About 25 species in tropical and subtropical regions.

Stem mostly climbing, armed: leaf-blades abruptly pointed or short-acuminate: fruits glandular from the base to the apex. 1. *P. aculeata.*
Stem erect, unarmed: leaf-blades blunt or retuse: fruits glandular above the middle. 2. *P. rotundata.*

1. P. aculeata L. Woody vine with branching thorns, the ultimate divisions curved or hooked, very sharp, or rarely erect and somewhat tree-like: leaf-blades elliptic, oval, or ovate, 2.5–7 cm. long: pedicels slender: calyx-lobes mostly longer than wide: fruit slender, 3–3.5 mm. thick.—(Cock-spur. Devil's-claws. Pull-and-hold-back. Old-hook.) — Hammocks, S pen. Fla. and the Keys.—(*W. I.*)—The calyx is usually purple.



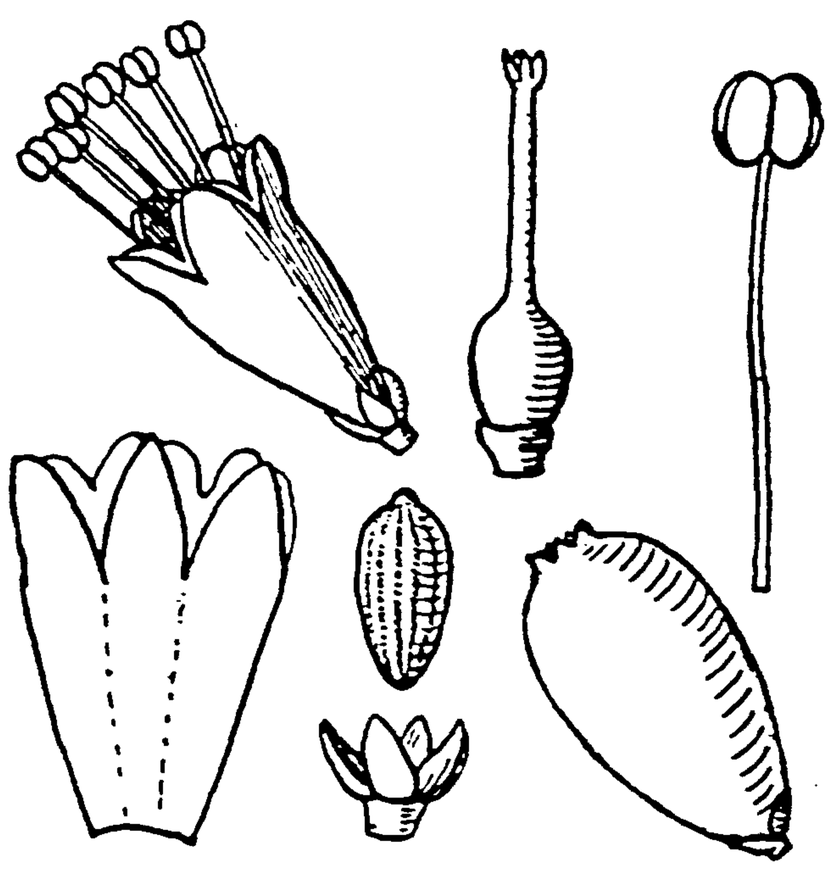
2. P. rotundata Griseb. Shrub or small tree, the bark pale: leaf-blades thick, broadly elliptic or oval, varying to obovate, 2.5–8 cm. long, short-petioled: cymes densely flowered: calyx green or whitish, broadly funnelform, about 3 mm. long, tomentulose along the edge: fruit broadly or narrowly obovoid, 5–6 mm. long.—(Pisonia.)—Hammocks and pinelands, Florida Keys.—(*W. I.*)

2. TORRUBIA Vell. Unarmed shrubs or trees. Leaves opposite: blades entire. Flowers in cymes. Calyx narrowly funnelform to tubular, with an erect nearly or quite even edge, purplish, pink, green, or white. Fruit juicy, without glands.—About 20 species, natives of tropical and subtropical America. —Beef-trees.

Leaf-blades glabrous: inflorescence-branches glabrous in age.
Fruit obovoid or ellipsoid-obovoid, 8–10 mm. long, the hard part ellipsoid: leaf-blades oblanceolate, obovate, cuneate, elliptic or oval.

Leaf-blades oblanceolate to cuneate or narrowly obovate: fruit obovoid. — 1. *T. longifolia.*
Leaf-blades obovate, elliptic, or oval: fruit ellipsoid or ellipsoid-obovoid. — 2. *T. Bracei.*
Fruit subglobose, 6–7 mm. long, the hard part oval: leaf-blades orbicular-cuneate to suborbicular. — 3. *T. globosa.*
Leaf-blades copiously pubescent: inflorescence-branches persistently pubescent. — 4. *T. floridana.*

1. T. longifolia (Heimerl) Britton. Shrub or small tree, with pale smooth bark and brittle branches: leaf-blades oblanceolate, to cuneate or narrowly obovate, 2.5–5 cm. long, thinnish, obtuse or rounded at the apex, slender-petioled: calyx green or purplish: fruit obovoid, about 8 mm. long, red, juicy, rounded or slightly depressed at the apex, the hard part 7–7.5 mm. long. [*Pisonia obtusata* (Chapm. Fl.)]—(BLOLLY.)—Hammocks, S pen. Fla. and the Keys.—(*W. I.*)



2. T. Bracei Britton. Shrub or small tree, with rather pale bark: leaf-blades obovate, elliptic, or oval, 3.5–6 cm. long, thick, rounded or retuse at the apex, rather slender-petioled: calyx purplish: fruit ellipsoid or ellipsoid-obovoid, 9–11 mm. long, red, very juicy, nearly truncate at the apex, the hard part 8–9 mm. long.—(BLOLLY.)—Hammocks and adj. pinelands, lower eastern coast, pen. Fla. and the Keys.—(*W. I.*)

3. T. globosa Small. Small tree, with gray, often dark-gray bark: leaf-blades orbicular-cuneate to suborbicular, mostly 1–2 cm. long, thinnish, rounded or emarginate at the apex, slender-petioled: calyx greenish-purple: fruit subglobose, 6–7 mm. long, dark-red, juicy, depressed at the apex, the hard part 5–6 mm. long.—Hammocks, lower eastern coast, pen. Fla. and the Keys.

4. T. floridana Britton. Low shrub with gnarled branches: leaf-blades spatulate, cuneate, or obovate, 2–3.5 cm. long: fruit slightly broadened upward, 6–7 mm. long.—Rocky places, Rock Key, Fla.—Collected nearly a century ago about twelve miles west of Key West; not found since.

FAMILY 11. TETRAGONIACEAE — CARPET-WEED FAMILY

Herbs, firm or succulent, or partially woody plants. Leaves alternate or opposite, sometimes apparently whorled. Flowers perfect, polygamous, or unisexual, regular or nearly so. Calyx of 4 or 5 sepals. Corolla wanting (in our species). Androecium of 4 or 5 hypogynous or perigynous stamens, or sometimes fewer, or more numerous. Gynoecium of 2-several united carpels. Ovary superior or partly inferior. Fruit a capsule or pyxis, or baccate or nut-like.—Twenty-two genera and 500 species, mostly natives of the tropics.

Hypanthium minute: ovary essentially superior. — Tribe I. MOLLUGINEAE.
Hypanthium quite evident, cylindric, turbinate, or campanulate: ovary more or less inferior.
Ovary partly inferior.
Capsule circumscissile. — Tribe II. SESUVIEAE.
Capsule loculicidal. — Tribe III. AIZOEAE.
Ovary inferior. — Tribe IV. TETRAGONIEAE.

I. MOLLUGINEAE

Radially prostrate wiry-stemmed herb. — 1. MOLLUGO.

II. SESUVIEAE

Leaves with stipules: ovary 1- or 2-celled.
  Sepals unappendaged: stamens 1–3. 2. CYPSELEA.
  Sepals appendaged: stamens 5–10. 3. TRIANTHEMA.
Leaves without stipules: ovary 3–5-celled. 4. SESUVIUM.

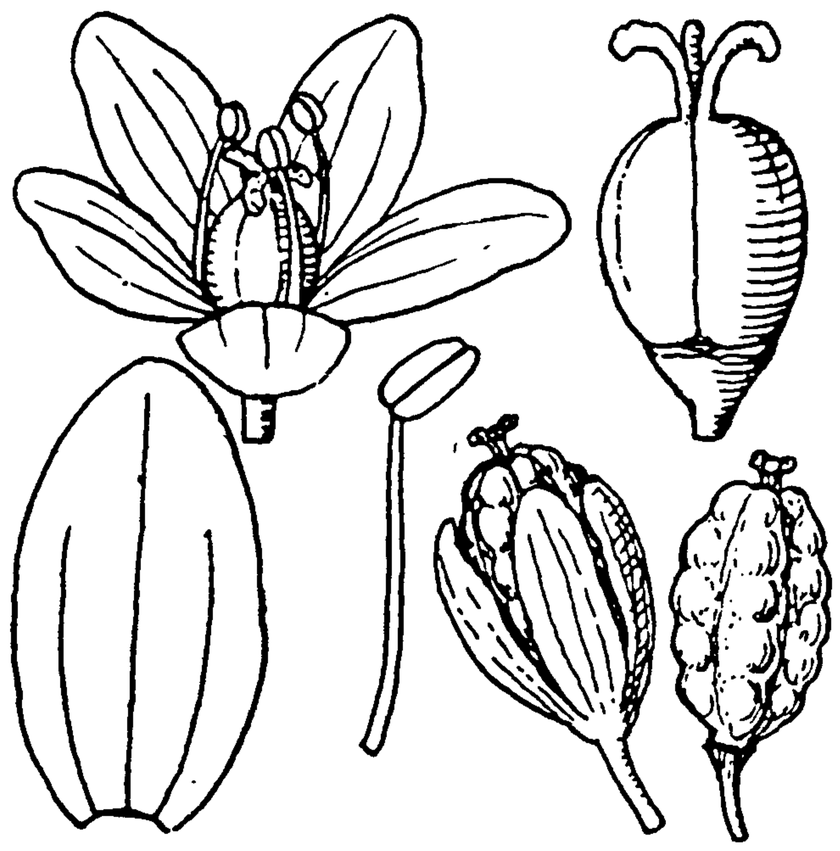
III. AIZOEAE

Diffuse or prostrate plants with numerous leaves and small axillary flowers. 5. GALENIA.

IV. TETRAGONIEAE

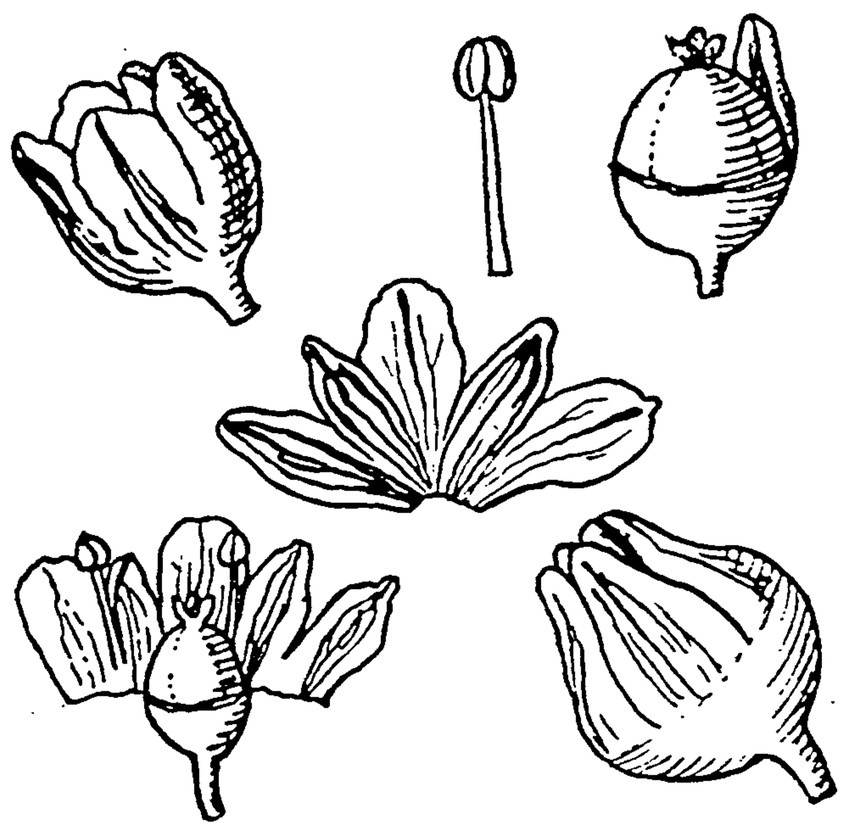
Diffuse somewhat fleshy plants with large leaves and small flowers in their axils. 6. TETRAGONIA.

1. MOLLUGO L. Annual slender herbs. Leaves alternate, sometimes apparently whorled: blades narrow. Sepals 5, hyaline-margined, glabrous. Stamens 3–5. Styles 5, short.—About 12 species, mostly tropical.



1. M. verticillata L. Branches slender, prostrate, 4–30 cm. long: stem-leaves 1–3 cm. long; blades spatulate to linear-spatulate, obtuse or acute at the apex: flowers 2–5 at each node, slender-pedicelled: sepals elliptic, 2.5–3 cm. long, green, or white within: stamens usually 3, occasionally 4; filaments 2.5–3 mm. long: capsule ellipsoid or nearly so, usually slightly exceeding the calyx, 20–30 seeded.—(INDIAN-CHICKWEED. CARPET-WEED.)—River-banks, waste-places, cult. grounds and roadsides, various provinces, Fla. to Tex., N. D., Ont., and N. B.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall.

2. CYPSELEA Turp. Annual or probably perennial succulent herbs. Leaves opposite: blades relatively broad. Sepals 4 or 5, herbaceous, not horned. Stamens mostly 1–3. Styles usually 2, very short.—Only the following species known.

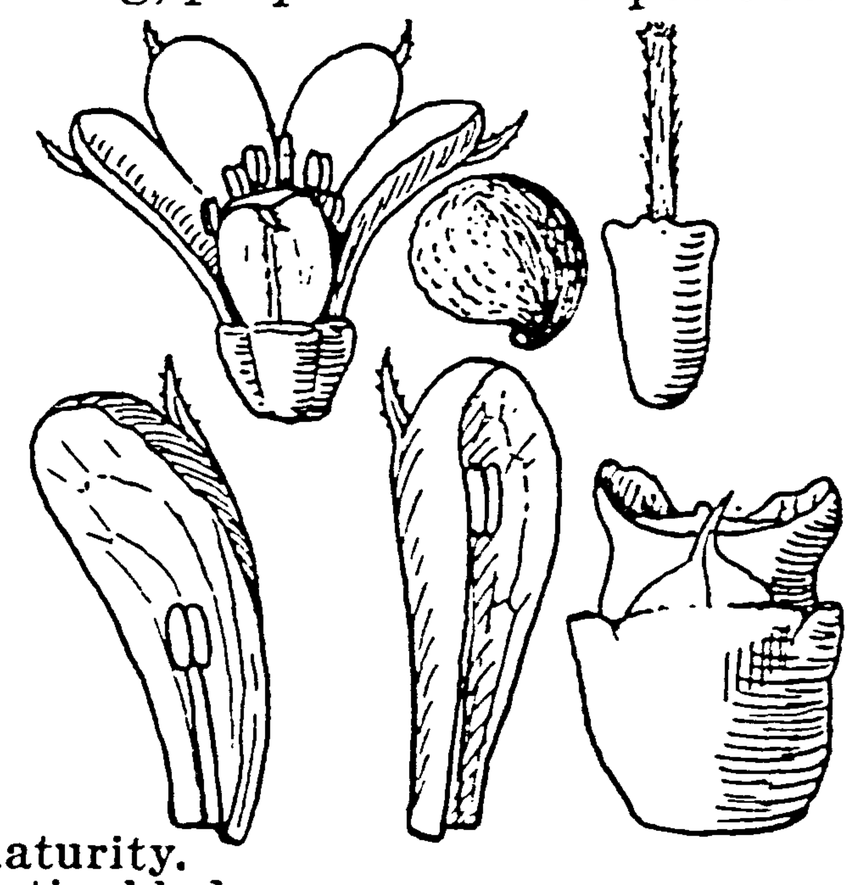


1. C. humifusa Turp. Plants forming mats 2–10 cm. wide, glabrous: leaf-blades elliptic to oval, 1.5–6 cm. long or rarely larger, obtuse, entire: flowers axillary, short-pedicelled: sepals ovate or oval, 1.5–2 mm. long or rarely longer, greenish, obtuse or acutish: filaments often nearly as long as the sepals: capsule subglobose, 1.5–2 mm. in diameter.—Pinelands and sandy soil, Fla. and Calif. Nat. of W. I.—Spr.–fall.

3. TRIANTHEMA L. Annual or perennial herbs or woody plants. Leaves opposite: blades broad. Sepals 5, petaloid, each horned at the tip. Stamens 5–10. Stigma lateral on the style. Ovules few.—About 12 species, mostly natives of the Old World tropics.

1. T. Portulacastrum L. Plants diffusely branched at the base, the branches often 5–10 dm. long: leaf-blades suborbicular to obovate, 0.5–2 cm. long: sep-

als ovate-lanceolate to oblong, becoming 4–5 mm. long, purple within: capsule 3.5–5 mm. long. [*T. monogyna* L.]—Hammocks and sandy shores, S pen. Fla. and the Keys; also Tex. to Ariz.—(*W. I., Mex., C. A., S. A., O. W.*)—All year.

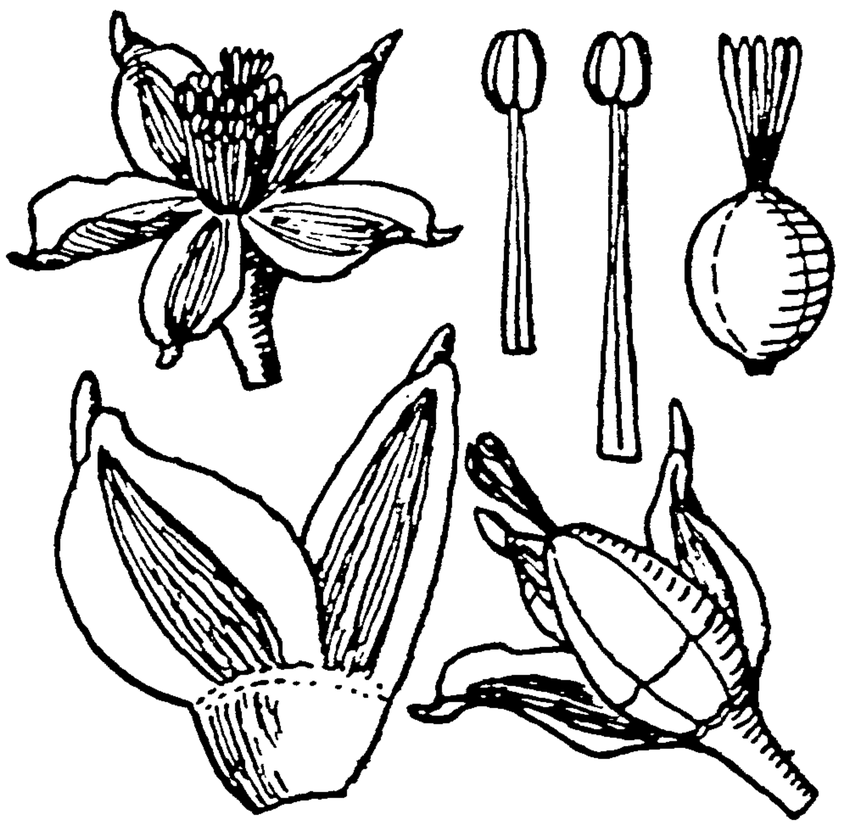


1. *S. Portulacastrum.*

4. **SESUVIUM** L. Annual or perennial succulent herbs, or partially woody plants. Leaves opposite: blades narrow. Sepals 5, petaloid, each horned at the apex. Stamens 1–many, sometimes grouped.—About 4 species natives of saline regions.—Spr.–fall.—SEA-PURSLANES.

Stamens numerous: sepals over 5 mm. long at maturity.
  Upper leaves with spatulate or rarely elliptic blades: sepals becoming ovate: plants green.
  Upper leaves with linear blades: sepals becoming hastate: plants glaucous.
Stamens 5: sepals less than 5 mm. long at maturity.

1. S. Portulacastrum L. Plants usually sparingly branched, the branches often 1–2 m. long: leaf-blades spatulate to oblanceolate or rarely elliptic, 1.5–4 cm. long: flowers short pedicelled: sepals ovate to ovate-lanceolate, 8–10 mm. long, the outer with a broad green body and narrow margins, the inner with a green rib and wide margins, all pink within: capsule 9–10 mm. long.—Coastal sand-dunes and shores, Coastal Plain, Fla. to N. C.—(*W. I., Mex., C. A.*)



2. *S. crithmoides.*

2. S. crithmoides Welw. Similar to *S. Portulacastrum* in habit: leaf-blades narrowly linear, 2–6 cm. long: flowers sessile: sepals 9–11 mm. long: capsule 9–11 mm. long.—Waste places among wharves, Brunswick, Ga. Nat. of Angola.

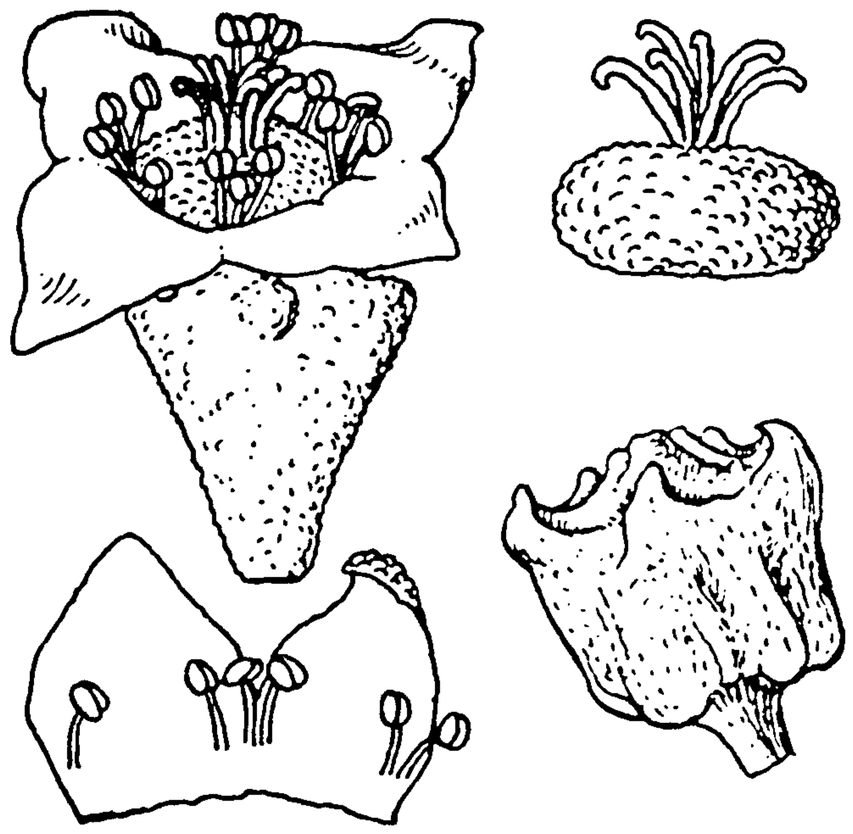
3. *S. maritimum.*

3. S. maritimum (Walt.) B. S. P. Plants copiously branched, 0.5–4 dm. long: leaf-blades spatulate to obovate, 1–2.5 cm. long: flowers sessile: sepals 3–4 mm. long: capsule about 5 mm. long. [*S. pentandrum* Ell.]—Sandy shores and waste grounds, Coastal Plain, Fla. to Tex. and N. Y.—(*W. I.*)

4. **GALENIA** L. Herbs or shrubs, with spreading or prostrate branches. Leaves opposite or alternate, often very variable in size. Flowers perfect, inconspicuous, axillary. Sepals 4 or 5. Stamens 8 or 10, in pairs at the sinuses of the perianth. Capsule 3–5 angled, leathery.—About 17 species, natives of Africa.

1. G. secunda Sond. Stem branched at the base, the branches radially spreading, several dm. long, much-branched: leaves numerous; blades rhombic, cuneate-obovate or spatulate-obovate, mainly 1–2 cm. long: calyx about 3 mm. long; lobes oblong or lanceolate-oblong, ciliate near the tip and pubescent without: filaments shorter than the calyx-lobes.—Waste places, W Fla. Nat. of S Africa.—Spr.–fall.

5. **TETRAGONIA** L. Annual or perennial fleshy herbs or partially woody plants. Leaves opposite or alternate: blades broad. Sepals mostly 4, fleshy. Stamens 1–many, often somewhat grouped. Styles short. Ovules solitary in each cavity.



1. **T. expansa** Murr. Stem or branches spreading or procumbent, 3–14 dm. long: leaf-blades ovate to deltoid, 2–6 cm. long, entire, truncate to cuneate at the base: sepals yellowish green, ovate to half-orbicular, about 2 mm. long: nut-like fruit 8–12 mm. long, 4–6-horned. — (NEW-ZEALAND SPINACH.)—Waste places and fields, Fla. and Calif. Nat. of Asia and Australia.—Spr.–fall.

FAMILY 12. **PORTULACACEAE** — PURSLANE FAMILY

Herbs, mostly fleshy or succulent, or partially woody. Leaves alternate or opposite: blades entire. Flowers perfect, regular. Calyx of 2 sepals. Corolla of 4 or 5, or rarely more, fugacious petals. Androecium of as many stamens as there are petals, or fewer or more. Gynoecium of 3 or more united carpels. Ovary superior or inferior, 1-celled. Fruit a capsule or pyxis.—About 40 species, mostly American.

Ovary and capsule superior: capsule 3-valved.
  Sepals deciduous: stamens more numerous than the sepals, or petals: capsules many-seeded. 1. TALINUM.
  Sepals persistent: stamens as many as the sepals, or petals: capsules few-seeded. 2. CLAYTONIA.
Ovary and capsule wholly or partly inferior: capsule circumscissile. 3. PORTULACA.

1. **TALINUM** Adans. Perennial succulent and sometimes partially woody herbs, or shrubs, the stem and branches often terminating in wiry peduncles. Leaves terete or flat. Flowers erect. Sepals 2, deciduous. Petals 5 or more. Stamens few or many. Style elongate. Ovules many on a stalked placenta.—About 35 species, mostly American.

Plant herbaceous: leaves crowded on a caudex; blades terete or nearly so. I. TERETIFOLIA.
Plant partly woody: leaves not crowded on a caudex; blades broad but succulent. II. LATIFOLIA.

I. TERETIFOLIA

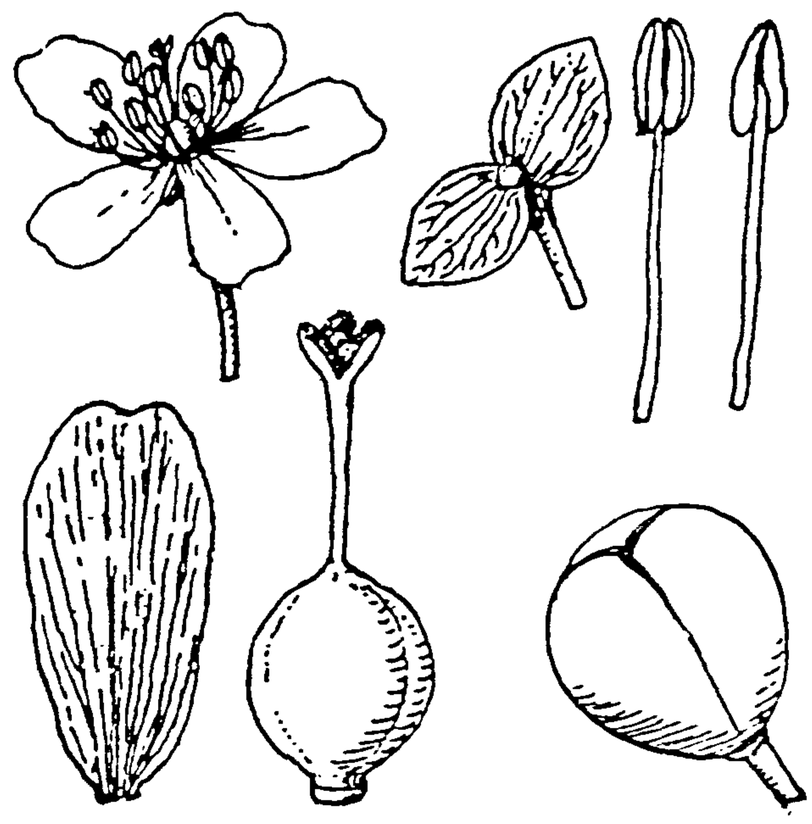
Stamens 20 or fewer: style scarcely, if at all exserted beyond the stamens: corolla less than 2 cm. wide. 1. *T. teretifolium.*
Stamens 40 or more: style much exceeding the stamens: corolla over 2 cm. wide. 2. *T. Mengesii.*

II. LATIFOLIA

Plant simple below the inflorescence or nearly so, leafy to about the middle, the upper part a naked elongate dichotomously compound inflorescence: peduncles terete. 3. *T. paniculatum.*
Plant much-branched, leafy throughout, the branches and branchlets terminating in corymbiform cymes: peduncles 3-angled. 4. *T. triangulare.*

1. **T. teretifolium** Pursh. Plant 1–3 dm. tall, the stems often tufted, sometimes branched, copiously leafy: leaves 2–6 cm. long: peduncles slender-wiry:

bracts appendaged at the base: flowers short-pedicelled: petals rose-purple, 5–6.5 mm. long: stamens mostly 12–20: capsule subglobose, 4–5 mm. in diameter.—(ROCK-PORTULACA.)—Rocks, rocky soil, and sand, various provinces, rarely Coastal Plain, Ga., Fla. (?) to Ala., Tenn. and Pa.—Spr.–fall.—The delicate flowers open only for a few hours during the middle of the day.



2. **T. Mengesii** W. Wolf. Plants similar to those of *T. teretifolium* in habit, but often larger: leaves 3–7 cm. long: petals rose-purple, 10–15 mm. long: stamens 40–100, usually 50–80: capsule 3–4 mm. in diameter.—Cliffs and rocky blanks, Appalachian Plateau and adj. provinces, Ala. and Ga. to Tenn.—Sum.

3. **T. paniculatum** (Jacq.) Gaertn. Plant slightly-woody, 3–15 dm. tall, (with procumbent branches in *T. paniculatum sarmentosum*): leaf-blades spatulate, obovate, or elliptic, 3–11 cm. long: flowers numerous in an elongate thyrsoid panicle: sepals 3–4 mm. long: corollas mostly carmine, sometimes yellowish, 0.8–1 cm. wide: capsule 3–4 dm. in diameter.—Sandy soil and cult. grounds, Fla. to Tex. and Ariz. Nat. of the W. I.—(*Mex., C. A., S. A.*)—All year.

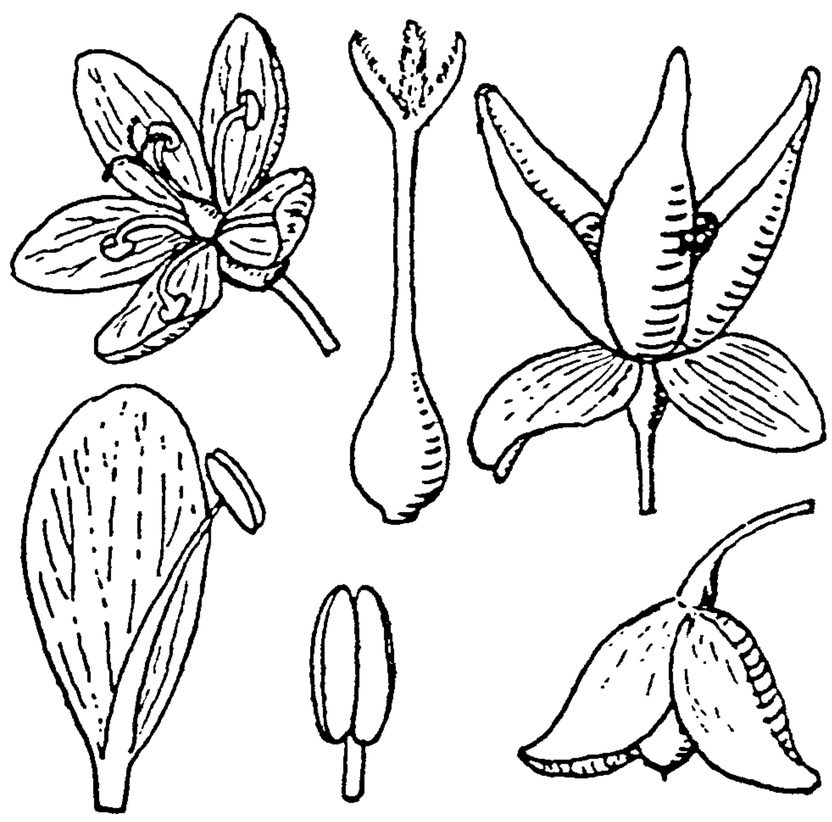
4. **T. triangulare** (Jacq.) Willd. Plant quite woody, 6–15 dm. tall: leaf-blades spatulate to narrowly elliptic, 2–9 cm. long: flowers few in corymbiform cymes: sepals 5–6 mm. long: corolla purple, pink, or yellow, 1.5–2 cm. wide: capsule 5–8 mm. in diameter.—Hammocks, pinelands, and waste places, S pen. Fla. and the Keys. Nat. of the W. I.—(*Mex., C. A., S. A.*)—All year.

2. **CLAYTONIA** L. Perennial or annual fleshy herbs, the weak stems often arising from tuber-like corms. Leaves flat. Flowers spreading or nodding. Sepals 2, persistent. Petals 5. Style elongate. Ovules few.—About 10 species, natives of N. A.—SPRING-BEAUTIES. ROSE-ELFS.

Leaf-blades relatively short and broad: petals abruptly narrowed into claws.
1. *C. caroliniana.*

Leaf-blades long and narrow: petals more gradually narrowed.
Capsule 4–4.5 mm. thick: leaf-blades of a broadly linear type. 2. *C. media.*
Capsule 2–3 mm. thick: leaf-blades of a narrowly linear type. 3. *C. virginica.*

1. **C. caroliniana** Michx. Plants 5–20 cm. tall: leaf-blades ovate to narrowly elliptic, 2–7 cm. long: sepals 6–9 mm. long: petals 10–12 mm. long: seed about 2.5 mm. wide.—(WIDE-LEAF SPRING-BEAUTY.)—Woods, Blue Ridge and more northern provinces, N. C. and Tenn. to Sask. and N. S.; reported from La.—Spr.–sum.



2. **C. media** (DC.) Small. Plants 10–30 cm. tall: leaf-blades broadly linear or tapering to both ends, 7–12 cm. long: sepals becoming 7–9 mm. long: petals 8–11 mm. long: seed about 1.5 mm. wide.—Woods, various provinces N of Coastal Plain, D. C. to Tenn., Kans., and N. S.—Spr.

3. **C. virginica** L. Plants 5–25 cm. tall: leaf-blades narrowly linear, sometimes very narrow, 6–14 cm. long: sepals becoming 4–7

mm. long: petals 9–13 mm. long: seed about 2.5 mm. wide.—Woods, Coastal Plain and adjoining provinces, Ga. to Miss., Tex., Ohio, and Va.—Spr.

3. **PORTULACA** [Tourn.] L. Annual or perennial succulent herbs. Leaves flat or terete. Flowers erect. Sepals 2, deciduous. Petals 4–6. Style short; stigmas 3–8, slender. Ovules many on a basal placenta.—About 20 species, mostly natives of America.—PORTULACAS.

Leaf-blades terete or nearly so: leaf-axils more or less hairy. I. PILOSAE.
Leaf-blades flat: leaf-axils not hairy. II. OLERACEAE.

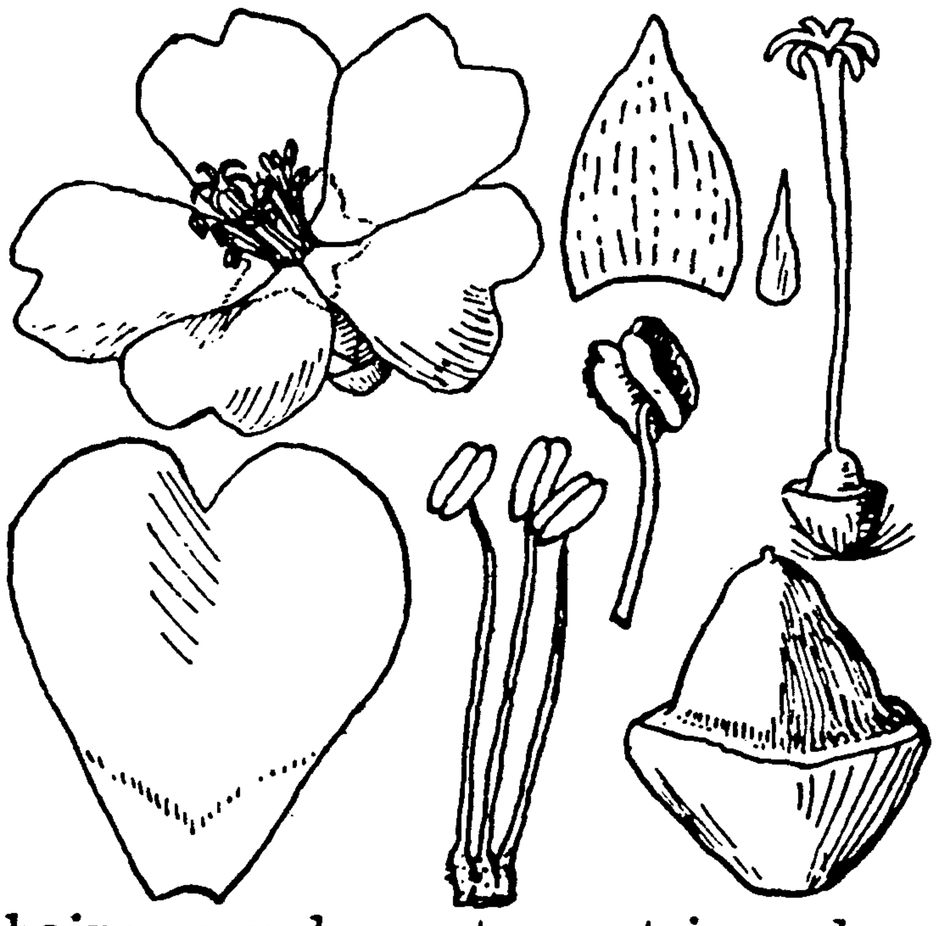
I. PILOSAE

Corolla 4–5 cm. wide: seeds silvery. 1. *P. grandiflora.*
Corolla less than 1.5 cm. wide: seeds black or brown.
  Corolla pink, or purplish, mostly over 1 cm. wide: seeds black.
    Petals obovate: seeds 0.4–0.5 mm. in diameter. 2. *P. pilosa.*
    Petals elliptic to elliptic-ovate: seeds 0.7–0.9 mm. in diameter. 3. *P. Smallii.*
  Corolla yellow or white, less than 1 cm. wide: seeds brown. 4. *P. phaeosperma.*

II. OLERACEAE

Upper leaves with lanceolate or elliptic-lanceolate blades: capsule with a crown like rim around the base of the cap: seeds gray. 5. *P. coronata.*
Upper leaves with cuneate or obovate blades: capsule with a mere line about the base of the cap: seeds black. 6. *P. oleracea.*

1. P. grandiflora Hook. Plant annual, with ascending or diffuse branches, hair-tufted in the leaf-axils: leaves 0.8–2.5 cm. long; blades terete: flowers solitary or 2 or 3 together in an involucre of 0–8 bracts and long hairs: sepals ovate or triangular-ovate, 7–10 mm. long: corolla white, pink, red, salmon, yellow, or orange; petals obovate, 1.5–2.5 cm. long: stamens 40 or more: capsule 4–5 mm. high: seeds somewhat silvery.— (SUN-PLANT.) —Roadsides, fence-rows, cult. grounds, and waste-places, E & W N. A. Nat. of S. A.—Sum.–fall.



2. P. pilosa L. Plants annual or sometimes persistent for more than a year, erect or diffuse, with conspicuously hair-tufted leaf-axils: leaves mostly 1–2 cm. long; blades nearly terete: flowers terminal, in an involucre 6–10 bracts and white or brownish hairs: sepals ovate or triangular-ovate, 2–3 mm. long: petals pink or purplish: stamens 15–32: capsule subglobose, 3–4 mm. broad.—Sandy woods, roadsides, and cult. grounds, Coastal Plain and adj. provinces, Fla. to Tex., and Ga.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall.

3. P. Smallii P. Wilson. Plants with spreading or prostrate branches, with slightly hair-tufted leaf-axils: leaves 1–1.5 cm. long; blades nearly terete: flowers terminal, in an involucre of 10 or more bracts and pale-brown hairs: sepals orbicular-deltoid, about 3 mm. long: petals pink: stamens 8–12: capsule subglobose, 3–3.5 mm. broad.—Sandy soil on granite outcrops, Piedmont, Ga. to N. C.—Spr.–fall.

4. P. phaeosperma Urban. Plants with more or less diffusely branched stems from tuberous roots and rather inconspicuously tufted leaf-axils: leaves 0.5–2 cm. long; blades nearly terete; flowers terminal, in an involucre of 5–8 bracts

and whitish or brownish hairs: sepals suborbicular to ovate-orbicular, 3–4 mm. long: petals yellow: stamens 12–16: capsule subglobose, 3–3.5 mm. broad. [*P. halimoides* A. Gray, not L.]—Sand-dunes, scrub, and shell-mounds, S pen. Fla. and the Keys.—(*W. I., Mex., S. A.*)—All year.

5. P. coronata Small. Plant nearly simple and erect or diffusely branched, the branches usually deep-pink or magenta: leaf-blades mostly 1–1.5 cm. long, the lower ones oblanceolate, the upper elliptic or elliptic-lanceolate, obtuse or acutish: sepals triangular, about 2 mm. long: corolla about 5 mm. wide; petals yellow, ovate to elliptic-ovate, acute: capsule hemispheric to turbinate-hemispheric, about 5 mm. high.—Granite rocks, Little Stone Mt. in the Piedmont of Ga.—Fall.

6. P. oleracea L. Plant prostrate, more or less radially branched, the branches green or dark-spotted: leaf-blades cuneate to obovate, 1–3 cm. long, rounded at the apex: sepals 2.8–4.5 mm. long: corolla mostly 8–20 mm. wide; petals yellow or orange, 3–8 mm. long, notched: capsule circumscissile about the middle, 5–9 mm. high.—(PURSLANE. PUSSLEY. DUCKWEED.)—Hammocks, pinelands, cult. grounds, and waste-places, U. S. and S Can.—(*W. I., Mex., C. A., S. A., O. W.*)—Spr.–fall or all year S.

FAMILY 13. ALSINACEAE — CHICKWEED FAMILY

Herbs, sometimes woody at the base. Leaves opposite: blades entire. Flowers mostly perfect. Calyx of 4 or 5 persistent, distinct sepals. Corolla of 4 or 5 clawless petals, or wanting. Androecium of twice as many stamens as sepals, or fewer. Gynoecium of 2–5 united carpels. Ovary superior. Fruit a capsule subtended by the calyx.—Thirty-two genera and 500 species, most abundant in temperate regions.

Styles distinct.	
Stipules wanting.	Tribe I. SAGINEAE.
Stipules present.	Tribe II. TISSEAE.
Styles partly united.	Tribe III. DRYMERIEAE.

I. SAGINEAE

Styles alternate with the sepals.	1. SAGINA.
Styles opposite the sepals or alternate in *Alsine aquatica*.	
Capsule short, ovoid or ellipsoid, the valves as many as the styles.	
Petals 2-lobed or wanting.	2. ALSINE.
Petals entire or slightly notched.	
Valves of the capsule entire.	3. SABULINA.
Valves of the capsule 2-lobed.	4. ARENARIA.
Capsule long, cylindric, opening by twice as many tooth-like valves as there are styles.	
Petals toothed.	5. HOLOSTEUM.
Petals deeply lobed.	6. CERASTIUM.

II. TISSEAE

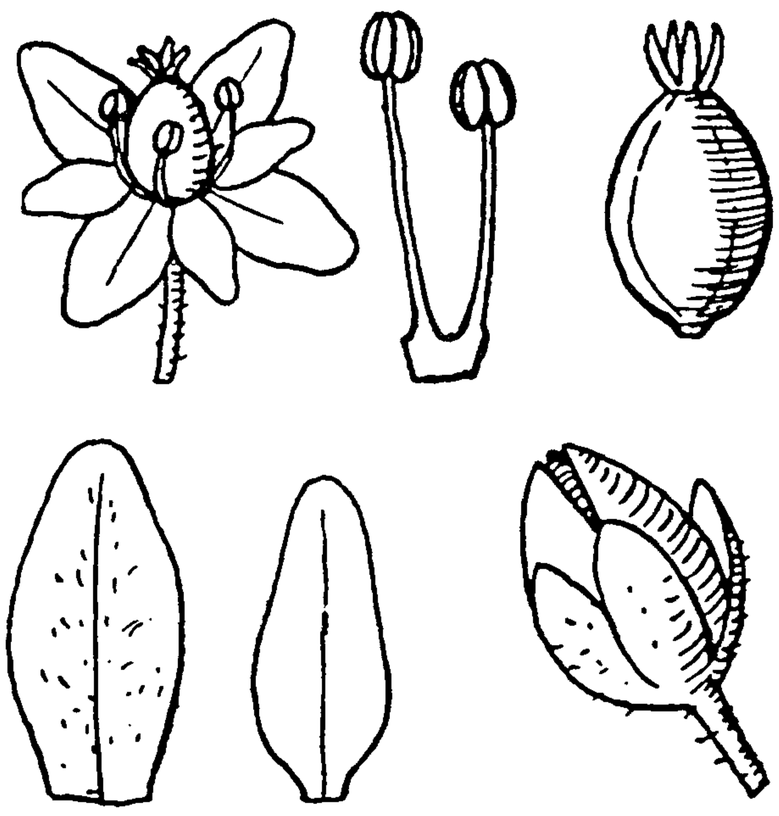
Leaves opposite: styles 3: capsule 3-valved.	7. TISSA.
Leaves whorled: styles 5: capsule 5-valved.	8. SPERGULA.

III. DRYMERIEAE

Petals deeply 2-lobed.	9. DRYMERIA.
Petals entire or merely toothed.	
Sepals keeled.	10. POLYCARPON.
Sepals not keeled.	11. STIPULICIDA.

1. SAGINA L. Annual or perennial diminutive herbs. Leaf-blades subulate to filiform. Flowers axillary. Sepals 4 or 5, persistent. Petals white, 4 or 5, about as long as the sepals, or wanting. Stamens 5, or sometimes 3–10.

Stigmas short. Capsule longer than the sepals.—About 10 species natives of the Northern Hemisphere.



1. S. decumbens (Ell.) T. & G. Plants 2–10 cm. tall, very slender: leaf-blades linear-subulate, 2–8 mm. long: pedicels erect, very slender: sepals ovate or oval, about 1.5 mm. long: petals scarcely as long as the sepals, (or wanting or rudimentary in *S. decumbens Smithii*): capsule oblong-ovoid, about twice as long as the calyx: seed orange-brown, resinous-dotted.—(PEARLWORT.)—Sandy soil, *Smithii*): capsule oblong-ovoid: seed orange-brown, resinous-dotted. — (PEARLWORT.) — Sandy soil, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Mass.—Spr.–sum.

2. ALSINE [Tourn.] L. Annual or perennial weak herbs. Leaf-blades succulent. Flowers cymose or axillary. Sepals 5 or 4, ribless. Petals 5 or 4, 2-cleft or 2-parted, rarely wanting. Stamens 10 or fewer. Stigmas 3–5, slender. Capsule barely exceeding the sepals, with twice as many valves as stigmas. [*Stellaria* L.]—About 75 species, most abundant in temperate and cold regions. —CHICKWEEDS. STARWORTS. STITCHWORTS.—Flowers white or pink.

Styles 5. I. AQUATICAE.
Styles 3, or rarely 4. II. MEDIAE.

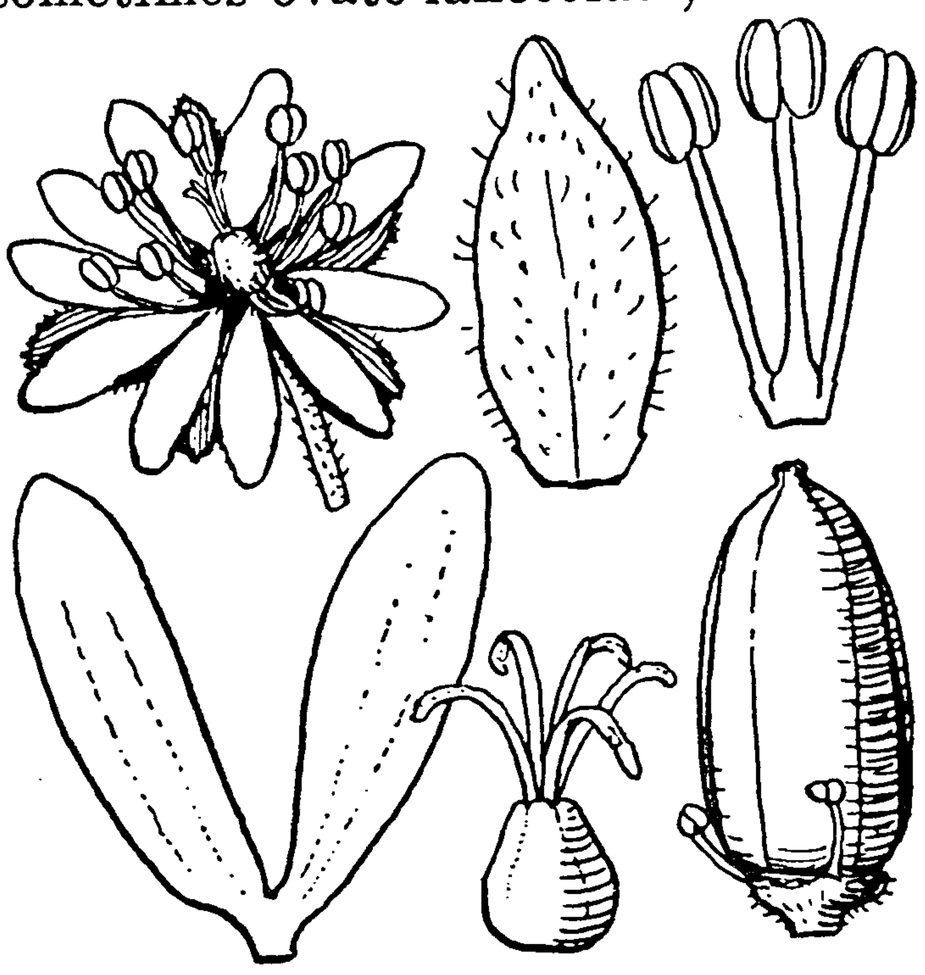
I. AQUATICAE

Perennial herb with broad leaf-blades, the upper ones sessile and cordate: pedicel and calyx glandular. 1. *A. aquatica.*

II. MEDIAE

Corolla present.
  Leaf-blades manifestly petioled.
    Sepals mostly over 3 mm. long: petals shorter 2. *A. media.*
    Sepals mostly less than 3 mm. long: petals longer. 3. *A. Baldwinii.*
  Leaf-blades, at least those of the upper leaves, sessile.
    Seeds smooth. 4. *A. longifolia.*
    Seeds rough.
      Sepals obtuse: petals longer than the sepals. 5. *A. pubera.*
      Sepals acute or acuminate: petals about as long as the sepals. 6. *A. tennesseensis.*
Corolla wanting. 7. *A. fontinalis.*

1. A. aquatica (L.) Britton. Stems 2–6 dm. long, usually villous and glandular above: leaf-blades ovate to elliptic-ovate, or sometimes ovate-lanceolate, 3–6 cm. long: sepals ovate, 4–5 mm. long: petals 1½–2 times as long as the sepals: capsule 5–6 mm. long. [*Stellaria aquatica* Scop.]—(WATER-CHICKWEED.)—Moist woods and waste-places, various provinces, La. to N. C., N. Y., and Ont.; also to B. C. Nat. of Eu. —Spr.–sum.



2. A. media L. Stems 1–3 dm. long, often growing in mats: leaf-blades ovate, 0.5–2 cm. long: sepals oblong-lanceolate, 3–4 mm. long, soft-tipped: petals shorter than the sepals: capsule 4–5 mm. long, longer than the calyx. [*Stellaria media* (L.) Vill.]—(COMMON-CHICKWEED.)—Cult. grounds, woods, and fields, throughout U. S. and Can., except the extreme N and S. Nat. of Eu.—All year.

3. **A. Baldwinii** Small. Stems 1–6 dm. long, often pubescent: leaf-blades ovate, sometimes very broadly so, 0.5–2 cm. long: sepals ovate, 2–3 mm. long: petals about twice as long as the sepals: capsule 3.5–4 mm. long. [*Stellaria prostrata* Bald. not *Alsine prostrata* Forsk.]—Moist soil, Coastal Plain and adj. provinces, Fla. to Tex. and Ga.—(*Mex.*)—Spr.

4. **A. longifolia** (Muhl.) Britton. Stems 1.5–4.5 dm. long, glabrous or nearly so: leaf-blades narrowly linear-lanceolate, 1.5–7 cm. long: sepals lanceolate, about 3 mm. long, acute, firm-tipped: petals as long as the sepals or somewhat longer: capsule 5–6 mm. long, longer than the calyx. [*Stellaria longifolia* Muhl.]—(STITCHWORT.)—Wet places and swamps, various provinces, La. to Colo., Alas., Md., and Newf.—Spr.

5. **A. pubera** (Michx.) Britton. Stems 1–3 dm. tall, finely pubescent: leaf-blades ovate, or elliptic, 14 cm. long, or those on the sterile branches 5–10 cm. long: sepals ovate to broadly oblong-lanceolate, 5–7 mm. long: petals longer than the sepals: capsule 3–4 mm. long, shorter than the calyx. [*Stellaria pubera* Michx.]—(GREAT-CHICKWEED. STAR-CHICKWEED.)—Rich mould on hillsides, various provinces, rarely Coastal Plain, N Fla. to Ala., Ind., and N. J.—Spr.

6. **A. tennesseensis** (C. Mohr) Small. Similar to *A. pubera* in habit: leaf-blades oval to suborbicular on the lower part of the stem, to elliptic or elliptic-lanceolate above, 3–5 cm. long, or longer on the sterile shoots: sepals narrowly lanceolate, 9–11 mm. long: capsule 4–5 mm. long.—Woods, Interior Low Plateau, Ala., Tenn., and Ky.—Spr.

7. **A. fontinalis** (Short & Peter) Britton. Stems 1–3 dm. long, glabrous: leaf-blades linear-spatulate, 0.5–2 cm. long, obtusish: sepals lanceolate to oblong-lanceolate, 2.5–3 mm. long: petals wanting: capsule surpassing the sepals. [*Stellaria fontinalis* Robinson]—River banks, Interior Low Plateau, Tenn. and Ky.—Spr.

3. **SABULINA** Reichenb. Annual or perennial herbs. Leaf-blades subulate or sometimes flat, but narrow. Flowers in cymes. Sepals 5, often fleshy. Petals 5, entire or emarginate. Stamens usually 10. Stigmas typically 3, slender. Capsule with as many valves as stigmas. [*Alsinopsis* (Fl. SE. U. S.)]—SANDWORTS. WITCHLINGS.—The flowers are white or pinkish.

Leaves herbaceous or fleshy. I. BREVIFOLIAE.
Leaves leathery, rigid, subulate or bristle-like. II. STRICTAE.

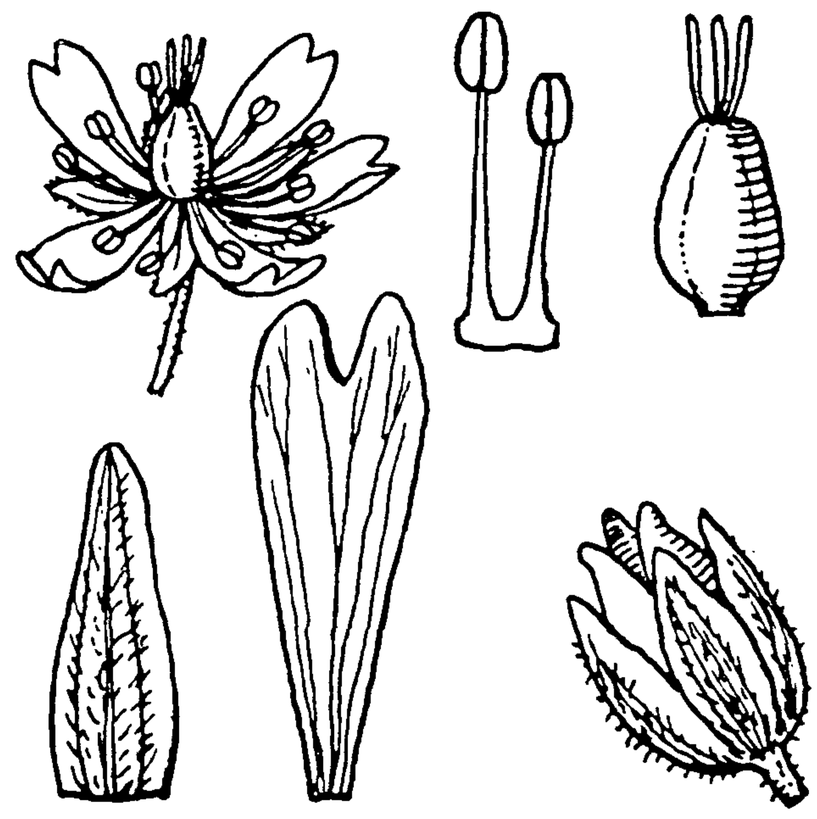
I. BREVIFOLIAE

Sepals not ribbed, scarcely nerved.
  Mature sepals 4–5 mm. long.
    Leaf-blades linear or linear-oblong. 1. *S. uniflora.*
    Leaf-blades filiform to subulate. 2. *S. groenlandica.*
  Mature sepals 2–3 mm. long.
    Basal and lower stem-leaves mostly less than 1 cm. long: upper stem-leaves and bracts minute or subulate. 3. *S. brevifolia.*
    Basal and lower stem-leaves mostly over 1 cm. long: upper stem-leaves and bracts linear. 4. *S. glabra.*
Sepals strongly 3–5-ribbed. 5. *S. patula.*

II. STRICTAE

Leaves clustered in the axils. 6. *S. stricta.*
Leaves densely imbricated. 7. *S. caroliniana.*

1. **S. uniflora** (Walt.) Small. Stems 1–3 dm. tall: leaf-blades linear, 1–4 cm. long, acute: pedicels 2–8 cm. long: sepals lanceolate, 4–5 mm. long, acute:



petals linear-cuneate, 6–8 mm. long: seed 0.5 mm. long, minutely roughened. [*Stellaria uniflora* Walt.]—Meadows or springy places, Coastal Plain and adj. provinces, Fla. to Ala. and N. C.—Spr.

2. **S. groenlandica** (Retz.) Small. Stems 0.3–2 dm. tall: leaf-blades filiform to subulate, 3–15 mm. long: sepals elliptic to elliptic-lanceolate, 3.5–4 mm. long, obtuse: petals obovate to cuneate, 6–8 mm. long: capsule 5–6 mm. long. [*Alsine groenlandica* (Retz.) A. Gray]—(MOUNTAIN-SANDWORT.)—Rocky soil, Blue Ridge and more northern provinces, N. C. and Tenn., to N. Y., Conn., Lab., and Greenl.—Spr.–sum.

3. **S. brevifolia** (Nutt.) Small. Stems 0.2–1.2 dm. tall: leaf-blades linear-spatulate to subulate, 2–6 mm. long: sepals ovate-lanceolate to elliptic-lanceolate, 2–3 mm. long, truncate or emarginate: petals spatulate or obovate: spatulate, 4–5 mm. long: capsule about 4 mm. long. [*Alsine brevifolia* Chapm.]—Flat granite rocks, and Altamaha grit, inner Coastal Plain and Piedmont, Ga. and Ala. to N. C.—Spr.

4. **S. glabra** (Michx.) Small. Stems 0.5–3 dm. tall: leaf-blades narrowly linear to nearly filiform, 1–2.5 cm. long: sepals elliptic to elliptic-ovate, 2.5–3 mm. long, obtuse: petals spatulate, 4–6 mm. long: capsule about 3 mm. long. [*Alsine glabra* A. Gray]—Cliffs, Blue Ridge and Appalachian Plateau, N. C. and Tenn.—Sum.

5. **S. patula** (Michx.) Small. Stems 0.4–3 dm. tall: leaf-blades linear or filiform, 1–4 cm. long: sepals lanceolate, 3–5 mm. long, acute or acuminate, prominently 3–5-ribbed: petals spatulate, 8–11 mm. long: capsule about as long as the sepals. [*Alsine patula* A. Gray]—Rocky woods, limestone outcrops, and prairies, various provinces N of Coastal Plain, Ala. to Tex., Minn., and Ky. —Spr.–sum.

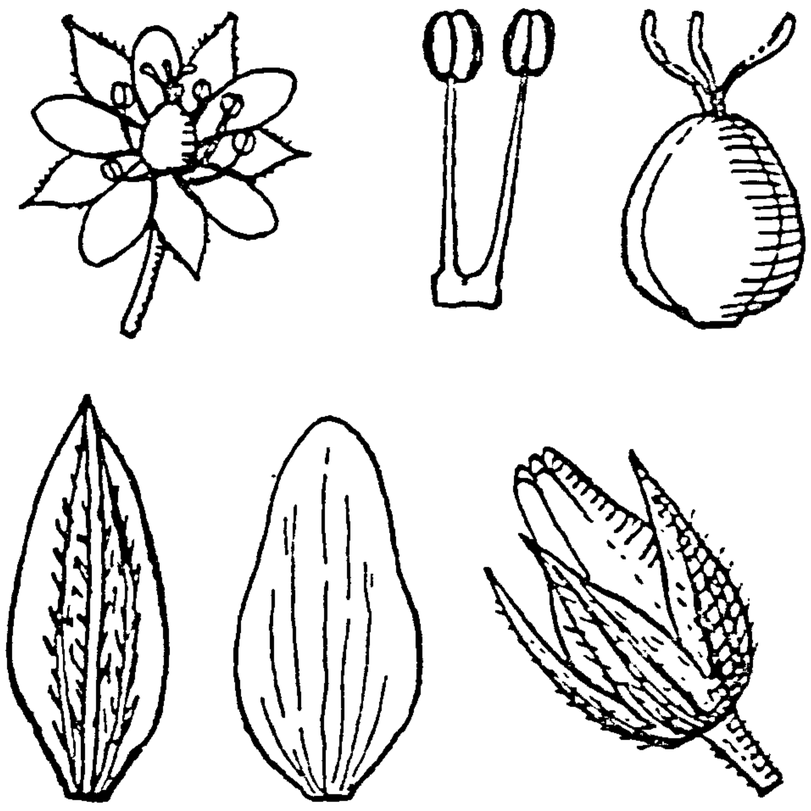
6. **S. stricta** (Michx.) Small. Stems 1–3 dm. tall: leaf-blades linear-subulate, 5–10 mm. long: sepals ovate, about 2.5 mm. long: petals about thrice as long as the sepals: capsule nearly twice as long as the sepals. [*Alsine Michauxii* Fenzl]—(ROCK-SANDWORT.)—Rocky hillsides and cliffs, often calcareous, various provinces N of Coastal Plain, S. C. to Minn., and N. H.—Sum.

7. **S. caroliniana** (Walt.) Small. Stems 0.5–3 dm. tall: leaf-blades linear-subulate, 5–10 mm. long: sepals ovate, about 2.5 mm. long: petals about thrice as long as the sepals: capsule nearly twice as long as the sepals. [*Alsine squarrosa* Fenzl]—(LONGROOT.)—Sand-hills and pinelands, often in acid soil, Coastal Plain, W Fla. to N. Y.—Spr.–sum.

4. **ARENARIA** L. Annual or perennial herbs. Leaf-blades flat, broad or sometimes narrow. Flowers axillary or cymose. Sepals 5, firm, often ribbed. Petals 5, entire or notched, or wanting. Stamens typically 10. Stigmas 3, or rarely 2–5. Capsules with twice as many valves as stigmas.—SANDWORTS. SANDYWINKS.

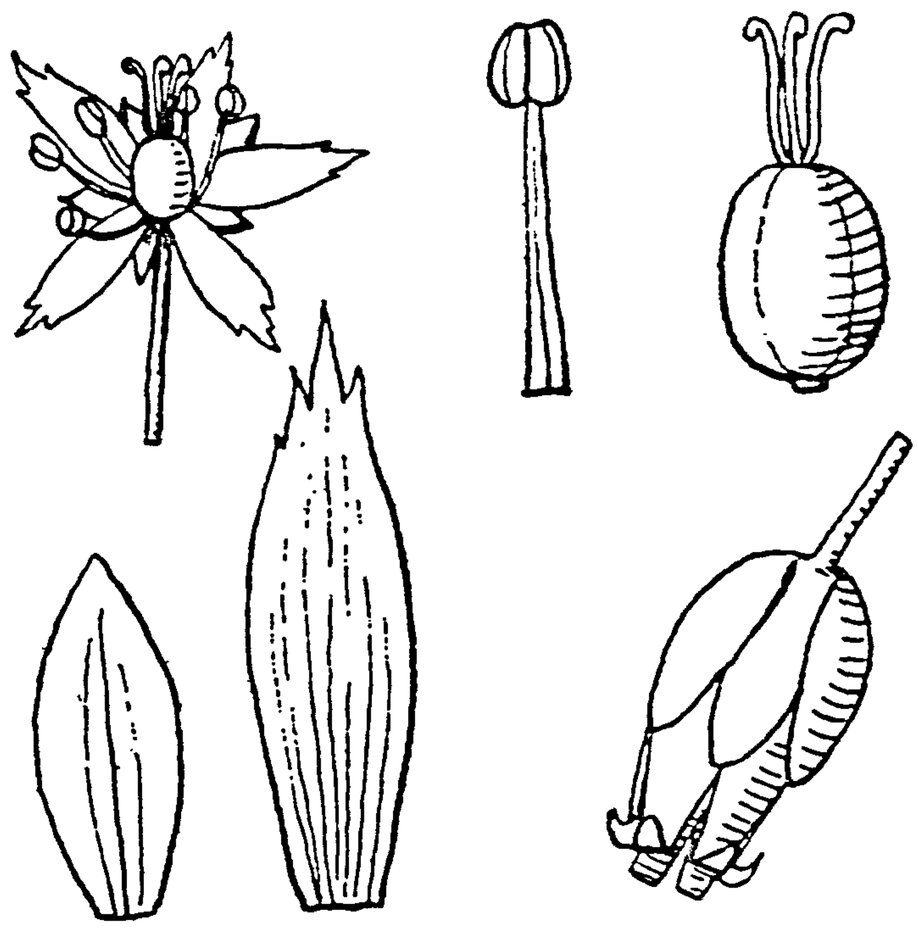
Plant annual: leaf-blades several-ribbed: outer sepals lanceolate, hispidulous.	1. *A. serpyllifolia.*
Plant perennial: leaf-blades not ribbed: outer sepals ovate, glabrous or nearly so.	2. *A. lanuginosa.*

1. A. serpyllifolia L. Plant 1–4 dm. tall, erect, sometimes in much-branched tufts: leaf-blades ovate, elliptic, or oval, 2–8 mm. long, ciliolate, hispidulous: outer sepals lanceolate, 2–2.5 mm. long, becoming strongly ribbed: petals white, shorter than the sepals: capsule with a turgid base and a constricted tip, about 2.5 mm. long. —(THYME-LEAVED SANDWORT.)—Dry soil, woods, fields, roadsides and waste-places, widely distributed in the U. S. and S Can. Nat. of Eurasia.—Spr.—A related species, *A. leptoclados* Guss. with smaller and narrower leaves and bracts on more slender branches, and narrower capsules is to be expected in N. C.; it has been found in S Va.



2. A. lanuginosa (Michx.) Rohrb. Plant with diffusely prostrate branches, mostly 1–6 dm. long: leaf-blades spatulate to elliptic, 1–2.5 cm. long, eciliate, often obscurely fine-pubescent: outer sepals ovate, 2.5–3.5 mm. long, not ribbed: petals white, much shorter than the sepals: capsule ovoid, about 3.5 mm. long.—Woods, shaded banks, swamps, and hammocks, Coastal Plain and adj. provinces, Fla. to Tex. and N. C.—(*W. I.*)—Spr.–fall.

5. HOLOSTEUM [Dill.] L. Annual tender herbs. Leaf-blades flat. Flowers in umbel-like cymes. Sepals 5, persistent. Petals 5, emarginate or toothed. Stamens 5, or 3. Stigmas slender. Capsule narrow, partly enclosed in the calyx. —Three species, natives of Europe and temperate Asia.



1. H. umbellatum L. Plants 8–40 cm. tall: leaf-blades elliptic or oblanceolate below, to elliptic or lanceolate above, 1–3 cm. long: sepals lanceolate, 4–5 mm. long: petals 5.5–6.5 mm. long, toothed: capsule 5–6 mm. long.—(JAGGED-CHICKWEED.)—Cult. grounds, roadsides, and waste-places, Coastal Plain, Ga. to Pa. and N. J. Nat. of Eu.—Spr.—This chickweed is one of the very early spring plants. The pale-green or glaucous foliage is usually strongly contrasted with that of the usually darker-green plants of the fields and roadsides where this plant thrives. The flowers are white or pinkish.

6. CERASTIUM L. Annual or perennial herbs. Leaf-blades herbaceous. Flowers cymose. Sepals 5, or 4, ribless. Petals 5, or 4, notched or 2-cleft, or rarely wanting. Stamens 10 or fewer. Stigmas 5 or 4, stout. Capsule much exceeding the calyx.—About 50 species, natives mostly of temperate regions.—Spr.–early sum.—MOUSE-EAR CHICKWEEDS. CERASTIUMS.—The various species of *Cerastium* exhibit great contrasts in flowers. The white or pinkish, or rarely greenish, corollas of some species form conspicuous patches when the plants are in flower, while in other species the petals are so small that they are scarcely visible.

Corolla shorter than the calyx or slightly longer, the petals inconspicuous. I. VULGATA.

Corolla twice as long as the calyx or nearly so, the petals conspicuous. II. ARVENSIA.

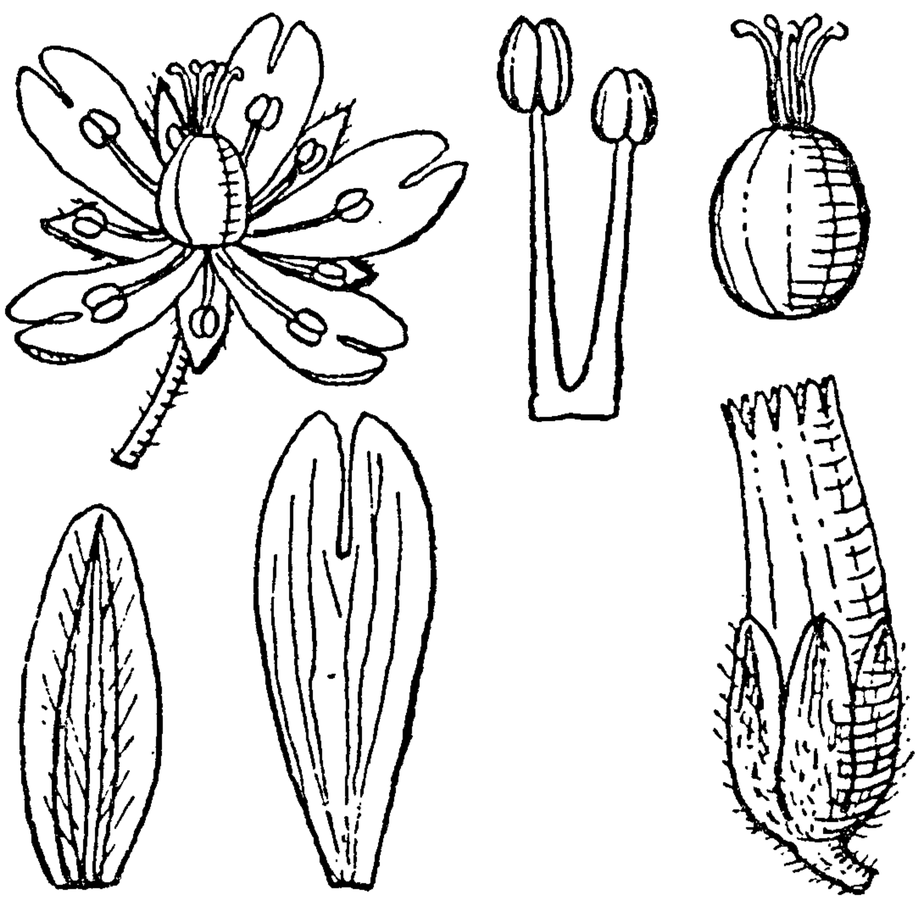
I. VULGATA

Bracts scarious or scarious-margined.
  Plants annual: capsule nearly straight, less than 8 mm. long. 1. *C. semidecandrum.*
  Plant perennial: capsule curved upward, over 8 mm. long. 2. *C. vulgatum.*
Bracts herbaceous.
  Capsule about twice as long as the calyx or less. 3. *C. viscosum.*
  Capsule fully twice as long as the calyx.
    Pedicel 3 times as long as the fruiting calyx or less, straight or nearly so: cymes more or less glomerate. 4. *C. brachypodum.*
    Pedicel about 5 times as long as the fruiting calyx, bent: cymes open. 5. *C. longipedunculatum.*

II. ARVENSIA

Capsule less than twice as long as the calyx: blades of the cauline leaves linear to linear-lanceolate. 6. *C. arvense.*
Capsule over twice the length of the calyx: blades of the cauline leaves narrowly lanceolate to elliptic. 7. *C. velutinum.*

1. C. vulgatum L. Plants 8–50 cm. tall, pubescent and somewhat clammy: blades of the upper leaves elliptic, narrowly elliptic, or ovate, 5–35 mm. long: sepals lanceolate, 5–6 mm. long, obtuse: petals narrowly obovate: capsule 9–11 mm. long. — (MOUSE-EAR.) — Roadsides, pastures, and fields, U. S. generally and S. Can. Nat. of Eu.—Sum.



2. C. semidecandrum L. Plants 5–15 cm. tall, viscid-villous; blades of the upper leaves obovate or elliptic, 5–10 mm. long: sepals lanceolate, 3–3.5 mm. long, acuminate: petals elliptic, about as long as the sepals: capsule 5–7 mm. long.—Dry pastures, fields, and waste-places, Coastal Plain and adj. provinces, N. C. to Mass. Nat. of Eu.—Sum.

3. C. viscosum L. Plants 8–40 cm. tall, viscid-villous: blades of the upper leaves oval or obovate, 8–25 mm. long: sepals oblong-lanceolate, 4–5 mm. long, acute: petals elliptic-oblong, shorter than the sepals or slightly longer: capsule 7–9 mm. long.—Hillsides, meadows, and moist soil, various provinces, Fla. to Tex., Ont., and N. B.; also Pacif. States.—Spr.

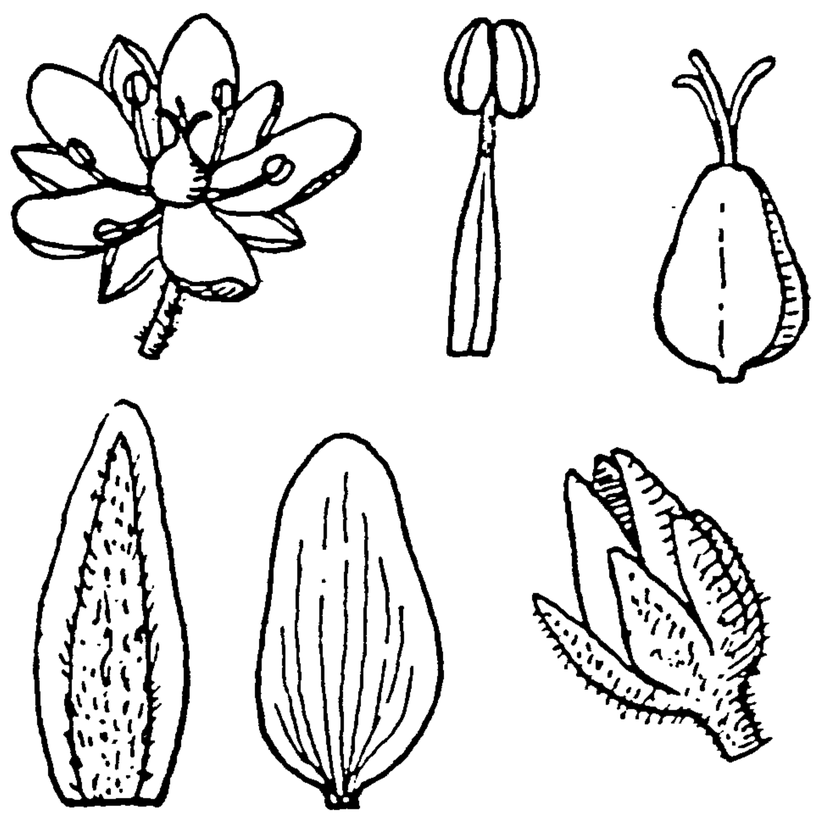
4. C. brachypodum (Engelm.) Robinson. Plants 5–15 cm. tall, viscid-pubescent: blades of the upper leaves oblanceolate, elliptic or linear-elliptic, 8–30 mm. long: cymes somewhat open (or congested and with very slender capsules in *C. brachypodum compactus*): sepals lanceolate, 3–4 mm. long, acute or acuminate: petals spatulate or elliptic-spatulate, fully as long as the sepals or shorter: capsule 5–8 mm. long.—Dry soil, various provinces, Ga. to Tex., Ariz., S. D., and Ill.—(*Mex.*)—Spr.–sum.

5. C. longipedunculatum Muhl. Plants 8–50 cm. tall, clammy-villous: blades of the upper leaves elliptic, linear-elliptic, or lanceolate, 9–60 mm. long: sepals elliptic or elliptic-lanceolate, 4–5 mm. long, acute: petals elliptic or linear-elliptic, somewhat longer than the sepals, or wanting: capsule 9–13 mm. long. [*C. nutans* Raf.]—Rich soil, moist thickets, and woods, various provinces, Fla. to Tex., Calif., B. C., and N. S.—(*Mex.*)—Spr.

6. C. arvense L. Plants 9–40 cm. tall, soft-pubescent: blades of the upper leaves linear-lanceolate to linear, 25–30 mm. long: sepals elliptic-lanceolate, 4–5 mm. long, acutish: petals cuneate, scarcely twice as long as the sepals: capsule 8–10 mm. long, less than twice the length of the mature calyx.—(STARRY-CERASTIUM.)—Hillsides, dry stony places, and cliffs, various provinces, in Coastal Plain only N, Ga. to Ind., Alas., Ont., and Lab.—Spr.

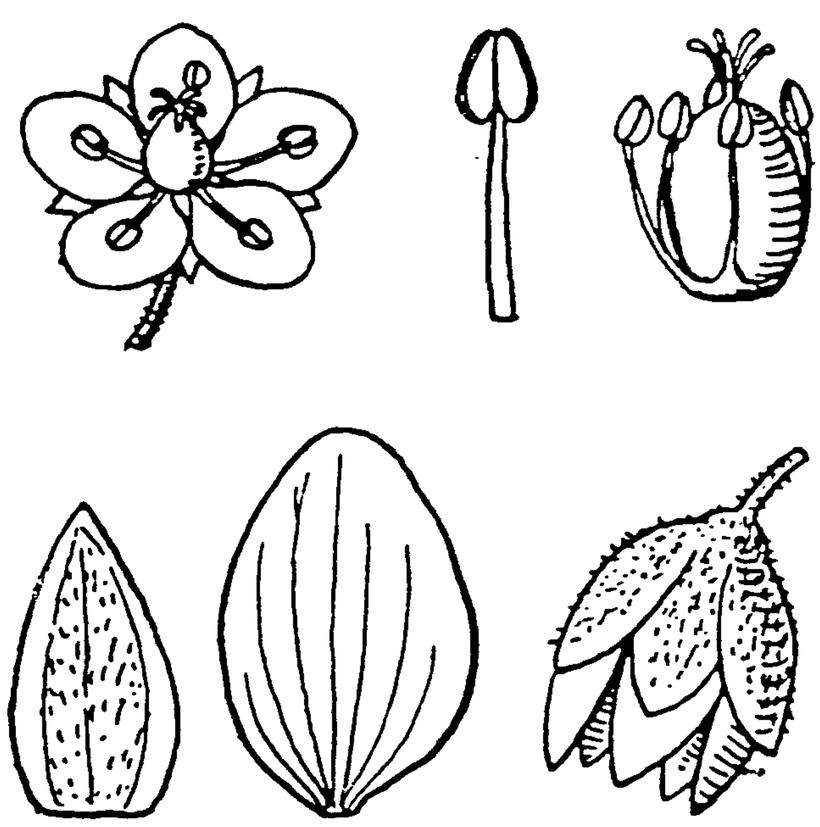
7. C. velutinum Raf. Plants 15–40 cm. tall, copiously soft-pubescent, or becoming glabrous in age: blades of the upper leaves mostly narrowly lanceolate to elliptic, 2.5–4 cm. long, flat: sepals elliptic to ovate-elliptic, 4.5–5.5 mm. long, obtuse: petals broadly cuneate, about twice as long as the sepals: capsule 12–14 mm. long, fully twice as long as the mature calyx.—Rocks or in stony soil, various provinces, N of Coastal Plain, Tenn. to Ark. (?), Minn., N. Y., and Md.—Spr.–sum.

7. TISSA Adans. Annual, biennial, or perennial, diffuse herbs. Leaf-blades narrow. Flowers in raceme-like cymes. Sepals 5, persistent. Petals 5, or fewer, entire, or wanting. Stamens 2–10. Stigmas slender.—About 20 species, widely distributed, but most abundant in saline regions.



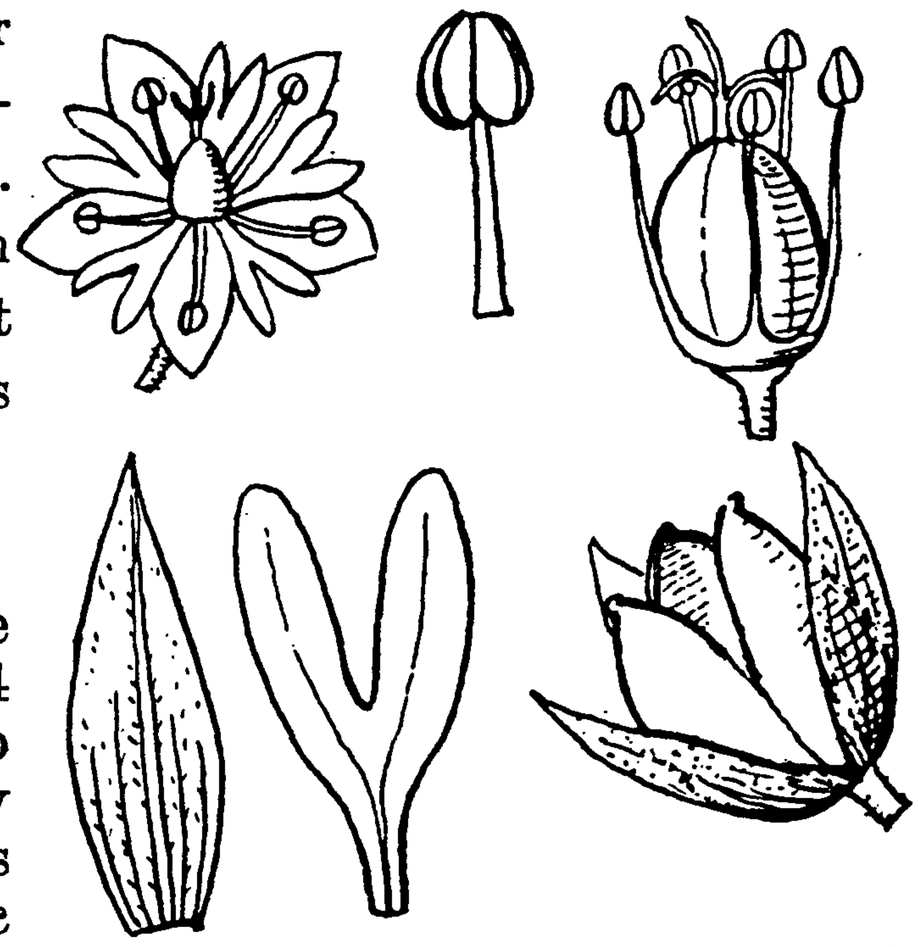
1. T. marina (L.) Britton. Plants 10–20 cm. tall: leaf-blades linear, 10–30 mm. long: sepals ovate to elliptic-ovate, 4–6 mm. long: petals about as long as the sepals: capsule somewhat longer than the sepals. [*Spergularia salina* Presl]—(SAND-SPURREY. PINK MARSH-SPURREY.)—Beach sands and gravel, and saline places, Coastal Plain, Fla. to Tex., and N. B.; also around salt springs in C U. S., and on the Pacific Coast.—Spr.–fall. —The petals are pale-pink or whitish.—Another species, *T. rubra* (L.) J. & C. Presl, native of Europe, with broad and short stipules and purplish-red or pink-red corollas, has been found in Va. and La. and should be looked for in our range.

8. SPERGULA L. Annual herbs. Leaves numerous: blades thick, narrow. Flowers cymose. Sepals 5, persistent. Petals 5, larger than the sepals. Stamens 10 or rarely 5. Stigmas very short. Capsule longer than the calyx.—Three species, natives of the Old World.



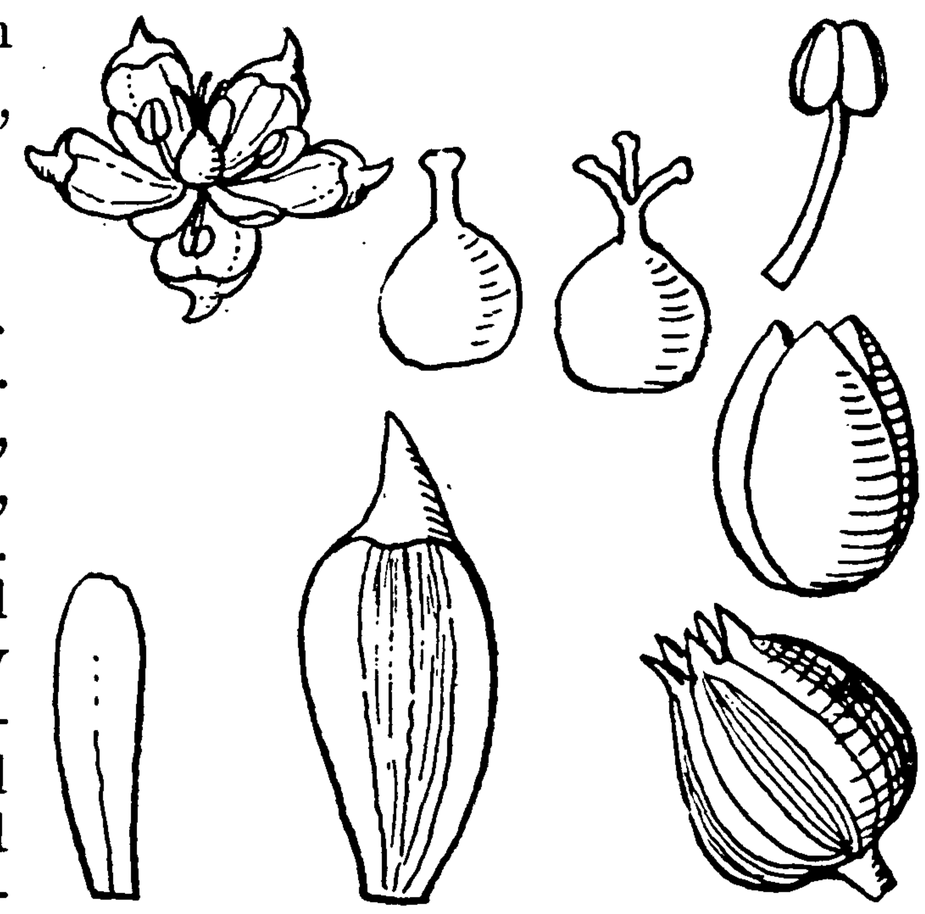
1. S. arvensis L. Plants diffuse, 8–45 cm. tall: leaf-blades linear-filiform, 10–35 mm. long: sepals elliptic to elliptic-ovate, 3.5–5 mm. long: petals about as long as the sepals: capsule globular or globose-ovoid, 6–7 mm. long.—(SPURRY. CORN SPURRY.)—Fields, cult. grounds, and waste-places, N. A. generally, except extreme N. Nat. of Eu. —Sum.—The other Old World species resemble *S. arvensis* in habit. They are to be expected in waste-places and cultivated grounds. In addition to minor foliage characters, they differ from *S. arvensis* in their winged seeds. The seeds of the latter species are margined. The petals of all the species are white or pinkish.

9. **DRYMARIA** Willd. Annual or perennial diffuse herbs. Leaves opposite, with small, often deciduous, stipules: blades broad. Flowers cymose, inconspicuous. Sepals 5, herbaceous or scarious-margined. Petals 5 or fewer, usually shorter than the sepals, deeply 2-lobed. Stamens 5 or fewer. Capsule shorter than the calyx, 3-valved.—About 30 species most abundant in tropical regions.—The petals are mostly white.



1. **D. cordata** (L.) Willd. Annual, the branches diffuse or prostrate, mostly 1–4 dm. long: leaf-blades orbicular-ovate to reniform, mostly 5–20 mm. long, usually abruptly pointed, slender-petioled: cymes slender-peduncled: sepals narrowly elliptic or nearly so, becoming 4–4.5 mm. long, acute or slightly acuminate: petals 2–2.5 mm. long, the lobes spatulate or nearly linear: capsule oval or oval-ovoid, 3–3.5 mm. long.—Roadsides, gardens, fields, and banks, pen. Fla.—Nat. of trop. Am.—All year.—(*W. I., Mex., C. A., S. A.*)

10. **POLYCARPON** L. Annual herbs. Leaves opposite or in 4's: blades flat. Flowers cymose. Sepals 5, keeled. Petals 5, shorter than the sepals. Stamens 3–5. Stigmas short. Capsule often shorter than the calyx.—Six or eight species, widely distributed.



1. **P. tetraphyllum** L. f. Plants 2–12 cm. tall: leaf-blades spatulate to oval, 5–15 mm. long: sepals 1.5–2 mm. long at maturity, the keel erose above: petals inconspicuous, emarginate: capsule shorter than the sepals. —Waste-places and woods, Coastal Plain and Piedmont, Ala. to S. C.; also Calif. Widely distributed.—Spr.–fall.—Nearly all the species of *Polycarpon* are natives of the Old World. They have been widely scattered through the agency of ballast and cultivation. The flowers of this species have partly united and wholly united styles. The petals are white.

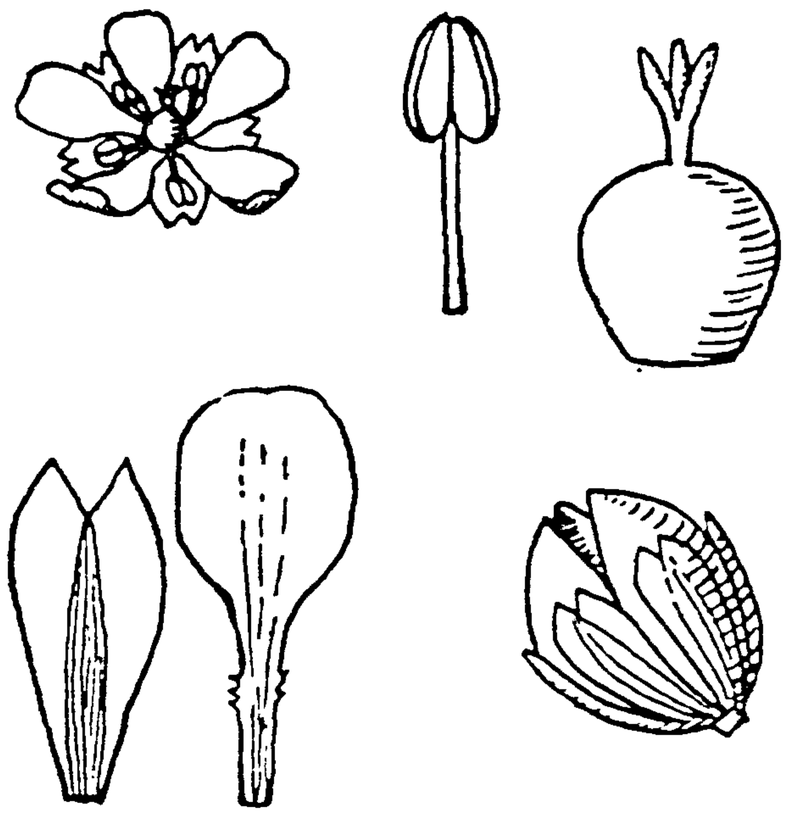
11. **STIPULICIDA** Michx. Perennial glabrous herbs. Leaf-blades dilated at the base of the plant, scale-like above. Flowers in terminal capitate clusters. Sepals 5, notched or emarginate. Petals 5, often toothed near the base. Stamens 3–5. Style short. Capsule longer than the sepals.—Only the following species known.—Spr.–fall.

Stem or branches wire-like: flowers 3–6 in a cluster: petals spatulate. 1. *S. setacea.*
Stems or branches filiform: flowers solitary or 2–3 in a cluster: petals constricted at the middle. 2. *S. filiformis.*

1. **S. setacea** Michx. Plants 5–22 cm. tall: leaf-blades spatulate to obovate or suborbicular, 8–15 mm. long or longer: sepals elliptic to cuneate, 1.5–2 mm.

long, narrowly hyaline-margined: capsule over 1 mm. long.—Pinelands and sandhills, Coastal Plain, Fla. to Miss. and N. C.

2. **S. filiformis** Nash. Plants 6–20 cm. tall: leaf-blades suborbicular, about 4 mm. long: sepals obovate, 1.5–3 mm. long, broadly hyaline-margined: capsule scarcely 1 mm. long.—Pinelands, and scrub, Coastal Plain, Fla. to Miss.—The plants start with a dense rosette of small leaves. They grow best in the apparently sterile white sand. Plants vary from those with a single stem to those with a hundred or more stems thus formed into dense dome-like clusters.



Family 14. **CARYOPHYLLACEAE** — Pink Family

Herbs with stems usually swollen at the nodes. Leaves opposite: blades often with connate bases. Flowers perfect, polygamous, or rarely dioecious. Calyx of 4 or 5 partially united sepals. Corolla of 4 or 5 distinct petals, the claws in the calyx-tube, the blades often appendaged at the base. Androecium of usually 8 or 10 distinct stamens. Gynoecium of 2–5 united carpels. Ovary often stalked. Fruit a capsule opening by apical valves.—Twenty genera and 600 species, widely distributed.

Calyx-tube with 5 ribs, nerved or nerveless: styles 2.	Tribe I. Diantheae.
Calyx-tube with 10 or more ribs: styles 3 or more.	Tribe II. Lychnideae.

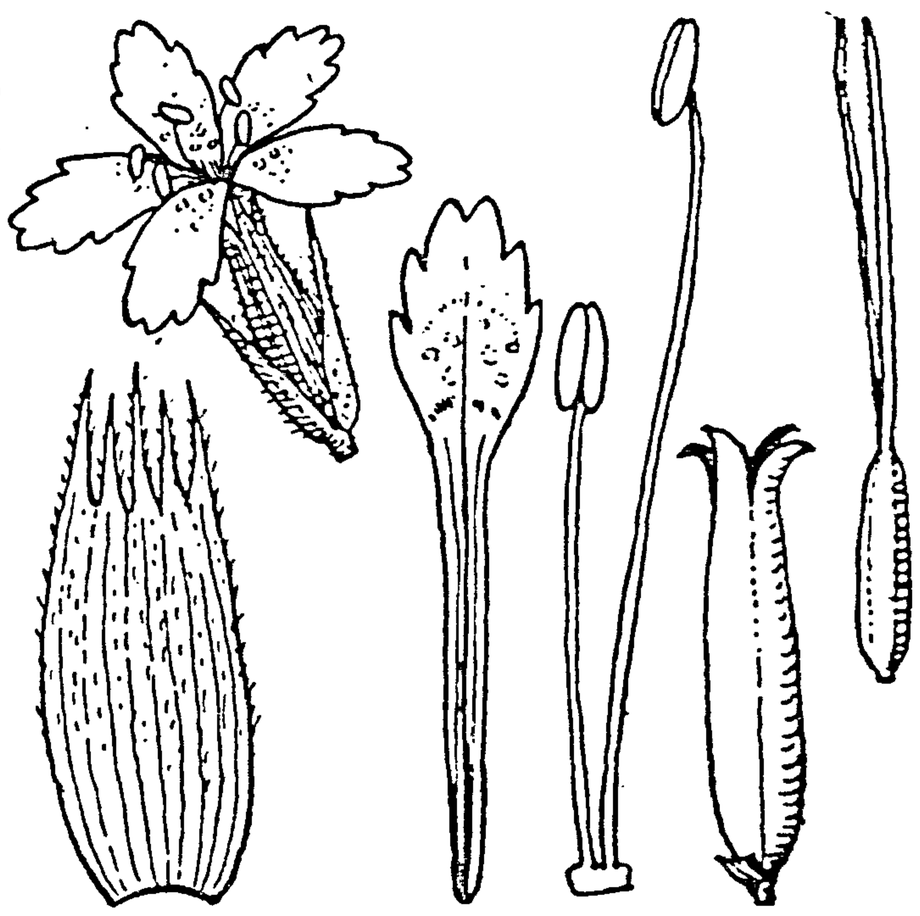
I. Diantheae

Petals unappendaged.	
Calyx terete or nearly so, subtended by bractlets.	1. Dianthus.
Calyx angled, or wing-angled in fruit, not bracteolate.	2. Vaccaria.
Petals appendaged at the blade-base: calyx without bractlets.	3. Saponaria.

II. Lychnideae

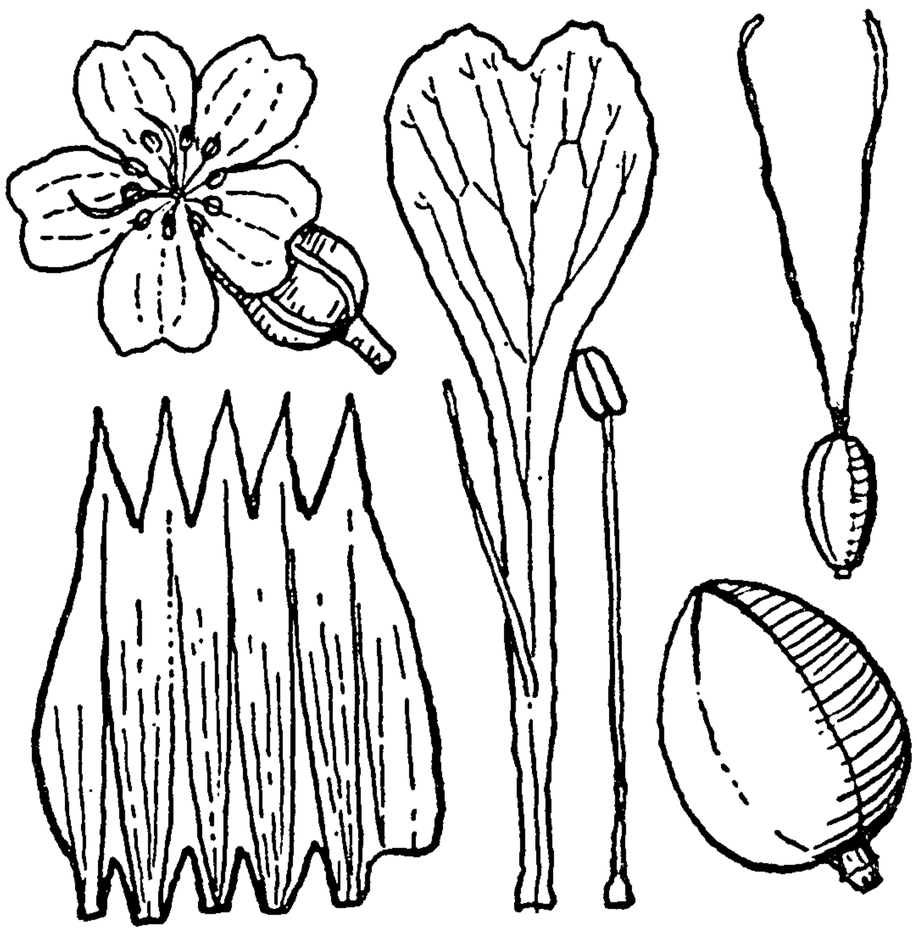
Styles 3, or rarely 4.	4. Silene.
Styles 5.	
Calyx-lobes relatively small, short: petal-blades appendaged.	5. Lychnis.
Calyx-lobes foliaceous, elongate: petal-blades unappendaged.	6. Agrostemma.

1. **DIANTHUS** L. Perennial or rarely annual herbs. Leaf-blades usually narrow. Flowers perfect, sessile. Calyx narrow: tube equally striate. Petals 5: blades narrow. Ovary elongate. Capsule narrow, sessile.—About 200 species, natives of the Old World, except one extending into Arctic America.—Pink. Carnation.—Many species are represented among the pinks of the gardens.



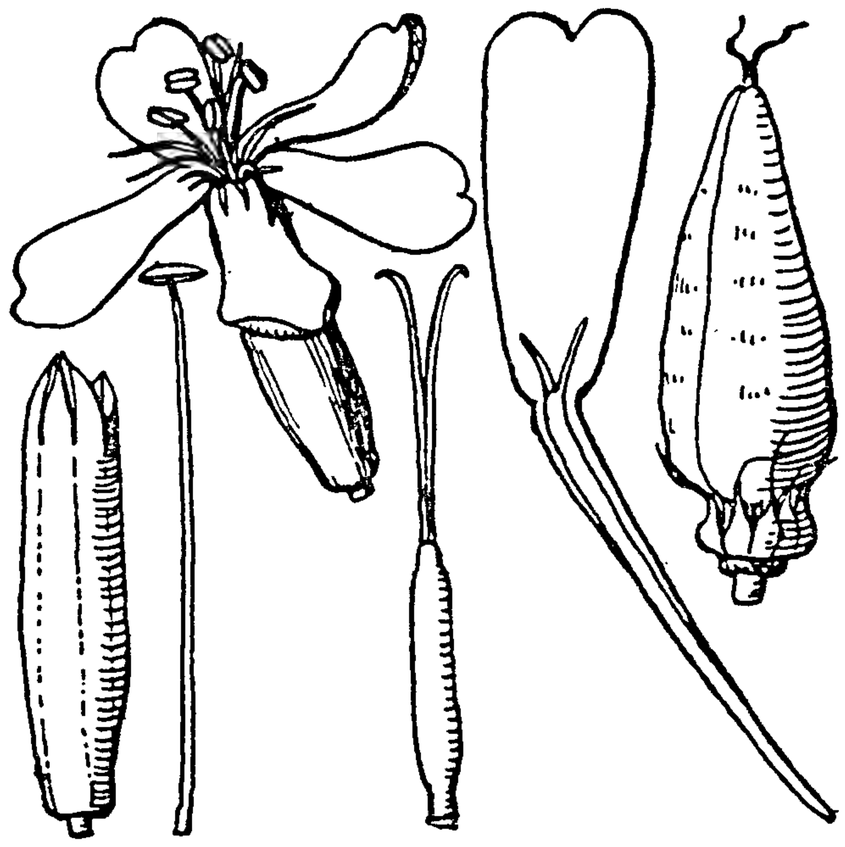
1. **D. Armeria** L. Stem 2–8 dm. tall, minutely pubescent: blades of the cauline leaves linear, 3–8 cm. long: calyx pubescent, 19–22 mm. long; lobes lanceolate, acuminate: petal-blades elliptic to cuneate, 5–6.5 mm. long, mainly pink, toothed: capsule 13–15 mm. long.—(Deptford-pink.) — Roadsides, fields, and woods, various provinces, Ga. to Ia., Mich., and Me. Nat. of Eu.—Sum.

2. **VACCARIA** Medic. Annual herbs. Leaf-blades relatively wide. Flowers pedicelled. Calyx inflated: tube angled or winged. Petals 5: blades broad. Capsule slightly longer than thick.—Three species, natives of Eu. and Asia.



1. **V. Vaccaria** (L.) Britton. Stems 2–9 dm. tall, glaucous: blades of the upper cauline leaves lanceolate to ovate-lanceolate, 3–11 cm. long: calyx 10–15 mm. long, ovoid at maturity; lobes acute: petal-blades obovate, rose-colored: capsule 5–10 mm. long.—(COW-HERB. DAIRY-PINK.) —Fields and waste-places, various provinces, Fla. to Tex., B. C., Ont., and Me. Nat. of Eu.—Sum.—This species is said to have come originally from continental Europe. The plants are showy when in flower. They were for a long time an esteemed garden annual. It is said to be a favorite food of cattle.

3. **SAPONARIA** L. Annual or perennial herbs. Leaf-blades often broad. Flowers pedicelled. Calyx narrow: tube terete. Petals 5: blades narrow. Ovary elongate. Capsule-body cylindric or oblong, short-stipitate.—About 35 species, natives of the Old World.



1. **S. officinalis** L. Stems 3–9 dm. long, often decumbent: leaf-blades elliptic to lanceolate, 3–11 cm. long: calyx 20–25 mm. long; lobes triangular to lanceolate: petal-blades cuneate, 15–18 mm. long, entire, pink or white: capsule-body 12–20 mm. long.—(SOAPWORT. BOUNCING-BET. HEDGE-PINK.) —Waste-places, roadsides, fence-rows, and river-banks, generally in eastern N. A. Nat. of Eu.—Sum.–fall.—A rapid-spreading and persistent weed. Double-flowered forms occur. The juices contain saponin.

4. **SILENE** L. Annual or perennial herbs. Leaf-blades various, commonly narrow. Flowers mostly pedicelled. Calyx narrow or becoming inflated: tube 10–many-nerved. Petals 5: blades often toothed at the apex or lobed. Ovary somewhat elongate. Capsule-body much longer than thick.—About 250 species of wide geographic distribution.—CAMPIONS. CATCHFLYS.

Calyx clavate, cylindric, or campanulate, definitely 10-ribbed. — I. STELLATAE.
Calyx ovoid or globular. obscurely 15–20-ribbed. — II. LATIFOLIAE.

I. STELLATAE

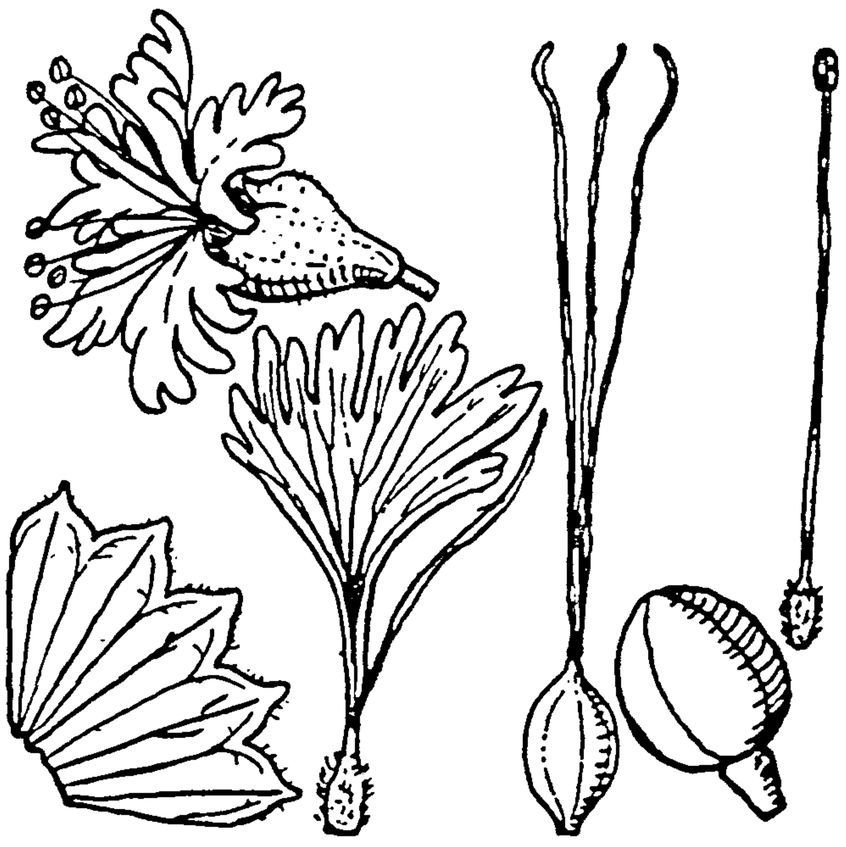
Plants perennial.
- Calyx inflated.
  - Leaves in whorls of 4's: petals laciniately cleft; appendages wanting. — 1. *S. stellata.*
  - Leaves opposite: petals 2-cleft; appendages present. — 2. *S. alba.*
- Calyx merely filled by the capsule.
  - Corolla white or pink.
    - Blades of the petals erose.
      - Petal-claws much exceeding the calyx: calyx rather sparsely glandular-pubescent: style much longer than the ovary. — 3. *S. caroliniana.*

Petal-claws about equalling the calyx: calyx densely pubescent with glandless hairs: style about as long as the ovary. 4. *S. Wherryi.*
Blades of the petals fringed or dichotomously cleft.
Stems with short rigid hairs: calyx about 1 cm. long. 5. *S. ovata.*
Stems with villous pubescence: calyx about 2.5 cm. long. 6. *S. Baldwinii.*
Corolla scarlet or crimson.
Petals 2-lobed.
Stems finely pubescent: upper stem-leaves with blades several times longer than broad. 7. *S. virginica.*
Stems villous: upper stem-leaves with blades usually less than twice as long as broad. 8. *S. rotundifolia.*
Petals entire or nearly so, sometimes merely erose. 9. *S. regia.*
Plants annual or biennial.
Inflorescence simple. 10. *S. anglica.*
Inflorescence branched.
Flowers in dichotomous racemes. 11. *S. dichotoma.*
Flowers in dichotomous cymes.
Foliage pubescent: stem viscid. 12. *S. noctiflora.*
Foliage glabrous, normally glutinous about the nodes of the stem. 13. *S. antirrhina.*

II. LATIFOLIAE

Perennial herb usually branched at the base, the flowers more or less nodding. 14. *S. latifolia.*

1. S. stellata (L.) Ait. f. Stem 3–12 dm. tall, usually minutely pubescent: leaf-blades ovate to lanceolate, 4–12 cm. long: calyx becoming 10–16 mm. long; lobes about ⅓ as long as the tube: petals white, 1.5–2 cm. long; blades laciniate: capsule-body subglobose to ovoid-globose, 6–8 mm. long, short-stipitate.—(STARRY-CAMPION. WIDOW'S-FRILL.)—Rich or dry woods, various provinces, Ga. to Tex., Minn., and Mass.—Sum.



2. S. alba Muhl. Stem 3–8 dm. tall, sometimes minutely pubescent: leaf-blades lanceolate to linear-lanceolate or slightly broadest above the middle, 4–15 mm. long: calyx becoming 14–16 mm. long: lobes about ¼ as long as the tube: petals white, 2–2.5 cm. long; blades cleft: capsule-body oblong to ovoid, 9–11 mm. long.—(SNOWY-CAMPION.)—River shores and islands, various provinces, N of Coastal Plain, Tenn. to Nebr., Minn., and Md.—Spr.-sum.

3. S. caroliniana Walt. Stem 1–2.5 dm. long, closely pubescent: leaf-blades spatulate to linear-spatulate on the lower part of the stem, lanceolate above, 3–12 cm. long: calyx clavate, becoming 2–2.5 cm. long; lobes broadly ovate: petals pink or white, the blades about 1.5 cm. long, notched, raised above the calyx-lobes on the long claws: capsule 9–11 mm. long. [*S. pennsylvanica* Muhl.]—(WILD-PINK. ROCK-CATCHFLY.)—Shaded banks and rocky woods, various provinces, Ga. to Ky. and Me.—Spr.

4. S. Wherryi Small. Plant similar to *S. caroliniana* in habit and foliage: calyx densely pubescent with whitish glandless hairs: petals white to rose-pink, the blades less notched than in those of the next preceding species, little, if at all raised above the calyx-lobes.—Rocky slopes and stream banks, Interior Low Plateaus and adj. provinces, Ala. to Mo. and S Ohio.—Spr.

5. S. ovata Pursh. Stem 5–12 dm. tall, minutely pubescent: leaf-blades ovate to ovate-lanceolate or elliptic-lanceolate, 4–15 cm. long: calyx becoming 8–10

mm. long; lobes deltoid to broadly triangular: petals white; blades 1–1.5 cm. long: capsule-body narrowly ovoid, 8–9 mm. long.—Woods, Blue Ridge and adj. provinces, Ga. to Ala. and N. C.; also Ozark Plateau, Ark.—Sum.

6. **S. Baldwinii** Nutt. Stem 1–4 dm. tall, villous: leaf-blades spatulate to elliptic or lanceolate, 3–9 cm. long: calyx becoming 2.5 cm. long; lobes lanceolate: petals white or pink; blades 2–2.5 cm. long, flabellate: capsule-body oval, 7–9 mm. long.—Woods, Coastal Plain and Piedmont, Fla. to Ga.—Spr.

7. **S. virginica** L. Stem 2–5 dm. tall, very clammy-pubescent: leaf-blades spatulate to elliptic or lanceolate, 5–20 cm. long: calyx becoming 2–2.5 cm. long; lobes ovate to deltoid-ovate: petals crimson; blades linear to narrowly elliptic, 2–2.5 cm. long: capsule-body narrowly obovoid, 10–15 mm. long.—(FIRE-PINK.)—Open woods and gravelly or sandy hillsides, various provinces, N of Coastal Plain, Ga. to Ark., Minn., Ont., N. Y., and N. J.—Spr.–fall.

8. **S. rotundifolia** Nutt. Stem 2–7 dm. tall, clammy-villous: leaf-blades spatulate to oval or ovate, 5–20 cm. long: calyx becoming 2.5–3 cm. long; lobes ovate-lanceolate: petals bright scarlet; blades elliptic, 1–1.5 cm. long: capsule-body 17–22 mm. long.—Rocky banks, Appalachian Plateau and occasionally adj. provinces, Ga. to Ala. and Ohio.—Sum.

9. **S. regia** Sims. Stems 6–15 dm. tall, viscid-pubescent: leaf-blades lanceolate to ovate, or narrower at the base of the stem, 4–8 cm. long: calyx becoming 2–2.5 cm. long; lobes ovate: petals scarlet; blades 1.5–2 cm. long: capsule-body 15–20 mm. long.—Dry or rocky woods, various provinces, N of Coastal Plain, Ga. to Okla., Mo., and Ohio.—Sum.

10. **S. anglica** L. Stems 2–4 dm. tall, villous: leaf-blades spatulate to linear, 1.5–3 cm. long: calyx-tube slightly ribbed, less than 1 mm. long: petal-blades white (or crimson with a pink or white border in *S. anglica quinquevulnera*), 5–6 mm. long: capsule 8–9.5 mm. long.—Waste-places, various provinces, S. C. to Ont. and Me.; also Pacific slope. Nat. of Eu.—Spr.–sum.

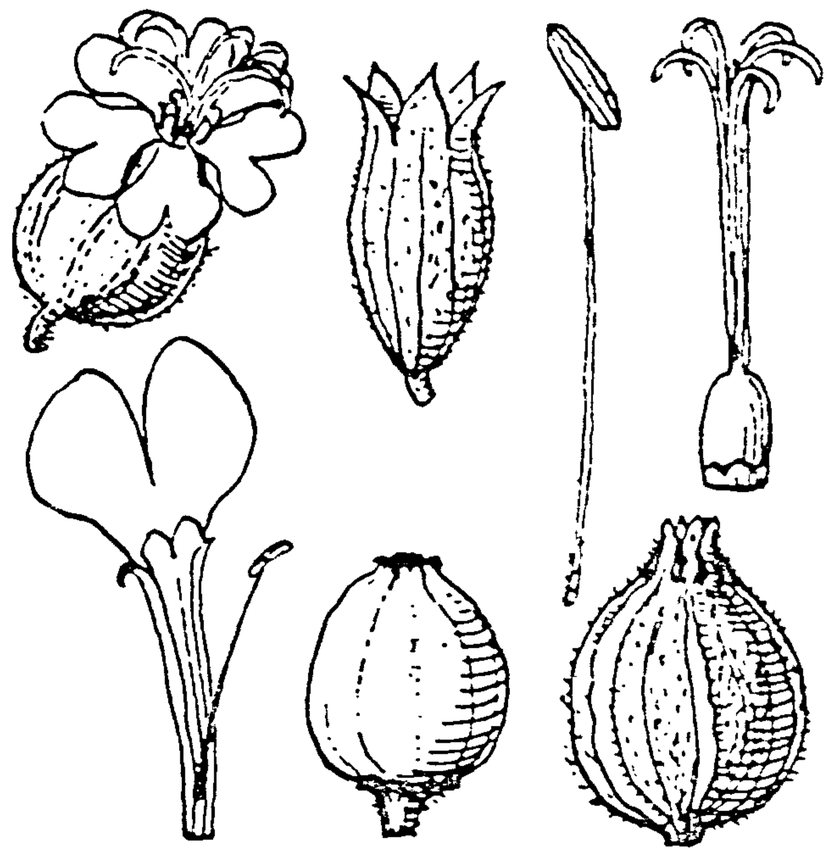
11. **S. dichotoma** Ehrh. Stems 3–7 dm. tall, finely pubescent: leaf-blades oblanceolate to lanceolate, 5–8 cm. long: calyx-tube wing-ridged, ultimately over 1 cm. long: petal-blades white or pink, 6–8 mm. long: capsule 10–11 mm. long.—Fields and waste-places, locally in the U. S. Nat. of Eurasia.—Sum.

12. **S. noctiflora** L. Stem 2–8 dm. tall, closely pubescent: leaf-blades spatulate to elliptic or lanceolate, 2–8 cm. long: calyx-tube prominently ribbed, ultimately 12–15 mm. long: petal-blades 9–11 mm. long, white or nearly so: capsule 15–20 mm. long.—(NIGHT-FLOWERING CATCHFLY.)—Roadsides, fields, and waste-places, various provinces, Fla. to Mo., Man., and N. B. Nat. of Eu.—Sum.

13. **S. antirrhina** L. Stem 2–8 dm. tall, with glutinous patches near the nodes: leaf-blades linear to linear-elliptic, or the lower ones elliptic, 2–8 cm. long: calyx-tube 5.5–7.5 mm. long, ultimately ovoid or oval (globose in *S. antirrhina linaria*): petals white or pink; blades cuneate to linear, 6–8 mm. long: capsule 6–8 mm. long, not stipitate.—(SLEEPY-CATCHFLY. GARTER-PINK.)—Waste-places, cult. grounds, and roadsides, various provinces, Fla. to Tex., B. C., Ont., and Me.—(*Mex.*)—Sum.

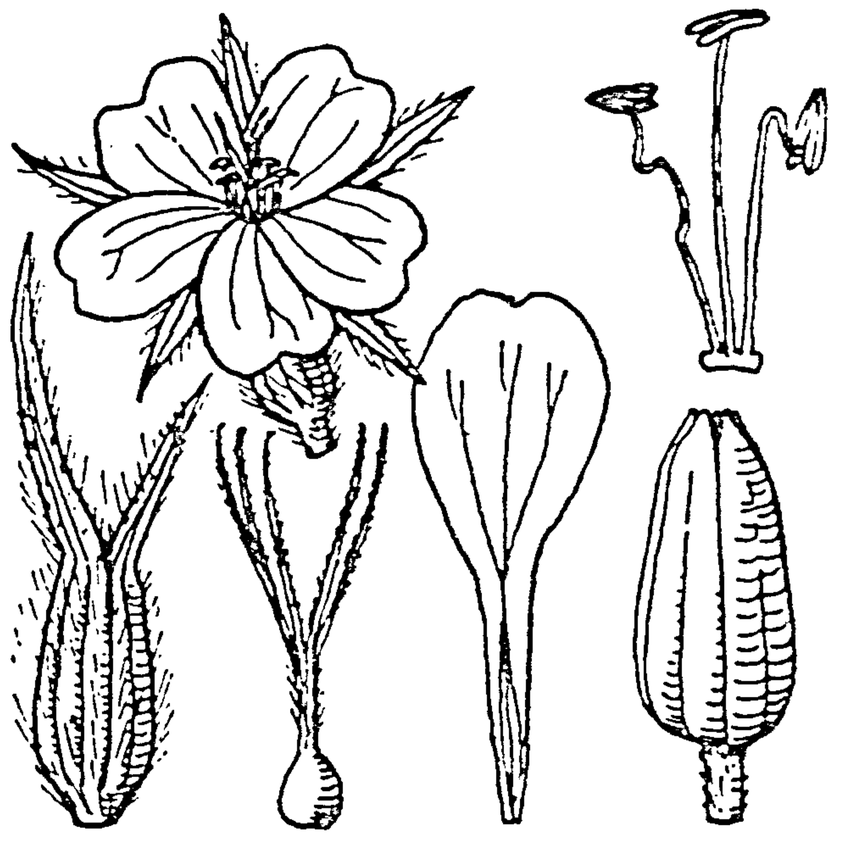
14. **S. latifolia** (Mill.) Britton & Rendle. Stem 2–5 dm. tall, glaucous and usually glabrous: leaf-blades various, spatulate on the lower part of the stem, lanceolate to ovate-lanceolate above: calyx becoming much inflated, finely reticulate between the inconspicuous ribs: petal-blades white or pink, about 1 cm. long, 2-lobed: capsule ovoid, 5–7 mm. long.—(BLADDER-CAMPION. COW-BELLS. RATTLE-BAGS.)—Fields, roadsides, meadows, woods, and waste-places, various provinces, Tenn. to Mo., Ia., Ont., and N. B.; also Pacific Coast. Nat. of Eu.—Sum.

5. **LYCHNIS** [Tourn.] L. Annual or perennial herbs similar to *Silene* in habit. Flowers pedicelled and mostly erect. Calyx becoming more or less inflated, 10-nerved. Petals 5: blades entire, cleft, or laciniate, generally appendaged. Ovary more or less elongate. Capsule as long as thick or longer.—About 35 species, natives of the temperate and Arctic zones.—CAMPIONS.



1. **L. alba** Mill. Plants 1 m. tall or less, the stem usually branched throughout, fine-pubescent: leaf-blades spatulate to elliptic, oval, or lanceolate, 3–8 cm. long: calyx becoming 14–21 mm. long; lobes triangular to ovate, ⅓–¼ as long as the tube: petals white or rarely pink; blades reniform to broadly cuneate: capsule conic-ovoid, the opening narrow.—(WHITE-CAMPION.)—Roadsides and fields, N. C. to Ont. and N. S. Nat. of Eu.—Sum.

6. **AGROSTEMMA** L. Annual coarse herbs. Leaf-blades very narrow. Flowers long-peduncled. Calyx becoming swollen: tube 10-ribbed. Petals 5: blades broad, unappendaged. Ovary about as thick as long. Capsule slightly elongate.—Two species, natives of Eurasia.



1. **A. Githago** L. Stems 2–9 dm. tall, appressed-pubescent: leaf-blades linear, 4–12 cm. long: calyx becoming 5–6 cm. long; lobes linear, acuminate, longer than the copiously pubescent tube: petals 30–35 mm. long; blades cuneate to obovate, purple or magenta: capsule 18–22 mm. long.—(CORN-COCKLE. CORN-ROSE. CORN-CAMPION.)—Grain-fields and fence-rows, nearly throughout cult. N. A. Nat. of Eu.—Sum.

ORDER **RANALES** — RANAL ORDER

Herbs, shrubs, or trees. Leaves mostly without stipules, with entire or dissected blades, in aquatics often various on the same plant. Flowers perfect, monoecious, or dioecious. Calyx and corolla of distinct sepals and petals. The corolla is sometimes wanting. Androecium of usually more hypogynous stamens than there are sepals. Gynoecium of 1 or several distinct or united carpels. Ovary superior. Fruit various.

Stamens usually numerous, the anther-sacs opening by slits.
  Land plants, except in CERATOPHYLLACEAE and some RANUNCULACEAE: leaf-blades not peltate.
    Flowers perfect or monoecious, if dioecious, on neither vines nor herbs with simple leaves.
      Plant with minute axillary monoecious flowers: anthers horned. — Fam. 1. CERATOPHYLLACEAE.
      Plant with perfect or rarely dioecious flowers: anthers not horned.
        Carpels 1 or more, distinct, at least at maturity.

Sepals 3–15: petals about as many: plants if shrubby not with pulpy fruit: endosperm even. — Fam. 2. RANUNCULACEAE.
Sepals 3 (or 4): petals 6: fruit pulpy: endosperm channeled. — Fam. 3. ANNONACEAE.
Carpels more or less coherent or united into cone-like structures, or immersed in the pulpy receptacle.
Sepals valvate. — Fam. 3. ANNONACEAE.
Sepals imbricated. — Fam. 4. MAGNOLIACEAE.
Flowers dioecious: vines with simple leaves. — Fam. 5. MENISPERMACEAE.
Water plants: emersed or floating leaves with peltate blades.
Carpels several and distinct.
Carpels not in a fleshy receptacle: sepals and petals 3 or 4 each: stamens 3–18. — Fam. 6. CABOMBACEAE.
Carpels immersed in a fleshy receptacle: sepals and petals numerous: stamens indefinite. — Fam. 7. NELUMBONACEAE.
Carpels united into a compound pistil. — Fam. 8. NYMPHAEACEAE.
Stamens few and definite, the anther-sacs opening by hinged valves, except in *Podophyllum*.
Herbs: leaves with simple or ternate blades. — Fam. 9. PODOPHYLLACEAE.
Shrubs: leaves with pinnately or digitately compound, sometimes 1-foliolate blades. — Fam. 10. BERBERIDACEAE.

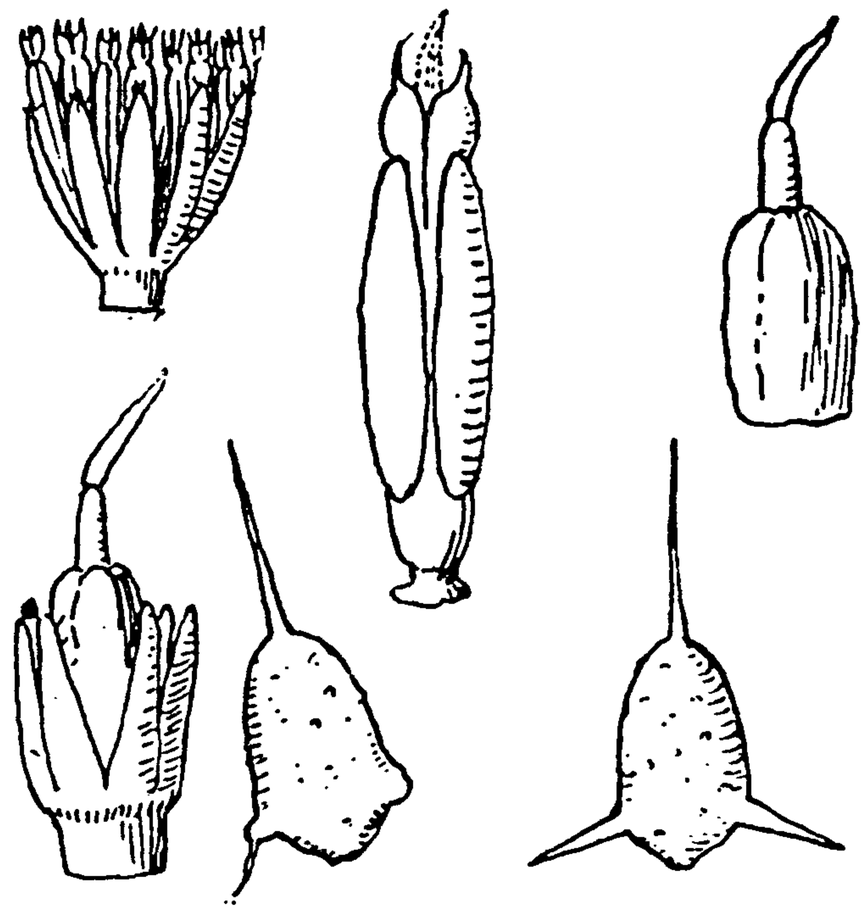
FAMILY 1. CERATOPHYLLACEAE — HORNWORT FAMILY

Annual aquatic herbs. Leaves whorled: blades cleft or finely dissected. Flowers monoecious. Calyx of 6–12 narrow toothed or cleft sepals. Corolla wanting. Androecium of 10–24 stamens with short filaments. Gynoecium 1-carpellary: stigma subulate. Fruit an achene, sometimes spine-armed.—Represented by the following genus only.

1. CERATOPHYLLUM L. Submerged plants with sessile leaf-blades, the divisions mostly thrice forked. Flowers sessile in the leaf-axils.—Following are the only known species.—Sum. or all year southward.—CEDAR-MOSSES. COONTAILS. FISH-BLANKETS. HORNWEEDS. HORNWORTS.

Achene armed on the edges with spines, long beaked.
Leaves 6–9 in a whorl; segments spiny-toothed; achenes with a spine on either side of the base. — 1. *C. demersum.*
Leaves 9–12 in a whorl; segments bristly-toothed: achenes fringed with spines. — 2. *C. echinatum.*
Achene unarmed, short-beaked. — 3. *C. submersum.*

1. C. demersum L. Stem 3–12 dm. long: leaves rather rigid; blades 1–2 times forking: sepals elliptic to ovate-elliptic, erose: stamens slightly exserted: style and stigma exserted: achene-body ovoid, ovoid-ellipsoid, or ellipsoid, 5–6 mm. long.—Shallow water and slow-flowing streams, various provinces, Fla. to La., Calif., and S Can.—(*W. I., Mex., O. W.*)



2. C. echinatum A. Gray. Stem 2–5 dm. long: leaves flaccid: blades 3–4 times forked: achene-body broadly ellipsoid, about 6 mm. long, margined.—Slow streams and ponds, various provinces, Fla. to Calif. and S Can.

3. C. submersum L. Stem 3–4 dm. long: leaves flaccid; blades 3–4 times forking, the segments bristly toothed: achene-body ellipsoid, 4 mm. long, spineless, sparingly warty.—Ponds, S pen. Fla.—(*O. W.*)

Family 2. **RANUNCULACEAE** — Crowfoot Family

Herbs or woody vines. Leaves alternate (opposite in Clematideae): blades simple or compound. Calyx of 3–5 imbricate (valvate in Clematideae) sepals. Corolla of about as many petals as there are sepals, occasionally wanting. Androecium of several of many hypogynous stamens. Gynoecium of 1 to many usually distinct carpels. Fruit an achene, a follicle or baccate.—About 35 genera and 1,100 species, widely distributed.

Fruit a follicle or a berry.
  Carpel with a pair of ovules: fruit 1-seeded or 2-seeded.
    Shrub: flowers paniculate: corolla present: fruit follicles. — Tribe I. Xanthorrhizeae.
    Herb: flowers solitary: corolla wanting: fruit berries. — Tribe II. Hydrasteae.
  Carpel with more than 2 ovules: fruit several-seeded. — Tribe III. Helleboreae.
Fruit an achene: carpel with a single ovule.
  Sepals imbricate: leaves, below the inflorescence, alternate, sometimes all basal. — Tribe IV. Anemoneae.
  Sepals valvate, the edges sometimes turned in: leaves opposite. — Tribe V. Clematideae.

I. Xanthorrhizeae

Shrub with pinnate leaf-blades. — 1. Xanthorrhiza.

II. Hydrasteae

Herb with simple lobed leaf-blades. — 2. Hydrastis.

III. Helleboreae

Flowers regular.
  Leaf-blades palmate or pedately veined or lobed.
    Petals wanting. — 3. Caltha.
    Petals present. — 4. Helleborus.
  Leaf-blades ternately compound.
    Petals without spurs, or wanting.
      Fruit dry follicles.
        Low herbs: flowers solitary or few.
          Carpels, and follicles, stalked: petals present. — 5. Coptis.
          Carpels, and follicles, not stalked: petals wanting. — 6. Isopyrum.
        Tall herbs: flowers many in elongate racemes. — 7. Cimicifuga.
      Fruit berry-like. — 8. Actaea.
    Petals prolonged backward into hollow spurs. — 9. Aquilegia.
Flowers irregular.
  Upper sepal prolonged into a spur: upper pair of petals sessile or nearly so, long-spurred. — 10. Delphinium.
  Upper sepal hooded: upper pair of petals long-clawed, wholly concealed in the sepal-hood. — 11. Aconitum.

IV. Anemoneae

Flowers, or their pedicels or peduncles subtended by involucres: petals wanting: sepals petal-like.
  Involucre close to the calyx; bracts entire. — 12. Hepatica.
  Involucre remote from the calyx: bracts toothed to dissected.
    Style subulate: leaf-segments sessile. — 13. Anemone.
    Style wanting: leaf-segments stalked. — 14. Syndesmon.
Flowers not subtended by involucres: sepals rarely petal-like.
  Leaf-blades simple, entire, toothed, lobed, or dissected.
    Sepals spurred: receptacle greatly elongate. — 15. Myosurus.
    Sepals spurless: receptacle not greatly elongate.
      Petals wanting. — 16. Trautvetteria.
      Petals present.
        Petal-blades with a nectariferous gland or pit at the base.
          Achene transversely wrinkled: petals white. — 17. Batrachium.
          Achene not transversely wrinkled: petals yellow, at least without. — 18. Ranunculus.
        Petal-blades without gland or pit at the base. — 19. Adonis.
  Leaf-blades ternately decompound: petals wanting. — 20. Thalictrum.

V. Clematideae

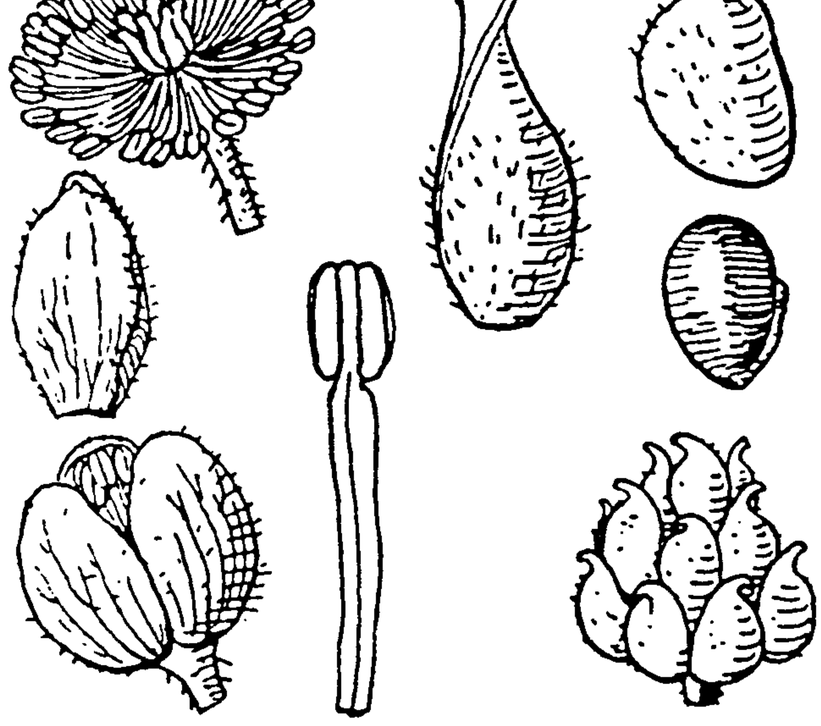
Petals wanting.
  Stamens spreading: sepals spreading.
    Sepals with scarcely any border: flowers dioecious or polygamo-dioecious. — 21. Clematis.

Sepals with a wide border: flowers perfect. 22. VITICELLA.
Stamens erect: sepals more or less converging. 23. VIORNA.
Petals present (in our species), smaller than the sepals. 24. ATRAGENE.

1. **XANTHORRHIZA** L'Her. Weak shrubs. Leaf-blades 1–2-pinnate. Flowers paniculate. Sepals 5, brownish-purple, deciduous. Petals 5, gland-like. Stamens 5 or 10: filaments stout. Carpels few, sessile, 2-ovuled, in fruit forming a whorl of follicles.—One species.

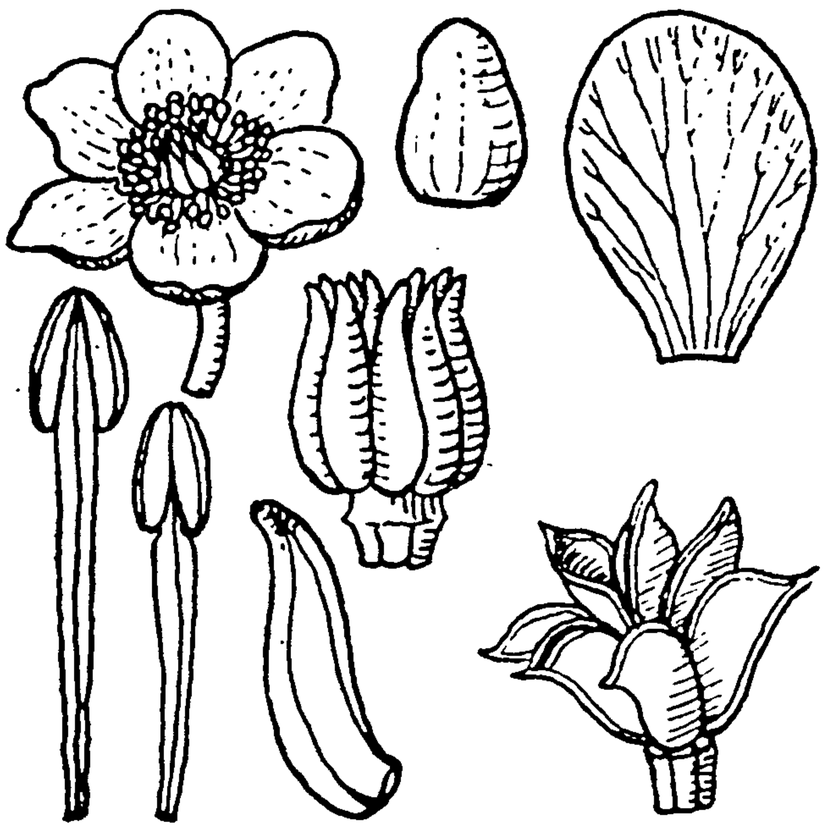
1. **X. simplicissima** Marsh. Plant 2–6 dm. tall, diffuse: leaves approximate: leaflets mostly 5, the blades ovate to elliptic, 2.5–7.5 cm. long, incised-toothed or divided: sepals ovate to ovate-lanceolate, brownish-purple: follicles elliptic, 3–4 mm. long. [*X. apiifolia* L'Her.] — (YELLOW-ROOT. SHRUB YELLOW-ROOT. BROOK-FEATHER.)—Woods, rocky banks, and ledges, various provinces, M Fla. to Tenn. and SW N. Y.—Spr.—The roots are brilliant yellow.

2. **HYDRASTIS** Ellis. Perennial herbs. Leaf-blades palmately lobed. Flowers solitary. Sepals 3, fugacious. Petals wanting. Filaments slender, white. Carpels several, 2-ovuled, in fruit forming a head of berries.—Two species, the following and one in Japan.



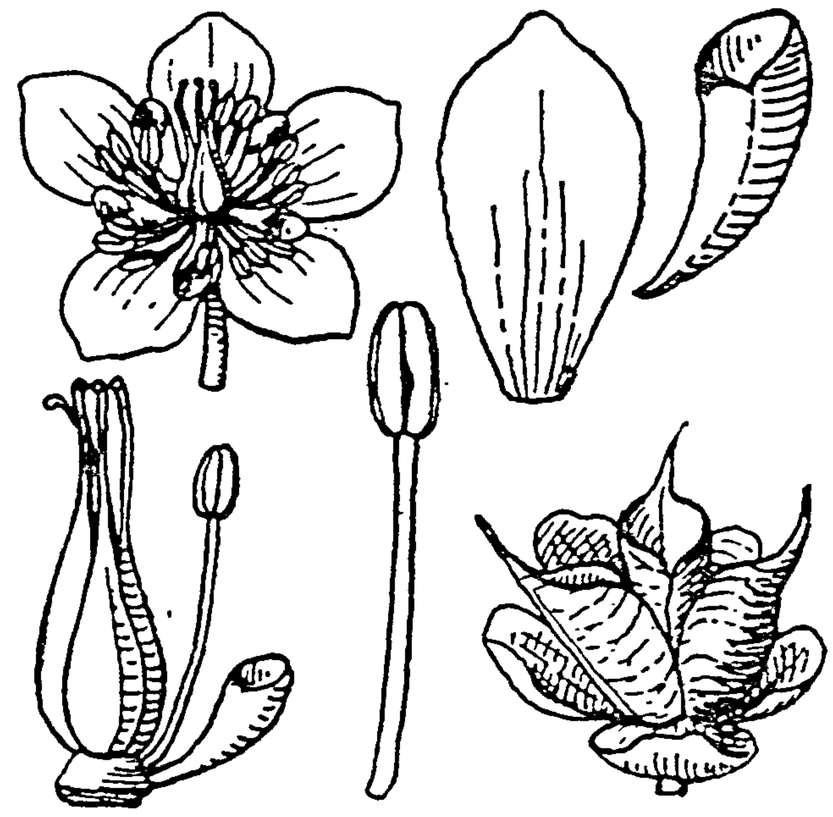
1. **H. canadensis** L. Plant pubescent, mostly 2–4 dm. tall: blade of the cauline leaf becoming 8–24 cm. wide: bract leaf-like, flower white: sepals ovate: fruit-head 14–16 mm. thick; berry 5–6 mm. long, crimson.—(GOLDEN-SEAL. ORANGE-ROOT. EYE-ROOT. INDIAN-DYE.)—Rich woods and shaded banks, various provinces N of Coastal Plain, Ga. to Kans., Minn., and Vt.—Spr.—The rootstock is used in medicine.

3. **CALTHA** [Rupp.] L. · Perennial herbs. Leaf-blades entire or toothed. Flowers few or solitary. Sepals few, yellow, pink, or white, deciduous. Petals wanting. Filaments slender. Carpels few or many, several-ovuled, in fruit forming a whorl of leathery green follicles.—About 15 species, widely distributed.



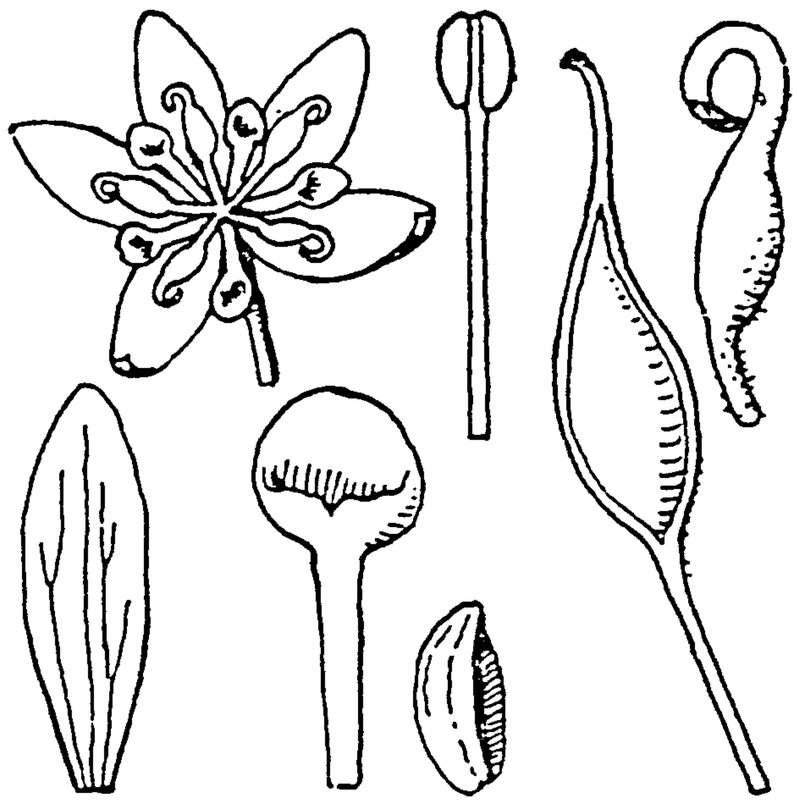
1. **C. palustris** L. Plant glabrous, 2–6 dm. tall: blades of the cauline leaves similar to those of the basal but smaller, reniform to orbicular-reniform, 4–9 cm. wide: sepals yellow, oblong to oval-orbicular, 1.5–2 cm. long: follicles 10–12 mm. long.—(MARSH-MARIGOLD. COWSLIP. BULL'S-EYES. KING-CUP.)—Swamps and low meadows, often calcareous, various provinces, S only in Blue careous, various provinces, S. C. to Sask., Ont., and Newf.—(*Eurasia.*)—Spr.

4. **HELLEBORUS** L. Perennial herbs. Leaf-blades palmately lobed or divided. Flowers few or solitary. Sepals 5, white, greenish, or yellowish, mainly persistent. Petals small. Filaments filiform or nearly so. Carpels generally few, several-ovuled, in fruit forming a whorl of follicles.—About 15 species, Eurasian.



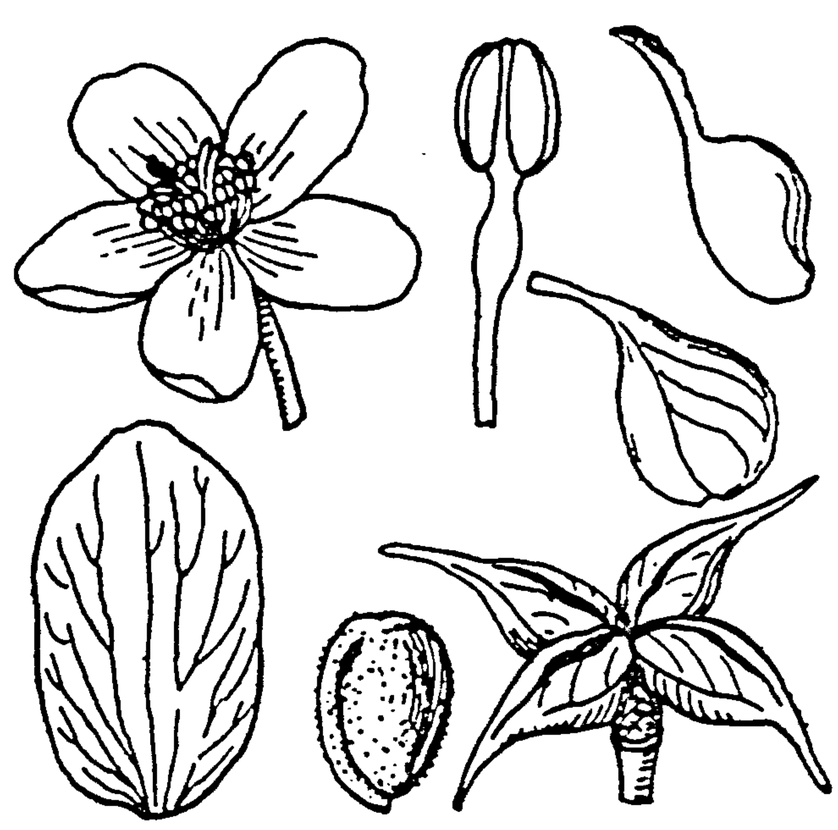
1. **H. viridis** L. Plant 3–6 dm. tall: blades of the basal leaves 1–3 dm. wide: segments 7–11, sharply serrate; sepals elliptic, about 25 mm. long: petals tubular, about 4 mm. long: follicles about 15 mm. long.—(CHRISTMAS-FLOWER. CHRISTMAS-ROSE. GREEN-HELLEBORE.)—Waste-places, cult. grounds, and fields, various provinces, N. C. to N. Y. Nat. of Eu.—Wint.–spr.

5. **COPTIS** Salisb. Perennial scapose herbs. Leaf-blades 3-foliate. Flowers solitary. Sepals 5–7, deciduous. Petals 5–7, cucullate. Stamens numerous: filaments slender. Carpels few, stipitate, several-ovuled, in fruit forming a cluster of apically beaked follicles.—About nine species, natives of the cooler parts of the north temperate zone.



1. **C. trifolia** (L.) Salisb. Plant 7–15 cm. tall: leaves persistent; divisions 3, obovate-cuneate to suborbicular, 1.5–3 cm. long, crenate or slightly lobed: flower white: sepals elliptic, 6–8 mm. long: petals about ½ as long as the sepals: follicles 3–7, the bodies 4–6 mm. long.—(GOLD-THREAD. CANKER-ROOT.)—Woods and bogs, various provinces, rarely Coastal Plain, S only in Blue Ridge and Appalachian provinces, N. C. to B. C., Alas., C Can. and Newf. —(*Eurasia.*)—Delights to form mats on decaying logs.—Spr.

6. **ISOPYRUM** L. Perennial caulescent herbs. Leaf-blades ternately decompound. Flowers few or solitary. Sepals 5–9, petal-like. Petals 5, gland-like or wanting. Stamens numerous: filaments clavate. Carpels mostly few, sessile (in ours), several-ovuled, in fruit forming ahead of follicles.—About 15 species, natives of the north temperate zone.



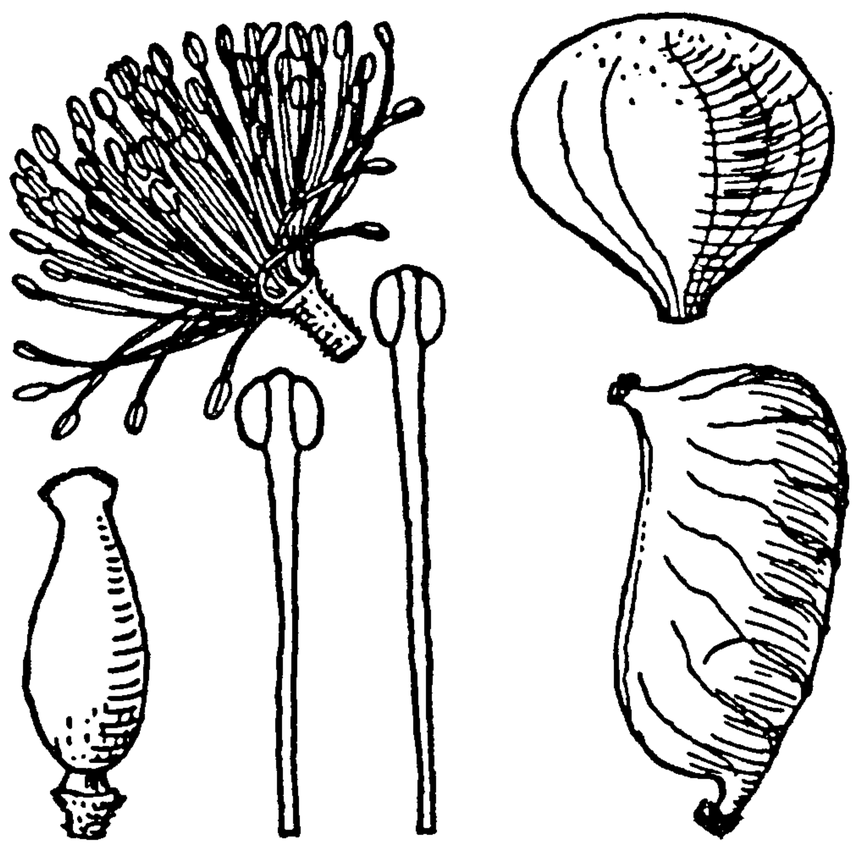
1. **I. biternatum** (Raf.) T. & G. Plant 1–3.5 dm. tall: leaflets 1–2.5 cm. long, lobed or divided; flower white: sepals elliptic or somewhat obovate, 9–12 mm. long: follicles 4–6 mm. long, slender-beaked.—(FALSE RUE-ANEMONE.)—Woods and bluffs, various provinces, west of Appalachians, W Fla. to Tex., Minn., and S Ont.—Spr.

7. CIMICIFUGA L. Perennial herbs. Leaf-blades decompound. Flowers numerous, in long racemes, white. Sepals 2–5, deciduous. Petals 1–8, clawed, notched at the apex. Stamens numerous: filaments filiform. Carpels few or solitary, many-ovuled, becoming dry follicles.—About 10 species, natives of North America and Eurasia.—BUGBANES.—Some species are used in medicine.

Carpels 1 or 2, sessile: seeds wholly or partially in 2 rows.
  Filaments about 4 mm. long: follicles 8–10 mm. long: seeds chaffy. 1. *C. rubifolia.*
  Filaments about 8 mm. long: follicles 5–7 mm. long: seeds smooth. 2. *C. racemosa.*
Carpels 3 or 8, stalked: seeds in 1 row. 3. *C. americana.*

1. C. rubifolia Kearney. Plant 6–14 dm. tall: terminal leaflets 5–7-lobed, 10–30 cm. wide: follicles glabrous, the beak spreading.—Wooded bluffs along Tennessee River, Appalachian Valley E Tenn.—Fall.

2. C. racemosa (L.) Nutt. Plant 10–25 dm. tall: terminal leaflets 3-lobed, 4–16 cm. wide: follicles puberulent and often pubescent, the beak recurved.—(BLACK-COHOSH. BLACK-SNAKEROOT. COHOSH-BUGBANE. FAIRY-CANDLES. RATTLE-TOP. STAR-LANCE.)—Woods, various provinces, rarely Coastal Plain, Ga. to Mo., Wisc., S Ont., and W Me.—Early sum.

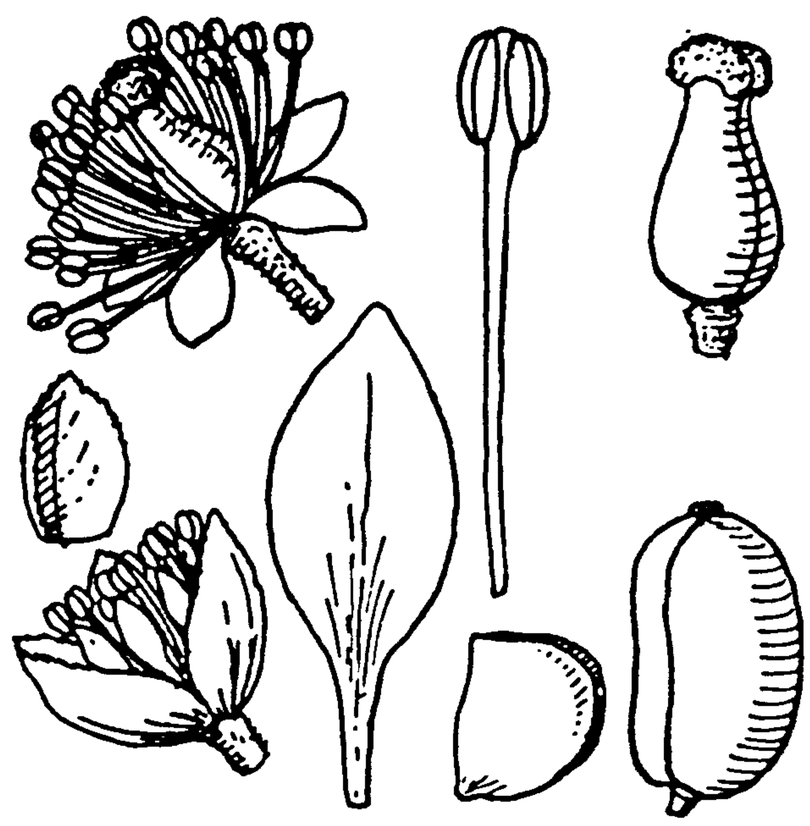


3. C. americana Michx. Plant 10–20 dm. tall: terminal leaflets 6–15 cm. wide: follicles glabrous, the bodies 10–12 mm. long. [*C. cordifolia* Pursh.].—(SUMMER-COHOSH. MOUNTAIN-BUGBANE.)—Woods, Blue Ridge and Appalachian provinces, Ga. to Tenn. and N. Y.—Late sum.

8. ACTAEA L. Perennial herbs. Leaf-blades ternately compound. Flowers rather many, in short racemes, white. Sepals 3–5, deciduous. Petals 4–10, clawed, not notched. Stamens numerous: filaments filiform. Carpel solitary, many-ovuled, becoming a baccate follicle.—About 6 species, natives of the north temperate zone.—Spr.—BANEBERRIES.

Pedicels slender, less than 1 mm. thick: fruits red. 1. *A. rubra.*
Pedicels stout, over 1 mm. thick: fruits white. 2. *A. alba.*

1. A. rubra (Ait.) Willd. Plant 3–8 dm. tall: terminal leaflets mostly as wide as long and deeply 3-lobed, truncate to cordate at the base: follicles decidedly elongate: seed about 3 mm. long. [*A. spicata rubra* Ait.]—(CORALBERRY. POISONBERRY. SNAKEBERRY. RED-BANEBERRY.)—Woods, various provinces, rarely Coastal Plain, N. C. to Tenn., Colo., Alb., Ont., and N. S.

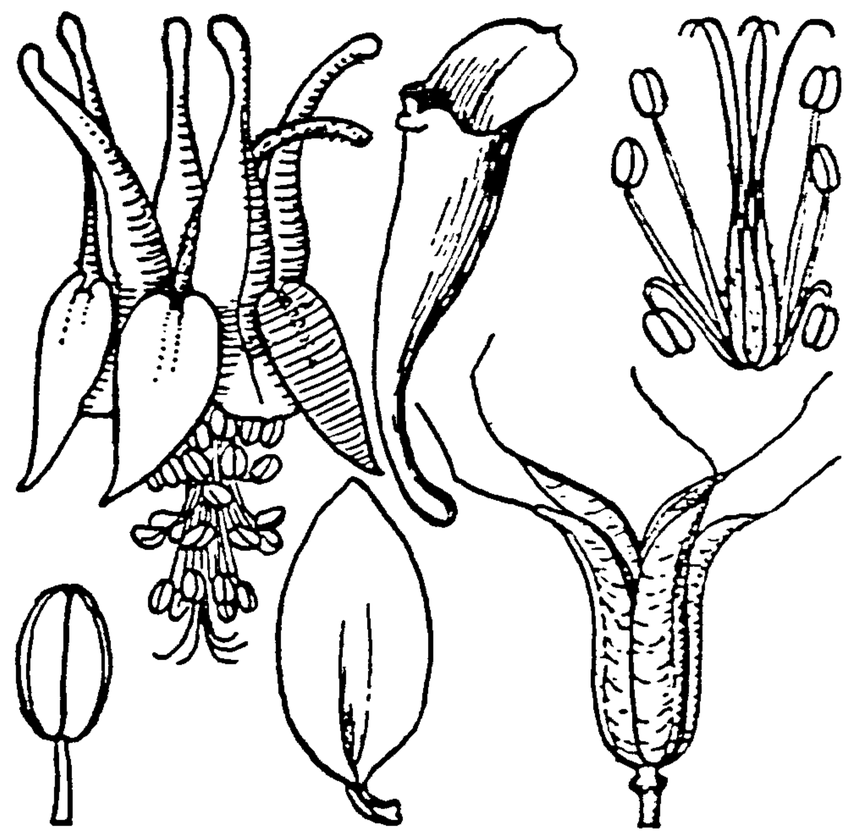


2. A. alba (L.) Mill. Plant 4–11 dm. tall: terminal leaflets mostly longer than wide and scarcely lobed, cuneate or rounded at the base: follicles white, about as thick as long, on spreading stout red pedicels: seed about 4 mm. long.—(DOLL'S-EYES. NECKLACE-WEED. WHITE-BANEBERRY. WHITEBERRY.)—Rocky woods, various provinces, N Fla. to La., B. C., Ont., Ga., and Que.

9. AQUILEGIA [Tourn.] L. Perennial herbs. Leaf-blades ternately compound, the segments broad. Flowers inverted on nodding pedicels, of many different colors, but ours scarlet and yellow. Sepals 5, equal, petal-like. Petals 5, cornucopia-like. Stamens numerous, the inner ones staminodia. Carpels 5, sessile, many-ovuled, in fruit forming a capsule-like erect head of follicles.—About 50 species, widely distributed in the north temperate zone.—Spr.—COLUMBINES.—Several species are widely cultivated.

Sepals ovate, sometimes broadly so, mostly less than 14 mm. long: spurs 2–2.5 cm. long: follicles with spreading tips. 1. *A. canadensis.*
Sepals lanceolate or elliptic-lanceolate, mostly more than 15 mm. long: follicles with erect tips.
  Sepals elliptic-lanceolate: follicle-body fully 2 cm. long. 2. *A. coccinea.*
  Sepals lanceolate: follicle-body about 1.5 cm. long. 3. *A. australis.*

1. A. canadensis L. Plant 2–6 dm. tall: leaflets or their divisions cuneate: sepals ovate, scarlet without, 10–14 mm. long: spurs scarlet without, 2.5–3 cm. long, swollen at the tip: follicle-body mostly 1.5–2 cm. long.—(RED-BELLS. ROCK-BELLS. ROCK-HONEYSUCKLE.)—Woods and rocky banks, often in calcareous soil, various provinces, Ga. to Tex., Ont., and N. S.



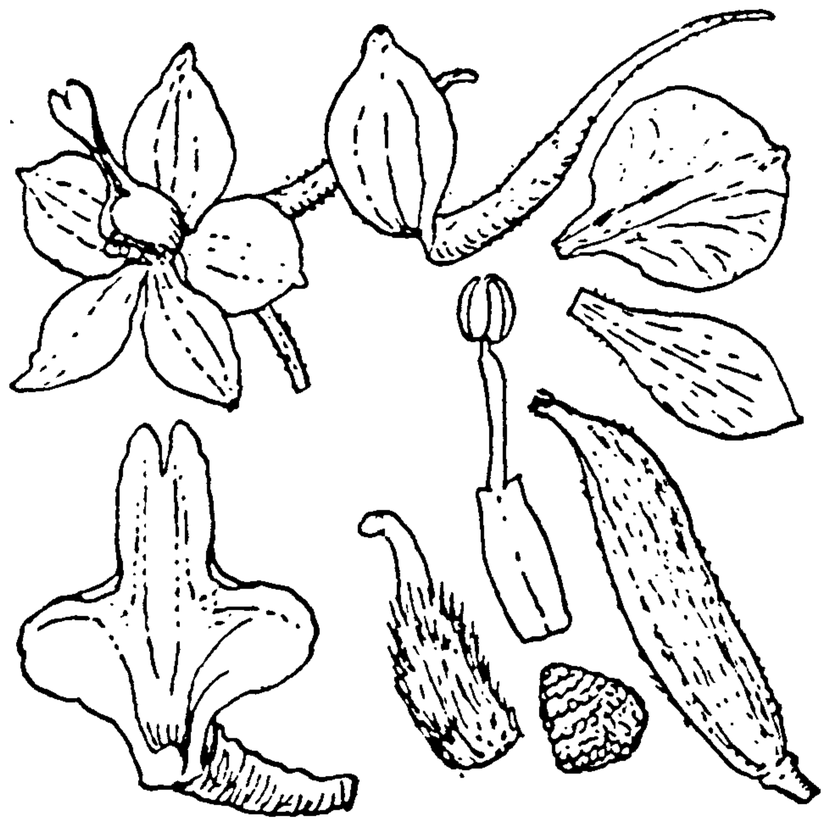
2. A. coccinea Small. Plant usually larger than in *A. canadensis*: leaflets or their divisions wider and often rounded at the base: sepals elliptic-lanceolate, 16–21 mm. long: spurs very stout: follicle-body 2–2.5 cm. long.—Hillsides, woods, and cliffs, various provinces, N of Coastal Plain, Ala. to Tex., Nebr., and S Ont.

3. A. australis Small. Plant 3–9 dm. tall, paler-green or more glaucous than in the two preceding species: sepals lanceolate, 16–18 mm. long: spurs slender: follicle-body 1.5–2 cm. long.—Cliffs and bluffs, in calcareous soil, Gulf Coastal Plain, Fla. to Tex. (?).

10. DELPHINIUM [Tourn.] L. Annual or perennial erect herbs. Leaf-blades palmately lobed or dissected, the segments narrow. Flowers spreading, blue to purple, or nearly white. Sepals 5, the posterior one spurred. Petals 2 or 4, the 2 posterior ones spurred. Filaments dilated below. Carpels few or solitary, sessile, many-ovuled, becoming dry follicles.—About 125 species, natives of the north temperate zone.—LARKSPUR.—Several species are favorite garden flowers. Albinos occur in some species.

Plant annual: carpel 1: petals 2, united.
  Follicle pubescent. 1. *D. Ajacis.*
  Follicle glabrous. 2. *D. Consolida.*
Plant perennial: carpels 3: petals 4, distinct.
  Follicles erect: raceme elongated.
    Leaf-segments narrow, the ultimate divisions linear or narrowly oblong.
      Seeds strongly wing-margined, slightly rugose-squamellate. 3. *D. carolinianum.*
      Seeds not wing-margined, strongly squamellate. 4. *D. vimineum.*
    Leaf-segments relatively broad, the ultimate divisions lanceolate. 5. *D. exaltatum.*
  Follicles widely spreading: raceme short. 6. *D. tricorne.*

1. D. Ajacis L. Plant 1 m. tall or less, branched: leaf-blades with short and diverging segments: sepals blue, with suborbicular to reniform or broadly ovate blades: posterior petals 10–12 mm. long, excluding the spur: follicle-body 13–20 mm. long, pubescent, stout-tipped. — (ROCKET-LARKSPUR.)—Fields and waste places, various provinces, S. C. to Kans., Mont., and N. S. Nat. of Eu.—Sum.



2. D. Consolida L. Plant 3–9 dm. tall: leaf-blades with narrowly linear cleft or toothed segments: sepals with elliptic blades: follicle-body 7–10 mm. long, slender-tipped.—(FIELD-LARKSPUR. KNIGHT'S-SPUR. LARK-HEEL.)—Waste places, various provinces, E U. S. Nat. of Eu.—Sum.

3. D. carolinianum Walt. Plant 3–6 dm. tall, minutely pubescent above; segments of the upper leaves very narrow: spur mostly slender, longer than the other sepals: follicle-body 14–18 mm. long.—[*D. azureum* Michx.]—Sand-hills, open woods, and rocky soil, various provinces, Fla. to Tex., Mo., and Va.—Spr.–sum.

4. D. vimineum D. Don. Plant 5–7 dm. tall, closely pubescent above: segments of the upper leaves narrow: spur mostly stout, shorter than the other sepals: follicle-body 13–16 mm. long.—Dry soil, Coastal Plain, and adjoining provinces, Ala. to Tex.—Spr.

5. D. exaltatum Ait. Plant 5–20 dm. tall, minutely pubescent above: leaf-divisions cuneate to lanceolate, thin: flowers 16–22 mm. long: follicle-body 8–10 mm. long: seeds wingless.—(TALL-LARKSPUR.)—Woods and rocky soil, various provinces, chiefly W of Blue Ridge, Ala. to Nebr., Minn., and Pa.—Sum.—Has been mistaken for *D. urceolatum* Jacq.

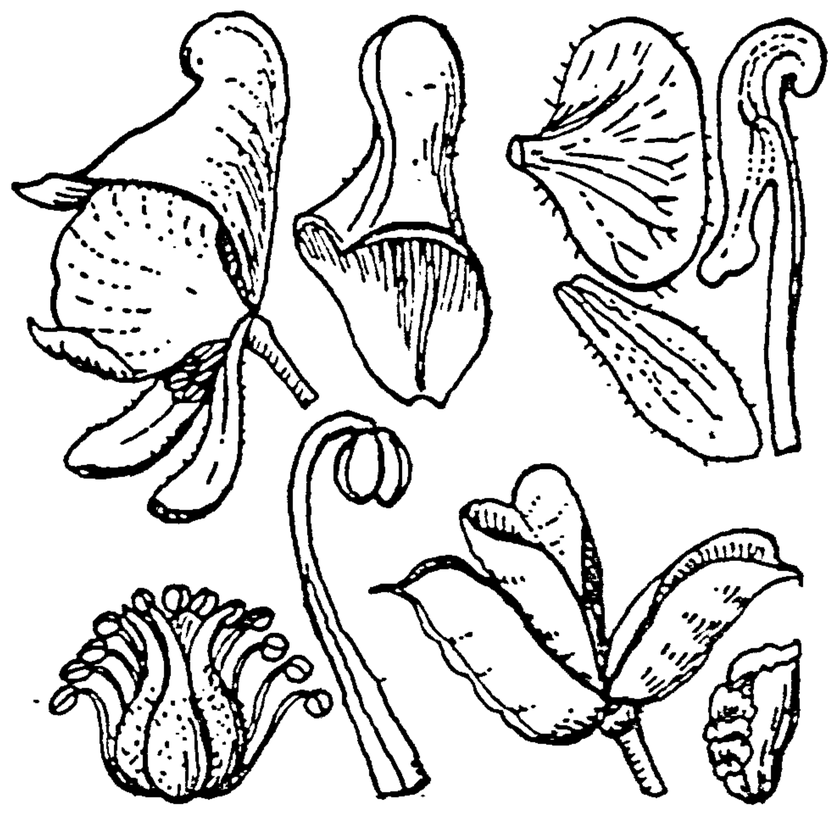
6. D. tricorne Michx. Plant 3–9 dm. tall, minutely pubescent above: leaf-divisions linear or nearly so, thick: flowers 25–35 mm. long: follicle-body 12–17 mm. long, or rarely shorter: seeds winged.—(DWARF-LARKSPUR. ROCK-LARKSPUR. STAGGERWEED.)—Woods, thickets, and rocky slopes, often in calcareous soil, various provinces, N of Coastal Plain, Ga. to Ark., Minn., and Pa.—Spr.

11. ACONITUM L. Perennial reclining or procumbent herbs. Leaf-blades palmately lobed or divided. Flowers somewhat nodding. Sepals 5, the posterior one hooded or helmet-like. Petals 2–5, the 2 posterior ones concealed in the helmet. Filaments dilated below. Carpels 3–5, many-ovuled, becoming follicles.—About 70 species, mostly in the higher parts of the north temperate zone.—MONKSHOODS. WOLFSBANES. ACONITES.

Flowers blue or purplish: hood helmet-shaped.	1. *A. uncinatum.*
Flowers white or yellowish: hood elongate-conic.	2. *A. reclinatum.*

1. A. uncinatum L. Stem ascending or reclining, 6–12 dm. tall: leaf-blades thick, the larger ones 8–10 cm. wide, the divisions mostly few-toothed: follicle 14–16 mm. long.—(CLAMBERING-MONKSHOOD. WILD-MONKSHOOD.)—Woods, vari-

ous provinces, N of Coastal Plain, Ga. to Ala., Wis., and Pa.—Sum.–fall.

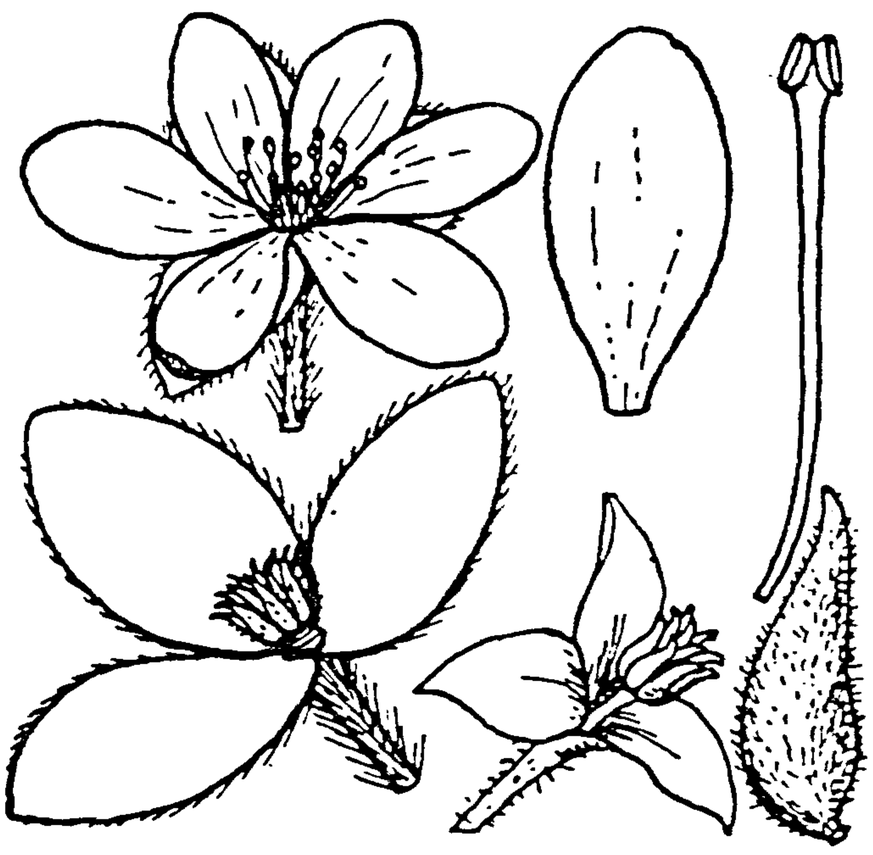


2. A. reclinatum A. Gray. Stem trailing, 5–25 dm. tall, leaf-blades thin, the larger ones 15–20 cm. wide, the divisions mostly many-toothed: follicle 8–11 mm. long.—(AMERICAN-WOLFSBANE. TRAILING-WOLFSBANE.)—Woods, Blue Ridge and Appalachian provinces, Ga. to Va.—Sum.—The wolfsbanes or monkshoods have long been known for the powerful narcotic poison contained in the roots. The first-cited popular name was derived from the use of the plant in poisoning wolves; the second name from the shape of the upper sepal.

12. HEPATICA [Rupp.] Hill. Perennial scapose tufted herbs. Leaf-blades 3-lobed, persistent. Flowers solitary on each scape, subtended by a calyx-like involucre. Sepals several, petal-like. Petals wanting. Achene-cluster seated in the involucre.—About 4 species, natives of the north temperate zone.—Wint.–spr.—LIVER-LEAF. HEPATICAS.

Lobes of the leaf-blades and bracts of the involucres obtuse. 1. *H. Hepatica.*
Lobes of the leaf-blades and bracts of the involucres acute. 2. *H. acuta.*

1. H. Hepatica (L.) Karst. Leaf-blades becoming 6–8 cm. wide, the middle lobe typically reniform: bracts of the involucre ovate to elliptic, obtuse: sepals blue, purple or white, or sometimes quite pink, 7–12 mm. long: achene-body ovoid-ellipsoid or ellipsoid, about 3 mm. long.—[*Anemone Hepatica* L.]—(BLUE-ANEMONE. SQUIRREL-CUPS.)—Rocky woods and banks, various provinces, N Fla. to Mo., Man., and N. S.



2. H. acuta (Pursh) Britton. Leaf-blades becoming 10–12 cm. wide, the middle lobe typically ovate: sepals white to bluish-purple: achene-body about 4 mm. long.—[*Anemone acutiloba* Lawson]—(SHARP-LOBE-LIVERLEAF.)—Rich woods, often in calcareous soil, Blue Ridge and more N provinces, Ga. to Mo., Minn., and Que.

13. ANEMONE [Tourn.] L. Perennial scapose herbs with rootstocks. Leaf-blades lobed, divided, or dissected, not persistent. Flowers subtended by a foliaceous involucre. Sepals 4–20, petal-like. Petals wanting. Filaments filiform. Achene-cluster long-peduncled.—About 85 species, widely distributed in temperate and arctic regions.—ANEMONES. WIND-FLOWERS.

Achene densely long-woolly: fruit-head cottony at maturity.
  Rootstock tuberous: scape simple, 1-flowered. I. DECAPETALAE.
  Rootstock elongate: scape mostly branched, several-flowered. II. VIRGINIANAE.
Achene finely or obscurely pubescent: fruit-head not cottony. III. QUINQUEFOLIAE.

I. DECAPETALAE

Involucre mostly above the middle of the scape: tips of the achenes not projecting beyond the wool. 1. *A. decapetala.*

Involucre mostly below the middle of the scape: tips of the achenes projecting beyond the wool. 2. *A. caroliniana.*

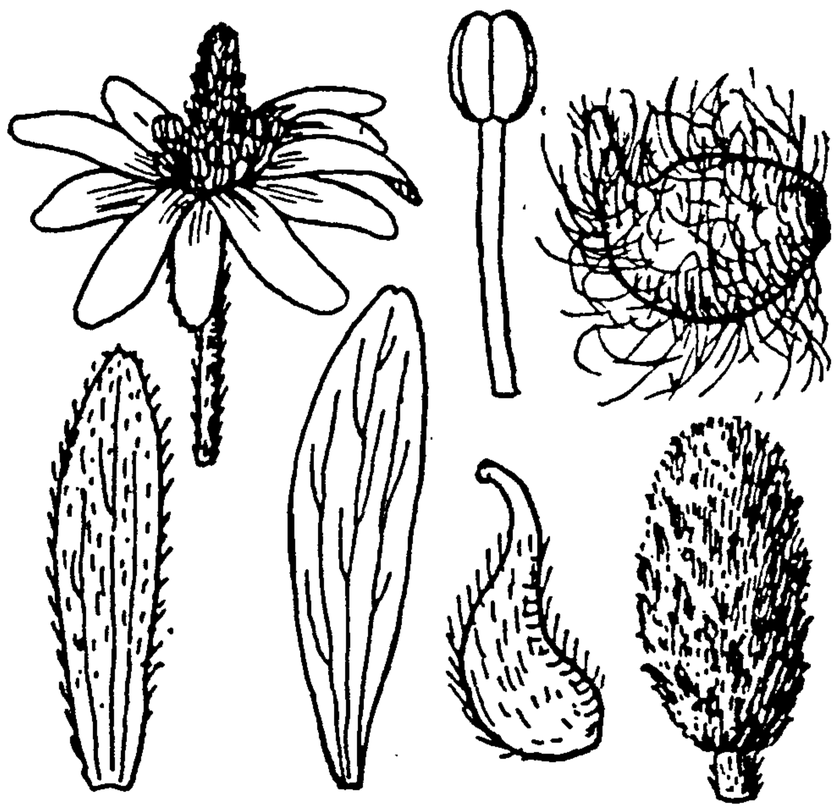
II. VIRGINIANAE

Sepals greenish: head of fruit mostly over 1 cm. thick: achene with a spreading style. 3. *A. virginiana.*
Sepals clear white: head of fruit mostly less than 1 cm. thick: achene with an appressed or ascending style. 4. *A. riparia.*

III. QUINQUEFOLIAE

Divisions of the involucral bracts lobed or incised, membranous. 5. *A. quinquefolia.*
Divisions of the involucral bracts merely toothed, leathery at maturity. 6. *A. lancifolia.*

1. A. decapetala Ard. Plant 1–3 dm. tall: leaf-segments ovate to obovate or cuneate, 1–2 cm. long: bracts of the involucre very different from the leaves: sepals pink or greenish-white: head of fruit cylindric, 2–3.5 cm. long: achene buried in wool.—Rich prairies, ravines, and hillsides, various provinces, Ala. to Tex. and Ark.—(*Mex.*)—Spr.



2. A. caroliniana Walt. Plant 1–2.5 dm. tall: leaf-segments narrower than those of *A. decapetala* and commonly quite similar to those of the bracts: sepals 6–20, purple or white: head of fruit ellipsoid, 1.5–2 cm. long: achene with a projecting tip.—Dry rich or stony soil, various provinces, Fla. to Tex., S. D., Wis., and N. C.

3. A. virginiana L. Plant 5–10 dm. tall: leaf-blades 3-parted, the divisions sharply lobed, incised and toothed: bracts of the involucre similar to the leaves: sepals greenish, mostly 8–13 mm. long, concave: head of fruit ellipsoid.—(THIMBLEWEED.)—Meadows, thickets, and woods, various provinces, Ga. to Ark., Alb., and N. S.—Sum.

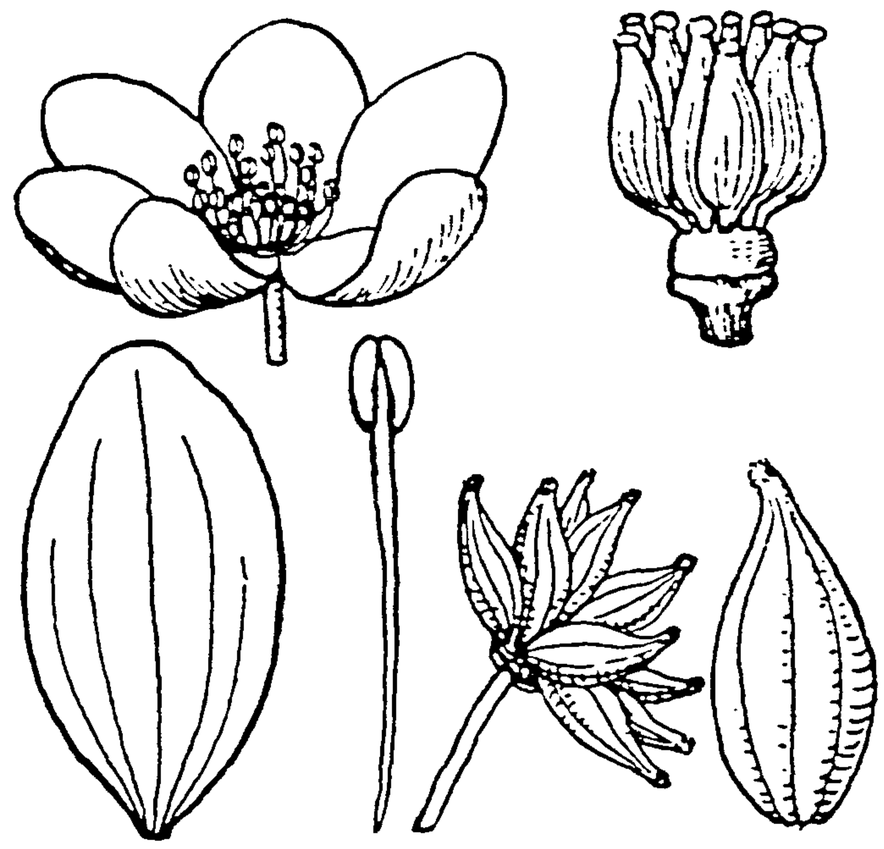
4. A. riparia Fernald. Plant 3–9 dm. tall: leaf-blades 3-parted, the divisions rather less sharply incised and toothed than in *A. virginiana*: bracts of the involucre similar to the leaves: sepals mostly 20–30 mm. long, flat: head of fruit cylindric.—(MOUNTAIN-THIMBLEWEED. WIND-WAIF.)—Banks, often calcareous stony soil, Blue Ridge and more northern provinces, N. C. to Tenn., Alb., and Que.—Sum.

5. A. quinquefolia L. Plant 1–2.5 dm. tall: leaf-divisions mainly lobed or parted: bracts of the involucre similar to the leaves: sepals white, usually purplish on the under side, mainly 1–1.5 cm. long: head of fruit globular, 1 cm. in diameter or less: achene slightly less than 4 mm. long, about 1.5 mm. wide.—(NIGHTCAPS. SNOWBOYS. WOOD-ANEMONE.)—Moist woods and thickets, various provinces, in Coastal Plain only N, Ga. to Ala., Ont., and N. S.—Spr.—Has been confused with *A. nemorosa* L. of Europe.

6. A. lancifolia Pursh. Plant 1–4 dm. tall: leaf-divisions merely toothed: sepals mainly 2–2.5 cm. long: achene slightly over 4 mm. long.—(MOUNTAIN-ANEMONE.) Woods, often in acid soil, Blue Ridge, extending into adjoining provinces, Ga. to Pa.—(*Eu.*)—Spr.—Has been confused with *A. trifolia* L.

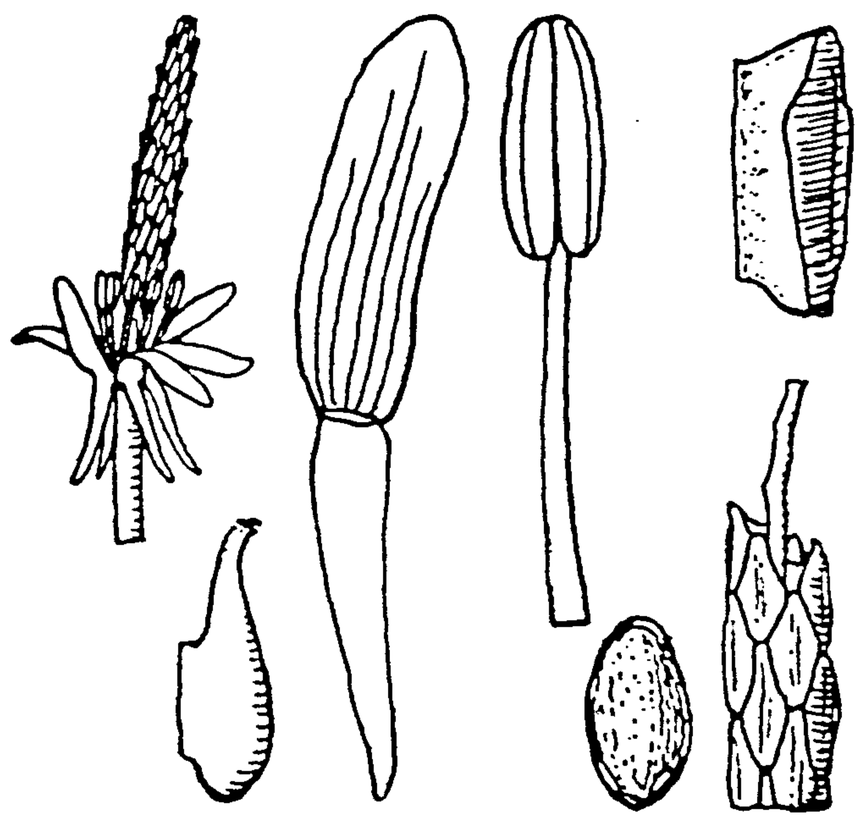
14. SYNDESMON Hoffmg. Perennial scapose herbs with tuberous roots. Leaf-blades 2–3-ternate. Flowers in an umbellate cluster, the involucre foli-

aceous. Sepals 5–10, petal-like. Petals wanting. Filaments clavate. Achene-cluster peduncled.—One species.



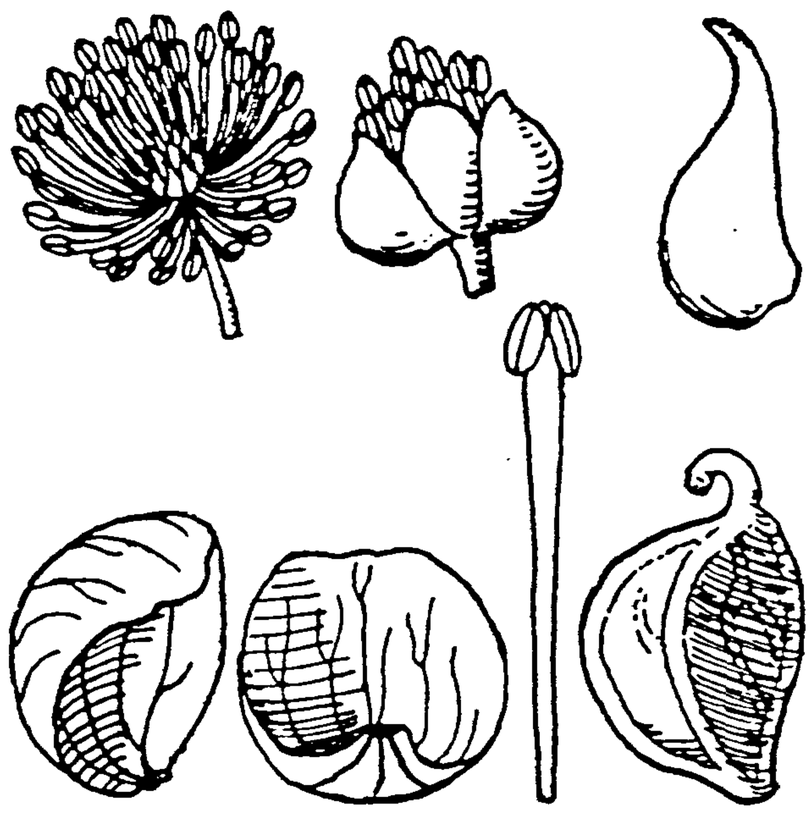
1. S. thalictroides (L.) Hoffmg. Plant 1–2.5 dm. tall: leaflets 1–2.5 cm. long, mostly 3-lobed: sepals 5–10, white or pinkish, 9–15 mm. long: achene 4–6 mm. long, or sometimes longer, ribbed. [*Anemonella thalictroides* Spach]—(RUE-ANEMONE. WILD-RUE. WIND-FLOWER.)—Moist woods and thickets, various provinces, N Fla. to Ark., Kans., Ont., and N. H.—Spr.–sum.—Plants occur with red leaves and pink flowers. The tuberous roots resemble miniature dahlia tubers.

15. MYOSURUS L. Annual diminutive acaulescent herbs. Leaf-blades narrow, entire. Flower solitary. Sepals 5, or 6 or 7, separated at the base. Petals 5, or 6 or 7, the claws, each with a pit at the summit, or wanting. Stamens 5–25: filaments filiform. Carpels many, on a greatly elongating receptacle. Achenes firm, imbricate.—About 5 species, widely distributed.



1. M. minimus L. Plant 2.5–15 cm. tall: leaves 5–10 cm. long; blades narrowly linear: flowers yellow: sepal-blades elliptic-spatulate: spike of achenes often 2–3 cm. long.—(MOUSE-TAIL.)—Moist alluvial or calcareous soil, various provinces, Fla. to N. M., Sask., Ont., and Va.; also on the Pacific coast.—(*Eu.*)—Spr.–sum.

16. TRAUTVETTERIA F. & M. Perennial large caulescent herbs. Leaf-blades broad, palmately lobed. Flowers corymbose-paniculate. Sepals 3–5, concave. Petals wanting. Stamens many: filaments clavate. Carpels numerous, on a short receptacle. Achenes inflated.—One or two species, North American and Asiatic.

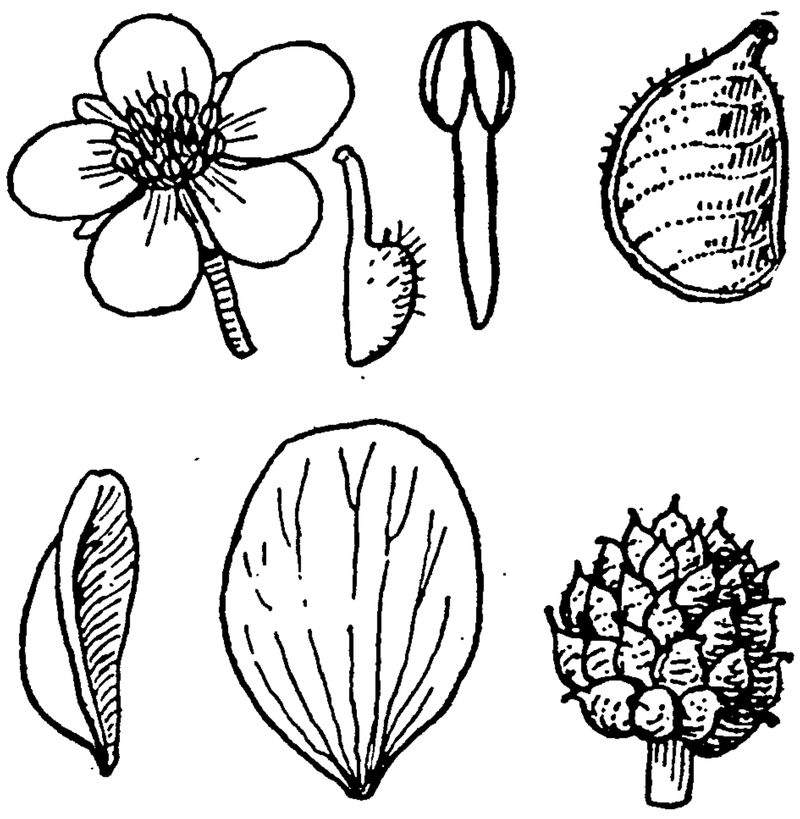


1. T. carolinensis (Walt.) Vail. Plant 4–15 dm. tall: leaf-blades deeply lobed, those of the lower leaves mainly 1–3 dm. wide, the lobes sharply toothed or incised: flowers white: sepals 4–5 mm. long: achene 4.5–5 mm. long. [*T. palmata* Fish. & Mey.]—(FALSE-BUGBANE. TASSEL-RUE.)—Woods and shaded stream-banks, various provinces, Coastal Plain only on river-bluffs toward the Gulf, W Fla. to Mo. and W. Pa.—Spr.–sum.—Plants in which the ribs of the achene are branched, thus making a vein through the usual plane faces of the achene, have been described as *T. nervata*.

17. BATRACHIUM S. F. Gray. Perennial aquatic or ditch herbs. Leaf-blades dissected or palmately lobed, the segments often narrow. Flowers on peduncles opposite the leaves. Sepals 5. Petals usually 5, mainly white, each claw with a pit. Stamens several–many. Achenes oblique, compressed, transverse-wrinkled, often nearly or quite beakless.—Spr.–fall.—(WATER-CROWFOOTS. FROGWEEDS.)—About 20 species, of wide geographic distribution.

Leaf-segments 10–15 mm. long, firm: blades scarcely collapsing when withdrawn from the water. 1. *B. trichophyllum.*
Leaf-segments 15–30 mm. long, flaccid: blades collapsing when withdrawn from the water. 2. *B. flaccidum.*

1. B. trichophyllum (Chaix) Bosch. Leaves firm, 3–5 cm. long, the segments mostly 10–15 mm. long; stipules short and broad, pubescent: petals 5–8 mm. long: head of achenes 4–5 mm. in diameter. [*Ranunculus aquatilis trichophyllus* A. Gray]—WHITE WATER-CROWFOOT.)—Ponds, springs, and spring-runs, various provinces, N. C. to Calif. and S Can.—(*Mex., O. W.*)



2. B. flaccidum (Pers.) Rupr. Similar to the preceding species: leaves with longer and more slender petioles, and very long slender segments.—Streams, various provinces, N. C. to Calif., Wash., S Can., and Mass.—(*Mex., O. W.*)

18. RANUNCULUS [Tourn.] L. Annual or perennial herbs. Leaf-blades entire, lobed, or divided. Flowers solitary or variously disposed. Sepals mostly 5, deciduous. Petals as many as the sepals or more, or rarely fewer, each with a pit or scale at the base. Carpels several or numerous. Achenes generally flattened, smooth, papillose, or echinate.—About 275 species, most abundant in temperate and cold regions.—BUTTERCUPS. CROWFOOTS. GOLD-CUPS.

Aquatic plants: submerged leaves with dissected blades; floating leaves with lobed blades. I. MULTIFIDI.
Terrestrial or mud-inhabiting plants: leaves with entire, toothed, lobed, or divided blades.
  Leaf-blades linear to oval, entire, crenate or denticulate. II. FLAMMULAE.
  Leaf-blades, at least some of them, lobed or divided.
    Achene turgid, marginless. III. ABORTIVI.
    Achene more or less flattened, margined or variously roughened.
      Achene smooth.
        Achene-beak distinctly hooked. IV. RECURVATI.
        Achene-beak straight or nearly so. V. REPENTES.
      Achene variously roughened. VI. MURICATI.

I. MULTIFIDI

Lower leaves with finely dissected, often thrice 3-cleft blades. 1. *R. delphinifolius.*

II. FLAMMULAE

Annuals: achene beakless.
  Head of fruit cylindric to ellipsoid. 2. *R. tener.*
  Head of fruit globose to ovoid.
    Achene papillose. 3. *R. Lindheimeri.*
    Achene smooth.
      Petals mostly less than 3 mm. long. 4. *R. pusillus.*
      Petals mostly over 3 mm. long.
        Petals less than 6 mm. long, mostly 5: 5. *R. oblongifolius.*
        Petals over 6 mm. long, mostly more than 5: 6. *R. mississippiensis.*
Perennial: stems creeping: achene with a subulate beak. 7. *R. obtusiusculus.*

III. ABORTIVI

Basal leaves with all or some of the blades crenate: stem not hollow.
  Style very short.
    Basal leaves with cordate blades: foliage glabrous or nearly so. 8. *R. abortivus.*
    Basal leaves with truncate or cuneately narrowed blades: foliage pubescent. 9. *R. micranthus.*
  Style subulate, hooked nearly ½ as long as the achene-body. 10. *R. allegheniensis.*
Basal leaves with all blades lobed or divided: stem hollow. 11. *R. sceleratus.*

IV. RECURVATI

Leaf-blades with broadly cuneate lobes. 12. *R. recurvatus.*

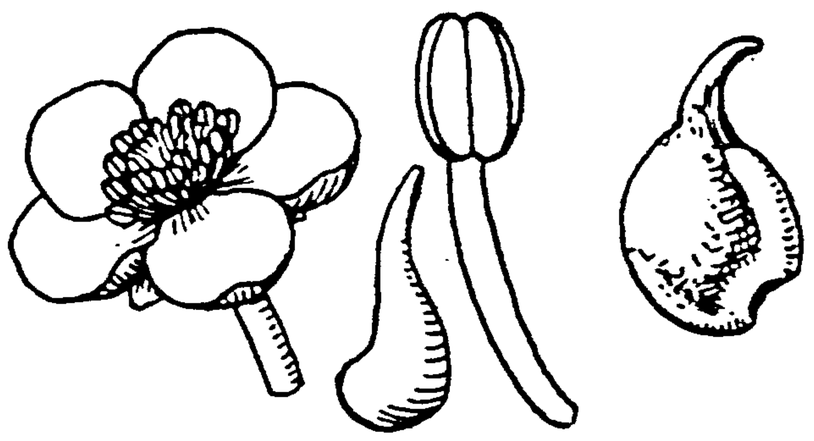
V. REPENTES

Achene with a beak less than ½ as long as the body.
  Petals about as long as the sepals: head of fruit ellipsoid or cylindric. 13. *R. pennsylvanicus.*
  Petals much longer than the sepals: head of fruit subglobose.
    Stem spreading and creeping, stoloniferous. 14. *R. repens.*
    Stem erect, not stoloniferous.
      Sepals spreading: leaf-blades digitately divided. 15. *R. acris.*
      Sepals reflexed: leaf-blades pinnately divided. 16. *R. bulbosus.*
Achene with a beak over ½ as long as the body; beaks sometimes partially deciduous.
  Carpels or achenes few. 17. *R. palmatus.*
  Carpels or achenes numerous.
    Plant stoloniferous: foliage glabrous or nearly so. 18. *R. septentrionalis.*
    Plant not stoloniferous: foliage copiously pubescent, except sometimes in age.
      Stem with silky or appressed pubescence. 19. *R. fascicularis.*
      Stem with spreading pubescence. 20. *R. hispidus.*

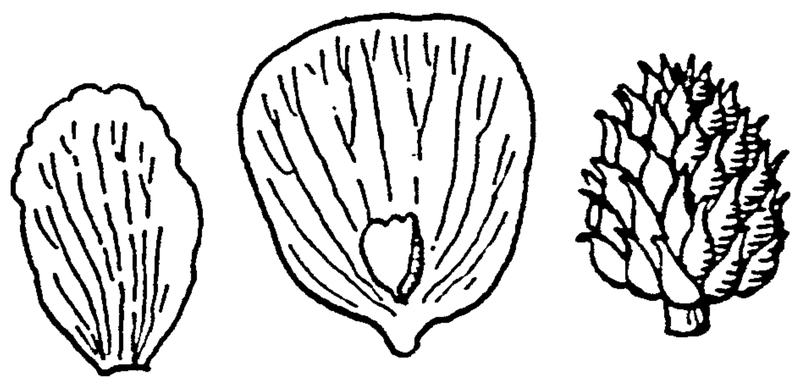
VI. MURICATI

Achene more or less papillose; beak minute.
  Corollas 2–3 cm. broad: achene sparingly papillose near the edges. 21. *R. parvulus.*
  Corollas 2–5 mm. broad: achene papillose all over. 22. *R. parviflorus.*
Achene muricate or spiny; beak about ½ as long as the body. 23. *R. muricatus.*

1. R. delphinifolius Torr. Stem mostly glabrous, 1–6 dm. long: blades of the emersed leaves smaller than those of the submersed: petals 5–8, 8–16 mm. long: head of fruit ellipsoid to nearly globose: achene-body about 2 mm. long, wide-margined below, the beak fully ½ as long as the body.—(WATER-BUTTERCUP.)—Ponds, various provinces, rarely Coastal Plain, N. C. to Kans., Mich., Ont., and Mass.—Sum.



2. R. tener C. Mohr. Stem glabrous, 0.5–6 dm. tall: blades of the lower leaves ovate to ovate-lanceolate, 1–3.5 cm. long, those of the upper ones much narrower: petals 1–3, or rarely 5, 1–2.5 mm. long: head of fruit cylindric to ellipsoid, 1.5–2.5 mm. thick: achene-body obovoid, nearly 1 mm. long, scarcely beaked. [*R. trachyspermus* Engelm. not Ell.]—Swamps and low woods, Coastal Plain, and adj. provinces, Ala. to Tex.—Spr.



3. R. Lindheimeri Engelm. Stem mostly glabrous, 1–4 dm. tall: blades of the lower leaves ovate to elliptic, 1–3 cm. long, those of the upper leaves narrower: petals mostly 1–3, 1–2 mm. long: head of fruit ovoid to globose, 2–3 mm. thick:

achene-body obovoid, about 1 mm. long, minutely beaked.—Ponds and low grounds, various provinces, Ala. to Calif. and Ark.—Sum.

4. R. pusillus Poir. Stem glabrous, 1–4 dm. tall: blades of the basal leaves ovate to oblong, 1–4 cm. long, those of the upper leaves mostly linear: petals mostly 1–3, 1–3 mm. long: head of fruit ovoid, 3–4 mm. thick: achene-body ellipsoid or ellipsoid-obovoid, about 1.5 mm. long, somewhat flattened.—(LESSER SPEARWORT.)—Marshes, various provinces, Fla. to Tex., Mo., and N. Y.—Spr.–sum.

5. R. oblongifolius Ell. Stem mostly pubescent below, 1–5 dm. tall: blades of the lower leaves ovate to elliptic, 1–4 cm. long, undulate to denticulate, those of the upper leaves narrow, commonly remotely toothed: petals mostly 5, 3.5–5.5 mm. long: head of fruit 3–4 mm. thick: achene-body obovoid, about 1 mm. long, turgid, margined within at the base.—(MANY-FLOWERED SPEARWORT.)—Swamps, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Va.—Spr.–sum.

6. R. mississippiensis Small. Stem sometimes pubescent below, 2–3 dm. tall: blades of the lower leaves ovate, 2–6 cm. long, crenate or undulate-crenate, those of the upper leaves narrow, more sharply and remotely toothed: petals more than 5, 7–8 mm. long: head of fruit 3–5 mm. in diameter: achene-body suborbicular, about 1.5 mm. long.—Alluvial soil, Coastal Plain, Miss. to Ark.—Spr.

7. R. obtusiusculus Raf. Stem stout, glabrous, 3–12 dm. long: leaf-blades linear to lanceolate, 8–15 cm. long, denticulate or entire: petals 5–7, 5–8 mm. long: head of fruit globose or nearly so, 4.5–6 mm. thick, or longer: achene-body orbicular-obovoid, about 2 mm. long, the subulate deciduous beak horizontal. [*R. ambigens* S. Wats.]—(WATER-PLANTAIN SPEARWORT.)—Swamps and marshes, various provinces, Coastal Plain only N, Ga. to Mo., Minn., Ont., and Me.—Sum.

8. R. abortivus L. Stem 1.5–6 dm. tall, glabrous or nearly so: blades of the lower leaves reniform to suborbicular, 2–4 cm. wide, mostly crenate: petals pale-yellow, 2–3 mm. long: head of fruit ellipsoid to cylindric: achene-body fully 1.5 mm. long, very minutely beaked.—(KIDNEY-LEAF BUTTERCUP.)—Moist ground and thickets, various provinces, Fla. to Ark., Colo., Man., and Lab.—Spr.

9. R. micranthus Nutt. Stem typically more slender than in *R. abortivus*, pubescent: blades of the lower leaves cuneate to ovate, 1–3 cm. long, mostly crenate-lobed or parted: petals light-yellow, 2–3 mm. long: head of fruit ellipsoid to ovoid-ellipsoid: achene-body barely 1.5 mm. long, minutely short-beaked.—Woods and rocky hillsides, various provinces N of Coastal Plain, Ga. to Ark., Colo., Sask., and Me.—Spr.

10. R. allegheniensis Britton. Stem 2–6 dm. tall, glabrous: blades of the lower leaves reniform to orbicular-reniform, 1.5–4 cm. long, commonly crenate-lobed: petals 1.5–2.5 mm. long: head of fruit mainly ovoid: achene-body fully 1.5 mm. long, with a slender curved beak.—Woods, Blue Ridge and more northern provinces, N. C. to Ala. and Mass.—Spr.

11. R. sceleratus L. Stem stout, 1.5–6 dm. tall, glabrous or nearly so: leaf-blades thick, the divisions cuneate, lobed: sepals ovate to suborbicular: petals bright-yellow, 3–5 mm. long: head of fruit cylindric to ellipsoid, the receptacle glabrous or sparingly pubescent: achene-body fully 1 mm. long, minutely beaked, thick-margined, the faces uneven.—(CELERY-LEAVED BUTTERCUP. DITCH-CROWFOOT. CURSED-CROWFOOT.)—Wet places and swamps, sometimes in saline soil, various provinces, throughout the U. S. and S Can.; also in Alas.—Nat. of Eu., whence apparently introduced into part of America.—Spr.–sum.

12. R. recurvatus Poir. Stem slender, 1.5–7 dm. tall, hirsute: leaf-blades thinnish, the divisions rhombic to ovate, toothed and sometimes also lobed: sepals mainly lanceolate: petals pale-yellow, 3–5 mm. long: head of fruit globular, the receptacle hispid: achene-body fully 2 mm. long, long-beaked, thin-margined, the faces granular.—(BLISTERWORT. HOOKED-BUTTERCUP.)—Rich woods and swamps, various provinces, Fla. to Miss., Kans., Man., and N. S.—Spr.

13. R. pennsylvanicus L. f. Stem erect, 3–7 dm. tall, hispid: leaf-blades thinnish, the divisions relatively narrow, irregularly sharp-toothed: petals pale-yellow, 2–4.5 mm. long: head of fruit cylindric to ellipsoid: achene-body about 2 mm. long, prominently beaked.—(BRISTLY-BUTTERCUP.)—Low grounds and river-banks, various provinces, Ga. to Ark., B. C., and N. S.—Sum.

14. R. repens L. Stem creeping, 1–8 dm. long, hirsute or glabrate: leaf-blades thickish, the divisions broad, coarsely toothed or lobed: petals bright-yellow, 10–13 mm. long: head of fruit globose: achene-body 3 mm. long, minutely beaked, narrow-margined.—(BUTTERROSE. CREEPING-BUTTERCUP. GOLD-WEED. HORSE-GOLD. MAT-BUTTERCUP. MEG-MANY-FEET.)—Fields, roadsides, and low grounds, various provinces, N of Coastal Plain, N. C. to Mo., B. C., Ont., and Newf. Nat. of Eu.—(*W. I.*)—Spr.–sum.

15. R. acris L. Stem 2–11 dm. tall, loosely pubescent: leaf-blades pedately mostly 5-divided, the divisions broad, sharp-toothed, the middle division not stalked: petals bright-yellow, about 1 cm. long: head of fruit globose: achene-body about 3 mm. long, obscurely margined, minutely fine-beaked.—(MEADOW-BUTTERCUP. TALL-BUTTERCUP.)—Woods, fields, and roadsides, various provinces, N. C. to Mo., B. C. and Newf. Nat. of Eu.—Spr.–sum.

16. R. bulbosus L. Stem 1.5–5 dm. tall, rather appressed-pubescent: leaf-blades thick, the divisions pinnate, broad, blunt-toothed: petals bright-yellow, 7–11 mm. long: head of fruit globose: achene-body about 3 mm. long, prominently margined, minutely stout-beaked.—(MEADOW-GOLD. TURNIP-BUTTERCUP.)—Roadsides, fields, and meadows, various provinces, N. C. to La., N. Y., and Me. Nat. of Eu.—Spr.–sum.

17. R. palmatus Ell. Stem 1–6.5 dm. long, sparingly appressed-pubescent or glabrate: leaf-blades thin, the divisions shallowly few-toothed and sometimes lobed: petals pale-yellow, 6–10 mm. long: head of fruit globose: achenes few in a head, the body about 3 mm. long, the broad beak nearly as long. [*R. septentrionalis nitidus* Chapm.]—Swamps and low woods, Coastal Plain and adj. provinces, Fla. to Tenn. and S. C.—Spr.

18. R. septentrionalis Poir. Stem 3–12 dm. long, glabrous or pubescent: leaf-blades thickish, the divisions incised-toothed and often lobed: petals bright-yellow, 10–14 mm. long: head of fruit globose to oval: achene-body 4–5 mm. long, wide-margined, the slender beak shorter than the body.—(SWAMP-BUTTERCUP.)—Low grounds and swamps, various provinces, Ga. to Tex., Man., and N. B.—Spr.–sum.

19. R. fascicularis Muhl. Stem 1–3 dm. tall, densely silky: leaf-blades thick, those of the lower leaves with typically cuneate-flabellate lobed or parted divisions: petals 8–14 mm. long: head of fruit globose: achene-body 2.5–3 mm. long, slightly margined, the beak as long, slender. [*R. apricus* Greene]—(EARLY-CROWFOOT. EARLY WOOD-BUTTERCUP.)—Woods and thickets, various provinces N of Coastal Plain, Ga. to Tex., Kans., Ont., and Mass.—Spr.—The roots of this species are tuber-like and clustered; the roots of the next preceding and next following species are more or less clustered, but they are long and slender.

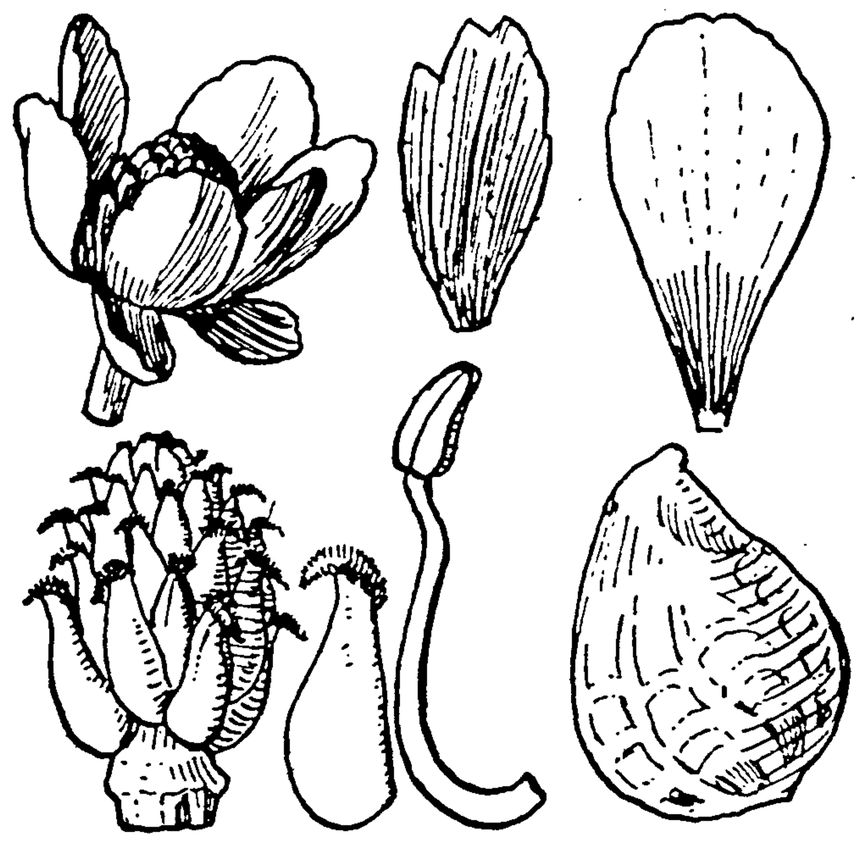
20. R. hispidus Michx. Stem 2–6 dm. tall, hirsute or villous-hirsute: leaf-blades pubescent, those of the lower leaves generally 3-parted, the divisions suborbicular to cuneate, incised, lobed, or sometimes parted: petals 9–16 mm. long: head of fruit globose to oval: achene-body 2.5–3 mm. long, slightly margined, the beak about ½ as long as the body. [*R. septentrionalis marilandicus* Champ.]—(BRISTLY-BUTTERCUP.)—Woods and thickets, various provinces, in Coastal Plain only N, Ga. to Ark., N. D., and Ont.—Spr.

21. R. parvulus L. Stem erect, 1.5–4 dm. tall, strigillose or somewhat hirsute: leaf-blades pubescent, those of the lower leaves mostly parted, the divisions incised or lobed: petals 7–11 mm. long: head of fruit ellipsoid or oval: achene-body 2–2.5 mm. long, minutely beaked, the faces papillose.—Waste-places, especially on ballast, Coastal Plain and New England Coast, Ga. to N. B. Nat. of Eu.—Sum.

22. R. parviflorus L. Stem diffuse, 1–3 dm. long, villous: leaf-blades finely pubescent, those of the lower leaves mostly lobed and toothed: petals 1–2 mm. long: head of fruit globose: achene-body about 2 mm. long, papillose all over, minutely beaked.—Waste-places and fields, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and Md. Nat. of Eu.—(*W. I.*)—Spr.–sum.

23. R. muricatus L. Stem 2–6 dm. tall, glabrous or nearly so: leaf-blades often with scattered hairs, those of the lower ones mostly 3-lobed and scarcely toothed or incised: petals 5–8 mm. long: head of fruit globose: achene-body 4–5 mm. long, prominently beaked, the faces spiny.—Waste-places, various provinces, Fla. to Tex., Calif., and Va. Nat. of Eu.—Widely distributed.—Spr.–sum.

19. ADONIS L. Annual or perennial herbs. Leaf-blades pinnately dissected. Flower solitary, terminal. Sepals often 5, broad. Petals 5–16, larger than the sepals. Filaments filiform. Carpels numerous. Achenes crowded at the rachis.—About 6 species, Eurasian.



1. A. annua L. Stem 2–6 dm. tall: leaf-blades 2–5 cm. long: sepals 6–9 mm. long: petals orange or red, 8–12 mm. long: head of achenes cylindric, 1–2 cm. long: achene 3–5 mm. long.—(PHEASANT'S-EYE. BIRD'S-EYE. ADONIS'-FLOWER.)—Waste-places and fields, various provinces, E U. S. to Tex. Nat. of Eu.—Spr.–sum.—This is a showy plant, but it has the habit of weeds in springing up in newly formed land. For example, on newly made levees along the Mississippi River it comes up in great quantities. The petals usually have a dark spot at the base.

20. THALICTRUM [Tourn.] L. Perennial herbs. Leaf-blades ternately decompound. Flowers perfect, polygamous, or dioecious, often numerous, white or greenish. Sepals 4–5. Petals wanting. Stamens numerous, conspicuous. Carpels commonly few. Achenes ribbed or nerved, sometimes stipitate.—About 85 species, mostly in the north temperate zone.—MEADOW-RUES.—Several species have found their way into ornamental gardening, being admired for their myriad miniature tassels of stamens or the mist-like effect when planted *en masse*.

Flowers perfect: filaments petal-like: carpels long-stipitate. I. CLAVATA.
Flowers dioecious or polygamous: filaments not petal-like: carpels short-stipitate or sessile. II. DIOICA.

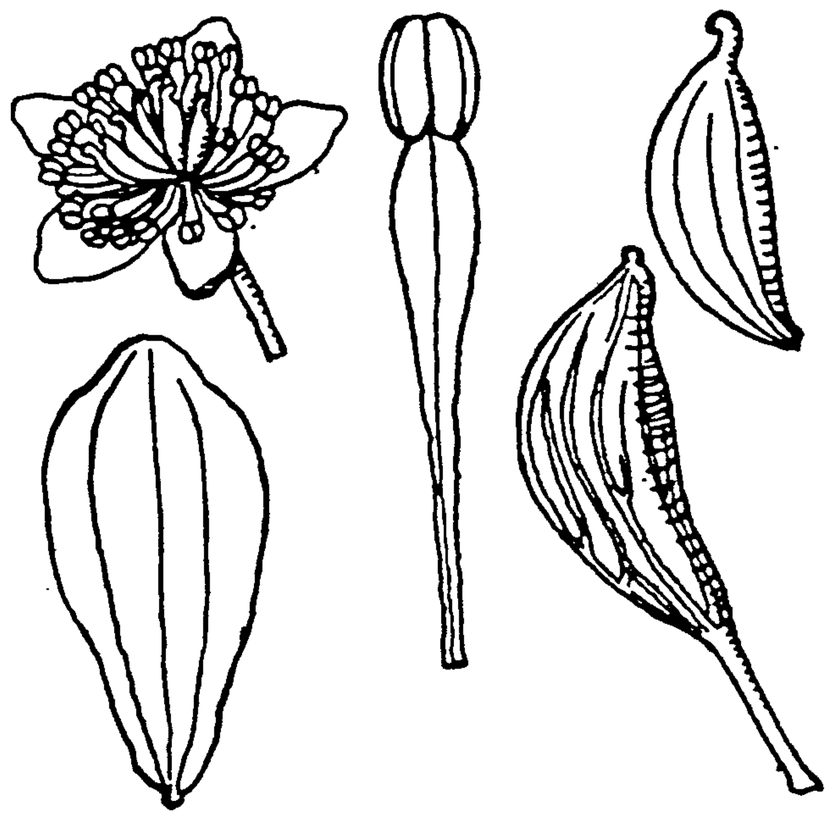
I. CLAVATA

Achene curved along the upper edge, the body longer than the stipe. 1. *T. clavatum.*
Achene straight along the upper side, the body shorter than the stipe. 2. *T. mirabile.*

II. DIOICA

Filaments subulate or filiform.
  Flowers dioecious: leaflets not waxy-granular beneath.
    Achenes distinctly stipitate.
      Achene-body oval: anther 3–4 mm. long: sepals of the staminate flowers 2.5–3.5 mm. long. 3. *T. coriaceum.*
      Achene-body ellipsoid: anther 5–6 mm. long: sepals of the staminate flowers 4.5–5.5 mm. long. 4. *T. caulophylloides.*
    Achenes not stipitate.
      Stem procumbent: stamens less than 18. 5. *T. debile.*
      Stem erect: stamens more than 18. 6. *T. dioicum.*
  Flowers polygamous: leaflets waxy-granular beneath. 7. *T. revolutum.*
Filaments spatulate, often broader than the anthers.
  Leaflets entire or nearly so: flowers nearly dioecious: achene-body 3–4 mm. long. 8. *T. macrostylum.*
  Leaflets strongly lobed: flowers polygamous: achene-body 4–5 mm. long.
    Achene sessile or nearly so: leaflets green beneath. 9. *T. polygamum.*
    Achene stipitate: leaflets glaucous beneath. 10. *T. perelegans.*

1. T. clavatum DC. Plant 1.5–6 dm. tall: blades of the leaflets thin, 1.5–3 cm. long, prominently lobed: achene scimitar-shaped, about 7 mm. long, the stipe shorter than the flat body.—(MOUNTAIN MEADOW-RUE. LADY-RUE.)—About brooks, Blue Ridge, and adj. provinces, Ga. to Ala., W. Va., and Va.—Spr.–sum.



2. T. mirabile Small. Plant 1–3 dm. tall: blades of the leaflets very thin, 2–3 cm. long, shallowly lobed: achene clavate, about 7 mm. long, the stipe longer than the turgid body.—Sandstone bluffs, Little Mt. in the Appalachian Plateau, Ala.—Spr.

3. T. coriaceum (Britton) Small. Plant 9–16 dm. tall: blades of the leaflets thickish, the terminal ones 2.5–4 cm. wide: carpel stipitate: achene-body 3–4 mm. long.—(MAID-OF-THE-MIST.)—Woods, Blue Ridge and Appalachian provinces, N. C. to Tenn., Ky., and Va.—Spr.–sum.

4. T. caulophylloides Small. Plant 6–18 dm. tall: blades of the leaflets thickish, the terminal ones 4–9 cm. wide: carpels stipitate: achene-body 4–6 mm. long.—Open woods, Blue Ridge and Appalachian provinces, extending into Piedmont along river valleys, Tenn. to Ky. and Md.—Spr.–sum.

5. T. debile Buckl. Plant 1–4.5 dm. tall: blades of the leaflets 6–15 mm. wide, mostly rounded or subcordate at the base: style slender, fully twice as long as the ovary: achene-body slender-ribbed, with a long and very slender beak.—Rich woods, Coastal Plain and adj. provinces, Ga. to Ark.—Spr.

6. T. dioicum L. Plant 3–6 dm. tall: cauline-leaves with long petioles; blades of the leaflets thin, the terminal ones 1.5–3 cm. wide, lobed: carpel sessile: achene-body 3–4 mm. long, abruptly beaked, blunt-ribbed.—(EARLY MEADOW-RUE. SPRING MEADOW-RUE.)—Rocky hillsides and woods, various provinces, in Coastal Plain only N, Ga. to Mo., Sask., and Lab.—Spr.

7. T. revolutum DC. Plant 9–20 dm. tall, the stem usually glabrous: blades of the leaflets thickish, glaucous beneath and becoming veiny, slightly revolute, the terminal one 3-lobed at the apex: achene-body ellipsoid, sharply ribbed, sessile or short-stipitate. [*T. purpurascens* (Fl. SE. U. S.)—SKUNK MEADOW-RUE.)—Woods and swamps, various provinces, Fla. to Ariz., Sask., and N. S.—Sum.

8. T. macrostylum (Shuttlw.) Small & Heller. Plant 5–15 dm. tall: blades of the leaflets thick, predominantly entire, glaucous beneath, the terminal one 5–15 mm. wide, but usually less than 10 mm.: achene-body oval, abruptly beaked.—Meadows, marshes, and lime-sinks, Coastal Plain, and adj. provinces, W Fla. to Ala. and Va.—Spr.

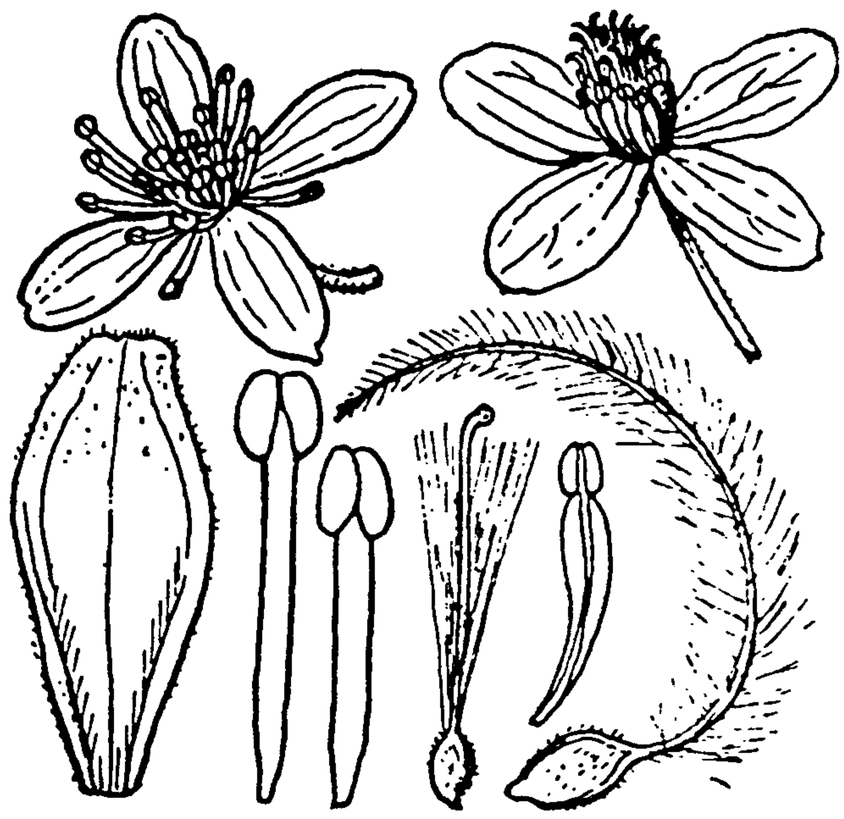
9. T. polygamum Muhl. Plant 9–30 dm. tall: cauline leaves sessile; blades of the leaflets thinnish, prominently lobed, green beneath, the terminal one mainly 1.5–4 cm. wide: filaments filiform-clavate: achene-body narrowly ellipsoid, gradually beaked, sharp-ridged.—(FEATHER-COLUMBINE. FENN-RUE. SUMMER MEADOW-RUE. TALL MEADOW-RUE.)—Swamps and low meadows, various provinces, Fla. to Ohio and Lab.—Sum.

10. T. perelegans Greene. Similar to *T. polygamum* in habit, the foliage bright-green and glaucous: cauline leaves rather large; blades of the leaflets thinnish, decidedly glaucous and finely pubescent beneath, narrowly obovate to reniform, with three broad apical mucronate lobes, mostly 1–2.5 cm. wide: filaments slender-clavate: achene-body broadly ellipsoid, narrowed at both ends, glabrous, decidedly stipitate, often slenderly so.—Woods, Blue Ridge and adj. provinces, E Tenn.—Sum.–fall.

21. CLEMATIS L. Perennial herbaceous vines. Leaf-blades 3–several-foliolate. Flowers dioecious or polygamo-dioecious, in broad paniculate cymes. Sepals relatively small, but petaloid, without a border, thin, spreading, white or pale. Petals wanting. Stamens spreading: anthers short, blunt. Carpels several. Achenes with silky or plumose styles.—About 25 species, of very wide distribution.—VIRGIN'S-BOWERS. OLD-MAN'S BEARDS.

Blades of the leaflets toothed and often also lobed, membranous.	
Leaves with once ternately compound blades.	1. *C. virginiana.*
Leaves with twice ternately compound blades.	
Calyx about 2 cm. wide: stamens 6–9 mm. long.	2. *C. Catesbyana.*
Calyx about 1 cm. wide: stamens 4–6 mm. long.	3. *C. micrantha.*
Blades of the leaflets entire, somewhat coriaceous.	4. *C. paniculata*

1. C. virginiana L. Plant sparingly pubescent or glabrate: leaves mainly 3-foliolate: sepals whitish, thin, 9–12 mm. long: achene-body 4–5 mm. long, very inequilateral.—(GANDER-VINE.)—Thickets and along streams, various provinces, Ga. to La., Man., and N. S.—Sum.

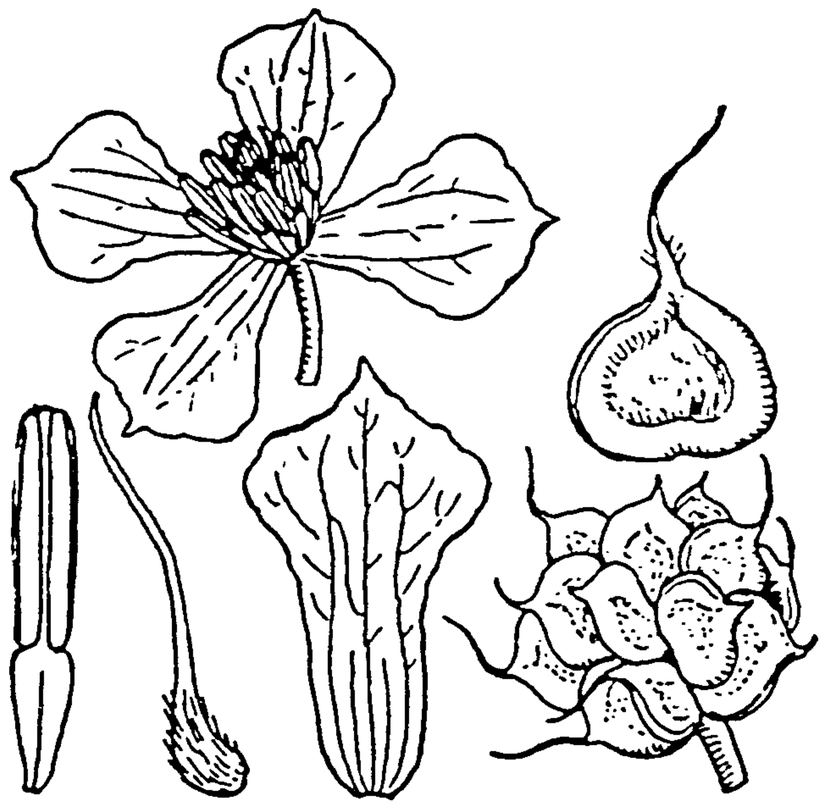


2. C. Catesbyana Pursh. Plant minutely pubescent or glabrate: leaves twice ternately compound: sepals linear to cuneate, 9–11 mm. long: achene-body about 4 mm. long, scarcely inequilateral. — (SATIN-CURLS.) — Sandy woods, Coastal Plain, Fla. to La. and S. C.—Spr.–sum.

3. C. micrantha Small. Plant closely fine-pubescent: leaves twice ternately compound: sepals broadly linear and obovate, 5–6.5 mm. long: achene-body narrowly ellipsoid, 3–3.5 mm. long.—Fence-rows, bushes, and trees, Brooksville Hammock region, W pen. Fla.—Sum.

4. **C. paniculata** Thunb. Plant glabrous or nearly so: leaves 1-ternate: leaflets ovate, elliptic-ovate, or orbicular-ovate, entire: sepals white or nearly so, thickish, 8–15 mm. long: achene-body 5–6 mm. long, slightly inequilateral.—Roadsides, thickets and woods, various provinces, Fla. to Tenn. and N. Y. Nat. of Japan and cult.—Sum.–fall.

22. **VITICELLA** Dill. Perennial vines. Leaf-blades several-foliolate. Flowers perfect, solitary or few together. Sepals spreading, petal-like, each with a wide border on either side of the veins. Petals wanting. Stamens spreading; anthers long and narrow. Carpels several. Achenes with pubescent, but rarely plumose styles.—About 6 species, Eurasian.



1. **V. Viticella** (L.) Small. Plant minutely pubescent: leaflets 2–5 cm. long, the blades thin, inequilateral: flowers showy: sepals cuneate to cuneate-spatulate, 2–4 cm. long, purple or blue: achene-body ovoid to elliptic-ovoid, 8–10 mm. long.—(ITALIAN-CLEMATIS.)—Stream-banks, Interior Low Plateaus, Tenn. Nat. of Eu. and cult.—Sum.

23. **VIORNA** Reichenb. Perennial herbs or vines. Leaf-blades entire or lobed, or pinnate. Flowers solitary or few together. Sepals 4 or 5, thick, valvate, petal-like. Petals wanting. Stamens erect: anthers long and narrow. Achenes with long plumose, silky, or naked style-tails. [*Clematis* L. in part.]—About 20 species, North American and European.—LEATHER-FLOWERS. VASE-VINES.—Some of the species have been brought into cultivation.—The flowers are purple or blue-violet, unless otherwise mentioned.

Vines with elongate stems and branches. I. VIORNAE.
Upright perennial herbs, the stems simple or with short branches. II. OVATAE.

I. VIORNAE

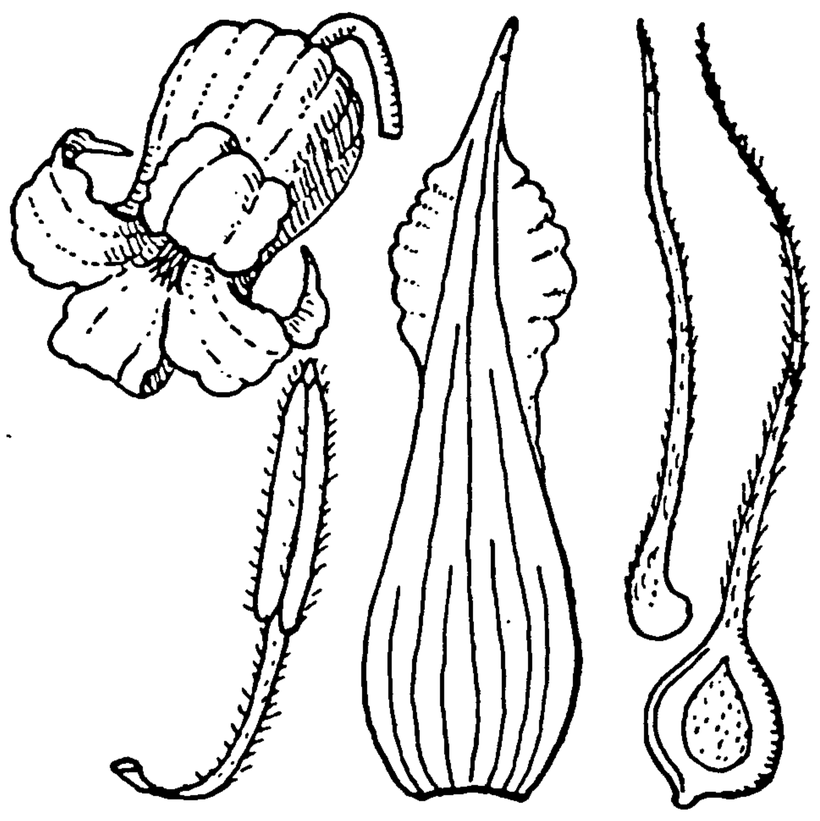
Flower-stalk bractless.
  Sepals with petal-like dilations above, the bodies long-tipped. 1. *V. crispa.*
  Sepals with mere cottony margins above, the bodies short-tipped. 2. *V. obliqua.*
Flower-stalk bracted.
  Achene with silky style-tips. 3. *V. Pitcheri.*
  Achene with plumose style-tips.
    Foliage glandular. 4. *V. Gattingeri.*
    Foliage glabrous, glaucous, or simply pubescent.
      Leaflets prominently and conspicuously reticulate.
        Leaflets nearly as prominently reticulate above as beneath.
          Leaflets thin, the larger ones 12 cm. long, the bracts nearly as large. 5. *V. subreticulata.*
          Leaflets thick, the larger ones less than 6 cm. long, the bracts much smaller. 6. *V. reticulata.*
        Leaflets much more prominently reticulate beneath. 7. *V. Beadlei.*
      Leaflets not reticulate, sometimes with a few prominent nerves.
        Elongate vines.
          Achene ovate or elliptic.: leaflets not glaucous beneath.
            Leaflets simple and usually entire. 8. *V. flaccida.*
            Leaflets, at least the lower ones, ternate or 3-lobed. 9. *V. Viorna.*

Achenes suborbicular: leaflets glaucous beneath.	10. *V. glaucophylla.*
Shrubby or stocky vine.	11. *V. Addisonii.*

II. OVATAE

Leaf-blades reticulate, rounded or cordate at the base: achenes with yellow plumes.	12. *V. ochroleuca.*
Leaf-blades not reticulate, mostly cuneately narrowed at the base: achenes with white plumes.	14. *V. Baldwinii.*

1. V. crispa (L.) Small. Stem often pubescent about the nodes: leaflets ovate to lanceolate (linear-lanceolate in *V. crispa Walteri*), 2.5–7 cm. long, thin, acute or acuminate: flower-stalks naked: sepals with showy marginal dilations above: achene-body ovate, 7–8 mm. wide. [*C. crispa* L.]—(BLUE-JASMINE. CURL-FLOWER. MARSH-CLEMATIS. CURLY-CLEMATIS.)—Swamps and wet woods, often in acid soil, Coastal Plain, Fla. to Tex. and Va.—Spr.–sum.



2. V. obliqua Small. Stem glabrous, or sometimes pubescent about the nodes: leaflets ovate to ovate-lanceolate, 3–8 cm. long, glabrous: sepals with mere cottony margins above: achene-body about 7 mm. wide.—Woods and swamps, Coastal Plain, Fla. to Tex. and Ga.—Spr.–sum.

3. V. Pitcheri (T. & G.) Britton. Stem pubescent, especially about the nodes: leaflets ovate, 3–7 cm. long, thick, reticulate, obtuse or acute: flower-stalk with ovate mostly entire bracts: sepals with mere margins above: anthers long-tipped: achene-body orbicular, 6–7 mm. wide. [*V. Simsii* (Fl. SE. U. S.)]—Low grounds, various provinces, Tenn. to Tex., Ia., and S Ind.—Spr.–sum.

4. V. Gattingeri Small. Stem glandular-pubescent: leaflets lanceolate to ovate-lanceolate, 1.5–7 cm. long, thin, not reticulate: flower-stalk with entire bracts: sepal-body 10–14 mm. long: achene-body ovoid, 5–6 mm. wide.—River banks, Interior Low Plateau, Tenn.—Sum.

5. V. subreticulata Harbison. Stem often finely pubescent: leaflets ovate, 6–12 cm. long, thin, prominently fine-reticulate, acute, predominantly lobeless: flower-stalk with large petioled bracts far above the middle: sepal-body globose-ovoid, 22–26 mm. long: achene-body orbicular-rhombic, 5.6–6.5 mm. wide.—Rocky or sandy banks, various provinces, Ala. to E Tex. and Ark.—Spr.—The leaflets are much less coarsely veined than in the related *V. reticulata.* The calyx is thinly pubescent and bright-purple.

6. V. reticulata (Walt.) Small. Stem pubescent at least about the nodes: leaflets elliptic, oval, ovate, or elliptic-lanceolate, 2–6 cm. long, thick and very prominently coarse-reticulate, on both sides, mostly rounded or mucronate at the apex, typically lobeless or lobed on one side: flower-stalk with petioled bracts about the middle or below it: sepal-body 17–21 mm. long, narrowly ovoid or conic-ovoid, closely covered with gray or brown hairs: achene-body rhombic, 5–6 mm. wide. [*C. reticulata* Walt.]—Sandy thickets, Coastal Plain, Fla. to Tex. and S. C.—Spr.–sum.

7. V. Beadlei Small. Stem pubescent, at least at the nodes: leaflets lanceolate to ovate and commonly lobed, 4–8 cm. long, thinnish, finely reticulate in age, acute or acuminate: flower-stalk with sessile or short-petioled bracts: sepal-body 16–22 mm. long: achene-body ovate, 4.5–5.5 mm. wide.—Thickets, Appalachian provinces, Ga. and Tenn.—Spr.–sum.

8. **V. flaccida** Small. Stem finely pubescent: leaflets thin, elliptic-ovate or ovate-lanceolate, 2–10 cm. long, closely silky beneath, mostly entire: flower-stalk with stout-stalked bracts below the middle: sepal-body 18–20 mm. long: achene-body ovate, 5.5–6.5 mm. wide.—Thickets, Interior Low Plateau, Tenn. and Ky.—Spr.

9. **V. Viorna** (L.) Small. Stem pubescent about the nodes: leaflets ovate to lanceolate or suborbicular in outline, 2.5–9 cm. long, entire or lobed, green and sometimes sparingly pubescent beneath: flower-stalk with short-stalked bracts near the middle: sepal-body 19–22 mm. long: achene-body ovate to elliptic, 4.5–5.5 mm. wide. [*C. Viorna* L.]—(VASE-VINE.)—Woods and thickets, various provinces N of Coastal Plain, Ga. to Ala., Ohio, and Pa.—Spr.–sum.—The achene-plumes are usually tawny, but sometimes white ones may be found.

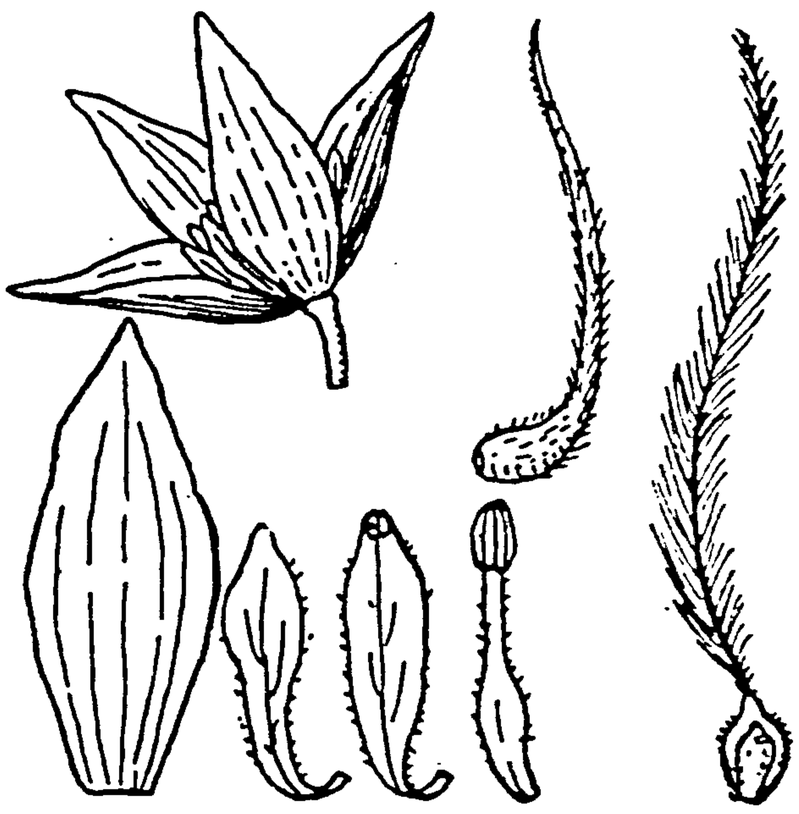
10. **V. glaucophylla** Small. Stem glabrous or nearly so: leaflets ovate to suborbicular, 3–10 cm. long, entire or lobed, glabrous, but glaucous beneath: flower-stalk with short-stalked bracts about the middle: sepal-body 20–25 mm. long: achene-body suborbicular or rhombic-orbicular, 6–8 mm. wide.—River valleys, various provinces, Fla. to Ala., Ky., and N. C.—Spr.–sum.

11. **V. Addisonii** (Britton) Small. Stem glabrous: leaf-blades ovate to suborbicular, 5–10 cm. long, entire or those of the lower ones lobed, glaucous beneath: flower-stalk with sessile bracts: sepal-body 18–20 mm. long, or rarely longer: achene-body suborbicular, about 6 mm. wide.—River banks, Blue Ridge and adj. provinces, N. C. to Tenn. and Va.—Spr.

12. **V. ochroleuca** (Ait.) Small. Plant 3–6 dm. tall: leaf-blades ovate, sometimes narrowly so, 3–12 cm. long, entire or the lower ones sometimes lobed: pedicels hirsute: sepal-body 19–22 mm. long: achene-body about 5 mm. wide. [*C. ochroleuca* Ait.]—(CURLY-HEADS.)—Sandy soil, various provinces, Ga. to N. Y.—The calyx is yellowish-white.—*V. ovata* (Pursh) Small, included in Fl. SE U. S. is believed to be identical with this species.

13. **V. Baldwinii** (T. & G.) Small. Plant 2–6 dm. tall: leaf-blades elliptic to lanceolate or linear, sometimes pinnately parted, 1.5–10 cm. long: sepals purple or paler, 2.5–4 cm. long, each with a thin crisped margin and a slender apex: achene-body 4.5–5.5 mm. wide, with style-tips 6–10 cm. long. [*C. Baldwinii* T. & G.]—(PINE-HYACINTH.)—Pinelands and marshes, pen. Fla.—Spr.–fall or all year S.—An infusion taken cold is considered a valuable remedy by the Seminoles in cases of sunstroke.

24. **ATRAGENE** L. Perennial vines. Leaf-blades several-foliolate. Flowers solitary on axillary branches. Sepals mostly 4, thin, petal-like, large, veiny. Petals small, spatulate. Stamens numerous, erect, the outer more or less petal-like; anthers oval. Carpels several. Achenes with long plumose styles.—About 5 species, natives of the north temperate zone.



1. **A. americana** Sims. Stem brown, trailing or diffuse: leaflets ovate to ovate-lanceolate, 2.5–9 cm. long, mostly toothed or somewhat lobed: sepals purplish-blue, 3–5 cm. long: petals 8–13 mm. long: achene-body 3–4 mm. wide, with style-tips 3–4 cm. long. [*Clematis verticillaris* DC.] — (BELL-RUE. MOUNTAIN-CLEMATIS. PURPLE VIRGIN-BOWER. ROCK-CLEMATIS.)—Rocky woods, Blue Ridge and more northern provinces, N. C. to Man. and Que.—Spr.

Family 3. **ANNONACEAE** — Custard-Apple Family

Shrubs or trees with uniform or dimorphous stems. Leaves alternate, estipulate: blades entire, pinnately veined and often prominently reticulate. Flowers perfect, monoecious, or dioecious, solitary in the leaf-axils, paired, or in threes. Calyx of 3 (rarely 4) sepals. Corolla much larger than the calyx, of 6, (9, or 12) petals. Androecium of many stamens: anthers blunt. Gynoecium of few or many carpels or sometimes of one carpel. Fruit berry-like, clustered (solitary by abortion), or aggregate. Seeds arillate, with ruminate endosperm.—About 48 genera and 550 species, most abundant in the tropics.

Carpels few and distinct or solitary, borne on a flat or globular receptacle: petals thin-edged, imbricate in the bud, herbaceous or coriaceous: anther-sacs separate. Tribe I. Asimineae.

Carpels numerous, confluent with each other and with the elongate receptacle: petals thick-edged, valvate in the bud, felt-like: anther-sacs contiguous. Tribe II. Annoneae.

I. Asimineae

Receptacle hemispheric or globular: petals relatively broad, those of the 2 series dissimilar.
- Petals impressed veiny within; inner merely concave at base; leaf-blades membranous. 1. Asimina.
- Petals not impressed veiny; inner corrugated within at base; leaf-blades coriaceous. 2. Pityothamnus.

Receptacle flat: petals narrow, of a linear type: those of the 2 or 3 series not very dissimilar. 3. Deeringothamnus.

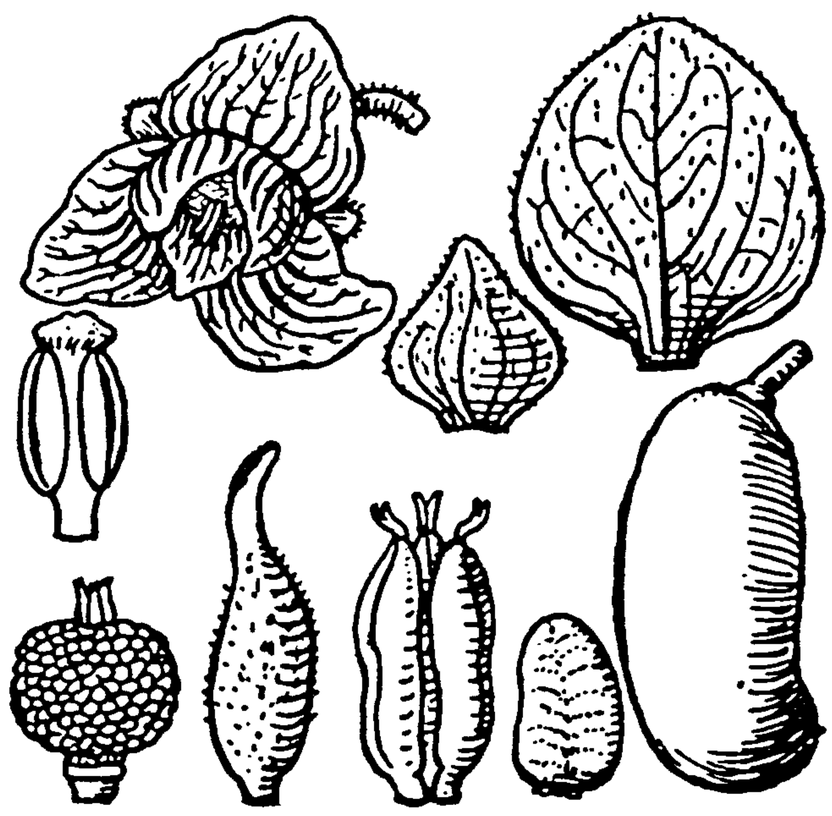
II. Annoneae

Tree or shrub of low situations: berry reticulate, scaly or muricate. 4. Annona.

1. ASIMINA Adans. Shrubs or trees with heavy-scented foliage. Leaves promptly deciduous: blades membranous, pinnately veined, not reticulate. Flowers inconspicuous, solitary in the axils of last year's leaves. Corolla lurid-green to dark-purple: petals much larger than the sepals, stiff, erect and recurved at the tip. Ovules few–several. Berries pulpy, solitary or 2–4 together, edible.—Following are the only known species.—Spr.—Pawpaws. Custard-apples.—The flowers are nearly or quite full-grown when they open.

- Corolla over 3 cm. wide: sepals 12–14 mm. long: seeds decidedly flattened, 2–3 cm. long. 1. *A. triloba.*
- Corolla less than 1.5 cm. wide: sepals 5–7 mm. long: seeds turgid, 1–1.5 cm. long. 2. *A. parviflora.*

1. A. triloba (L.) Dunal. Shrub, or small tree up to 12 m. tall: leaves narrowly obovate to cuneate-obovate, 10–30 cm. long, acuminate: pedicels 10 mm. long or more, densely hirsute: sepals ovate: outer petals orbicular or reniform, 2–2.5 cm. long, glabrous or sparingly pubescent: berries ellipsoid to somewhat cylindric, 7–16 cm. long.—(False-banana. Pawpaw-apple.)—River banks and rich woods, various provinces, Fla. to Tex., Nebr., Mich., and Ont.—Efforts are now being made to grow the fruit on a commercial scale.



2. A. parviflora (Michx.) Dunal. Shrub 4 m. tall or less: leaf-blades obovate, elliptic-obovate, or cuneate-obovate, 6–17 cm. long, acuminate or abruptly pointed: pedicels very short, 5 mm. long or less, tomentulose: sepals

broadly ovate: outer petals ovate or nearly so, 7–10 mm. long, densely pubescent: berries oval or ellipsoid, often irregular, 2–6 cm. long.—(SMALL-FRUITED PAWPAW. DWARF-PAWPAW.)—Pinelands, oak-woods, and hammocks, Coastal Plain and adj. provinces, N pen. Fla. to Miss. and N. C.

2. **PITYOTHAMNUS** Small. Shrubs with odorous, somewhat aromatic, foliage and uniform stems. Leaves tardily deciduous or somewhat persistent: blades leathery or chartaceous, reticulate-veined. Flowers conspicuous, solitary or in pairs, before or after the leaves. Corolla white or yellowish, or partly or wholly red-purple: petals very much larger than the sepals, more or less drooping. Ovules few. Berries solitary or 2–7 together, more or less inequilateral, often uneven from the unequal development of the seeds, edible.—Comprising only the following species.—Spr.—PAWPAWS. DOG-APPLES.—The flowers often increase much in size and assume deeper colors after they open.

Flowers arising from axils of the deciduous leaves of the preceding season, appearing before the leaves of the season or with them as they develop. I. RETICULATAE.
Flowers terminal on short-scaly stalks or leafy branchlets axillary to the leaves of the season, thus appearing after the leaves. II. OBOVATI.

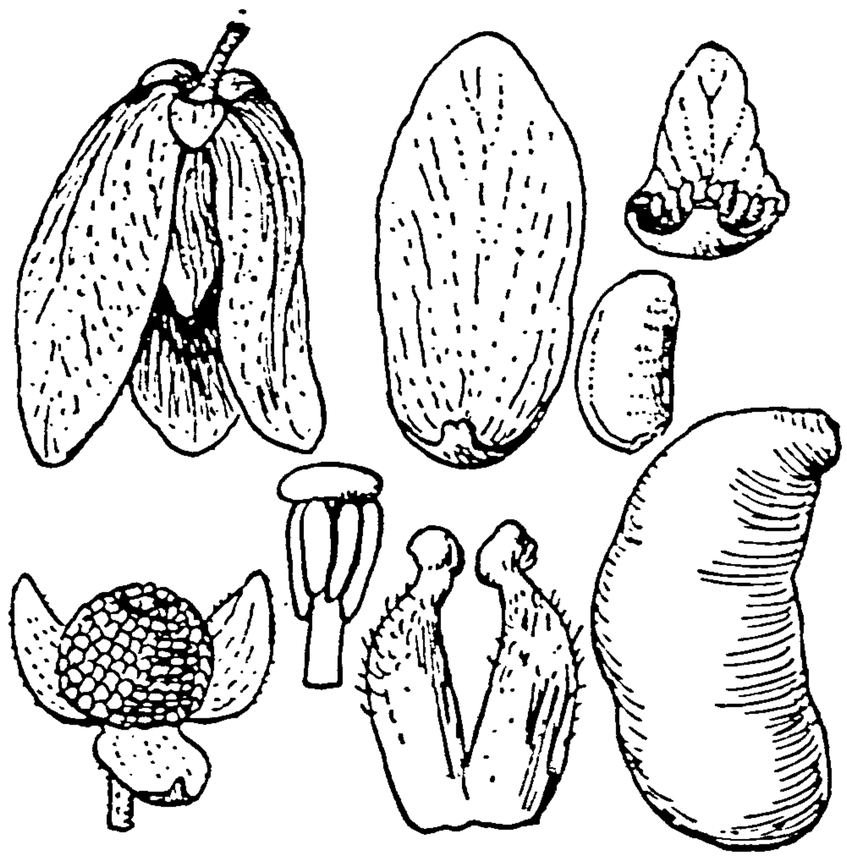
I. RETICULATAE

Young leaves copiously pubescent beneath, but not lanate-tomentose: mature outer petals obovate: inner petals strongly auriculate near the base. 1. *P. reticulatus.*
Young leaves densely lanate-tomentose: mature outer petals oval, often broadly so, or oval-obovate: inner petals not strongly auriculate. 2. *P. incanus.*

II. OBOVATI

Flowers borne on a short axillary stalk which bears a scale-like bract at the base or near it: outer petals 6 cm. long or less.
Outer petals flat, mostly over 5 cm. long: inner petals corrugated at the base: anthers over 2 mm. long. 3. *P. angustifolius.*
Outer petals revolute, mostly less than 5 cm. long: inner petals corrugated all over: anthers less than 2 mm. long.
Inner petals narrowed at the apex, decidedly longer than wide: perianth trimerous. 4. *P. pygmaeus.*
Inner petals rounded at the apex, as wide as long or nearly so: perianth tetramerous. 5. *P. tetramerus.*
Flowers borne on a short leafy branchlet: outer petals 6 cm. long or more. 6. *P. obovatus.*

1. P. reticulatus (Chapm.) Small. Shrub 1 m. tall or less, the stems with grayish or brown bark, the shoots tawny tomentulose: leaf-blades elliptic-cuneate to cuneate, or individually narrowly elliptic, 2.5–9 cm. long, mostly rounded at the apex, abruptly narrowed at the base, very short-petioled: sepals oval to ovate, about 1 cm. long, tawny-tomentulose: outer petals obovate, 3–4 cm. long, finely pubescent without: inner petals 2–2.5 cm. long: berry elliptic, 2.5–9 cm. long, rounded at base: seeds 1–1.5 cm. long. [*Asimina reticulata* Chapm. *A. cuneata* Shuttlw.]—Pinelands and scrub, pen. Fla.—A tea made from the flowers of this and the other species is used by the Seminoles as a remedy for kidney disorders.



2. P. incanus (Bartr.) Small. Shrub 1.5 m. tall or less, the stems with a dark-gray bark, the shoots densely tawny tomentulose: leaf-blades elliptic-obovate or obovate, or individually elliptic or some-

what cuneate, mostly rounded at the apex, gradually narrowed at the base, short-petioled: sepals ovate, 6–8 mm. long, tawny-tomentulose: outer petals obovate or oval, 4–6 cm. long, rather coarsely pubescent without; inner petals about 2 cm. long: berry mostly oval, varying to ovoid or obovoid, 4–7 cm. long: seeds 1–1.5 cm. long. [*Asimina grandiflora* (Michx.) A. Gray *A. speciosa* Nash]—(FLAG-PAWPAW.)—Pinelands, Coastal Plain, NE Fla. to S Ga.

3. P. angustifolius (A. Gray) Small. Shrub 1.5 m. tall or less, the erect or ascending, often virgate stems with brown or red bark, or gray when very old, the twigs minutely tawny-pubescent: leaf-blades narrowly linear, often elongate-linear, to oblanceolate or narrowly spatulate, 6–10 cm. long, acute or obtuse, glabrous and shining, gradually narrowed to the base, short-petioled: sepals ovate, 1–1.5 cm. long, glabrous or nearly so: outer petals elliptic, varying to broadest above or below the middle, 4–6 cm. long: inner petals somewhat pandurate, 4–5 cm. long: berry ellipsoid or cylindric-ellipsoid, 4–8 cm. long: seeds 1–2 cm. long. [*Asimina angustifolia* A. Gray]—Pinelands, woods, and hammocks, Coastal Plain, N pen. Fla. to SE Ala. and S Ga.

4. P. pygmaeus (Bartr.) Small. Shrub with arching ascending or decumbent stems 2–6 dm. long, usually several together from the top of the root, the bark red or reddish, the twigs tawny-pubescent: leaf-blades spatulate, oblanceolate, or elliptic-oblanceolate, or individually obovate or cuneate, 8–15 cm. long, acute or obtuse, glabrous or nearly so when full grown and sharply reticulate: sepals 3, broadly ovate to reniform, 6–7 mm. long, minutely pubescent when young: petals 6, the outer narrowly obovate, but more or less revolute and crisped above the middle, 2–4 cm. long or rarely longer, white tinted with purple to dark-maroon; inner petals narrowly obovate to lanceolate, 1.5–2.5 cm. long, sometimes acuminate, dark-purple: berry inequilaterally ellipsoid or ellipsoid-obovoid, 4–7 cm. long: seeds mostly less than 1.5 cm. long. [*Asimina pygmaea* (Bartr.) A. Gray *A. secundiflora* Shuttlw.]—Pinelands, E Fla. and N Fla.

5. P. tetramerus Small. Shrub 1–3 m. tall, with irregularly placed, often virgate branches, the bark gray and glabrous, the twigs finely red-pubescent: leaf-blades spatulate to elliptic-spatulate, 3–13 cm. long, obtuse, glabrous and obscurely reticulate at maturity: sepals 4, rhombic-ovate, 7–10 mm. long: petals 8, the outer lanceolate to elliptic-lanceolate, somewhat revolute above the middle, 1.5–2.5 cm. long, white above, reddish-purple below; inner petals rhombic or rhombic-ovate, 9–11 mm. long, reddish-purple, obtuse, constricted at the base: berry ellipsoid or cylindric-ellipsoid, mostly 5–9 cm. long: seeds mostly over 1.5 cm. long.—Scrub, near estuary of the St. Lucie River, Fla.

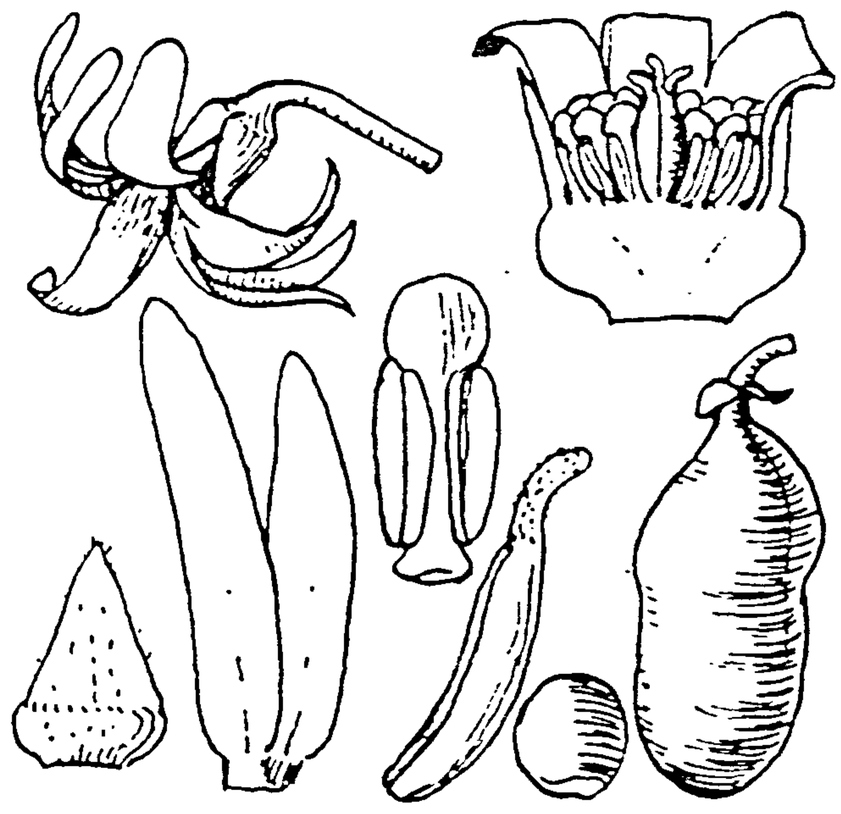
6. P. obovatus (Willd.) Small. Shrub 3 m. tall or less, with erect branching stems, sometimes tree-like, the bark dark-gray or gray-brown, the twigs red- or brown-tomentulose: leaf-blades obovate, elliptic-obovate, or cuneate-obovate, 4–10 cm. long, rounded or notched at the apex, with the veins and veinlets red-tomentulose beneath, abruptly narrowed at the base, short-petioled: sepals ovate, oval, or elliptic, 10–16 mm. long, thinly pubescent when young: outer petals obovate or oval, 6–11 cm. long; inner petals elliptic to obovate, often somewhat pandurate, 3–6 cm. long: berry oval, obovate, or oval-ellipsoid, mostly 6–12 cm. long: seeds 1.5–2 cm. long. [*Asimina obovata* (Willd.) Nash]—(FLAG-PAWPAW.)—Pinelands and scrub, pen. Fla.

3. **DEERINGOTHAMNUS** Small. Shrubs with aromatic foliage and dimorphous stems, *i.e.*, foliaceous and floriferous. Leaves persistent on the slender stems which are longer than the flower stems: blades firm-membranous. Flowers very fragrant, on stout stems clustered on the top of a long tap-root,

solitary or two or three together in the axils of broad foliaceous bracts. Sepals 2 to 4, broad. Corolla white or ochroleucous: petals 6–12, narrow, coriaceous, often curled backward. Ovules 6–8. Berry solitary or 2 or 3 together.—Following are the only known species.—Spr.

Corolla white or pinkish; petals of a linear type, the longer ones more than four times the length of the sepals: pedicels over 1 cm. long. 1. *D. pulchellus.*
Corolla yellow; petals of a lanceolate type, the longer ones less than four times the length of the sepals: pedicels less than 1 cm. long. 2. *D. Rugelii.*

1. D. pulchellus Small. Root fusiform, 3–6 dm. long: stems 3 dm. tall or less, those bearing flowers stouter than the leafy ones, all early glabrous: leaves bright-green; blades cuneate to spatulate, 3–11 cm. long, obtuse or rounded at the apex, sharply reticulate above, glabrous at maturity or with persistent scattered fuscus hairs on the midrib beneath: bracts of the flowering stems foliaceous, ovate, oval, or elliptic, sessile or nearly so: pedicels curved, 1–2.5 cm. long: sepals coriaceous, triangular to lanceolate, 4–8 mm. long, acute, glabrous or obscurely pubescent: petals linear, varying to broadest above the middle or below it, 11–22 mm. long, the outer finely pubescent: stamens 2.5–3 mm. long; apical gland of the connective knob-like: berry obovoid, or cylindric-ellipsoid, often somewhat constricted between the seeds, 2–4.5 cm. long: seeds very turgid, subglobose or flattened on one side.—Low pinelands, SW pen. Fla.



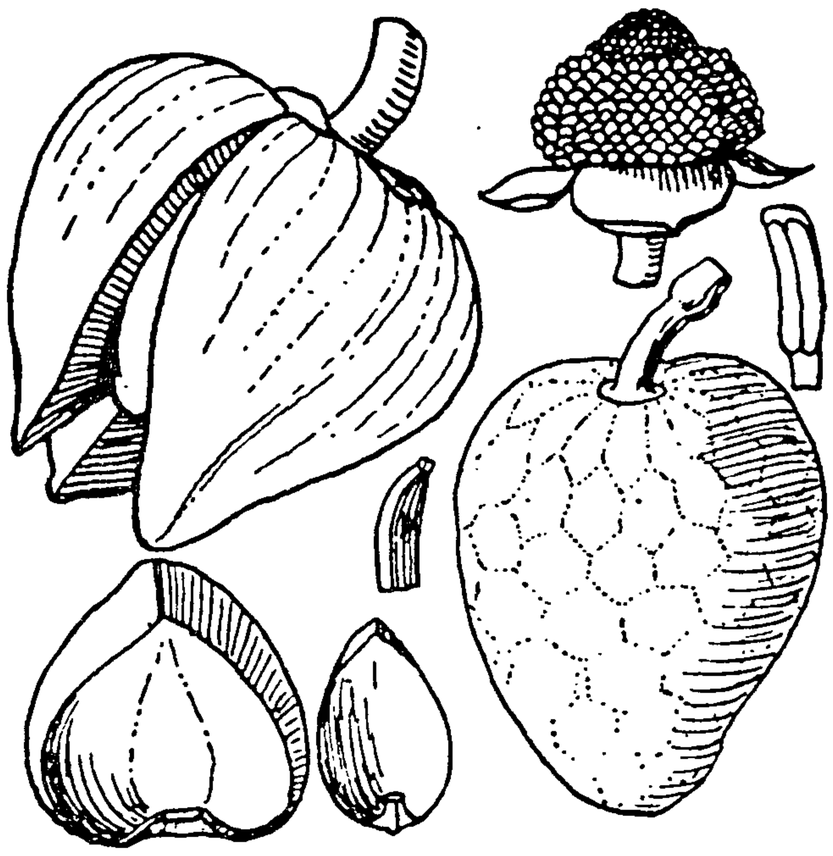
2. D. Rugelii (Robinson) Small. Plant similar in habit to that of *D. pulchellus,* but more erect: but more copiously red-tomentose, at least when young: stems 2–6 dm. tall: leaves deep-green; blades spatulate, cuneate, or obovate: bracts of the flowering stem foliaceous, elliptic or nearly so, 2.5–4 cm. long, rounded at the apex, reticulate, abruptly contracted to a short petiole: pedicels spreading or recurved spreading, less than 1 cm. long: sepals broadly ovate to deltoid, obtuse, copiously pubescent at least when young: petals lanceolate, or sometimes elliptic-lanceolate, 12 mm. long, very fleshy, obtuse, minutely pubescent: stamens 2.5–3 mm. long or less: berry obovoid to cylindric-obovoid, often curved and constricted between the seeds, 2–6 cm. long: seeds subglobose to oval, very turgid. [*Asimina Rugelii* Robinson]—Flatwoods, NE pen. Fla.

4. ANNONA L. Trees with pungent-aromatic foliage. Leaves persistent: blades thick-membranous or coriaceous, pinnately veined or reticulate. Flowers perfect, solitary or clustered. Sepals usually broad. Corolla white or yellow, conic to globose-conic: petals 6, very broad, the outer converging to the apex, completely enclosing the smaller inner ones. Ovule solitary in each carpel. Fruit an aggregate of the receptacle and the fleshy mature carpels.—About 60 species, mostly in tropical America.—PAWPAWS. CUSTARD-APPLES.

Petals very broad, often wider than long: fruit not tuberculate. 1. *A. glabra.*
Petals narrow: fruit strongly tuberculate. 2. *A. squamosa.*

1. A. glabra L. Tree 14 m. tall or less with stout buttressed trunks: leaf-blades elliptic, oval, or elliptic-ovate, 9–18 cm. long, acute or short-acuminate,

short-petioled: flowers drooping, short-pedicelled: sepals reniform, appressed: petals white, except the red or crimson blotch within, clamshell-like, the outer 3–3.5 cm. long or smaller: stamens 3.5–4 mm. long: berry ovoid, inequilateral, 5–12 cm. long, yellow blotched with brown, coarsely reticulate: seeds 9–20 mm. long. [*A. laurifolia* Dunal.] — (POND-APPLE. CUSTARD-APPLE. ALLIGATOR-APPLE.) — Swamps, ponds, and low hammocks, S pen. Fla. and the Keys.—(*W. I.*)—Spr.—The form with small flowers and small fruits has sometimes been considered a distinct species, under the name *A. palustris*.



2. A. squamosa L. Tree with glabrous or nearly glabrous twigs: leaf-blades mainly elliptic, varying to elliptic-lanceolate, mostly 10–15 cm. long, rather slender petioled: sepals broadly deltoid, about 2 mm. long, acute: outer petals narrowly elliptic tc linear-lanceolate, 24–28 mm. long: berries ovoid to globose-ovoid, 6–10 cm. long, tuberculate, yellowish-green.—(SUGAR-APPLE. SWEETSOP.)—Hammocks, Florida Keys. Nat. of trop. Am.—(*W. I.*)—Grown extensively in the tropics for its edible fruits.

FAMILY 4. MAGNOLIACEAE — MAGNOLIA FAMILY

Shrubs, trees, or vines. Leaves, alternate, sometimes apparently whorled: blades entire, toothed, or lobed. Flowers perfect or monoecious. Calyx of 3 petaloid sepals or rarely more. Corolla of 5 imbricate petals as large as the sepals or larger, or more. Androecium of many stamens or rarely few. Gynoecium of several or many distinct carpels. Fruit a cone or a whorl of accrescent carpels which become baccate or follicular, or rarely samaroid.—About 10 genera and 75 species, widely distributed.

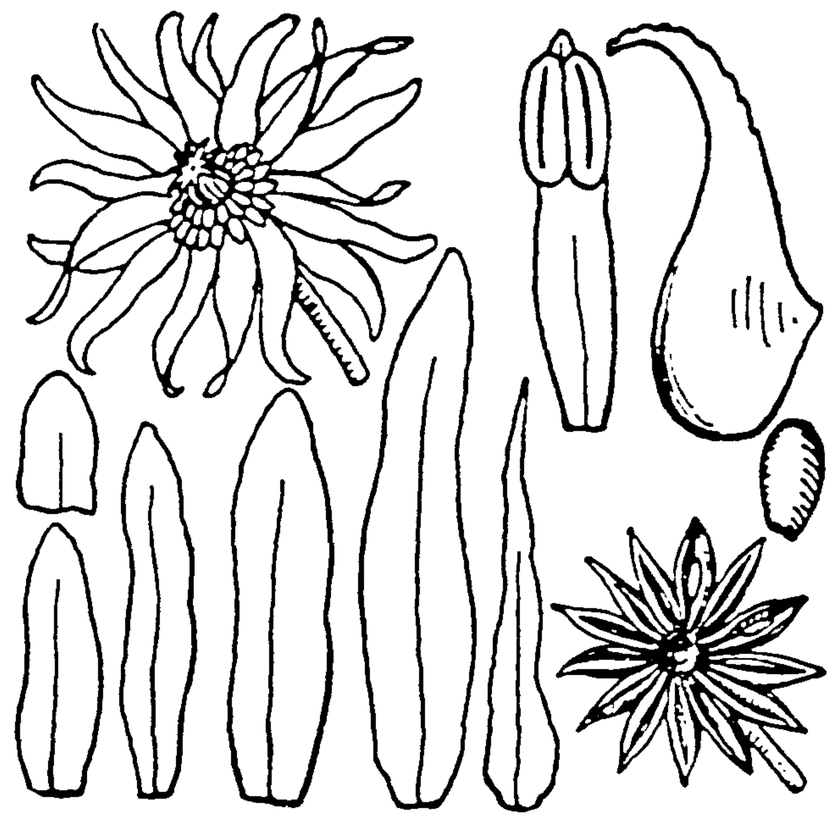
Leaves not lobed, sometimes merely auricled at the base: mature carpels dehiscent or berry-like.
  Carpels in a whorl: petals many. — 1. ILLICIUM.
  Carpels imbricated in several series: petals about 5.
    Twining shrubs with monoecious flowers: stamens 5, united into a disk: fruit a spike of berries. — 2. SCHIZANDRA.
    Erect shrubs or trees with perfect flowers: stamens numerous, distinct: fruit a head of imbricated follicles.
      Corolla greenish or yellow: styles or stigmas filiform, deciduous: follicle rounded. — 3. TULIPASTRUM.
      Corolla white: styles or stigmas stout, persistent: follicle tipped by the style or stigma. — 4. MAGNOLIA.
Leaves 4-lobed: mature carpels samara-like, indehiscent. — 5. LIRIODENDRON.

1. ILLICIUM L. Aromatic shrubs or trees. Leaves evergreen: blades entire, exstipulate. Flowers perfect, more or less nodding. Sepals 3–6. Petals many, in 3–several series, the inner the narrower. Stamens numerous: filaments nearly linear: anther-sacs contiguous. Carpels in 1 series. Seed solitary.—Seven species, the following and 5 in Asia.—Spr.—ANISE-TREES. STAR-ANISES.

Corolla 2 cm. broad: petals 6–12: leaf-blades obtuse. — 1. *I. parviflorum*.
Corolla 2.5–3 cm. broad: petals 20–30: leaf-blades acuminate. — 2. *I. floridanum*.

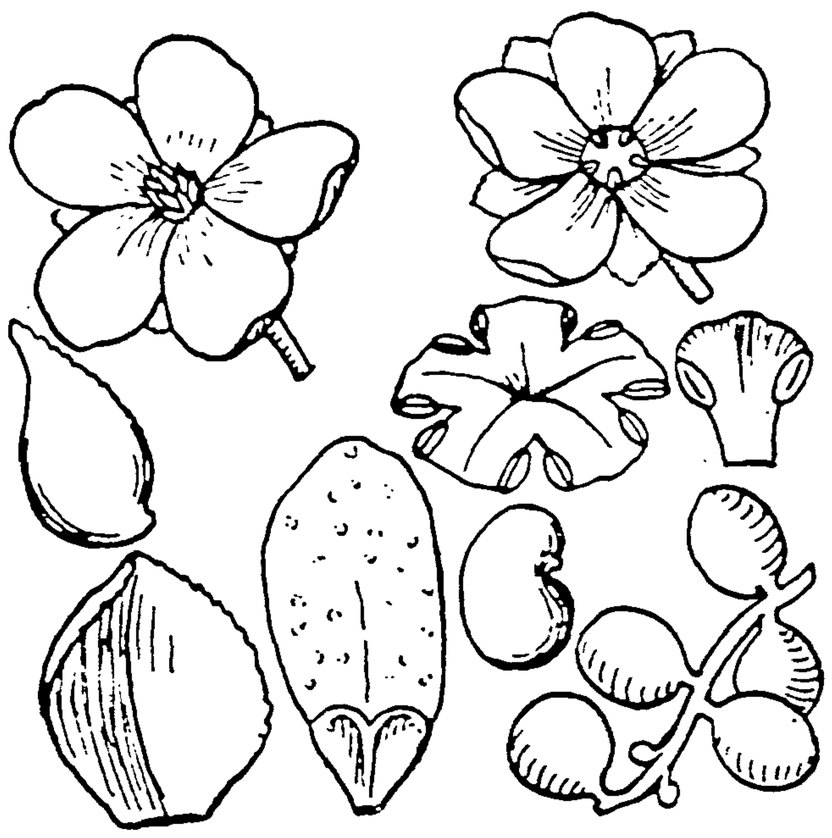
1. I. parviflorum Michx. Shrub 1–2 m. tall: leaf-blades elliptic, 6–10 cm. long, sepals less than 10 mm. long: petals ovate or suborbicular, about as long

as the sepals, yellow: fruit about 2 cm. wide. —(STAR-ANISE.)—Low woods and swamps, Coastal Plain, Fla. to Ga.



2. I. floridanum Ellis. Shrub 2–3 m. tall: leaf-blades elliptic, 6–15 cm. long, rosin-scented: sepals over 10 mm. long: petals linear or nearly so, 15–20 mm. long, dark-red: fruit 25–30 mm. wide — (PURPLE-ANISE. STINK-BUSH.)—Swamps and low hammocks, Coastal Plain, N Fla. to La. and N Ala.—The flowers have the odor of decaying fish.

2. SCHIZANDRA Michx. Vines. Leaves deciduous: blades sometimes toothed. Flowers monoecious, drooping. Sepals 5 or 6. Petals 5 or 6, each thickened at the base. Stamens 5: filaments dilated, united into a disk: anther-sacs separated. Carpels in several series. Seeds 2.—Six species, the following and 5 others Asiatic.

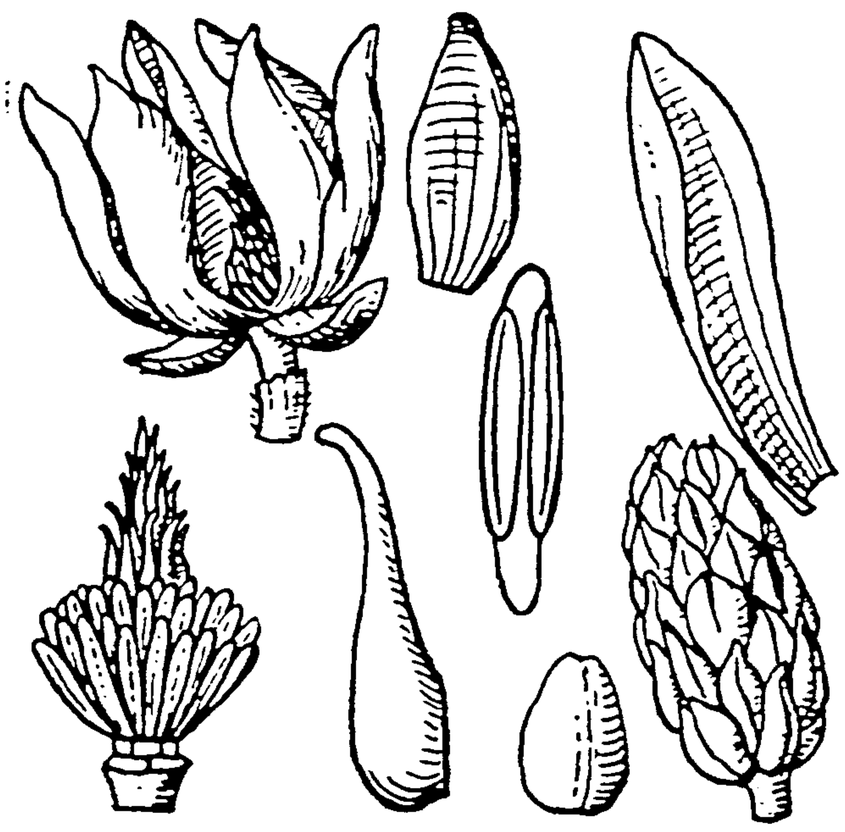


1. S. coccinea Michx. Woody vine: leaf-blades thickish, oval, elliptic or ovate, 5–15 cm. long, slender-petioled: sepals oval to ovate, 3–6 mm. long: petals obovate-cuneate, mostly crimson: spike of fruit 4–7 cm. long, the berries about 1 cm. long.—(WILD-SARSAPARILLA. BAY STAR-VINE.) — Rich woods, Coastal Plain, Fla. to La. and S. C.—Spr.–sum.

3. TULIPASTRUM Spach. Trees. Leaves deciduous: blades entire. Flowers perfect, greenish, yellowish, or yellow, erect. Fruit a torulose cone.—The following are the only known species.—Spr.—CUCUMBER-TREES.

Leaf-blades more or less acuminate: corolla greenish. 1. *T. acuminatum.*
Leaf-blades obtuse or abruptly pointed: corolla canary-yellow. 2. *T. cordatum.*

1. T. acuminatum (L.) Small. Tree becoming 30 m. tall: leaf-blades elliptic to ovate, or rarely obovate, 1.5–3 dm. long, more or less acuminate, usually membranous: sepals mostly lanceolate or elliptic: petals cuneate to oblanceolate, 5–7 cm. long, greenish or yellowish-green, (or yellowish in *T. acuminatum flavum*): fruit-cone 5–8 cm. long, usually with many follicles. [*Magnolia acuminata* L.]—(CUCUMBER-TREE. MOUNTAIN-MAGNOLIA. BLACK-LINN. YELLOW-LINN.)—Rich woods, various provinces, S Ga. to Ark. and Ont.



2. T. cordatum (Michx.) Small. Shrub or small tree: leaf-blades oval or orbicular-oval, to broadly ovate or obovate, 1–1.5 dm. long, coriaceous: sepals ovate: petals obovate, 4–5 cm. long, light-yellow: fruit-cone 2–5 cm. long, with few follicles. [*Magnolia cordata* Michx.] —Rich woods, Piedmont and Blue Ridge, Ga. to N. C.; Ala.

4. MAGNOLIA L. Shrubs or trees. Leaves deciduous or persistent, sometimes very large, scattered or in umbrella-like clusters; blades entire, sometimes auricled at the base. Flowers perfect, erect, white. Sepals and petals about equal in size, more or less coriaceous. Fruit an echinate cone of usually colored carpels.—About 25 species, North American and Asiatic—BAYS.—The trees are ornamental both in flower and in fruit. The fruits are very conspicuous when the scarlet seeds dangle from the follicles on invisible threads.

Leaves persistent; blades coriaceous, gradually or abruptly narrowed at the base: flower-buds silky: petals short and broad. I. GRANDIFLORAE.
Leaves deciduous; blades membranous, cordate, auriculate, or acute at the base: flower-buds tomentose or glabrous: petals elongate: pale-barked trees.
  Leaf-blades green, often pale beneath: buds glabrous: fruit-cone somewhat elongate, often ellipsoid: leaves of the flowering branches umbrella-clustered. II. UMBRELLAE.
  Leaf-blades glaucous beneath: buds tomentose: fruit-cone subglobular, oval or ovoid: leaves of the flowering branches not umbrella-clustered. III. MACROPHYLLAE.

I. GRANDIFLORAE

Leaf-blades thick-coriaceous: corolla 1–1.5 dm. long: fruit-cone 8–12 cm. long, the carpels numerous. 1. *M. grandiflora.*
Leaf-blades thin-coriaceous: corolla 3–5 cm. long: fruit-cone 3–5 cm. long, the carpels few. 2. *M. virginiana.*

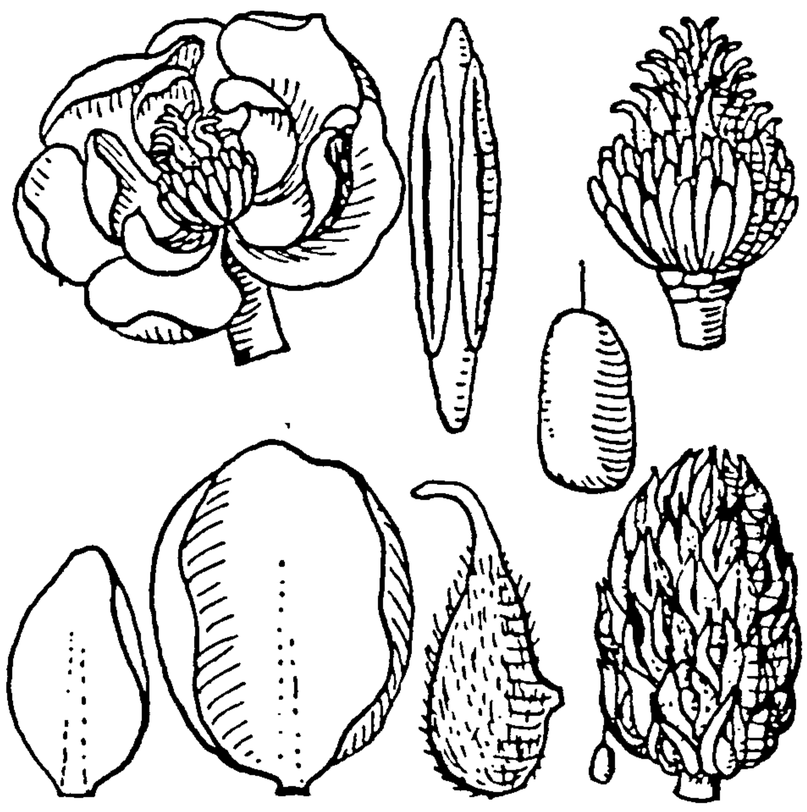
II. UMBRELLAE

Leaf-blades acute at the base. 3. *M. tripetala.*
Leaf-blades auricled at the base.
  Leaf-blades elongate-obovate, to obovate-spatulate, gradually pointed at the apex: stamens 9–12 mm. long. 4. *M. Fraseri.*
  Leaf-blades rhombic-obovate, abruptly acute: stamens 4–6 mm. long. 5. *M. pyramidata.*

III. MACROPHYLLAE

Leaves very large, cordate or subcordate at the base, very glaucous beneath: fruit-cone subglobose or cylindric-ovoid.
  Corolla mostly 2–3 dm. wide: fruit-cone subglobose: seed 11–14 mm. long. 6. *M. macrophylla.*
  Corolla mostly 3–4 dm. wide: fruit-cone cylindric-ovoid: seed 9–10 mm. long. 7. *M. Ashei.*

1. M. grandiflora L. Tree, when large with a trunk-diameter of over 2 m. and dark bark: leaf-blades elliptic, oval, broadly oblanceolate, or rarely ovate, 10–30 cm. long, brown- or rusty-tomentose beneath: flowers very conspicuous, lemon-scented: petals creamy-white; blades suborbicular to orbicular-obovate, 5–10 cm. wide: fruit-cone oval; carpels pubescent: seeds 1.5–2 cm. long. [*M. foetida* (L.) Sarg.]—(LAUREL. BULL-BAY. LOBLOLLY-MAGNOLIA. SOUTHERN-MAGNOLIA.)—Hammocks, bluffs, sand-dunes, and sandy bottoms, Coastal Plain, C Fla. to Tex., Ark., and N. C.—Spr.–sum.—Cult. for ornament as far N as Washington, D. C.



2. M. virginiana L. Shrub or tree, at most with a trunk-diameter of 1 m., and pale bark: leaf-blades elliptic or oval, or rarely oblanceolate, 5–15 cm. long, glaucous and more or less silky beneath: flowers rather inconspicuous, but very fragrant: petals white; blades elliptic, oval or obovate, mostly 2–3 cm. wide: fruit-cone oval or ovoid; carpels glabrous: seeds 8–10 mm. long. [*M. glauca* L.]—

(SWEET-BAY. SWAMP-BAY. WHITE-BAY. BEAVER-TREE.)—Swamps and low woods, Coastal Plain and rarely adj. provinces, Fla. to E Tex., Tenn. and Mass.—Spr.–fall.—Of all our trees, this is one of the most consistent occupants of mediacid soils. It is deciduous N.

3. M. tripetala L. Tree with a maximum trunk-diameter of 4 dm., the twigs glabrous: leaf-blades elliptic-oblanceolate to obovate-oblanceolate, 2–7 dm. long, acute, sometimes abruptly pointed, pubescent beneath at least when young: flowers scented, but not pleasantly so: petals elliptic-oblanceolate, 11–16 cm. long: fruit-cone ellipsoid, 8–12 cm. long, pink. [*M. Umbrella* L.]—(UMBRELLA-TREE. UMBRELLA-MAGNOLIA. ELK-WOOD.)—Rich woods and ravines, various provinces N of Coastal Plain, Ga. to Ark., Mo., and Pa.—This and the four following species are called cucumber-trees.

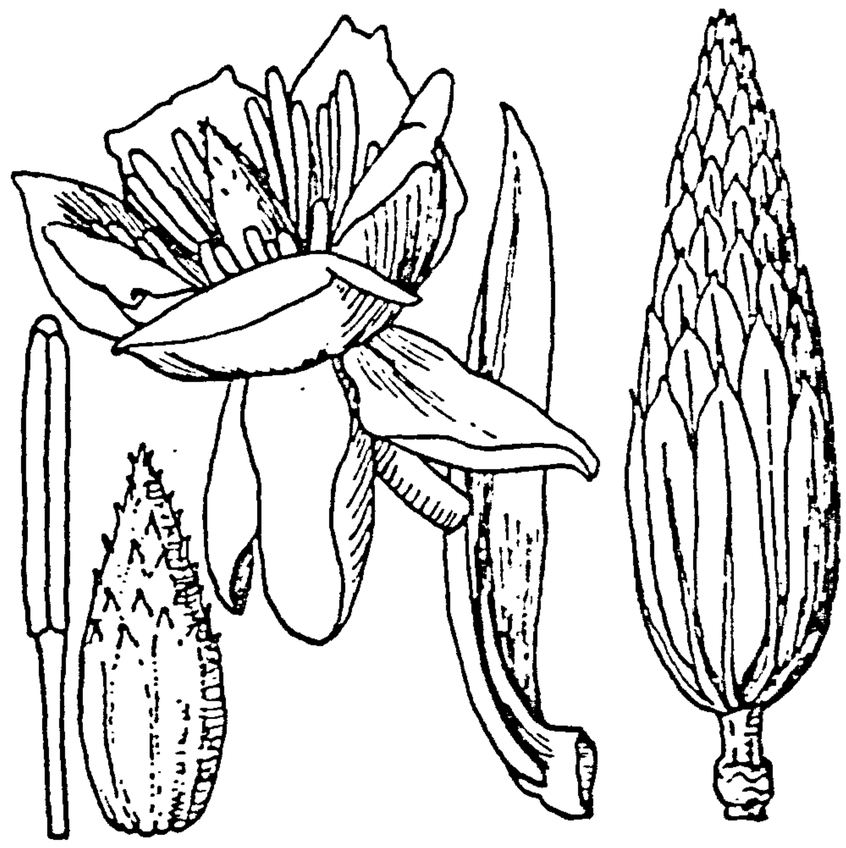
4. M. Fraseri Walt. Tree with a maximum trunk-diameter of 5 dm., the twigs glaucous: leaf-blades elongate-obovate to obovate-spatulate, 2–4 dm. long, the basal auricles mostly directed backward: flowers pleasantly scented: petals elliptic to narrowly ovate, 6–14 cm. long: fruit-cone ellipsoid-conic, 7–12 cm. long, deep-pink.—(EAR-LEAF UMBRELLA-TREE. MOUNTAIN-OREAD. INDIAN-PHYSIC.)—Woods, Blue Ridge and adj. provinces, Ga. to Ala., Ky., and Va.

5. M. pyramidata Pursh. Tree with a maximum trunk-diameter of about 2 dm., the twigs green: leaf-blades rhombic-obovate, 1–2 dm. long, the basal auricles diverging: flowers somewhat fragrant: petals lanceolate, 5–8 cm. long: fruit-cone ellipsoid, 6–8 mm. long, pink.—(WOOD-OREAD.)—Woods and stream-banks, Coastal Plain, W Fla. to Miss. and Ga.

6. M. macrophylla Michx. Tree with a maximum trunk-diameter of about 5 dm., the twigs pubescent: leaf-blades obovate to elliptic-lanceolate, 3–9 dm. long, the basal lobes broad: flowers fragrant: petals rather irregular in shape, but broad, the outer 19–23 cm. long: fruit-cone subglobose or broadly oval, 6–11 mm. in diameter, deep-pink.—(GREAT-LEAF MAGNOLIA. ROYAL-OREAD. SILVER-LEAF. BIG-BLOOM.)—Rich woods, various provinces, W Fla. to La., Ark., Ky., and N. C.—The trunk is sometimes branched near the base

7. M. Ashei Weatherby. Tree similar to *M. macrophylla*, but smaller and sometimes shrubby: leaf-blades with the pubescence of the midrib beneath subappressed: petals more or less irregular in shape, mostly elliptic to oval, varying to broadest above the middle or below it, the outer 12–15 cm. long: fruit-cone cylindric-ovoid, 5–11 cm. long.—Sandy woods near streams, Coastal Plain, W Fla. (and S Ga.?); also Tex.

5. LIRIODENDRON L. Trees. Leaves deciduous: blades lobed. Flowers perfect, greenish-yellow. Sepals 3, reflexed. Petals 6, broader than the sepals, erect. Fruit a cone of appressed samara-like carpels.—Two species, the following and one in China.



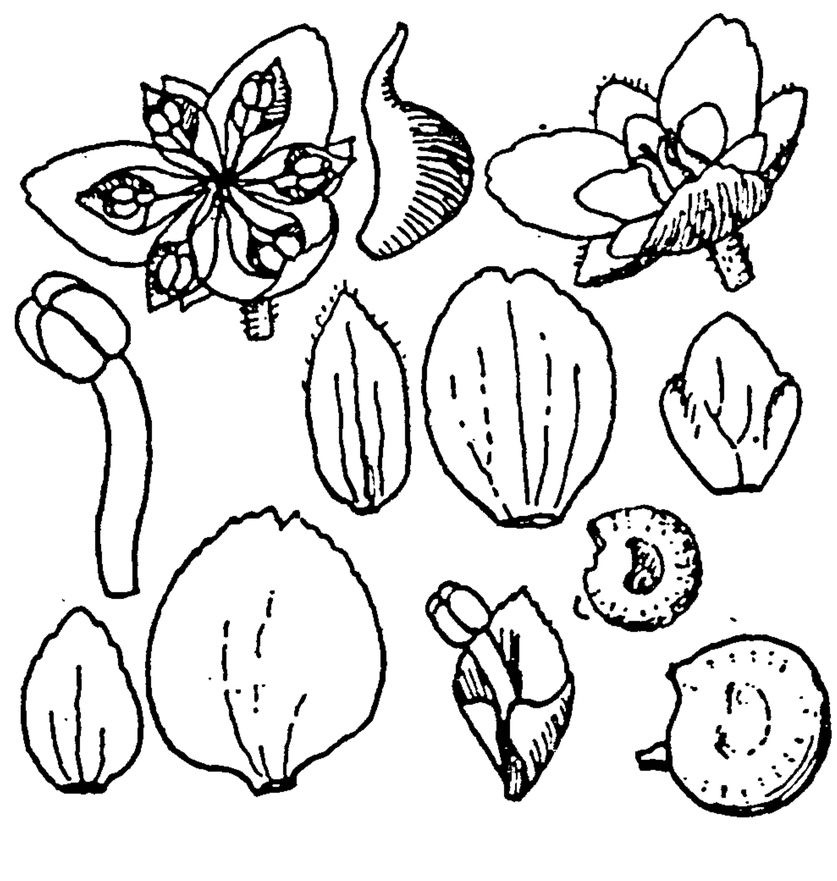
1. L. Tulipifera L. Tree becoming 60 m. tall, the bark with flat ridges: leaf-blades 6–20 cm. wide, 4-lobed, truncate or notched at the apex: flowers campanulate: sepals elliptic to elliptic-obovate, 4–5 cm. long: petals elliptic, oval, or suborbicular, greenish-yellow and often tinged with orange: fruit conic, 5–7 cm. long, erect, the carpels 3–4 cm. long, indehiscent.—(TULIP-TREE. WHITE-WOOD. YELLOW-POPLAR.)—Rich or damp woods, various provinces, N pen. Fla. to Ark., Mich., Ont., and Mass.—Sum.—An important timber-tree.

Family 5. **MENISPERMACEAE** — Moonseed Family

Perennial herbaceous vines. Leaves alternate: blades entire or lobed, sometimes peltate. Flowers polygamous or dioecious, in racemose or paniculate cymes. Calyx of 6 sepals, or fewer or more. Corolla of 4–6, or more, petals smaller than the sepals, or wanting. Androecium of 6–12 stamens, or more. Gynoecium of 3–6 distinct carpels, or more. Fruit a berry-like drupe.—About 55 genera and 150 species, mostly natives of the tropics.

Corolla none: stigma radiate.	1. Calycocarpum.
Corolla present: stigma entire or 3-lobed.	
Pistillate flowers with 4–8 petals: gynoecium of 3–5 carpels, the stigmas not lobed: androecium of 6–24 stamens, the anthers terminating long filaments: drupe glabrous.	
Stamens 6: stigma subulate: drupe red.	2. Epibaterium.
Stamens 12–24: stigma dilated: drupe black.	3. Menispermum.
Pistillate flowers with 1 petal: gynoecium a single carpel, the stigma 3-lobed: androecium of 2 or 4 stamens, the anthers sessile on a central peltate column: drupe pubescent.	4. Cissampelos.

1. CALYCOCARPUM Nutt. Vines with relatively large prominently lobed leaf-blades. Sepals 6. Filaments nearly linear. Stigma radiate. Seed cup-like.—One species.

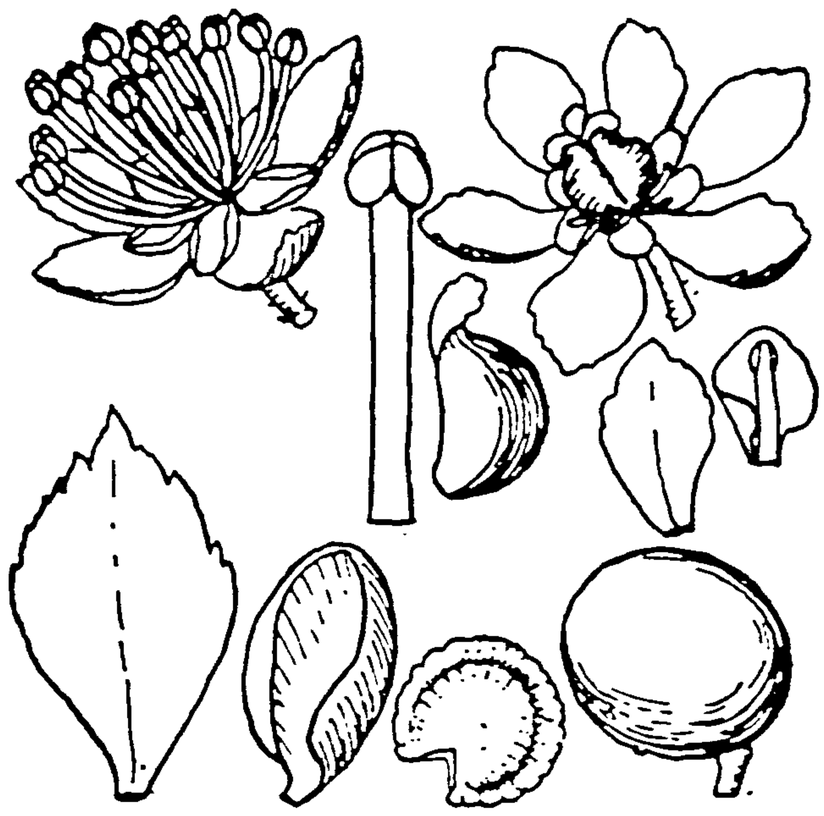


1. C. Lyonii (Pursh) Nutt. Stems twining: leaf-blades 6–20 cm. in diameter, palmately 3–7-lobed: flowers green: sepals elliptic or elliptic-obovate, 4.5–5 mm. long, or smaller: drupes subglobose or oval, about 25 mm. long, black, the stone toothed along the edge.—(Cup-seed. Lyonia-vine.)—Rich woods and river-banks, various provinces, Fla. to La., Kans., Ill., and Ky.—Spr.—The stem and branches, mostly herbaceous, are often greatly elongate. The unripe green plum-like and ripe black fruits hang on long stalks from the branches.

2. EPIBATERIUM Forst. Vines with relatively small entire or lobed leaf-blades. Sepals 6. Petals 6, involute at the base. Stamens club-like. Gynoecium sessile. Stigmas subulate. Seed cochleate. [*Cebatha* Forsk. *Cocculus* DC.]—About 11 species, mostly tropical.

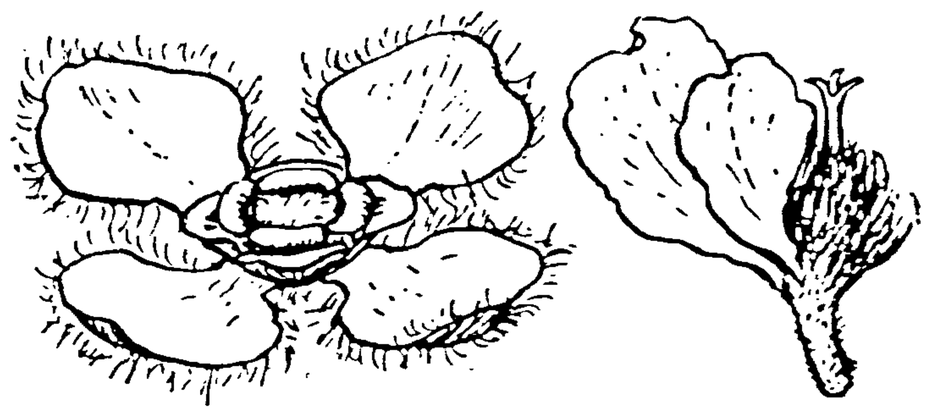
1. E. carolinum (L.) Britton. Leaf-blades broadly ovate to deltoid, 4–12 cm. long: flowers white: outer sepals elliptic: drupes red, 7–8 mm. long. [*Cocculus carolinus* DC.]—(Coral-beads. Carolina-moonseed. Red-moonseed. Snailseed.)—Woods, fields and thickets, various provinces, Fla. to Tex., Kans., and Va.—Sum.—This is a much less woody vine than the next following. The leaf-blades vary much, some are entire, others prominently lobed. The dense clusters of bright-red fruits borne close along the branches are very conspicuous.

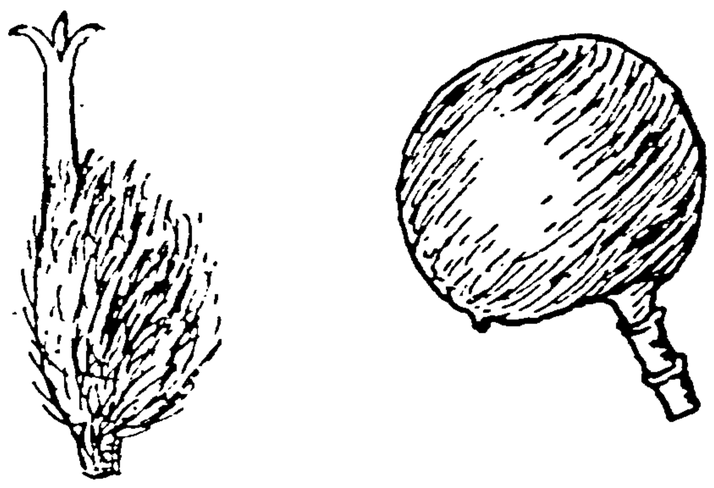
3. MENISPERMUM [Tourn.] L. Vines, with rather large entire or shallow-lobed leaf-blades. Sepals 4–8. Petals 4–8, with involute sides. Filaments clavate. Gynoecium stipitate. Stigmas flabellate. Seed cochleate.—Two species, the following and one Asiatic.



1. M. canadense L. Stems finely pubescent: leaf-blades 5–20 cm. wide, peltate near the base: flowers greenish-white: sepals elliptic or oval, 1.5–2 mm. long: petals with somewhat flabellate blades: drupes bluish-black, about 1 cm. in diameter.—(MOONSEED.)—Woods, thickets, and fencerows, various provinces, Ga. to Okla., Man., and Que.—Sum.—The stout woody stems and branches of this vine sprawl over rock or climb over shrubs. The clusters of dark-blue or blue-black fruits often resemble bunches of grapes.

4. CISSAMPELOS L. Vines with broad entire leaf-blades which are sometimes notched at the apex. Sepals 4 in the staminate flowers, one in the pistillate flowers. Petals 4 and united into a cup in the staminate flowers, one in the pistillate flowers. Stamens 2 or 4, the anthers sessile on a central peltate column. Gynoecium of a single inequilateral carpel with a short style and 3 acute stigmas. Drupe subglobose.—Several dozen species, widely distributed, especially in the tropics.





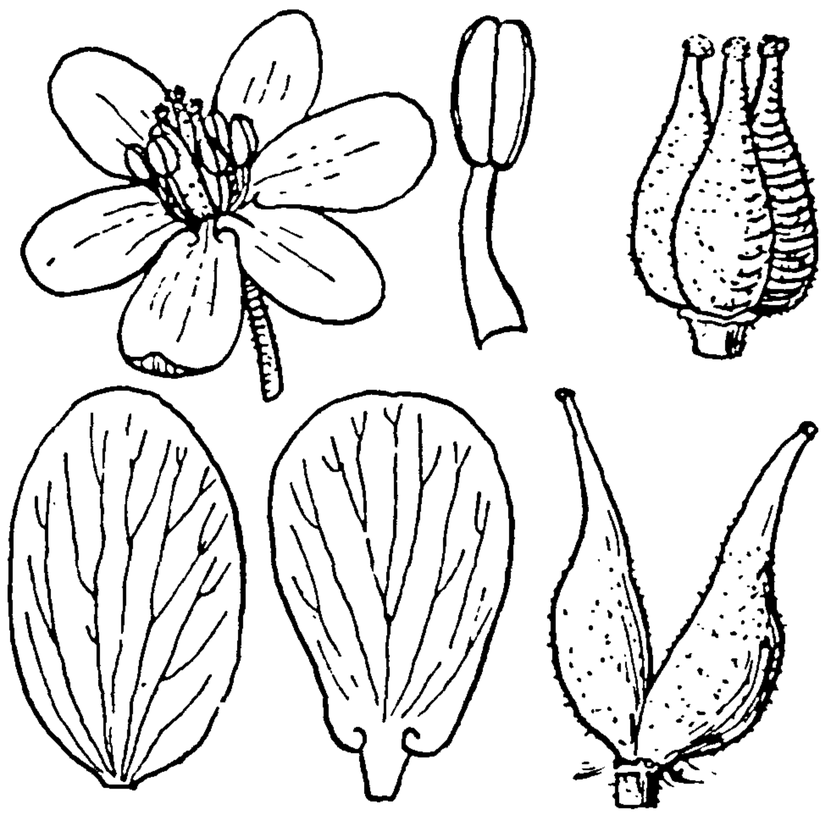
1. C. Pareira L. High-climbing vine: leaf-blades bright-green suborbicular varying to ovate-orbicular or orbicular-reniform, 4–10 cm. broad, entire, truncate or cordate and more or less peltate at the base, long-petioled: staminate flowers in much-branched cymes, the calyx nearly 2 mm. wide; sepals suborbicular: pistillate flowers in bracted clusters along a long rachis, the sepals and petals cuneate or obovate: drupe subglobose, 7–10 mm. in diameter, red, pubescent.—Hammocks, Everglade Keys, pen. Fla.—(*W. I., Mex., C. A., S. A.*)—Sum.

FAMILY 6. CABOMBACEAE — WATER-SHIELD FAMILY

Aquatic caulescent plants, often coated with transparent jelly. Leaves alternate or opposite: blades of the submerged ones palmately dissected, those of the floating leaves entire and peltate. Flowers perfect. Calyx and corolla of 3 or 4 sepals or petals each, the latter not larger than the former. Androecium of 3–18 stamens.—Two genera and about 5 species, widely distributed in fresh lakes and streams.

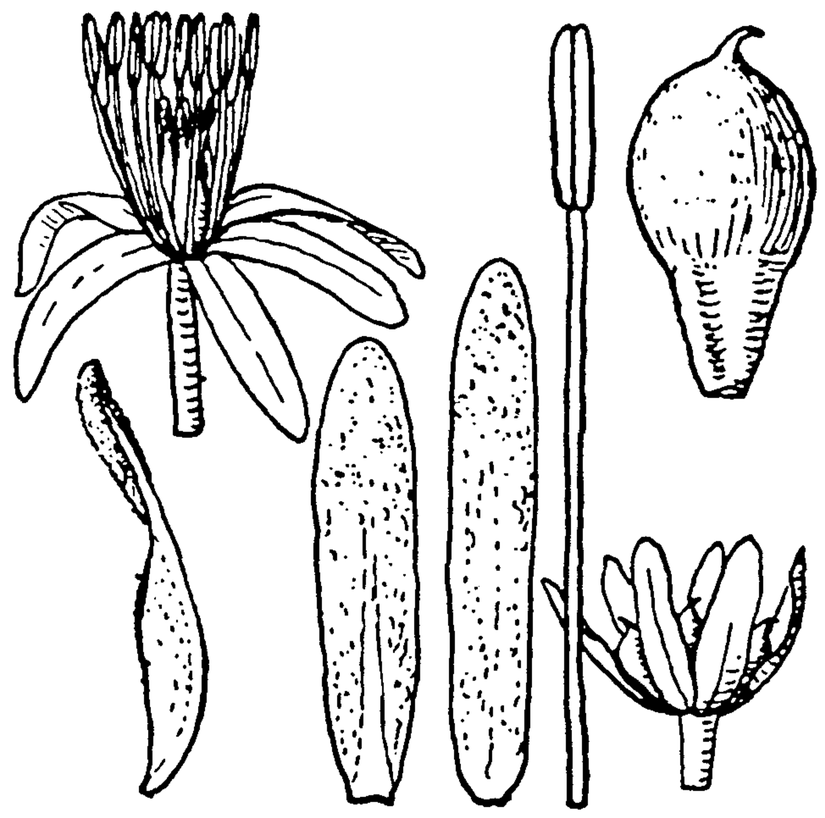
Leaf-blades dissected except the inconspicuous floating ones: petals auricled: carpels 2–4. 1. CABOMBA.
Leaf-blades all entire: petals entire: carpels 4–18. 2. BRASENIA.

1. **CABOMBA** Aubl. Slender tender herbs. Blades of the submerged leaves dissected. Sepals and petals about equal. Stamens mostly shorter than the carpels: filaments subulate. Stigma terminal. Seed rough.—Four species, natives of the warmer parts of America.



1. **C. caroliniana** A. Gray. Stems green (or purple or deep-pink as are also the petals in *C. caroliniana pulcherrima* SW Fla. and S Ga.): blades of the floating leaves linear-elliptic, peltate, 1.5–2 cm. long: sepals and petals obovate, white or pink-purple, sometimes yellow at the base, 8–12 mm. long: mature carpels flask-shaped, 5–7 mm. long, the beak shorter than the body.—(FANWORT. WATER-SHIELD. WEN-DOCK.)—Ponds and slow-flowing streams, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and N. C.—Spr.–sum.

2. **BRASENIA** Schreb. Stout herbs. Leaves peltate: blades entire. Petals narrower than the sepals. Stamens mostly longer than the carpels: filaments filiform.—One species.—The leaves evergreen in the southern part of our range, and the flowers are long-stalked and floating.

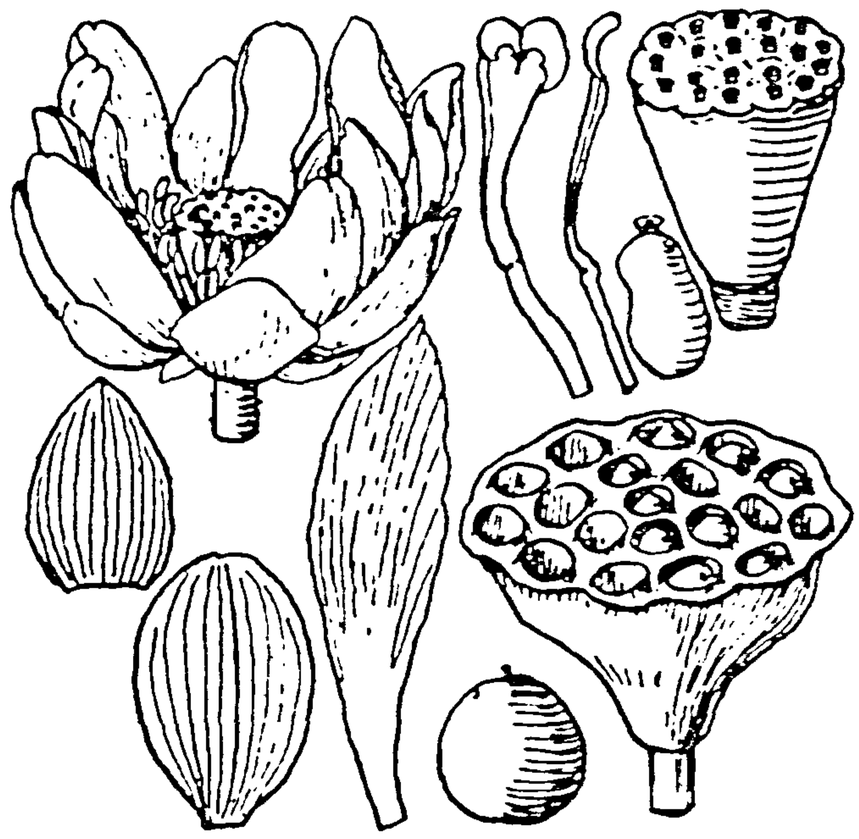


1. **B. Schreberi** Gmel. Stems, and other submerged parts, mucilage-coated: leaf-blades oval or elliptic, 5–12 cm. long: sepals and petals linear or linear-lanceolate, 1–1.5 cm. long, dull-purple: mature carpels 5–8 mm. long, the beak angled. [*B. purpurea* (Michx.) Casp. *B. peltata* Pursh]—(PURPLE-BONNET. PURPLE WEN-DOCK. WATER-SHIELD. WATER-TARGET.)—Ponds and still-water, various provinces, Fla. to Tex., Man., and N. S.—(*W. I., O. W.*)—Sum.

FAMILY 7. **NELUMBONACEAE** — LOTUS FAMILY

Aquatic acaulescent plants with rootstocks. Leaves alternate, blades suborbicular, centrally peltate, the principal veins radiating from the center and forking towards the margins. Flower solitary on the erect scape. Calyx of several sepals. Corolla of many petals, larger than the sepals. Androecium of numerous stamens: anthers narrow, over-topped by the prolonged connective. Gynoecium of several carpels separately immersed in an obconic enlargement of the receptacle. Stigma umbilicate. Fruit several nuts immersed in the accrescent turbinate or hemispheric receptacle. Represented by the following genus:

1. **NELUMBO** Adans. Leaves and flowers erect on the tuberous rootstock. Leaf-blades large, elevated above the water on stout petioles, depressed



or cup-like at the center. Flowers erect. Sepals and petals passing gradually into each other. Stamens numerous, deciduous. Fruits acorn-like, imbedded in the top of the receptacle.—Three species, the following and two in the Old World—The flowers and leaves are elevated above the water, the latter are not evergreen.

1. N. lutea (Willd.) Pers. Leaf-blades elevated on the petioles, or floating, orbicular, 3–6 dm. in diameter, the edges turned upward: peduncles 1–2 m. tall: corolla pale-yellow, 1–2.5 dm. wide: appendages of the anthers 4–7 mm. long: fruiting receptacle 7–10 cm. wide: nuts 10–12 mm. in diameter.—(DUCK-ACORN. LOTUS. WATER-CHINQUAPIN. WATER-NUT. YONKAPIN. ALLIGATOR-BUTTONS. CAN-DOCK.)—Ponds, lakes, and slow streams, Coastal Plain and isolated localities in other provinces, Fla. to Tex., Nebr., Minn., Ont., and Mass.—Sum.—The fruits were used as food by the aborigines.

FAMILY 8. NYMPHAEACEAE — WATER-LILY FAMILY

Aquatic plants with stout horizontal rootstocks. Leaves with erect or floating blades. Flower terminating a long scape. Calyx of 4–6 sepals. Corolla of many petals passing into the stamens. Androecium of numerous stamens. Gynoecium of 6–36 united carpels, the stigmas radiate on a disk. Fruit baccate.—Five genera and about 45 species, widely distributed in fresh water.—In addition to emersed and floating leaves there are sometimes submersed ones.

Petals small, filament-like: stamens hypogynous: ovary superior. 1. NYMPHAEA.
Petals about as large as the sepals: stamens epigynous: ovary inferior. 2. CASTALIA.

1. NYMPHAEA [Tourn.] L. Plants with erect or floating leaf-blades and yellow flowers. Leaf-blades not peltate, with a deep sinus at the base. Sepals 5 or 6, concave, converging. Petals numerous, thick, scale-like, borne, with the stamens, under the ovary. Berry smooth, maturing above water.—About 12 species, natives of the north temperate zone.—SPLATTER-DOCKS. SPATTER-DOCKS. BONNETS. COW-LILIES. YELLOW POND-LILIES.

Leaf-blades more than twice as long as wide, the sinus less than one-fourth the length of the blade. I. SAGITTIFOLIAE.
Leaf-blades less than twice as long as wide, the sinus one-fourth to one-half the length of the blade.
  Leaf-blades glabrous beneath. II. ADVENAE.
  Leaf-blades pubescent beneath. III. ORBICULATAE.

I. SAGITTIFOLIAE

Leaf-blades over thrice as long as wide, the sinus open: stigma-rays linear. 1. *N. sagittifolia.*
Leaf-blades less than thrice as long as wide, the sinus closed: stigma-rays elliptic. 2. *N. ulvacea.*

II. ADVENAE

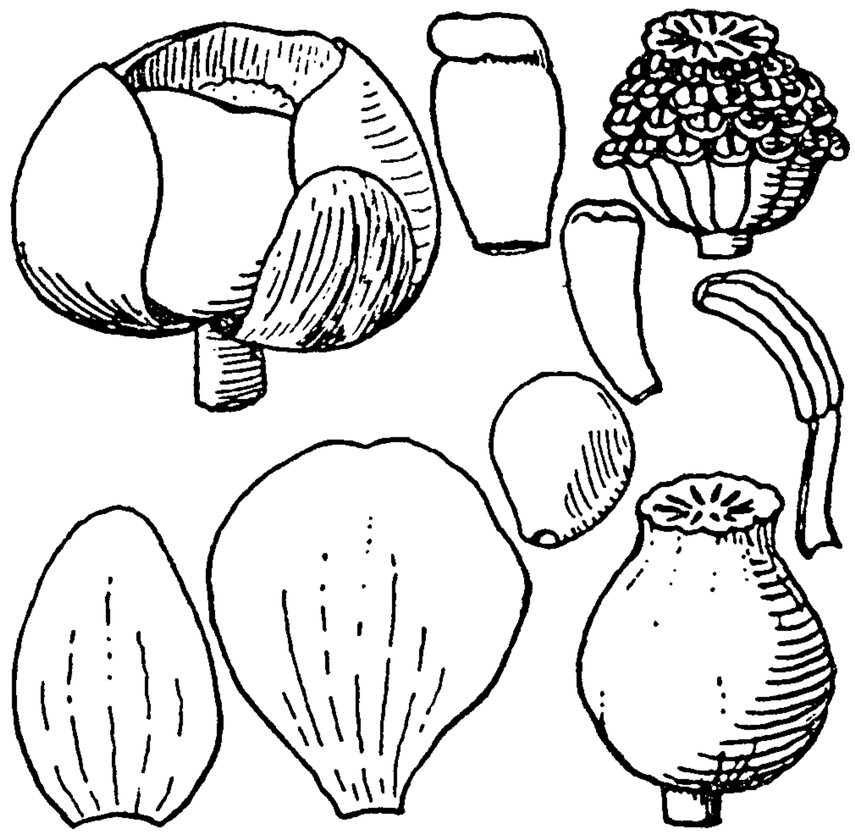
Leaf-blades of an orbicular or ovate-orbicular type. 3. *N. fluviatilis.*
Leaf-blades markedly longer than wide.
  Sepals and leaf-blades very thin: submersed leaves present. 4. *N. chartacea.*

Sepals and leaf-blades thick: submersed leaves wanting.	
Leaf-blades ovate or oval: inner sepals suborbicular: fruits subglobose: disk green or yellowish-green.	6. *N. macrophylla.*
Leaf-blades elliptic-ovate: inner sepals cuneate-obovate: fruits narrowly ovoid; disk chrome-yellow to red.	5. *N. advena.*

III. ORBICULATAE

Leaf-blade with a closed sinus: stamens in 9 or 10 rows: flowers about 5 mm. in diameter: seeds about 4 mm. long.	7. *N. orbiculata.*
Leaf-blade with an open sinus: stamens in 6 or 7 rows: flowers about 7 mm. in diameter: seeds about 6 mm. long.	8. *N. bombycina.*

1. N. sagittifolia Walt. Blades of the floating leaves narrowly elliptic-lanceolate to elliptic, 14–28 cm. long, the sinus V-shaped; petioles stoutish: flowers spheroidal, 2.6–2.9 cm. in diameter: sepals 6, the 3 outer elliptic or nearly so, 2–2.6 cm. long, the 3 inner suborbicular: filaments fully as long as the anthers or nearly so: fruit ovoid, 3–3.4 cm. long, ribbed above, the disk with linear stigma-rays: seed 4–5 mm. long. [*Nuphar sagittaefolia* Pursh]—(ARROW-LOTUS.)—Sluggish streams and tidal bayous, Coastal Plain, S. C. and N. C.



2. N. ulvacea Miller & Standley. Blades of the floating leaves lanceolate to ovate-lanceolate, 11.5–16.5 cm. long, the sinus closed; petioles slender: flowers spheroidal, 2–2.3 cm. in diameter: sepals 6, the 3 outer broadly elliptic, 2.4–2.8 cm. long, the 3 inner broadly obovate, clawed: filaments shorter than the anthers: fruit subglobose or ovoid-globose, 1.5–2.1 cm. long, ribbed to the base, the disk with elliptic stigma-rays: seed 3–4 mm. long.—Slow streams, W Fla.

3. N. fluviatilis Harper. Blades of the floating leaves suborbicular or ovate-orbicular, 18–25 cm. long, thin, the sinus open: flowers spheroidal, about 2.5 cm. in diameter: sepals 6, very thin, the 3 outer nearly elliptic, 16–18 mm. long, the 3 inner obovate, slightly longer than the outer, clawed: petals about as long as the stamens, mostly truncate: fruit (immature) ovoid; disk orbicular, the rays linear.—Streams and bayous, Coastal Plain, and adj. provinces, W Fla. to Ala. and N. C.

4. N. chartacea Miller & Standley. Blades of the floating leaves ovate to elliptic-ovate, 14–23 cm. long, thin, the sinus closed or very narrow: flowers spheroidal, 3–3.5 cm. in diameter: sepals 6, thin, the 3 outer elliptic, 12–20 mm. long, the 3 inner obovate, nearly or quite as long as the outer, and thinner: petals about as long as the stamens, rounded or truncate at the apex: fruit not seen.—Ponds and bayous, near the Gulf, Fla. to Miss.

5. N. advena Ait. Leaf-blades erect, normally borne above the surface of the water, ovate to oval, 15–33 cm. long, glabrous, obtuse, the sinus usually forming a right angle; petioles nearly terete: flowers spheroidal, 3–4 cm. in diameter: sepals usually 6, the 3 outer ovate, about 35 mm. long, the 3 inner suborbicular, about as long as the outer: petals clear-yellow like the inner sepals, about 20, elliptic-cuneate, about 8 mm. long, truncate or retuse at the apex: filaments cuneate-linear, somewhat shorter than the anther, usually dull-red except the yellow tip: fruit subglobose, about 5 cm. in diameter; disk light-green or yellowish-green. [*Nuphar advena* R. Br.]—(MULEFOOT-LILY.)—Ponds and streams, various provinces, Ga. to Tex., Nebr., Wis., and N. Y.

6. N. macrophylla Small. Leaf-blades erect or floating, elliptic-ovate, 28–40 cm. long, glabrous, the sinus V-shaped: flowers spheroidal, 3.2–3.8 cm. in diameter: sepals 6, the 3 outer obovate, about 32 mm. long, the 3 inner broadly cuneate-obovate; petals light lemon-yellow, broadly cuneate, about 10 mm. long: filaments about ½ as long as the anthers, lemon-yellow: fruit narrowly ovoid, about 3.5 cm. long; disk chrome-yellow to red.—Streams and sloughs, N E Fla. and the peninsula.

7. N. orbiculata Small. Leaf-blades floating, suborbicular, 3–5 dm. long, glabrous above, silky beneath, the sinus closed by the overlapping lobes: flowers spheroidal, about 5.5 cm. in diameter: outer sepals elliptic, about 45 mm. long, the inner suborbicular, short-clawed: petals linear to elliptic-obovate: filaments slightly shorter than the anthers: fruit subglobose, about 4.5 cm. long, the stigmatic disk with erect edges: seed 4 mm. long.—Lakes and ponds, Coastal Plain, M Fla. and adj. Ga.

8. N. bombycina Miller & Standley. Leaf-blades floating, broadly ovate to orbicular-ovate, 2–3 dm. long, glabrous above, densely silky beneath, the sinus open: flowers spheroidal, 6–8 cm. in diameter: outer sepals elliptic, 2.5–4.5 cm. long, the inner obovate: petals broad, often truncate, 6–10 mm. long: filaments about ½ as long as the anthers: fruit ovoid to nearly cylindric, 5–6 cm. long, the stigmatic disk with somewhat spreading edges: seed 6 mm. long. —Ponds, Coastal Plain, N Fla. to Ga.

2. CASTALIA Salisb. Plants with floating leaf-blades and white, pink, blue, or yellow flowers. Leaf-blades subpeltate, cleft at the base. Sepals mostly 4, spreading. Petals few to many, spreading, the outer ones as large as the sepals, borne with the stamens on the hypanthium, which encloses the ovary. Berry covered with the persistent petal- and stamen-bases, maturing under water.—About 40 species, of wide geographic distribution.—WATER-LILIES. WATER-NYMPHS. POND-LILIES.—The inner petals resemble stamens.

Corolla white, pinkish, blue or violet: rootstock not stoloniferous.
- Corolla white or pinkish: outer stamens not appendaged at the apex: styles subulate. — I. ODORATAE.
- Corolla blue or violet: outer stamens with the connective produced into an apical appendage: styles mere blunt protuberances. — II. ELEGANTES.

Corolla yellow: rootstock stoloniferous at the tip. — III. FLAVAE.

I. ODORATAE

Styles stout-subulate, 5 mm. long or less, when converging not meeting at the tip: style-disk basin-shaped: corolla mostly 10 cm. wide or less: leaf-blades flat.
- Calyx 9–11 cm. wide: petaloid stamens 3–3.5 cm. long: anthers of the inner stamens 6–7 mm. long: style-disk 17–20 mm. wide. — 1. *C. odorata.*
- Calyx mostly 6–8 cm. wide: petaloid stamens 2–2.5 mm. long: anthers of the inner stamens 10–11 mm. long: style-disk 10–13 mm. wide. — 2. *C. minor.*

Styles slender-subulate, 10 mm. long or more, when converging meeting at the tip: style-disk funnelform: corolla mostly over 15 cm. wide: leaf-blades with the edges turned up. — 3. *C. lekophylla.*

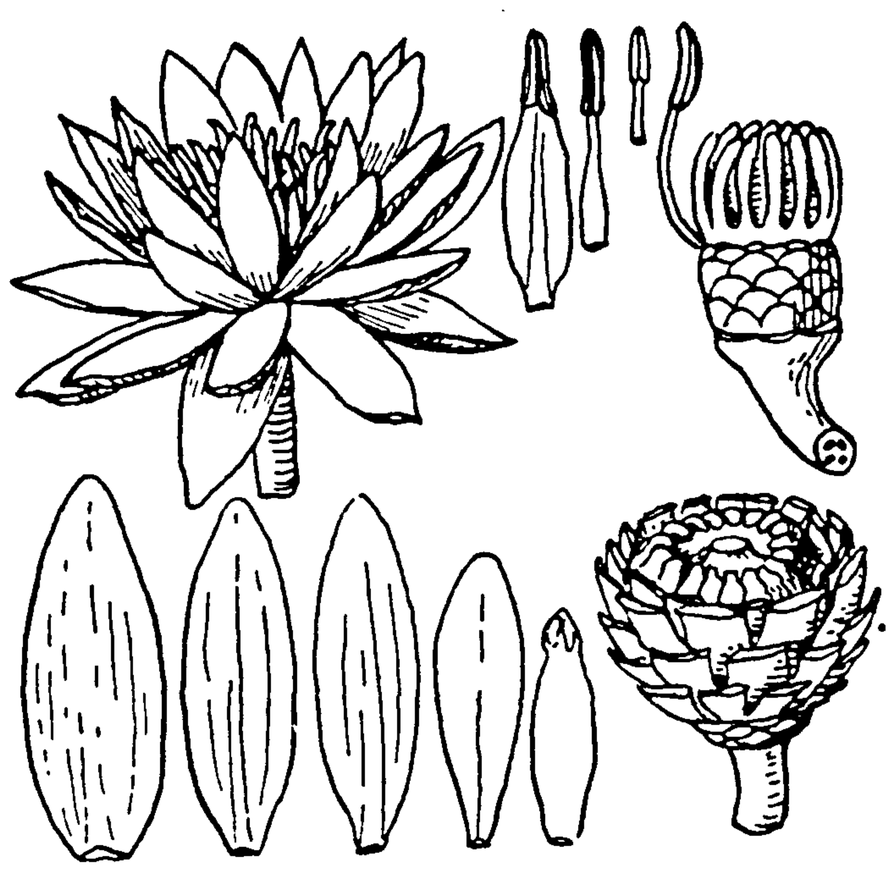
II. ELEGANTES

Plants with slender petioles and flower-stalks, the leaf-blades floating, the flowers elevated above the water. — 4. *C. elegans.*

III. FLAVAE

Plant with warty rootstocks and somewhat peltate leaf-blades. — 5. *C. flava.*

1. C. odorata (Ait.) Woodv. & Wood. Roostock stout, mostly 2.5–3 cm. thick: leaf-blades suborbicular, 15–20 cm. wide, green tinged with red or



purple-red and obscurely veined beneath: sepals elliptic or elliptic-ovate, 5–6 mm. long: petals usually more than 25, elliptic or slightly broadened upward, thickish: stamens mostly more than 70, the petaloid ones 3–3.5 cm. long: styles mostly 18–20: berry depressed-globose, mostly 2.5–3 cm. in diameter: seed about 3 mm. long. [*Nymphaea odorata* Ait.]—(ALLIGATOR-BONNET. STAR-LOTUS.)—Ponds, lakes, slow streams, and ditches, various provinces, Fla. to La., Man., and N. S.

2. C. minor (Sims) DC. Rootstock slender, mostly about 1.5 cm. thick: leaf-blades oval-orbicular, 5–11 cm. wide, dark red-purple and scarcely veined beneath: sepals narrowly elliptic, mostly about 4 cm. long: petals usually less than 20, narrowly elliptic or elliptic-cuneate, very thin and delicate: stamens usually less than 60, the petaloid ones 2.5–3 cm. long: styles mostly 10–15: berry subglobose or somewhat depressed, mostly less than 2.5 cm. in diameter: seed about 2 mm. long.—Lakes, ponds, and ditches, often in acid water, Coastal Plain, Fla. to La. and N. J.

3. C. lekophylla Small. Rootstock very stout, 4–6 cm. thick: leaf-blades suborbicular, 20–60 cm. wide, with the edges turned upwards somewhat as in Victoria, deep-green beneath or tinged with purple or red, coarsely reticulate beneath with very stout veins: sepals elliptic-ovate or broadly elliptic, 8–10 cm. long: petals 25–30, narrowly elliptic to linear-elliptic, thick: stamens mostly 80–100, the petaloid ones about 5 cm. long: styles 20–25: berry depressed globose, 3.5–4.5 cm. in diameter. [*C. reniformis* (Fl. SE. U. S.)]—(APPLE-LOTUS.)—Lakes and ponds, Coastal Plain, Fla. to Tex. and Del.—(*W. I., Mex.*)—The West Indian specimens seem to be like those from Florida. Those from Mexico may represent a different species.

4. C. elegans (Hook.) Greene. Rootstock stout: leaf-blades ovate to oval-orbicular, mostly 8–20 cm. wide, undulate-sinuate or near entire, usually dark red-purple and somewhat veiny beneath: flowers usually standing 1–2.5 dm. above the water: sepals mostly lanceolate, 4–5 cm. long: petals 6–10, lanceolate or sometimes ovate-lanceolate, blue or pale-violet: stamens numerous: styles mere blunt protuberances; 15–25: berry depressed-globose, 1.5–3 cm. in diameter: seeds 1–1.5 mm. in diameter.—(BLUE WATER-LILY.)—Ponds, pools, and ditches, Big Cypress swamp, Fla., also Coastal Plain, S Tex.—(*Mex.*)

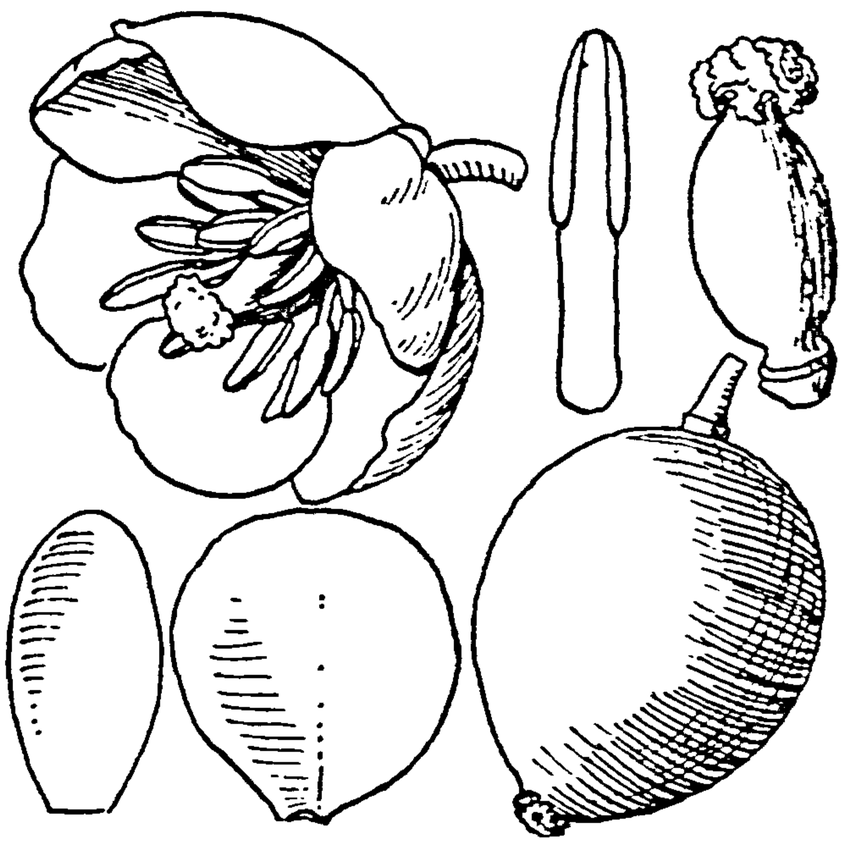
5. C. flava (Leitner) Greene. Rootstock warty with the persistent petiole-bases: leaf-blades oval to suborbicular, 6–20 cm. wide, glabrous, bright-green above, purple or crimson beneath: flowers 6–10 cm. wide: sepals lanceolate to narrowly elliptic-lanceolate: petals usually about 25, bright yellow, more elliptic than the sepals: stamens 50–60, the petaloid ones mostly 2–2.5 cm. long: anthers of the inner ones 4–6 mm. long: styles 7–9: berry ovoid, 2–2.5 cm. long: seed 4–5 mm. in diameter. [*Nymphaea flava* Leitner]—(YELLOW WATER-LILY. SUN-LOTUS.)—Lakes, ponds, and slow streams, pen. Fla.

FAMILY 9. PODOPHYLLACEAE — MAY-APPLE FAMILY

Perennial herbs. Leaves alternate, sometimes all basal and scale-like: blades simple or ternately compound. Flowers perfect, of 4 or 6 sepals. Corolla of 6 or 9 petals resembling the sepals except in *Caulophyllum*. Androecium of 6–18 stamens, the anthers opening by valves, except in *Podophyllum*.—About 10 genera and 30 species, widely distributed.

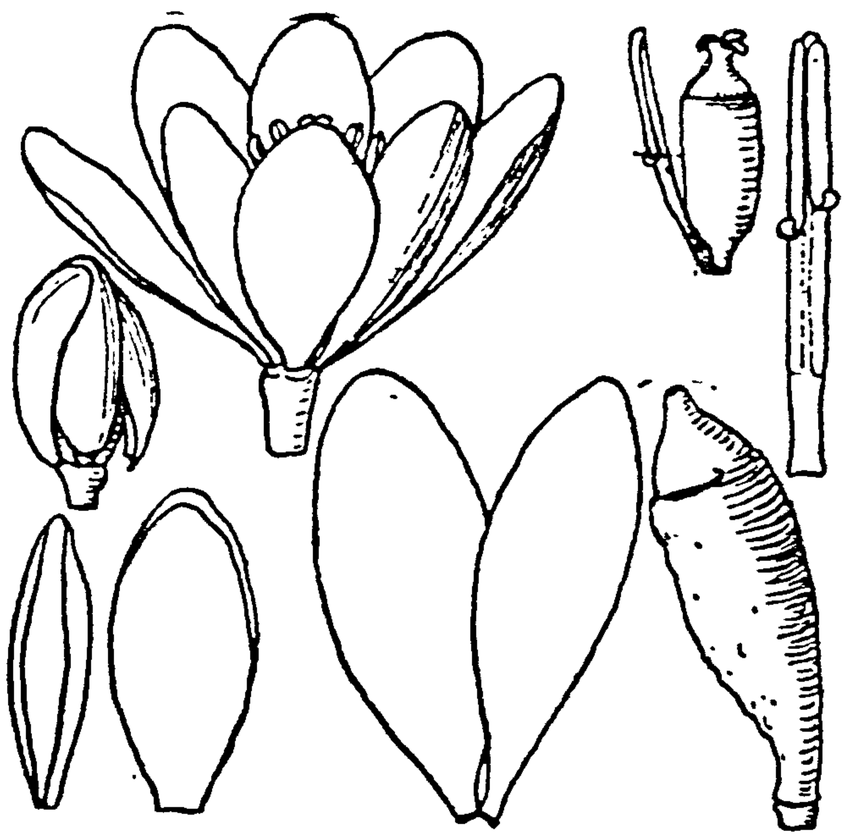
Anthers opening lengthwise. 1. PODOPHYLLUM.
Anthers opening by valves hinged at the top.
  Leaf-blades simple: seeds enclosed.
    Flower solitary: stamens 8: fruit a capsule. 2. JEFFERSONIA.
    Flowers several, cymose: stamens 6: fruit baccate. 3. DIPHYLLEIA.
  Leaf-blades ternately compound: seed naked, drupe-like. 4. CAULOPHYLLUM.

1. PODOPHYLLUM L. Glabrous herbs, with elongate rootstocks. Leaves solitary, or 2 at the top of the flowering stem: blades peltate, many-lobed. Flower solitary, nodding. Sepals 6, fugaceous. Petals 6–9. Stamens 12–18. Berry fleshy, nodding.—About 4 species, the following and 3 in Asia.



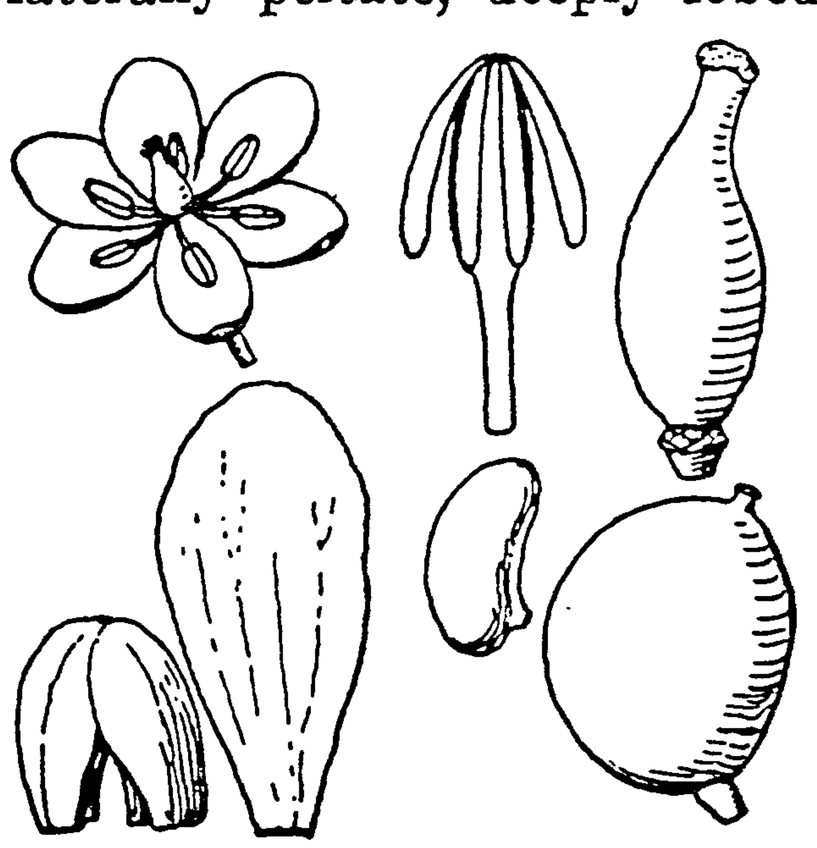
1. P. peltatum L. Plants 2–4 dm. tall: leaf-blades suborbicular, 1–3 dm. in diameter, 7–9-lobed: pedicel 2–4 cm. long: petals white, 6–9, obovate, 2.5–4 cm. long, waxlike: berry yellow, somewhat oblique, 4–5 cm. long.—(MAY-APPLE. MANDRAKE. GROUND-LEMON. UMBRELLA-LEAF.)—Rich soil, especially in woods, various provinces, Fla. to Tex., Minn., and Que.—Spr.—The rootstock is used in medicine. The fruit is edible.

2. JEFFERSONIA Bart. Small herbs, with short rootstocks. Leaves basal: blades 2-parted. Flower solitary, erect at the end of the scape. Sepals 4, deciduous. Petals 8. Stamens 8: anthers longer than the filaments. Stigma 2-lobed. Capsule opening by a lid.—About 2 species, the following and 1 in Asia.



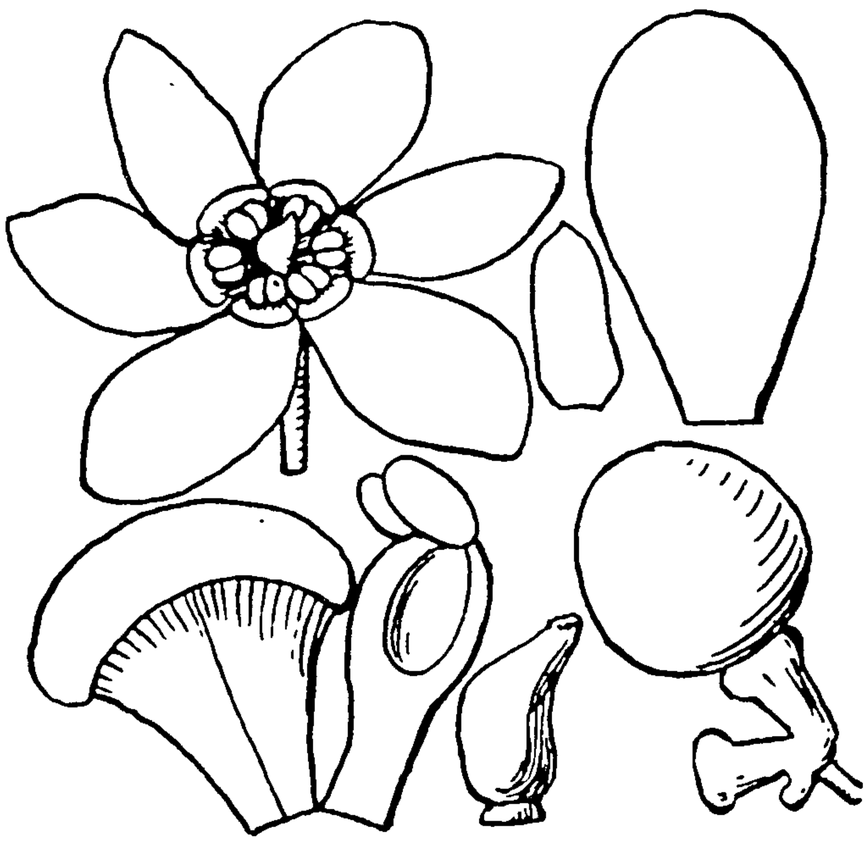
1. J. diphylla (L.) Pers. Plants 1–3.5 dm. tall: leaf-blades 5–10 cm. long, the segments entire or coarsely crenate: petals white, 1.5–2 cm. long, mostly elliptic-lanceolate or oblanceolate: capsule erect, obovoid or obconic, 1.5–2 cm. long: seed 4-7 mm. long.—(TWIN-LEAF. RHEUMATISM-ROOT.)—Rich woods, often in calcareous soil, various provinces N of Coastal Plain, Ala. to Wis., Ont., N. Y., and Md.—Spr.

3. DIPHYLLEIA Michx. Large herbs, with stout rootstocks. Leaves mostly 1 or 2 on the flowering stem: blades laterally peltate, deeply lobed. Flowers cymose. Sepals 6, deciduous. Petals 6. Stamens 6: anthers longer than the filaments. Stigma umbilicate. Berry oblique, erect.—Two species, the following and 1 in Japan.



1. D. cymosa Michx. Plants 6–12 dm. tall: leaf-blades suborbicular, 3–6 dm. in diameter, 2-cleft and many-lobed: petals 6, white, 8–10 mm. long: berry subglobose, 10–12 mm. in diameter: seed about 5 mm. long.—(PIXIE-PARASOL. UMBRELLA-LEAF.) — Along brooks, Blue Ridge, Ga. to Va.—Spr.

4. CAULOPHYLLUM Michx. Large herbs, with thick rootstocks. Leaf high up on the flowering stem, ternately compound. Flowers in a raceme-like cyme. Sepals 6, accompanied by 3 or 4 bractlets. Petals 6, gland-like, dilated. Stamens 6: anthers shorter than the filaments. Fruit erect.—Two species, the following and one in Asia.

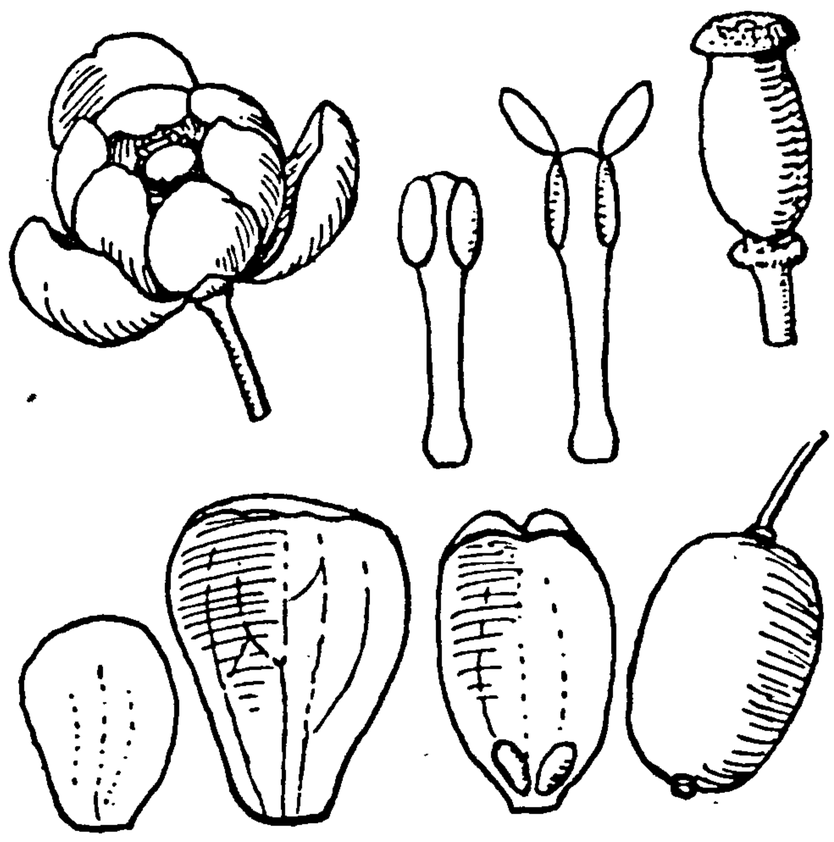


1. C. thalictroides (L.) Michx. Plants 3–9 dm. tall: leaflets 2–3-lobed at the apex, 4–10 cm. long: panicle 4–10 cm. long: sepals greenish or purplish, 3–6 mm. long: petals about 2 mm. long: seed about 1 cm. in diameter.—(BLUE-COHOSH. BLUE-GINSENG. GREEN-VIVIAN. PAPPOOSE-ROOT.)—Rich woods, various provinces N of Coastal Plain, S. C. to Nebr., Minn., and N. B.—Spr.—The exserted seed is likely to be mistaken for a drupe. The plant is medicinal.

FAMILY 10. BERBERIDACEAE — BARBERRY FAMILY

Shrubs or small trees, sometimes spiny. Leaves alternate: blades compound, sometimes 1-foliolate. Flowers perfect. Calyx of 6–9 sepals usually accompanied by bractlets. Corolla of 6–9 petals usually smaller than the inner sepals. Androecium of 6 irritable stamens, the anthers opening by valves. Gynoecium of a single carpel. Stigma orbicular. Fruit a berry.—Two genera and about 100 species, widely distributed.

1. BERBERIS L. Shrubs with lax branches. Leaves of the main branches transformed into spines, those of the branchlets with 1-foliolate deciduous blades. Flowers racemose. Sepals 6–9, the inner the larger, resembling the petals. Petals 6–9, with basal glands. Berry red.—About 80 species, American and Eurasian.



1. B. canadensis Pursh. A shrub 3–20 dm. tall: leaflets mostly 3–6 cm. long, the blades mainly spatulate, sometimes elliptic-spatulate or rarely oval, spiny-serrate: racemes 2–6 cm. long: calyx 8–11 mm. wide, the inner sepals 3–4 mm. long: petals yellow, mainly 2.5–3.5 mm. long: berry scarlet, 5–7 mm. long.—(BARBERRY. ALLEGHENY-BARBERRY. CLIFF-BARBERRY.)—Rocky woods and cliffs, various provinces N of Coastal Plain, Ga. to W. Va., also Mo.; not in Can.—Spr.—The berries are edible.—*B. Thunbergii* DC. A native of Japan, a much-branched spiny shrub up to 15 dm. tall, with obovate or spatulate entire leaf-blades, numerous yellow flowers, and bright red, ellipsoid or subglobose persistent berries, is naturalized in the mountains of N. C.

Order **PAPAVERALES** — Papaveral Order

Herbs, shrubs, trees, or vines. Leaves with entire, toothed, dissected, or compound blades. Flowers perfect. Calyx of distinct or nearly distinct sepals. Corolla of distinct or nearly distinct petals, or wanting. Androecium of few or many hypogynous stamens. Gynoecium of 2–several united carpels. Ovary superior. Fruit capsular or baccate.

Sepals 2, or very rarely 3 or 4: endosperm present.
- Flower regular: stamens 8 or numerous: juice usually milky or colored. — Fam. 1. Papaveraceae.
- Flower irregular: stamens 6: juice usually watery. — Fam. 2. Fumariaceae.

Sepals 4–8: endosperm wanting.
- Capsule 2-celled: stamens 6, tetradynamous. — Fam. 3. Brassicaceae.
- Capsule 1-celled: stamens when 6 not tetradynamous.
  - Gynoecium 2-carpellary: leaves with simple or palmately compound blades. — Fam. 4. Capparidaceae.
  - Gynoecium 3-carpellary: leaves with pinnately compound blades. — Fam. 5. Moringaceae.

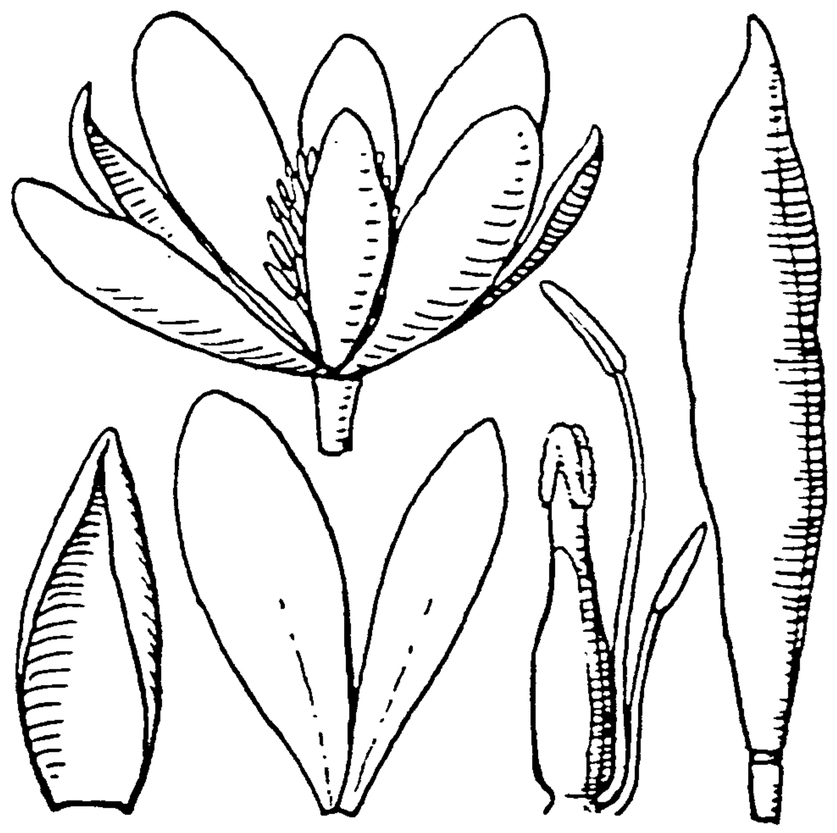
Family 1. **PAPAVERACEAE** — Poppy Family

Herbs or rarely woody plants, the sap colored. Leaves alternate or opposite: blades entire, toothed, or divided. Flowers perfect, regular. Calyx of 2 or rarely 3 caducous sepals. Corolla of 4, 8, or 12, or rarely more, deciduous petals. Androecium usually of many distinct stamens. Gynoecium 2–several-carpellary. Fruit a capsule or a silique.—About 23 genera and 115 species, most abundant in the north temperate zone.

Acaulescent herbs: petals 8–12, not crumpled in the bud: stigmas over the valves of the capsule. — 1. Sanguinaria.

Caulescent herbs: petals 4–6, mostly crumpled: stigmas over the placentae.
- Capsule splitting to the base.
  - Capsule pubescent. — 2. Stylophorum.
  - Capsule glabrous. — 3. Chelidonium.
- Capsule dehiscent at the top or only to the middle.
  - Stigma crown-like or disk-like: capsule opening by tooth-like lids under the edge of the stigma: leaf-blades unarmed. — 4. Papaver.
  - Stigmas 4–6-lobed: capsule 4–6-valved: leaf-blades spiny-toothed. — 5. Argemone.

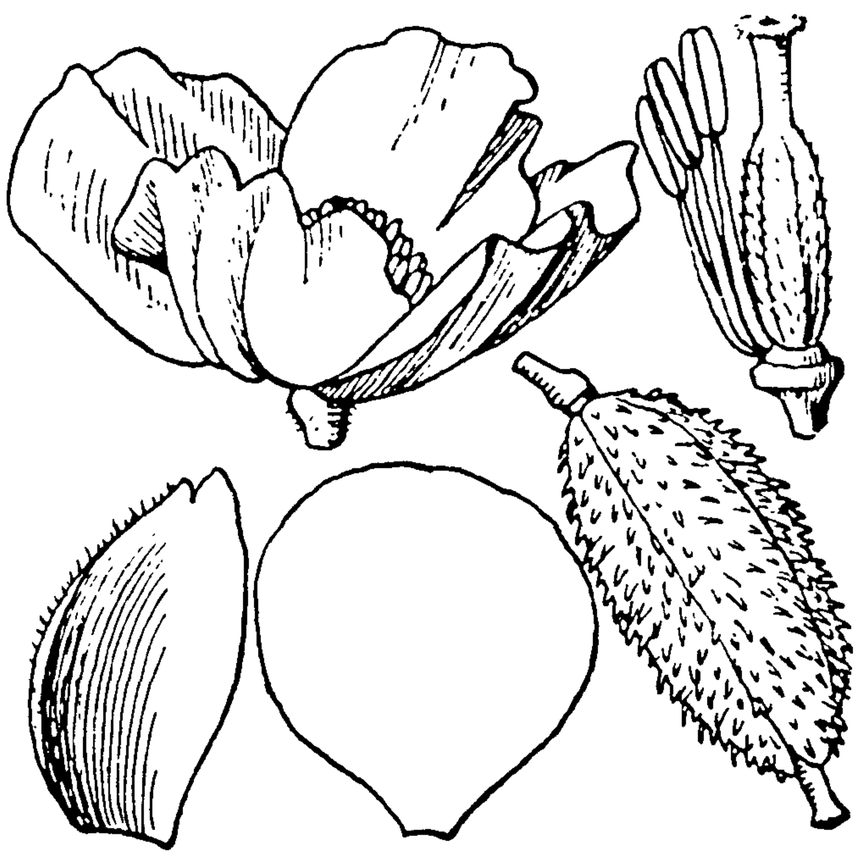
1. SANGUINARIA [Dill.] L. Perennial herbs with red rootstocks. Leaves basal: blades palmately lobed. Flowers solitary. Sepals 2, glabrous. Petals 8–12, narrow, white. Gynoecium 2-carpellary, glabrous.—One species.



1. S. canadensis L. Plant 8–30 cm. tall, glabrous: leaf-blades orbicular to reniform in outline, 6–25 cm. wide, 5–9-lobed: scapes finally over-topped by the leaves: petals elliptic or rarely broader, 2–3 cm. long: capsule fusiform, 3–5 cm. long.—(Bloodroot. Red-puccoon.)—Rich woods, various provinces, N Fla. to Ark., Man., and N. S. —Spr.—The rootstock furnished a dye for the aborigines.—Two or three or even a half-dozen species additional to the one here recognized have been described. However, the characters of the rootstocks, the

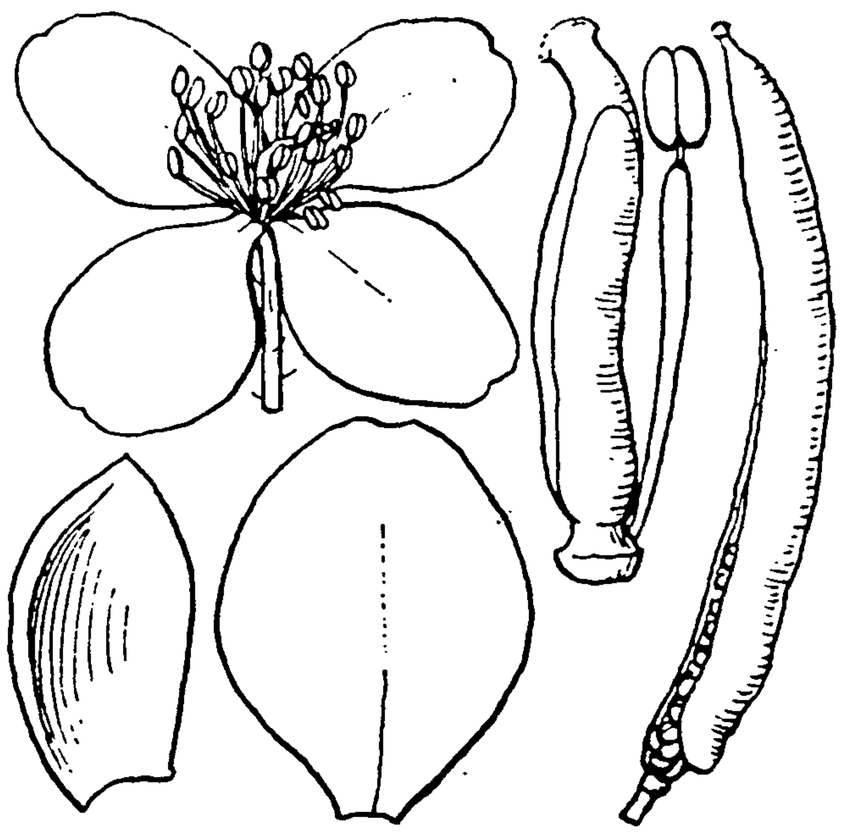
leaf, and the flower used to distinguish them do not seem to be constant indices to the groups.

2. **STYLOPHORUM** Nutt. Perennial herbs, with orange-yellow roots. Leaves cauline: blades pinnately lobed or dissected. Flowers usually few or several. Sepals 2, pubescent. Petals 4, broad, yellow or red. Gynoecium 3–4-carpellary, pubescent. Stigma crown-like. Capsule stout. Seed thick-crested.—About 4 species, the following and 3 in Asia.



1. S. diphyllum (Michx.) Nutt. Plant 2–5 dm. tall, pubescent: leaf-blades 2-pinnatifid, the segments broadened upward; petals deep-yellow, obovate, 1–1.5 cm. long: capsule ovoid or oval, about 2.5 cm. long.—(CELANDINE-POPPY. MOCK-POPPY. WOOD-POPPY. YELLOW-POPPY.)—Woods, often in calcareous soil, various provinces, N of Blue Ridge, Tenn. to Mo., Wis., and W Pa.—Spr.

3. **CHELIDONIUM** [Tourn.] L. Biennial or perennial herbs. Leaves cauline: blades pinnately dissected. Flowers numerous. Sepals 2. Petals 4, broad, but longer than wide, yellow. Gynoecium slender, 2-carpellary. Stigmas 2. Capsule elongate.—One species.



1. C. majus L. Plants 2–7 dm. tall: leaf-blades 1–3 dm. long, the segments with lobes or teeth: petals suborbicular, 8–13 mm. long: capsule slender, 3–5 cm. long.—(CELANDINE. ROCK-POPPY. SWALLOW-WORT.)—Roadsides and fence rows, Appalachian provinces in S, various provinces in N, Ga. to Tenn., Ont., and Me.—Nat. of Eu.—Spr.—Celandine, like hoarhound, catnep, and similar herbs, was brought to this country by early settlers from Europe. Being a popular remedy for various external and internal body-disorders it early became naturalized about dwellings over a large area. It has active medicinal properties.

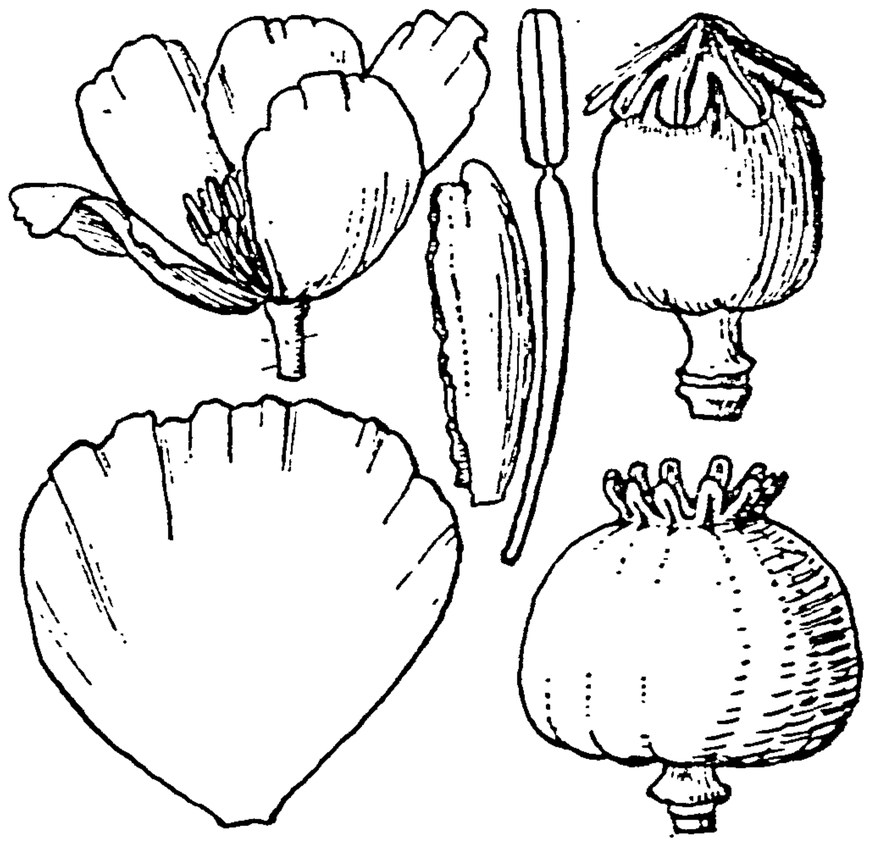
4. **PAPAVER** [Tourn.] L. Annual or perennial herbs. Leaves sometimes mainly basal: blades mostly pinnately lobed. Flowers few or solitary, the buds drooping. Sepals 2, or rarely 3. Petals 4, or rarely 6, broad. Gynoecium several-carpellary, the ovary with 4–20 septiform placentae. Stigma crown-like or disk-like. Capsule long, short, or depressed.—About 45 species, all, except 4 or 5, natives of the Old World.—POPPIES.

Plant glaucous: leaf-blades lobed, clasping at the base: capsule subglobose or depressed. 1. *P. somniferum.*

Plant pubescent, mostly hirsute: leaf-blades pinnately divided, narrowed at the base: capsule elongate, or longer than thick. 2. *P. dubium.*

1. P. somniferum L. Plant 3–10 dm. tall: leaf-blades 6–20 dm. long, the lobes toothed: sepals glabrous: petals white to purple, 2.5–5 cm. long: fila-

ments clavate: capsule subglobose or depressed, 2–3 cm. long. — (OPIUM-POPPY. GARDEN-POPPY.)—Fields and waste-places, various provinces, Fla. to La., Tenn., and S Can. Nat. of Eu.—Sum.—The capsule produces opium and its derivatives.

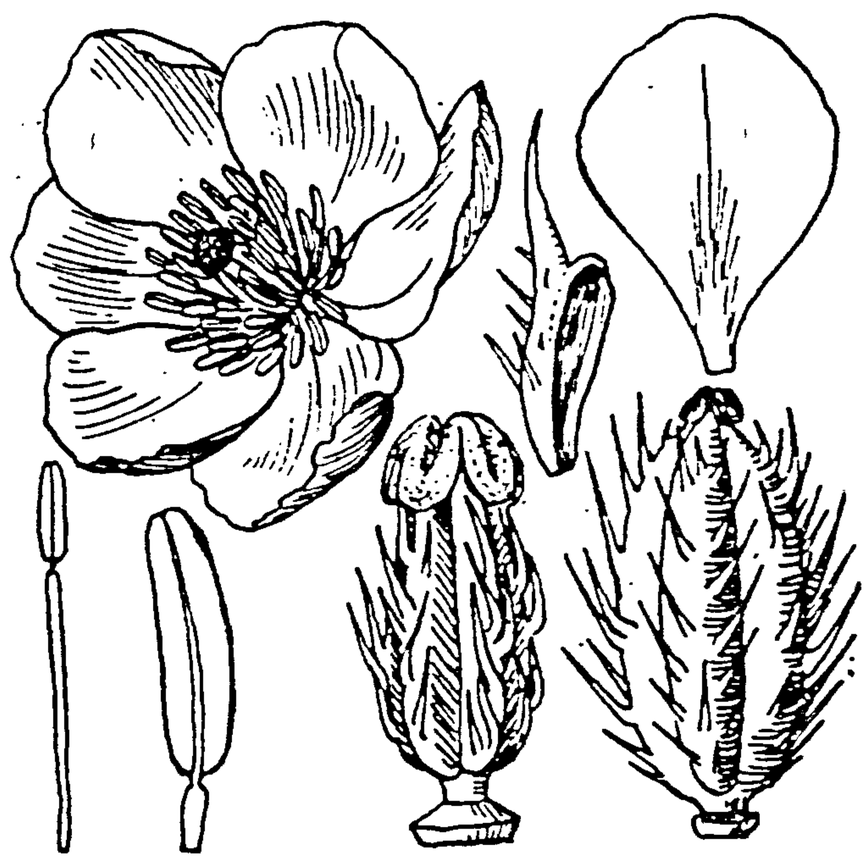


2. **P. dubium** L. Plant 2–7 dm. tall: leaf-divisions entire, or sparingly toothed or incised: sepals hirsute: petals scarlet, 2.5–3.5 cm. long: filaments filiform: capsule 1.5–2 cm. long.—(SMOOTH-FRUITED POPPY. BLIND-EYE HEADACHE-POPPY. LONG-POD POPPY.)—Fields, roadsides, and waste-places, various provinces N of Coastal Plain, N. C. to Tenn. and R. I. Nat. of Eu.—Spr.–sum.

4. **ARGEMONE** L. Annual or biennial herbs. Leaves cauline: blades incised-pinnatifid. Flowers few, the buds erect. Sepals 2 or 3, hooded or horned. Petals 4 or 6, broad. Gynoecium 4–6-carpellary, the ovary with 4–6 nerviform placentae. Stigma 4–6-lobed. Capsule stout.—About 10 species, American.—PRICKLY-POPPIES. THORN-APPLES.

Inflorescence and capsule spine-armed.
  Corolla yellow: leaf-blades blotched. 1. *A. mexicana.*
  Corolla white: leaf-blades not blotched or sometimes slightly so. 2. *A. alba.*
Inflorescence and capsule spineless. 3. *A. leiocarpa.*

1. **A. mexicana** L. Plant glaucous, 3–9 dm. tall, more or less spiny: leaves 10–25 cm. long; blades runcinate-pinnatifid, blotched, spiny-toothed and commonly spiny along the midrib, sessile and clasping: flowers sessile or nearly so: sepals acuminate and bristle-tipped: corolla yellow, 3–7 cm. broad: capsule ellipsoid, 2.5–3 cm. long, spine-armed. — (MEXICAN-POPPY. THORN-APPLE. YELLOW-THISTLE.) — Roadsides, waste-places and fields, various provinces, Fla. to Tex., Tenn., Pa., and Mass.—Sum.–fall or all year S.



2. **A. alba** Lestib. Plant pale or somewhat glaucous, spine-armed: stems stout, 3–5 dm. tall, often diffuse: leaves 3–15 cm. long: blades pinnately lobed or pinnatifid, sometimes whitish along the veins, the midrib slightly prickly: flowers pedicelled: sepals 1.5–2 cm. long, the terminal spine 1–1.5 mm. long, distinctly flattened: corolla white, 7–10 cm. broad: capsule oval or ellipsoid, 2.5–4 cm. long.—(CAROLINA-POPPY.)—Roadsides, waste-places, and cult. grounds, various provinces, Fla. to Tex., Mo., and S. C.—Spr.–sum. or all year S.

3. **A. leiocarpa** Greene. Plant resembling those of *A. mexicana,* but more glaucous, devoid of spines, except on the margins of the leaf-blades, which are rather more copiously spinescent: calyx unarmed: petals yellow, 3–4 cm. long: capsule smooth and glabrous, 3–4 cm. long.—Hammocks and cult. grounds, S pen. Fla. and the Keys.—All year.

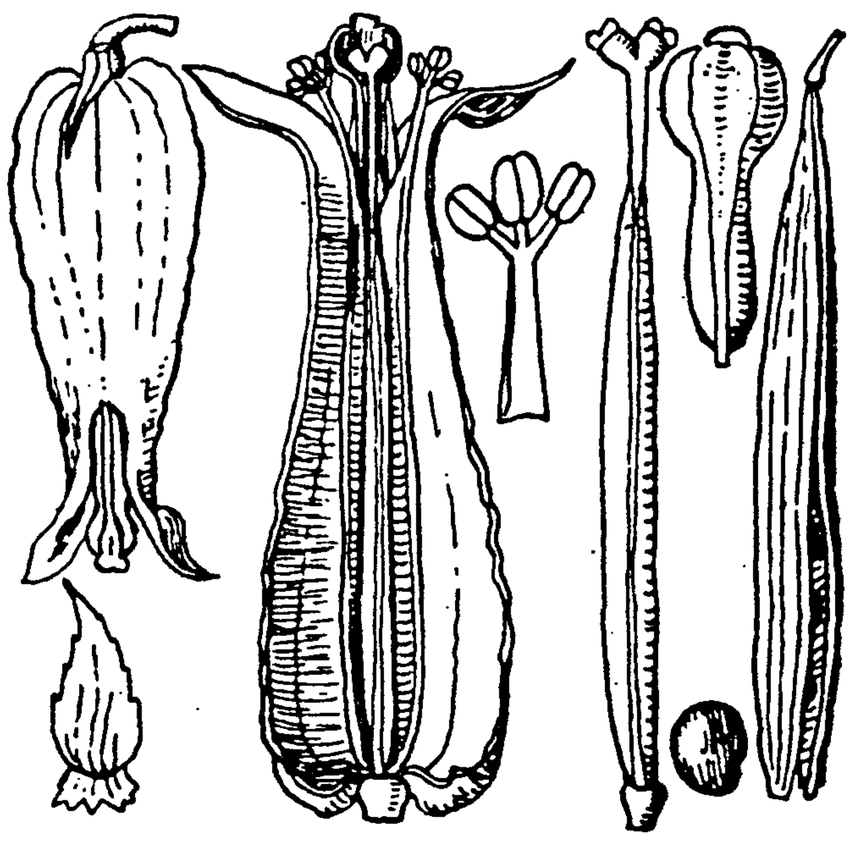
FAMILY 2. FUMARIACEAE — FUMITORY FAMILY

Herbs, sometimes vines, the sap colorless. Leaves alternate: blades dissected. Flowers perfect, irregular. Calyx of 2 scale-like sepals. Corolla of 4 petals, sometimes persistent, the outer with spreading tips and one or both of them saccate or spurred at the base, the inner 2 smaller, thickened at the tip and enclosing the stigma. Androecium of 6 diadelphous stamens, the middle anther of each group 2-celled, the lateral ones 1-celled. Gynoecium 2-carpellary. Fruit a silique, a capsule, or a nutlet.—Five genera and 170 species, natives of the north temperate zone and Africa.

Both of the two outer petals spurred at the base.
- Petals permanently united and enclosing the capsule: seed crestless: vines. — 1. ADLUMIA.
- Petals lightly united, deciduous: seed mostly crested: acaulescent herbs. — 2. BICUCULLA.

One of the 2 outer petals spurred at the base.
- Ovules several or many: fruit an elongate capsule: seed with crests or arils. — 3. CAPNOIDES.
- Ovule solitary: fruit a globose nutlet: seed crestless. — 4. FUMARIA.

1. ADLUMIA Raf. Biennial or perennial tender vines. Leaf-blades with broad segments. Flowers mostly in panicle-like cymes, white or pink. Sepals 2, toothed. Stamens 6, monadelphous below, the 3 filaments of each group united to near the anthers. Capsule included.—One species.



1. A. fungosa (Ait.) Greene. Leaf-blades decompound, the ultimate divisions entire or lobed, 3–10 mm. long: corolla 15–18 mm. long: petals pink or whitish, the inner with suborbicular blades about 1.5 mm. broad: capsule slender, 1.5–2 cm. long. [*A. cirrhosa* Raf.]—(ALLEGHENY-VINE. CLIMBING-FUMITORY. FAIRY-CREEPER. MOUNTAIN-FRINGE. CLIFF-HARLEQUIN.)—Rich woods and stream banks, various provinces N of Coastal Plain, N. C. to Tenn., Wis., and N. B.—Sum.–fall.

2. BICUCULLA Adans. Perennial herbs, with granular or tuberous rootstocks. Leaf-blades with narrow segments. Flowers in racemes or panicles, mostly white to deep-pink. Sepals 2, entire. Stamens 6, somewhat diadelphous at the base. Capsule not included. [*Dicentra* Bork.]—About 16 species, North American and Asiatic.—Stagger-weeds.

- Inflorescence a simple raceme: corolla not deep-pink, deciduous. — I. CUCULLARIAE.
- Inflorescence a thyrsoid panicle: corolla deep-pink, marcescent. — II. EXIMIAE.

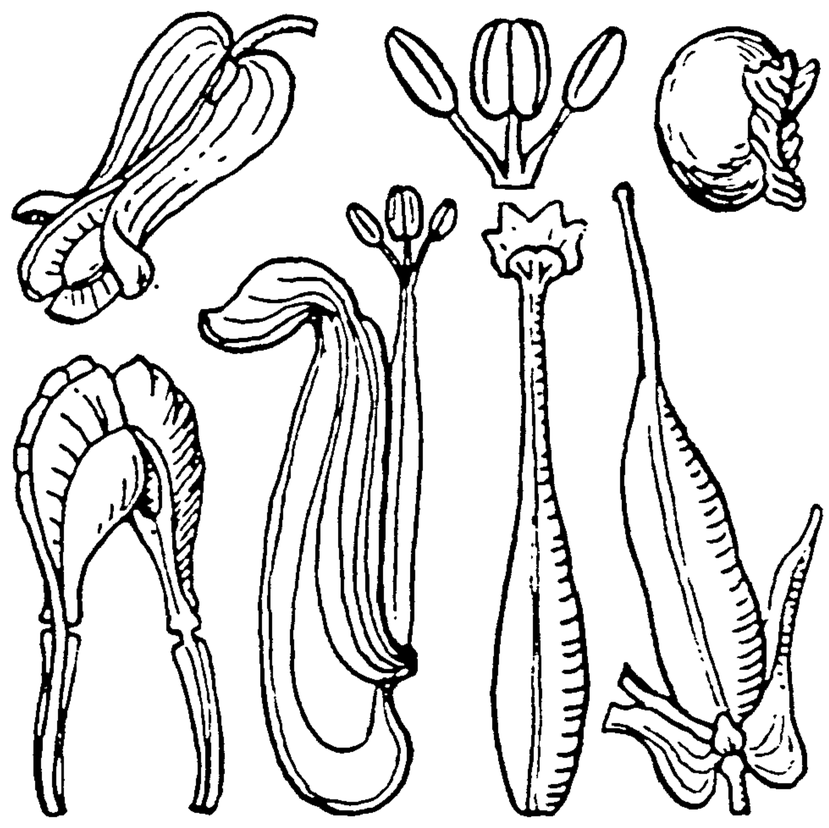
I. CUCULLARIAE

- Rootstocks bearing yellow tubers: outer petals with rounded sacs: inner-petals conspicuously crested. — 1. *B. canadensis.*
- Rootstocks without tubers: outer petals with spreading spurs: inner petals minutely crested. — 2. *B. Cucullaria.*

II. EXIMIAE

- Leaves and stem arising from stout fleshy rootstocks. — 3. *B. eximia.*

1. B. canadensis (Goldie) Millsp. Plant 2–3 dm. tall: leaf-blades dissected into linear or nearly linear segments, pinkish-gray on the under side: corolla greenish-white or purplish-tinged, the spurs much shorter than the upper portion of the petals: capsule-body 11–15 mm. long, abruptly narrowed at both ends. [*D. canadensis* DC.] — (SQUIRREL-CORN. TURKEY-CORN.)—Rich woods, various provinces N of Coastal Plain, N. C. to Mo., Minn., and N. S.—Spr.



2. B. Cucullaria (L.) Millsp. Plant 1–3 dm. tall: leaf-blades similar to those of *B. canadensis* but greenish-gray on the under side: corolla white or pale-pink, the spurs about as long as the other portion of the petals: capsule-body 10–13 mm. long, gradually narrowed at both ends. [*D. Cucullaria* DC.] — (BUTTERFLY-BANNER. PEARL-HARLEQUIN. EAR-DROPS. KITTEN-BREECHES. DUTCHMAN'S-BREECHES. LITTLE-STAGGERWEED. SOLDIER'S-CAP. WHITE-HEARTS.)—Rich woods, Blue Ridge and Appalachian provinces in the S, various provinces in the N, Ga. to Nebr., Minn., and Ont.—Spr.—After flowering the foliage soon yellows, and the plants usually vanish by mid-summer.

3. B. eximia (Ker) Millsp. Plants 3–6 dm. tall: leaf-blades with the ultimate segments oblong or ovate: corolla deep-pink, the outer petals with rounded spurs at the base: capsule-body 16–21 mm. long, long-beaked. [*D. eximia* DC.] —(BLEEDING-HEART. FRINGED BLEEDING-HEART. STAGGERWEED. TURKEY-CORN. RED-HARLEQUIN.)—Rocky woods and cliffs, often in rather acid soil, Blue Ridge and Appalachian provinces, Ga. to W N. Y.—Spr.–fall.—This species is much used in rock gardens, its long flowering season making it especially desirable.

3. CAPNOIDES Adans. Annual or biennial caulescent herbs. Leaf-blades with toothed segments. Flowers racemose, yellow, pink or white. Sepals 2, usually toothed. Stamens 6, diadelphous. Ovary elongate, several-ovuled: style persistent. Capsule often torulose. [*Corydalis* Vent.]—About 110 species, natives of the north temperate zone and Africa.—Spr.—SCRAMBLED-EGGS. WILD-FUMEROOTS. ROKE-LADIES.—The roots of most species emit a pungent nitrous odor.

Corolla pink or purple, except the yellow tip : plant erect. — I. SEMPERVIRENTES.
Corolla yellow : plant diffuse. — II. AUREA.

I. SEMPERVIRENTES

Plant pale-green : flower with a short rounded spur : capsule erect. — 1. *C. sempervirens.*

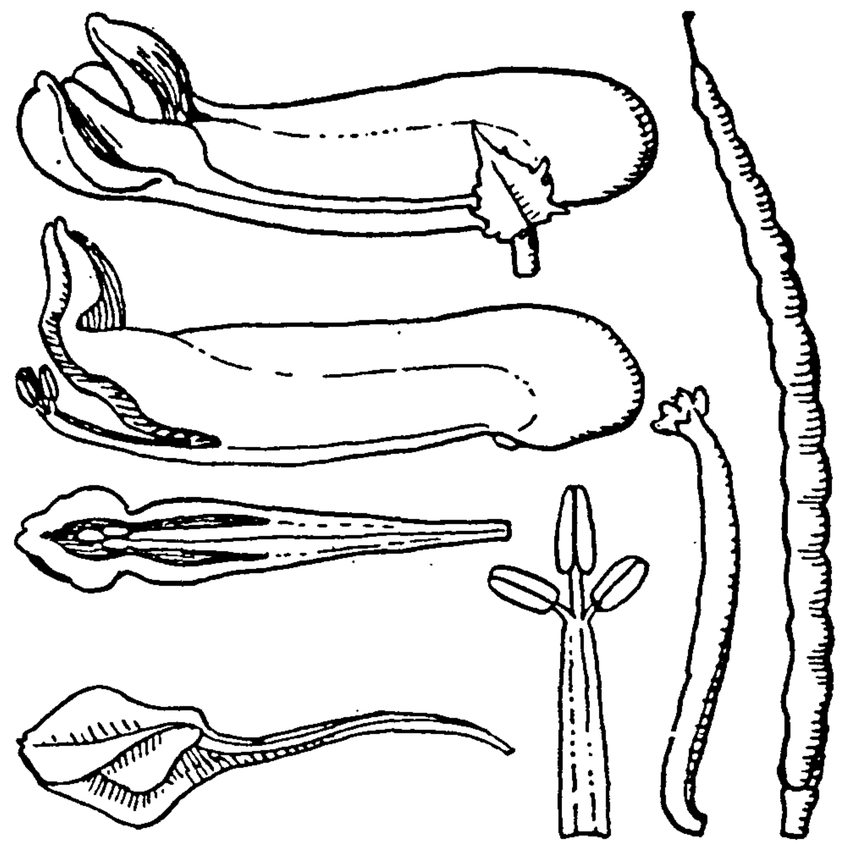
II. AUREA

Corolla less than 12 mm. long.
- Capsule ascending : seed with blunt margins. — 2. *C. micranthum.*
- Capsule drooping or spreading : seed with acute winged margins. — 3. *C. flavulum.*

Corolla over 12 mm. long.
- Hood or sac of the outer petals with a wing-like crest. — 4. *C. Halei.*
- Hood or sac of the outer petals merely keeled. — 5. *C. aureum.*

1. C. sempervirens (L.) Borck. Plant 3–12 dm. tall, the branches ascending: leaf-segments obovate to cuneate: corolla 14–16 mm. long, the spur

rounded, the inner petals about 15 mm. long, the blade about ⅓ as long as the claw: capsule 3–4 cm. long.—(PINK-CORYDALIS. PALE-CORYDALIS. ROCK-FUMEROOT. ROKE-HARLEQUIN.)—Rocky places and open woods, often in rather acid soils, various provinces N of Coastal Plain, Ga. to Minn., B. C., Alas., Ont., and N. S.



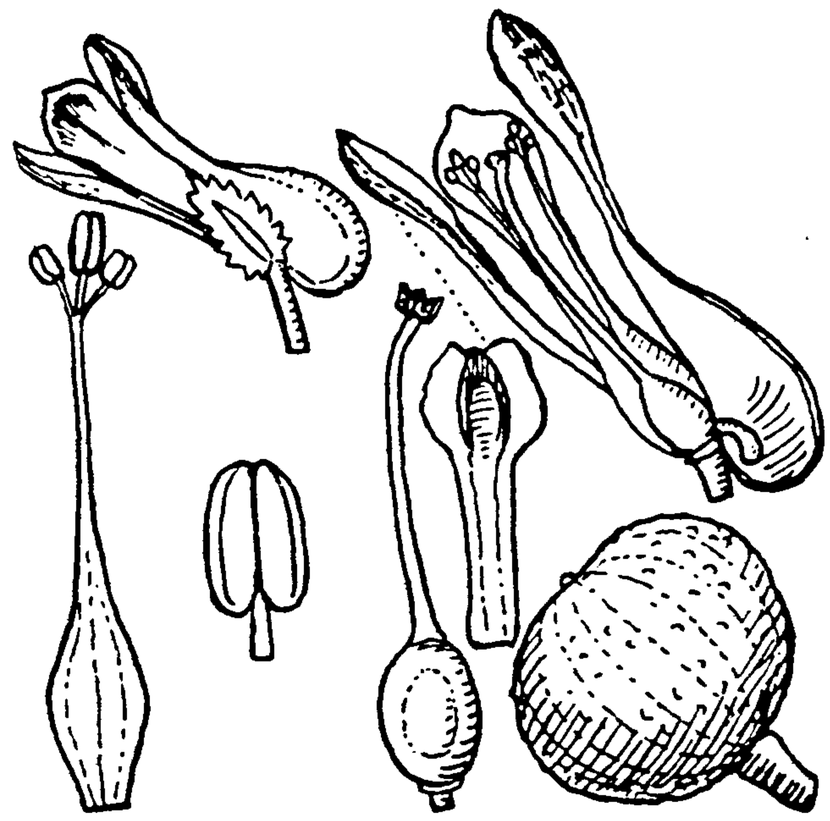
2. C. micranthum (Engelm.) Britton. Plant 1–3 dm. tall, the branches spreading: leaf-blades finely divided: corolla pale-yellow, 9–10 mm. long, the smaller outer petals with a minute crest: capsule 1–2 cm. long, prominently torulose. [*C. micrantha* A. Gray] — (SLENDER-FUMEROOT.) — Woods, various provinces, Fla. to Mo., Minn., and Va.

3. C. flavulum (Raf.) Kuntze. Plant 1–5 dm. tall, the branches spreading, leaf-segments narrow, acute: corolla yellow, 10–11.5 mm. long, the smaller outer petals prominently crested: capsule 1.5–2.5 cm. long, somewhat torulose. [*C. flavula* DC.]—(YELLOW-FUMEROOT. YELLOW-HARLEQUIN.)—Rich soil, especially in rocky woods, various provinces, La. to Kans., Minn., Ont., N. Y., and Va.

4. C. Halei Small. Plant 1–3 dm. tall, the branches spreading or ascending: leaf-blades with rather broad segments: corolla yellow, 14–16 mm. long, the spur somewhat inflated at the tip, the smaller outer petals with a narrow crest: capsule 2–2.5 cm. long.—Dry soil, Coastal Plain, Fla. to La.

5. C. aureum (Willd.) Kuntze. Plant 1.5–3 dm. tall, the branches sometimes decumbent: leaf-segments mostly elliptic: corolla golden-yellow, 12–14 mm. long, the spur somewhat conic, slightly curved, the smaller outer petals with a toothed crest: capsule 1–2 cm. long, slender. — (GOLDEN-FUMEROOT.) — Woods and banks, often in calcareous soil, various provinces, N of Coastal Plain, Tenn. to Tex., Ariz., Alas., Ont., N. S., and W. Va.

4. FUMARIA [Tourn.] L. Annual herbs. Leaf-blades with small segments. Flowers racemose, white or pink. Sepals 2, scale-like. Stamens 6, diadelphous. Ovary scarcely longer than thick, 1-ovuled: style deciduous. Nutlet globular.—About 40 species, natives of the Old World.



1. F. officinalis L. Stem and branches 2–10 dm. long: leaf-segments linear or nearly so: racemes 2–10 cm. long: pedicels 2–4 mm. long: corolla purplish or flesh-colored, and crimson at the tip, 6–8 mm. long: nutlet 2–2.5 mm. in diameter, emarginate at the apex.—(EARTH-SMOKE. FUMITORY. FUMEROOT. FUME-WEED. FUME-WORT.)—Fields and roadsides, various provinces, Fla. to Tex., Tenn., N. Y., and N. S. Nat. of Eu.

FAMILY 3. BRASSICACEAE — MUSTARD FAMILY

Herbs or partially woody plants, the sap watery. Leaves alternate: blades entire, toothed, or dissected. Flowers perfect, in spikes or racemes.

Calyx of 4 mostly erect or appressed sepals. Corolla of 4 usually clawed petals, or wanting. Androecium of 6 stamens with 1 pair shorter than the others, or rarely of 2 or 4 stamens. Gynoecium of 2 united carpels. Stigma depressed or 2-lobed. Fruit capsular, elongate (silique) or short (silicle), flat, terete, or angled.—About 200 genera and 1,800 species, of wide geographic distribution; many are cultivated, some are weeds.

Pod longitudinally dehiscent or indehiscent, not transversely jointed.
Pod not stipitate.
Pod flattened or compressed contrary to the narrow partition. Tribe I. LEPIDIEAE.
Pod neither compressed nor flattened contrary to the partition.
Pod terete or prismatic.
Length of pod less than twice its width.
Seeds flat: plants pubescent with mostly branched hairs.
Pods globular, the valves nerveless: cotyledons accumbent. Tribe II. PHYSARIEAE.
Pods pyriform, the valves 1-nerved: cotyledons incumbent. Tribe III. CAMELINEAE.
Seeds turgid: plants pubescent with simple hairs or glabrous. Tribe IV. COCHLEARIEAE.
Length of pod over twice its width.
Pod merely tipped with the short style.
Pod terete or nearly so.
Seeds in 2 rows in each cavity. Tribe IV. COCHLEARIEAE.
Seeds in 1 row in each cavity. Tribe V. ERYSIMEAE.
Pod 4-sided or 4-angled. Tribe VI. BARBAREAE.
Pod markedly beaked. Tribe VII. BRASSICEAE.
Pod flattened or compressed parallel to the broad partition. Tribe VIII. ARABIDEAE.
Pod stipitate. Tribe IX. WAREAE.
Pod transversely 2-jointed, the joints indehiscent. Tribe X. CAKILEAE.

I. LEPIDIEAE

Pods didymous, separating from the partition as 2 plump nutlets. 1. CARARA.
Pods flat, regularly dehiscent, many-seeded.
Pods cuneate, wingless, 1–several-seeded. 2. BURSA.
Pods orbicular to elliptic or obovate, wing-margined at least at the apex.
Seeds solitary in each cavity of the pod. 3. LEPIDIUM.
Seeds several in each cavity of the pod. 3a. THLASPI.

II. PHYSARIEAE

Stellate-pubescent herbs with mostly yellow flowers and inflated pods. 4. LESQUERELLA.

III. CAMELINEAE

Erect herbs with yellowish flowers and obovoid or pyriform turgid pods. 5. CAMELINA.

IV. COCHLEARIEAE

Pod less than twice as long as wide.
Corolla yellow. 6. RADICULA.
Corolla white.
Plant with a long pungent tap-root: stamens with short filaments and ellipsoid anthers appendaged at the tip: style very short. 7. ARMORACIA.
Plant with elongate rootstocks: stamens with slender filaments and sagittate unappendaged anthers: style slender. 8. NEOBECKIA.
Pod over twice as long as wide.
Corolla yellow: leaf-blades toothed or pinnatifid. 6. RADICULA.
Corolla white: leaf-blades pinnately divided. 9. SISYMBRIUM.

V. ERYSIMEAE

Leaf-blades pinnatifid or coarsely toothed.
Anthers ovoid: pod slender and tapering to the apex, appressed to the rachis.
Outer sepals not horned: corolla yellow or white. 10. ERYSIMUM.
Outer sepals horned: corolla violet or purple. 11. IODANTHUS.
Anthers ellipsoid-sagittate: pod very slender but not tapering to the apex, widely spreading. 12. NORTA.

Leaf-blades entire or slightly toothed.
  Leaf-blades cordate-clasping: corolla yellowish. 13. CONRINGIA.
  Leaf-blades not clasping: corolla purple or white. 14. HESPERIS.

VI. BARBAREAE

Corolla white. 15. ARABIDOPSIS.
Corolla yellow.
  Seed flat: leaf-blades pinnatifid. 16. CAMPE.
  Seed plump: leaf-blades entire or toothed. 17. CHEIRINIA.

VII. BRASSICEAE

Pod dehiscent.
  Pod-beak conic, terete, the pod-body relatively long.
    Pod terete: seeds in one row in each cavity. 18. BRASSICA.
    Pod flattened: seeds in two rows in each cavity. 19. DIPLOTAXIS.
  Pod-beak flat, 2-edged, the pod-body relatively short.
    Pod-valves 3-nerved; beak long. 20. SINAPIS.
    Pod-valves 1-nerved; beak short. 22. RAPHANUS.
Pod indehiscent: spongy between the seeds. 21. ERUCA.

VIII. ARABIDEAE

Pod suborbicular or ovoid. 23. KONIGA.
Pod elliptic to narrowly linear.
  Valves of the pod nerveless.
    Seeds wingless.
      Seeds in 2 rows in each cavity. 24. DRABA.
      Seeds in 1 row in each cavity.
        Scapose, with 2–4 leaf-like bracts subtending the peduncle: cotyledons unequal. 25. DENTARIA.
        Caulescent, with alternate leaves: cotyledons equal. 26. CARDAMINE.
    Seeds winged. 27. LEAVENWORTHIA.
  Valves of the pod nerved.
    Leaf-blades entire or merely toothed.
      Pod oval, elliptic to broadly linear. 24. DRABA.
      Pod narrowly linear to linear-filiform. 28. ARABIS.
    Leaf-blades finely dissected. 29. SOPHIA.

IX. WAREAE

Slender herbs with entire leaf-blades and elongate pods. 30. WAREA.

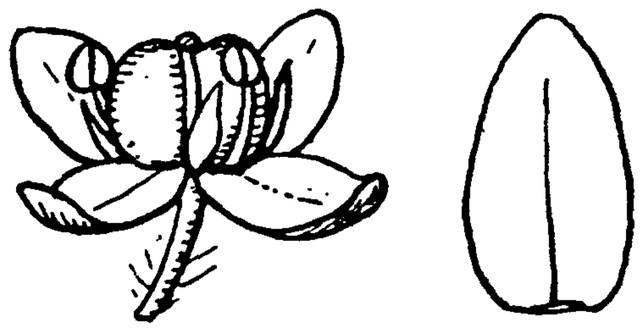
X. CAKILEAE

Fleshy seaside, dune, or hammock plants with toothed or pinnatifid leaf-blades. 31. CAKILE.

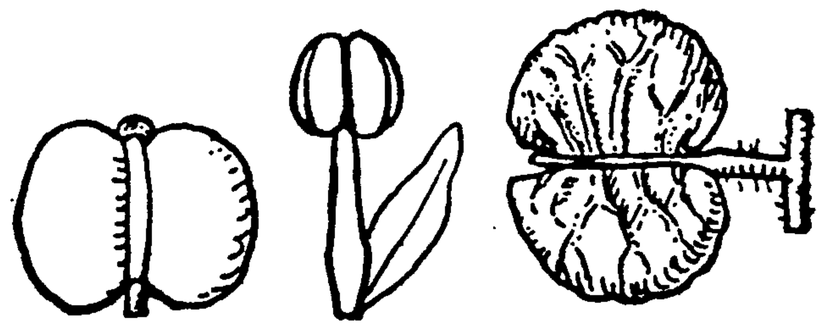
1. CARARA Medic. Annual or biennial herbs. Leaf-blades entire to pinnatifid. Racemes lateral. Sepals 4, spreading. Corolla greenish or whitish. Petals 4, broad or narrow, without distinct claws, or abortive. Stamens often 2 or 4: anthers didymous. Ovule and seed 1 in each carpel. Pod with crested, rugose, or tuberculate valves. [*Senebiera Poir.*]—About 6 species, widely distributed in warm regions.—WART CRESSES. SWINE CRESSES.

Ovary smooth: capsule reticulate, notched. 1. *C. didyma.*
Ovary tuberculate: capsule tuberculate-wrinkled, not notched. 2. *C. Coronopus.*

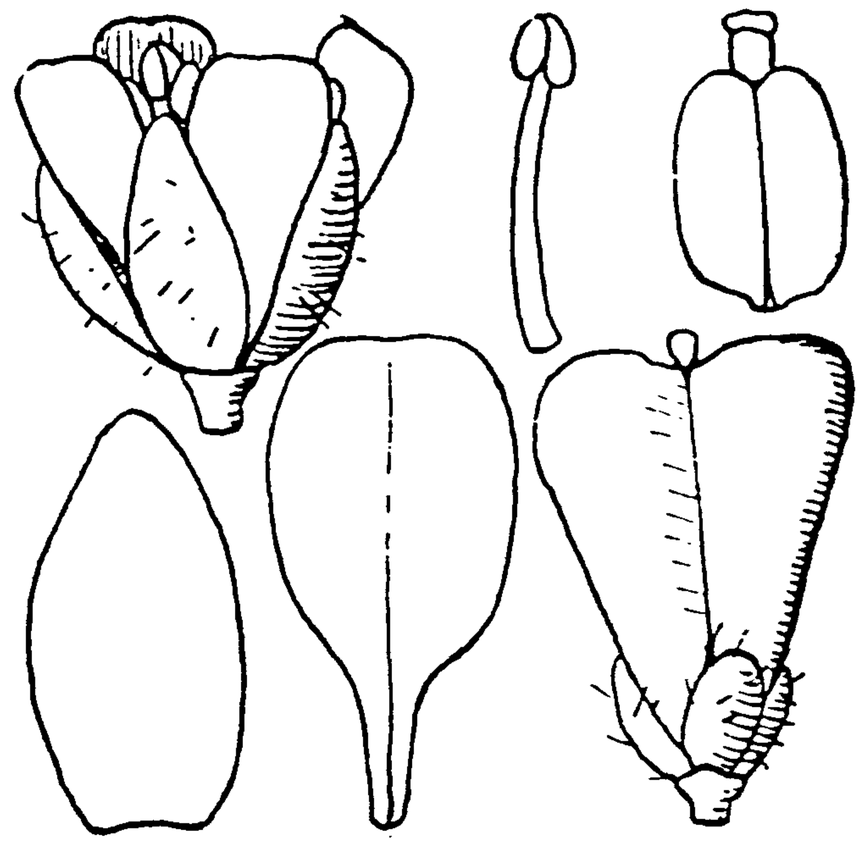
1. C. didyma (L.) Britton. Branches ascending or spreading: lower leaves 3–10 cm. long; blades 1–2-pinnatifid: sepals 0.6–0.8 mm. long: petals shorter than the sepals or slightly longer: pod didymous, 2–2.5 mm. wide, notched above and below. [*Senebiera pinnatifida* DC.]—Waste places, various provinces, Fla. to Tex., Calif., Mo., and Newf.—Nat. of Eu.—Spr.–sum.



2. C. Coronopus (L.) Medic. Similar to *C. didyma* in habit: lower leaves 4–12 cm. long; blades pinnately parted: sepals 1–1.5 mm. long: petals much longer than the sepals: pod not didymous, 3.5–4 mm. wide, apiculate.—Waste places, various provinces, Fla. to Tex. and N. B.; also on Pacif. coast. Nat. of Eu.—Spr.–fall.



2. **BURSA** Weber. Annual erect herbs. Leaves sometimes mainly basal: blades entire to pinnatifid. Raceme terminal. Sepals 4, spreading. Petals 4, much longer than the sepals. Anthers broad. Ovules and seeds many in each carpel. Pod cuneate. [*Capsella* Vent.] —Four species, in the Northern Hemisphere. Some appear to be unstable and develop mutants.

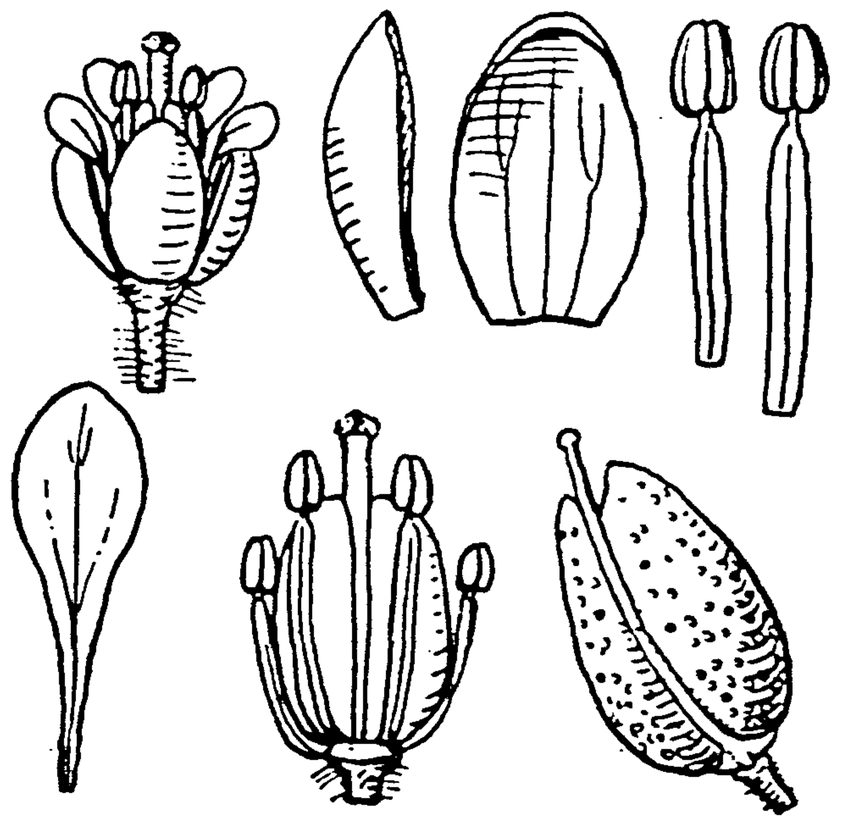


1. B. Bursa-pastoris (L.) Britton. Stem 3–9 dm. tall: basal leaves 3–15 cm. long; blades mainly pinnately lobed or pinnatifid; blades of the stem-leaves auricled at the base; pedicels 10–15 mm. long: sepals 1.5–1.7 mm. long: petals white, spatulate, 2–2.3 mm. long: pod 5–8 mm. long.—(SHEPHERD'S-PURSE. SHOVEL-WEED. HEN-PEPPER.)—Common, in fields and waste places, almost throughout N. A. Nat. of Eu.—Spr.–fall.—Plants grown from seeds collected at Tuscaloosa, Ala., have been described as *B. tuscaloosae* Shull. They differ from plants of *B. Bursa-pastoris* in the backwardly curved and rather blunt leaf-lobes.—Known only from the original station.

3. **LEPIDIUM** [Tourn.] L. Annual, biennial, or perennial herbs. Leaf-blades entire to pinnatifid. Racemes terminal. Sepals 4, spreading. Petals 4, longer than the sepals or wanting. Stamens usually fewer than 6. Ovule, and seed, 1 in each carpel. Pod suborbicular to oblong.—About 65 species of wide distribution.—Spr.–sum.—PEPPER-GRASSES. PEPPER-CRESSES. CHURL'S-CRESSES.

Blades of the cauline leaves sagittate-clasping: pod winged. — 1. *L. campestre.*
Blades of the cauline leaves tapering at the base: pod wingless, margined.
  Cotyledons accumbent. — 2. *L. virginicum.*
  Cotyledons incumbent.
    Pod wingless and marginless: plant strong-scented. — 3. *L. ruderale.*
    Pod winged or margined at the apex: plant not strong-scented. — 4. *L. densiflorum.*

1. L. campestre (L.) R. Br. Plant 1–4 dm. tall, softly fine-pubescent: blades of the lower leaves spatulate to oblanceolate, those of the upper leaves sagittate, clasping, shallowly toothed: pedicels downy: sepals elliptic to elliptic-ovate, about 1.5 mm. long: petals white, spatulate, 2–2.5 mm. long: pod ovoid, 4.5–5.5 mm. long, winged above the base, minutely pubescent.—(COW-CRESS. FIELD-CRESS.)—Waste places, fields, and roadsides, various provinces, rarely Coastal Plain, N. C. to Kans., Ont., and N. B.; also on Pacif. coast.



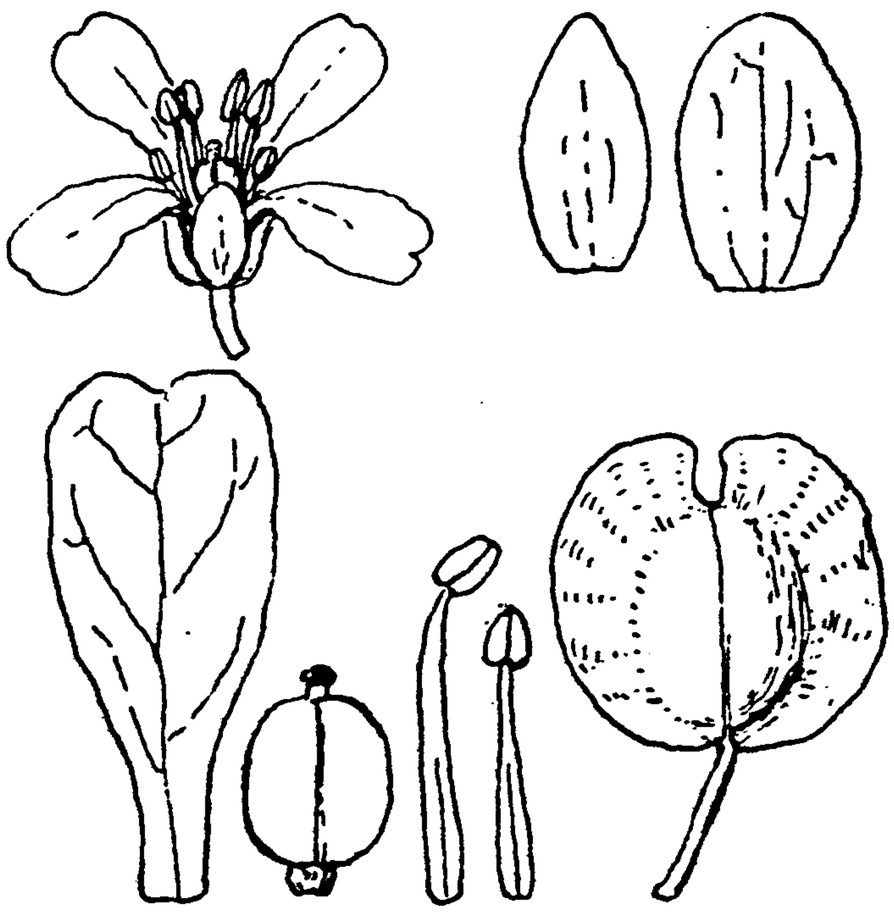
2. L. virginicum L. Annual or biennial, more or less puberulent: stem 2–9 dm. tall, simple or widely branched: basal leaves seldom persistent: blades spatulate or oblanceolate, pinnatifid, the segments toothed or incised, the terminal one much longer than

the others: stem-leaves narrow, erect or ascending; blades sharply toothed or incised: pedicels finally spreading, 3–4 mm. long: sepals elliptic, about 1 mm. long, obtuse: petals white, spatulate, slightly longer than the sepals: pod suborbicular, 3–4 mm. broad, margined above, notched at the apex.—(FIELD-CRESS. POOR-MAN'S PEPPER. YELLOW-SEED.)—Waste places, fields, and roadsides, various provinces, S Fla. to Tex., Minn., and Que.—(*W. I.*, *Mex.*, *O. W.*)—Spr.–fall.

3. L. ruderale L. Annual, unpleasantly scented: stem mostly 1–3 dm. tall, commonly branched at the base, glabrous or nearly so: leaves rather numerous, the basal with pinnatifid blades, rather early withering: cauline leaves more persistent; blades narrower, mostly 1–3 cm. long, entire or few-toothed: racemes ultimately open: flowers numerous: pedicels very slender, glabrous or minutely pubescent, 2–3 mm. long: petals wanting or minute: pod oval, 2.5–3 mm. long, smooth and glabrous, wingless and marginless.—Roadsides and waste-places, about seaports, Tex. to Fla. and N. S. Nat. of Eu.—Sum.

4. L. densiflorum Schrad. Annual, finely pubescent or puberulent, odorless: stem 2–7 dm. tall, more or less branched: basal leaves and sometimes the lower stem-leaves with pinnatifid blades, glabrous or sparingly pubescent, not hispidulous: upper stem-leaves narrow, incised or toothed, erect or ascending: pedicels becoming 2–3 mm. long, spreading or curving out, making the fruiting raceme much thicker than the top: petals rudimentary or wanting: pod suborbicular, about 2.5 mm. broad, glabrous, notched at the narrowly wing-margined apex.—Dry soil and waste-places, various provinces, Tex. to B. C., Me., and N. C.—Spr.–fall.

3a. **THLASPI** [Tourn.] L. Annual or perennial erect or depressed caulescent herbs. Leaf-blades entire or toothed, those of the upper leaves auriculate-clasping. Racemes inconspicuously bracted or bractless, elongating. Sepals rather broad. Petals white or purplish, longer than the sepals, equal or nearly so. Filaments stout: anthers short. Pods orbicular, obovate or cuneate, winged, notched at the apex.

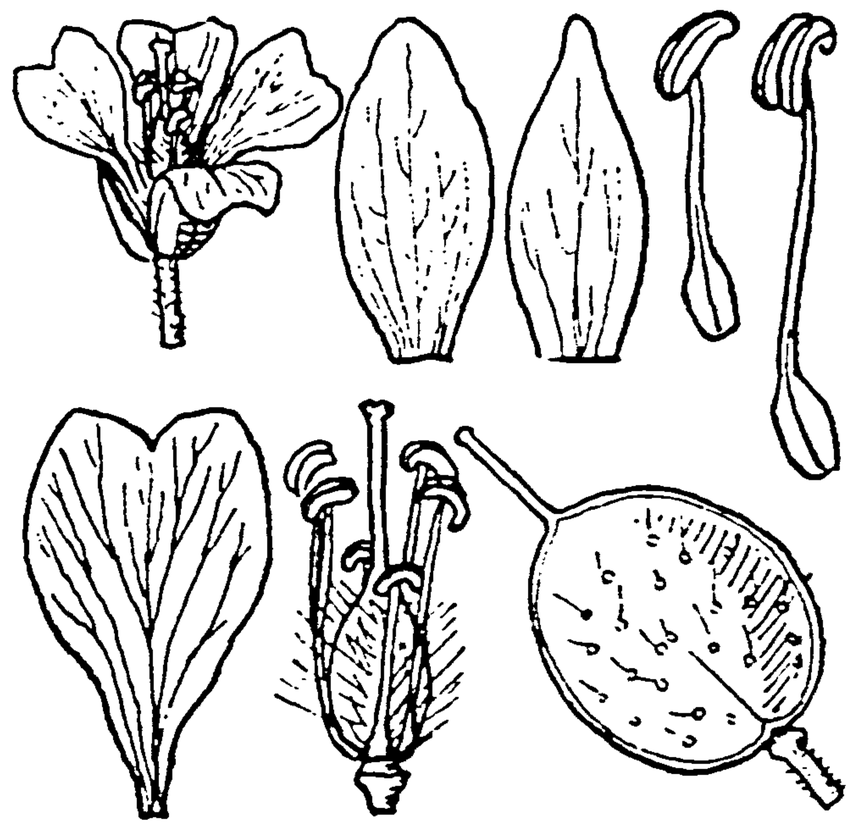


1. T. arvense L. Annual, 1–5 dm. tall, glabrous: blades of the lower cauline leaves of a spatulate type, those of the upper cauline leaves sagittate, 1.5–5 cm. long, toothed: sepals oblong or oblong-ovate, 2–2.5 mm. long: petals white, cuneate to spatulate, 2.5–3 mm. long: pods suborbicular to orbicular-obovate, 1–1.5 cm. broad, broadly winged.—(FIELD-PENNYCRESS. FRENCHWEED.)—Waste-places, roadsides, and fields, various provinces, N. C. to Ark., Kans., Man., and Que. Nat. of Eurasia.—Spr.–sum.

4. **LESQUERELLA** S. Wats. Annual, biennial, or perennial herbs. Leaf-blades entire, undulate, or pinnatifid. Raceme simple or sometimes branched. Sepals 4, usually pubescent like the leaves. Petals 4, of a spatulate type, often broadly so, yellow (or rarely white or purplish). Stamens 6: filaments slender throughout or enlarged or winged near the base: anthers oblong or sagittate. Style slender. Ovules few. Pod globular oblong or ovoid, rarely flattened. Seed sometimes margined.—About 35 species, American.—Spr.—BLADDER-PODS.

Filaments winged at the base: pods flat, ovoid: leaf-blades auriculate-clasping. 1. *L. Lescurii.*
Filaments slightly enlarged at the base: pods globular: leaf-blades neither auriculate nor clasping. 2. *L. globosa.*

1. L. Lescurii (A. Gray) S. Wats. Branches loosely stellate-pubescent, 1–3 dm. long: cauline leaves 1–4 cm. long; blades elliptic-oval to elliptic-ovate, repand-dentate: sepals becoming 3–3.5 mm. long: petals spatulate, 4–6 mm. long: ovary long-pubescent, flat: pod ovoid, 5–6.5 mm. long, coarsely pubescent. — Glades and fields, Interior Low Plateaus, near Nashville, Tenn.

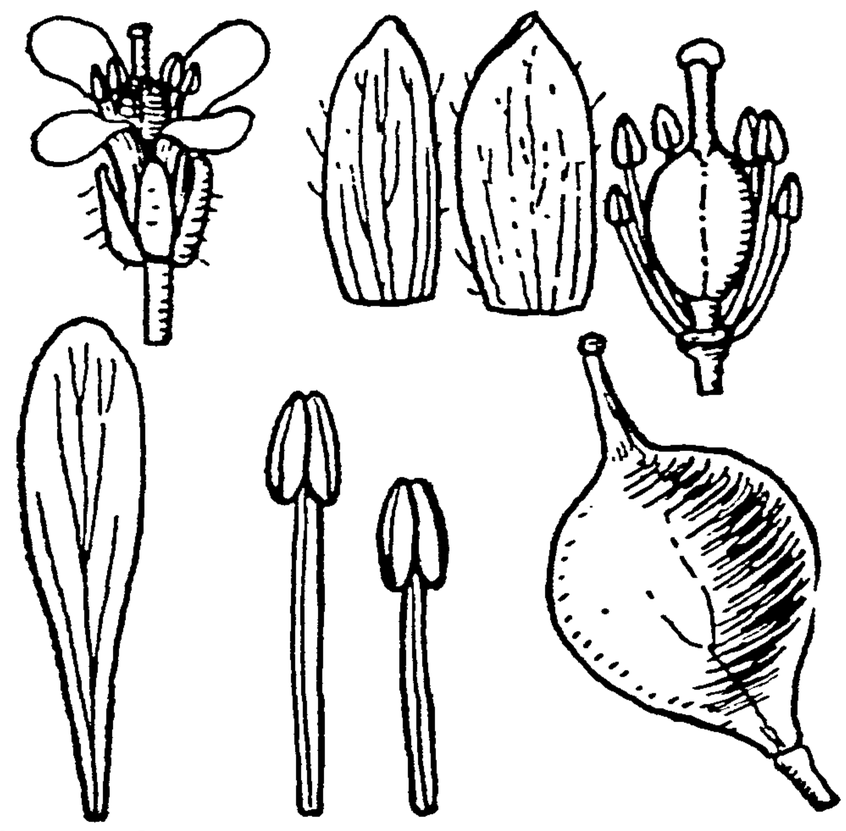


2. L. globosa (Desv.) S. Wats. Branches finely and closely hoary with stellate hairs, 2–4 dm. long: cauline leaves 1–2 cm. long; blades oblanceolate to elliptic or linear, entire or rarely undulate-repand, sessile or nearly so: sepals ovate to elliptic, becoming 3–3.5 mm. long: petals spatulate, 5–6 mm. long: ovary short-pubescent, turgid: pod globular, about 2 mm. long, sparingly fine-pubescent.—River bluffs and rocky banks, Interior Low Plateaus, Tenn. to Ky.

5. CAMELINA Crantz. Annual herbs. Leaf-blades entire or toothed, or pinnatifid at the base of the stem, sometimes clasping. Raceme elongate. Sepals 4, rather broad. Petals 4, narrow, yellowish or greenish. Stamens 6: anthers ovoid. Style columnar. Ovules few or many. Pod turgid, margined. Seed marginless.—About 5 species, Eurasian.—Spr.—FALSE-FLAXES.

Stem manifestly pubescent: pod rounded at the apex, 4–5 mm. wide. 1. *C. microcarpa.*
Stem glabrous or nearly so: pod truncate or notched at the apex, 6–8 mm. wide. 2. *C. sativa.*

1. C. microcarpa Andrz. Plants pubescent, at least below, 5–8 dm. tall: blades of the upper cauline leaves lanceolate, 1.5–7 cm. long, sagittate-auriculate at the base: pod narrowly obovoid, 4–5 mm. wide: seed fully 1 mm. long.—Fields and waste-places, various provinces, N. C. to Ariz., B. C. and Ont. Nat. of Eu.—All the species of *Camelina* are much alike in habit. Species additional to those described here, are to be expected in cultivated N. A.



2. C. sativa (L.) Crantz. Plants glabrous or nearly so, 3–9 dm. tall: leaves nearly similar to those of *C. microcarpa*: pod broadly obovoid, 6–7 mm. wide: seed fully 2 mm. long. — (DUTCH-FLAX. OIL-SEED.) — Waste-places, cult. grounds, banks, and roadsides, various provinces, N. C. and Tenn. to S Can. Nat. of Eu.

6. RADICULA [Dill.] Hill. Annual, biennial, or perennial herbs. Leaf-blades toothed, lobed, or dissected. Raceme often branched. Sepals 4, broad or narrow. Petals 4, yellow, often scarcely longer than the sepals. Stamens

1–6: anthers ovoid to globose. Style very short. Pod short or elongate. Seed turgid. [*Nasturtium* R. Br.]—About 50 species, widely distributed.—WATER-CRESSES. MARSH-CRESSES.

Annual or biennial plants with fibrous roots.
  Pod short, ellipsoid to subglobose. I. PALUSTRES.
  Pod elongate, linear-filiform. II. HETEROPHYLLAE.
Perennial plants with creeping or horizontal rootstocks. III. SYLVESTRES.

I. PALUSTRES

Pedicel short, much less than half the length of the pod.
  Leaf-blades bipinnatifid: style 1–2 mm. long: pod narrowly elliptic, curved. 1. *R. Walteri.*
  Leaf-blades 1-pinnatifid: style almost wanting: pod broadly elliptic, straight. 2. *R. sessiliflora.*
Pedicel rather long, half the length of the pod or more.
  Pod ellipsoid: stem glabrous. 3. *R. palustris.*
  Pod oval, ovoid, or subglobose: stem hirsute. 4. *R. hispida.*

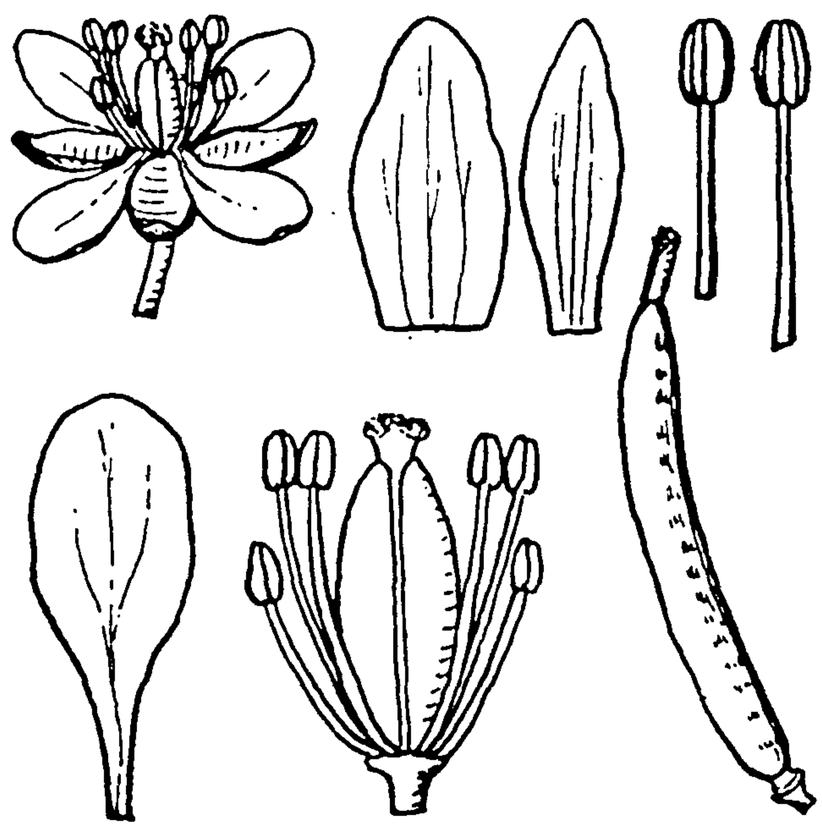
II. HETEROPHYLLAE

Plant diffuse, the leaves usually with a large terminal lobe: flowers with inconspicuous white corollas. 5. *R. heterophylla.*

III. SYLVESTRES

Plant with rather large yellow corollas and very narrow slender pedicelled pods. 6. *R. sylvestris.*

1. R. Walteri (Ell.) Small. Stem often diffusely branched, 1–4 dm. tall: cauline leaves 2–10 cm. long; blades bipinnatifid, the segments irregular: petals slightly longer than the sepals: pod long-beaked. [*N. tanacetifolium* (Chapm. Fl.)] —Low grounds, fields, and ditches, Coastal Plain and rarely adj. provinces, Fla. to Tex., Okla., and S. C.—(*Mex.*)—Spr.



2. R. sessiliflora (Nutt.) A. Hitchc. Stem branched above, 2–6 dm. tall: cauline leaves 3–15 cm. long; blades toothed, lobed or pinnatifid: petals about twice as long as the sepals: pod short-beaked.—Damp places or wet banks, various provinces, Fla. to Tex., Nebr., Ia., and D. C.—Spr.–sum.

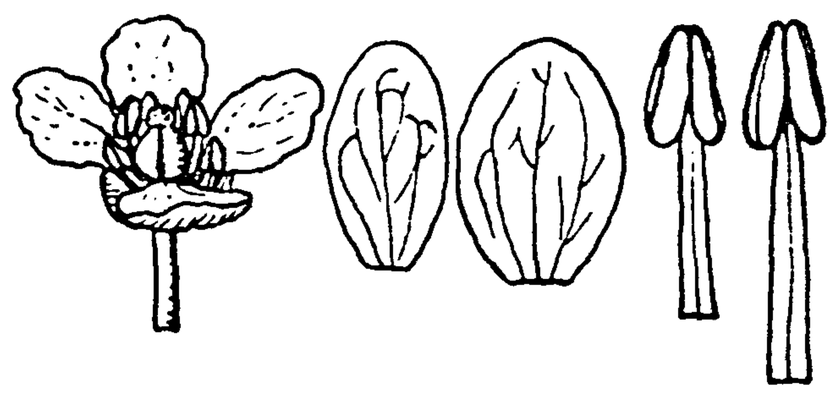
3. R. palustris (L.) Moench. Stem glabrous or minutely pubescent, 2–10 dm. tall: leaf-blades oblanceolate to elliptic or linear-elliptic, pinnatifid, or toothed or repand above, 2–20 cm. long: ovary elliptic: pod 5–8 mm. long.—(MARSH-CRESS. YELLOW WATER-CRESS.)—Low grounds and meadows, various provinces, Fla. to Tex., Ariz., Alas., Ont., and N. B. Apparently nat. of Eu.—Spr.–sum.

4. R. hispida (Desv.) Heller. Stem hirsute or hispid, 3–12 dm. tall: leaf-blades oblanceolate, elliptic, pinnatifid or rarely only toothed, 2–18 cm. long: ovary globular: pod 2–3 mm. long.—Sandy soil, especially along streams, various provinces, N. C. to Tex., Calif., and S Can.—Sum.

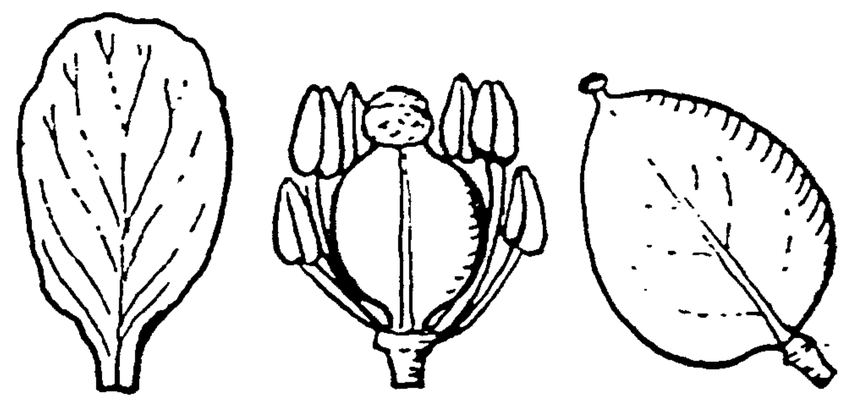
5. R. heterophylla (Blume) Small. Stem diffusely branched, the branches sometimes divaricate, glabrous or nearly so: cauline leaves 3–11 cm. long; blades obovate, oval, ovate, or ovate-lanceolate in outline, toothed, unequally lobed or pinnatifid: flowers inconspicuous: sepals 2–2.5 mm. long: petals about as long as the sepals or wanting: pod linear-filiform, 1.5–2.5 cm. long, stiffly ascending or spreading, straight.—Low grounds and ditches, Coastal Plain, S Miss. and S La. Nat. of Asia.—Wint.–spr.

6. **R. sylvestris** (L.) Druce. Stem ascending or decumbent, 2–7 dm. long: leaf-blades often ovate or elliptic, 4–15 cm. long, pinnately divided, the segments distant, entire or toothed: sepals becoming 2–2.5 mm. long: filaments scarcely longer than the anthers: pod slender, 8–15 mm. long, short-beaked.—(YELLOW-CRESS.)—Wet ground along streams and waste-places, various provinces, rarely Coastal Plain, Ala. to La., Ill., Ont., Newf., and Va. Nat. of Eu.—Spr.–sum.

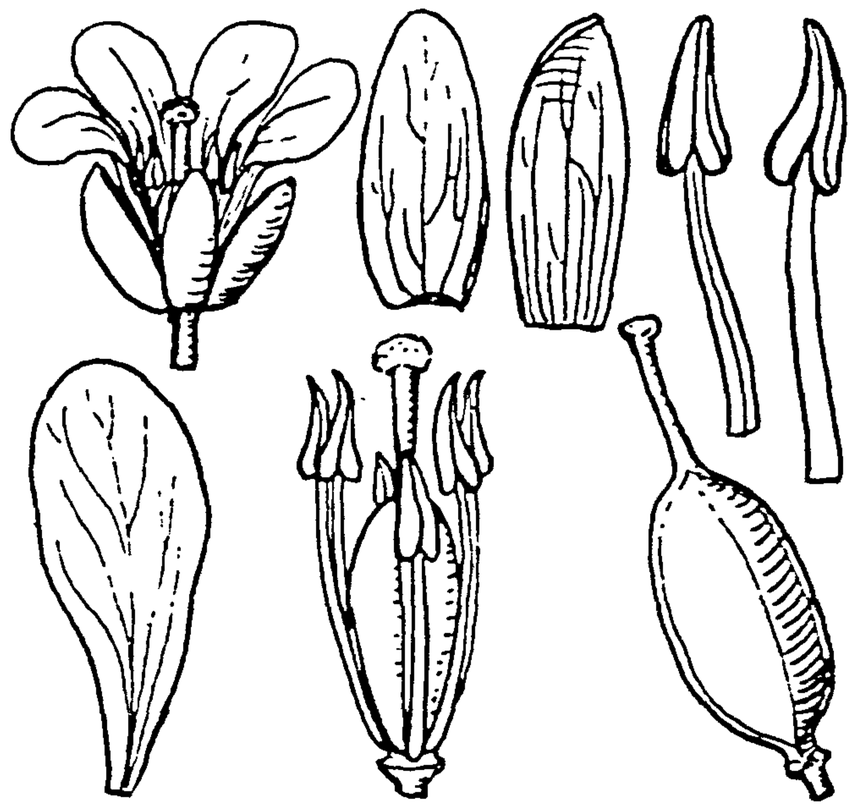
7. **ARMORACIA** Gaertn. Perennial erect herbs with long, pungent roots. Leaf-blades coarsely toothed or sometimes pinnatifid. Raceme stiff, with slender pedicels. Sepals rather broad. Petals white, much exceeding the sepals. Stamens 4 or 6: anthers ovoid. Ovary obovoid: style short-columnar: stigma capitate. Pod short and stout.—About 4 species, Eurasian.



1. **A. Armoracia** (L.) Britton. Stem erect: leaf-blades various, those of the basal leaves elliptic to elliptic-lanceolate, mostly 15–40 cm. long, irregularly crenate, unequally cordate or truncate at the base; those of the cauline leaves smaller and more coarsely toothed or incised: petals white, obovate, 6–8 mm. long: pod 5–7 mm. long, straight. [*Roripa Armoracia* (L.) A. Hitchc.]—(HORSERADISH.)—Roadsides, thickets, low grounds, various provinces N of Coastal Plain, N. C. to Tenn. and S Can. Nat. of Eu.—Spr.



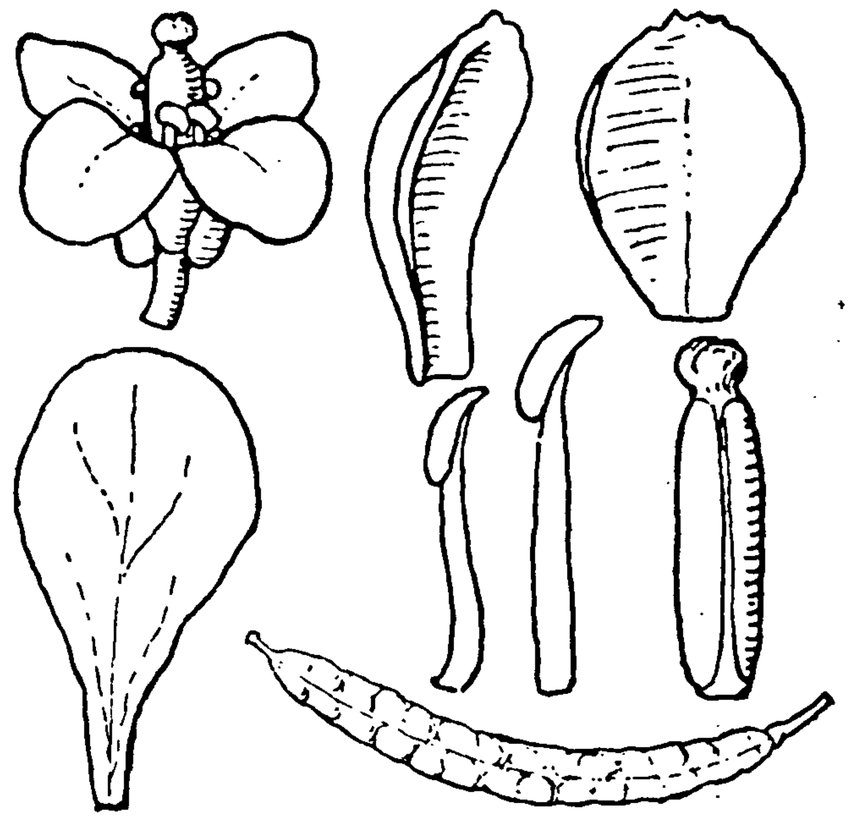
8. **NEOBECKIA** Greene. Perennial aquatic herbs. Leaves various, the immersed ones with finely dissected blades, the emersed ones with smaller, entire, toothed, or pinnatifid blades. Raceme often paniculate. Sepals 4, erect. Petals 4, of a spatulate type, white. Stamens 6: filaments slender, but slightly enlarged below: anthers sagittate. Ovary not stipitate: style slender. Ovules numerous. Pod 1-celled, short, turgid.—One species.



1. **N. aquatica** (Eaton) Britton. Stem partly immersed, weak: immersed leaves sometimes numerous; blades 1–3-pinnately dissected, the segments filiform or capillary: emersed leaves distant; blades elliptic to linear, entire, toothed, or pinnatifid: pedicels spreading: sepals elliptic to ovate, 3.5–4 mm. long: petals broadly spatulate, 6–7 mm. long: pod ellipsoid, 5–6 mm. long. [*Nasturtium lacustre* A. Gray *Roripa americana* (A. Gray) Britton]—(LAKE-CRESS.)—Lakes and slow streams, various provinces, Fla to La., Minn., and Que.—Sum.

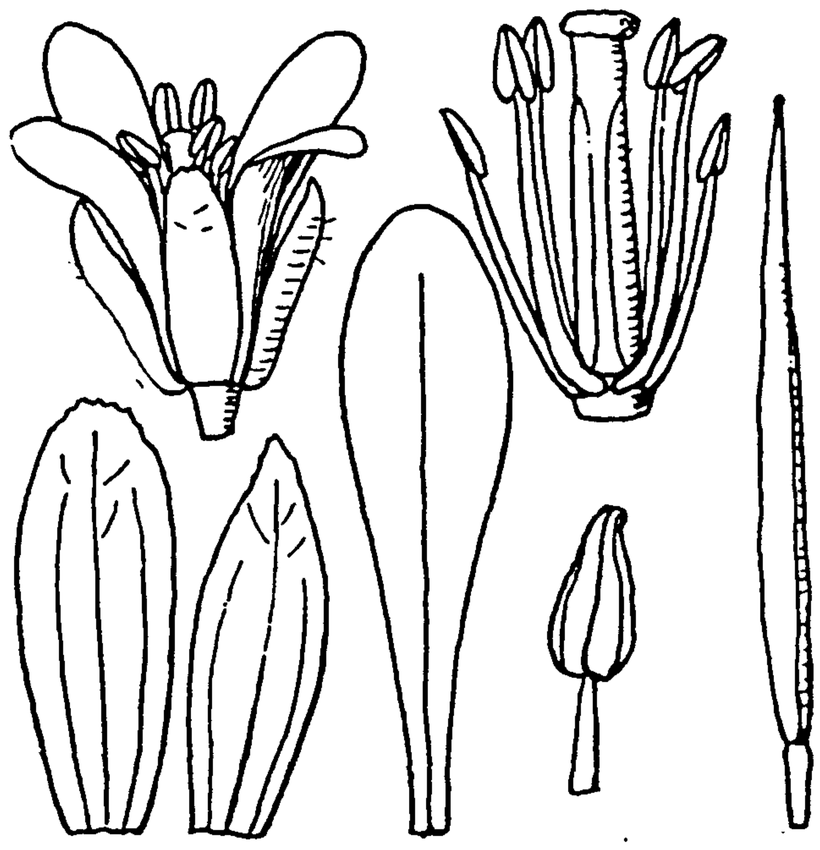
9. **SISYMBRIUM** [Tourn.] L. Perennial diffuse aquatic herbs with creeping stems. Leaf-blades pinnately divided. Raceme lax. Sepals broad. Petals 4, white, much exceeding the sepals. Stamens mostly 6: anthers ovoid.

Ovary narrow: style very stout: stigma discoid. Pod elongate, linear.—One species.



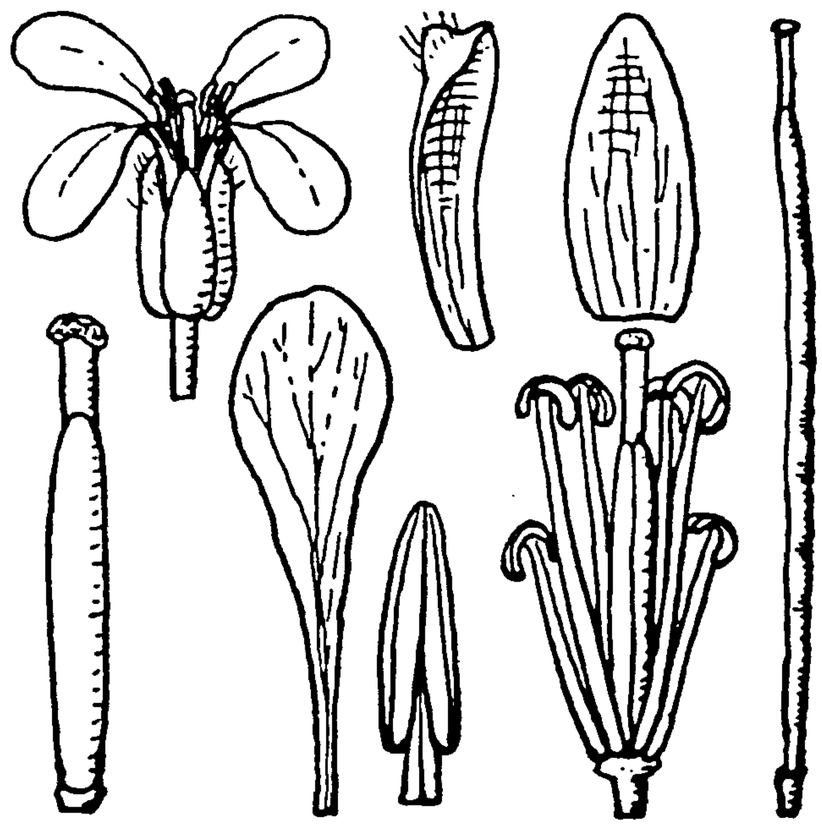
1. S. Nasturtium-aquaticum L. Stems diffuse or floating, 1–6 dm. long: leaf-blades unequally pinnate, 2–15 cm. long, the segments irregular: petals white, 3–4 mm. long: pods linear, 10–25 mm. long, curved. [*Nasturtium officinale* R. Br. *Roripa Nasturtium* (L.) Rusby]—(WATER-CRESS. STURSHUM.)—Springs and slow streams, various provinces, Ga. to Tex., Calif., and S Can. Nat. of Eu.—Spr.–fall.—Frequently used as a garnish and a condiment.

10. ERYSIMUM [Tourn.] L. Annual or perennial herbs. Leaf-blades entire, lobed or pinnatifid. Raceme elongating, strict. Sepals 4, rather narrow, nearly equal. Petals 4, slightly larger than the sepals, yellow, spatulate. Stamens 6: anthers ovoid. Ovary narrow: style very short or obsolete: stigma 2-lobed. Pod elongate.—About 3 species, natives of the Old World.



1. E. officinale L. Stem 3–12 dm. tall, the branches spreading: leaf-blades 2–20 cm. long, runcinate-pinnatifid, the segments irregular, entire, toothed, or lobed: sepals 1.5–2 mm. long: petals yellow, spatulate: pod slender, 10–16 mm. long, slender-beaked. [*Sisymbrium officinale* (L.) Scop.]—(HEDGE-MUSTARD.)—Waste-places and roadsides, nearly throughout cult. N. A. Nat. of Eu.—Spr.

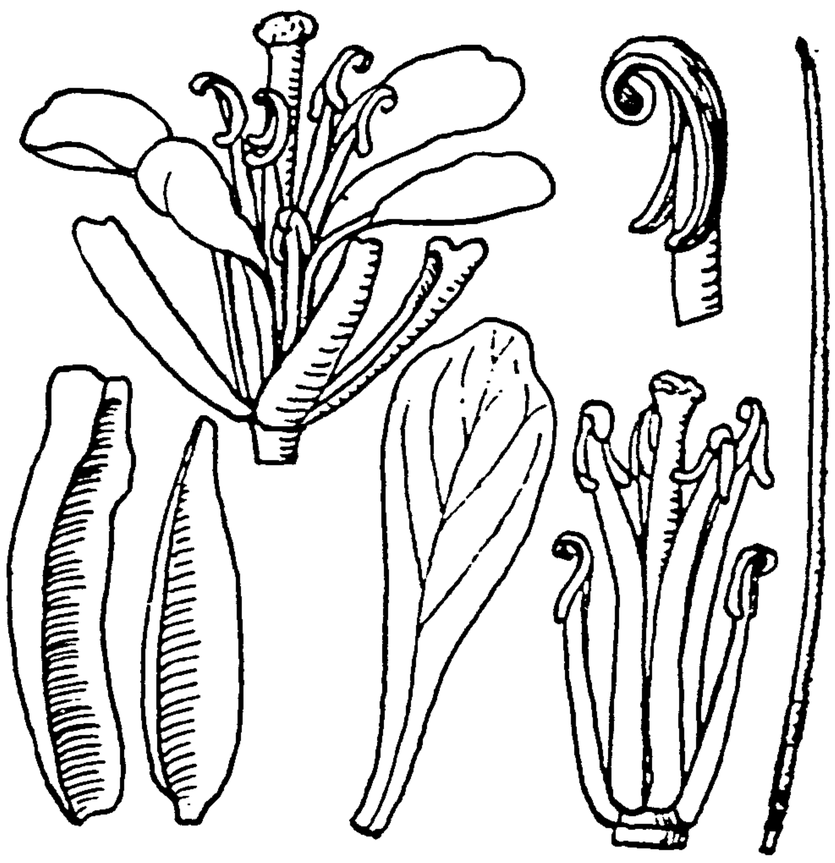
11. IODANTHUS T. & G. Perennial herbs. Leaf-blades toothed to lyrate-pinnatifid. Racemes or panicles elongate. Sepals 4, the lateral ones more or less appendaged near the apex. Petals 4, white or violet, spatulate. Stamens 6: anthers elliptic to ovoid. Style short. Pod elongate.—One species.



1. I. pinnatifidus (Michx.) Steud. Stem 3–10 dm. tall: blades of the lower leaves often pinnatifid, the terminal segment larger, incised or with flaring teeth, blades of the upper leaves dentate or incised; petioles broad, clasping: sepals elliptic, 3–4 mm. long: petals over twice as long as the sepals: pod 3–4 cm. long. [*I. hesperioides* T. & G.]—(PURPLE-ROCKET.)—River banks, various provinces, La. to Tex., Minn., Tenn., and W Pa.—Spr.

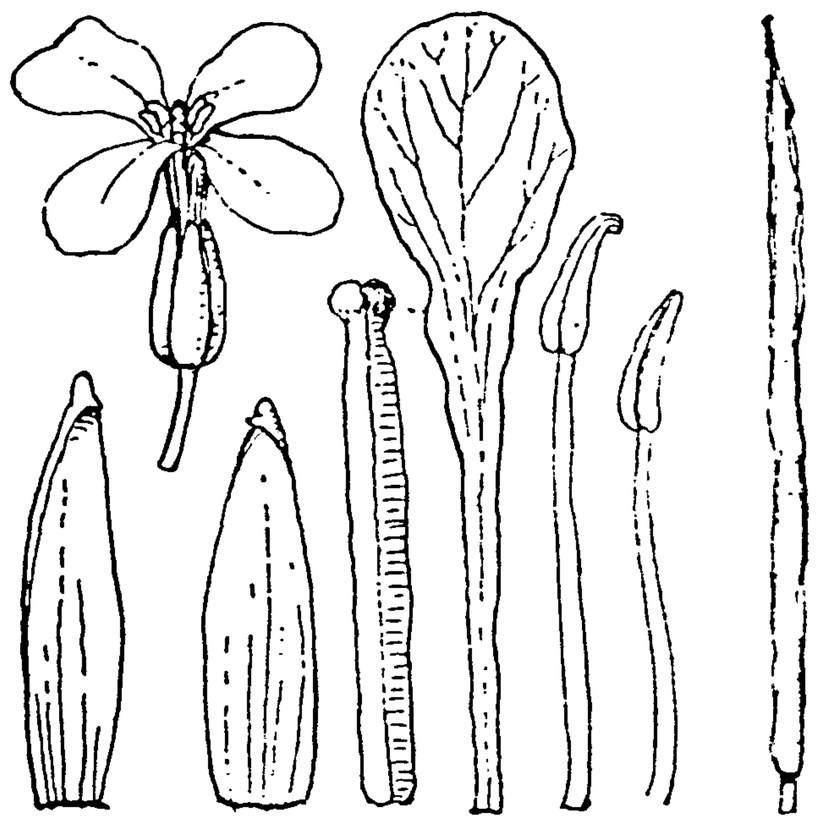
12. NORTA Adans. Biennial, tall, sometimes diffusely branched, herbs. Leaf-blades toothed or pinnatifid. Raceme lax, becoming very lax in age,

the pedicels short and stout. Sepals rather narrow, spreading. Petals yellow, exceeding the sepals. Stamens 6: anthers elliptic-sagittate. Style short: stigma 2-lobed. Pod slender, much-elongate, spreading.—About 10 species, natives of the Old World.



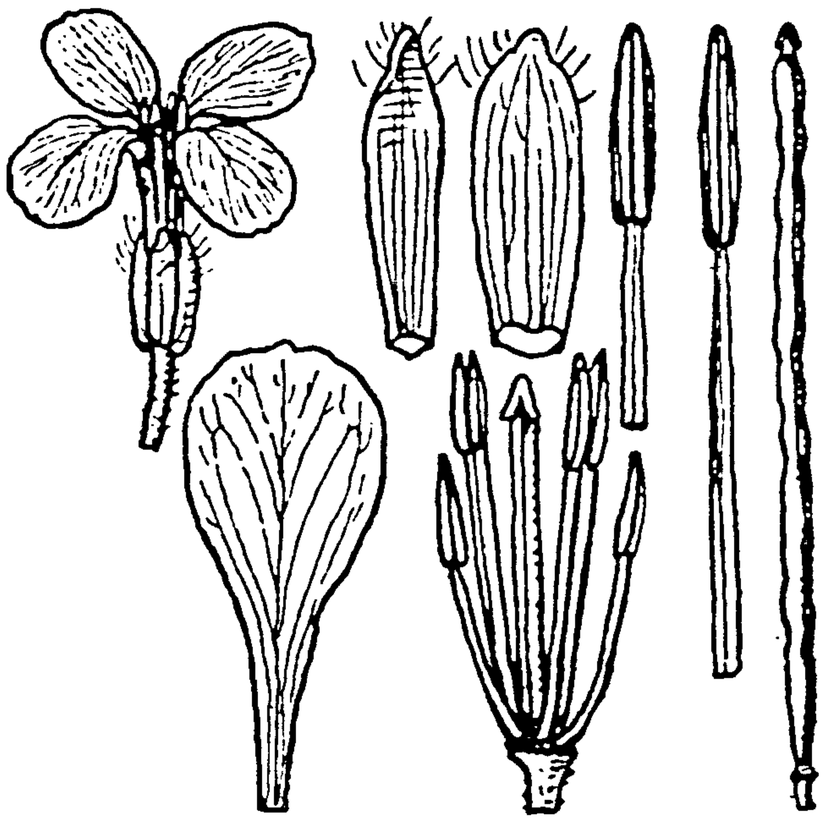
1. N. altissima (L.) Britton. Stem 1.5 m. tall or less, the branches spreading, often divaricate: leaf-blades mostly 1–2 dm. long, deeply 1–2-pinnatifid, the segments narrow, entire or toothed: sepals 4–5 mm. long: petals spatulate: pod elongate-linear, 6–10 cm. long, stout-beaked. [*Sisymbrium altissimum* L.] — (TUMBLE-MUSTARD.) — Fields and waste-places, nearly throughout cult. N. A. Nat. of Eu.—Sum.

13. CONRINGIA [Heist.] Adans. Annual glabrous herbs. Leaf-blades entire, sessile, cordate. Racemes elongating, becoming lax, the pedicels rather long. Sepals narrow, erect. Petals yellowish, much longer than the sepals, the blades rather narrow. Stamens 6: anthers narrow. Ovary elongate: style very short: stigma slightly 2-lobed. Pod narrow, much elongate, angled, erect or ascending.—About 7 species, Eurasian.



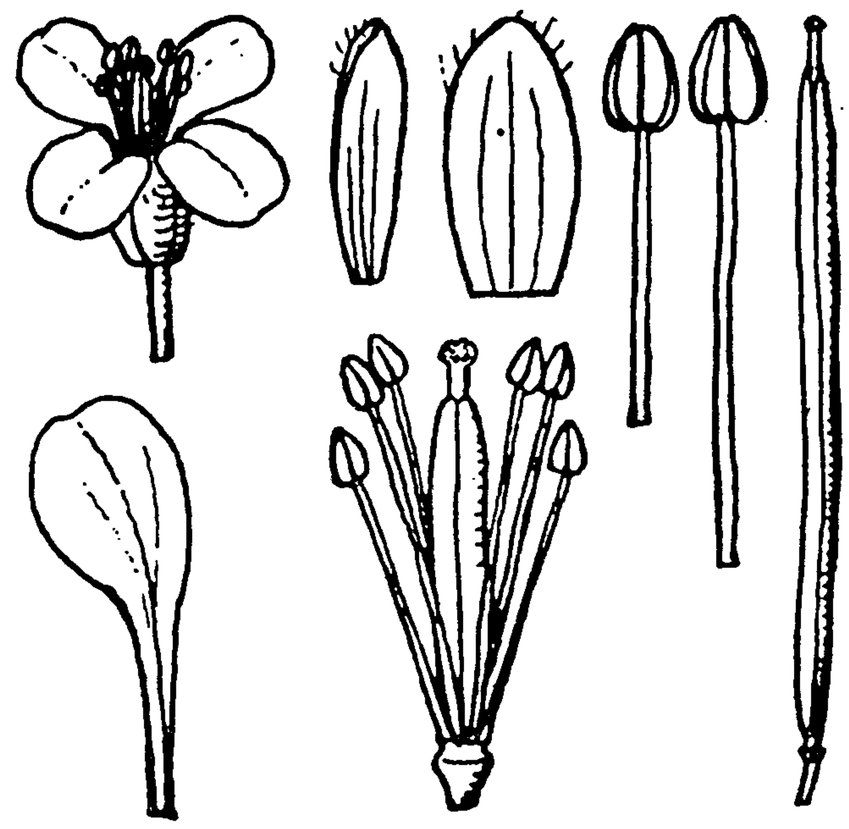
1. C. orientalis (L.) Dumort. Stem up to 1 m. tall, simple or sparingly branched: leaf-blades spatulate or obovate at the base of stem, elliptic-obovate, elliptic, elliptic-ovate or ovate above, pale-green 3–16 cm. long, obtuse at the apex, cordate-sagittate at the base: sepals lanceolate, 5–6 mm. long: petals spatulate, pale-yellow, 8–11 mm. long: pod narrowly linear, 6–12.5 cm. long, rather slender-beaked.—Waste-places and fields, various provinces, Fla. to Mo., Ore., Alb., and N. B. Nat. of Eu.—Spr.–sum.

14. HESPERIS [Tourn.] L. Biennial or perennial herbs. Leaf-blades entire, toothed, or rarely pinnatifid. Raceme or panicle elongate. Sepals 4, broad. Petals 4, white or purple, with broad blades. Stamens 6: anthers oblong. Style very short or obsolete. Pod elongate.—About 25 species, Eurasian.



1. H. matronalis L. Stems 3–12 dm. tall, roughish-pubescent: leaves 2–15 cm. long; blades of the upper ones elliptic or ovate-lanceolate, denticulate or rarely pinnatifid: sepals becoming 6–8 mm. long: petals 19–22 mm. long, the broadly obovate blades about as long as the claws: pod 5–10 cm. long.—(ROCKET. DAME'S-VIOLET. DAME'S-ROCKET. SWEET-ROCKET.)—Fields and on roadsides, various provinces, Ga. to Utah, Minn., Ont., and Mass.—Nat. of Eu.—Spr.–sum.

15. ARABIDOPSIS Schur. Annual or perennial herbs. Leaf-blades entire, toothed, or pinnatifid. Raceme elongate. Sepals 4, narrow. Petals 4, spatulate, white. Stamens 6: anthers ovoid. Style short. Pod elongate.—About 12 species, North American and Eurasian.

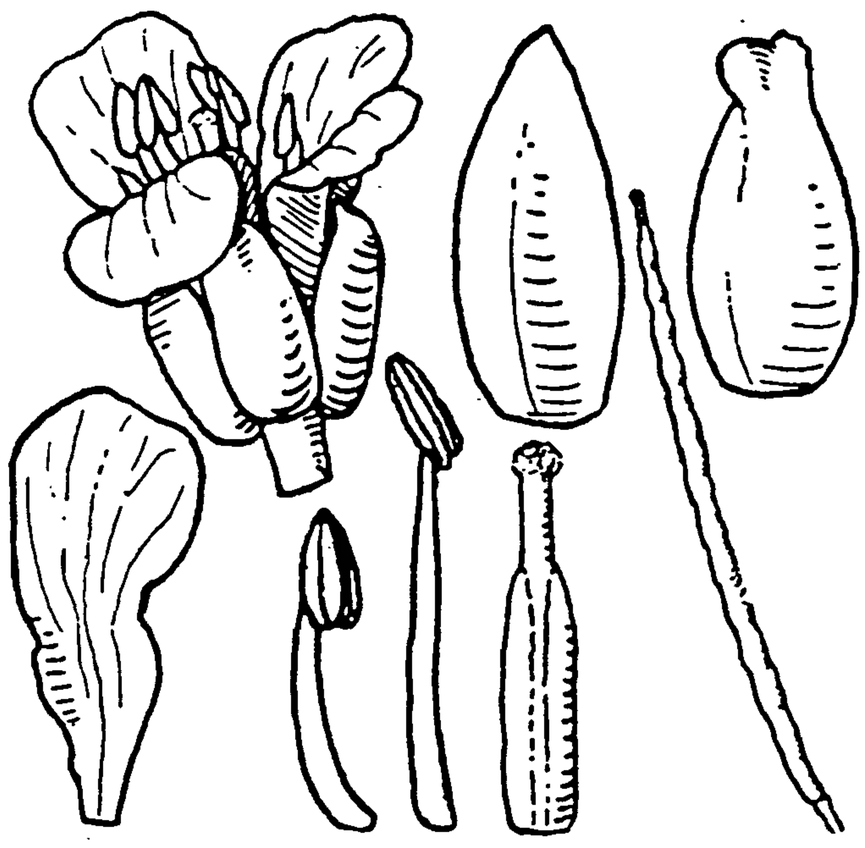


1. A. Thaliana (L.) Britton. Plant 0.3–5 dm. tall, mainly branched throughout, pubescent near the base: blades of the basal leaves elliptic, or oblanceolate, 1.5–4.5 cm. long, entire or shallowly toothed: sepals 1–1.5 mm. long: petals about twice as long as the sepals: pod linear-filiform, 10–15 mm. long. [*Sisymbrium Thaliana* Gay. *Stenophragma Thaliana* (L.) Celak.]—(MOUSE-EAR CRESS. WALL-CRESS.)—Waste-places and fields, various provinces, Ga. to Ark., Utah., Minn., Ont., and Mass.—Nat. of Eu.—Spr.

16. CAMPE Dulac. Biennial or perennial herbs. Leaf-blades lyrate-pinnatifid. Raceme or panicle often dense. Sepals 4, unequal. Petals 4, yellow, spatulate. Stamens 6: anthers elliptic to ovoid. Style columnar: stigma not dilated. Pod elongate. [*Barbarea* R. Br.]—About 7 species, natives of temperate regions.—SCURVY-GRASSES. WINTER-CRESSES. ROCKETS. CORN-MUSTARDS.

Pod slender-pedicelled, obtusely 4-angled: leaf-segments 3–9.
  Pod spreading or ascending: corolla bright-yellow. 1. *C. Barbarea.*
  Pod erect and appressed: corolla pale-yellow. 2. *C. stricta.*
Pod stout-pedicelled, acutely 4-angled: leaf-segments 9–17. 3. *C. verna.*

1. C. Barbarea (L.) W. F. Wight. Plant 2–9 dm. tall: leaves 5–15 cm. long, or shorter above; blades of the lower ones pinnatifid, those of the upper ones toothed or incised: sepals mostly 3–3.5 mm. long: petals 5–5.5 mm. long: pod 2–2.5 cm. long, slender-beaked. [*B. vulgaris* R. Br.]—(BITTER-CRESS. YELLOW-ROCKET.)—Roadsides and fields, and cult. grounds, various provinces, on Coastal Plain only N, Ga. to N. Y. and Ont., and locally in the interior and on Pacif. coast. Native northward and in Eu.—Spr.–sum.



2. C. stricta (Andrz.) W. F. Wight. Plant similar to that of *C. Barbarea* in habit and foliage: sepals mostly 4–4.5 mm. long: petals 5.5–6.5 mm. long: pod 2–2.5 cm. long, short-beaked. [*B. stricta* Andrz.]—Roadsides and fields, and cult. grounds, various provinces, Fla. to Nebr., Alas., Ont., and Que. Nat. northward and in Eu.—Spr.

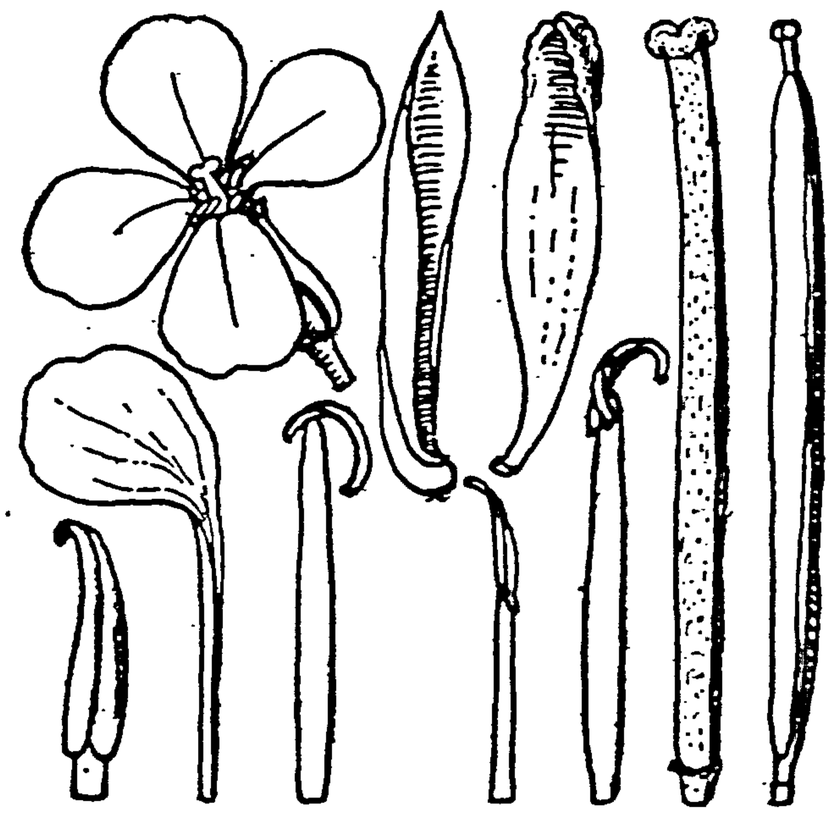
3. C. verna (Mill.) Heller. Plant 1–6 dm. tall: leaves 2–15 cm. long; blades pinnatifid, the segments toothed: sepals 3–3.5 mm. long: petals about twice as long as the sepals: pod 3.5–8 cm. long. [*B. verna* Asch.]—(EARLY WINTER-

CRESS. LAND-CRESS.)—Roadsides and in waste-places, various provinces, Fla. to Calif., Wash., and Mass. Nat. of Eu., and cult.—Spr.

17. **CHEIRINIA** Link. Annual or biennial herbs. Leaf-blades entire, toothed, or lobed. Sepals 4, nearly equal. Petals 4, yellow, with broad blades. Stamens 6: anthers elliptic to sagittate. Style very short: stigma depressed. Pod elongate.—About 90 species, natives of the north temperate zone.—TREACLE-MUSTARDS. BLISTER-CRESSES.

Petals less than 5 mm. long: anthers over 2 mm. long: pod less than 15 times as long as wide: seed about 1 mm. long. 1. *C. cheiranthoides.*
Petals over 15 mm. long: anthers about 1 mm. long: pod over 30 times as long as wide: seed about 2 mm. long. 2. *C. aspera.*

1. **C. cheiranthoides** (L.) Link. Stem 1–7 dm. tall, strigillose: leaf-blades elliptic to lanceolate or linear, 2–10 cm. long, entire, or obscurely toothed: sepals 2–2.5 mm. long: petals with obovate blades about as long as the claws: filaments 3–4 mm. long: pod ascending, 1.5–2 cm. long, the style-beak about 1 mm. long. [*Erysimum cheiranthoides* L.] — (WORMSEED-MUSTARD. WILD-WALLFLOWER.)—Sandy soil, especially along streams, various provinces N of Coastal Plain, N. C. to Tenn., Wash., Alas., and Newf.—Sum.



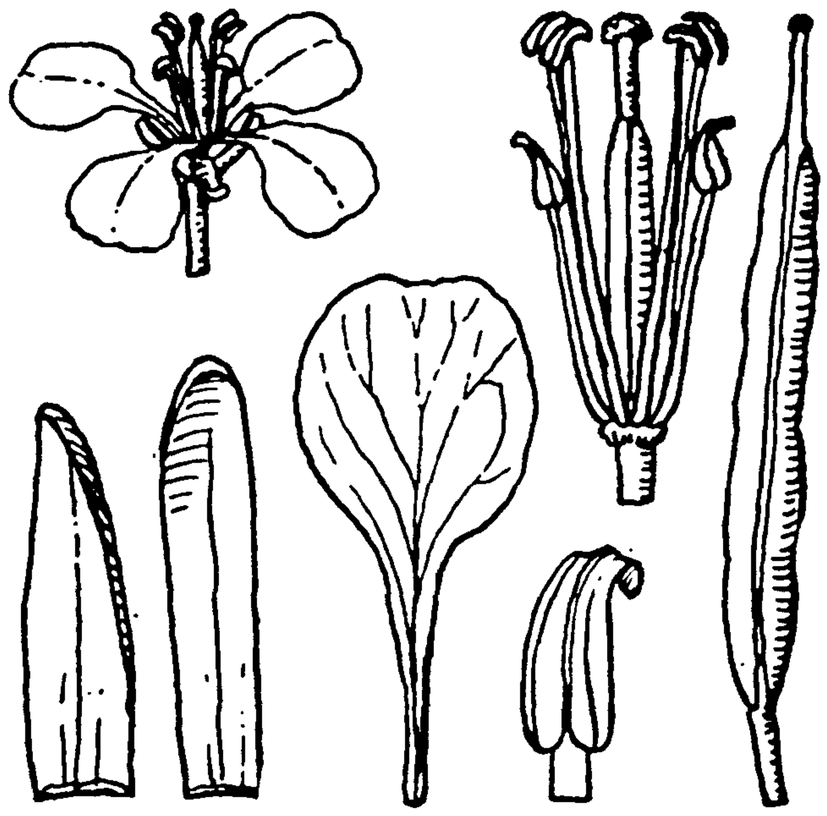
2. **C. aspera** (Nutt.) Rydb. Stem 6–10 dm. tall, scabrous and canescent with forked hairs: leaf-blades lanceolate to linear or elliptic, 3–15 cm. long, entire or repand, or the lower ones sometimes pinnatifid: sepals 10–12 mm. long: petals with cuneate-obovate blades much shorter than the claws: longer filaments 12–14 mm. long: pod stout, spreading, 8–11 cm. long, the style-beak about 4 mm. long.—Dry soil, various provinces, Tenn. to N. M. and S. Can.—Spr.

17. **BRASSICA** [Tourn.] L. Annual, biennial, or perennial herbs. Leaf-blades lobed or pinnatifid, or those of the upper leaves entire. Sepals 4, rather narrow. Petals 4, yellow, cream-colored, or white, the blades broad. Stamens 6: anthers sagittate. Style columnar: stigma depressed or 2-lobed. Pod elongate, sometimes angled, the beak conic.—About 80 species, Eurasian and African—MUSTARDS.—Many of the species are important food plants. Here belongs cabbage in its many varieties, mustards, turnips, and charlocks.

— Blades of the upper leaves merely sessile: petal-blades abruptly narrowed into slender claws, yellow.
Pod erect or appressed, short-beaked, less than 2 cm. long: pedicel appressed. 1. *B. nigra.*
Pod spreading, long-beaked, over 2 cm. long: pedicel spreading.
Leaf-blades lyrate: pod stout, mostly over 3 mm. wide. 2. *B. juncea.*
Leaf-blades much incised and crisped: pod slender, mostly less than 3 mm. wide. 3. *B. japonica.*
Blades of the upper leaves clasping: petal-blades gradually narrowed into broad claws, cream-colored. 4. *B. campestris.*

1. **B. nigra** (L.) Koch. Stem 1–2 m. tall, sometimes sparingly pubescent, widely branched: leaves 5–20 cm. long; blades of the lower ones lyrate-

pinnatifid, the terminal segment the largest: sepals becoming 4.5–5 mm. long: petals 7–9 mm. long: pod 10–16 mm. long. [*Sinapis nigra* L.]—(BLACK-MUSTARD. CHARLOCK.)—Waste-places and fields, nearly throughout cult. N. A. Nat. of Eu.—Spr.–sum.



2. B. juncea (L.) Cosson. Stem 3–17 dm. tall, glaucous, sparingly branched: leaves 5–17 cm. long; blades of the lower ones elliptic to oval, coarsely toothed or lyrate-pinnatifid: sepals becoming 4–6 mm. long: petals 9–12 mm. long: pod 30–50 mm. long.—(INDIAN-MUSTARD.)—Waste-places and roadsides, nearly throughout cult. N. A. Nat. of Asia.—Spr.–sum.

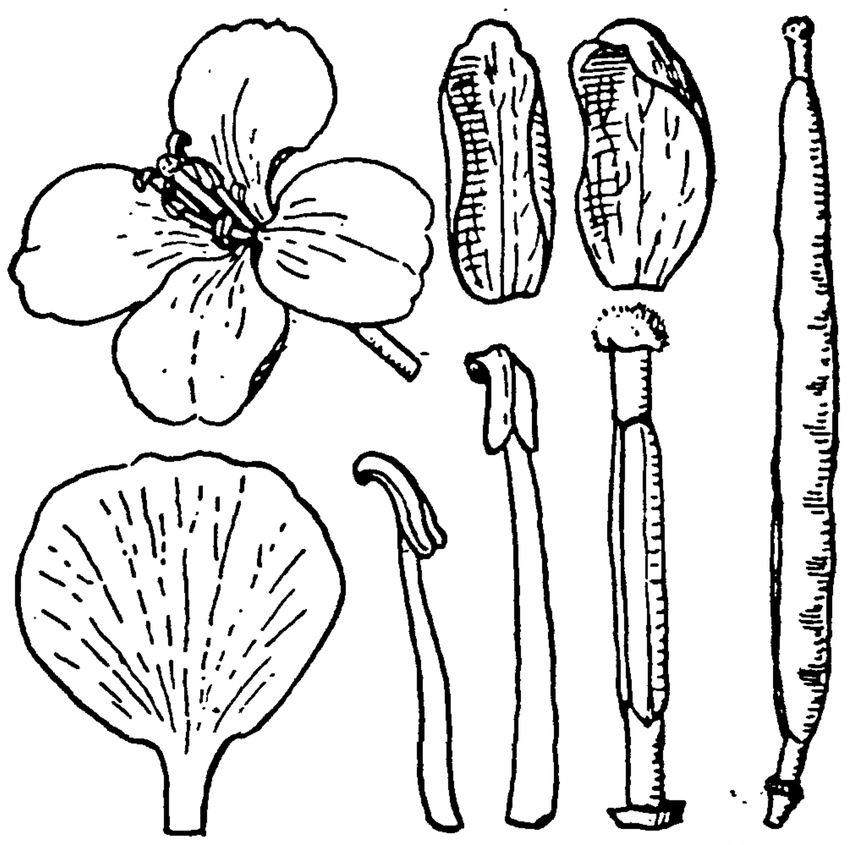
3. B. japonica Siebold. Similar to B. juncea in habit: leaves 6–21 cm. long: blades incised, lobed and crisped: sepals becoming 4–5 mm. long: petals 7–9 mm. long: pod 30–40 mm. long.—(CURLED-MUSTARD. POTHERB-MUSTARD.)—Fields and waste-places, various provinces, Fla. to Me. Nat. of Asia.—Spr.–fall.

4. B. campestris L. Stem 3–6 dm. tall, glabrous and glaucous: leaves 9–30 cm. long, or shorter above; blades lyrate-pinnatifid: sepals becoming 4–5 mm. long: petals 8–12 mm. long: pod 30–70 mm. long.—(RUTA-BAGA. TURNIP.)—Fields and roadsides, nearly throughout cult. N. A. Nat. of Eu.—Spr.

19. DIPLOTAXIS DC. Annual, biennial, or perennial caulescent herbs. Leaf-blades coarsely toothed or pinnatifid, sometimes lyrate. Sepals 4, rather narrow. Petals 4, yellow, the blades broad. Stamens 6: anthers oblong to linear. Style short-columnar: stigma depressed, slightly 2-lobed. Pod elongate, flattened, short-beaked.—About 20 species, natives of the Old World.—SAND-ROCKETS.—Spr.–fall.

Plant perennial: ovary, and pod, short-stipitate: flowers large; petals 1 cm. long or more. 1. *D. tenuifolia.*
Plant annual: ovary, and pod, not stipitate: flowers small; petals less than 1 cm. long. 2. *D. muralis.*

1. D. tenuifolia (L.) DC. Perennial, 3–12 dm. tall, the branches glabrous or nearly so: leaves mainly cauline; blades conspicuously pinnatifid, the lobes usually narrow: sepals 5–7 mm. long: petals 10–12 mm. long: pod linear, short-stipitate: seed over 1 mm. long.—(FLIX-WEED. SAND-ROCKET.)—Waste-places and ballast, about sea-ports, La. to N. S. Nat. of Eu.

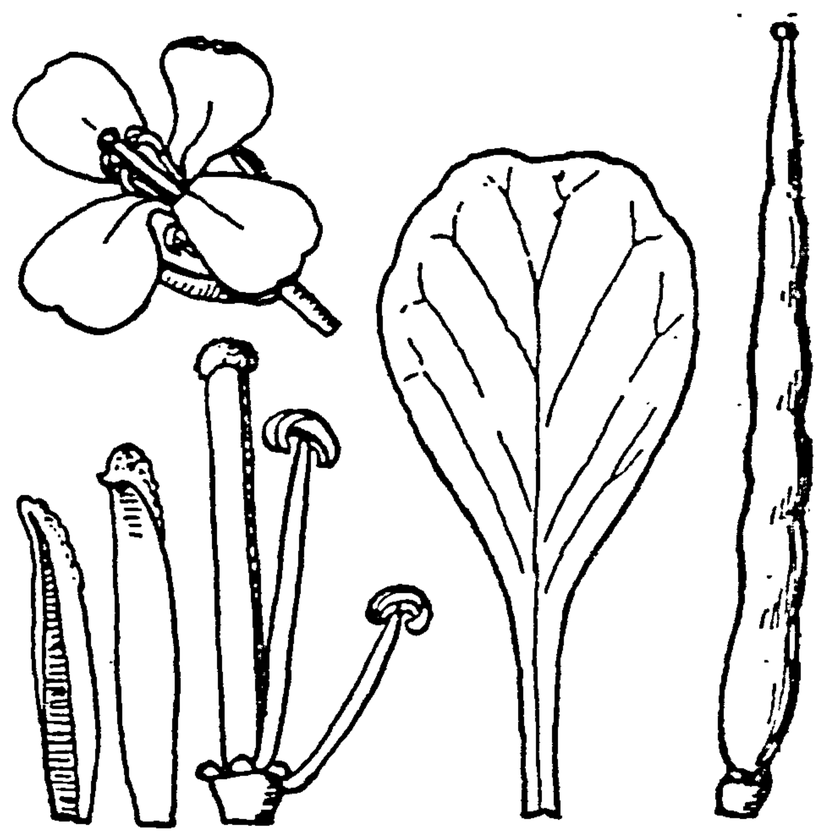


2. D. muralis (L.) DC. Annual or biennial, mostly 2–4 dm. tall, the branches sometimes decumbent, sparingly pubescent: leaves mostly near the base of the plant; blades elliptic to spatulate, coarsely pinnately toothed to somewhat pinnatifid: sepals 3.5–4 mm. long: petals 7–8 mm. long: pod narrowly linear, not stipitate: seed less than 1 mm. long.—(CROSS-WEED. WALL-ROCKET.)—Waste-places and ballast, usually about sea-ports, various provinces, La. to Ont., and N. S. Nat. of Eu.

20. SINAPIS L. Annual or biennial herbs. Leaf-blades lobed or pinnatifid. Sepals 4, herbaceous. Petals 4, mostly yellow, the blades broad. Stamens 6: anthers narrowly oblong. Style columnar: stigma depressed. Pod elongate, the beak sword-like.—About 5 species, European.—CHARLOCKS.

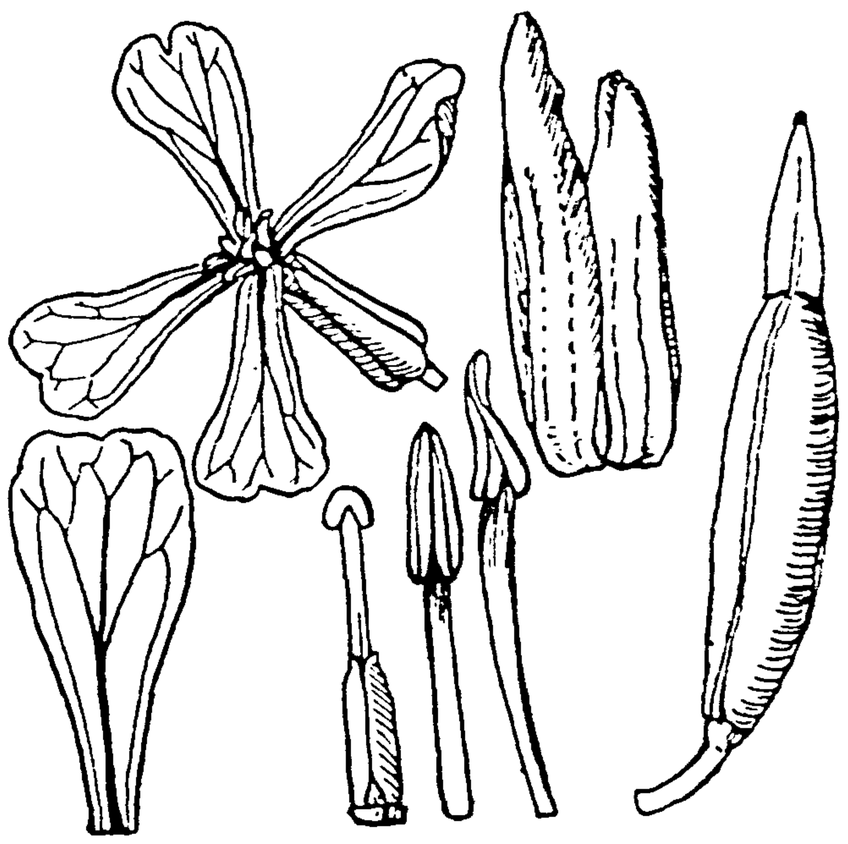
Blades of the upper leaves toothed: pod with a somewhat 4-angled beak about ½ the length of the pod-body. 1. *S. arvensis.*
Blades of the upper leaves pinnatifid: pod with a flat beak about as long as the pod-body. 2. *S. alba.*

1. S. arvensis L. Stem 3–6 dm. tall, hispid: leaves 4–17 cm. long; blades of the lower ones coarsely toothed or lyrate-pinnatifid: sepals becoming 5–6 mm. long: petals 5.8–8.5 mm. long, the suborbicular or obovate blades abruptly contracted into the slender claws: pod 21–24 mm. long.—(WILD-MUSTARD. CRUNCH-WEED.) —Fields and waste-places, nearly throughout cult. N. A. Nat. of Eu.—Spr.–fall.



2. S. alba L. Stem pubescent with rigid spreading hairs, 3–7 dm. tall, branched: blades of the basal leaves obovate, pinnatifid, on long petioles, those of the upper leaves narrow, elliptic to lanceolate, pinnatifid, those near the top of the stem sessile: sepals 4–5 mm. long: petals yellow, much longer than the sepals: pods hispid, the body 8–15 mm. long, constricted below the seeds, the beak flat, as long as the body or longer.—(WHITE-MUSTARD.)—Fields, roadsides, and waste-places, U. S. and S Can. Nat. of Eurasia.—Sum.

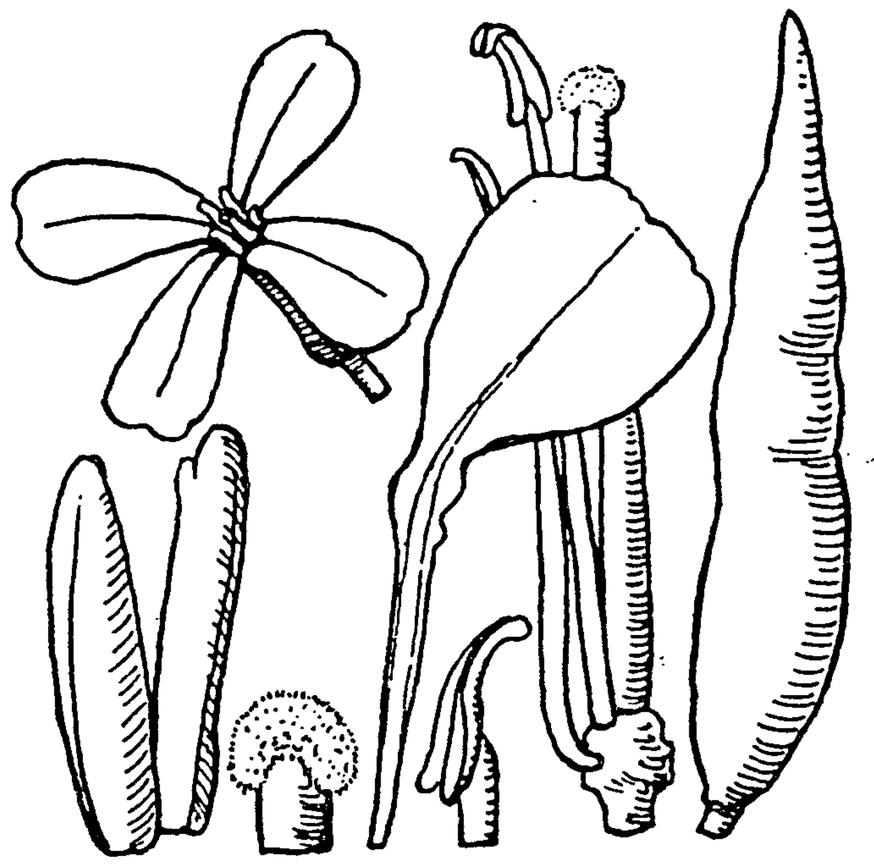
21. ERUCA L. Herbs resembling *Brassica* and *Sinapis*. Leaf-blades pinnatifid or some of them merely toothed, not clasping. Raceme narrow: pedicels ascending. Sepals narrow, erect. Petals with spreading dilated veiny blades. Anthers sagittate. Ovary short. Style short, but longer than the ovary. Pod short, turgid, the beak flat, shorter than the body.—About 10 species, Eurasian.



1. E. Eruca (L.) Britton. Plant 2–7 dm. tall, the stem usually branched, sparingly pubescent: leaf-blades various, those of the lower leaves shallowly toothed or pinnatifid, those of the upper leaves usually pinnatifid, the segments toothed: pedicels stout, 2–4 mm. long: sepals linear-lanceolate, 13–15 mm. long, glabrous: petals dirty-yellow, spatulate, 1.5–2 cm. long, veiny: pod erect, slender-fusiform, 2–3 cm. long, the beak much shorter than the body. [*E. sativa* Mill.] — (GARDEN-ROCKET.) — Fields, nearly throughout cult. N. A. Nat. of Eu.—Spr.–sum.

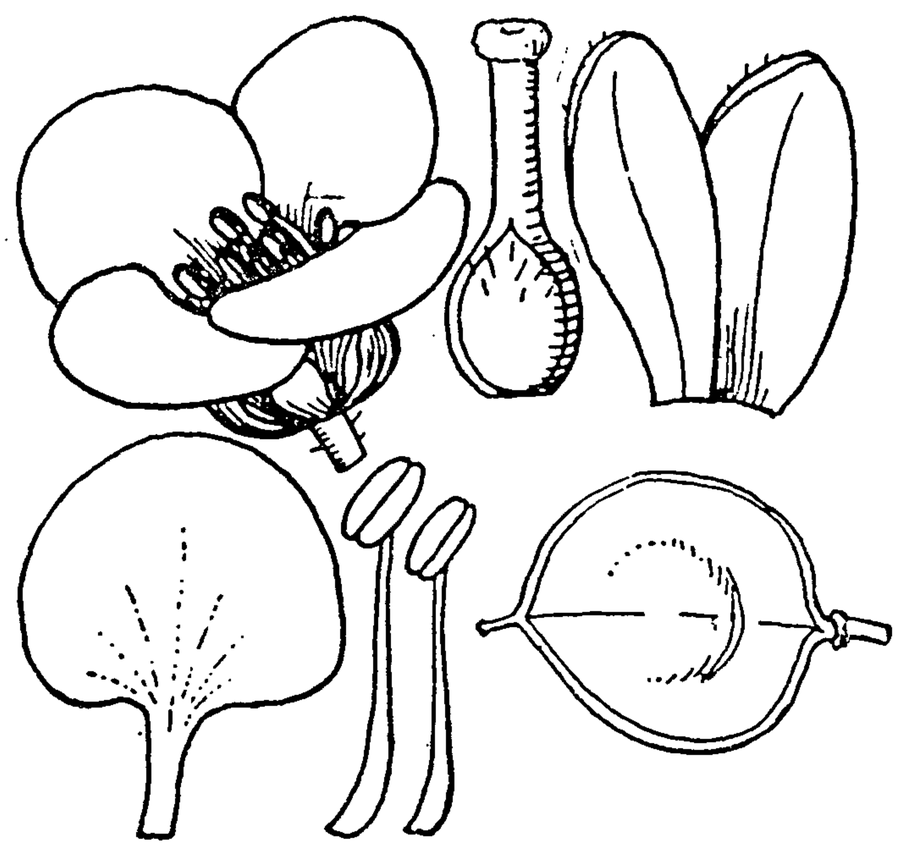
22. RAPHANUS [Tourn.] L. Annual or mostly biennial herbs. Leaf-blades lyrate-pinnatifid, or those of the upper ones merely toothed. Sepals 4,

narrow. Petals 4, yellow, pink, or white, the blades cuneate or obovate. Stamens 6: anthers narrow. Style columnar: stigma depressed or globular. Pod elongate, beaked. —About 6 species, Eurasian.



1. **R. sativus** L. Plant 3–11 dm. tall, usually with scattered hairs: leaves finely pubescent; blades spatulate to obovate in outline, pinnatifid or pinnately parted, the terminal lobe very large and irregularly toothed: flowers rather short-pedicelled: sepals elliptic to linear, 6–7 mm. long, bearded at the apex: petals pink or white, spatulate, 11–14 mm. long: pod turgid, the body mostly 2.5–3.5 cm. long, beaked.—(RADISH.)—Fields and roadsides, more or less persistent after cultivation, various provinces, U. S. and S Can. Nat. of Eu.—Spr.

23. **KONIGA** Adans. Annual or perennial, often diffuse herbs, or shrubby plants. Leaf-blades entire. Sepals 4, herbaceous. Petals 4, white, with broad blades. Stamens 6: anthers ovoid. Style slender: stigma depressed. Pod ovate to subglobose. Seed solitary.—About 4 species, natives of the Mediterranean region.

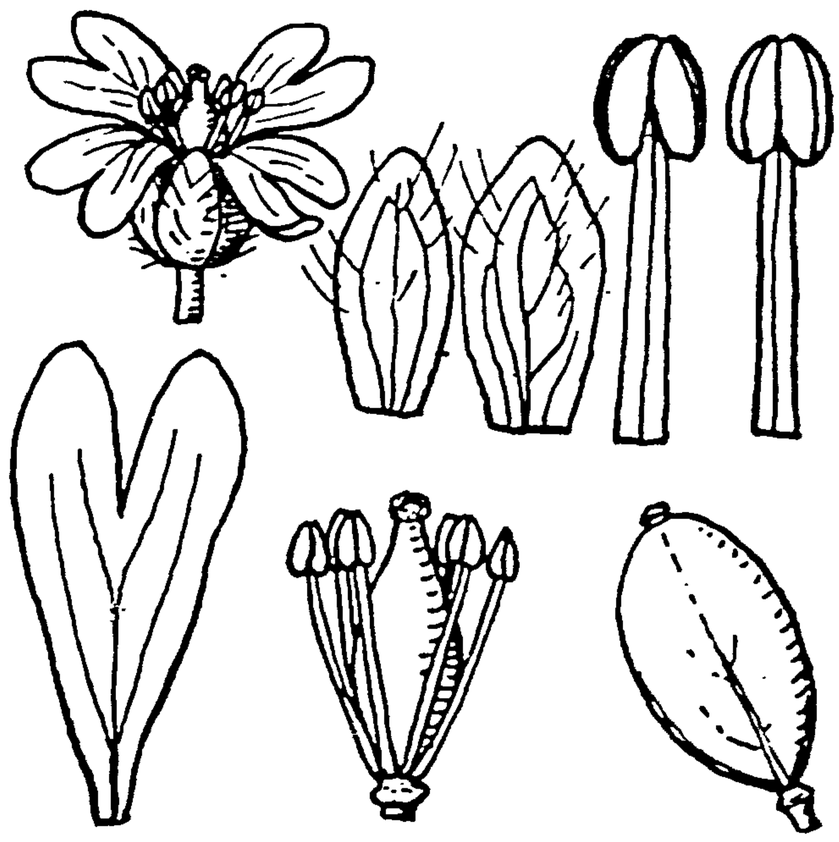


1. **K. maritima** (L.) R. Br. Stem usually diffuse, minutely pubescent: leaves 1–5 cm. long; blades of the cauline ones oblanceolate to linear or linear-lanceolate: flowers fragrant: sepals becoming 1.5–2 mm. long: petals 3–4 mm. long, the suborbicular blades longer than the claws: pod 2–3 mm. long, short-beaked. [*Alyssum maritimum* L.]—(SWEET-ALYSSUM.)—Waste places, and cult. grounds, various provinces, Fla. to Tex., Calif., and S Can. Nat. of Eu. and cult.—Spr.–fall.

24. **DRABA** [Dill.] L. Annual or perennial, often small herbs. Leaf-blades entire or toothed. Sepals 4, rather broad. Petals 4, white or yellow, or rarely pink or purple, or wanting. Stamens 6: anthers ovoid. Style columnar or very short: stigma depressed. Pod oval to linear, sometimes twisted. Seeds several.—About 175 species, natives, mainly, of north temperate and arctic regions.—Spr.—WHITLOW-GRASSES. WHITLOW-WORTS.

Annuals or often winter-annuals: pod not spirally twisted: petals about twice as long as the sepals.
  Petals 2-cleft. 1. *D. verna.*
  Petals entire, erose or emarginate.
    Leaf-blades entire.
      Pod glabrous. 2. *D. caroliniana.*
      Pod pubescent. 3. *D. aprica.*
    Leaf-blades toothed.
      Pod 5–15 mm. long: sepals 2 mm. long. 4. *D. cuneifolia.*
      Pod 2–3 mm. long: sepals 1–1.5 mm. long. 5. *D. brachycarpa.*
Perennial: pod spirally twisted: petals thrice as long as the sepals. 6. *D. ramosissima.*

1. **D. verna** L. Plant 2–16 cm. tall, acaulescent: leaf-blades spatulate to narrowly elliptic, 5–15 mm. long, entire, or toothed near the apex, sparingly pubescent: scape glabrous: sepals becoming 1.5–2 mm. long: petals cuneate, nearly twice as long as the sepals: pod elliptic or rarely oval, 4–9 mm. long.—(WHITE-BLOW. WHITLOW-GRASS.)—Dry banks and fields, various provinces, Ga. to Ark., Minn., and Mass. Nat. of Eu.—Wint.–spr.



2. **D. caroliniana** Walt. Plant 4–10 cm. tall, often short-stemmed: leaf-blades obovate, spatulate, elliptic, or suborbicular, 5–15 mm. long, entire or shallowly few-toothed, closely pubescent: scape pubescent, at least below: sepals becoming 2–2.5 mm. long, glabrous: petals 3–4 mm. long, with cuneate or oval blades: ovary glabrous: pod linear, 7–18 mm. long.—Rocks, fields, and sandy soil, various provinces, Ga. to Ark., Minn., and Mass.—Spr.

3. **D. aprica** Beadle. Plant 1–2.5 dm. tall, finely appressed-pubescent: leaves distant; blades obovate or oval to elliptic or linear-lanceolate, 19–26 mm. long, coarsely few-toothed: peduncles very short or wanting: terminal raceme elongate, the lateral racemes wholly or partially congested: sepals elliptic, becoming 0.8–1 mm. long: petals spatulate, 2.5–3 mm. long: ovary pubescent: pod linear-elliptic 4–6 mm. long.—Dry soil, Kennesaw Mt. in the higher Piedmont, Ga.—Spr.

4. **D. cuneifolia** Nutt. Plant 6–10 mm. tall, usually short-stemmed, stellate-pubescent: leaves approximate; blades cuneate, obovate or sometimes spatulate, 8–30 mm. long, coarsely few-toothed: peduncles elongate: racemes not congested: sepals becoming 3–5 mm. long, broad: petals spatulate, 3–5 mm. long: ovary pubescent: pod linear-elliptic, 8–15 mm. long.—Fields and cliffs, various provinces, Fla. to Tex., Calif., Ill., and Ky.—Spr.

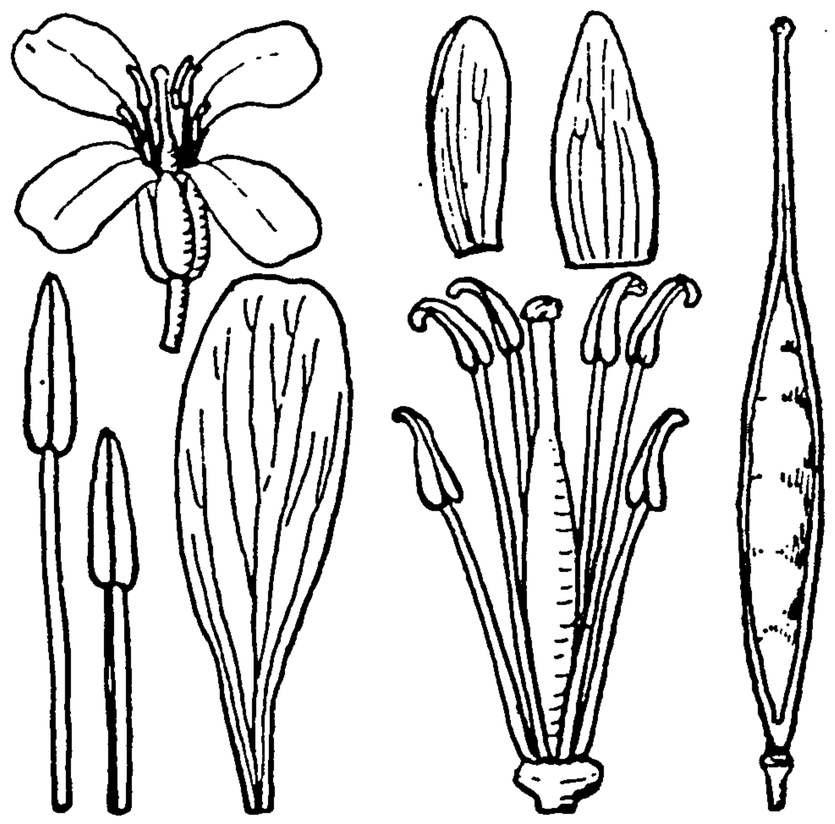
5. **D. brachycarpa** Nutt. Plant 4–20 cm. tall, strigillose, caulescent: leaves 5–15 mm. long; blades ovate to elliptic or elliptic-lanceolate, or rarely obovate at the base of the plant, entire or nearly so: raceme elongate: sepals becoming 1–1.5 mm. long, glabrous: petals 1.5–2.5 mm. long, with oval rounded blades, or wanting: ovary glabrous: pod elliptic, 2–3 mm. long.—Dry soil, various provinces rarely Coastal Plain, N Fla. to Tex., Mo., and Va.—Spr.

6. **D. ramosissima** Desv. Plant 10–40 cm. tall, caulescent, stellate-pubescent all over: leaves 10–45 mm. long: blades spatulate at the base of the stem; elliptic to elliptic-lanceolate above, with remote spreading teeth; racemes corymbosely disposed: sepals becoming 2.5–3 mm. long: petals 6–8 mm. long, spatulate: ovary pubescent: pod narrowly elliptic, 5–12 mm. long, long-beaked.—Cliffs and rocky banks, often calcareous, Blue Ridge and Appalachian provinces, N. C. to Tenn., W. Va. and Va.

25. DENTARIA [Tourn.] L. Perennial scapose herbs with horizontal rootstocks. Leaves basal: blades palmately cleft or divided. Scapes simple, each bearing 2 or 3 bracts with blades similar to the basal leaves. Sepals 4, much shorter than the petals. Petals 4, white or purple, relatively large. Stamens 6; anthers elliptic to lanceolate. Style slender. Pod elongate.—About 15 species, natives of the Northern Hemisphere.—Spr.—CRINKLE-ROOTS. TOOTHWORTS. PEPPERWORTS.

Blades of leaves and bracts similar.
  Leaf-segments linear.
    Leaf-segments 1–2-parted. 1. *D. multifida.*
    Leaf-segments entire, toothed or merely incised. 2. *D. furcata.*
  Leaf-segments not linear.
    Rootstock tuberous, moniliform, not scaly: leaf-segments laciniate. 3. *D. laciniata.*
    Rootstock elongate, continuous, scaly: leaf-segments toothed or incised.
      Leaf-segments incised, with narrow, very acute, often flaring teeth. 4. *D. incisa.*
      Leaf-segments not incised, with broad, blunt or merely mucronate teeth. 5. *D. diphylla.*
Blades of leaves and bracts very dissimilar. 6. *D. heterophylla.*

1. D. multifida Muhl. Rootstock continuous: scape 2–3 dm. tall: bracts 2; segments with linear, entire or sparingly toothed blades: sepals broad, 5–6 mm. long: petals 12–14 mm. long: pod 3–3.5 cm. long.—Rich woods, Appalachian provinces, Ga. to Ala. and Ohio.



2. D. furcata Small. Rootstock moniliform: scape 2–3 dm. tall: bracts 3: segments with linear, entire, toothed, or incised blades: sepals narrow, 5–6 mm. long: petals 12–17 mm. long: pod 2.5–3 cm. long.—Rich woods, Appalachian provinces, Ala. to Ohio.

3. D. laciniata Muhl. Rootstock jointed: scape 1–3.5 dm. tall: bracts 3; segments with linear-lanceolate or elliptic coarsely serrate or incised blades: sepals narrow, 5–6 mm. long: petals oblong-spatulate, 12–15 mm. long: pod 3–5 cm. long, slender-beaked.—(PEPPER-ROOT.)—Moist banks and rich woods, various provinces, M Fla. to La., Minn., and Que.

4. D. incisa Small. Rootstock continuous: scape 2–3 dm. tall: bracts 3; segments with ovate or lanceolate conspicuously incised blades, the teeth narrow, more or less flaring: sepals narrow, 5.5–7 mm. long: petals broadly spatulate, 10–13 mm. long: pod not seen.—Moist rich woods, Lookout Mt., Tenn.

5. D. diphylla Michx. Rootstock continuous: scape 1–3 dm. tall: bracts 2; segments with ovate or lanceolate cuneate serrate blades: sepals narrow, 5–7 mm. long: petals broad, 12–14 mm. long: pod 2.5–4 mm. long.—(CRINKLE-ROOT.)—Woods, various provinces, S. C. to Ky., Minn., and N. S.

6. D. heterophylla Nutt. Rootstock continuous: scape 2–3 dm. tall: bracts usually 2; segments with ovate or obovate coarsely crenate or lobed blades: sepals 5–7 mm. long: petals narrow, 14–17 mm. long: pod 2.5–3.5 cm. long.—Rich woods, various provinces N of Coastal Plain, Ga. to Tenn., Pa., and N. J.

26. CARDAMINE [Tourn.] L. Annual or perennial herbs with erect or creeping stems. Leaves alternate: blades entire to pinnately dissected. Sepals 4, much shorter than the petals. Petals 4, white, pink, or purple. Style very short. Pod elongate.—About 125 species, natives of temperate regions.—BITTER-CRESSES. BOG-CRESSES.

Plants perennial: leaf-blades entire or pinnatifid, with 3 segments or with 3–7 segments in *C. curvisiliqua.*
  Plant with an erect, simple stem from a tuberous-thickened base: leaf-blades entire or merely undulate. I. BULBOSAE.

Plant with elongate rootstocks or rootstocks and creeping stems: leaf-blades simple, with 3 segments or 3–7 segments.
Stem weak, diffuse or prostrate and more or less creeping, with flowering branches or stolons from the upper leaf-axils. II. ROTUNDIFOLIAE.
Stem stiffly erect, not creeping, typically simple, not stoloniferous. III. CLEMATITES.
Plants annual or biennial: leaf-blades with several to many segments. IV. PARVIFLORAE.

I. BULBOSAE

Plant with long-petioled basal leaves, and sessile cauline leaves. 1. *C. bulbosa.*

II. ROTUNDIFOLIAE

Cauline leaves simple: pod slender-beaked. 2. *C. rotundifolia.*
Cauline leaves pinnatifid: pod stout-beaked. 3. *C. curvisiliqua.*

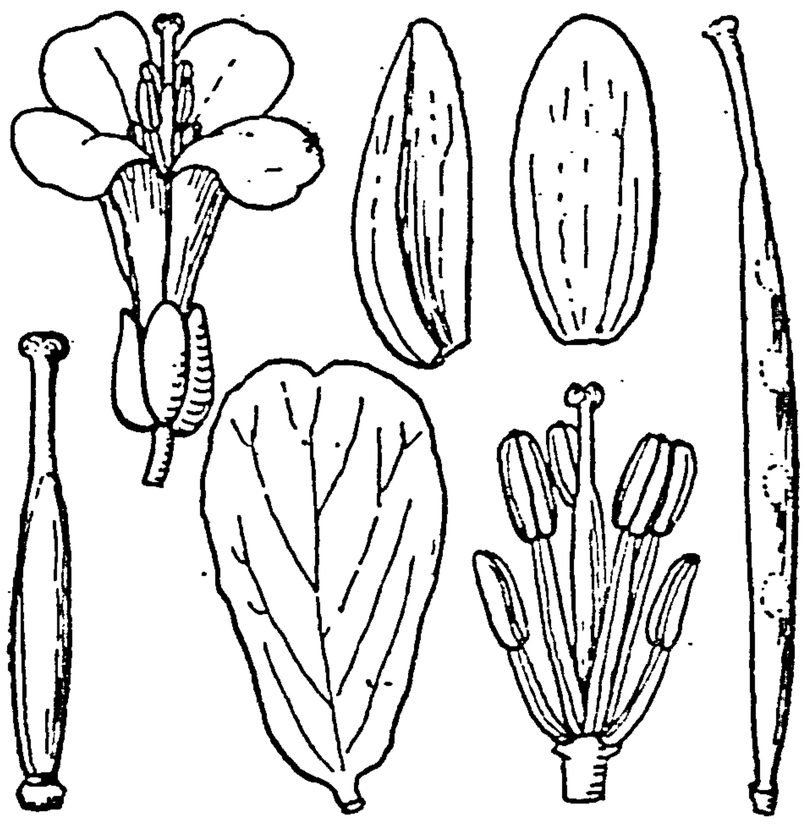
III. CLEMATITES

Leaf-blades or leaflets shallowly 3- or 5-lobed: style columnar. 4. *C. Clematitis.*
Leaf-blades or leaflets coarsely crenate or crenate-lobed: style subulate.
Flowers large; petals 7–9 mm. long, long-clawed. 5. *C. flagellifera.*
Flowers small; petals 4–5 mm. long, almost clawless. 6. *C. Hugeri.*

IV. PARVIFLORAE

Pod short, mostly 1–1.5 cm. long.
Lower leaves with few broad slender-stalked segments. 7. *C. debilis.*
Lower leaves with several narrow segments which are more or less narrowed at the base. 8. *C. parviflora.*
Pod elongate, mostly 2–3 cm. long.
Stamens 6: flowering stems leafy, often conspicuously so.
Lower leaves with several to many narrow segments. 9. *C. arenicola.*
Lower leaves with few broad segments. 10. *C. pennsylvanica.*
Stamens 4: flowering stems leafless or sparingly leafy, but scape-like. 11. *C. hirsuta.*

1. C. bulbosa (Schreb.) B. S. P. Plant 1–5 dm. tall, with tuber-like bases: cauline-leaves 3–8 cm. long; blades oval, elliptic, ovate, or lanceolate: sepals becoming 3–3.5 mm. long: petals broadly cuneate, 7–12 mm. long: pod mostly 2–2.5 cm. long. [*C. rhomboidea* DC.]—(SPRINGCRESS.)—Swamps and low woods, various provinces, N Fla. to Tex., Minn., and N. S. —Spr.



2. C. rotundifolia Michx. Plant 1–4 dm. long, cauline leaves 1–4.5 cm. long; blades ovate, oval, or suborbicular, entire, undulate, or angled, sometimes lobed: sepals becoming about 3 mm. long: petals 8–10 mm. long, the claws broad: pod mostly 1.5–2 cm. long, straight.—(MOUNTAIN-WATERCRESS.)—Springy places, Blue Ridge and Appalachian provinces, N. C. to Ky., Ohio, and N. J. —Spr.–sum.

3. C. curvisiliqua Shuttlw. Plant 3–8 dm. long, cauline leaves 3–9 cm. long; blades mostly pinnately parted, with 3–7 suborbicular, oval, or obovate undulate segments: sepals becoming 2–2.5 mm. long: petals 4–5 mm. long, spatulate, the claws slender: pod 1.5–2 cm. long, curved.—(COASTAL WATERCRESS.)—Springs and streams, Fla.—Spr.–fall.

4. C. Clematitis Shuttlw. Plant stiffly erect, 1–3 dm. tall, from a slender horizontal rootstock: cauline leaves 3–8 cm. long; blades or the 3 divisions

irregularly 3–5-lobed: sepals becoming 3.5–4 mm. long: petals 6–7 mm. long, pandurate, the claws very broad: pod 2.5–4 cm. long.—Wet mt. peaks, Blue Ridge and Appalachian provinces, Ala. to Tenn. and Va.—Spr.–sum.—Usually growing at about 6,000 feet alt. in the Blue Ridge.

5. C. flagellifera O. E. Schulz. Plant erect, 1–3 dm. tall, from a stoutish horizontal rootstock: cauline leaves 7–16 cm. long; blades pinnately parted, with 3–5 ovate, orbicular, or reniform coarsely crenate or crenate-lobed divisions, the teeth or lobes mucronate: sepals becoming 4–4.5 mm. long: petals 7–9 mm. long, spatulate, pandurate: filaments much flattened: pod not seen.—Mt. slopes, Blue Ridge, N. C.—Spr.—Usually at 3,000–4,000 feet alt.

6. C. Hugeri Small. Plant similar to *C. flagellifera* in habit, but usually more slender and with the lobes or teeth of the leaf-divisions less prominently mucronate: sepals becoming 2–2.5 mm. long: petals 4–5 mm. long, pandurate: filaments scarcely flattened: pod not seen.—Mt. woods, Blue Ridge, Ga. and S. C.—Spr.—Usually at 1,500–2,000 feet alt.

7. C. debilis D. Don. Plant with ascending or spreading stems 1–4 dm. long: cauline leaves 1–7 cm. long; blades pinnately divided, the few lateral segments wide, broadened upward, often lobed: sepals becoming about 1 mm. long: petals nearly twice as long as the sepals: pod 1–1.5 cm. long.—Hammocks and cult. places, Fla.—(*Asia.*)—Spr.–sum. or all year S.

8. C. parviflora L. Plant with slender stems 0.5–3 dm. tall: cauline leaves 1.5–6 cm. long; blades pinnately divided, the several lateral segments narrow, but broadened upward: sepals becoming 1–1.5 mm. long: petals slightly longer than the sepals: pod 1–1.5 cm. long.—Dry banks, roadsides and waste places, Coastal Plain, Fla. to Me. Nat. of Eurasia.—Spr.

9. C. arenicola Britton. Plant 1–3 dm. tall: cauline leaves 1–4 cm. long; blades pinnately divided, the lateral segments linear or linear-elliptic, mainly entire: sepals becoming about 1 mm. long: petals about twice as long as the sepals, mostly cuneate: pod linear, 2–2.5 cm. long.—Spring-runs, moist sandy soil, prairies, rock ledges, and woods, various provinces, Fla. to Tex., Mo., and Conn.—Spr.—Appears to be the American counterpart of *C. parviflora.*

10. C. pennsylvanica Muhl. Plant 2–10 dm. tall, glabrous or nearly so: cauline leaves 4–8 cm. long; blades pinnately divided, the lateral segments very broad or narrow, undulate, toothed, or lobed: sepals becoming about 2 mm. long: petals somewhat longer than the sepals, mostly spatulate: pod linear-filiform, 2–2.5 cm. long.—Wet places and meadows, various provinces, Fla. to Ark., Minn., and Newf.—Spr.

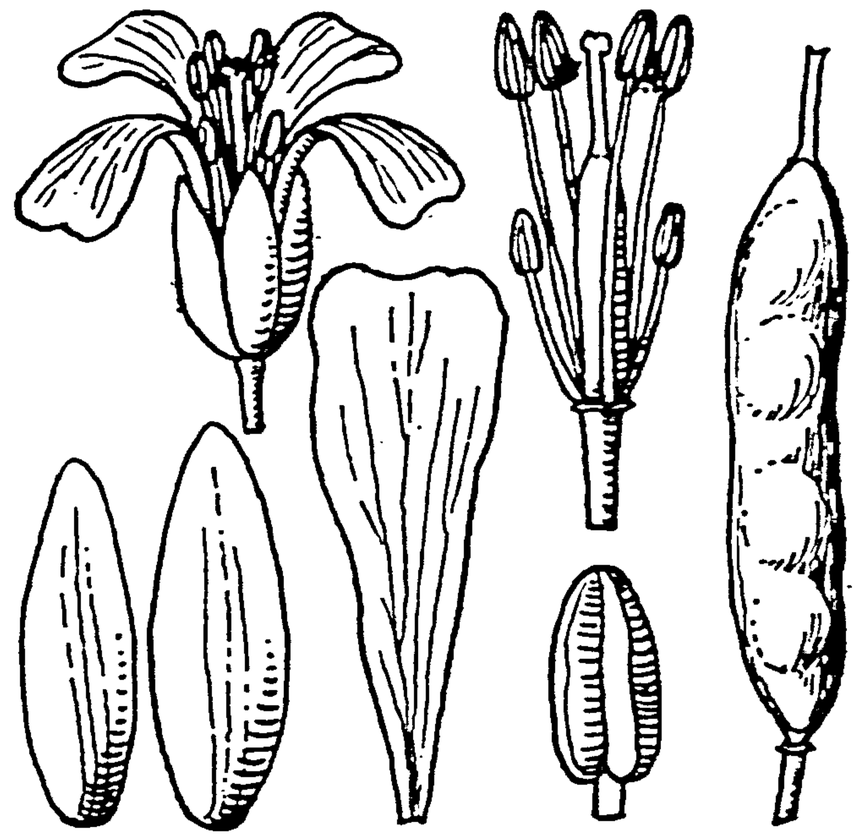
11. C. hirsuta L. Plant 0.5–2.5 dm. tall, pubescent: cauline leaves few or wanting: sepals becoming 1.5–2 mm. long: petals about twice as long as the sepals: pod narrowly linear, 2–2.5 cm. long.—Moist places and waste grounds, various provinces, Ga. to Mich. and Wash.—(*Eurasia.*)—Spr.

27. **LEAVENWORTHIA** Torr. Annual or biennial herbs with tufted scapes or scape-like stems. Leaf-blades lyrate-pinnatifid. Sepals 4, erect. Petals 4, white, yellowish, or purple, cuneate. Stamens 6: anthers ellipsoid to ovoid. Style columnar. Pod elongate, sometimes constricted between the seeds.—Four species.—Spr.

Pod broadly linear or elliptic, not torulose.
  Pod with a very short stout or slender beak, 4–8-seeded, linear.
    Pod with a short slender beak: leaves with a few relatively large blunt-lobed segments. 1. *L. aurea.*

Pod with a very short stout beak: leaves with many small sharp-toothed or angulate segments. 2. *L. uniflora.*
Pod with a long slender beak, 1–3-seeded, elliptic or linear-elliptic. 3. *L. stylosa.*
Pod narrowly linear, torulose. 4. *L. torulosa.*

1. L. aurea Torr. Leaf-blades with few blunt-lobed segments: pedicels becoming 3–11 cm. long: sepals 3–3.5 mm. long: petals 5–7 mm. long, white or purplish, except the yellow base: pod linear, 2–2.5 cm. long: seed with a straight radicle.—Rocks, often calcareous, various provinces N of Coastal Plain, Ala. to Tex., Ark., and Tenn.



2. L. uniflora (Michx.) Britton. Leaf-blades with many unequal toothed or angular segments: pedicels becoming 7–15 cm. long: sepals 3.5–4 mm. long: petals 5–7 mm. long, white with a yellow claw or purplish: pod linear-elliptic, 2.5–4 mm. long: seed with an oblique radicle. [*L. Michauxii* Torr.]—Dry soil or wet rocks, often calcareous, various provinces N of Coastal Plain, Ala. to Ark., Mo., and Ind.

3. L. stylosa A. Gray. Leaf-blades with 3–7 entire or angled segments: pedicels becoming 3–15 cm. long: petals yellow: pod elliptic, 12 mm. long.—Cedar glades, on limestone rocks, Interior Low Plateaus, Tenn.

4. L. torulosa A. Gray. Leaf-blades with entire angled or lobed segments: pedicels becoming 9–20 cm. long: petals purplish with a yellow base: pod narrowly linear, 2–5.5 cm. long.—Moist Cedar glades, Interior Low Plateaus, N Ala., Tenn., and Ky.

28. ARABIS L. Annual or perennial herbs. Leaf-blades entire, toothed, or pinnatifid. Sepals 4, erect, broad or narrow. Petals 4, white, pink, purple, or yellowish, as long as the sepals or much longer. Stamens 6: anthers ovoid to ellipsoid or sagittate. Style very short or obsolete. Pod elongate.—About 120 species, natives of the Northern Hemisphere.—Spr.–sum.—ROCK-CRESSES. SPIKED-CRESSES.

Seed winged, sometimes only so at the apex.
Pods erect, ascending, or spreading, straight. I. VIRGINICAE.
Pods recurved, nodding, or drooping, curved. II. LAEVIGATAE.
Seed wingless. III. LYRATAE.

I. VIRGINICAE

Low plants, ultimately much-branched at the base and diffuse: lower leaves with deeply pinnatifid blades. 1. *A. virginica.*
Taller plants, simple or sparingly branched at the base, erect or nearly so: lower leaves with merely toothed blades.
Stem and leaves conspicuously pubescent: pod spreading: sepals becoming 5–6 mm. long: petals broadly spatulate. 2. *A. patens.*
Stem and leaves inconspicuously pubescent: pod erect: sepals becoming 2.5–4 mm. long: petals narrowly spatulate.
Petals fully twice as long as the sepals: anthers sagittate: pod 4.5 cm. long or more: style 1 mm. long. 3. *A. georgiana.*
Petals less than twice as long as the sepals: anthers ovoid: pod 4 cm. long or less: style obsolete. 4. *A. ovata.*

II. LAEVIGATAE

Outer sepals narrow, linear to elliptic-linear: plant glabrous, mostly glaucous: pod 1–2 mm. wide.
Seed suborbicular, broadly winged all around: petals 6–8 mm. long. 5. *A. Burkii.*

Seed oblong, winged at the apex, margined on the sides: petals 4–4.5 mm. long. 6. *A. laevigata.*

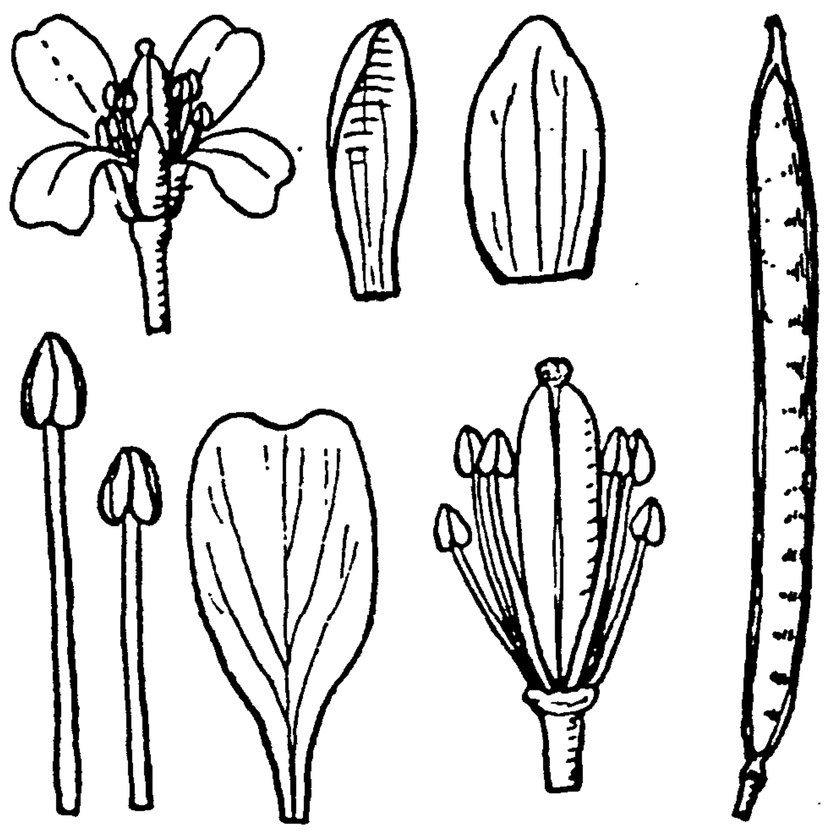
Outer sepals broad, ovate to elliptic-ovate: plant pubescent, at least below: pod 2.5–3.5 mm. wide. 7. *A. canadensis.*

III. Lyratae

Blades of the basal leaves toothed: stem and leaves finely grayish-pubescent: petals slightly longer than the sepals: anthers ovoid: pod finely pubescent. 8. *A. dentata.*

Blades of the basal leaves lyrate-pinnatifid: stem and leaves glabrous or nearly so: petals twice as long as the sepals: anthers sagittate: pod glabrous. 9. *A. lyrata.*

1. A. virginica (L.) Trelease. Stem branched at the base, the branches ascending or decumbent, 1–4 dm. tall, sparingly short-hirsute or nearly glabrous: cauline leaves 2–7 cm. long, glabrous or nearly so; blades deeply pinnatifid, the segments often uniform, linear, spatulate, or elliptic, entire or 1- or 2-toothed: sepals elliptic or ovate-elliptic, becoming 1.5 mm. long: petals white, spatulate, 2.5–3 mm. long: anthers ovoid, apiculate: pod ascending, linear, 2–3 cm. long, less than 2 mm. wide, straight: seed suborbicular, about 1 mm. in diameter, narrowly winged. [*A. ludoviciana* C. A. Meyer]—Sandy or stony soil, woods, prairies, waste places, and cult. grounds, various provinces, Fla. to Tex., Kans., and Pa.—Spr.



2. A. patens Sulliv. Stem simple or branched at the base, 3–7 dm. tall, the branches ascending, closely hirsute: cauline leaves 2–7 cm. long, hirsute; blades ovate, oblong, or lanceolate, coarsely serrate, sessile and clasping: sepals oblong to ovate-elliptic, becoming 5–6 mm. long: petals white, broadly spatulate, 6–10 mm. long: anthers sagittate, apiculate: pod spreading or ascending, very narrowly linear, 2.5–4 cm. long, about 1 mm. wide, straight or slightly curved: seed elliptic, nearly 1.5 mm. long, narrowly winged.—Rocky river-banks, various provinces N of Coastal Plain, Ala. to Mo., Minn., and Pa.—Spr.

3. A. georgiana Harper. Stem 9 dm. tall or less, short-hirsute below, with few erect mostly basal branches: cauline leaves 3–9 cm. long; bright green, sparsely pubescent on the lower surface and margin: blades elliptic-lanceolate to lanceolate or linear-lanceolate, acute or acutish, entire, or remotely and saliently denticulate, sessile and half-clasping: raceme rather lax: sepals elliptic to elliptic-ovate, becoming 3.5–4 mm. long: petals white, oblanceolate, 6–10 mm. long: anthers sagittate, apiculate: style 1 mm. long: pod erect, linear-filiform, 4.5–7 cm. long, about 1 mm. wide: seeds narrowly elliptic, about 1.5 mm. long, narrowly winged.—Shaded river banks, Appalachian Valley, Ga. and Ala.—Spr.

4. A. ovata Michx. Stem 1 m. tall or less, simple or with few erect or ascending branches, short-hirsute or nearly glabrous: cauline leaves erect or ascending, 1–6 cm. long, often pubescent; blades ovate, elliptic, or lanceolate, entire or dentate, sessile, slightly auricled and clasping: sepals elliptic, becoming 2–2.5 mm. long: petals greenish or greenish-white, spatulate, 3–4 mm. long: anthers ovoid, acute: pod erect or nearly so, 2.5–4 cm. long, about 1 mm. wide, straight: seeds broadly oblong, nearly 1.5 mm. long, rather broadly winged. [*A. hirsuta* (Fl. SE. U. S.)]—Stony or sandy soil, various provinces N of Coastal Plain, Ga. to Calif., B. C. and Newf.—Spr.–fall.

5. **A. Burkii** (Porter) Small. Stem nearly 1 m. tall or less, glabrous and sometimes glaucous, simple or with few erect branches: cauline leaves elliptic or elliptic-oblanceolate to lanceolate, or linear-lanceolate, 1.5–6 cm. long, acute or acutish, entire or saliently toothed, sessile and sometimes slightly auricled at the base: raceme compact, at least when young: sepals linear-spatulate to linear-elliptic, becoming 4.5–5.5 mm. long, obtuse: petals white or yellow-tinged, linear-spatulate, 6–8 mm. long: anthers sagittate, acute: pod drooping, narrowly linear, 7–9 mm. long, curved, 2 mm. wide or less: seed suborbicular, 1–1.5 mm. in diameter, broadly winged all around. [*A. laevigata Burkii* Porter]—Dry hillsides or bluffs, various provinces N of Coastal Plain, N. C. to Mo. and Vt.—Spr.

6. **A. laevigata** (Muhl.) Poir. Stem 1 m. tall or less, glaucous, glabrous, with erect or ascending branches: cauline leaves oblanceolate to lanceolate or linear-lanceolate, entire, denticulate, or saliently few-toothed, sessile auriculate, and clasping: raceme strict: sepals linear to linear-elliptic, becoming 3.5–4 mm. long, obtuse: petals white, spatulate, 4–5 mm. long: anthers rounded at the apex: pod drooping, very narrowly linear, 6–11 cm. long, curved, less than 2 mm. wide: seed elliptic, about 2 mm. long, wing-margined on the sides, decidedly winged at the apex.—Woods and rocky soil, various provinces, rarely Coastal Plain, Ga. to Ark., N. D., Ont., and Que.—Spr.

7. **A. canadensis** L. Stem 1 m. tall or less, usually sparingly pubescent, at least below, simple or with few ascending branches: cauline leaves 3–12 cm. long, often sparingly pubescent; blades oblanceolate, elliptic, or lanceolate, thin, entire, sinuate or dentate-serrate, narrowed at the base, sessile: sepals broadly elliptic, becoming about 3.5 mm. long, pubescent: petals greenish-white, oblanceolate, 5–6 mm. long: anthers oblong, obtuse or minutely pointed: pod drooping, narrowly linear, 5–7.5 cm. long, 3–4 mm. wide, curved: seed orbicular-reniform, about 3 mm. in diameter, broadly winged.—(SICKLE-POD.)—Rocky woods, various provinces, rarely Coastal Plain, Ga. to Tex., Minn., and Ont.—Spr.–sum.

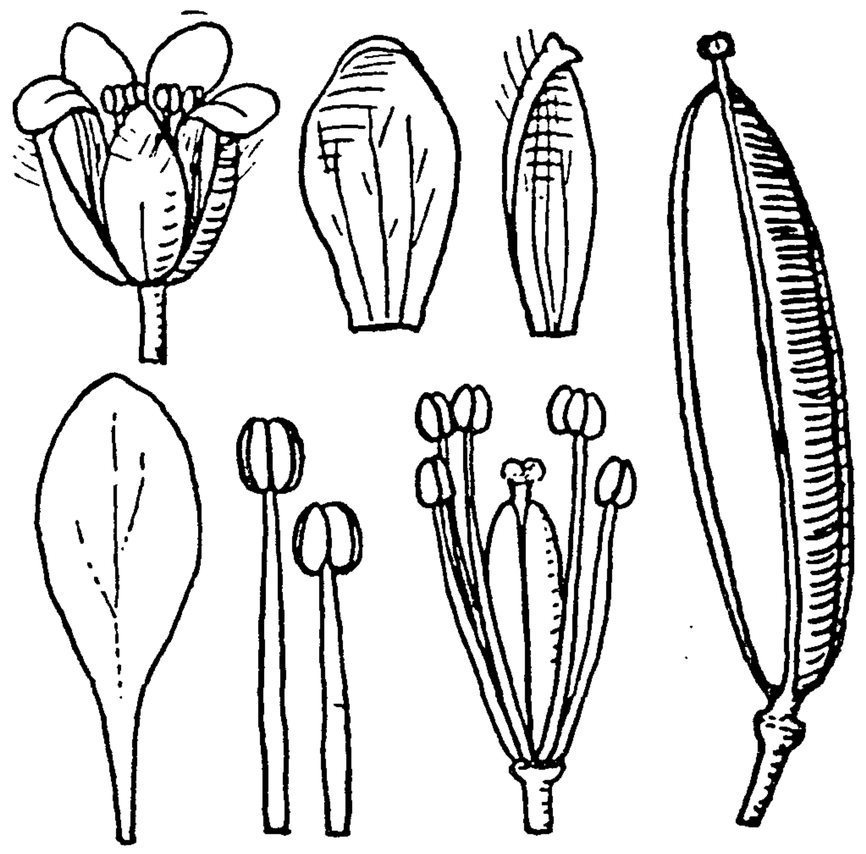
8. **A. dentata** T. & G. Stem 2–6 dm. tall, finely roughish-pubescent, usually branched at the base and often with ascending branches above: cauline leaves 1.5–6 cm. long, pubescent; blades oblanceolate to elliptic-ovate, or elliptic-lanceolate, irregularly dentate, sessile, auricled and clasping: sepals elliptic, becoming 1.5–2 mm. long, often sparingly pubescent: petals whitish, spatulate, 2.5–3 mm. long: anthers ovoid, obtuse or acutish: pod spreading, narrowly linear, 2–3 cm. long, about 1 mm. wide, straight: seed elliptic, fully 1 mm. long, wingless.—Rich woods and river-banks, various provinces N of Coastal Plain, Tenn. to Kans., Minn., and N. Y.—Spr.

9. **A. lyrata** L. Stem usually branched at the base, the branches erect or ascending, 1–4 dm. tall, glabrous or finely hirsute near the base: cauline leaves 1–3 cm. long, glabrous, spatulate to linear, entire or the lower ones individually irregularly toothed: sepals elliptic, becoming 2.5 mm. long, obtuse: petals white, spatulate, 7–9 mm. long: anthers elliptic or ovate-elliptic, abruptly pointed: pod ascending, narrowly linear, 2–3 cm. long, about 1 mm. wide, nearly straight: seed elliptic, less than 1.5 mm. long, wingless.—(DWARF ROCK-CRESS.)—Cliffs, wet rocks, and sandy soil, various provinces, N. C. to Mo., Man., and Ont.—Spr.

29. **SOPHIA** Adans. Annual or perennial herbs or shrubby plants, densely fine-pubescent. Leaf-blades 2-pinnatifid or dissected. Sepals 4, early deciduous. Petals 4, yellow or yellowish, slightly longer than the sepals or shorter. Anthers globular to ovoid. Style very short. Pod elongate.—About 20 species of wide geographic distribution.—FLIXWEEDS. TANSY-MUSTARDS.

Pod narrowly linear, 1.5–2.5 cm. long, 1 mm. wide, curved upward. — 1. *S. Sophia.*
Pod elliptic or linear-elliptic, 5–14 mm. long, 1–2 mm. wide, straight or nearly so.
  Foliage densely canescent: pedicels horizontal: pod ascending. — 2. *S. pinnata.*
  Foliage glabrate or sparingly canescent.
    Pedicel and pod horizontal. — 3. *S. millefolia.*
    Pedicel ascending: pod nearly erect. — 4. *S. intermedia.*

1. S. Sophia (L.) Britton. Stem 3–7.5 dm. tall, hoary-canescent: leaf-blades 2–3-pinnatifid, the segments linear to elliptic-linear: sepals linear to lanceolate, about 1.5 mm. long: petals mainly shorter than the sepals: ovary linear: pod with seeds in 1 row.—(HERB-SOPHIA. FLIXWEED.)—Waste places, various provinces, about S seaports, and from N. Y. to Nebr., Ont., and N. B. Nat. of Eu.



2. S. pinnata (Walt.) Britton. Stem 3.5–7 dm. tall, hoary-canescent: leaf-blades 2–3-pinnatifid, the segments linear to elliptic-linear: sepals linear to lanceolate, about 1.5 mm. long: petals mainly shorter than the sepals: ovary linear: pod with seeds in 1 row. [*Sisymbrium canescens* Nutt.]—Cult. grounds and waste places, various provinces, Fla. to Tex., Tenn., and Va.

3. S. millefolia Rydb. Stem rather taller and less leafy than in *S. pinnata*, and nearly glabrous: leaf-blades 2.5–10 cm. long, less finely dissected than in *S. pinnata*: sepals about 1.5 mm. long: petals about as long as the sepals: ovary narrowly oblong: pod clavate, 7–9 mm. long, the seeds in 2 rows.—Dry soil, Coastal Plain and adj. provinces, Ky. to Tex.

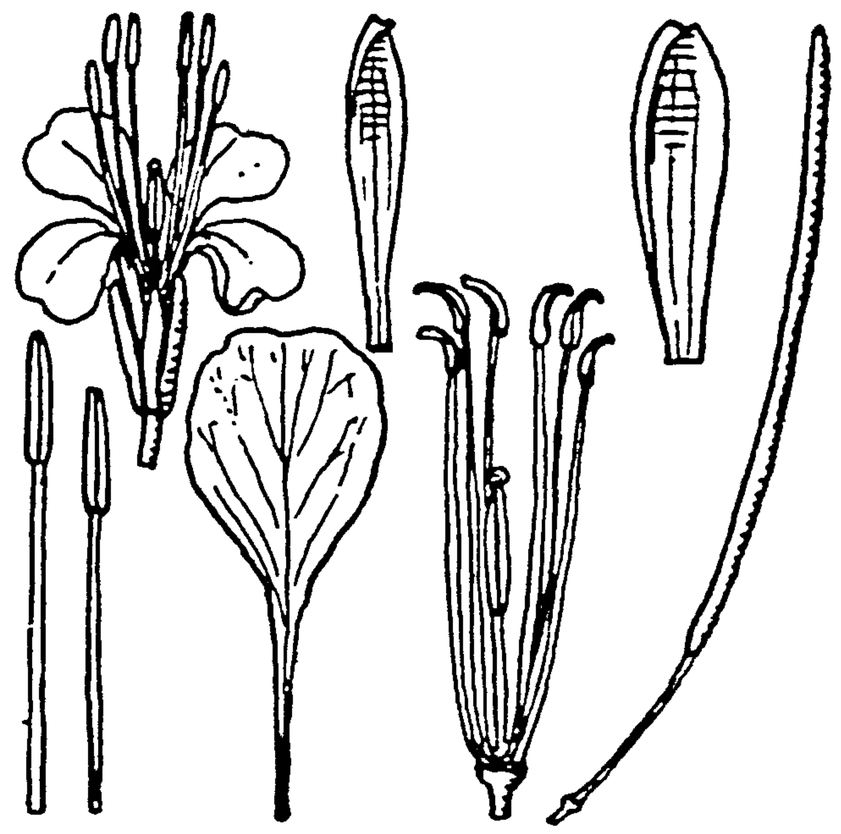
4. S. intermedia Rydb. Stem 2–7 dm. tall, nearly glabrous, or thinly stellate-pubescent and glandular: leaf-blades pinnately-parted or 2-pinnatifid, the segments linear to elliptic: sepals about 1.5 mm. long: petals about as long as the sepals: ovary elliptic: pods linear or elliptic or nearly so, 8–15 mm. long, the seeds in 1 row.—Dry soil, various provinces W of Blue Ridge, Tenn. to Tex., Calif., B. C. and Minn.

30. **WAREA** Nutt. Slender glabrous herbs. Leaf-blades entire. Sepals 4, narrow. Petals 4, white, rose, or purple, each abruptly narrowed into a slender claw. Stamens 6: anthers elliptic to elliptic sagittate. Style wanting. Pod very narrow, thick, long-stipitate.—Following are the only known species.

Leaf-blades cuneately narrowed at the base: claw of the petal pectinate fimbriate.
  Stipe of the pod longer than the pedicel: petal-blade obovate or cuneate. — 1. *W. cuneifolia.*
  Stipe of the pod shorter than the pedicel: petal-blade suborbicular. — 2. *W. Carteri.*
Leaf-blades rounded or auricled at the base.
  Leaf-blades not auricled at the base: petal-claw granular-toothed. — 3. *W. sessilifolia.*
  Leaf-blades auricled at the base: petal-claw erose-toothed. — 4. *W. amplexifolia.*

1. W. cuneifolia (Muhl.) Nutt. Plant 3–12 dm. tall: leaf-blades cuneate to oblanceolate or linear-cuneate, 1–2.5 cm. long: sepals about 5 mm. long: petals pinkish-purple or bluish, 5.5–6.5 mm. long, the claw minutely toothed: pedicels becoming 4–6 mm. long: pod-body 3–4 cm. long.—Sandhills, Coastal Plain, Fla. to Ala. and S. C.—Spr.–sum.

2. W. Carteri Small. Plant 4–15 dm. tall: leaf-blades linear or sometimes cuneate on the lower part of the stem, 1.5–3.5 cm. long: sepals 4.5–5.5 mm. long: petals white or nearly so, 5–6 mm. long, the claw prominently densely glandular-pubescent: pedicels becoming 9–12 mm. long: pod-body 5–6 cm. long.—Pinelands, scrub, and sandhills, S pen. Fla.—All year.



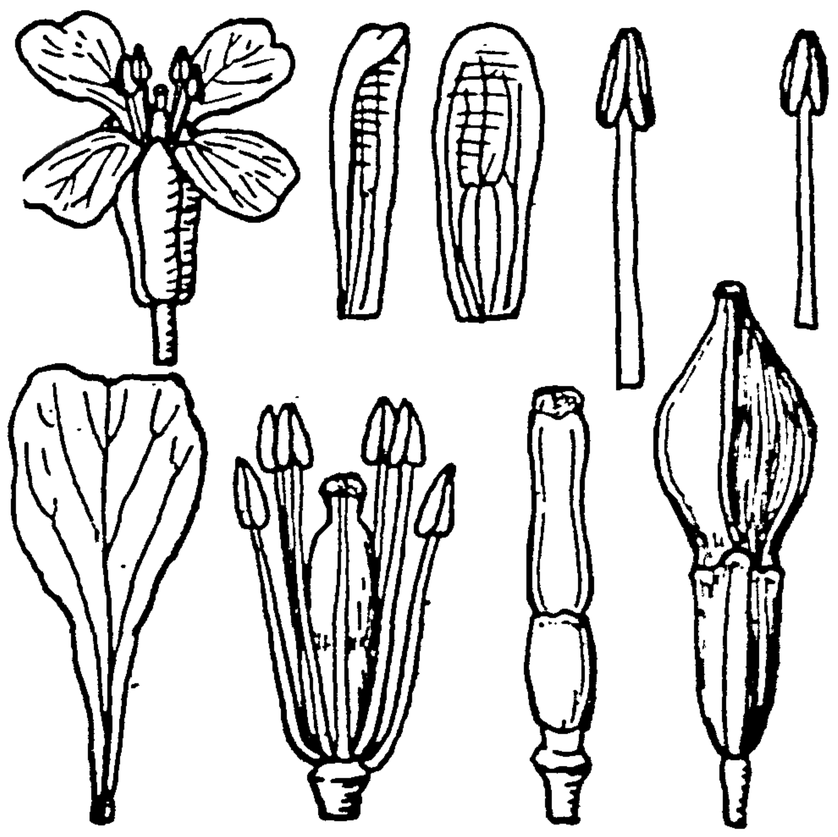
3. W. sessilifolia Nash. Plant 3–6 dm. tall: leaf-blades ovate to ovate-lanceolate, 1–2 cm. long, sessile: sepals 6.5–7.5 mm. long: petals pink, 5–6 mm. long, the blade suborbicular, the claw minutely granular-toothed: pedicels becoming 10–11 mm. long: ovary ⅓–¼ as long as the stipe: pod-body 3–4 cm. long.—Sandhills, dunes, and pinelands, M Fla.—Spr.–sum.

4. W. amplexifolia (Nutt.) Small. Plant 3–7 dm. tall: leaf-blades lanceolate to elliptic-lanceolate or ovate, 1–3 cm. long, clasping: sepals 6–6.5 mm. long: petals white, fading purple, 8–9 mm. long, the blade orbicular-reniform, the claw erose-toothed: pedicels becoming 10–12 mm. long: ovary ½ as long as the stipe: pod 3–4 cm. long.—Dry pinelands and sandhills, E Fla.—Spr.–sum.

31. CAKILE [Tourn.] Ludwig. Chiefly maritime fleshy herbs. Leaf-blades entire to pinnatifid. Sepals 4, succulent. Petals 4, white, pink, or purple. Stamens 5: anthers ovoid. Style very short: stigma depressed. Pod of two dissimilar portions.—About 10 species, natives of North America and Europe.—Spr.–fall, or all year southward.—SEA-ROCKETS.

Lower joint of the pod 2-seeded.	1. *C. fusiformis.*
Lower joint of the pod 1-seeded.	
Upper joint of the pod slender, about as thick as the lower.	2. *C. americana.*
Upper joint of the pod swollen, much thicker than the lower.	
Pod without lateral projections at the node, the upper joint not constricted.	
Pod with a 4-ridged upper joint.	3. *C. edentula.*
Pod with a 6–10-ridged upper joint.	
Facial ridges of the upper joint 8, sharp.	4. *C. Harperi.*
Facial ridges of the upper joint 6 or 10, rounded.	
Upper joint 6-ridged.	5. *C. Chapmanii.*
Upper joint 10-ridged.	6. *C. lanceolata.*
Pod with 2 lateral projections at the node, the upper joint much constricted.	7. *C. Cakile.*

1. C. fusiformis Greene. Plant diffuse, rather stout: leaves 5–15 cm. long; blades laciniate-pinnatifid, the segments linear: sepals becoming 4.5–5 mm. long: petals 7–8 mm. long: pod 1.5–2.5 cm. long; the upper joint subulate to lanceolate-subulate.—Sandy shores and sand-dunes, pen. Fla. and the Keys to Miss.



2. C. americana Nutt. Plant erect or spreading: leaves 2.5–7 cm. long; blades oblanceolate to spatulate, toothed near the apex, or sometimes slightly incised: sepals becoming 3–4 mm. long: petals 6–7 mm. long: pod 1.5–2 cm. long, the upper joint fusiform.—Beaches, S. C. ? to Conn.; also Great Lake Region.

3. C. edentula (Bigel.) Hook. Plant erect or decumbent: leaves 2–16 cm. long; blades oblanceolate to elliptic-lanceolate or rarely ovate, coarsely toothed or lobed: sepals becoming 3–3.5 mm. long: petals 4.5–6.5 mm. long: pod 1.5–2 cm. long, the upper ovoid or ellipsoid-ovoid.—Beach sands, Fla. to Lab.

4. C. Harperi Small. Similar to *C. edentula* in habit: leaves 3–11 cm. long; blades spatulate to oblanceolate, crenate or incised-crenate: sepals becoming 3–3.5 mm. long: petals 4–5 mm. long: pod 2–2.5 cm. long, the upper joint ellipsoid-conic.—Sandy beaches, Coastal Plain, Fla. to La. and S. C.

5. C. Chapmanii Millsp. Plant spreading or prostrate: leaves 2–10 cm. long; blades oblanceolate to elliptic, undulate to coarsely toothed: sepals becoming 3.5–4 mm. long: petals 6–7 mm. long: pod 1.5–2 cm. long, the upper joint fusiform-lanceolate.—(BEACH-SAP.)—Drifting sand, Coastal Plain, Fla. to Miss.

6. C. lanceolata (Willd.) O. E. Schulz. Plant spreading or procumbent: leaves 3–9 cm. long; blades oblanceolate to broadly linear or lanceolate, 3–8 cm. long, entire, or dentate, or the lower pinnatifid: sepals becoming 3.5–4 mm. long: petals 4–7 mm. long: pod 1.7–2 cm. long, the upper joint conic or ovoid-conic.—Coastal sand-dunes and shores, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)

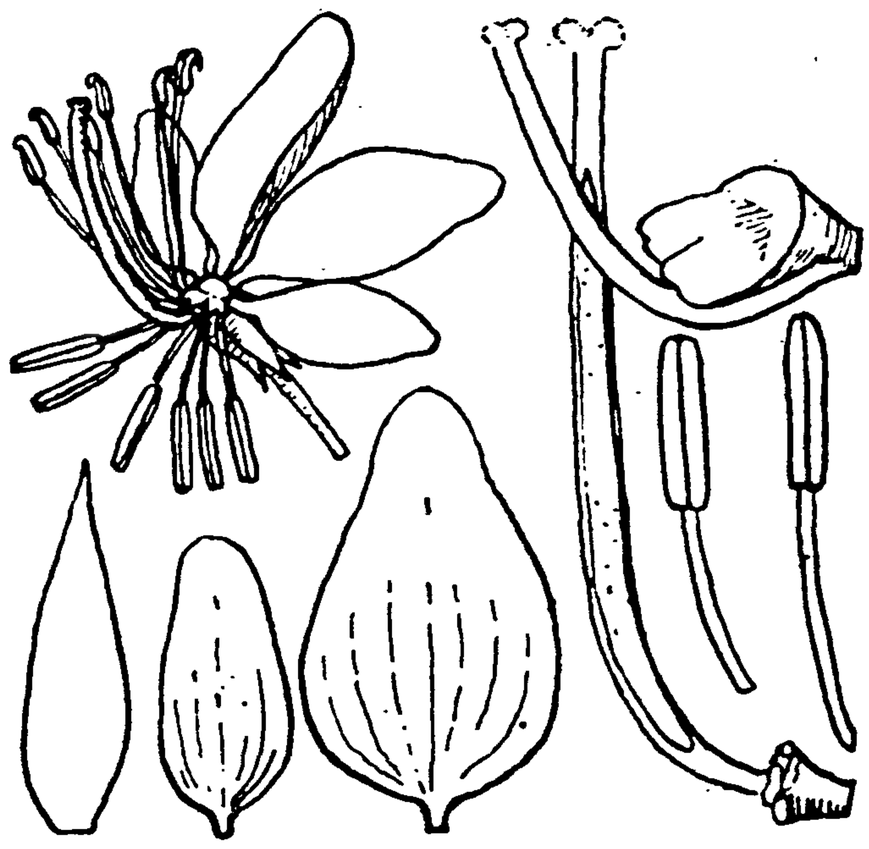
7. C. Cakile (L.) Karst. Plant spreading: leaves 4–11 cm. long; blades pinnatifid, the segments linear: sepals becoming 4–11 mm. long: petals 6–8 mm. long: pod about 2 cm. long, the upper joint mitre-like.—About seaports, Fla. to Ala., and N. J. Nat. of Eu.

FAMILY 4. CAPPARIDACEAE—CAPER FAMILY

Herbs, shrubs, trees, or vines. Leaves alternate or rarely opposite. Flowers perfect, in racemes or cymes, or solitary. Calyx of 4 or 5 sepals. Corolla of 4 or 5, often unequal, petals. Androecium of 4–6 stamens or more. Gynoecium of 2 united carpels. Fruit capsular, baccate. Seeds conduplicate.—About 35 genera and 450 species, widely distributed.

Herbs or herbaceous plants: fruit a 2-valved capsule.	
Receptacle neither elevated nor elongate, with or without an appendage.	
Appendage present: filaments distinct.	
Petals very unequal, barely clawed: capsule with deciduous valves.	1. ALDENELLA.
Petals nearly equal, long-clawed: capsule opening near the apex.	2. POLANISIA.
Appendage wanting: filaments united below.	3. CLEOME.
Receptacle elevated or elongate.	4. NEOCLEOME.
Shrubs or trees: fruit baccate, or a pulpy capsule, sometimes opening irregularly.	5. CAPPARIS.

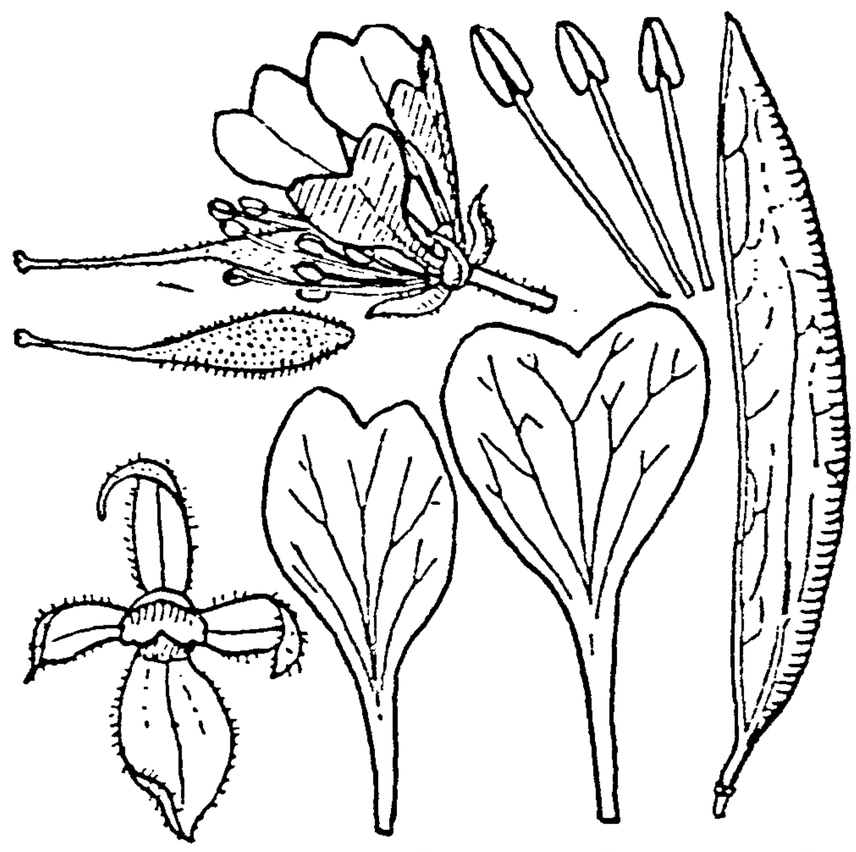
1. ALDENELLA Greene. Herbs. Leaf-blades 3-foliolate, except some of the upper ones, the leaflets very narrow. Sepals 4, reflexed. Petals 4, unequal, the posterior pair before a solid gland, barely clawed. Stamens 9–12: anthers linear, curved. Ovary short. Style slender. Capsule narrowly linear. One species.



1. A. tenuifolia (T. & G.) Greene. Stem 2–8 dm. tall: leaflets 1–4 cm. long; blades narrowly linear or filiform-linear: sepals 2–2.5 mm. long: petals white, the larger ones 6–8 mm. long; blades oval or ovate, entire: capsule 4–6 cm. long. [*Polanisia tenuifolia* T. & G.]—Scrub, dry pinelands, and sand hills, Coastal Plain, Fla. to Miss.

and Ga.—Spr.–fall.—There is much variation in the size of the flower, and in the sepals. One pair of sepals may be ovate and the other lanceolate. Sometimes all are ovate or ovate-lanceolate.

2. **POLANISIA** Raf. Herbs. Leaf-blades simple or 3-foliolate. Sepals 4, spreading. Petals 4, white or pink, somewhat unequal, long-clawed, the posterior pair before a short gland. Stamens 12–32: anthers oval to ovoid. Ovary sessile or nearly so: style slender. Capsule linear or linear-oblong.—About 30 species, natives of temperate and tropical regions.

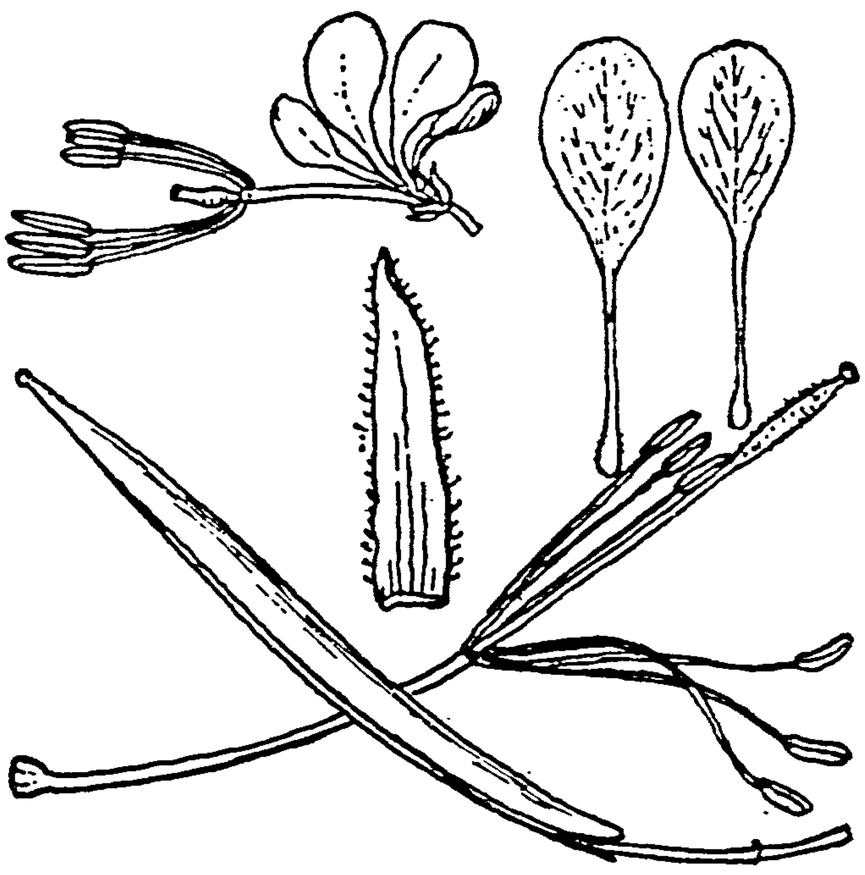


1. **P. graveolens** Raf. Plant 1–8 dm. tall: leaflets 1.5–3.5 cm. long; blades elliptic or obovate: lower bracts 3-foliolate: sepals elliptic to lanceolate, about 3 mm. long: petals 4–5 mm. long: blades obovate-cuneate: capsule linear-elliptic, 3–5 cm. long.—(CLAMMY-WEED. SPIDER-ROSE. WORM-WEED.)—Fields, roadsides, and river-shores, various provinces, Tenn. to Kans., Man., Que., and Md.—Sum. **P. trachysperma** T. & G. with flowers about twice the size of those of *P. graveolens* and elongate stamens, has been collected near Dadeville, Ala.

3. **CLEOME** L. Herbs. Leaf-blades 3–7 foliolate. Sepals 4, spreading. Petals 4, white or pink, nearly equal, long-clawed. Gland wanting. Stamens 6, borne on the gynophore; anthers elliptic. Ovary long-stipitate: style almost wanting. Capsule linear. [*Gynandropsis* DC.]—About 12 species, natives of tropical regions.—Sum.–fall or all year S.—SPIDER FLOWERS.

Bracts 3-foliolate: sepals glandular: petals 1-1.5 cm. long: stipe of the capsule shorter than the gynophore. 1. *C. gynandra.*
Bracts simple: sepals glabrous: petals 2.5-3.5 cm. long: stipe of the capsule many times longer than the gynophore. 2. *C. speciosa.*

1. **C. gynandra** L. Stem glandular-pubescent and with scattered long hairs: leaflets 3–5; blades obovate, oval, elliptic, or ovate, the larger ones 2–8 cm. long, mostly acute or short-acuminate, finely toothed, often obscurely so: pedicel glandular: corolla 2–3 cm. in diameter, bright-pink: capsule-body 5–7 cm. long, the stipe 1 cm. long or less: seed 1.5 mm. in diameter, sharply tuberculate. [*Pedicellaria pentaphylla* Schrank.] — (SPIDER-WISP.) — Cult. grounds, waste-places, and roadsides, Coastal Plain, Fla. to La. and Ga. Nat. of the Old World.—(*W. I., Mex., C. A., S. A.*)

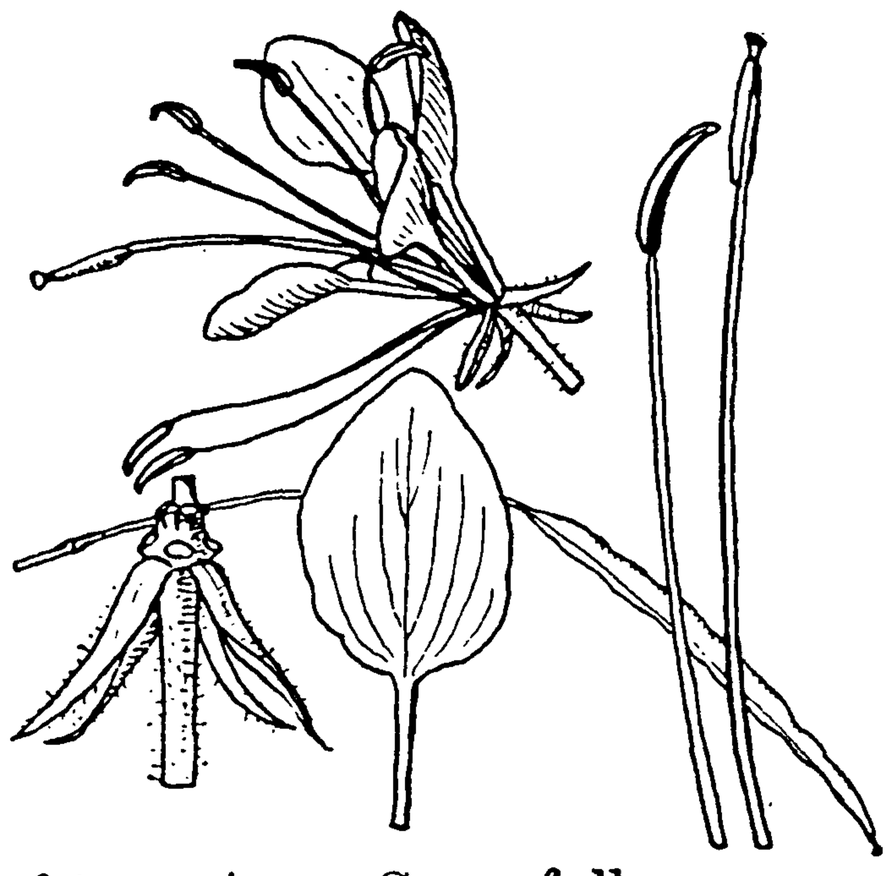


2. **C. speciosa** H. B. K. Stem glabrous or sparingly pubescent: leaflets 5–7; blades oblanceolate to narrowly elliptic, the longer ones 7–15 cm. long, often long-acuminate, entire or minutely toothed: pedicels glabrous: corolla 5–7 cm. in diameter, pink: capsule-body 6–10 cm. long, the stipe half as long as the body or more: seed nearly or quite 3 mm. in diameter, sparingly tuberculate.—Waste-places and cult. grounds, Fla. Nat. of Cont. Trop. Am.

4. **NEOCLEOME** Small. Herbs or somewhat woody plants. Leaf-blades 3–7 foliolate. Sepals 4, spreading. Petals 4, bright-pink, nearly equal, slender-clawed. Receptacle produced into a long gland. Stamens 6, or rarely 4, borne below the gynophore: anthers elliptic. Ovary long-stipitate: style wanting or nearly so. Capsule narrow, the valves linear.—About 70 species, natives, mainly, of tropical regions.—SPIDER-FLOWERS.

Bracts more or less foliaceous: sepals subulate: corolla 4-5 cm. wide: capsule-body as long as the stipe or shorter. 1. *N. spinosa.*
Bracts minute or obsolete: sepals elliptic to lanceolate-elliptic: corolla about 2 cm. wide: capsule-body many times longer than the very short stipe. 2. *N. serrata.*

1. N. spinosa (L.) Small. Stem glandular: leaflets 5–7; blades pubescent, the terminal one elliptic to elliptic-lanceolate, 3–10 cm. long, entire: flowers numerous, the buds clavate: sepals 5–7 mm. long: petals 2.5–3 cm. long: capsule-body 5–8 cm. long, the stipe filiform: seed about 2 mm. in diameter, tuberculate. [*Cleome spinosa* Jacq. *C. pungens* Willd.]—Waste places, cult. grounds, and roadsides, various provinces, Fla. to Tex., Mo., and N. Y. Nat. of trop. Am.—(*O. W.*)—Apr.–fall, or all year S.

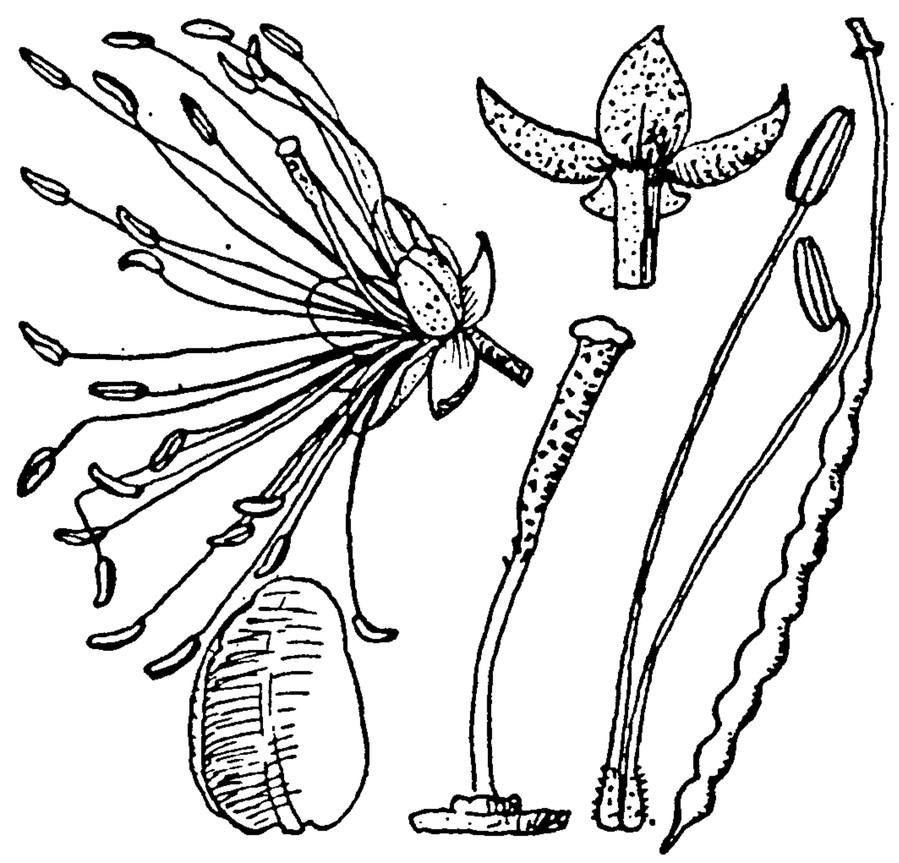


2. N. serrata (Jacq.) Small. Stem glabrous: leaflets 3; blades glabrous, the terminal one ovate-lanceolate, 4–14 cm. long, shallowly toothed: flowers few, sepals 2–3 mm. long: petals 1 cm. long or less: capsule-body 4–7 cm. long, the stipe very short: seed about 1.5 mm. in diameter, smooth. [*Cleome serrata* Jacq.]—Collected many years ago in Ga. Nat. of trop. Am.—Sum.–fall.

5. **CAPPARIS** [Tourn.] L. Shrubs, trees, or vines. Leaf-blades simple, entire. Sepals 4 or 5, often spreading or reflexed. Petals 4 or 5, sessile, white. Receptacle unappendaged. Stamens numerous: anthers elliptic to linear. Ovary long-stipitate: style wanting. Capsule sometimes baccate, often torulose.—About 150 species, natives of tropical and subtropical regions.—Spr.

Leaves glabrous; blades reticulate: capsule glabrous. 1. *C. flexuosa.*
Leaves scaly; blades not reticulate: capsule scaly. 2. *C. cynophallophora.*

1. C. flexuosa L. Shrub or small tree: leaf-blades elliptic to elliptic cuneate, mainly 5–8 cm. long: sepals suborbicular: corolla 5.5–7.5 cm. wide: fruit-body mostly 10–20 cm. long. [*C. cynophallophora* L. 1759.]—(BAY-LEAVED CAPER-TREE.)—Coastal hammocks, S pen. Fla. and the Keys.—(*W. I., C. A., S. A.*)



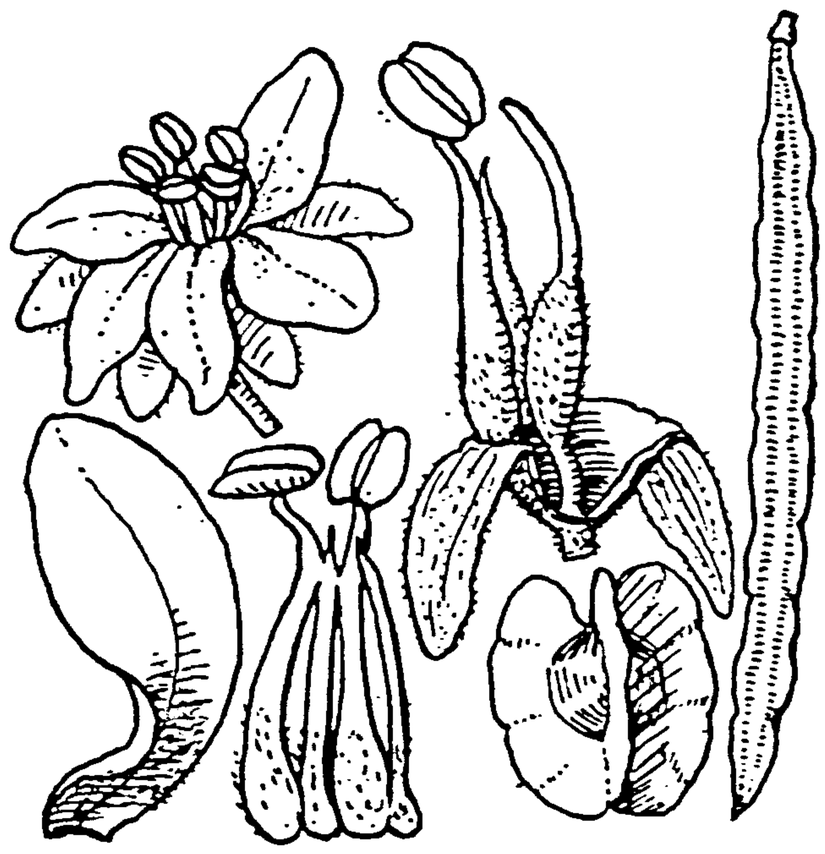
2. C. cynophallophora L. Shrub or small tree: leaf-blades elliptic or oval, mainly 4–10 cm. long: sepals lanceolate to ovate-lanceolate: corolla about 3 cm. wide: fruit-body mostly 20–30 cm. long. [*C. jamaicensis* Jacq.]—(JAMAICA CAPER-TREE.)—Hammocks, usually coastal, S pen. Fla. and Keys. (*W. I.*)—The relatively high and even temperature of the coastwise kitchenmiddens of Florida enables these tropical caper-trees to grow far up the peninsula.

Family 5. **MORINGACEAE**—Horseradish-tree Family

Trees. Leaves alternate: blades 2–3-pinnate. Flowers perfect, slightly irregular, panicled. Calyx of 5 unequal sepals borne on the edge of the cup-shaped hypanthium. Corolla of 5 petals resembling the sepals, the lower petal reflexed, the upper one erect-spreading. Androecium of 5 stamens, borne on the hypanthium, and 5 staminodia. Gynoecium 3-carpellary. Ovary stipitate, with 3 parietal placentae. Fruit an elongate capsule. Seeds 3-winged or wingless.—One genus.

1. MORINGA Juss. Trees, with spreading branches. Panicles axillary, long-peduncled. Pods drooping.—Three known species.

1. M. Moringa (L.) Millsp. Tree becoming 11 m. tall: leaves 3–6 cm. long; leaflets cuneate to oval or elliptic, mostly 1–2 cm. long; panicles many-flowered: sepals linear or elliptic-linear, 9–10 mm. long: petals usually white or pinkish, mainly elliptic: capsule 2.5–3.5 dm. long: seed 3-winged, the body fully 1 cm. long.—(Horseradish-tree.)—Pinelands, hammocks, roadsides, and fields, S pen. Fla. and Florida Keys.—Nat. of S Asia, and cult.—(*W. I.*)—All year.—The roots have the odor of horseradish. The seeds produce a fixed oil.



Order **SARRACENIALES**—Sarracenial Order

Insectivorous, usually scapose herbs, with viscid-fluid secreting tissues. Leaves alternate, various, filiform, or with dilated, sometimes sensitive blades, or hollow. Flowers usually perfect and regular. Calyx of distinct sepals. Corolla of distinct petals. Androecium of few or many stamens. Gynoecium of 2–5 united carpels. Ovary 1-celled, with 3–5 parietal or basal placentae, or 3–5-celled. Fruit capsular. Endosperm fleshy.

Ovary 1-celled, with a basal placenta or parietal placentae, not surmounted by a peltate disk: leaves with filiform or dilated blades.	
Styles distinct: stigmas 2-lobed: placentae parietal: stamens 4-8, usually 5.	Fam. 1. Droseraceae.
Styles united: stigmas pinnatifid: placentae basal: stamens 10-20.	Fam. 2. Dionaeaceae.
Ovary 3–5-celled with central placentae, surmounted by a peltate disk: leaves with hollow blades.	Fam. 3. Sarraceniaceae.

Family 1. **DROSERACEAE**—Sundew Family

Annual, biennial, or perennial, glandular-pubescent herbs. Leaves circinate in the bud, merely filiform or with broad blades. Flowers spicate or racemose. Calyx of 4–8 persistent sepals. Corolla of 4–8 petals, or rarely of 1–3 petals. Androecium of 4–8, usually 5, distinct stamens. Capsule loculicidally 3–5-valved.—About 5 genera and 90 species, widely distributed.

1. DROSERA L. Annual or perennial scapose herbs. Leaves clustered. Scape nodding at the apex.—About 85 species, most abundant in Australia.—Corolla white or pink.—SUNDEWS.

Leaves spreading, with petioles and blades: corolla white or pink. I. ROTUNDIFOLIAE.

Leaves erect, elongate, bladeless phyllodia: corolla rose-purple, or rarely white. II. FILIFORMES.

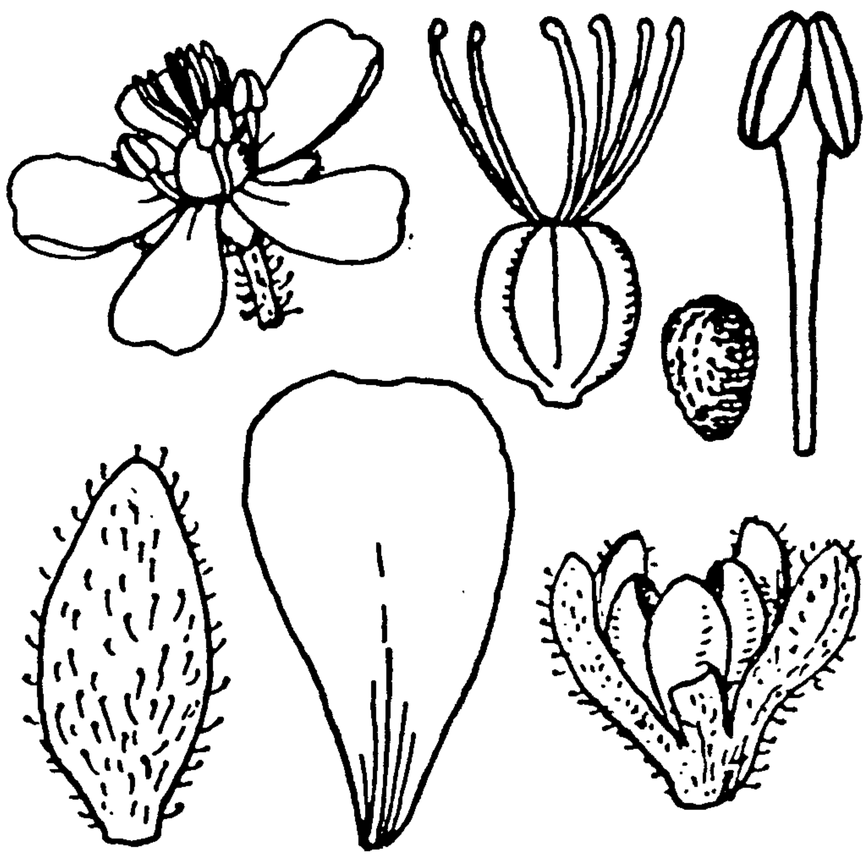
I. ROTUNDIFOLIAE

Scape glandular-pubescent. 1. *D. brevifolia.*
Scape glabrous.
  Corolla pink. 2. *D. capillaris.*
  Corolla white.
    Leaf-blades spatulate: seed ellipsoid. 3. *D. intermedia.*
    Leaf-blades suborbicular or wider than long: seed spindle-shaped. 4. *D. rotundifolia.*

II. FILIFORMES

Leaves filiform, copiously glandular. 5. *D. Tracyi.*

1. D. brevifolia Pursh. Plant 10–15 cm. tall: leaves mainly 1–1.5 cm. long; blades cuneate, with short pubescent petioles: sepals becoming 3–3.5 mm. long: corolla white, 11–15 mm. wide: capsule scarcely as long as the sepals: seed ovoid, about 0.3 mm. long.—(DWARF-SUNDEW.)—Damp pinelands, low sandy woods, and acid swamps, Coastal Plain, Fla. to Tex. and Va.—Spr.—Whole plant sometimes red.



2. D. capillaris Poir. Plant 5–40 cm. tall: leaves 3–8 cm. long; blades broadly spatulate, with long, ultimately glabrous, petioles: sepals becoming about 3 mm. long: corolla pink, 7–9 mm. wide: capsule about equalling the sepals: seed oval, scarcely 0.5 mm. long.—(PINK-SUNDEW.)—Damp, acid, sandy places, Coastal Plain, Fla. to Tex. and S. C.—(*W. I.*)—Spr.–fall.

3. D. intermedia Hayne. Plant 5–20 dm. tall: leaves 2–6 cm. long: blades linear-spatulate, with long glabrous petioles: sepals becoming 5–5.5 mm. long: corolla white, 10–12 mm. wide: capsule scarcely as long as the sepals: seed oblong-cylindric, about 0.8 mm. long. [*D. longifolia* Michx. not L.]—(NARROWLEAF SUNDEW.)—Bogs and moist, acid, sandy soil, various provinces, Fla. to La., Man., and Newf.—(*W. I., O. W.*)—Sum.–fall.

4. D. rotundifolia L. Plant 5–30 cm. tall: leaf-blades suborbicular or reniform: scape glabrous: sepals becoming 5–6 mm. long: corolla 5–6 mm. wide: capsule slightly exceeding the sepals: seed fusiform, 1.5 mm. long.—(DEW-PLANT. ROUNDLEAF SUNDEW.)—Moist, acid, sandy soil, bogs, and sandy swamps, various provinces, Fla. to Calif., Alas., Ont., and Lab.—(*O. W.*)—Sum.–fall.

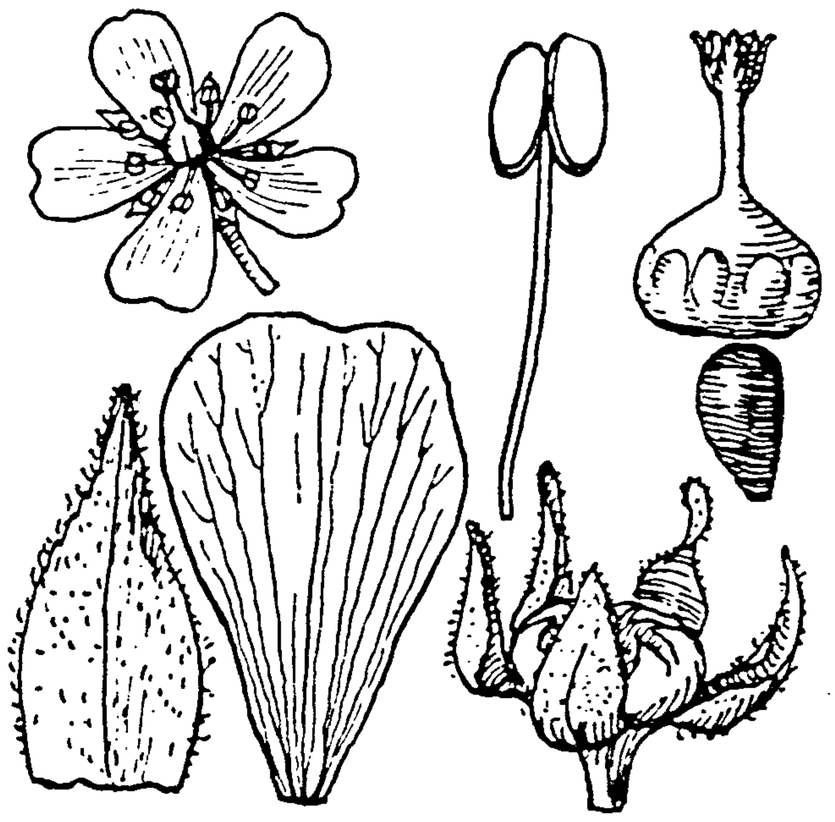
5. D. Tracyi Macfarlane. Plant mostly 3–6 cm. tall: leaves coarse-filiform, mostly over 1 mm. wide: lower pedicels longer than the calyx or becoming so in age: sepals becoming 5–6 mm. long: petals 15–17 mm. long: anthers about 2.5 mm. long: capsule broadly obovoid, about 4 mm. long. [*D. filiformis* (Fl. SE. U. S. in part.)]—(DEW-THREADS.)—Low pinelands, Coastal Plain, N Fla. to La. and S. C.—Spr.

Family 2. **DIONAEACEAE**—Venus'-flytrap Family

Perennial glabrous herbs. Leaves conduplicate and inflexed in the bud, the blade folding lengthwise. Flowers corymbose. Calyx of 5 persistent sepals. Corolla of 5 petals. Androecium of 10–20 stamens united at the base. Gynoecium of 5 united carpels. Fruit an irregularly opening capsule. Seed shining.—One genus and one species.

1. **DIONAEA** Ellis. Erect herbs. Leaves basal, arching-decumbent. Petioles winged. Petals white, marcescent. Capsule erect.

1. **D. muscipula** Ellis. Leaves 4–15 cm. long: petioles spatulate or obovate, naked: blades suborbicular to reniform, long-ciliate: scapes 1–4 dm. tall: sepals 7–9 mm. long: petals cuneate, 11–13 mm. long, truncate and erose at the apex: capsule ovoid, 3–4 mm. long.—(Flytrap. Venus'-flytrap.)—Sandy bogs, savannas, and low pinelands, usually in acid soil, Coastal Plain, E S. C. and N. C.—Spr.—The outstanding features of the flytrap are the three irritable cilia on the face of each leaf-lobe which transmit the stimulus that causes the paired lobes to snap shut on an insect, and the eyelash-like cilia of the lobes which close together like the fingers when one's hands are folded, thus making sure the victim is securely held.



Family 3. **SARRACENIACEAE**—Pitcher-plant Family

Perennial bog herbs, living to some extent on decaying insects and leaves which have fallen into the tubular or pitcher-like leaves. Flowers perfect, nodding. Calyx of 5 persistent sepals, accompanied by 3 bracts. Corolla of 5 deciduous petals. Androecium of numerous stamens. Gynoecium of 5 united carpels. Fruit a 5-valved capsule.—Three genera and 10 species, all American.

1. **SARRACENIA** [Tourn.] L. Acaulescent herbs with horizontal rootstocks. Leaves basal, erect or decumbent, hollow, with a ventral ridge or wing and a terminal expansion or hood, green, yellow, or purple, or variegated; phyllodia, not pitcher-like or trumpet-like, sometimes present. Flowers on erect hollow scapes. Stigmas hooked, under the angles of the umbrella-like expansion of the style.—About 8 species, natives of eastern North America.—Eve's-cups. Frog-bonnets. Bog-bugles. Pitcher-plants. Trumpets.—Spr.–sum.—Natural hybrids observed and described are cited under the species following. There are many artificial hybrids. The morphology of the leaf is such that insects are entrapped and digested, thus furnishing material which the plant uses for nourishment. Some species have phyllodia in winter.

Leaves (pitchers) decumbent, relatively short. I. Purpureae.
Leaves (trumpets) erect, elongate:
  Orifice open, at least not closely covered by the hood: petals yellow, cream-colored or red. II. Flavae.
  Orifice closely covered by the arched cucullate hood: petals clear-yellow. III. Minores.

I. PURPUREAE

Pitchers ventricose; hood erect, reniform, opening outward, the orifice terminal. — 1. *S. purpurea.*
Pitchers tubular-clavate; hood globose-cucullate, opening inward, the orifice lateral. — 2. *S. psittacina.*

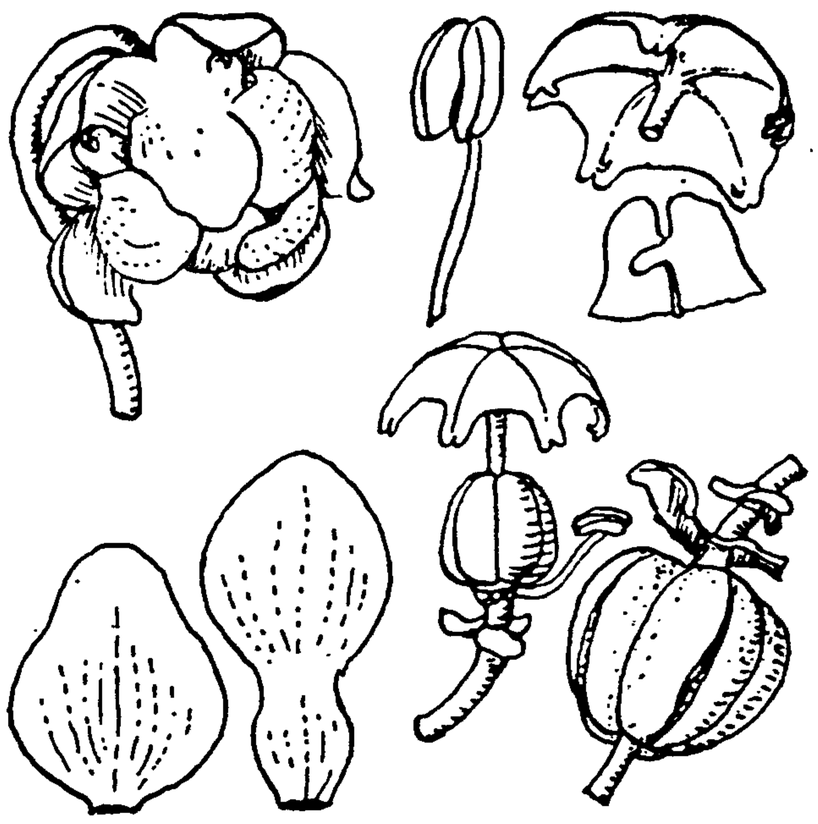
II. FLAVAE

Hood flat, green, more or less veined with purple: flower small, the petals less than 4 cm. long. — 3. *S. rubra.*
Hood with more or less reflexed sides, yellow, yellow-green, green and white, or dark-red, often red-veined; flower large, the petals over 4 cm. long.
  Hood mottled green and white and purple-veined: petals dark-red. — 4. *S. Drummondii.*
  Hood yellow or yellow-green, or dark-red in a variety of *S. flava*, veinless or red-veined.
    Petals yellow or cream-colored, or dark-red in a variety of *S. flava.*
      Hood reniform or orbicular-reniform: petals yellow or rarely red in isolated colonies. — 5. *S. flava.*
      Hood ovate sometimes broadly so: petals cream-colored. — 6. *S. Sledgei.*
    Petals dark-red. — 7. *S. Jonesii.*

III. MINORES

Plant growing in clumps and colonies, conspicuous on account of the variegated tops and backs of the leaves. — 8. *S. minor.*

1. S. purpurea L. Leaves 1–2 dm. long, evergreen, decumbent, in a basal rosette, often variegated with purple: pitcher ventricose, with a half-obovate or half-oblanceolate wing, the orifice not contracted: hood erect, reniform, often notched at the apex: scape erect, 2–4 dm. tall: flower 5–6 cm. broad: sepals ovate, about 3 cm. long, obtuse: petals fiddle-shaped, 4–5 cm. long, obtuse, purple: style-disk 3–4 cm. broad, the lobes notched: capsule about 1.5 cm. broad. — (PITCHER-PLANT. INDIAN PITCHER. FLYTRAP. SIDESADDLE-PLANT. ADAM'S-PITCHER. HUNTSMAN'S-CUP. FOREFATHER'S-CUP. DEVIL'S-BOOTS.) — Sphagnous or rarely marly bogs, various provinces, N Fla. to La., Man., and Newf.—Spr. — Hybridizes with *S. flava* = × *S. Catesbaei;* also with *S. Drummondii.* The representative of this species in our region differs from that further north in having much shorter and broader pitchers, and may be found on further study to be a distinct species, in which case it should bear the name *S. venosa* Rafinesque.



2. S. psittacina Michx. Leaves 0.5–1.5 dm. long, evergreen, in a basal rosette, variegated, especially above, with white spots and purple veins: pitcher tubular-clavate, with a broad half-obovate wing: hood strongly incurved, inflated, globose-cucullate: scape erect, 2–4 dm. tall: flowers 3–5 cm. broad: sepals ovate, 2–2.5 cm. long, obtuse: petals 3–4 dm. long, rounded or retuse at the apex, purple: style-disk about 3.5 cm. broad, the lobes 2-cleft: capsule 9–14 mm. in diameter.—(PARROT PITCHER-PLANT.)—Lowlands, Coastal Plain, N Fla. to La. and Ga.—Spr.—Hybridizes with *S. minor.*

3. S. rubra Walt. Leaves 1–4 dm. long: trumpets nearly tubular or narrowly trumpet-shaped, narrowly winged, hardly expanded at the throat, slightly paler above, and, like the ovate acute or acuminate finally erect hood, faintly reticulate with purple: scape erect, most taller than the leaves: flower 3–5 cm. broad: sepals ovate, 2–2.5 cm. long, obtuse: petals 3–4 cm. long, reddish-

purple, with obovate blades: style-disk 3–3.5 cm. broad, the lobes notched at the apex: capsule about 1.5 cm. in diameter.—(SWEET PITCHER-PLANT.)—Bogs and low pinelands, Coastal Plain and adj. Piedmont, W Fla. to SE N. C. —Spr.—Flowers very fragrant.

4. S. Drummondii Croom. Leaves erect, elongate: trumpets narrowly trumpet-shaped, 4–12 dm. long, slightly winged (or sometimes all wing and no tube), the upper part gradually expanding, white, reticulate with purple, like the erect ovate or suborbicular hood, whose margins are undulate above and recurved below, the edges of the pitcher revolute: scape erect, scarcely longer than the leaves: flowers 7–9 cm. broad: sepals ovate, 5–6 cm. long, obtuse: petals fiddle-shaped, 5–7 cm. long, purple: style-disk 5–6 cm. broad, the lobes 2-cleft: capsule 2.5–3.5 cm. in diameter.—(PURPLE-TRUMPET. FIDDLER'S-TRUMPET.)—Sandy bogs, Coastal Plain, NW Fla. to Miss., and W Ga.—Spr.—Hybridizes with *S. flava* (or perhaps *S. rubra*) =× *S. Mandaiana;* also with *S. purpurea.*—Bartram planned to call this species *S. lacunosa,* but accompanied his proposal with a description of *S. minor,* so his name is invalid. Rafinesque named it *S. leucophylla* in 1817, 31 years before the publication of Croom's name, but his name has not been adopted because he based it on a mere description by Robin, without seeing actual specimens.

5. S. flava L. Leaves (summer) erect, elongate: trumpet-shaped, narrowly-winged, 5–13 dm. tall, gradually expanding above, the edges revolute, the upper part, as well as the very broad apiculate hood which is 8–12 cm. broad, often bright-yellow, more or less reticulate with reddish or purple veins; winter leaves consisting of wing without tube or hood: scape about as tall as the leaves: flower 10–12 cm. broad: sepals widest at the middle, 4–5 cm. long, rounded at the broad apex: petals bright-yellow, 7–10 cm. long: blades narrowly obovate, abruptly narrowed to the elliptic claw, scarcely widened at the base: style-disk 7–9 cm. broad, the lobes 2-cleft at the apex: capsule about 2 cm. in diameter.—(TRUMPETS. GOLDEN-TRUMPETS. WATCHES. TRUMPET-LEAF. HUNTSMAN'S-HORN. FLY-CATCHERS.)—Wet pinelands, Coastal Plain, Piedmont, and S end of Appalachians, N Fla. to Ala. and Va.—Spr.—Hybridizes with *S. minor.*—The mountain plant may be a distinct species.

6. S. Sledgei Macfarlane. Leaves (summer) erect, rather slender: pitchers narrowly trumpet-shaped, 2–8 dm. long, slightly expanding above: hood ovate, with relatively straight inconspicuous red veins, these much less branched than in *S. flava:* scape about as tall as the leaves: sepals widest near the base, tapering to the narrow but blunt apex, 4–5 cm. long, resembling the petals in texture: petals greenish-yellow, 5–6 cm. long, fiddle-shaped: blades rhombic-ovate, the abruptly widened basal portion nearly 2 cm. long, rhombic-obovate: capsule similar to that of *S. flava.*—(YELLOW TRUMPETS.)—Wet pinelands, Coastal Plain, Ala. to E Tex.—Spr.

7. S. Jonesii Wherry. Leaves (summer) erect, distinctly expanded upward, but rather slender, narrowly trumpet-shaped, 3–7.5 dm. tall, green, but often with rather inconspicuous red veinings. Hood ovate to suborbicular, curving high over the orifice, finely inconspicuously veined: scape about as tall as the leaves, at least in anthesis: sepals widest near the base, obtuse, 2–3 cm. long: petals dark-red, 4–5 cm. long, fiddle-shaped; blades orbicular-obovate: capsule about 1.5 cm. in diameter.—Bogs, wet meadows, and swamps, various provinces, W. Fla. to Miss. and N. C.—Spr.

8. S. minor Walt. Leaves erect, 2–10 dm. long, trumpet-shaped, gradually expanding from the base, variegated at and near the top with green and purple veins and white or yellowish scar-like blotches: hood ovate, arch-

ing, incurved over the orifice of the pitcher: scape erect, shorter than the leaves or slightly longer: flower 4–6 cm. broad: sepals ovate, 2.5–3 cm. long, obtuse: petals narrowly fiddle-shaped, 4–5 cm. long, rounded at the apex, clear-yellow: style-disk 2.5–3 cm. broad, the lobes notched: capsule about 1.5 cm. broad. [*S. variolaris* Michx.]—(HOODED PITCHER-PLANT.)—LOW pinelands and hogs, Coastal Plain, Okeechobee region, Fla. to SE N. C.—Spr.—Hybridizes with *S. flava, S. psittacina, S. rubra,* and *S. purpurea.*

ORDER ROSALES—ROSAL ORDER

Herbs, shrubs, or trees, or rarely aquatic plants or vines. Leaves with simple or compound blades. Flowers mostly perfect. Calyx and corolla present and sometimes irregular, or the latter occasionally, or both rarely, wanting. Androecium of few or many stamens. Gynoecium of 1–several distinct or united carpels. Fruit various.

Aquatic alga-like fleshy herbs, with spathe-like involucres: perianth usually wanting.	Fam. 1. PODOSTEMACEAE.
Terrestrial or swamp plants, without spathe-like involucres: perianth present.	
Endosperm present, usually copious and fleshy: stipules mostly wanting.	
Herbs.	
Carpels as many as the sepals: stamens as many as the sepals or twice as many.	
Plants succulent: carpels distinct or united at the base, opening lengthwise.	Fam. 2. SEDACEAE.
Plants not succulent: carpels united to the middle, circumscissile.	Fam. 3. PENTHORACEAE.
Carpels fewer than the sepals.	
Staminodia present: carpels 3 or 4, wholly united into a 1-celled gynoecium.	Fam. 4. PARNASSIACEAE.
Staminodia wanting: carpels mostly 2, distinct or partially united.	Fam. 5. SAXIFRAGACEAE.
Shrubs or trees.	
Leaves opposite.	Fam. 6. HYDRANGEACEAE.
Leaves alternate.	
Fruit a 2-celled capsule.	
Capsule thin-walled, almost free from the hypanthium.	
Stamens 5: hypanthium flattish, not accrescent: leaves without stipules.	Fam. 7. ITEACEAE.
Stamens numerous: hypanthium hemispheric, inflated in age: leaves with stipules. *Opulaster* in	Fam. 12. ROSACEAE.
Capsule woody or thick-walled, manifestly adnate to the hypanthium.	
Calyx, or calyx and corolla, present: ovule solitary in each carpel, suspended.	Fam. 8. HAMAMELIDACEAE.
Calyx and corolla wanting: ovules several or numerous in each carpel, horizontal.	Fam. 9. ALTINGIACEAE.
Fruit a 1-celled berry.	Fam. 10. GROSSULARIACEAE.
Endosperm wanting or scant (copious in *Opulaster* in ROSACEAE): stipules mostly present.	
Flowers monoecious, in dense capitate clusters.	Fam. 11. PLATANACEAE.
Flowers perfect, or if monoecious or dioecious, not in capitate clusters.	
Flowers regular.	
Carpels several or numerous, or if solitary becoming an achene.	
Carpels distinct, rarely adnate to the hypanthium: fruit achenes or follicles.	
Sepals and petals 5: leaves mostly alternate.	Fam. 12. ROSACEAE.

Sepals and petals numerous: leaves opposite.	Fam. 13. CALYCANTHACEAE.
Carpels united, enclosed by the hypanthium and adnate to it: fruit a pome.	Fam. 14. MALACEAE.
Carpel solitary, not becoming an achene.	
Ovary with 2 ovules: leaf-blades simple: fruit a drupe.	Fam. 15. AMYGDALACEAE.
Ovary with several ovules: leaf-blades 2–3-pinnate: fruit a legume.	
Petals valvate in the bud.	Fam. 16. MIMOSACEAE.
Petals imbricated in the bud, *Gleditsia* and *Gymnocladus* in	Fam. 17. CASSIACEAE.
Flowers irregular (nearly or quite regular in *Gleditsia* and *Gymnocladus* in CASSIACEAE).	
Fruit indehiscent, armed with barbed spines: leaf-blades simple: stipules wanting.	Fam. 18. KRAMERIACEAE.
Fruit a legume or loment: leaf-blades compound: stipules usually present.	
Upper petal enclosed by the lateral ones in the bud.	Fam. 17. CASSIACEAE.
Upper petal enclosing the lateral ones in the bud.	Fam. 19. FABACEAE.

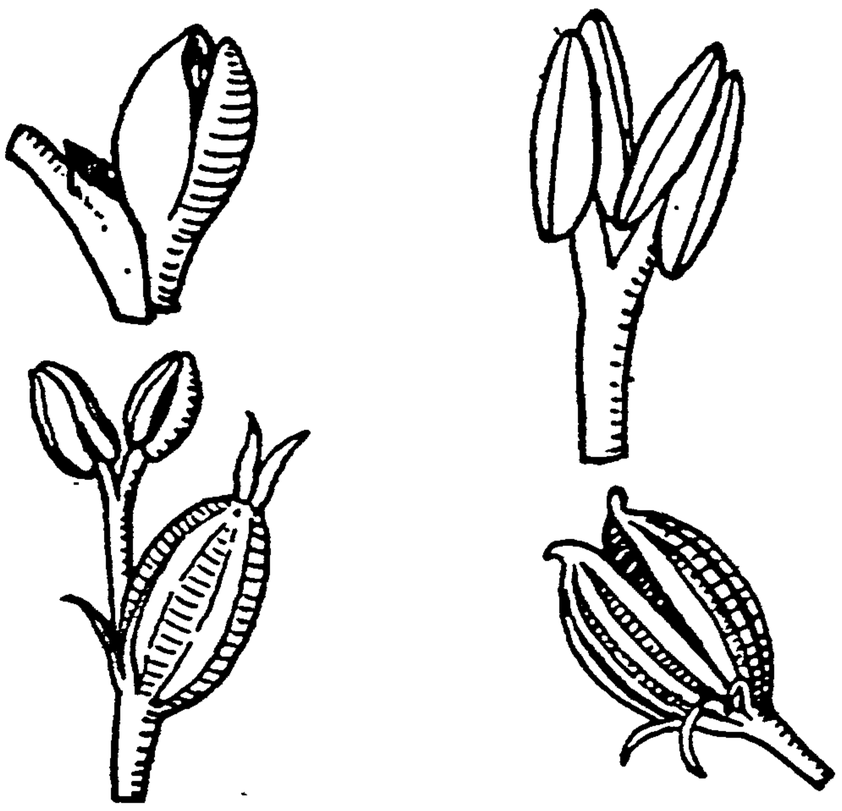
FAMILY 1. **PODOSTEMACEAE**—RIVER-WEED FAMILY

Aquatic herbs, adhering to rocks, the vegetative organs resembling the thallus of an alga or a hepatic. Leaves alternate: blades lobed or decompound. Flowers perfect, arising from a spathe. Perianth wanting, or of 3–5 scale-like or membranous sepals. Androecium of 1–many stamens. Gynoecium of 2 or 3 united carpels. Fruit capsular.—About 21 genera and 175 species, mostly natives of the tropics.

1. PODOSTEMON Michx. Caulescent alga-like herbs. Leaf-blades divided or dissected. Flowers green. Perianth obsolete. Stamens 2. Ovary 2-celled. Capsule unequally 2-valved, one valve persistent.—About 12 species of wide geographical distribution.—Sum.–fall.—RIVER-WEED.

Flower solitary: leaf-segments flattened.	1. *P. Ceratophyllum.*
Flowers 2 or 3 together: leaf-segments almost capillary.	2. *P. abrotanoides.*

1. P. Ceratophyllum Michx. Plant olive-green, glabrous. Stems 0.5–2 dm. long, attached to stones in running water by disk-like expansions: leaves rigid; blades divided into many narrow segments, the base sheathing the stem: flowers solitary, slender-pedicelled: united filaments much longer than the ovary: capsule oval, 2.5 mm. long.—(THREAD-FOOT. JASPER-GREEN.)—Attached to rocks in streams, various provinces N of Coastal Plain, Ga. to Ala., Ont., and N. B.



2. P. abrotanoides Nutt. Similar to the preceding species in habit, but larger, the stems sometimes becoming 6–8 dm. long: leaves often numerous: blades much divided into almost capillary segments: flowers 2 or 3 together, sessile or short-pedicelled: capsule ellipsoid, 10-ribbed. — Streams, Coastal Plain, extending into adj. provinces, W Fla. to Miss., Tenn., and C Ga.

Family 2. **SEDACEAE**—Orpine Family

Herbs, usually succulent, or partially woody plants. Leaves alternate, opposite, or whorled: blades thick, flat to terete. Flowers perfect or dioecious, cymose. Calyx of usually 4–6 persistent sepals. Corolla of as many petals as sepals, or wanting. Androecium of as many stamens as sepals or twice as many. Gynoecium of as many distinct or partially united carpels as there are sepals. Fruit follicular.—About 30 genera and 600 species of wide geographic distribution.

Sepals distinct or united only at the base: calyx not inflated.
  Petals distinct.
    Carpels distinct: petals not hooded at the apex.
      Stamens as many as the sepals. — Tribe I. Tillaeae.
      Stamens twice as many as the sepals. — Tribe II. Sedeae.
    Carpels united to the middle: petals hooded. — Tribe III. Diamorpheae.
  Petals with the claws united into a tube. — Tribe IV. Kalanchoeae.
Sepals united into a tube: calyx inflated. — Tribe V. Bryophylleae.

I. Tillaeae

Very small annual herbs with opposite leaves. — 1. Tillaeastrum.

II. Sedeae

Follicles erect: plant perennial by stout, woody-fleshy, mostly underground caudices.
  Flowers dioecious or polygamous: follicle-beaks stout, short, spreading. — 2. Rhodiola.
  Flowers perfect: follicle-beaks slender, erect. — 3. Anacampseros.
Follicles widely spreading: plant annual or perennial by fleshy stolons. — 4. Sedum.

III. Diamorpheae

Diminutive annuals or biennials with wiry stems: corolla pink or purple. — 5. Diamorpha.

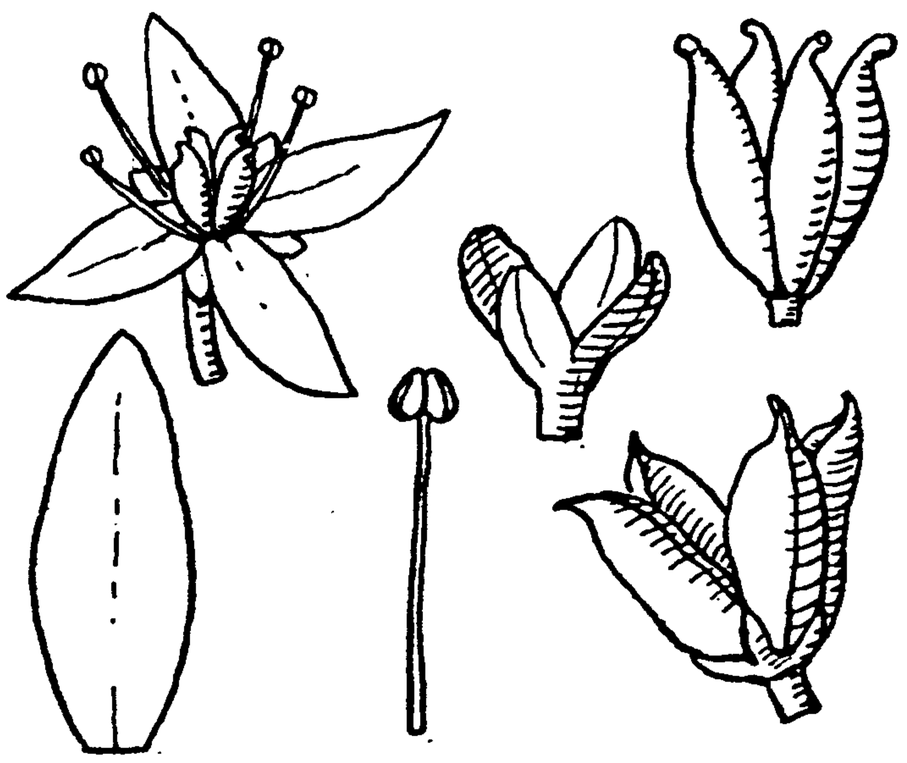
IV. Kalanchoeae

Rather coarse succulent perennials, growing in tufts, with broad-toothed leaves: corolla yellow; lobes spreading. — 6. Kalanchoe.

V. Bryophylleae

Coarse succulent herbs, growing in colonies by branching rootstocks. — 7. Bryophyllum.

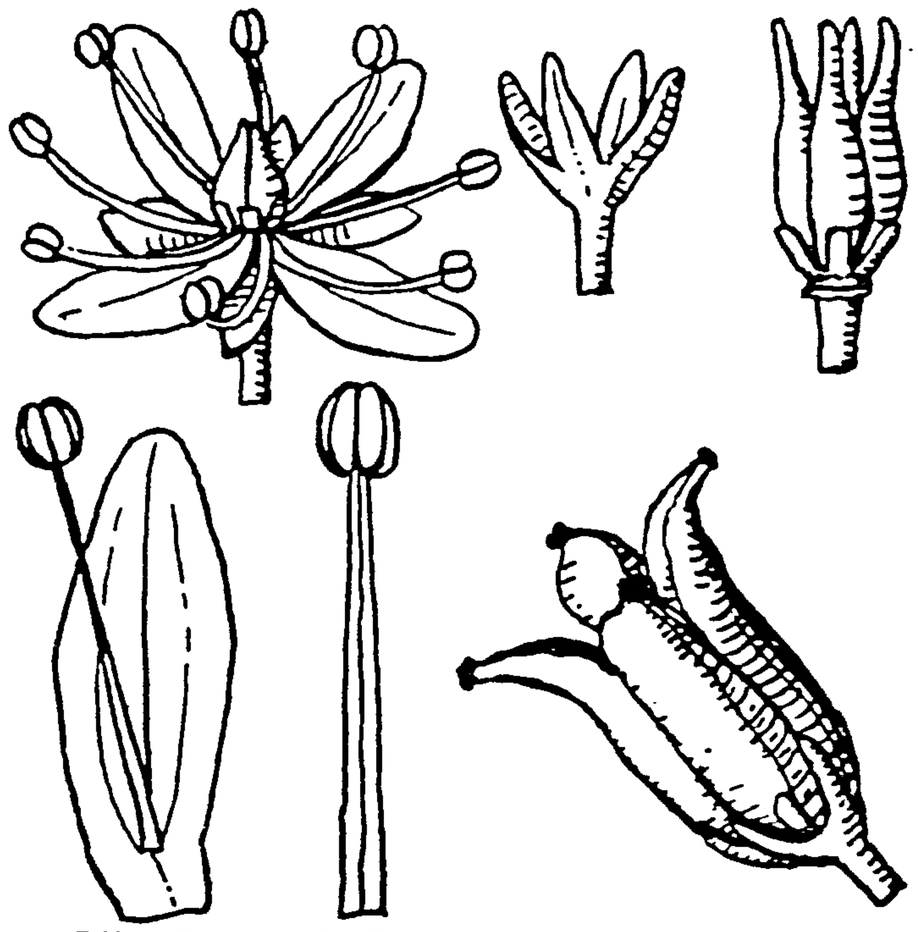
1. **TILLAEASTRUM** Britton. Annual small aquatic or mud-inhabiting herbs. Leaves opposite. Flowers solitary in the axils. Sepals mostly 4. Petals mostly 4. Stamens free. Carpels usually 4, distinct. Ovules, or seeds, few–several. About 20 species, widely distributed.



1. **T. aquaticum** (L.) Britton. Plant 1–8 cm. tall: leaves 4–6 mm. long; blades linear-elliptic: sepals about 0.5 mm. long: petals about twice as long as the sepals, whitish. [*Tillaea aquatica* L. *T. simplex* Nutt.]—(River-leek.)—Muddy banks, various provinces, La. to Tex., N. S., Mass., and Md., also in W N. A.—Spr.–fall.

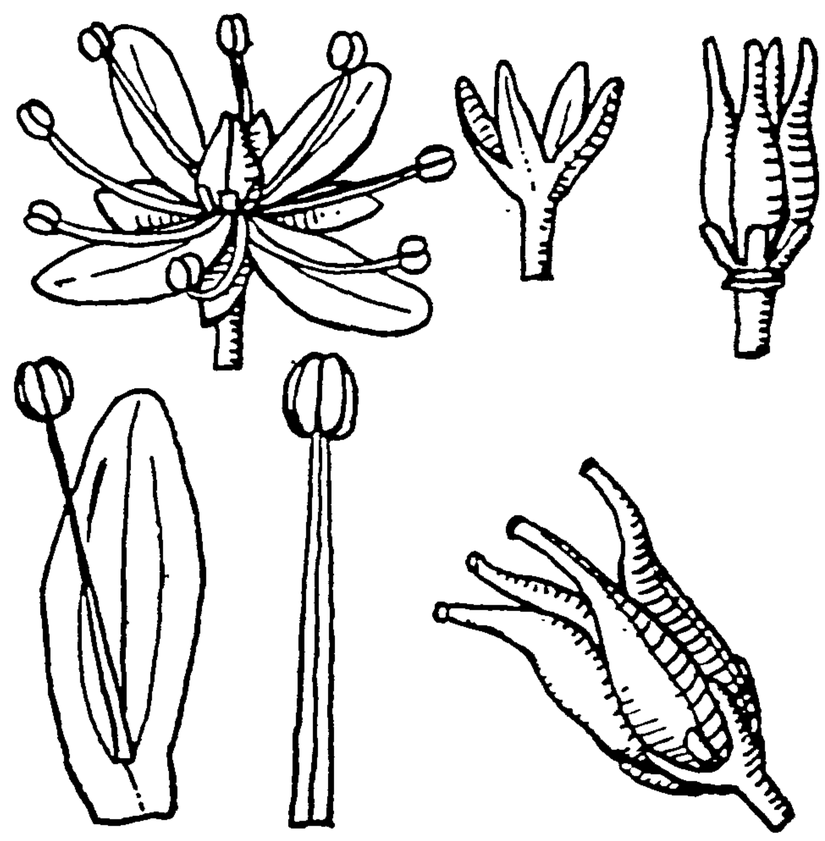
2. **RHODIOLA** L. Perennial herbs with woody rootstocks. Leaves alternate: blades flat, sometimes toothed. Flowers dioecious or polygamous, borne

in a dense terminal cyme. Sepals 4 or 5, decidedly longer than wide. Petals 4 or 5, yellowish, purplish, or greenish. Follicles erect.—About 8 species, natives of the north temperate zone.—ROSEROOTS.



1. **R. roanensis** Britton. Plant 1–4 dm. tall, tufted: leaf-blades elliptic to cuneate or linear-cuneate, 1–3.5 cm. long, entire or nearly so: sepals lanceolate-acuminate, about 2 mm. long: petals elliptic or slightly broadened upward, 3–4 mm. long, purplish: follicles 8–10 mm. long. [*Sedum Rhodiola* (Chapm. Fl.) *Sedum roanense* Britton]—(PURPLE-ORPINE. ROSEROOT.)—Cliffs, in rather acid soil, top of Roan Mt., Blue Ridge, N. C. and Tenn.—Spr.-sum.

3. **ANACAMPSEROS** Mill. Perennial tufted herbs. Leaves alternate: blades flat, relatively broad, often toothed. Flowers perfect, in terminal corymbose cymes. Sepals 4 or 5, mostly ovate to lanceolate. Petals 4 or 5, pink or purple, much longer than the sepals. Follicles 4 or 5, erect. Few species of the Old World, except the following.



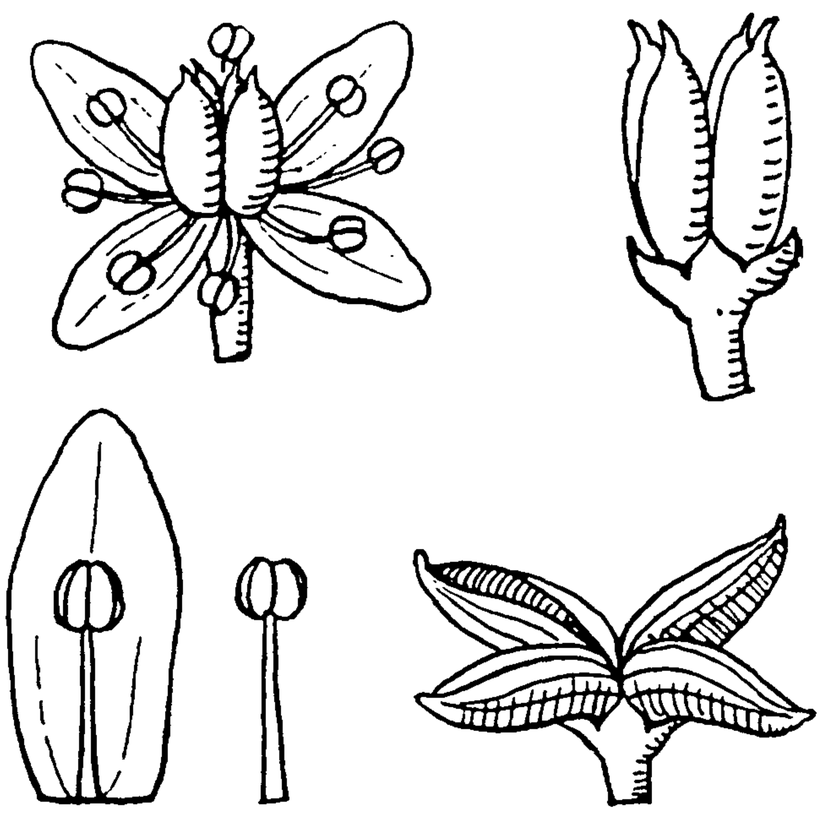
1. **A. telephioides** (Michx.) Haw. Plant 1–4 dm. tall, glabrous: leaf-blades flat, obovate or ovate, coarsely toothed: sepals triangular-lanceolate, about 2 mm. long: petals pale-pink, elliptic to elliptic-lanceolate, 4.5–6 mm. long: follicles 4–5 mm. long. [*Sedum telephioides* L.]—(CLIFF-ORPINE. WILD-LIVE-FOREVER.)— Cliffs and rocks, various provinces, N. of Coastal Plain, Ga. to Ill., W N. Y., and D. C.—Sum.

4. **SEDUM** L. Annual or perennial, fleshy, often stoloniferous herbs. Leaves alternate, opposite, or whorled: blades flat, but thick, turgid or terete, entire. Flowers perfect, in cymes which are often branched and sometimes very one-sided. Sepals 4 or 5, deltoid to linear. Petals 4 or 5, white or variously colored, longer than the sepals. Follicles 4 or 5, spreading, beaked, the beaks sometimes short.—About 200 species, most abundant in the temperate and cold regions of the Northern Hemisphere.—STONECROPS. SEDUMS.

Sepals deltoid: carpels and follicles short-beaked. 1. *S. pusillum.*
Sepals ovate to linear: carpels and follicles long- or slender-beaked.
  Corolla white to pink.
    Plant perennial, producing leafy stolons; petals white: leaf-blades thick, but flat or somewhat turgid.
      Leaves of the rosettes of the stolons with orbiculate-obovate blades; leaves of the flowering stem with obovate to elliptic blades. 2. *S. ternatum.*
      Leaves of the rosettes of the stolons with spatulate or narrowly cuneate blades; leaves of the flowering stems with spatulate to cuneate blades. 3. *S. Nevii.*

Plant annual, without stolons: petals pink or pinkish: leaf-blades terete or subterete, linear-filiform or very narrowly linear.
Leaves linear-filiform: petals broadly lanceolate: follicles 6–7 mm. long. 4. *S. pulchellum.*
Leaf-blades subterete, narrowly linear; petals narrowly lanceolate: follicles 4–4.5 mm. long. 5. *S. vigilimontis.*
Corolla yellow. 6. *S. acre.*

1. S. pusillum Michx. Plant 5–12 cm. tall, pale-green, the stem glabrous, simple or branched throughout: leaves 2–9 mm. long; blades spatulate to obovate or elliptic, turgid, obtuse: cymes often copiously flowered, but not densely so: pedicels clavate: sepals deltoid, 1 mm. long or nearly so: acute: petals white or pink, ovate, 2.5–3 mm. long, obtuse: follicles 3.5–4 mm. long, very short-beaked. [*Tetrorum pusillum* (Michx.) Rose]—(PUCK'S-ORPINE.)—Rocks, chiefly granite, Piedmont and Blue Ridge, M Ga. to N. C.—Spr.



2. S. ternatum Michx. Plant light-green, with matted branches: leaves various, those of the sterile shoots whorled near the tip, alternate below, with the blades obovate to suborbicular, mostly 1–2 cm. long; the upper ones of the flowering branches smaller, scattered, with obovate to elliptic blades; sepals about 5 mm. long: petals broadly lanceolate, 6–7 mm. long: follicles 5.5–8 mm. long.—(MOUNTAIN-STONE CROP. SHEPHERD'S CRESS. THREE-LEAF STONECROP.)—Rocks and damp shaded banks, various provinces, rarely Coastal Plain, Ga. to Mo., Mich., and Mass.—Spr.—Extensively grazed by sheep in the mountains in winter.

3. S. Nevii A. Gray. Plant light-green, with often densely matted branches: leaves various, those of the sterile shoots alternate, but often crowded, with the blades narrowly cuneate to spatulate, mostly 0.5–2 cm. long; the upper leaves of the flowering branches scattered, with cuneate, spatulate, or linear-spatulate blades: sepals 3–3.5 mm. long: petals narrowly lanceolate, 5–6 mm. long: follicles 4–4.5 mm. long.—(CLIFF-STONECROP.)—Rocky woods, Blue Ridge, Appalachian provinces, and rarely Interior Low and Ozark Plateaus, Ga. to Mo. and Va.—Spr.

4. S. pulchellum Michx. Plant 5–30 cm. tall, bright-green, the stem branched, ascending or decumbent: leaves often crowded, terete, linear-filiform, 9–25 mm. long: flowers crowded on the cyme-branches: sepals narrowly ovate, 2.5–3 mm. long: petals broadly lanceolate, 5–6 mm. long: anthers about 1 mm. long: follicles 6–7 mm. long, relatively long-beaked.—(ROCK-CRESS. ROCK-ORPINE. WIDOW'S CROSS.)—Calcareous rocks, various provinces, N of Coastal Plain, Ga. to Tex., Kans., and W Va.—Spr.–sum.

5. S. vigilimontis Small. Plant 6–15 cm. tall, bright-green, the stems erect or ascending: leaves numerous, subterete, narrowly linear, 0.5–2 cm. long: flowers rather close on the cyme-branches, but not crowded: sepals narrowly lanceolate, 1.5–2 mm. long: petals narrowly lanceolate, 3.5–4 mm. long: anthers about 0.6 mm. long: follicles 4–4.5 mm. long, relatively short-beaked.—Rocks, lower slopes, Lookout Mt., Ga.—Spr.

6. S. acre L. Plant in a depressed mat, the stems very leafy, creeping, yellowish-green: leaf-blades very thick, ovate, 2–5 mm. long, imbricate: sepals ovate, 2–2.5 mm. long: petals lanceolate, 5–6.5 mm. long: follicles broad, 4–5 mm. long or rarely shorter, short-beaked.—(MOSSY-STONECROP. GOLD-MOSS.

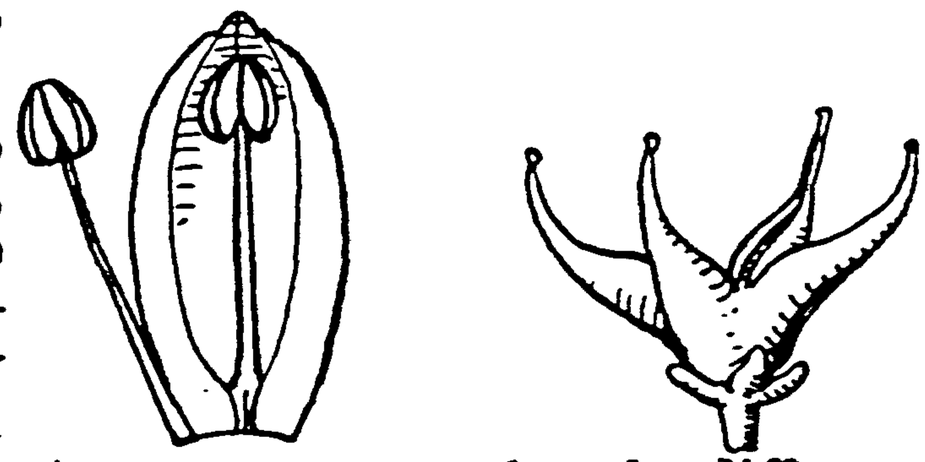
WALL-PEPPER.)—Rocks, walls, and stony roadsides, various provinces N of Coastal Plain, N. C. to Colo., Ont., and N. S. Nat. of Eu.—Sum.—Another yellow-flowered stonecrop—*Sedum mexicanum* Britton—is often cultivated and occasionally escapes from gardens.

5. **DIAMORPHA** Nutt. Annual or biennial slender herbs. Leaves alternate: blades nearly terete. Flowers borne in corymbose cymes. Sepals 4 or 5, about as wide as long. Petals 4 or 5, pink or purple, not contracted below the middle. Stamens free. Carpels 4 or 5, united to below the middle, widespreading in age.—Following are the only known species.—Spr.—ELF-ORPINES.

Petals elliptic, about twice as long as wide: carpel long-tipped. 1. *D. cymosa.*
Petals ovate, slightly longer than wide: carpel short-tipped. 2. *D. Smallii.*

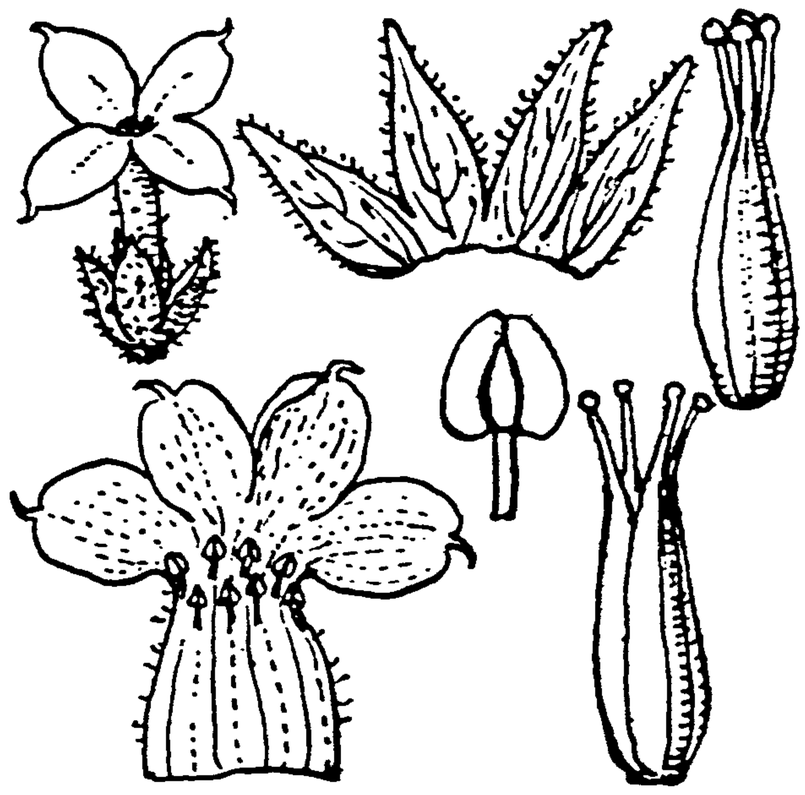
1. **D. cymosa** (Nutt.) Britton. Plant reddish, 2–10 cm. tall: leaves 2–5 mm. long; blades obtuse: sepals deltoid, about 1 mm. long: petals elliptic, 3–3.5 mm. long: carpels lanceolate. [*D. pusilla* Nutt.]—Rocks, chiefly granite, Piedmont to Appalachian provinces, Ga. to Ala., Tenn., and N. C.—Flat granite exposures are the favorite habitats of this plant. When in flower, the unusual abundance of the plants forms large pink areas.

2. **D. Smallii** Britton. Plant similar to that of *D. cymosa* but more slender: sepals about 0.5 mm. long: petals ovate, 2–2.5 mm. long: carpels ovoid.—Rocks, Falls of the Yadkin River, at the juncture of the Piedmont and Coastal Plain, N. C.—*Sedum pusillum* often occurs intimately associated with these plants, especially when the growth is abundant. The plants of the two genera are sharply differentiated by their respective colors.

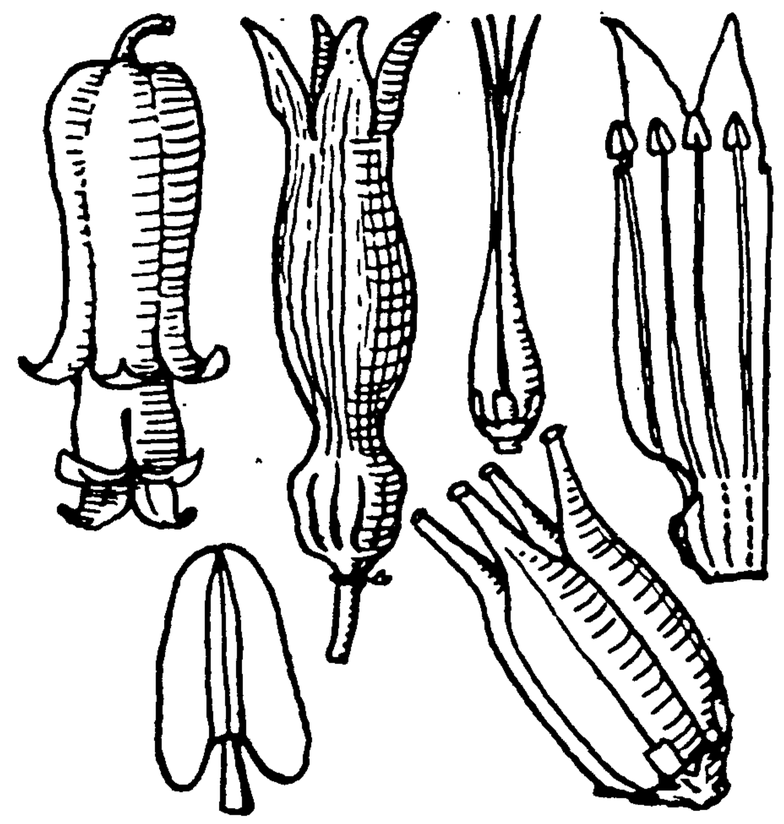


6. **KALANCHOE** Adans. Perennial tufted succulent herbs, or plants sometimes woody at the base. Leaves opposite: blades simple, usually toothed. Flowers perfect, borne in corymbose cymes. Calyx 4-lobed, the tube very short. Corolla much exserted, salverform, the tube usually exceeding the calyx, the 4 lobes spreading. Stamens with united filaments. Follicles 4, erect. Capsule somewhat swollen.—About 20 species, African and Asiatic.

1. **K. crenata** Haw. Plant often tufted, mostly 3–7 dm. tall: leaf-blades obovate, oval, ovate, or elliptic, 5–12 cm. long, crenate, those of the lower ones narrowed at the bases: cymes corymbose: flowers pedicelled: calyx-lobes lanceolate, 4–5 mm. long, acuminate, minutely glandular-ciliate: corolla yellow: lobes obovate, oval or ovate, 6–8 mm. long, longer than the tube, caudate-tipped: capsule conic or conic-ovoid, 6–8 mm. long.—Hammocks, waste-places, and roadsides, S pen. Fla. and the Keys. Nat. of Africa.—(*W. I., Mex., C. A., S. A.*)—All year.



7. BRYOPHYLLUM Salisb. Perennial coarse gregarious herbs. Leaves opposite: blades simple or pinnately compound. Flowers perfect, borne in simple or compound cymes. Calyx 4-lobed. Corolla exserted, 4-lobed. Follicles 4.—Four known species, of Asia and Africa.

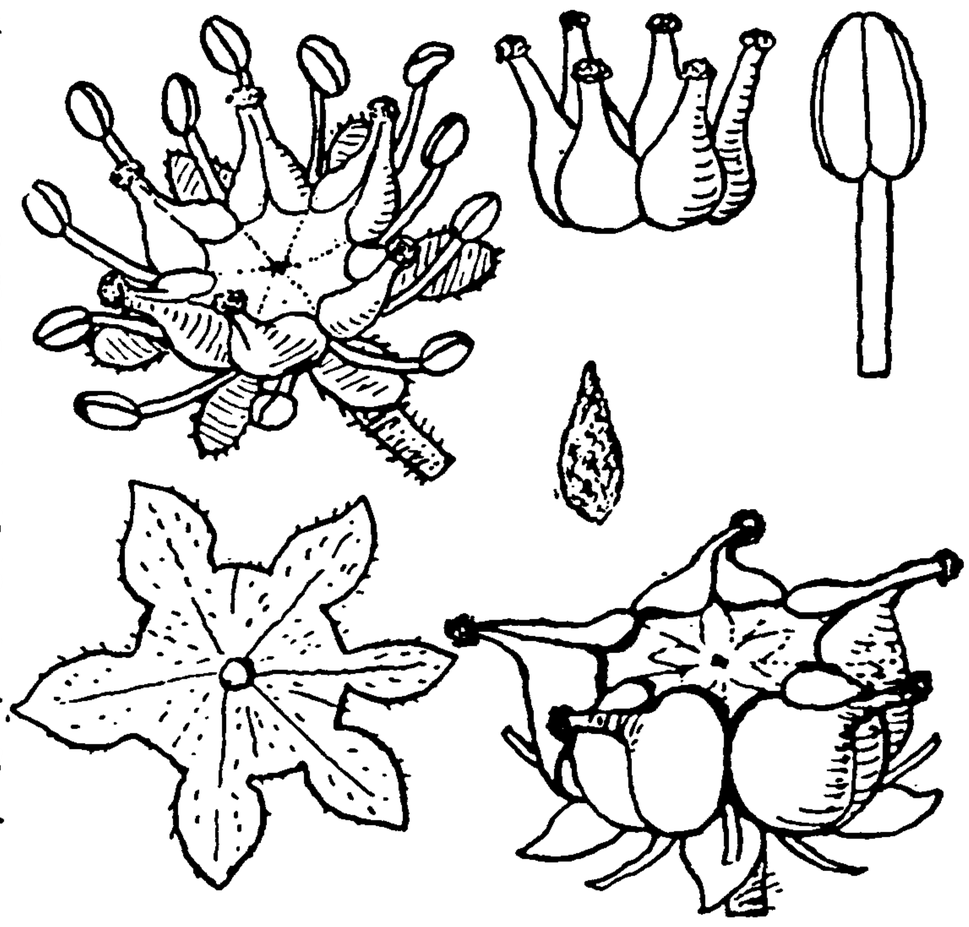


1. B. pinnatum (Lam.) S. Kurz. Plant 4–15 dm. tall, glaucous: leaves 1–3 dm. long; blades of the leaflets elliptic, crenate: panicles 1–4 dm. long: calyx becoming 3–3.5 cm. long: corolla lobes narrowly ovate.—(LIFE-PLANT. LIVE-LEAF. SHADOW-WITCH.)—Hammocks and waste places, S Fla. Nat. of trop. Asia.—(*W. I., Mex., C. A., S. A.*)—All year.—Frequently grown in tropical gardens. Well known for its tenacity of life. The corolla is greenish with dark-red streaks.

FAMILY 3. PENTHORACEAE—DITCH-STONECROP FAMILY

Caulescent plants. Leaves alternate: blades toothed. Flowers perfect, borne in terminal cymes. Calyx of 5 or 6 sepals. Corolla of 5 or 6, inconspicuous veinless petals, or wanting. Androecium of twice as many stamens as sepals. Gynoecium of 5 or 6 carpels united to the abruptly contracted middle. Fruit depressed, the follicle bodies circumscissile near the base of the free portion.—One genus and one species.

1. PENTHORUM [Gronov.] L. Perennial herbs with rootstocks. Flowers greenish-white or yellowish, borne along one side of the cyme-branches. Styles incurved during anthesis, recurved at maturity. Follicles stout, ascending.



1. P. sedoides L. Plant 1–6 dm. tall, bright-green, the stem above, and branches angled: leaf-blades narrowly elliptic to elliptic-lanceolate or lanceolate, 3–15 cm. long, finely serrate: cyme-branches spreading: flowers contiguous: sepals ovate, about 1.5 mm. long, acute: capsule depressed, 4–5 mm. broad, each lobe tipped with the recurved style. — (DITCH-STONECROP.) — Meadows, swamps, and low grounds, various provinces, Fla. to Tex., Minn., and N. B.—Sum.

FAMILY 4. PARNASSIACEAE—GRASS-OF-PARNASSUS FAMILY

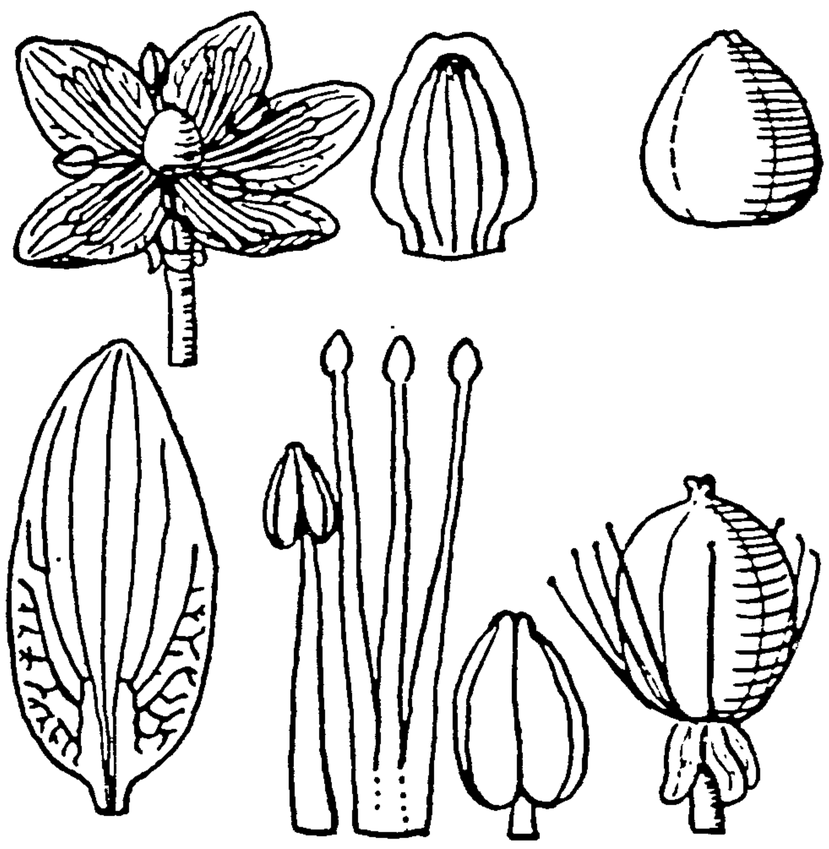
Acaulescent herbs, with glabrous foliage. Leaves basal: blades leathery, entire: petioles usually elongate, erect, dilated at the base. Scapes simple, each bearing a bract. Flowers perfect, white or pale-yellow, solitary. Calyx persistent: sepals 5, imbricate. Corolla of 5 variously shaped imbricate, entire or fimbriate, white, often conspicuously nerved, deciduous petals. Androecium of 5 hypogynous or perigynous stamens alternating with entire or tufted staminodia. Gynoecium of 3 or 4 united carpels.

Ovary 1-celled, superior or half-inferior, with 3 or 4 parietal placentae. Styles very short. Stigmas 3 or 4, over the placentae. Fruit a 1-celled loculicidal capsule, 3–4-valved at the apex. Seeds numerous, winged, the testa loose.—Represented by the following genus:

1. **PARNASSIA** L. Perennial herbs with basal or nearly basal leaves. Flower terminating the scape.—About 15 species, natives of the north temperate and arctic regions.—Sum.–fall.—GRASSES-OF-PARNASSUS. BOG-STARS.

Petals clawless: leaf-blades ovate, elliptic, or orbicular.
  Anthers acute: petals slightly 5–7-veined. 1. *P. grandifolia.*
  Anthers obtuse: petals strongly many-veined. 2. *P. caroliniana.*
Petals clawed: leaf-blades reniform or orbicular-reniform. 3. *P. asarifolia.*

1. P. grandifolia DC. Plant 3–6 dm. tall: leaf-blades oval or ovate, usually subcordate, 3–10 cm. long: sepals oval to elliptic, 4–5 mm. long: petals elliptic to oval, 15–20 mm. long: anthers 4–5 mm. long: capsule about 1.5 cm. long.—(UNDINE)—Wet soil, various provinces, Fla. to Tex., Mo., and Va.



2. P. caroliniana Michx. Plant 2–4 dm. tall: leaf-blades ovate, 2–5 cm. long, cordate: sepals linear-elliptic, 5–6 mm. long: petals broadly oval, 15–17 mm. long: anthers 2–3 mm. long: capsule oval or ovoid-oval, 1–1.5 cm. long.—Swamps and flat woods, Coastal Plain, Fla. to N. C.—Fall.

3. P. asarifolia Vent. Plant 2–4 dm. tall: leaf-blades 4–10 cm. wide: sepals ovate or elliptic, 4–5 mm. long: petals 15–21 mm. long; blades ovate to suborbicular: capsule ovoid, 6–11 mm. long.—(BROOK-PARNASSIA.)—Wet woods and stony brooks, often in acid soil, Blue Ridge to Appalachian provinces and rarely Coastal Plain, Ga. to Ala., W. Va. and Va.

FAMILY 5. SAXIFRAGACEAE—SAXIFRAGE FAMILY

Herbs. Leaves alternate or sometimes opposite: blades simple or compound. Flowers perfect or polygamo-dioecious. Calyx of 5, or rarely of 4 or more, persistent sepals. Corolla of 5, or rarely of 4 or more, petals, or wanting. Androecium of as many stamens as there are sepals, or twice as many. Gynoecium of fewer carpels than there are sepals. Fruit a capsule, or follicles.—About 90 genera and 650 species of wide geographic distribution.

Leaves with simple blades: flowers perfect. Tribe I. SAXIFRAGACEAE.
Leaves with 3-ternate blades: flowers polygamous. Tribe II. ASTILBEAE.

I. SAXIFRAGACEAE

Placentae parietal, sometimes nearly basal: ovary 1-celled.
  Flowers solitary and axillary to leaf-like bracts, or 2–4 in corymbs each with a leaf-like bract.
    Sepals, and petals, 5: stamens 10: gynoecium 3-carpellary: annuals. 1. LEPUROPETALON.
    Sepals, and petals, 4: stamens 4–8: gynoecium 2-carpellary: perennials. 2. CHRYSOSPLENIUM.
  Flowers in elongate racemes or panicles.
    Gynoecium of 2, or 3, equal carpels.
      Petals pinnately cleft or pinnatifid. 3. MITELLA.
      Petals entire or toothed. 4. HEUCHERA.
    Gynoecium of 2 very unequal carpels. 5. TIARELLA.

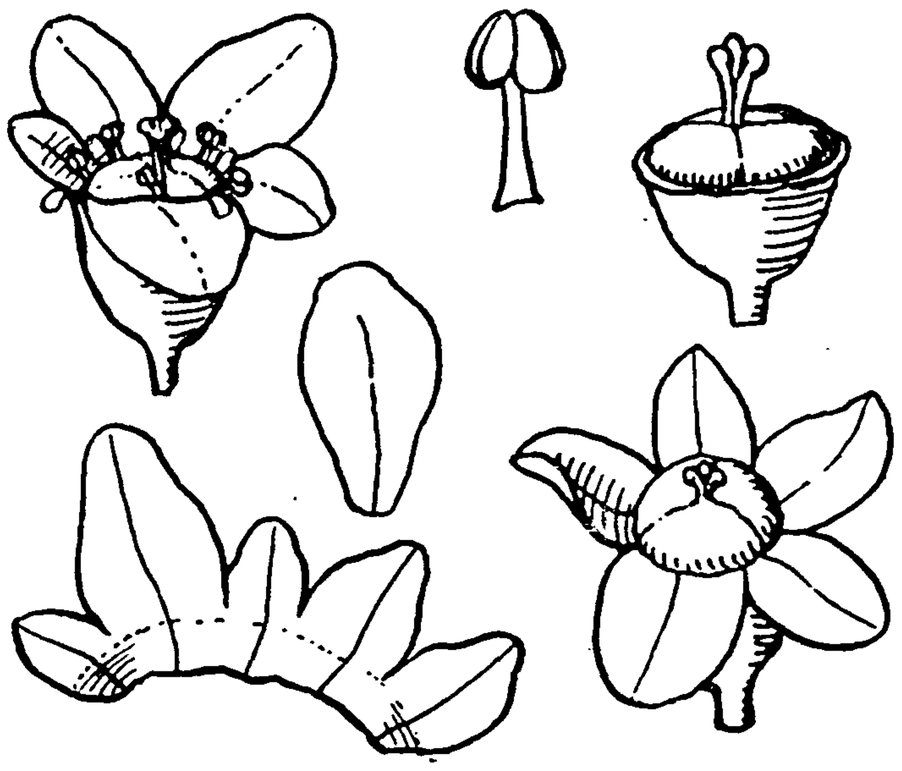
Placentae axile: ovary 2-celled or rarely 3-celled.
  Stamens 5: ovary almost all adnate to the hypanthium. 6. THEROPHON.
  Stamens 10: ovary basally adnate to the hypanthium.
    Corolla regular, the petals essentially similar. 7. MICRANTHES.
    Corolla irregular, the petals of 2 kinds. 8. HYDATICA.

II. ASTILBEAE

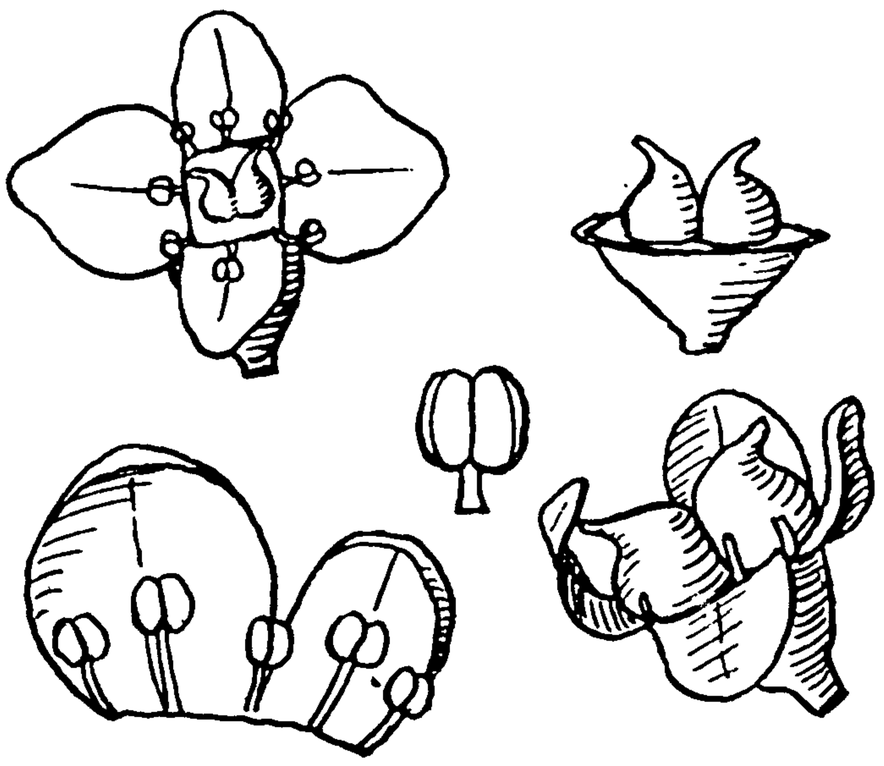
Large herbs with much-branched plume-like panicles. 9. ASTILBE.

1. **LEPUROPETALON** Ell. Annual diminutive terrestrial herbs. Leaf-blades entire. Petals white. Stamens 10. Styles 3.—One species.

1. **L. spathulatum** (Muhl.) Ell. Plant glabrous, in patches 1–15 cm. wide: leaf-blades spatulate, 2–6 mm. long: sepals ovate, about 1 mm. long: petals broad: follicles short-beaked.—Moist clay soil, Coastal Plain extending into adj. provinces, Ga. to Tex. and S. C.—(*Mex.*)—This plant is so small that it may have been overlooked outside of the range given above. The whole plant is inconspicuous, the pale flowers serving but little more to attract the attention than the foliage. The calyx and corolla are curiously irregular in the size of the parts.

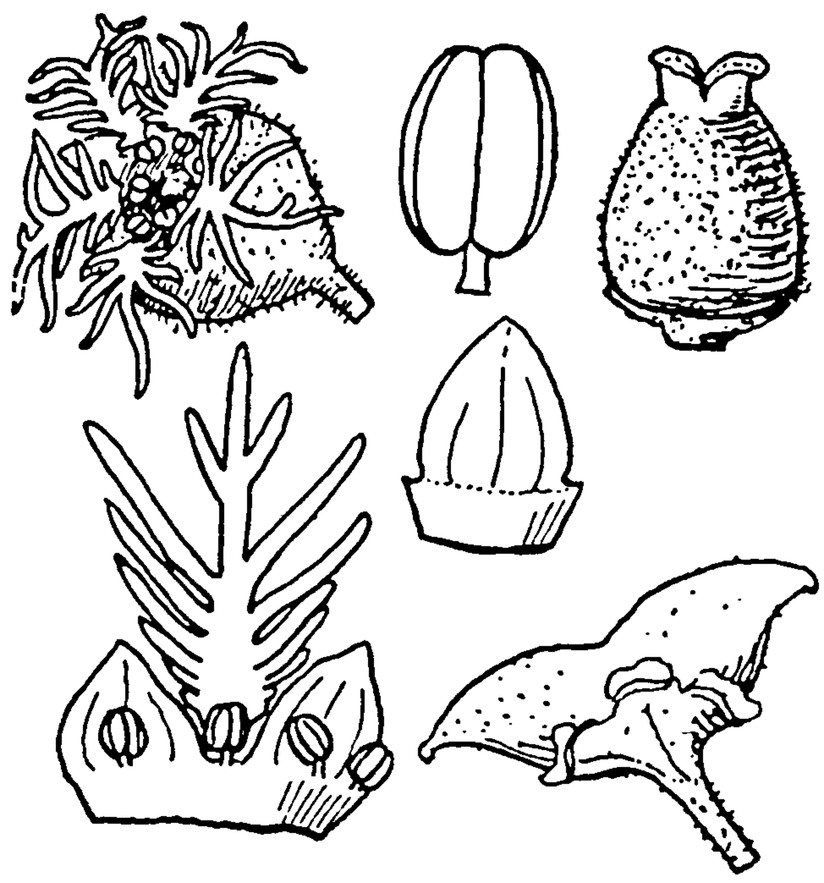


2. **CHRYSOSPLENIUM** [Tourn.] L. Perennial (ours) semiaquatic herbs. Leaf-blades crenate or lobed. Petals wanting. Stamens mostly 4–8. Styles 2. Capsule flattened, 2–lobed, very short.—About 15 species, natives of the north temperate zone and S. America.



1. **C. americanum** Schwein. Plants decumbent, 2–20 cm. long: leaf-blades suborbicular to orbicular-reniform, 4–20 mm. broad: sepals 4, yellowish or purplish within: capsule about 3 mm. long.—(GOLDEN-SAXIFRAGE. WATER-CARPET.)—Brooks and wet shaded places, various provinces, in Coastal Plain only N, Ga. to Sask. and N. S.—Spr.

3. **MITELLA** L. Perennial herbs with lateral flowering branches. Leaf-blades lobed and toothed. Flowers in racemes. Sepals equal. Petals pectinately pinnatifid. Stamens 10: filaments very short. Styles very short. Capsule abruptly narrowed near the apex.—Four species, North American and Asiatic.



1. **M. diphylla** L. Plant 2–4 dm. tall: leaf-blades ovate to orbicular-ovate in outline, 3–5 lobed, 3–8 cm. long, acute, cordate: petals white: sepals ovate, 1–1.5 mm. long, acute: petals 2.5–3 mm. long, white: capsule 2-beaked at the apex, about 3 mm. long.—(FAIRY-CUP. MITREWORT. BISHOP'S-CAP.)—Rich woods, various provinces, N. C. to Mo., Minn., and Que.—Spr.

4. **HEUCHERA** L. Perennial herbs with lateral flowering branches. Leaf-blades toothed and usually lobed. Flowers in panicled cymes. Sepals often unequal. Petals entire, erose or toothed. Stamens 5: filaments elongate. Styles slender. Capsule gradually narrowed into the slender elongate beak. — About 70 species, North American. — ALUMROOTS. ROCK-GERANIUMS. CRAG-JANGLES.—The hypathium and calyx are green, pink, or red, and sometimes veined; the petals are usually whitish or yellowish.

Flowers essentially regular, the upper sepals sometimes larger than the lower.
  Petals much exceeding the calyx, with long very slender claws and long blades.
    Leaves, at least the larger ones, with low rounded lobes: panicle-branches filiform or capillary. I. MICRANTHAE.
    Leaves, at least the larger ones, with prominent angled lobes: panicle-branches slender. II. VILLOSAE.
  Petals shorter than the calyx or slightly longer, with short stout claws and short blades. III. AMERICANAE.
Flowers decidedly irregular: calyx oblique or 2-lipped. IV. HISPIDAE.

I. MICRANTHAE

Sepals acute or acutish, ovate, much shorter than the hypanthium during anthesis: petioles villous. 1. *H. parviflora.*
Sepals obtuse, broadly ovate, as long as the hypanthium during anthesis or nearly so: petioles puberulent. 2. *H. puberula.*

II. VILLOSAE

Terminal leaf-lobe elongate: petals, and filaments, thrice as long as the sepals or more. 3. *H. villosa.*
Terminal leaf-lobe short and wide: petals, and filaments, twice as long as the sepals or less. 4. *H. macrorhiza.*

III. AMERICANAE

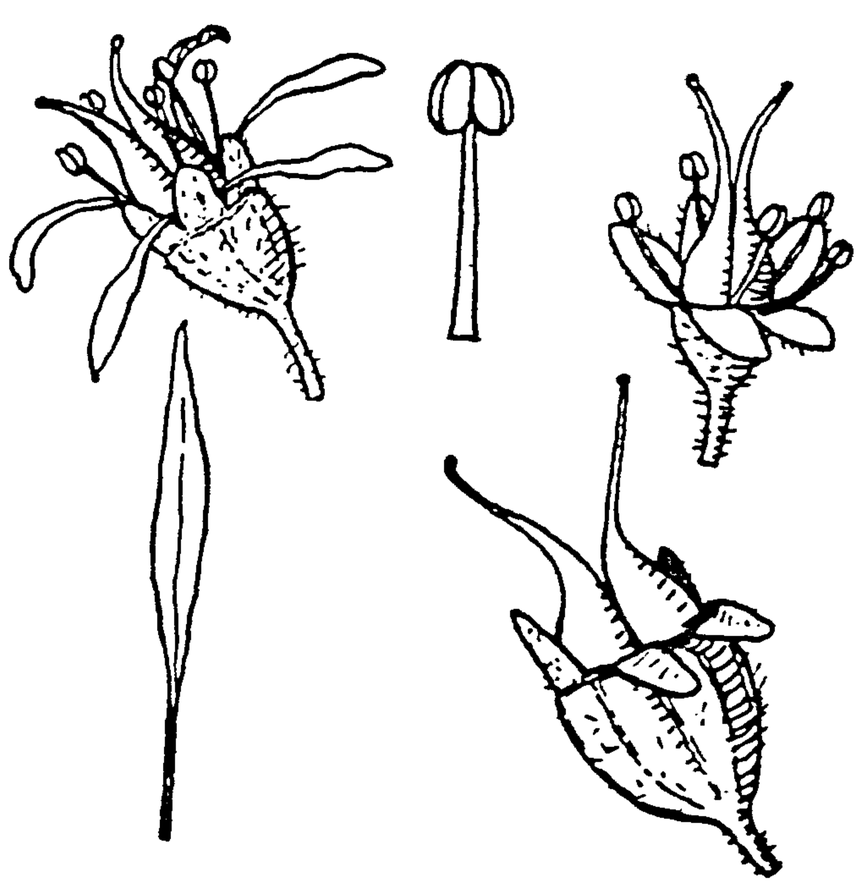
Petals as long as the calyx or shorter.
  Hypanthium fully 1 mm. long during anthesis, this together with the calyx becoming 4–5 mm. long. 5. *H. americana.*
  Hypanthium barely 1 mm. long during anthesis, this together with the calyx becoming 3 mm. long. 6. *H. calycosa.*
Petals longer than the calyx, or individually shorter.
  Petal-blades narrow, entire: flowering branches leafless. 7. *H. lancipetala.*
  Petal-blades broad, toothed: flowering branches leafy. 8. *H. Curtisii.*

IV. HISPIDAE

Flowering branches leafy: free portion of the hypanthium not gibbous.
  Sepals of the upper lip about as long as the free portion of the hypanthium, the lateral ones not spreading. 9. *H. pubescens.*
  Sepals of the upper lip shorter than the free portion of the hypanthium, the lateral ones spreading. 10. *H. aceroides.*
Flowering branches not leafy: free portion of the hypanthium gibbous below.
  Anthers long-exserted: flowers short. 11. *H. hirsuticaulis.*
  Anthers included or slightly exserted: flowers long.
    Lower petals with spatulate blades, longer than the sepals. 12. *H. scabra.*
    Lower petals with orbicular or rhombic-orbicular blades, about as long as the sepals. 13. *H. longiflora.*

1. **H. parviflora** Bartl. Leaf-blades reniform, often broadly so, 5–14 cm. wide, more or less pubescent, often reddish beneath, the teeth broad, mucronate: flowering branch 1.5–6 dm. tall, villous-hirsute; inflorescence branches glandular-hirsute; petals 2–2.5 mm. long, with linear or spatulate blades. [*H. Rugelii* Shuttlw.]—Cliffs and rocky places, Blue Ridge, Appalachian provinces, and Interior Low Plateaus, Ga. to Ala., Ill., and Va.—Sum.–fall.—Corolla usually white.

2. **H. puberula** Mackenzie & Bush. Similar to *H. parviflora* in habit and closely related to it: leaf-blades usually smaller and with shorter hairs: flowering branch 0.5–3 dm. tall, puberulent: inflorescence branches



finely glandular-pubescent: petals 3.5–4 mm. long, with linear-spatulate or spatulate blades.—Bluffs, Ozark and Interior Low Plateaus, Tenn. to Mo. and Ky.—Sum.–fall.—Corolla white.

3. H. villosa Michx. Leaf-blades 5–12 cm. wide, acutely 7–9 lobed; middle lobe relatively long and narrow; petioles villous or glabrate: flowering branch 2–4 dm. tall: calyx and hypanthium long-hairy: petals 2–2.5 mm. long: panicle at maturity, as well as during anthesis, rather lax and open.—(HAIRY-ALUMROOT. ROCK-SANICLE.)—Cliffs and rocks, Blue Ridge, Interior Low Plateau provinces, Ga. to Ky. and Va.—Sum.–fall.—Corolla pinkish.

4. H. macrorhiza Small. Leaf-blades 8–22 cm. wide, shallowly 5–9-lobed; middle lobe very broadly triangular or depressed; petioles densely villous-hirsute: flowering branch 2–8 dm. tall: calyx and hypanthium short-hairy: petals 2.5–3 mm. long: panicle at maturity, as well as during anthesis, rather compact.—(GIANT-ALUMROOT.)—Bluffs and river-banks, Appalachian and Interior Low Plateau provinces, Ala. to Ark. and Ky.—Sum.–fall.—Corolla white.

5. H. americana L. Leaf-blades orbicular-ovate or suborbicular, 5–11 cm. wide, the lobes broad and with broad teeth: flowering branch 3–9 dm. tall: sepals much longer than the free portion of the hypanthium: petals about 1.5 mm. long, spatulate, the blades elliptic, finely toothed.—The campestrian plants are commonly copiously hirsute.—(COMMON-ALUMROOT. ROCK-GERANIUM.)—Rocky woods, various provinces, Ga. to La., Minn., Ont., and Conn.—Sum.—Corolla yellowish or pinkish.

6. H. calycosa Small. Resembling *H. americana*, but more slender: leaf-blades ovate or orbicular-ovate, 5–10 cm. wide, shallowly lobed, ciliate and pubescent near the margins: flowering branch 2–9 dm. tall: hypanthium turbinate, barely 1 mm. long during anthesis: sepals broadly ovate, rounded at the apex: petals oblong or spatulate-oblong, much surpassed by the sepals, acute or apiculate, entire.—Woods, Appalachian provinces, Ga. and Ala.—Spr.—Corolla pinkish.

7. H. lancipetala Rydb. Leaf-blades suborbicular or orbicular-reniform, 4–8 cm. wide, with shallow lobes and broad sharply mucronate teeth, glabrous except the margins and the veins beneath: flowering branch short-hirsute: sepals about as long as the free-portion of the hypanthium: petals white or pink, about 3 mm. long, much exceeding the sepals, the blades oblanceolate to linear-elliptic, acute, entire.—Woods, Interior Low Plateaus, Tenn. and Ky.—Spr.–sum.

8. H. Curtisii T. & G. Leaf-blades suborbicular, varying to ovate or reniform, sometimes hispidulous above, and ciliate, the lobes broad and with few coarse broad teeth: flowering branch glabrous below, puberulent above, leafy: petals purple or pinkish, exceeding the sepals, the blades usually rhombic, finely toothed, (individually shorter than the sepals, and flowering branches very leafy in *H. Curtisii crenata*): free portion of the mature hypanthium short.—Rich woods, various provinces N of Coastal Plain, N. C. and Tenn. to N. Y.—Spr.–sum.

9. H. pubescens Pursh. Leaf-blades orbicular-ovate, glabrate in age, the lobes often ovate, with usually sharply mucronate teeth: flowering branch densely glandular-puberulent at least above: sepals together with the hypanthium 6–8 mm. long, the lower ones ovate: petals purplish, the larger ones 2.5–3 mm. long, the blades obovate, coarsely toothed: free portion of the mature hypanthium long: stamens exserted.—(MARBLED-ALUMROOT.)—Rocky woods, various provinces N of Coastal Plain, N. C., and Tenn. to Mo. and Pa.—Spr.–sum.

10. H. aceroides Rydb. Leaf-blades ovate, about 7-lobed, shining above, puberulent beneath: flowering branch glabrous or glandular-puberulent above, usually leafy: sepals together with the hypanthium 8–10 mm. long, the lower ones oblong: petals pink, the larger ones 3.5–4 mm. long, the blades cuneate, toothed: free portion of the mature hypanthium much longer than in *H. pubescens*.—Hillsides, Blue Ridge, N. C.—Spr.

11. H. hirsuticaulis (Wheelock) Rydb. Leaf-blades reniform or suborbicular with broad lobes, hirsute on both sides, except sometimes in age: flowering branch hirsute: hypanthium together with the sepals 5–6 mm. long at maturity: petals spatulate, about 2 mm. long, the upper ones shorter than the sepals: capsule-body short.—Shaded banks, various provinces, La. to Mo. and Mich.—Spr.—Corolla pinkish or yellowish.

12. H. scabra Rydb. Leaf-blades ovate, 7–9-lobed, scabrous-puberulent above, hirsute beneath: flowering branch glandular-puberulent, usually leafless: hypanthium green, together with the sepals 9–10 mm. long; lower sepals narrowly oblong: petals pinkish or purplish, the larger ones 4–5 mm. long, the blades spatulate.—Woods, Blue Ridge, N. C.—Sum.

13. H. longiflora Rydb. Leaf-blades orbicular-reniform to ovate, glabrous, except the margins and veins beneath, the lobes shallow and rounded: flowering branch glabrous or glandular-pubescent above: hypanthium often reddish: lower sepals elliptic, together with the hypanthium 6–8 mm. long: petals yellowish, or purple-tipped, the larger ones 4–4.5 mm. long, the blades orbicular or rhombic-orbicular.—Hillsides, Appalachian and Interior Low Plateau provinces, Ala. to Ky.—Spr.

Heuchera hispida Pursh with a narrow, lax panicle, nearly regular flowers, and exserted anthers was originally described from plants from the mountains of Virginia. It is not definitely known from our range.

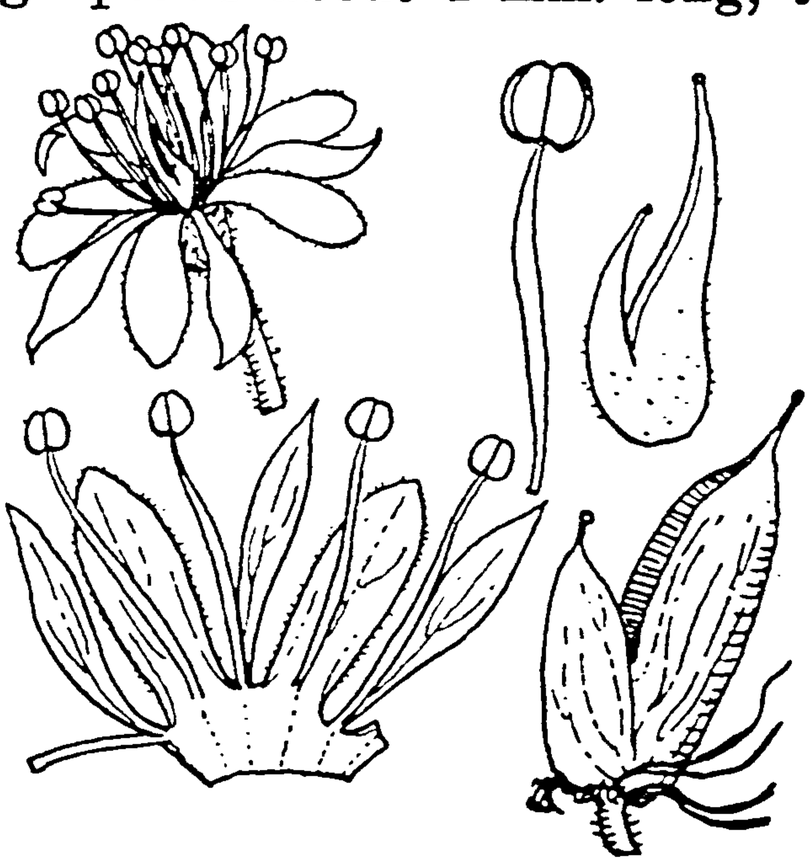
5. **TIARELLA** L. Perennial herbs usually with leafy runners. Leaves mostly at the base of the plant, except on the runners. Petals white, with narrow blades. Stamens 10, the filaments elongated. Styles unequal. Follicles unequal, with erect beaks.—About 6 species, North American and Asiatic.—Spr.—FALSE-MITREWORTS. COOLWORTS. FOAM-FLOWERS.

Terminal leaf-lobe ovate, larger than the others: petals long-clawed. 1. *T. cordifolia.*

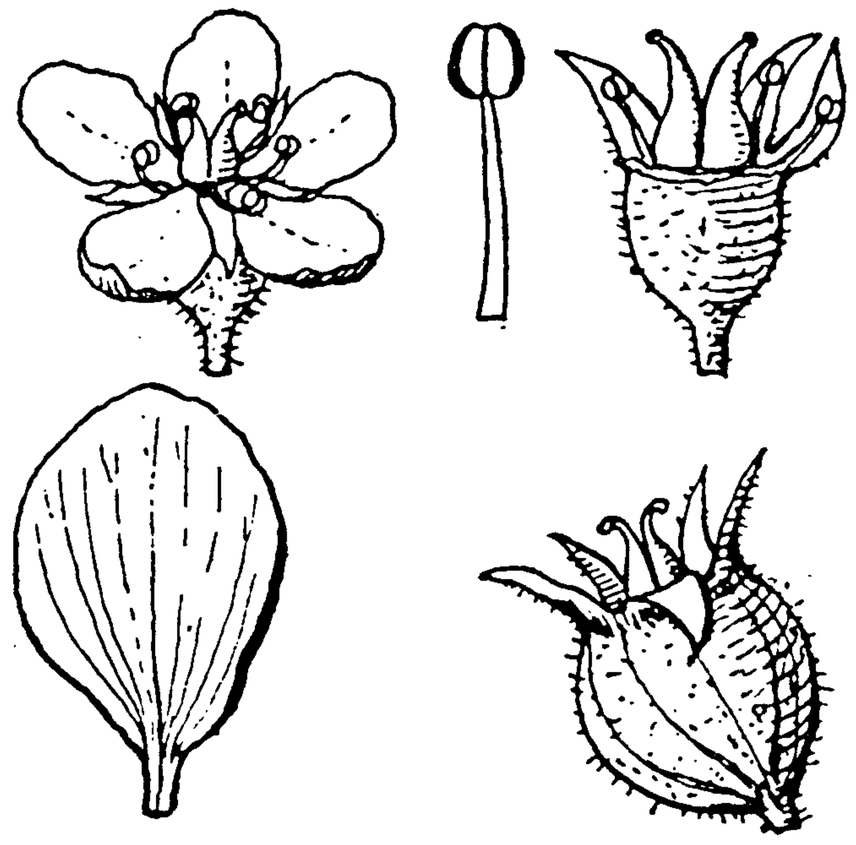
Terminal leaf-lobe triangular, not larger than the others: petals short-clawed. 2. *T. macrophylla.*

1. T. cordifolia L. Leaf-blades mostly 3–7 cm. wide; petioles mostly hirsute: flowering branch scaly: sepals typically oblong: petals about 4 mm. long, the claw over ½ as long as the acuminate blade: capsule slender-beaked.—Rich woods, various provinces, rarely Coastal Plain, Ga. to Ark., Minn., and N. S.

2. T. macrophylla Small. Leaf-blades mostly 12–20 cm. wide; petioles mostly glabrous: flowering branch leafy: sepals typically ovate or oval: petals 2.5–3 mm. long, the claw less than ½ as long as the acute blade: capsule short-beaked.—Woods, Blue Ridge, N. C.—It is impossible to tell whether this species is starting on its career or if its restricted range is the remnant of a former wider distribution.



6. **THEROPHON** Raf. Perennial herbs without runners. Leaves mainly cauline. Petals white, with broad blades. Stamens 5, the filaments short. Styles equal. Follicles with spreading beaks. [*Boykinia* Nutt.]—About 10 species, North American.



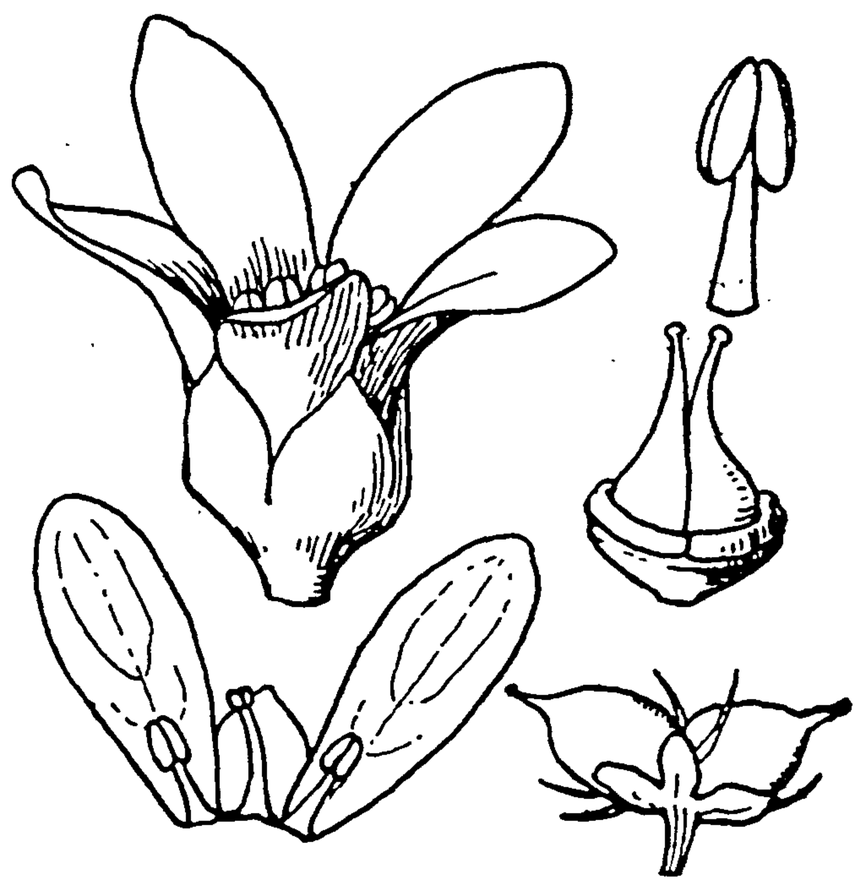
1. T. aconitifolium (Nutt.) Millsp. Plants 2–10 dm. tall: leaf-blades 4–18 cm. wide, 5–9-lobed and incised-serrate: sepals triangular-ovate to broadly lanceolate, about 1 mm. long: petals 3–3.5 mm. long; blades oval to orbicular-ovate: capsule 3–4 mm. long. [*B. aconitifolia* Nutt.]—(BROOK-SAXIFRAGE.)—Along streams, Blue Ridge and Appalachian provinces, Ga. to Tenn., W. Va., and Va.—Spr.-sum.

7. **MICRANTHES** Haw. Acaulescent herbs with short caudices. Leaf-blades ovate to flabellate, or rarely cordate at the base. Petals white, nearly equal. Carpels slightly united below. [*Saxifraga* L. in part.]—About 65 species, most abundant in the cooler parts of the Northern Hemisphere.—SAXIFRAGES. DWARF-SAXIFRAGES.

Filaments subulate or filiform-subulate.
- Petals wholly white, destitute of yellow spots. — 1. M. *virginiensis.*
- Petals bimaculate, each with 2 yellow spots below the middle.
  - Petals lanceolate to elliptic-lanceolate: follicles 4–5 mm. long. — 2. *M. tennesseensis.*
  - Petals elliptic: follicles 2.5–3 mm. long. — 3. *M. Careyana.*

Filaments clavate.
- Leaf-blades not elongate: petals bimaculate. — 4. *M. caroliniana.*
- Leaf-blades elongate: petals wholly white. — 5. *M. micranthidifolia.*

1. M. virginiensis (Michx.) Small. Leaves 2–20 cm. long; blades ovate, oval or elliptic: cymules becoming lax, the axis often elongate: petals elliptic, 4–5.5 mm. long. [*S. virginiensis* Michx.]—(ST. PETER'S-CABBAGE.)—Dry hillsides and rocks, various provinces, Ga. to Ala., Minn., and N. B.—Spr.



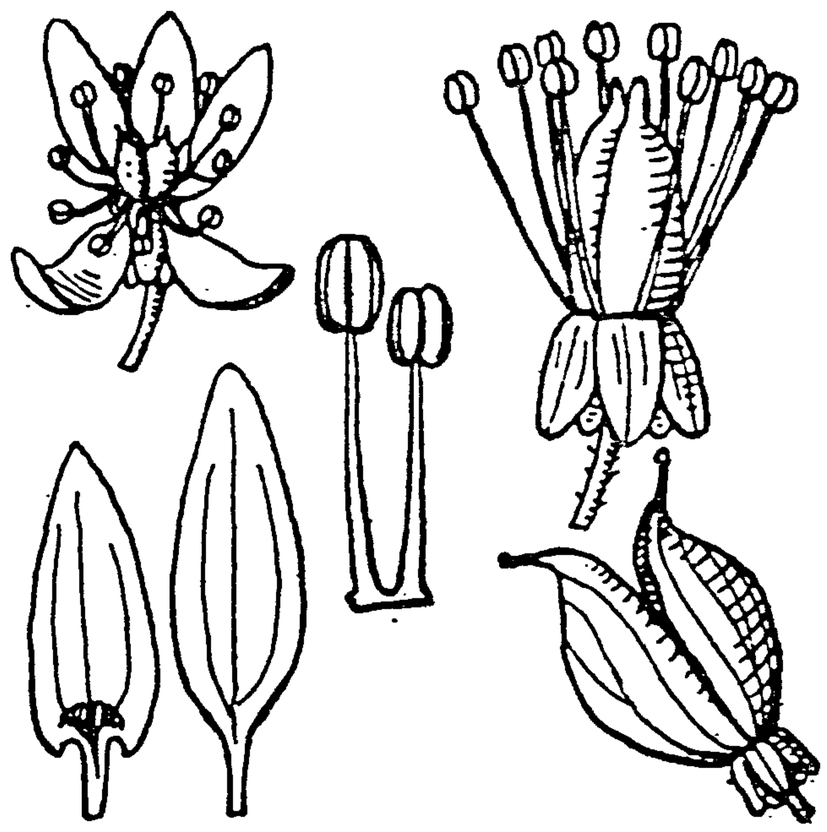
2. M. tennesseensis Small. Leaves 4–13 cm. long; blades ovate, sometimes suborbicular or elliptic-ovate or occasionally orbicular-reniform: cymules open: petals lanceolate to elliptic-lanceolate, 4–4.5 mm. long.—(GOLDEN-EYE SAXIFRAGE.)—Limestone bluffs, Appalachian Valley, Tenn.—Spr.

3. M. Careyana (A. Gray) Small. Leaves 2–11 cm. long; blades ovate to orbicular-ovate or somewhat reniform: cymules lax: petals elliptic, 2.5–3 mm. long: follicles 2.5–3 mm. long. [*S. Careyana* A. Gray.]—Cliffs, Blue Ridge, N. C. and Tenn.—Spr.

4. M. caroliniana (A. Gray) Small. Leaves 5–19 cm. long; blades oval to orbicular or ovate: panicle wide: petals 3–3.5 mm. long, ovate to elliptic-ovate: follicles 4–6 mm. long. [*S. caroliniana* A. Gray.]—Banks and limestone cliffs, Blue Ridge and Appalachian provinces, N. C. to Va.—Sum.

5. **M. micranthidifolia** (Haw.) Small. Leaves 10–32 cm. long; blades elliptic to oblanceolate: panicles narrow: petals 2.5–3.5 mm. long, elliptic to elliptic-ovate: follicles 7–8 mm. long. [*S. erosa* Pursh.]—(LETTUCE-SAXIFRAGE. MOUNTAIN-LETTUCE.)—Brooks, logs, and wet rocks, Blue Ridge and Appalachian provinces, Ga. to Tenn. and Pa.—Spr.–sum.

8. **HYDATICA** Neck. Acaulescent herbs with short or slightly elongate caudices. Leaf-blades broadened upward. Petals mainly white, unequal, the 3 upper ones abruptly narrowed into the claws, the 2 lower ones gradually narrowed. Carpels nearly distinct. [*Spatularia* Haw.]—About 12 species, natives of the cooler parts of the Northern Hemisphere.

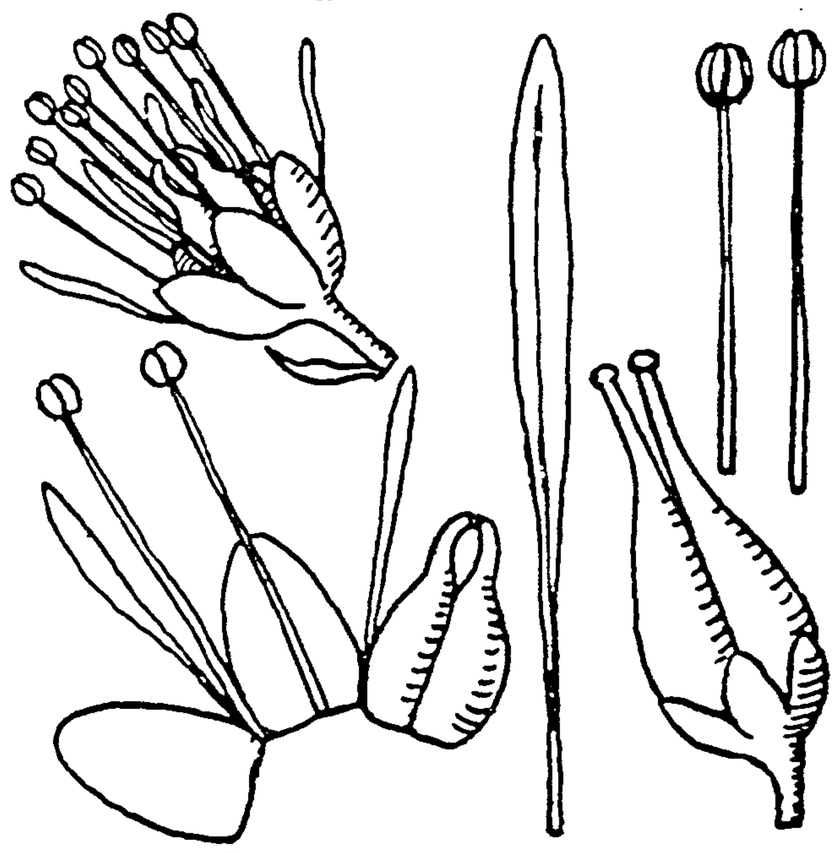


1. **H. petiolaris** (Raf.) Small. Plant 2–9 dm. tall or rarely smaller: leaf-blades 3–30 cm. long, oblanceolate to elliptic-spatulate, coarsely dentate-serrate: sepals strongly deflexed at maturity: petals 3.5–5.5 mm. long, the 3 upper with lanceolate blades; the 2 lower ones with yellow or brown spots: follicles 4.5–5 mm. long. [*Saxifraga leucanthemifolia* Michx. *Spatularia Michauxii* (Britton) Small.]—(MOUNTAIN-SAXIFRAGE.)—Cliffs and banks, Blue Ridge, Ga. to Tenn and Va.—Sum.

9. **ASTILBE** Hamilt. Perennial caulescent herbs. Leaflets numerous, the terminal one 3-lobed. Flowers very numerous, in spikes, racemes or panicles. Petals 5, or rarely 4, long and narrow, white, or wanting. Follicles erect.—About 7 species, North American and Asiatic.—FALSE GOAT'S-BEARDS. FEATHER-TREES.

Leaflets sharply toothed or lobed: fruit 4–5 mm. high. 1. *A. biternata.*
Leaflets crenately toothed or lobed: fruit 3 mm. high. 2. *A. crenatilobata.*

1. **A. biternata** (Vent.) Britton. Plants 1–2 m. tall: leaflet-blades sharply serrate or incised: panicle 1–3 dm. long; petals linear-spatulate, 2.5–4 mm. long, or obsolete in perfect flowers: fruit conic, the follicles 4–5 mm. long. [*A. dodecandra* Don.]—Woods, Blue Ridge, extending into adj. provinces, Ga. to Tenn. and Va.—Spr.—Resembles *Aruncus* in habit, but more graceful.



2. **A. crenatiloba** (Britton) Small. Plants rather smaller than those of *A. biternata:* leaflet-blades crenate, the teeth mucronate-tipped: fruit ovoid, the follicles 3 mm. long.—Woods, Roan Mt. region, Blue Ridge, N. C. and Tenn.—Sum.—Interesting, not only in being two of our very large herbs, but also, as in the case of *Tiarella,* a pair of species, the one widely distributed; the other very local.

FAMILY 6. HYDRANGEACEAE—HYDRANGEA FAMILY

Shrubs or trees, or vines. Leaves mostly opposite: blades often toothed. Flowers borne in raceme-like, corymb-like, or panicled cymes.

Calyx of usually 4–10 sepals, surmounting the often ribbed hypanthium. Corolla of mostly 4–10 petals. Androecium of 8–many stamens. Gynoecium of 2–5, or rarely of 10, united carpels. Ovary wholly or partially inferior. Fruit capsular.—About 16 genera and 80 species, natives of temperate and tropical regions.

Sepals, and petals, 5 or fewer: styles and stigmas mostly distinct: stigmas when united elongate.
  Stamens 8–10: corolla relatively small; petals valvate. 1. HYDRANGEA.
  Stamens 12–20, or more: corolla large; petals convolute. 2. PHILADELPHUS.
Sepals, and petals, 7 or more: styles united: stigma depressed. 3. DECUMARIA.

1. **HYDRANGEA** [Gronov.] L. Shrubs. Leaf-blades toothed or lobed. Sepals 4 or 5, minute, or petal-like in the marginal flowers. Petals valvate, small, white or greenish. Stamens 8–10. Styles wanting. Capsule opening between the stigmas.—About 35 species, American and Asiatic.—Spr.–sum.—HYDRANGEAS. SEVENBARKS.—Several species are grown as ornamental shrubs. They are hardy northward of their natural range.

Leaf-blades merely toothed: inflorescence corymbose; sterile flowers around the edge. I. RADIATEAE.
Leaf-blades deeply lobed: inflorescence paniculate, sterile flowers throughout the panicle. II. QUERCIFOLIAE.

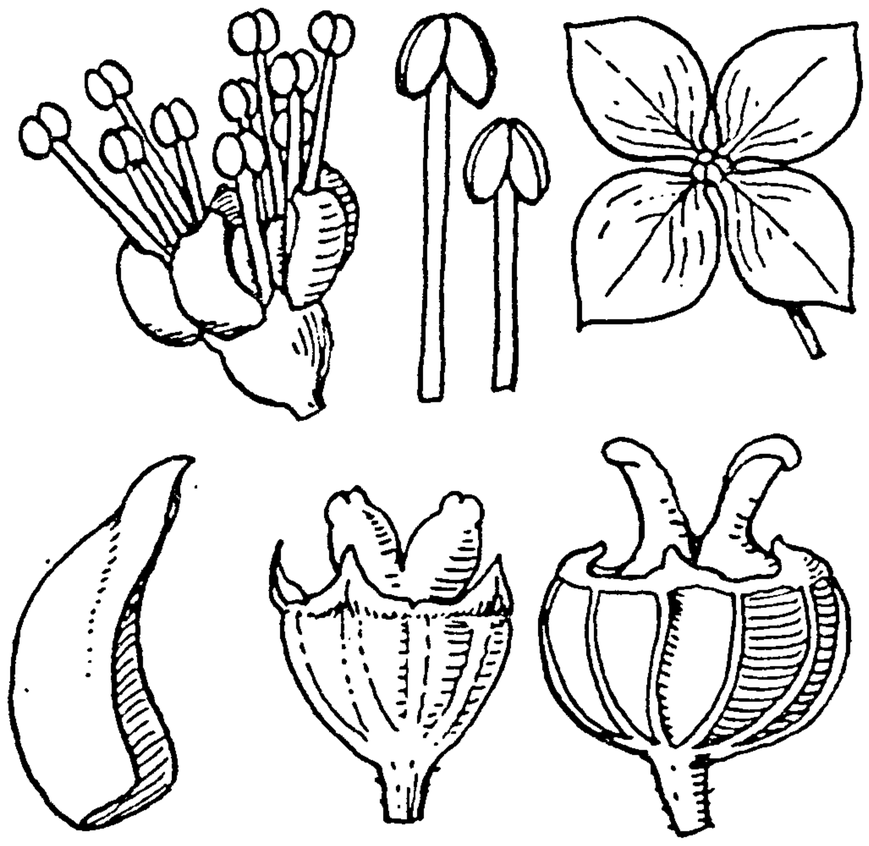
I. RADIATEAE

Leaf-blades glabrous or inconspicuously pubescent beneath: hypanthium mostly wider than high. 1. *H. arborescens.*
Leaf-blades conspicuously and copiously pubescent beneath: hypanthium mostly higher than wide.
  Leaf-blades membranous, light-gray beneath. 2. *H. cinerea.*
  Leaf-blades leathery, bright-white beneath. 3. *H. radiata.*

II. QUERCIFOLIAE

Spreading or sprawling shrub, with large panicles. 4. *H. quercifolia.*

1. H. arborescens L. Shrub with sparingly pubescent branches and twigs: leaf-blades thin, ovate, oval or elliptic: petals 1–1.5 mm. long: capsule-body 2–2.5 mm. long, broader than high.—(MOUNTAIN HYDRANGEA. SMOOTH-HYDRANGEA. SEVEN-BARK.)—Woods and stream-banks, various provinces, Fla. to La., and N. Y.



2. H. cinerea Small. Shrub with copiously or densely pubescent twigs: hypanthium about 2 mm. wide at maturity: petals 1.5–2 mm. long: capsule-body usually higher than broad.—(ASHY-HYDRANGEA.)—Woods, Blue Ridge and Appalachian provinces, Ga. to Ala., Tenn., and N. C.

3. H. radiata Walt. Shrub with finely pubescent twigs: hypanthium about 2.5 mm. wide at maturity: ray-flowers few: petals 1–1.5 mm. long: capsule often smaller than that of *H. cinerea.*—(SNOWY-HYDRANGEA. SILVER-LEAF.)—Rocky slopes, Blue Ridge and Piedmont, S. C. and N. C.

4. H. quercifolia Bartr. Shrub with densely reddish-tomentose twigs which are usually also arachnoid: hypanthium 3–3.5 mm. wide at maturity: ray-flowers numerous, becoming purple: petals 1.5–2 mm. long: capsule-body about 3 mm. high.—(GRAY-BEARD. OLD-MAN'S BEARD. SEVEN-BARK. OAK-LEAF HYDRANGEA.)—River-banks, bluffs and woods, Coastal Plain, extending into adj. provinces, N Fla. to Miss., Tenn., and Ga.

2. **PHILADELPHUS**[1] L. Shrubs. Leaves deciduous: blades entire or toothed. Sepals 4 or 5, prominent. Petals convolute, relatively large, white or pinkish. Stamens numerous, or very rarely 15. Styles present. Capsule loculicidal.—About 50 species, North American and Eurasian.—SYRINGAS. MOCK-ORANGES.—Some species are much grown for their abundance of white flowers.

Stigmas and upper part of styles distinct.
  Flowers few together, not more than 5: bark of last year's shoots brown, exfoliating. I. GRANDIFLORI.
  Flowers racemose, numerous: bark of last year's shoots gray or cchre-colored, not exfoliating. II. CORONARII.
Stigmas and styles united. III. HIRSUTI.

I. GRANDIFLORI

Pedicel and hypanthium glabrous.
  Base of the mature hypanthium attenuate to the pedicel, the point of union obscure.
    Leaf-blades ovate or oval, entire or with minute distant teeth: sepals acute. 1. *P. inodorus.*
    Leaf-blades ovate-lanceolate to elliptic, sharply and remotely toothed: sepals acuminate. 2. *P. grandiflorus.*
  Base of the mature hypanthium abruptly contracted, it and the pedicel sharply differentiated. 3. *P. gloriosus.*
Pedicel and hypanthium, and outer surface of the sepals pubescent. 4. *P. floridus.*

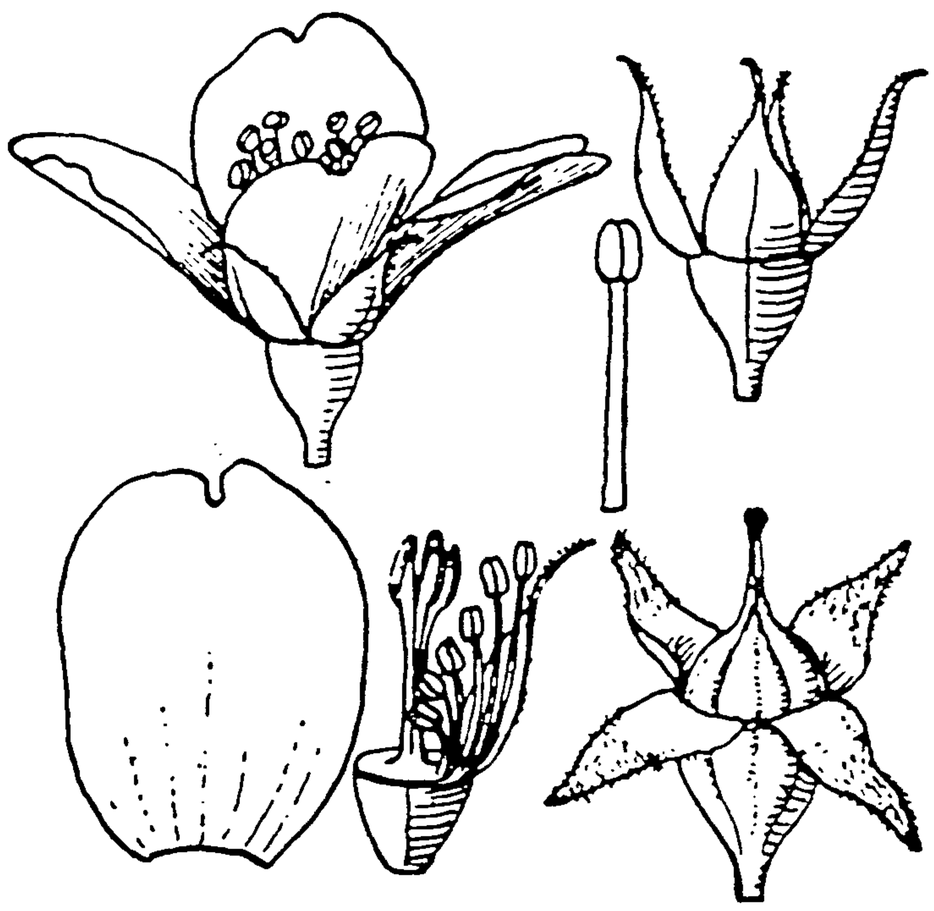
II. CORONARII

Leaf-blades pubescent on the lower surface: hypanthium and calyx pubescent. 5. *P. latifolius.*
Leaf-blades glabrous or nearly so: hypanthium and calyx glabrous without. 6. *P. intectus.*

III. HIRSUTI

Shrub with erect or spreading branches: twigs brownish, more or less pubescent. 7. *P. hirsutus.*

1. P. inodorus L. Shrub 2–3 m. high, the bark of the shoots brown, exfoliating: leaf-blades ovate, broadly ovate or oval, acute at the apex, rounded or slightly narrowed at the base, 3–10 cm. long, glabrate or with short appressed hairs either scattered or more copious especially on the lower surface, (thickly covered with stiff appressed hairs on the lower surface, and frequently on the sepals, in *P. inodorus strigosus*), prominently 3-veined, entire or with minute distant teeth: sepals acute: corolla 3–4 cm. wide.—Banks of streams and moist woods, various provinces, Ala. to Miss., Tenn., and N. C.



2. P. grandiflorus Willd. Shrub 2–3 m. tall, the bark of the shoots brown, exfoliating: leaf-blades ovate-lanceolate or elliptic, acuminate, sharply dentate, either rounded or narrowed at the base, 4–12 cm. long, glabrate or with short appressed pubescence. 3-veined: sepals acuminate: corolla 4–5 cm. wide: capsule attenuate to the pedicel.—Banks of streams and moist rocky slopes, Blue Ridge and Piedmont extending into Coastal Plain along river bluffs, Fla. to Tenn. and Va.—*P. laxus* Schrad., similar to the last, but with much narrower leaf-blades more densely appressed pubescent on the lower surface, and smaller and usually solitary flowers, is unknown to the writer in a wild state, although apparently of eastern American origin.

[1] Contributed by Chauncey Delos Beadle.

3. P. gloriosus Beadle. Shrub 2–3 m. high, the bark of the previous season's growth dark brown, exfoliating: leaf-blades ovate or elliptic, acute at the apex, either rounded or narrowed at the base, 4–10 cm. long, glabrate or with short appressed hairs, remotely dentate, 3-veined: hypanthium and sepals glabrous: corolla 3–4 cm. broad: stigmas distinct: capsule abruptly contracted at the base.—Rocky banks of the Coosa River in the Appalachian Valley, Ga.

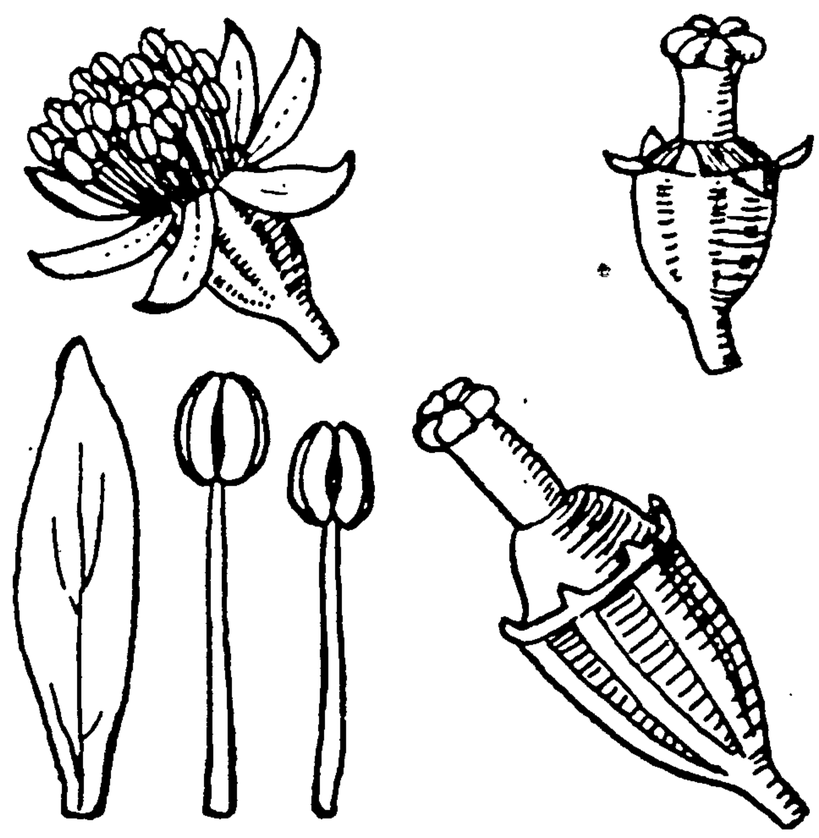
4. P. floridus Beadle. Shrub 2–3 m. high, the bark of last year's shoots dark brown, exfoliating: leaf-blades oval or elliptic, acute, remotely toothed, either rounded or narrowed at the base, 4–10 cm. long, sparsely pubescent on the lower surface, glabrate above, prominently 3-veined: pedicels, hypanthium, and exterior surface of the acuminate sepals appressed pubescent: corolla 3–4 cm. broad: stigmas not united.—Rocky slopes and banks of streams, Floyd Co. in the Appalachian Valley, Ga.

5. P. latifolius Schrad. Shrub 2–3 m. high, the bark of the shoots gray or yellowish, not exfoliating: leaf-blades broadly ovate or elliptic, acute at the apex, rounded or contracted at the base, 3–10 cm. long, mostly dentate, softly and densely pubescent on the lower surface, glabrate or glabrous above, 3–4-nerved: flowers racemose, the lower pair axillary: pedicels, hypanthium, and exterior of the sepals pubescent: corolla 3–4 cm. wide: stigmas not united.—Rocky banks of streams, Interior Low Plateaus, Tenn.—*P. pubescens* Loisel., resembling the last but with brown bark and more numerous flowers, the lower two or three pairs of which are axillary, is unknown in a wild state.

6. P. intectus Beadle. Shrub 2–3 m. tall, the bark of the shoots gray or ochre-color, not exfoliating: leaf-blades ovate, oval or elliptic, acute or acuminate at the apex, either rounded or narrowed at the base, 3–12 cm. long, glabrous or glabrate on both surfaces, prominently 3-nerved either entire or prominently 3-nerved: flowers solitary or in twos and threes; pedicels, hypanthium, and exterior of the sepals glabrous: corolla 3–4 cm. wide: stigmas distinct.—Bluffs of the Cumberland River, Interior Low Plateaus, Tenn.

7. P. hirsutus Nutt. Shrub 1–2.5 m. tall, the bark of the previous season's growth brown, exfoliating: leaf-blades ovate or ovate-acuminate, either rounded or narrowed at the base, gray-pubescent on the lower surface, appressed-pubescent or eventually glabrate or glabrous above, 3–8 cm. long, dentate, prominently 3-nerved: flowers solitary or in twos and threes; pedicels, hypanthium, and sepals pubescent: corolla 2–3 cm. wide: stigmas united.—Rocky slopes and banks of streams, various provinces N of Coastal Plain, Ga. to Ala., Tenn., and N. C.

3. DECUMARIA L. Woody vines. Leaves opposite, deciduous: blades entire or sparingly toothed. Flowers numerous in corymbose panicles, small. Sepals 7–10, minute. Petals narrow, valvate. Stamens 20–30. Styles united. Capsule opening between the ribs.—One species.



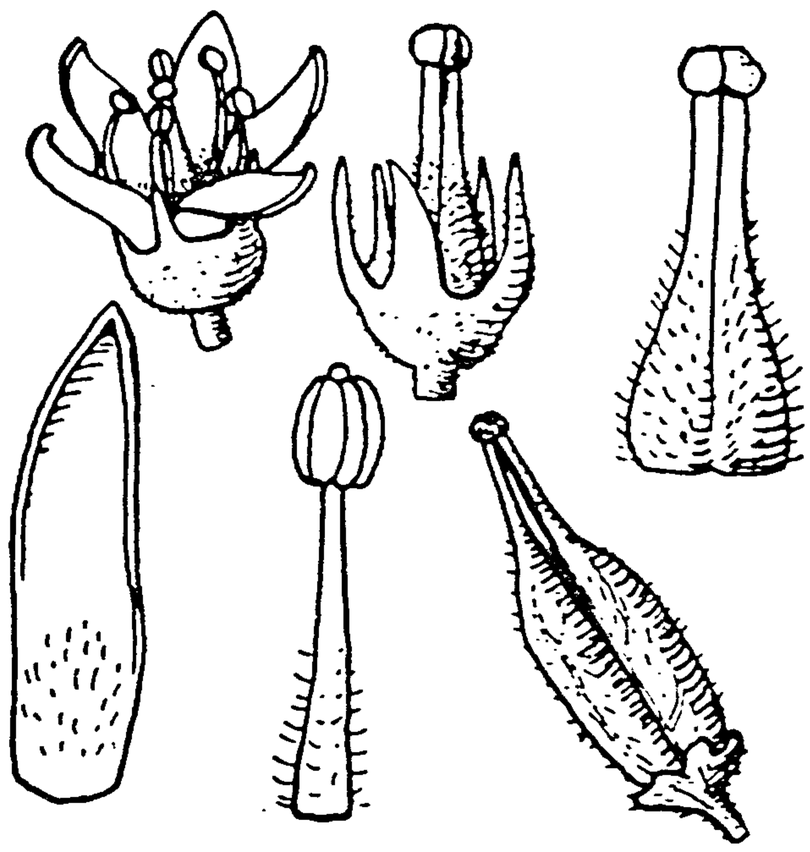
1. D. barbara L. Stem with aerial rootlets: leaf-blades tender, ovate, oval or suborbicular or rarely obovate, 5–10 cm. long, toothed: hypanthium with a prominent border: flowers fragrant: petals white, elliptic to linear-elliptic, 3–4 mm. long: capsule-body 4–5 mm. long, with a capitate beak.—(WOOD-VAMP. COWITCH-VINE. CLIMBING-HYDRANGEA.)—River-banks and low woods, Coastal Plain and adj. provinces, Fla. to La., Tenn., and Va.—Spr.

Family 7. **ITEACEAE**—Virginia-willow Family

Shrubs or trees. Leaves alternate: blades toothed. Flowers perfect, borne in racemes or panicles. Calyx of 5 sepals. Corolla of 5 narrow petals. Androecium of 5 stamens. Gynoecium of 2 united carpels. Fruit an elongate, 2-grooved, septicidal capsule. Seeds flattened. One genus.

1. ITEA [Gronov.] L. Shrubs with estipulate leaves. Racemes narrow. Hypanthium flattish, not accrescent.—About 5 species, the following and the others in Asia.

1. I. virginica L. Shrub 1–3 m. tall, twigs and racemes pubescent: leaf-blades elliptic to oval or obovate, 5–14 cm. long, bristly serrate: sepals lanceolate, 1–1.5 mm. long: petals linear to linear-lanceolate, 4 mm. long, white: filaments pubescent: capsule 6–8 mm. long.—(Virginia-willow. Sweet-spires. Tassel-white.) — Swamps and stream-banks, Coastal Plain and adj. provinces, Fla. to La., Mo., and N. J.—Spr.—This shrub often grows intermixed with other shrubs which produce an abundance of racemes of white or pale-pink flowers.

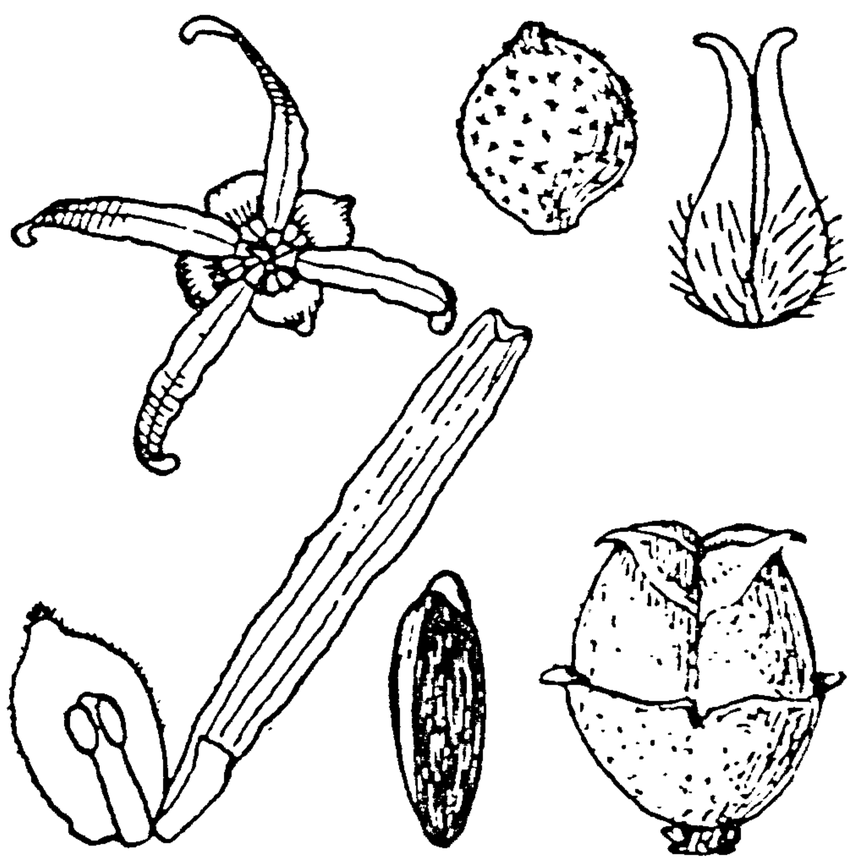


Family 8. **HAMAMELIDACEAE**—Witch-hazel Family

Shrubs or trees. Leaves alternate: blades mostly toothed. Flowers perfect, monoecious, or polygamous, variously clustered or spicate. Calyx of 4 or 5 sepals. Corolla of 4 or 5 narrow petals, or wanting. Androecium of 4–many stamens. Gynoecium 2- or 3-carpellary. Ovary 2- or 3-celled: styles distinct. Fruit a leathery or woody capsule, often elastically dehiscent.—About 13 genera and 40 species, widely distributed.

Petals 4, ribbon-shaped: stamens 4: filaments short. 1. Hamamelis.
Petals wanting: stamens about 24: filaments elongate. 2. Fothergilla.

1. HAMAMELIS L. Shrubs or trees with perfect or polygamous flowers, which are borne 3 together on short lateral peduncles. Sepals spreading or reflexed. Petals linear or nearly so. Stamens 4; filaments short-subulate. Capsule abruptly beaked.—About 5 species, North American and Asiatic.

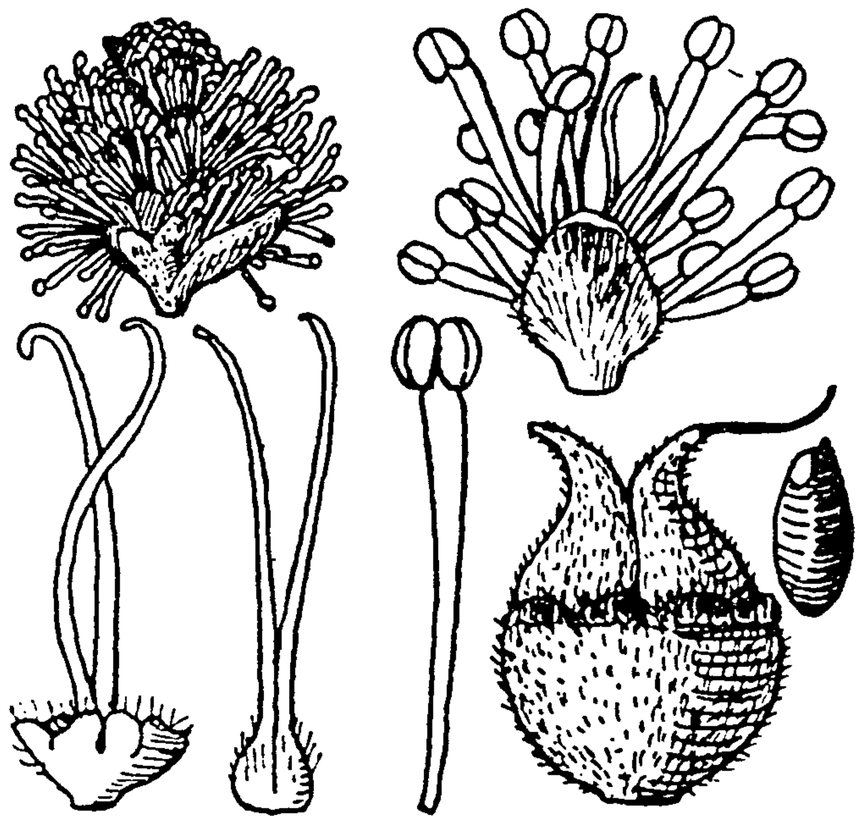


1. H. virginiana L. Small tree or shrub: leaf-blades suborbicular, oval-elliptic or obovate, 4–15 cm. long, coarsely crenate: petals yellow, 1–2 cm. long: capsule ovoid to subglobose, 12–15 mm. long, elastically dehiscent. — (Snappy-hazel. Winter-bloom. Witch-hazel.)—Low woods and moist hillsides, various provinces, N Fla. to Tex., Ont., and N. S.—Fall.—The bark is used medicinally. A small-leaved form occurs on the coast of S. C.

2. **FOTHERGILLA** Murr. Shrubs with monoecious flowers, which are borne in dense terminal ament-like yellow spikes. Sepals erect. Stamens numerous, long-clavate. Capsule gradually beaked. Three species.—Spr.—WITCH-ALDERS. BUTTON-HAZELS. BUTTON-ALDERS.

Flowers appearing with the leaves: leaf-blades glabrate above: filaments mostly over 11 mm. long: capsules 11–13 mm. long. 1. *F. major.*
Flowers appearing before the leaves: leaf-blades stellate-pubescent above: filaments and capsules less than 11 mm. long.
  Leaf-blades cuneate or rounded at the base, much longer than broad, toothed only near the apex. 2. *F. Gardeni.*
  Leaf-blades cordate at the base, about as broad as long, toothed from below the middle to the apex. 3. *F. parvifolia.*

1. F. major Lodd. Shrub mostly 1 m. tall or more: leaf-blades suborbicular to ovate, obovate to oval, 6–12 cm. long, coarsely repand-toothed or nearly entire: capsule 10–13 mm. long.—Rich moist woods, Blue Ridge and Appalachian provinces, Ala. to S. C. and N. C.



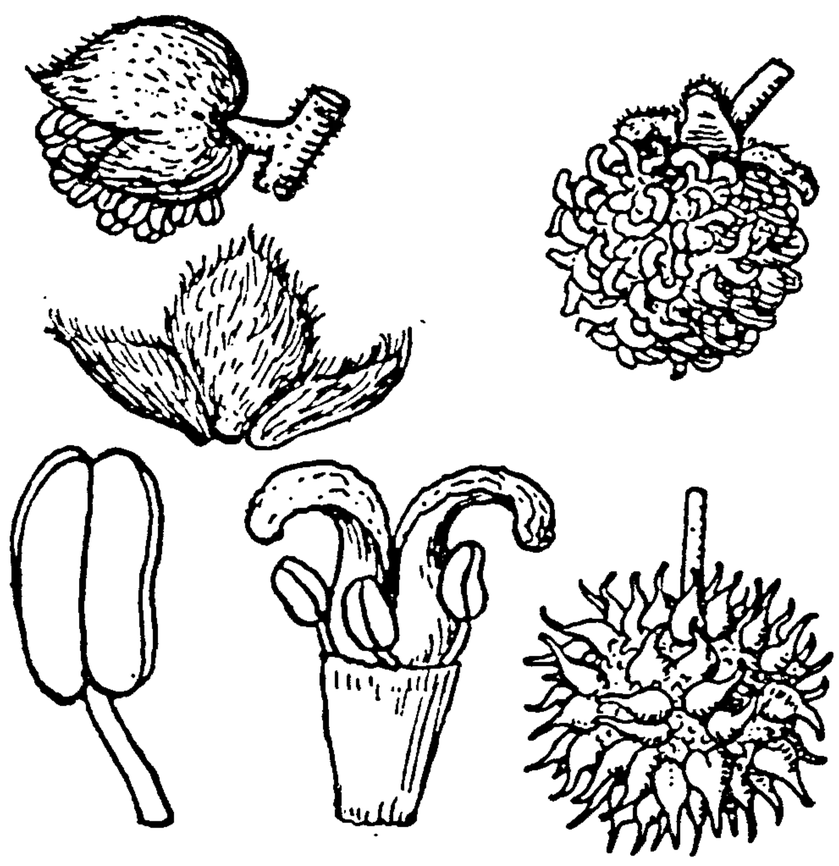
2. F. Gardeni Murr. Isolated shrub usually less than 1 m. tall, branched: leaf-blades elliptic to elliptic-ovate or ovate-orbicular below, repand or coarsely toothed near the apex: capsule 8–10 mm. long. [*F. alnifolia* L.f.]—(DWARF-WITCH-ALDER.)—Sandy swamps, Coastal Plain, Ga. to Ala. and Va.

3. F. parvifolia Kearney. Gregarious shrub 3–6 dm. tall, with underground stems: leaf-blades suborbicular to oval, or broadly ovate, 2–6 cm. long, coarsely toothed mostly from below the middle to the apex: capsule 6–8 mm. long.—Pinelands, Coastal Plain, Fla. to N. C.

FAMILY 9. **ALTINGIACEAE**—SWEET-GUM FAMILY

Shrubs or trees. Leaves alternate: blades toothed or palmately lobed. Flowers usually monoecious, borne in heads. Calyx and corolla wanting. Androecium of numerous stamens interspersed in scales. Gynoecium of 2 partially united carpels. Stigmas introrse. Fruit a head of many concreted capsules.—Five genera and about 10 species.

1. **LIQUIDAMBAR** L. Trees with balsamic sap and corky-winged branches. Leaf-blades palmately lobed. Staminate flowers in racemes or panicled green heads. Pistillate flowers in solitary heads. Fruiting head pendulous. Fertile seeds small, numerous, winged at one end.—One species.



1. L. Styraciflua L. Tree becoming 45 m. tall: leaf-blades 5-lobed, the lobes triangular or lanceolate: fruiting heads 3–4 cm. in diameter, persistent: fertile seeds about 1 cm. long.—(SWEET-GUM. RED-GUM. BILSTED. STAR-LEAVED GUM. ALLIGATOR-TREE.)—Moderately rich soil, Coastal Plain and adj. provinces, C. Fla. to Tex., Mo., and Conn.—(*Mex.*)—The foliage is brilliant in fall. The wood is used for cabinet-work, interior

finish of houses, for boxes and utensils. The leaf-blades are sometimes 7-lobed.

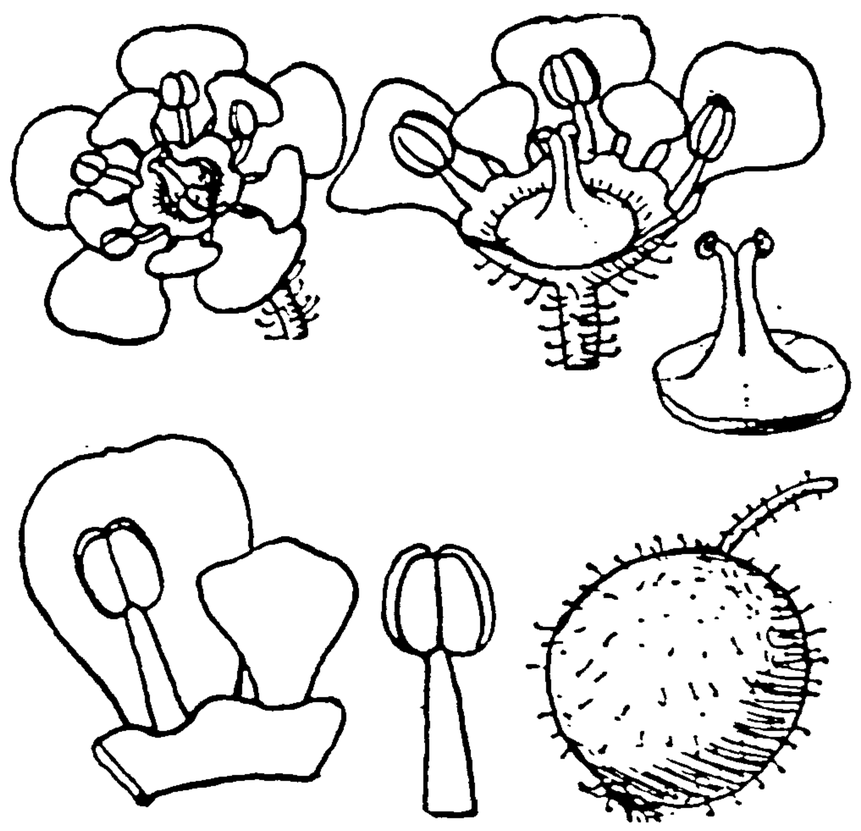
FAMILY 10. GROSSULARIACEAE—GOOSEBERRY FAMILY

Shrubs, often spiny. Leaves alternate: blades usually palmately lobed or cleft. Flowers borne in racemes, which are sometimes reduced to few flowers, or to a single flower. Calyx of 5 sepals borne on the hypanthium. Corolla of 5 relatively small petals. Androecium of 5 stamens. Gynoecium of 2 partially united carpels: ovary with 2 parietal placentae: styles more or less united. Fruit a many-seeded berry.—Three genera and about 130 species, widely distributed.

Flower-stalk jointed beneath the ovary: berry disarticulating from the pedicel. 1. RIBES.

Flower-stalk not jointed beneath the ovary: berry not disarticulating from the pedicel. 2. GROSSULARIA.

1. RIBES L. Shrubs with erect stems and branches, without nodal spines. Leaf-blades palmately veined and lobed. Flowers solitary or few together, borne on stalks which are jointed beneath the ovary. Berry disarticulating from the stalk.—About 65 species, natives of the north temperate zone, Mexico, and South America.—CURRANTS.



1. R. glandulosum Grauer. Decumbent diffuse shrub: leaf-blades with angular lobes: racemes with remote flowers and minute ovate bracts: hypanthium short, less than 3 mm. long: sepals rhombic-obovate, 2.5–3 mm. long: petals greenish or reddish, cuneate, about 1 mm. long: berry red, 5–8 mm. in diameter. [*R. prostratum* L'Her.] — (FETID-CURRANT. SKUNK-CURRANT. MOUNTAIN-CURRANT.)—Deep woods, Blue Ridge and more N provinces, N. C. to Colo., Sask., Mich., and Lab.

R. resinosum Pursh, described in the first edition of Flora of the Southeastern United States, from specimens supposed to have been collected in the mountains of North Carolina by Fraser, seems to be *Ribes orientale* Desf. of Asia.

2. GROSSULARIA Mill. Shrubs with irregular arching or recurved stems and branches, and with nodal spines. Leaf-blades palmately veined. Flowers in drooping racemes or panicles, borne on stalks which are jointed near the base. Petals white or greenish-white. Berry not disarticulating from the stalk.—About 60 species, natives of the north temperate zone.—Spr.—The fruits are sometimes used for preserves.—GOOSEBERRIES.

Sepals longer than the free part of the hypanthium: stamens exserted.
Berry smooth and glabrous: petals not tubular. I. ROTUNDIFOLIAE.
Berry echinate, the spines gland-tipped: petals tubular. II. ECHINELLAE.
Sepals shorter than the free part of the hypanthium: stamens included. III. CYNOSBATI.

I. ROTUNDIFOLIAE

Filaments pubescent: hypanthium glandular. 1. *G. curvata.*
Filaments glabrous: hypanthium glandless.

Free part of the hypanthium and calyx 5–6 mm. long: petals flabellate-cuneate, 1.5–2 mm. long. 2. *G. rotundifolia.*
Free part of the hypanthium and calyx 9–10 mm. long: petals cuneate-spatulate, 2–2.5 mm. long. 3. *G. missouriensis.*

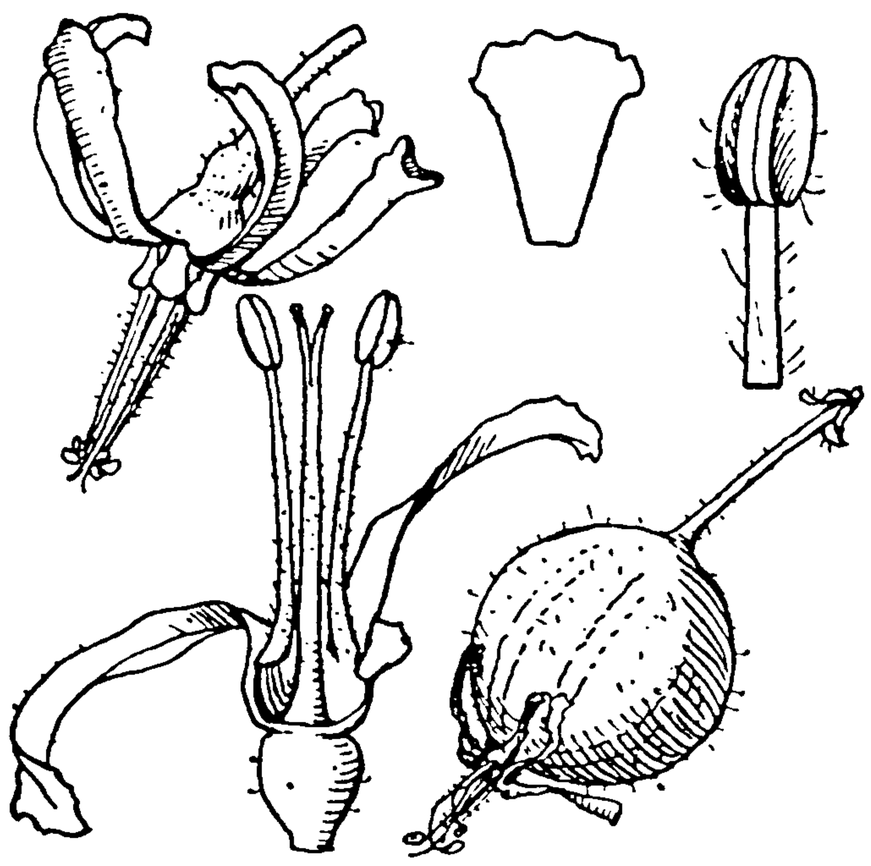
II. ECHINELLAE

A diffuse shrub with glabrous or nearly glabrous twigs: free part of the hypanthium shorter than the sepals: stamens long-exserted. 4. *G. Echinella.*

III. CYNOSBATI

A rigid shrub with closely pubescent twigs: free part of hypanthium longer than the sepals: stamens not long-exserted. 5. *G. Cynosbati.*

1. G. curvata (Small) Coville & Britton. Diffusely branched shrub, 5–8 dm. tall, armed with slender red spines, the branches purplish, shining, recurved or drooping: leaf-blade 1–2 cm. broad, 3-lobed, the lobes few-toothed: hypanthium glandular: sepals linear or linear-spatulate, 6–10 mm. long, white, reflexed and recurved: petals prominently toothed near the apex, 1.5–2 mm. long: stamens conspicuous, erect: filaments villous: berry globular, 6–8 mm. in diameter. [*Ribes curvatum* Small.] — (GRANITE-GOOSEBERRY.) — Rocky woods and slopes, Piedmont, Ala. and Ga.



2. G. rotundifolia (Michx.) Coville & Britton. Straggling shrub, armed with slender reddish spines, the branches reddish or brownish: leaf-blades 2–5 cm. in diameter, glabrate or finely pubescent, especially on the veins beneath, 3–5-lobed, the lobes toothed: hypanthium glabrous: sepals linear or linear-spatulate, 4–5 mm. long, obtuse: petals flabellate-cuneate, 1.5–2 mm. long, undulate, at length crisped: filaments glabrous: anthers less than 1 mm. long: berry globular, 8–10 mm. in diameter, reddish-purple. [*Ribes rotundifolium* Michx].—(MOUNTAIN-GOOSEBERRY.)—Rocky woods, Piedmont and Blue Ridge, rarely extending into Coastal Plain, N. C. to N. Y. and Mass.

3. G. missouriensis (Nutt.) Coville & Britton. Spreading shrub, armed with stout reddish spines, the branches gray or buff: leaf-blades 2–6 cm. in diameter, more or less pubescent, especially when young, prominently 3–5–lobed; hypanthium glabrous: sepals narrowly elliptic or elliptic-spatulate or narrower, 7–8 mm. long: petals cuneate-spatulate, 2–2.5 mm. long: filaments glabrous: anthers over 1 mm. long: berry globular, 9–15 mm. in diameter, purple or brown. [*R. gracile* Pursh not Michx.]—(MISSOURI-GOOSEBERRY.)—Thickets and river-banks, Interior Low Plateaus and Central Lowlands, Tenn. to Kans., S. D., and Mass.

4. G. Echinella Coville. Diffuse shrub with pale-gray branches armed with stoutish purple-brown spines: leaf-blades 1–2.5 cm. in diameter, 3-lobed, with the lobes incised and toothed, sparingly pubescent, slender-petioled: lower part of the hypanthium closely covered with gland-tipped hairs; free part campanulate, 3–5.4 cm. long, pubescent: sepals linear or nearly so, about 5 mm. long, recurved: petals erect, about 3 mm. long, convolutely-folded and thus tubular, with the truncate top rolled back: filaments glabrous; anthers less than 2 mm. long: style glabrous: berry globular or oval, green, echinate, 1–1.5 cm. in diameter, closely beset with gland-tipped spines.—(FLORIDA-GOOSEBERRY.)—Rich woods, along Lake Miccosukee, Fla.—The leaves unfold in the fall.

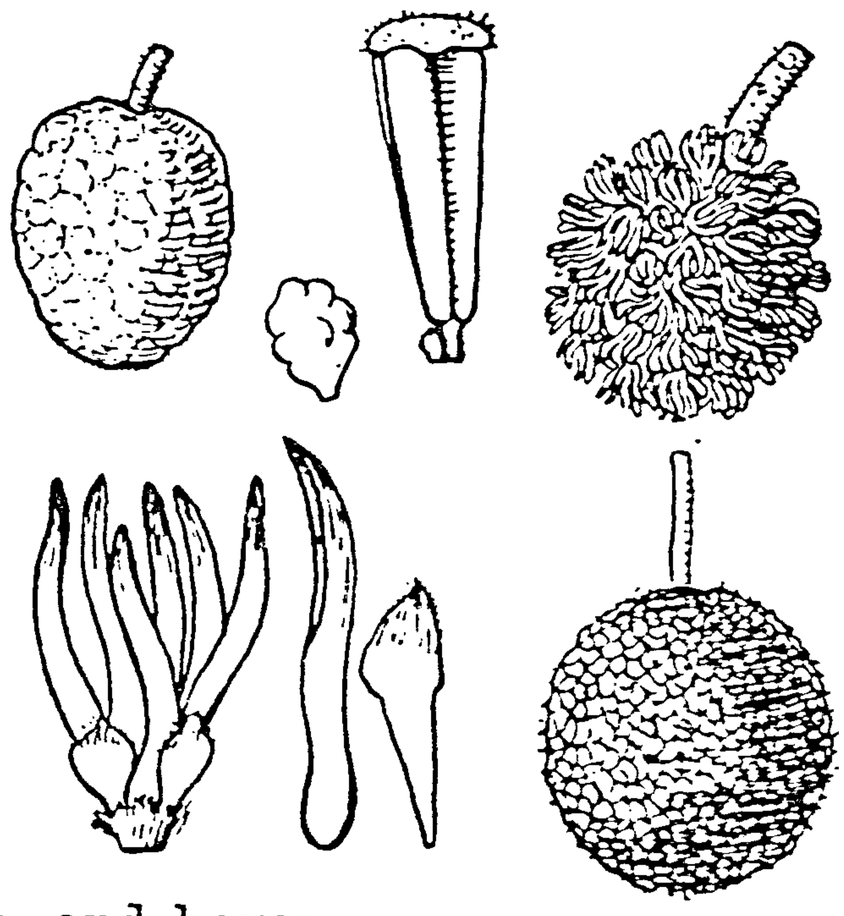
5. G. Cynosbati L. Straggling shrub, with spine-armed and often prickly stems, the twigs closely pubescent: leaf-blades 3–5 cm. in diameter, pubescent

when young, mostly glabrate in age, 3–5–lobed, the lobes rounded or the terminal one acute, all crenate; hypanthium glabrous but more or less spiny: sepals elliptic, obtuse: petals 1–1.5 mm. long, broadly cuneate or somewhat truncate, reniform: filaments subulate, as long as the anthers or about ½ as long: berry globular, about 1–1.5 cm. in diameter, armed wth stout prickles. [*Ribes Cynosbati* L. *R. gracile* Michx.]—(DOGBERRY. PASTURE-GOOSEBERRY. PRICKLY-GOOSEBERRY.)—Rocky woods and hillsides, various provinces, N of Coastal Plain, Ala. to Mo., Man., N. B., and N. C.

FAMILY 11. **PLATANACEAE**—PLANE-TREE FAMILY

Trees, with exfoliating bark. Leaves alternate: blades membranous-leathery, palmately lobed. Flowers monoecious, minute, borne on globose receptacles, in dense pedunculate pendent solitary, spicate, or racemose heads. Perianth obsolete. Staminate heads red: filaments nearly obsolete: anthers elongate, each surmounted by a dilated connective. Pistillate heads green: carpels 2–9, 1-celled, mingled with staminodia which are pilose at the apex, surrounded by long-jointed persistent hairs: style terminal, stigmatose to below the middle on the ventral suture. Fruit an elongate achene, surrounded by rigid hairs, with a thin leathery pericarp, crowded in dense globose heads.—Comprises the following genus:

1. PLATANUS [Tourn.] L. Trees, with smooth bark and stout irregular branches from which are suspended the usually numerous long-peduncled fruit-heads.—About 8 species in the north temperate zone.—PLANE-TREES.



1. P. occidentalis L. Tree with a maximum trunk diameter of over 4 m., becoming 50 m. tall: leaves numerous; blades angularly 3–5–lobed, permanently woolly on the veins beneath, mostly truncate at least at the base, the lobes acute: flowers green or purplish: fruiting heads solitary, subglobose, 2–4 cm. in diameter, drooping.—(SYCAMORE. BUTTONWOOD. BUTTONBALL.)—Low grounds, usually near streams, various provinces, N Fla. to Tex., Nebr., and Me.—Spr.—Frequently grown as a shade tree.—Sections of the trunk are used for butcher's blocks. The wood is used for furniture, interior finish, and boxes.

FAMILY 12. **ROSACEAE**—ROSE FAMILY

Herbs, shrubs, trees, or rarely vines. Leaves mostly alternate: blades simple or compound, often stipulate. Flowers perfect or rarely dioecious. Calyx of 5, or rarely 4–9, sepals borne on the edge of the hypanthium, sometimes accompanied by as many bractlets. Corolla of as many distinct petals as there are sepals, or wanting. Androecium of 1 or more series of stamens. Gynoecium of 1–many carpels. Ovary 1-celled or imperfectly 2-celled. Fruit mostly follicles or drupelets, or achenes which are borne in the hypanthium or on the accrescent receptacle.—About 75 genera and 1300 species, of wide geographic distribution.

Fruit consisting of 1–5 dehiscent follicles.
Carpels as many as the sepals and alternate with them, or fewer: stipules none or deciduous.
Carpels 1–5, if more than one, more or less united below: seeds shining, thick, pyriform, the coat bony: endosperm present. Tribe I. NEILLIEAE.
Carpels usually 5, distinct: seeds dull, narrow, linear to linear-lanceolate, the coat thin: endosperm wanting. Tribe II. SPIRAEAE.
Carpels opposite to the sepals: stipules present, persistent. Tribe III. SORBARIEAE.
Fruit consisting of indehiscent achenes or drupelets.
Carpels not enclosed in a fleshy hypanthium.
Fruits consisting of dry achenes.
Ovules 2, one above the other: achenes more or less flattened, usually 1-seeded, borne in a single whorl. Tribe IV. ULMARIEAE.
Ovules, and seeds, solitary: achenes usually turgid, if many borne in a spiral.
Seeds inserted at the distal end of the ovary, that is, at the point where the style arises, pendulous, or in genera with basal styles, ascending: radicle superior.
Style articulated to the ovary: hypanthium campanulate to almost flat, neither contracted at the throat nor closely investing the achenes. Tribe V. POTENTILLEAE.
Style not articulated to the ovary; hypanthium more or less urceolate, contracted at the mouth.
Style nearly basal: inflorescence cymose: hypanthium loosely investing the achenes. Tribe VI. ALCHEMILLEAE.
Style terminal: inflorescence spicate, racemose, or paniculate: hypanthium closely investing the achenes. Tribe VII. SANGUISORBEAE.
Seeds inserted at the proximal end of the ovary, that is, perfectly basal: radicle inferior.
Style wholly deciduous. Tribe VIII. COLURIEAE.
Style partly or wholly persistent. Tribe IX. DRYADEAE.
Fruits of more or less fleshy drupelets: ovules collateral.
Carpels at least as many as the sepals, usually numerous: corolla present at least in the staminiferous flowers, the petals white to purple. Tribe X. RUBEAE.
Carpels fewer than the sepals: corolla wanting or if present the petals yellow. Tribe XI. KERRIEAE.
Carpels enclosed in the hypanthium which becomes fleshy in fruit. Tribe XII. ROSEAE.

I. NEILLIEAE

Shrubs with alternate leaves, with toothed and usually lobed blades. 1. OPULASTER.

II. SPIRAEAE

Stamens borne on the edge of the hypanthium: flowers perfect: shrubs or undershrubs: leaf-blades simple. 2. SPIRAEAE.
Stamens borne on the inside of the hypanthium: flowers dioecious: tall herbs: leaf-blades twice or thrice compound. 3. ARUNCUS.

III. SORBARIEAE

Perennial herbs with rootstocks: leaves with 3-foliolate blades. 4. PORTERANTHUS.

IV. ULMARIEAE

Perennial herbs with rootstocks: leaf-blades pinnatifid and incised. 5. FILIPENDULA.

V. POTENTILLEAE

Style terminal or nearly so, or lateral.
Style terminal or nearly so. 6. POTENTILLA.
Style lateral.
Herbs. achenes glabrous, borne on the surface of an enlarged receptacle.

Corolla yellow: receptacle not pulpy. 7. DUCHESNEA.
Corolla white or pinkish: receptacle pulpy. 8. FRAGARIA.
Shrubs: achenes pubescent, borne on an inconspicuous receptacle.
Low shrub: leaf-blade 3-foliolate: style filiform: corolla white. 9. SIBBALDIOPSIS.
Tall shrub: leaf-blades pinnate: style clavate: corolla yellow. 10. DASIPHORA.
Style nearly basal. 11. DRYMOCALLIS.

VI. ALCHEMILLEAE

Small annual herbs: leaf-blades digitately 3-parted and again toothed or lobed. 12. APHANES.

VII. SANGUISORBEAE

Hypanthium not prickly: petals wanting: inflorescence compact.
Stamens 2–4, not declined: pistil 1. 13. SANGUISORBA.
Stamens, in staminate flowers, numerous, declined: pistils 2. 14. POTERIUM.
Hypanthium with hooked spines: petals present: inflorescence open. 15. AGRIMONIA.

VIII. COLURIEAE

Perennial herbs with rootstocks: leaves basal; blades lobed or compound: hypanthium mostly obconic: corolla yellow: achenes in the hypanthium. 16. WALDSTEINIA.

IX. DRYADEAE

Style conspicuously bent and geniculate above, the upper portion usually hairy, readily deciduous.
Head of achenes sessile: sepals accompanied by bractlets. 17. GEUM.
Head of achenes stalked: sepals not accompanied by bractlets. 18. STYLIPUS.
Style neither conspicuously bent nor distinctly geniculate, the upper portion glabrous, persistent. 19. SIEVERSIA.

X. RUBEAE

Spreading stoloniferous herb, with reniform leaf-blades: flowers of 2 kinds, the essentially staminate flowers petaliferous, the fructiferous flowers apetalous, and with few stamens: drupelets nearly dry. 20. DALIBARDA.
Erect or diffuse shrubs, with lobed or compound leaf-blades: flowers all petaliferous: drupelets juicy and pulpy.
Styles clavate: stigmas slightly 2-lobed: receptacle flat: leaf-blades digitately veined and lobed: plants unarmed. 21. RUBACER.
Styles filiform, glabrous: stigmas capitate: receptacle convex, hemispheric, or nipple-shaped: leaf-blades mostly compound: plants usually prickly. 22. RUBUS.

XI. KERRIEAE

Corolla wanting: calyx corolloid; sepals toothed. 23. NEVIUSIA.
Corolla present: calyx herbaceous; sepals entire. 24. KERRIA.

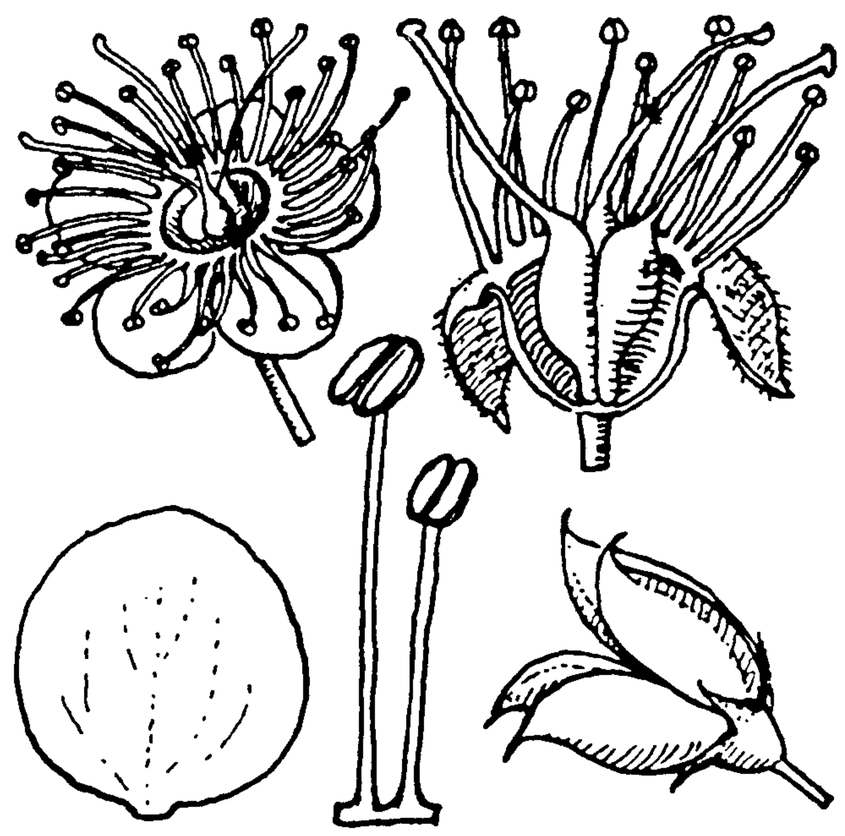
XII. ROSEAE

Shrubs with usually bristly or prickly stems: leaf-blades 3-foliolate or pinnate. 25. ROSA.

1. **OPULASTER** Medic. Shrubs. Leaf-blades palmately lobed. Flowers corymbose. Corolla white. Stamens numerous, without staminodia. Carpels 1–5, short-stipitate: styles filiform. Stigmas depressed-capitate. Follicles inflated. [*Physocarpus* Maxim.]—NINEBARKS.—About 12 species, North American and Asiatic.

Follicles glabrous at maturity, ovoid, usually 5 together.
Seed with a long lateral caruncle: follicles usually twice as long as the sepals: leaf-blades of the sterile shoots usually longer than wide. 1. *O. opulifolius.*
Seed with a short almost terminal caruncle: follicles not more than half longer than the sepals: leaf-blades of the sterile shoots scarcely longer than wide. 2. *O. australis.*
Follicles stellate-pubescent, ellipsoid, usually 3 or 4 together.
Leaf-blades of the sterile shoots ovate in outline, acuminate, sparingly pubescent. 3. *O. alabamensis.*
Leaf-blades of the sterile shoots orbicular-ovate in outline, acute, densely stellate-pubescent. 4. *O. stellatus.*

1. O. opulifolius (L.) Kuntze. Shrub 1–3 m. tall: leaf-blades 3–8 cm. long, acutely lobed: sepals ovate, 2.5–3.5 mm. long: follicles 8–10 mm. long, acute. [*P. opulifolius* Maxim.]—Rocky soil and river banks, various provinces, Tenn. to Mich., Que., and Va.—Spr.–sum.



2. O. australis Rydb. Shrub with glabrous angled branches: leaf-blades broadly ovate, 4–8 cm. long, acute, deeply 3-lobed and doubly toothed, rounded or truncate at the base: follicles usually 5, glabrous, 3–6 mm. long, acute.—Wooded slopes, Blue Ridge, S. C. to Va.—Sum.

3. O. alabamensis Rydb. Shrub, with stellate branches: leaf-blades broadly ovate, 2–5 cm. long, obtuse or acute at the apex, often indistinctly 3-lobed, doubly crenate, stellate-pubescent, at least beneath, acute or rounded at the base: inflorescence densely stellate: follicles 3–5, permanently stellate, about 8 mm. long.—Thickets and river-bottoms, Coastal Plain and Piedmont, Ala., Ga., and S. C.—Sum.

4. O. stellatus Rydb. Low shrub, with decidedly pubescent foliage: leaf-blades 1–4 cm. long: sepals narrowly ovate, 2–2.5 mm. long: follicles mostly 4, about 5 mm. long.—Stream-banks, Coastal Plain, Fla. and Ga.—Spr.–sum.

2. SPIRAEA [Tourn.] L. Shrubs. Leaf-blades toothed or lobed. Flowers corymbose or paniculate. Corolla white, pink, or rose. Stamens numerous, accompanied by lobe-like staminodia. Carpels usually 5, mostly stipitate: styles clavate: stigmas minute and oblique. Follicles not inflated.—About 70 species, natives of the north temperate zone.—SPIREAS.—Several species are extensively grown for ornament.

Inflorescence elongate, paniculate, ovoid or conic.	I. SALICIFOLIAE.
Inflorescence flat-topped, corymbose.	II. CORYMBOSAE.

I. SALICIFOLIAE

Sepals merely spreading: disk obsolete.	
Inflorescence glabrous: leaf-blades broadly oblanceolate to obovate.	1. *S. latifolia.*
Inflorescence pubescent: leaf-blades narrowly oblanceolate.	2. *S. alba.*
Sepals early reflexed: disk prominent.	
Follicles glabrous: leaf-blades lanceolate to elliptic-lanceolate.	3. *S. subcanescens.*
Follicles pubescent: leaf-blades elliptic or oval, varying to ovate or elliptic-ovate.	4. *S. tomentosa.*

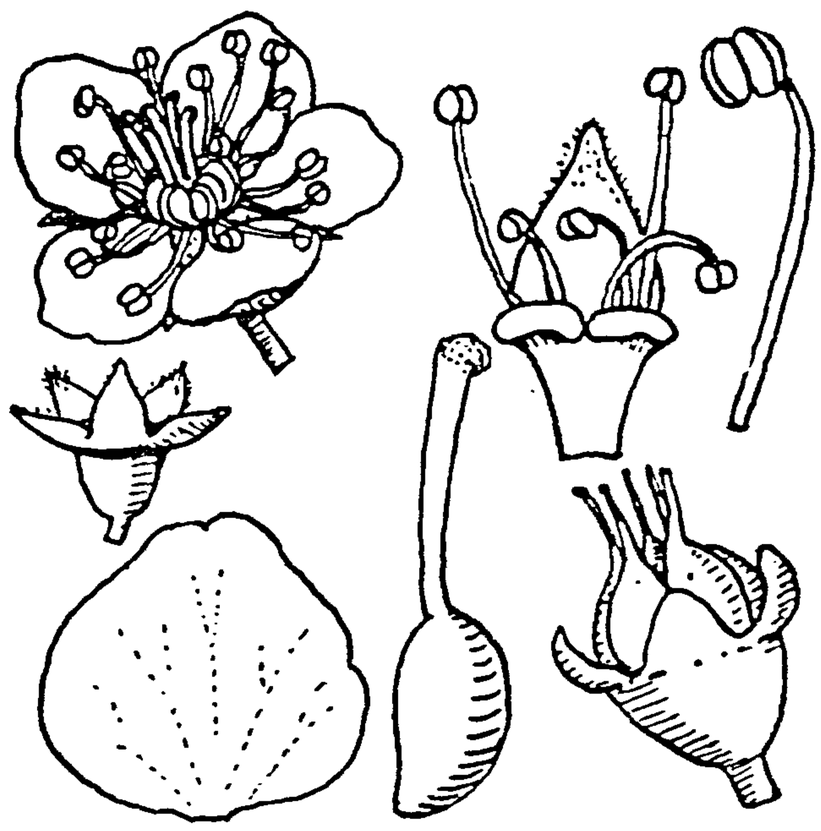
II. CORYMBOSAE

Hypanthium turbinate, tapering to the base: leaf-blades glaucous beneath.	5. *S. virginiana.*
Hypanthium campanulate, abruptly contracted at the base: leaf-blades scarcely glaucous beneath.	6. *S. corymbosa.*

1. S. latifolia (Ait.) Borkh.[1] Shrub with glabrous twigs: leaf-blades broadly oblanceolate to obovate, 2–8 cm. long, sharply serrate, glabrous or nearly so:

[1] Formerly included in *Spiraea salicifolia,* a native of Siberia and eastern Russia.

hypanthium hemispheric, less than 1 mm. high, glabrous: petals white, or pinkish in the bud, about 1.5 mm. long: follicles oblanceolate, 3–4 mm. long.—(MEADOW-SWEET. MEADOW-QUEEN. PINK MEADOW-SPIREA.) — Moist slopes, meadows and rocky banks, various provinces, in Coastal Plain only N, N. C. to Sask. and Newf.—Sum.



2. **S. alba** Du Roi. Shrub with puberulent twigs: leaf-blades narrowly oblanceolate, 3–6 cm. long, sharply serrate, more or less puberulent on the veins: hypanthium puberulent, about 1 mm. high: petals white, about 2 mm. long: follicles oblanceolate, about 3.5 mm. long.—(MEADOW-SWEET. MEADOW-SPIREA.)—Wet thickets and meadows, various provinces N of Coastal Plain, N. C. to Mo., Ont., and N. Y.—Sum.

3. **S. subcanescens** Rydb. Shrub somewhat resembling *S. tomentosa* in habit, but with the stem and branches less densely pubescent: leaf-blades thinnish, but firm, lanceolate to elliptic-lanceolate, acute at both ends, sharply and finely serrate, slightly pubescent above, tomentulose beneath: sepals ciliate: petals pink, suborbicular, about 2 mm. wide: follicles glabrous, about 2 mm. long.—Woods, near Anderson, on Piedmont of S. C.—Sum.—This may be a hybrid between *S. tomentosa* and *S. alba*.

4. **S. tomentosa** L. Shrub 3–15 dm. tall: leaf-blades thick, tomentose beneath: flowers stout-pedicelled: sepals ciliate: petals rose-colored or rarely white, 1–15 mm. wide: carpels and follicles pubescent, the latter 2–2.5 mm. long.—(HARDHACK. STEEPLE-BUSH.)—Swamps and meadows, various provinces, in Coastal Plain only N, Ga. to Kans., Man., and N. S.—Sum.

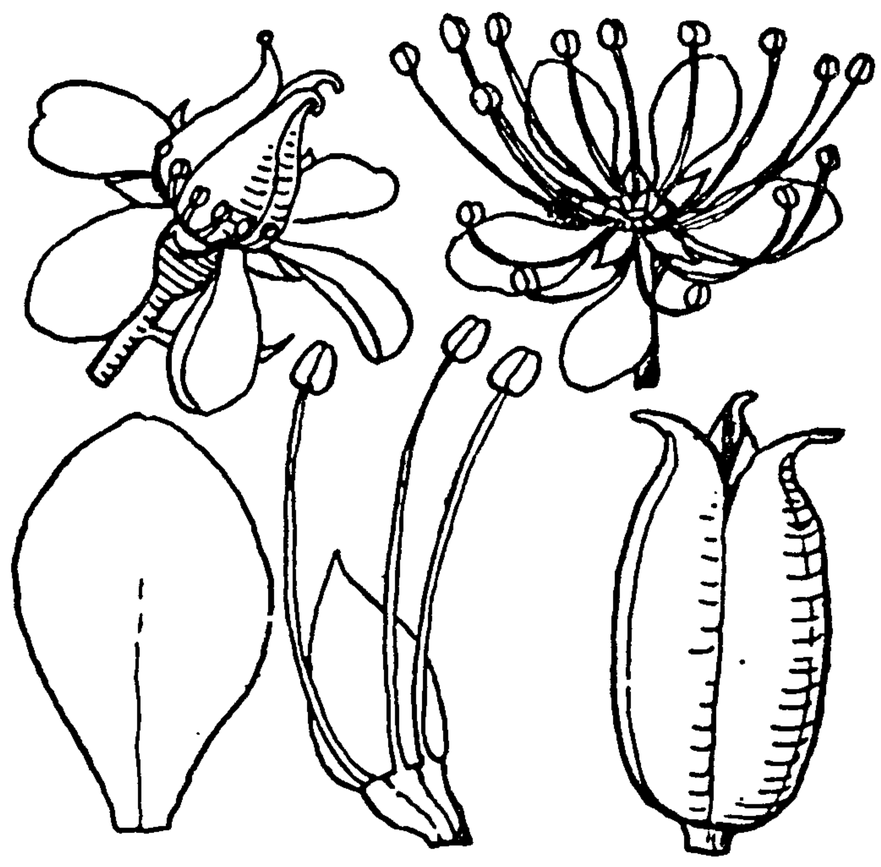
5. **S. virginiana** Britton. Straggling shrub: leaf-blades 2–6 cm. long: longer stamens about twice as long as the sepals: staminodia ovate: petals white, about 2 mm. in diameter.—(MOUNTAIN MEADOW-SWEET.)—Rocky banks, Blue Ridge and Appalachian Plateau, Tenn. to W. Va.—Spr.–sum.

6. **S. corymbosa** Raf. Erect shrub: leaf-blades 2–10 cm. long: longer stamens about thrice as long as the sepals: staminodia depressed: petals white, about 1.5 mm. in diameter.—(DWARF-SPIREA.)—Rocky banks and acid soil, Blue Ridge, extending into adj. provinces, Ga. to W. Va. and N. J.—Spr.–sum.

3. **ARUNCUS** Adans. Perennial herbs. Leaf-blades twice or thrice pinnately compound. Flowers dioecious, very many, borne in panicled narrow racemes. Sepals deltoid to triangular. Petals broad, white. Stamens numerous, conspicuous: filaments elongate. Carpels mostly 3: styles short or elongate. Follicles erect or deflexed.—About 5 species, natives of North America and Eurasia.—Spr.–sum.—GOAT'S-BEARDS. BRIDE'S-FEATHERS.

Style short, much shorter than the carpel-body during anthesis: follicle-bodies narrowly ellipsoid, about 3 mm. long. 1. *A. Aruncus.*
Style long, about as long as the carpel-body during anthesis: follicle-bodies turgid, oval or ovoid, about 2 mm. long.
  Mature carpel-bodies ovoid, sometimes apparently ellipsoid when dry, the beaks mostly spreading: leaflets decidedly pubescent beneath. 2. *A. pubescens.*
  Mature carpel-bodies oval, sometimes apparently ovoid when dry, the beaks mostly erect: leaflets glabrous or nearly so. 3. *A. allegheniensis.*

1. **A. Aruncus** (L.) Karst. Plant 2 m. tall or less, glabrous or nearly so up to the inflorescence at maturity: leaflets ovate, 2–7 cm. long, acuminate, doubly serrate, glabrous, smooth and shiny, or with scattered hairs especially when young: sepals of the pistillate flowers lanceolate or triangular-lanceolate, acuminate: petals of the staminate flowers scarcely 1.5 mm. long, narrowed at the base: follicles narrowly elliptic, about 3 mm. long, less than 1 mm. thick, slightly beaked.—Thickets and waste places, locally nat. in various provinces in E U. S., from N. C. northward. Nat. of Eu.



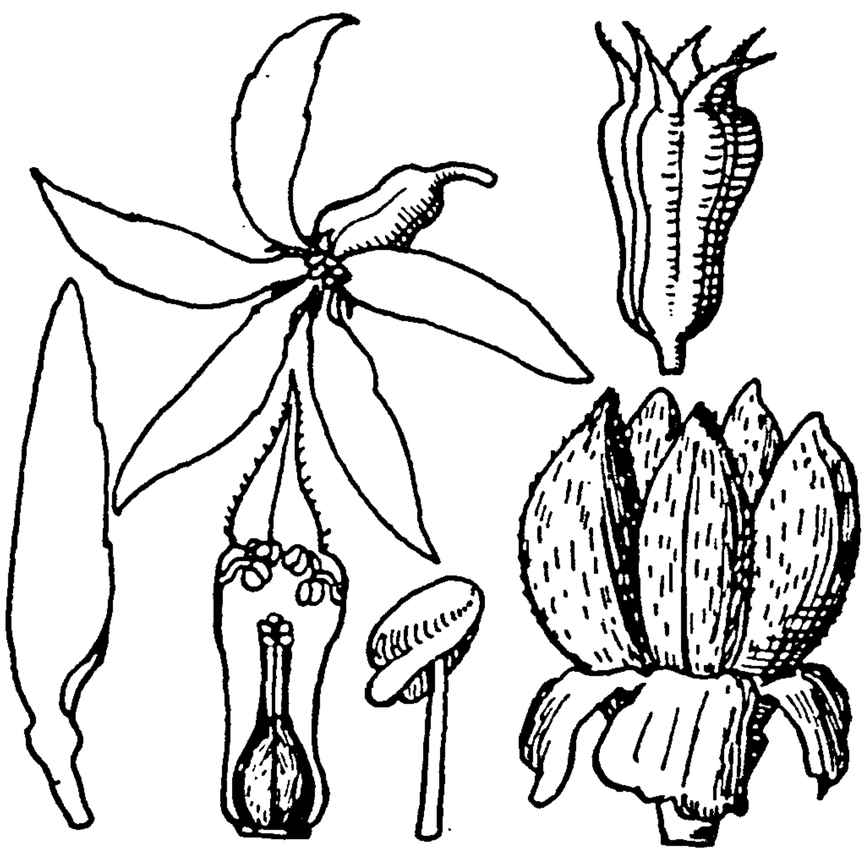
2. **A. pubescens** Rydb. Plant 3 m. tall or less, decidedly pubescent: leaflets ovate, 3–10 cm. long, short-acuminate, singly or doubly serrate, pubescent beneath: sepals of the pistillate flowers triangular lanceolate, acute: petals of the staminate flowers slightly over 1 mm. long, scarcely narrowed at the base: follicles ovoid, sometimes appearing ellipsoid when dry, the body about 2 mm. long, with the slender beak mostly spreading.—Woods, various provinces N of Coastal Plain, Okla. to Ia. and Va.

3. **A. allegheniensis** Rydb. Plant 2.5 m. tall or less, glabrous or nearly so at maturity below the inflorescence: leaflets ovate to elliptic, 3–10 cm. long, short-acuminate, doubly serrate, glabrous or with scattered hairs beneath: sepals of the pistillate flowers deltoid or ovate-deltoid, acute or acutish: petals of the staminate flowers about 1 mm. long, not narrowed at the base: follicles oval, sometimes appearing ovoid when dry, the body about 2 mm. long, with the slender beak mostly erect. [*Spiraea Aruncus* (Chapm. Fla.).] Rich woods, various provinces, in Coastal Plain only N, Ga. to Ala., Ky., and Pa.

4. **PORTERANTHUS** Britton. Perennial herbs. Leaf-blades 3-parted or 3-foliolate. Flowers perfect, few, borne in open lax panicles. Sepals shorter than the hypanthium. Petals narrow, white or pink. Stamens numerous, in one row: filaments very short. Carpels mostly 5: styles subulate. Follicles erect. [*Gillenia* Moench.]—Two species.—Spr.–sum.—INDIAN PHYSICS.

Sepals glandular-serrate, caudate-acuminate: stipules subulate or lanceolate, entire or nearly so: dorsal suture of the follicle not prominent. 1. *P. trifoliatus.*
Sepals merely ciliolate, acute or slightly acuminate: stipules foliaceous, coarsely laciniate: dorsal suture of the follicle keel-like. 2. *P. stipulatus.*

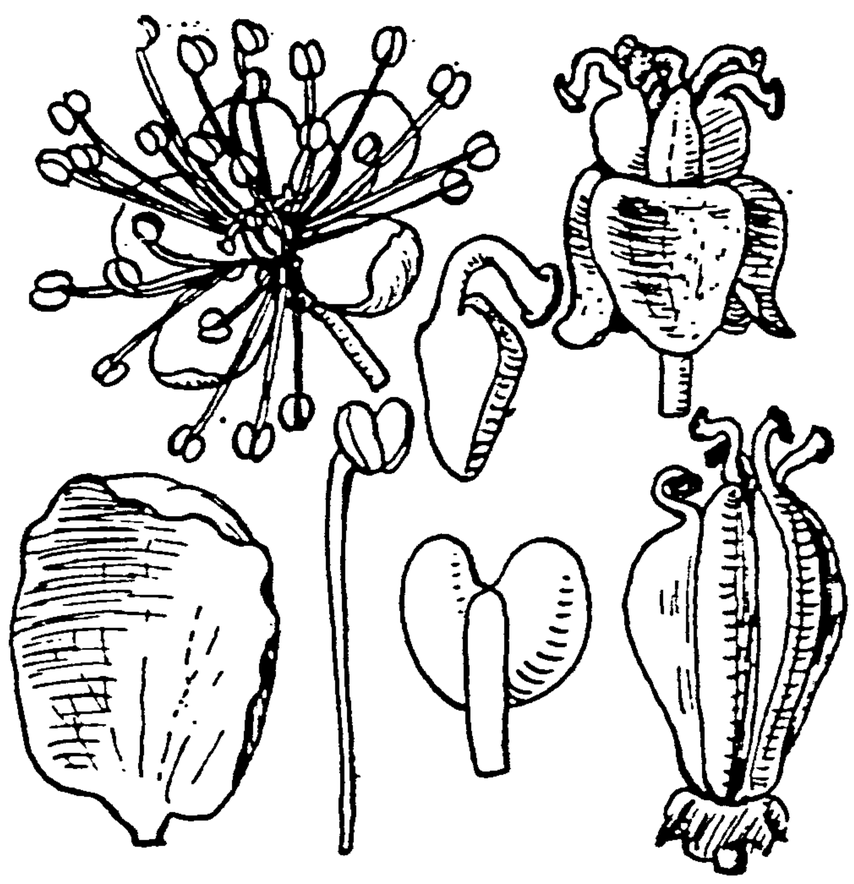
1. **P. trifoliatus** (L.) Britton. Plant 3–14 dm. tall: leaflets 3–9 cm. long; blades oval or elliptic to obovate, or those of upper leaves sometimes lanceolate, sharply serrate or incised-serrate: petals white, mostly 15–20 mm. long; blades nearly linear or slightly broadened upward: follicles 5.5–7 mm. long, stout-beaked, not stipitate, closely fine-pubescent. [*G. trifoliata* Moench.]—(BOWMAN'S-ROOT. FALSE IPECAC.—Woods, thickets, and river-banks, various provinces, in Coastal Plain only N, Ga. to Mo., Mich., Ont., and N. Y.



2. **P. stipulatus** (Muhl.) Britton. Plant 1.5–12 dm. tall: leaflets 5–8 cm. long; blades oblanceolate to elliptic or lanceolate, acuminate, those of the lower leaves incised or laciniate, those of the upper coarsely doubly-toothed: petals white or pinkish, 11–

15 mm. long; blades oblanceolate or elliptic-oblanceolate: follicles 6.5–9.5 mm. long, slender-beaked, stipitate, glabrous or with few hairs. [*G. stipulata* Muhl.]—(AMERICAN IPECAC.)—Woods and thickets, often in calcareous soil, various provinces, chiefly W of Blue Ridge, extending into Piedmont and Atlantic Coastal Plain only in river valleys, Ga. to La., Kans., and N. Y.

5. **FILIPENDULA** [Tourn.] Hill. Perennial caulescent herbs. Leaf-blades pinnate. Flowers numerous, borne in corymbose cymes. Sepals entire. Petals broad, white, pink, or purple. Carpels 5–15: style short: stigma capitate. Achene capsule-like.—About 10 species, natives of the north temperate zone.—MEADOW-SWEETS.



1. F. rubra (Hill) B. L. Robinson. Plant 5–24 dm. tall: lower leaves 3–9 dm. tall; blades of the leaflets palmately 3–5-lobed: sepals almost half-orbicular: petals 2–3 mm. long, pink or purple; the blades sub-orbicular: fruits 6–7 mm. long, clavate. [*Spiraea lobata* Chapm. Fl.]—(PRAIRIE-MEADOW-SWEET. QUEEN-OF-THE-PRAIRIE.)—Swamps and low grounds, Blue Ridge and more N provinces, Ga. to Ia., Pa., and Vt.—Spr.–sum.

6. **POTENTILLA** L. Herbs or partially woody plants. Leaf-blades pinnately or digitately foliolate. Flowers in corymbose cymes or solitary. Petals white, yellow, red, or purple, notched. Receptacle hemispheric or conic. Carpels and achenes ovoid.—About 325 species, natives of the north temperate zone.—CINQUEFOILS. FIVE-FINGERS. MEADOW-STARS.—Our species all have yellow flowers.

Flowers solitary, on long axillary pedicels: plant perennial.	I. TORMENTILLAE.
Flowers cymose: cymes many-flowered, leafy bracted: plant annual.	II. SUPINAE.

I. TORMENTILLAE

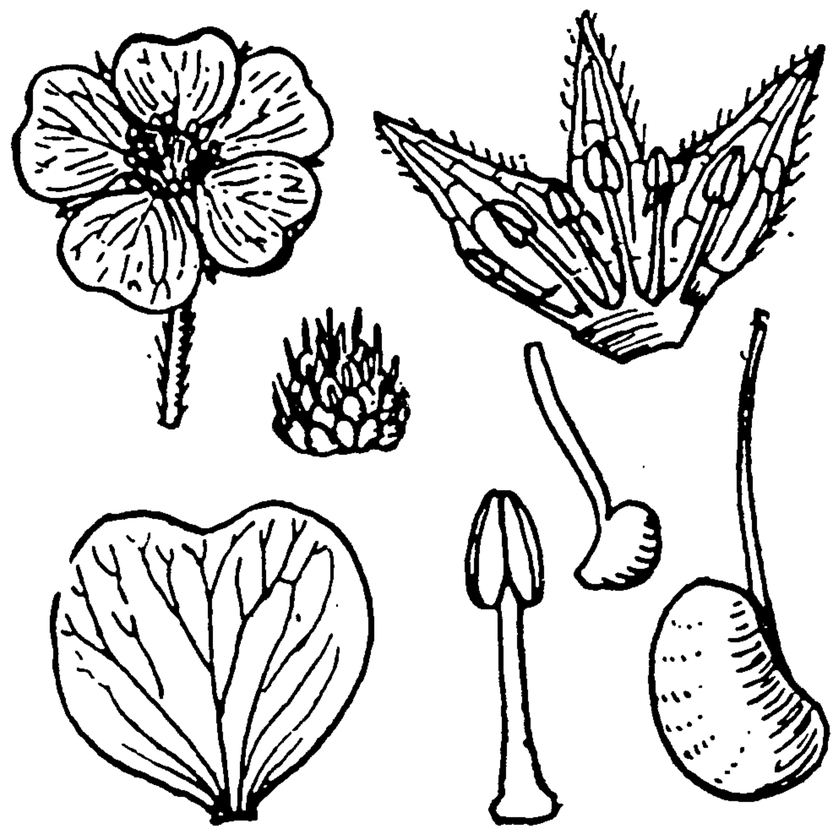
Stem, branches, petioles, and pedicels with appressed pubescence.	
Leaflets sparingly silk or strigose: blades oblanceolate, elliptic-oblanceolate or rarely obovate. toothed except at the base.	1. *P. simplex.*
Leaflets densely silky beneath; blades of those of the basal ones cuneate-obovate, toothed only at the apex or above the middle.	2. *P. pumila.*
Stem, branches, petioles, and pedicels with spreading hairs.	
Blades of the leaflets obovate or oblanceolate, appressed-pubescent.	3. *P. canadensis.*
Blades of the leaflets cuneate, pubescent with long lax hairs.	4. *P. caroliniana.*

II. SUPINAE

Achene corky-gibbous on the upper suture: corolla less than 8 mm. wide: lower leaves with 9–11 leaflets.	5. *P. paradoxa.*
Achene not gibbous: corolla over 9 mm. wide: lower leaves with 3–5 leaflets.	6. *P. monspeliensis.*

1. P. simplex Michx. Stem erect or early decumbent, 4–10 dm. long, appressed-pubescent: leaflets 2–6 cm. long; mostly 5; blades oblanceolate, elliptic-

oblanceolate, or rarely obovate, coarsely toothed except near the base: sepals lanceolate, 4–5 mm. long, about equalling the linear-lanceolate bractlets: petals 5–6 mm. long.—Grassy slopes and open woods, various provinces N of Coastal Plain, Ala. to Mo., Minn., and N. S.—Spr.—This, and related species, are sometimes called wild-strawberry.



2. **P. pumila** Poir. Stem erect in anthesis, producing runner-like branches, densely silky-strigillose: leaflets 5; blades 2–2.5 cm. long, cuneate-obovate, coarsely toothed at the apex or above the middle: sepals narrowly lanceolate, 3–5 mm. long, about equalling the brackets: petals 4–7 mm. long. [*P. canadensis pumila* T. & G.] —Sandy banks and dry woods, various provinces, Ga. to Ohio, Ont., and Me.—Spr.

3. **P. canadensis** L. Stem branched at the base, the branches decumbent or prostrate, 4–6 dm. long, with spreading hairs: leaflets 3 or 5; blades obovate-oblanceolate, or oval, 2–5 cm. long, coarsely toothed: corolla 12–15 mm. wide, the petals about 1/3 longer than the sepals.—(FIVE-FINGER.)—Dry soil, banks, and thickets, various provinces, La. to Tex., Wis., N. B., and N. C.—Spr.–sum.

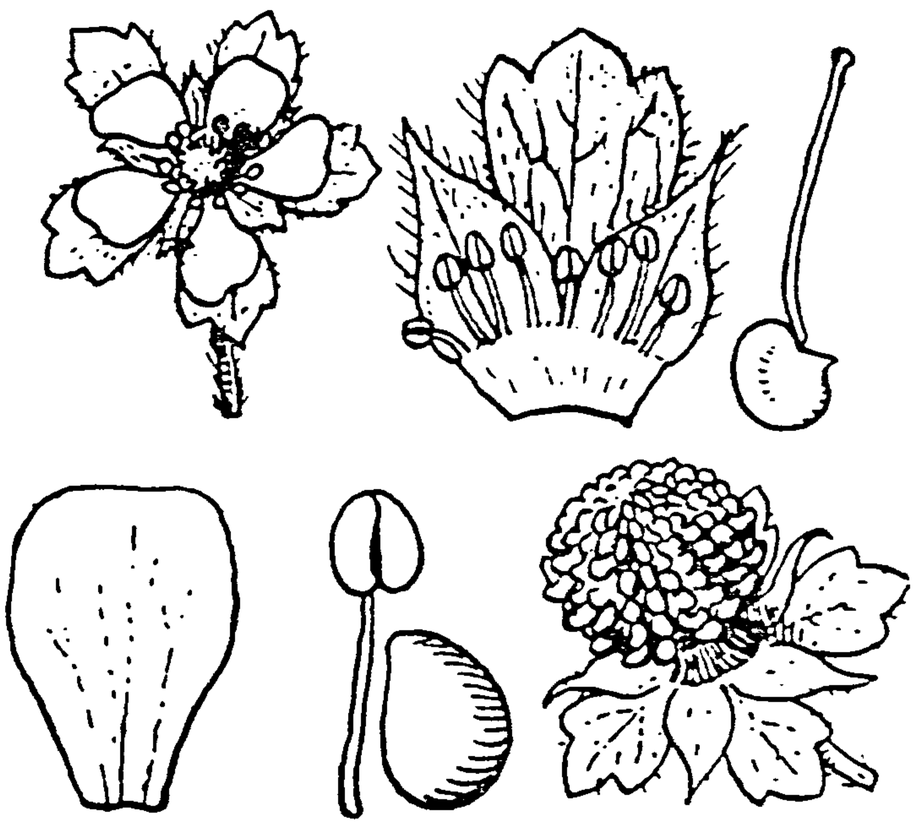
4. **P. caroliniana** Poir. Stem often branched at the base, the branches prostrate, usually rooting at the nodes, 3–10 dm. long, with spreading pubescence: leaflets mostly 5; blades cuneate, 1.5–4 cm. long, coarsely toothed above: corolla 8–10 mm. wide, the petals about 1/3 longer than the sepals.—Dry woods, various provinces, Ga. to Mo. and Va.—Sum.

5. **P. paradoxa** Nutt. Stem becoming much-branched, the branches mostly ascending or spreading, 2–5 dm. tall, hirsute above, sometimes glabrate below: leaflets pinnate, 9–11 on the lower leaves, 1–2 cm. long; blades obovate-cuneate, crenate or cleft, the teeth rounded: cymes leafy: hypanthium becoming 7–9 mm. in diameter, hirsute: sepals elliptic ovate, 3–4 mm. long: petals obovate-cuneate, equalling the sepals or exceeding them: stamens 15–20: achene corky, thickened on the inner side.—Low grounds, Appalachian and more N provinces, Tenn. to N. M., Wash., Ont. and N. Y.—(*Mex.*, *O. W.*)—Sum.

6. **P. monspeliensis** L. Stem simple and erect, or with ascending branches, 1 m. tall or less, hirsute (finely pubescent and with oblong narrowly serrate leaflets in *P. norvegica*): leaflets 3, digitate, or in luxuriant plants 5, digitate or pinnate, 3–10 cm. long; blades obovate, broadly serrate: cymes dense: hypanthium becoming 7–8 mm. wide, hirsute: sepals elliptic lanceolate, 7–8 mm. long: petals obovate to cuneate, nearly equalling the sepals: stamens mostly 20; achene usually rugulose. [*P. norvegica* L.]—(ROUGH-CINQUEFOIL.) —Waste-places, cult. grounds, and fields, various provinces, N. C. to Tex., Calif., Alas., Ont., and Lab.—(*Mex.*, *O. W.*)—Sum.

7. **DUCHESNEA** J. E. Smith. Caulescent creeping herbs. Leaf-blades pinnately 3-foliolate. Peduncles 1-flowered. Bractlets larger than the sepals,

toothed. Petals surpassed by the bractlets. —Two species, natives of Asia.—MOCK-STRAWBERRIES.—The receptacle is red and spongy, but not juicy, at maturity.

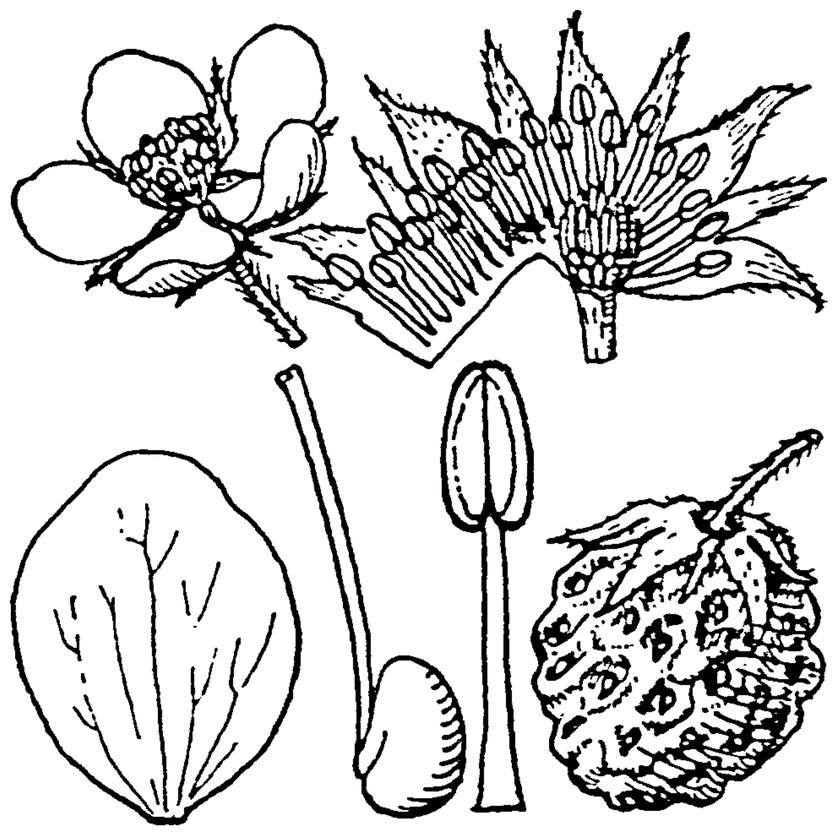


1. D. indica (Andr.) Focke. Stem or branches elongate: leaflets ovate to obovate: sepals 6–8 mm. long: petals obovate, yellow: fruit ovoid or subglobose, 8–10 mm. in diameter, red, insipid: achenes red. [*Fragaria indica* Andr.]—(YELLOW-STRAWBERRY. INDIAN-STRAWBERRY. SNAKE-BERRY.)—Fields and roadsides, various provinces, N Fla. to Ark., Mo., and N. Y. Nat. of Asia.—Spr.–sum.

8. FRAGARIA [Tourn.] L. Acaulescent erect and often stoloniferous herbs. Leaf-blades pinnately 3-foliolate. Scapes several-flowered. Bractlets smaller than the sepals, entire. Petals white, surpassing the bractlets.—About 35 species, natives of the north temperate zone to the mts. of South America. —Spr.—STRAWBERRIES.—Some species and many hybrids are extensively grown for their fruits. The receptacle, conic or globose at maturity, is red or scarlet.

Blades of the leaflets petiolulate: achenes in pits.
  Pedicels with appressed hairs.
    Blades of the leaflets sessile or nearly so. 1. *F. virginiana.*
    Blades of the leaflets petioluled. 2. *F. australis.*
  Pedicels with spreading hairs. 3. *F. Grayana.*
Blades of the leaflets sessile or nearly sessile: achenes superficial. 4. *F. americana.*

1. F. virginiana Duchesne. Rootstock stout: blades of the leaflets thick, elliptic to obovate, 3–10 cm. long, coarsely toothed, obtuse: scape stout, 1.5–3 dm. tall, villous: pedicels strigose: bractlets, and sepals, lanceolate: petals obovate: fruit subglobose, 1–1.5 cm. in diameter: achenes in deep pits.—Fields, roadsides, and cult. grounds, various provinces, Fla. to Okla., Minn., and Que.

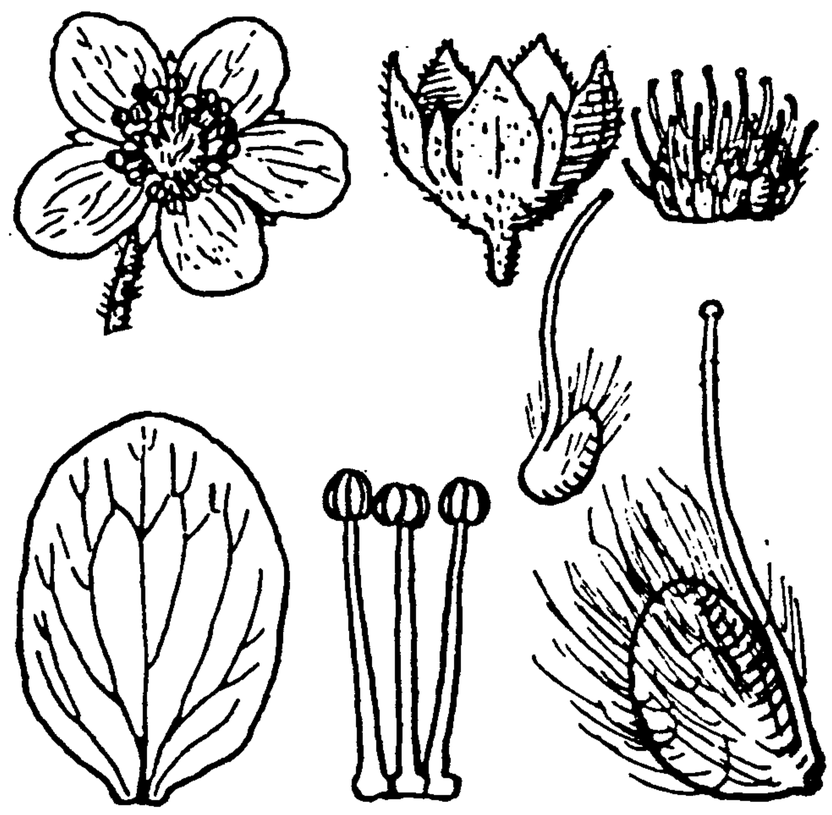


2. F. australis Rydb. Rootstock short, rather slender: blades of the leaflets elliptic-oblanceolate or obovate, 1–4 cm. long, coarsely few-toothed: scape less than 1 dm. tall, silky: bractlets linear-lanceolate: sepals broadly lanceolate: petals oval: fruit not seen. Woods and river-banks, various provinces, N. C. and Tenn. to W. Va. and Va.

3. F. Grayana Vilmorin. Rootstock stout, short: blades of the leaflets firm, obovate, 3–10 cm. long, coarsely toothed, acute or obtuse: scape stout, 1–1.5 dm. tall, hirsute with spreading or reflexed hairs: pedicels hirsute: bractlets linear-lanceolate: sepals lanceolate: petals suborbicular: fruit subglobose, about 1.5 cm. in diameter: achenes in pits.—Cult. grounds, fields, and gardens, Coastal Plain, extending into adj. provinces, Ala. to La., Mo., and Md.

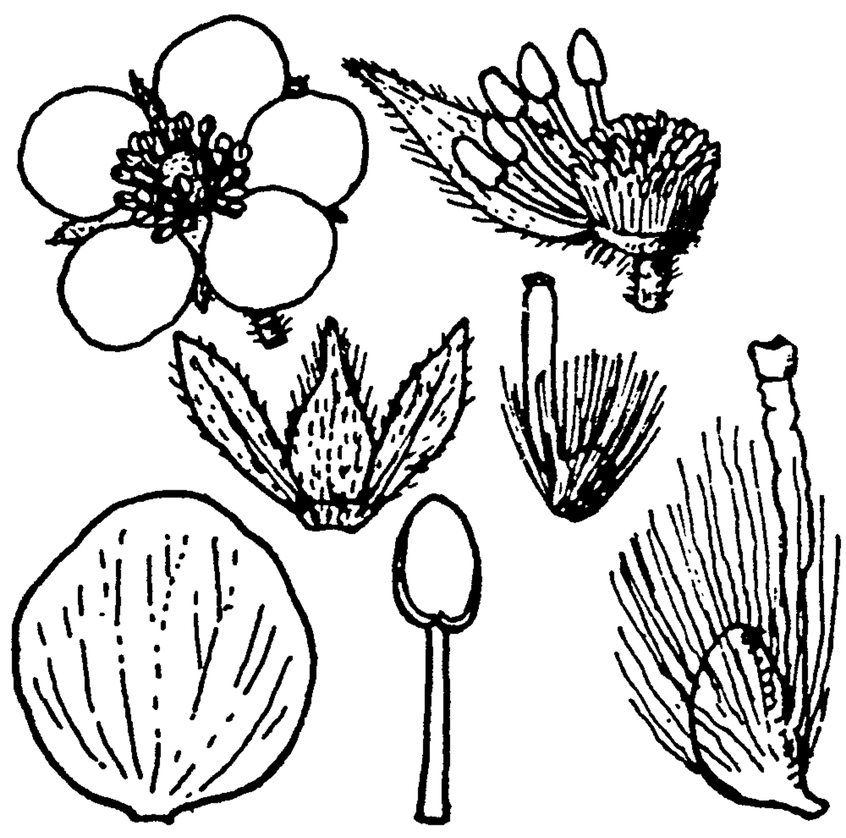
4. F. americana (Porter) Britton. Rootstock slender: blades of the leaflets thin, rhombic-obovate, mostly acute, 3–8 cm. long: scape 1.5 dm. tall or less, villous: pedicels somewhat appressed-pubescent: sepals, and bractlets, ovate to lanceolate, 5–6 mm. long: fruit conic-ovoid, 5–7.5 mm. long, red. [*F. vesca* Chapm. not L.]—(WOOD-STRAWBERRY.)—Cliffs, hillsides, and roadsides, various provinces, N of Coastal Plain, N. C. to N. M., Man., and Newf.

9. **SIBBALDIOPSIS** Rydb. Shrubs with creeping stems. Leaf-blades pinnately 3-foliolate, 3-toothed at the apex. Petals white, rounded. Stamens in 3 rows. Carpel-body mostly obovoid: style filiform, lateral. Achene pubescent.—One species.



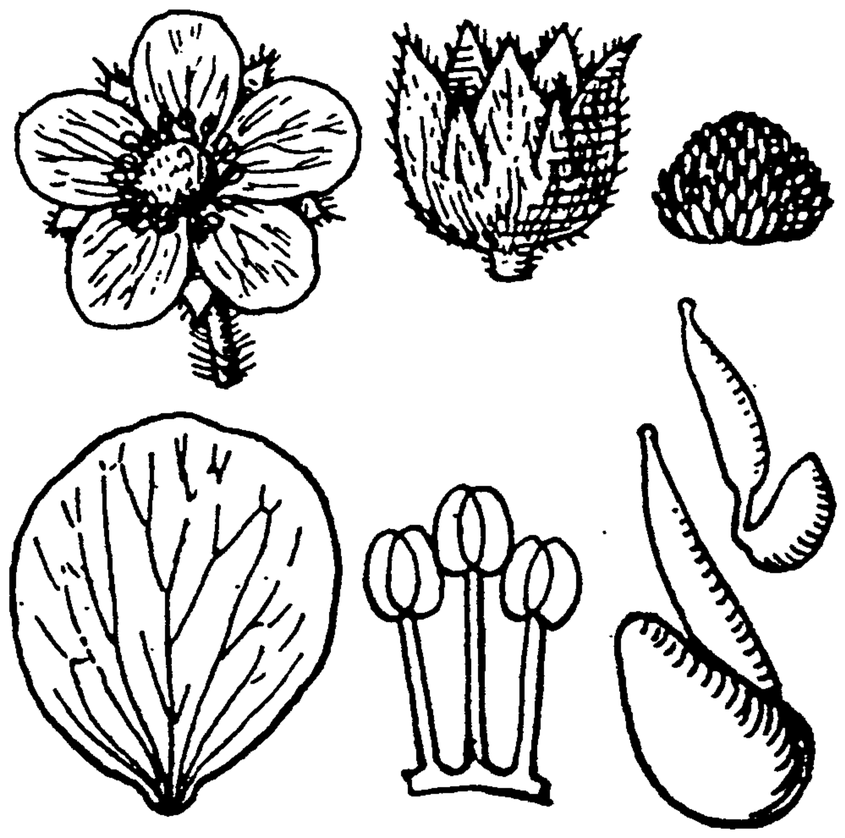
1. **S. tridentata** (Soland.) Rydb. Plant matted, 0.5–3 dm. tall, somewhat pubescent: leaflets 1–3 cm. long; blades cuneate or obovate-cuneate: cymes open: sepals triangular-ovate to ovate: petals white, 5.5–7 mm. long: achene nearly 2 mm. long. [*Potentilla tridentata* Ait.]—(MOUNTAIN-CINQUEFOIL. WINELEAF-CINQUEFOIL.)—Rocky acid soil, Blue Ridge and more N provinces, Ga. to Man., Newf., and Greenl.—Spr.-sum.—Deposits itself on the most wind-swept summits, either on "balds" or in rock crevices.

10. **DASIPHORA** Raf. Shrubs with unarmed branches. Leaf-blades pinnately several foliolate, the leaflets broad or narrow, entire. Petals yellow, suborbicular, clawless. Stamens about 25, in 5 groups on a pentagonal disk. Carpel-body angular. Achenes pubescent.—About 5 species, natives of the north temperate and arctic regions.



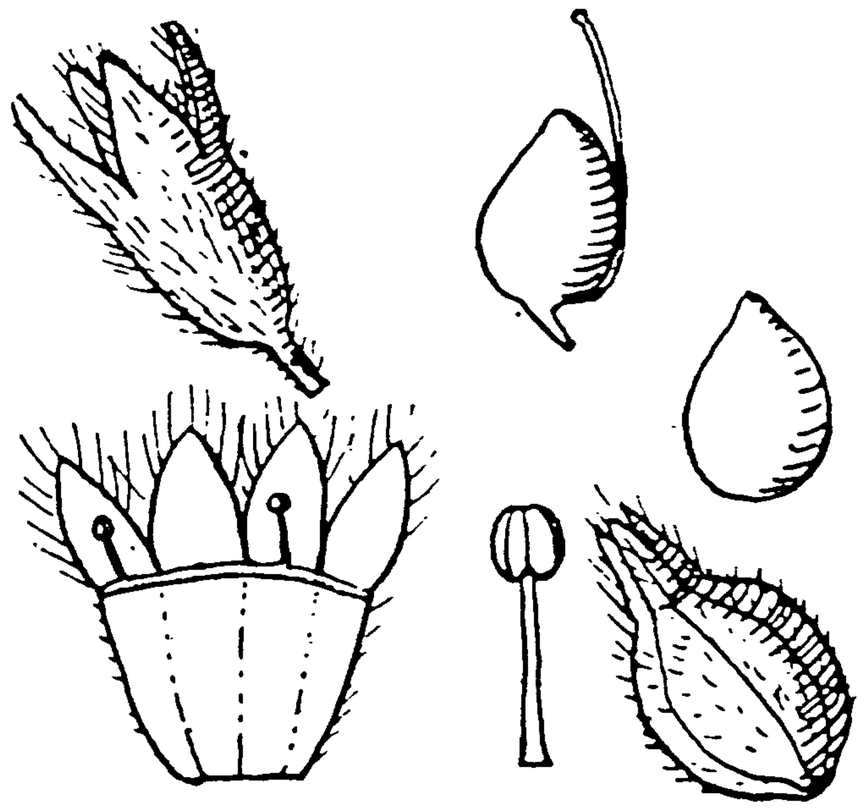
1. **D. fruticosa** (L.) Rydb. Shrub 1.5 m. tall or less with silky twigs: leaflets 3–7, usually 5; blades leathery, elliptic, linear-elliptic, or linear, 1–2 cm. long, or less, silky on both sides: bractlets linear-elliptic: sepals broadly obovate, acuminate: petals about twice as long as the sepals: achene about 1.5 mm. long, long-hairy.—(GOLDEN-HARDHACK. SHRUBBY-CINQUEFOIL.)—Swamps or moist rocky soil, Tenn. to N. M., Calif., Alas., Que., and N. J.—(*Eurasia.*)—Sum.

11. **DRYMOCALLIS** Fourr. Herbs with erect stems. Leaf-blades pinnately several-foliolate, the leaflets toothed. Petals yellow or white, rounded. Stamens in 5 clusters. Carpel-body ovoid: style fusiform, basal. Achene glabrous.—About 30 species, natives of the north temperate and subarctic regions.



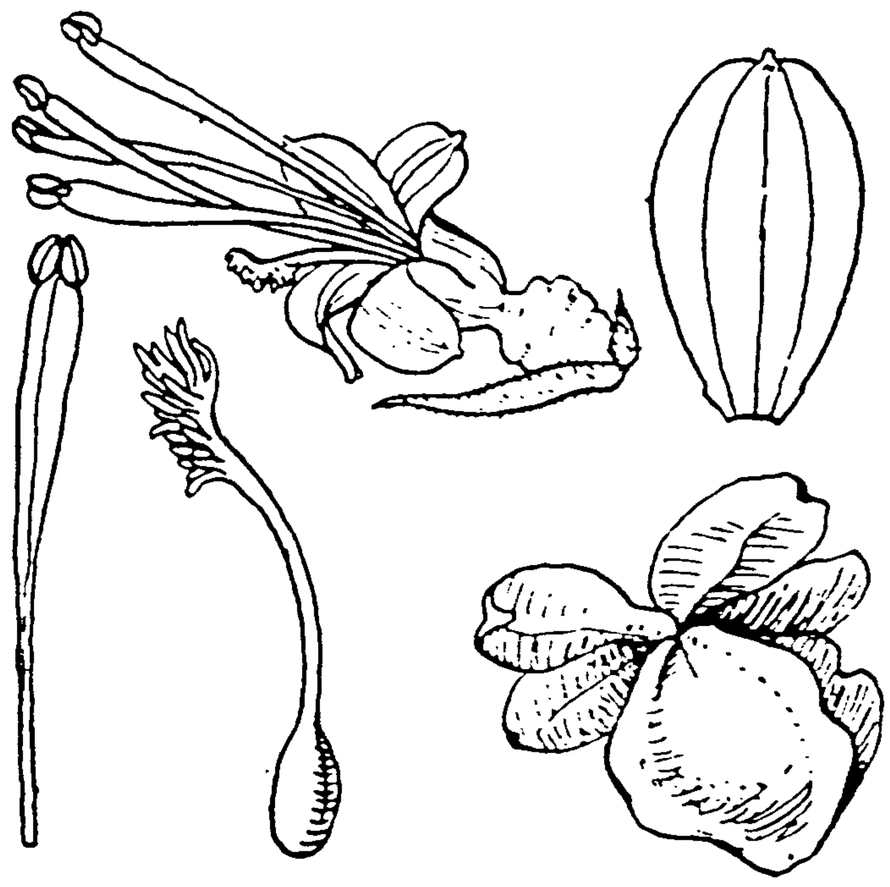
1. **D. agrimonioides** (Pursh) Rydb. Stem 3–10 dm. tall, glandular, villous: leaflets 1–6 cm. long; blades sharply incised-serrate: cymes dense: sepals ovate: petals white: achene about 3 mm. long. [*Potentilla arguta* Pursh.]—Dry banks, rocky hills, and meadows, various provinces, N of Coastal Plain, Tenn. to Colo., Mack., N. B., and D. C.—Sum.

12. APHANES L. Annual small caulescent herbs. Leaf-blades digitately lobed or dissected. Flowers minute or inconspicuous, greenish, in small axillary clusters. Hypanthium ellipsoid-urceolate, contracted at mouth, unarmed. Petals wanting. Stamens 1–4. Styles basal. —About 20 species, natives of the north temperate zone.



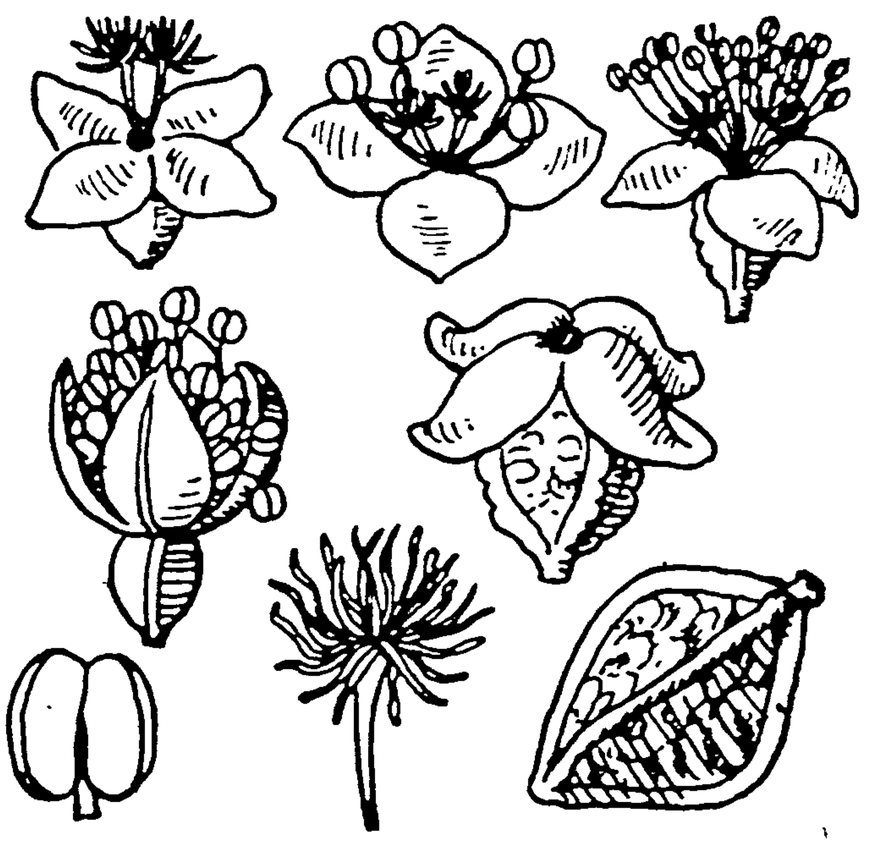
1. A. australis Rydb. Plant pubescent, the stems or branches 2–10 cm. long: leaves 4–8 mm. long; blades 3-parted, the segments cuneate, with obtuse lobes: flower-clusters sessile: sepals ovate, 0.5 mm. long, or less: achenes about 1 mm. long. [*Alchemilla arvensis* (Chapm. Fl.)]—(PARSLEY-PIERT.) —Fields and pastures, various provinces, Ga. to Tenn. and D. C.—Spr.

13. SANGUISORBA [Rupp.] L. Perennial or rarely annual, caulescent herbs. Leaf-blades unequally pinnate. Flowers white, or greenish white, in dense heads or spikes. Hypanthium angled, unarmed. Sepals petal-like, deciduous. Petals wanting. Filaments mostly clavate. —Two species, North American.



1. S. canadensis L. Plant 3–4 dm. tall: leaflets 7–15; blades elliptic, ovate-elliptic, or elliptic-lanceolate, 1.5–8 cm. long, serrate: spikes 3–15 cm. long: sepals oval or oval-ovate, varying to oblong or cuneate, about 2 mm. long, mucronate: achene about 3 mm. long. [*Poterium canadense* B. & H.] —(BURNET.)—Swamps, low meadows, and wet thickets, various provinces, in Coastal Plain only northward, Ga. to Mich. and Lab.—Sum.–fall.

14. POTERIUM L. Caulescent herbs resembling *Sanguisorba* in habit. Leaflets with toothed blades. Flowers monoecious or polygamous, greenish, in dense short peduncled spikes. Hypanthium 4-angled. Sepals 4, green. Petals wanting. Stamens, in the staminate flowers, numerous: filaments elongate. Pistils 2: stigmas tufted. Achenes included.—About 4 species, native of the Old World.

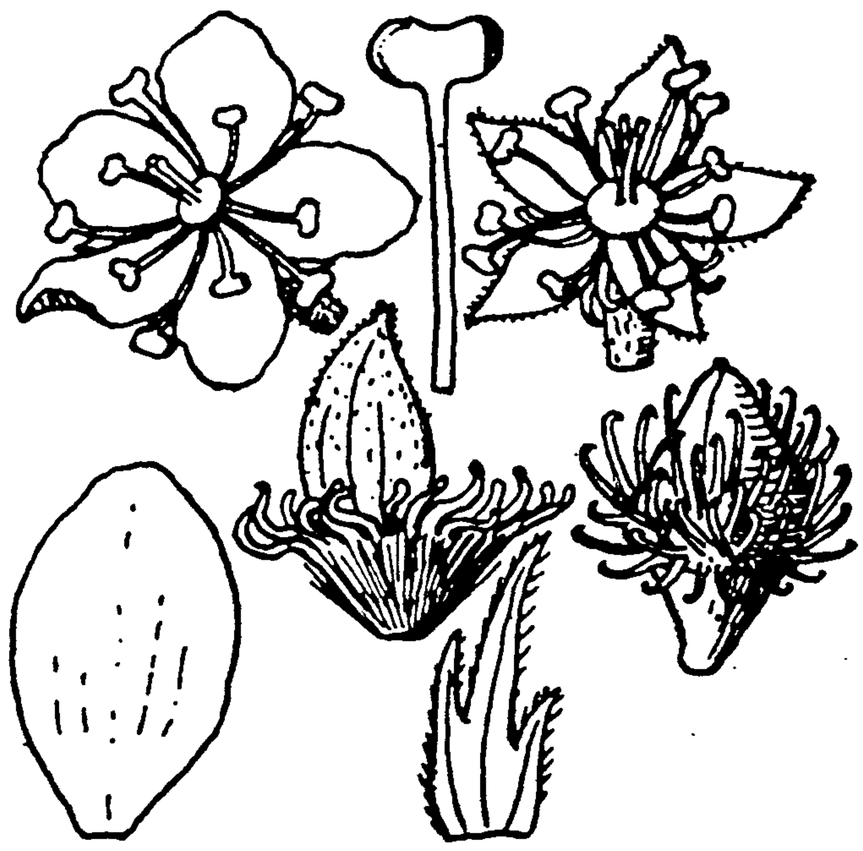


1. P. Sanguisorba L. Plant 3–8 dm. tall, glabrous or nearly so: leaflets mostly 9–13; blades suborbicular or reniform, varying to ovate or obovate, serrate or crenate: spikes globose to ovoid: sepals ovate, 3–3.5 mm. long: achene about 3 mm. long.—(GARDEN-BURNET.) — Roadsides and cult. grounds, various provinces, Md. to Ark., Ont., and Me. Nat. of Eu.—Sum.

15. AGRIMONIA [Tourn] L. Perennial, often glandular, caulescent herbs. Leaf-blades unequally and interruptedly pinnate, with small leaflets interposed between the larger ones. Flowers small, in virgate interrupted racemes. Hypanthium fluted, armed with hooked bristles. Sepals green, persistent. Petals yellow. Stamens 5–15. Filaments subulate. Style terminal.—About 15 species, widely distributed.—AGRIMONIES. HARVEST-LICE.

Mature hypanthium with 2–4 series of bristles, these erect, ascending, or merely spreading: sepals acute.
Leaflets large (mostly over 2 cm. long); blades serrate or crenate, the teeth directed forward.
Raceme and lower surface of the leaflets decidedly pubescent.
Roots not tuberous-thickened: leaflets glandular-granulose beneath.
Leaflets 11–27; blades narrowly lanceolate or elliptic, many-toothed: mature hypanthium 2.5–3 mm. long, the outer bristles spreading or reflexed. 1. *A. parviflora.*
Leaflets 5–9: blades broadly lanceolate to elliptic or oblanceolate, few-toothed: mature hypanthium 5 mm. long, with erect or connivent bristles. 2. *A. striata.*
Roots tuberous-thickened: leaflets not glandular-granuliferous or very slightly so, velvety beneath.
Mature hypanthium campanulate or turbinate, longer than broad, with an inconspicuous or evident rim: stems with the long hairs erect or ascending.
Leaflets mostly 7–13; blades, lanceolate to narrowly elliptic; mature hypanthium with an evident rim, the outer bristles spreading. 3. *A. Bicknellii.*
Leaflets mostly 5–7; blades obovate or oval, or rarely elliptic; mature hypanthium with an obsolete rim, the bristles erect or ascending. 4. *A. pubescens.*
Mature hypanthium broadly obconic, as broad as long or nearly so, shorter than the sepals, with a prominent rim: stem with the long hairs spreading.
Leaflets 3 to 7; blades acute: mature hypanthium usually broader than long: leaves scattered on the stem. 5. *A. platycarpa.*
Leaflets 3 or 5, the lower pair much reduced; blades rounded at the apex: mature hypanthium about as broad as long: leaves approximate on the lower part of the stem. 6. *A. microcarpa.*
Raceme and leaves glabrous or nearly so, but grandular, granuliferous: roots tuberous-thickened. 7. *A. rostellata.*
Leaflets small (1–2 cm. long); blades with few, coarse salient or somewhat recurved teeth. 8. *A. incisa.*
Mature hypanthium with several series of bristles, the outer reflexed: sepals acuminate, with the tips incurved at maturity. 9. *A. gryposepala.*

1. A. parviflora Ait. Stem 3–20 dm. tall, finely pubescent and densely hirsute: primary leaflets 11–27; blades 3–12 cm. long or rarely smaller, strongly veined, sharply serrate: sepals ovate: petals elliptic, about 2 mm. long, pale yellow: mature hypanthium short-turbinate, 2.5–3 mm. long, the bristles in 2 series with an obscure rim. [*A. Eupatoria* Michx. not L.]—Meadows, stream-banks and rich woods, various provinces, Fla. to Miss., Nebr., and N. Y.—(*W. I., Mex.*)—Spr.-sum.



2. A. striata Michx. Stem 3–21 dm. tall, hirsute and glandular-papillose: primary leaflets 5–9; blades 3–10 cm. long, serrate with mucronate teeth: sepals triangular-ovate: petals obovate, 3–4 mm. long, deep-yellow: mature hypanthium long-turbinate, about 5 mm. long, the bristles in 3 or 4

series, the rim thick. [*A. Eupatoria* (Chapm. Fl.)]—Woods, fence-rows, and thickets, various provinces, Ga. to N. M., B. C., and N. S.—Sum.

3. **A. Bicknellii** (Kearney) Rydb. Stem 3–15 dm. tall, densely villous-canescent and also with scattered long hairs: primary leaflets 7–13; blades 3–8 cm. long, with coarse ovate teeth: sepals ovate, about 1 mm. long: petals elliptic, about 2 mm. long, pale-yellow: mature hypanthium turbinate, about 3 mm. long, the bristles in 3 or 4 series.— Woods and stream-banks, various provinces, Ga. to Tenn. and Mass.—Sum.

4. **A. pubescens** Wallr. Stem 3–15 dm. tall, loosely tomentose and also somewhat villous-hirsute: primary leaflets 5–7 (rarely 9); blades 3–8 cm. long or rarely smaller, with triangular-ovate teeth: sepals ovate, about 1.5 mm. long: petals obovate, about 1.5 mm. long, deep-yellow: mature hypanthium turbinate to campanulate, 2.5–3 mm. long, the bristles in 3 series. [*A. Eupatoria mollis* (Chapm. Fl.) *A. mollis* Britton.]—Dry woods and thickets, various provinces, Ga. to Ark., Kans., Ont., and N. Y.—Sum.

5. **A. platycarpa** Wallr. Stem 3–8 dm. tall, finely pubescent and also sparingly hirsute: primary leaflets 3–5 (rarely 7); blades oval to elliptic, 2–6 cm. long, with ovate teeth: sepals ovate, about 1.5 mm. long: petals obovate, 1.5–2 mm. long, light-yellow: mature hypanthium broadly obconic, about 2 mm. long and 3 mm. wide, the bristles in 2 or 3 series, the rim prominent.—Woods, various provinces, Ga. to Ala. and Pa.—Sum.

6. **A. microcarpa** Wallr. Stem 1–7 dm. tall, finely pubescent and also hirsute: primary leaflets 3–5; blades obovate to cuneate, 1–5 cm. long, crenate or dentate: sepals ovate, about 1.5 mm. long: petals elliptic, 2–2.5 mm. long, deep-yellow: mature hypanthium broadly obconic, 2–2.5 mm. long and about as wide, the bristles in 2 or 3 series, the rim evident. [*A. pumila* Muhl.]—Woods and shaded banks, various provinces, Fla. to E Tex. and Pa.—Sum.

7. **A. rostellata** Wallr. Stem 2–10 dm. tall, sparingly hirsute or nearly glabrous: primary leaflets 3–9; blades obovate or oval, 3–10 cm. long, serrate with broadly ovate teeth: sepals ovate-lanceolate, about 1.5 mm. long: petals elliptic, 2–3 mm. long, pale-yellow: mature hypanthium hemispheric, about 2 mm. long, the bristles in about 3 series, the rim obsolete.—Wooded hillsides, stream-banks, and fence rows, various provinces, Ga. to Kans. and Conn.—Sum.–fall.

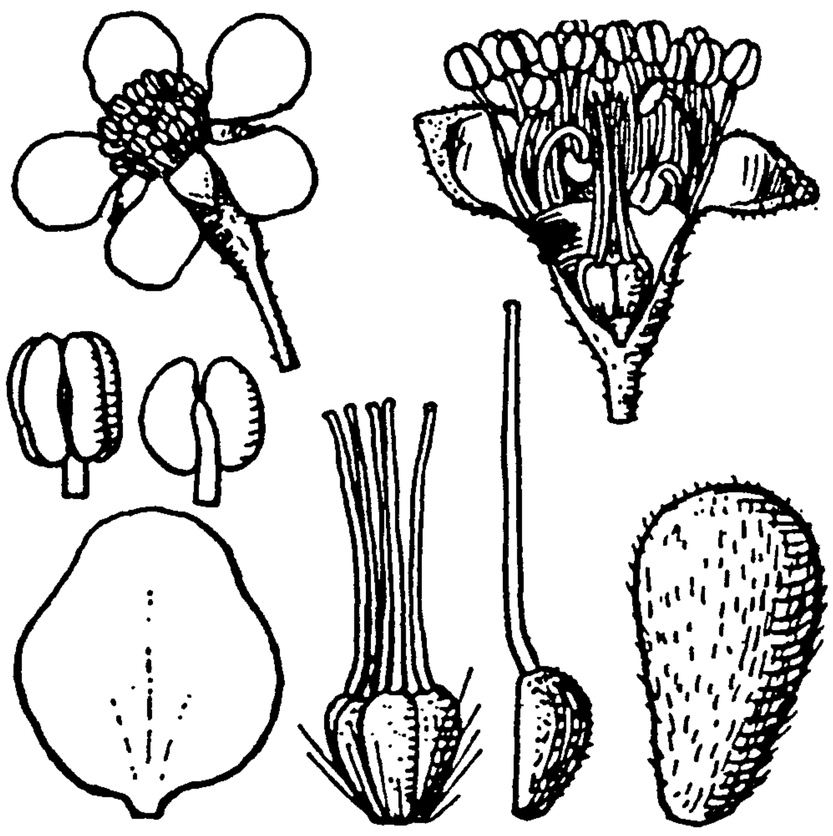
8. **A. incisa** T. & G. Stem 3–10 dm. tall, canescent and somewhat villous: primary leaflets 7–11; blades obovate to elliptic-obovate, 1–2 cm. long, prominently veined: sepals ovate, about 1.5 mm. long: petals elliptic, 2–3 mm. long, deep-yellow: mature hypanthium campanulate, about 2.5 mm. long, the bristles in 3 or 4 series.—Pinelands, Coastal Plain, Fla. to Miss. and N. C.—Sum.

9. **A. gryposepala** Wallr. Stem 3–18 dm. tall, pubescent with spreading hairs: primary leaflets 7–11; blades oval to obovate, oblanceolate or elliptic, 4–12 cm. long, coarsely serrate with ovate teeth: sepals acuminate, about 2 mm. long: petals obovate, 2.5–3 mm. long, bright-yellow: mature hypanthium broadly turbinate, 5–6 mm. long, the outer bristles much shorter than the inner. [*A. hirsuta* Bickn.]—Borders of woods and thickets, various provinces, N. C. to Nebr., N. D., and N. S.; also Calif.—(*Mex.*)—Sum.

16. **WALDSTEINIA** Willd. Acaulescent herbs. Leaf-blades lobed or divided. Flowers in corymbose cymes. Petals yellow, rounded. Receptacle minute. Carpels and achenes obovoid. Five species, natives of the north temperate zone.—Spr.—BARREN-STRAWBERRIES. STRAWBERRY-FOOL.

Leaf-blades 3-foliolate: style arising abruptly from the ovary.
  Petals twice as long as the sepals or longer: sepals mostly longer than the hypanthium. 1. *W. fragarioides.*
  Petals as long as the sepals or shorter: sepals mostly shorter than the hypanthium. 2. *W. Doniana.*
Leaf-blades 3-lobed: style arising gradually from the ovary. 3. *W. lobata.*

1. W. fragarioides (Michx.) Tratt. Plant 0.5–3 dm. tall: leaf-blades 3-foliolate; leaflets 2–4 cm. long, the blades cuneate to obovate, crenate-lobed or incised: petals 8–10 mm. long, twice as long as the sepals: style glabrous.—Damp woods and shaded banks, various provinces N of Coastal Plain, Ga. to Ind., Minn., and N. B.



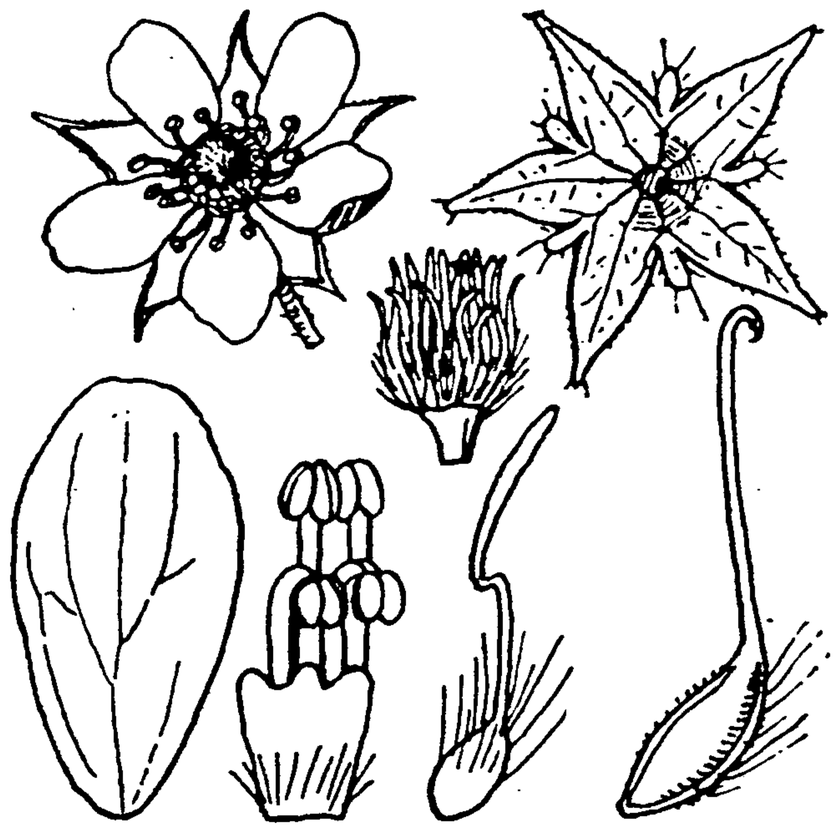
2. W. Doniana Tratt. Plant 1–3 dm. tall: leaflets irregularly crenate or somewhat lobed: petals 2–4 mm. long: style glabrous. [*W. parviflora* Small.]—Rich woods and banks, various provinces N of Coastal Plain, Ga. to Tenn. and Pa.

3. W. lobata (Baldw.) T. & G. Plant 1–2 dm. tall: leaf-lobes mucronulate-crenate: sepals longer than the hypanthium: petals narrowly elliptic, as long as the sepals or shorter: style pubescent at the base.—River banks, Coastal Plain and Piedmont, Ga. to N. C.

17. GEUM L. Herbs. Leaf-blades mostly 3-foliolate or pinnately divided. Flowers solitary or in open cymes. Petals rounded or retuse. Receptacle sessile. Carpels numerous: style jointed, elongate. Head of carpels, or achenes, sessile.—About 40 species, most abundant in the north temperate zone.—Spr.–sum.—AVENS.

Style bent near the apex: petals not veiny, 2–4 mm. long: bractlets obtuse.
  Corolla yellow or cream-yellow. 1. *G. hirsutum.*
  Corolla white.
    Receptacle bristly: stem glabrous or softly pilose. 2. *G. canadense.*
    Receptacle glabrous: stem hirsute. 3. *G. virginianum.*
Style bent near the middle: petals veiny, 6–7 mm. long: bractlets acute. 4. *G. geniculatum.*

1. G. hirsutum Muhl. Stem 3–15 dm. tall, hirsute below: blades of the lower leaves usually pinnately divided: sepals about twice as long as the bractlets: achene-body about 3 mm. long. [*G. flavum* (Porter) Bicknell.]—Thickets and open woods, various provinces N of Coastal Plain, N. C. to Tenn., Ohio, and Conn.

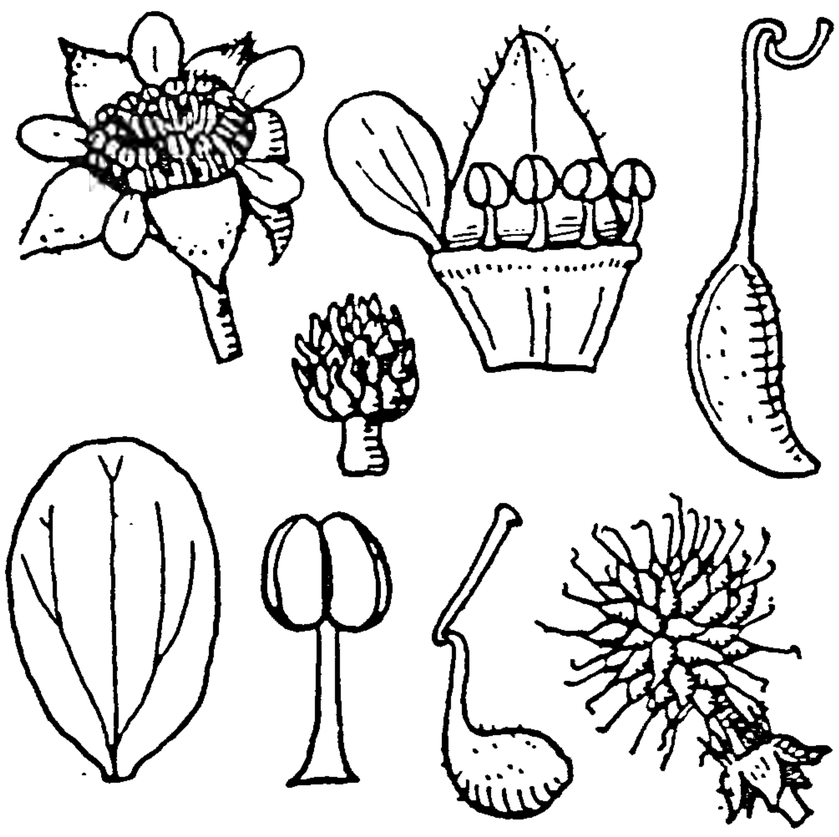


2. G. canadense Jacq. Stem 3–9 dm. tall: blades of the lower leaves 3-divided or pinnate: sepals about thrice as long as the bractlets: hypanthium glabrous or finely canescent: heads of achene 8–11 mm. long: achene-body 2.5–3 mm. long. [*G. album* Gmel.]—(REDROOT.)—Thickets and open woods, various provinces, Ga. to Tex., S. D., and N. S.—(*Mex.*)

3. G. virginianum L. Similar to *G. canadense* in habit, but stouter, and petals rather smaller: hypanthium hirsute: heads of achenes 12–16 mm. long: achene-body 2.5–3 mm. long.—Damp thickets and low grounds, various provinces, N. C. to Mo., Minn., and N. B.

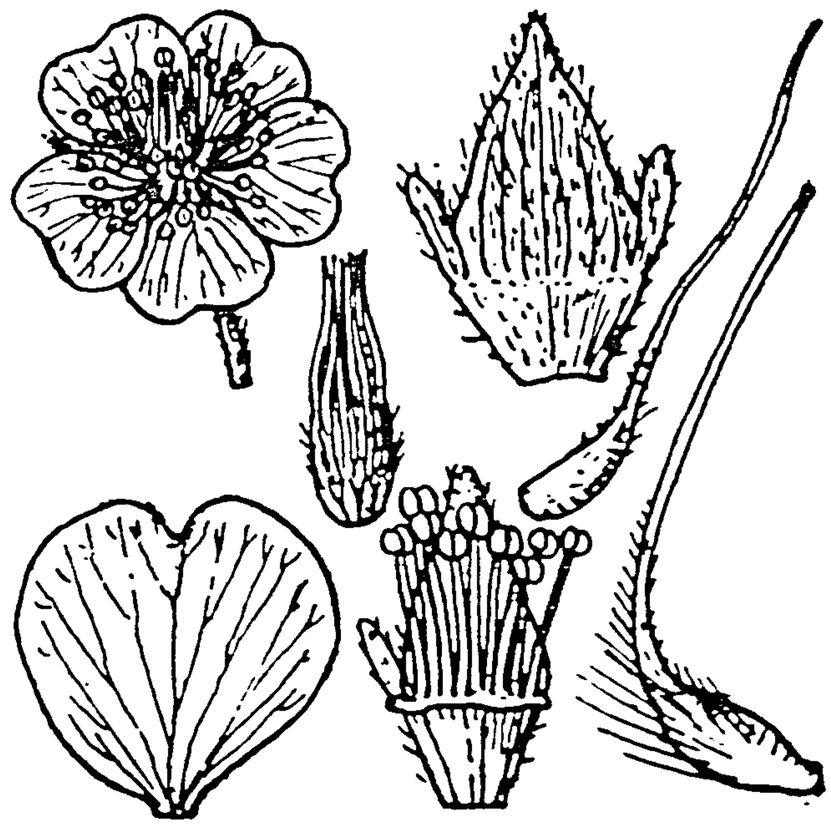
4. G. geniculatum Michx. Stem 5–9 dm. tall: blades of the lower leaves toothed or 3-divided: bractlets linear, about ½ as long as the sepals: white, with darker veins: achene-body 3.5–4.5 mm. long.—Wooded slopes, Blue Ridge, N. C. and Tenn.

18. STYLIPUS Raf. Perennial herbs resembling *Geum* in habit, but calyx not accompanied by a series of bractlets. Style elongated and tapering, bent near the apex. Head of carpels, or achenes, stipitate.—About 3 species, North American.



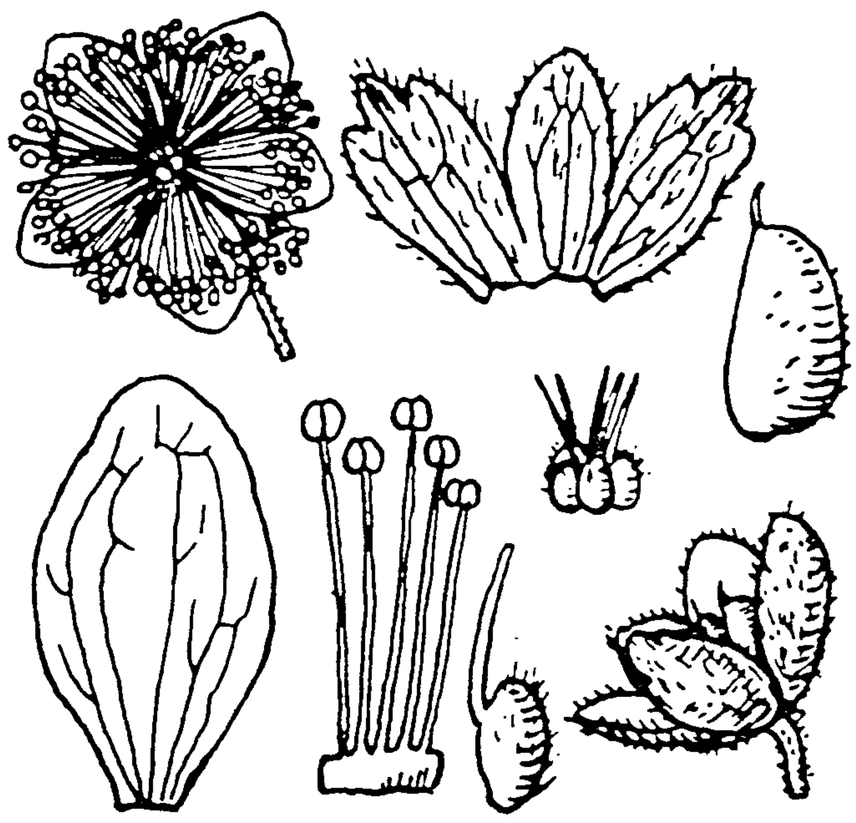
1. S. vernus Raf. Stem and branches often decumbent: blades of the lower leaves both lobed and pinnate: sepals about 2 mm. long: petals yellow, shorter than the sepals: head of achenes 7–9 mm. in diameter: achene-body 3 mm. long. [*Geum vernum* T. & G.] —Thickets and open woods, various provinces N of Coastal Plain, Tex. to Ont. and N. J. This is one of the "western" plants that have migrated eastward through the channels of agriculture.

19. SIEVERSIA R. Br. Perennial caulescent herbs. Leaf-blades various, those of the basal leaves with odd-pinnate blades, those of the cauline smaller and usually simple. Flowers few or solitary. Petals yellow or purplish, mostly notched. Carpels numerous: style elongate, not jointed, pubescent or plumose. About 15 species, of Alpine and arctic regions.



1. S. radiata (Michx.) Greene. Plant 1–6 dm. tall, hirsute: basal leaves with lyrate-pinnate blades, the terminal division sub-orbicular or reniform, 4–15 cm. wide: sepals acuminate: petals deep-yellow, 12–18 mm. long, deeply obcordate: achene-body 3–4 mm. long. [*Geum radiatum* Michx.]—Summits, Blue Ridge, N. C. and Tenn.—Sum.

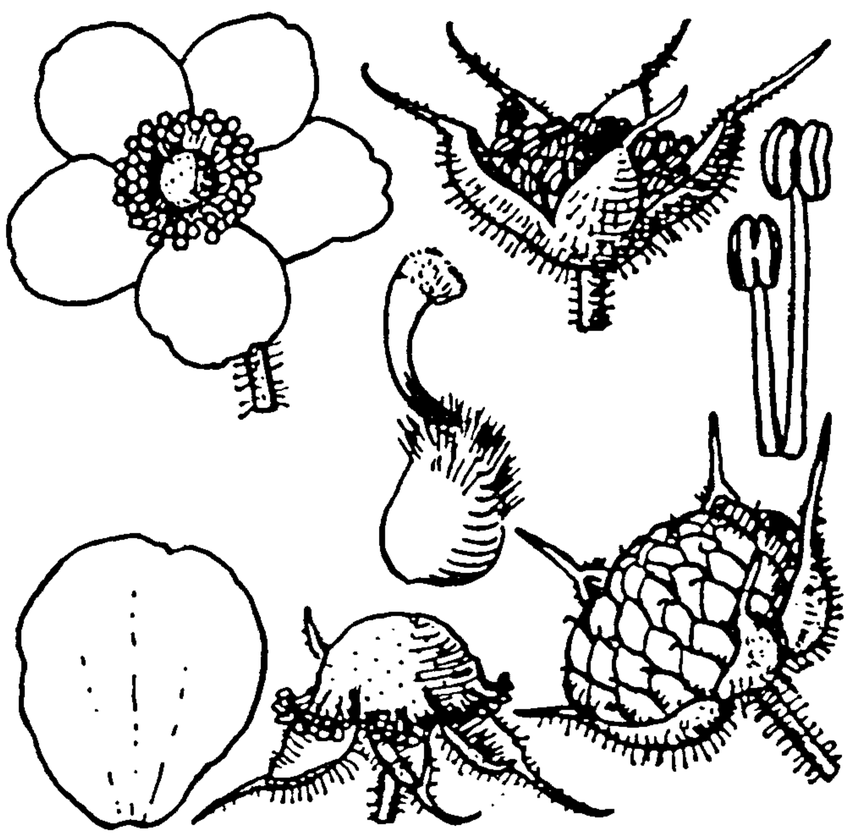
20. DALIBARDA L. Perennial unarmed creeping herbs. Leaf-blades broad, toothed. Flowers of 2 kinds, some petaliferous, but usually sterile on long erect peduncles, others apetalous and fruit-producing on short curved peduncles (not further considered here). Sepals 5 or 6, the 3 larger ones, at least, toothed at the apex. Petals mostly 5, white, deciduous. Carpels 5–10. Fruit a cluster of nearly dry drupelets.—One species.



1. D. repens L. Stem and branches soft-pubescent: leaf-blades ovate to orbicular, 2–5 cm. wide, crenate, pubescent on both sides, cordate, slender-petioled: sepals 6–7 mm. long, pubescent: petals elliptic, oval,

or ovate, 7–8 mm. long: drupelets ellipsoid to ovoid, 3–4 mm. long.—(DEW-DROPS. STAR-VIOLET.)—Woods, often in acid soil, Blue Ridge and more N provinces, rarely extending into Coastal Plain northward, N. C. to Minn. and N. B.—Spr.–sum.

21. **RUBACER** Rydb. Perennial partly shrubby diffuse plants. Leaf-blades palmately lobed. Flowers corymbose or racemose. Carpels borne on a flat receptacle. Fruit depressed-hemispheric or nearly flat.—About 3 species, North American.



1. **R. odoratum** (L.) Rydb. Stem 1–2 m. tall, clammy-pubescent: leaf-blades 5–30 cm. wide, 3–5 lobed: sepals elongate, each with an ovate or elliptic-ovate body and a slender appendage: petals rose-purple or rarely white, 1.5–2 cm. broad: fruits red, 15–20 mm. broad, insipid. [*Rubus odoratus* L.]—(FLOWERING-RASPBERRY. RASPBERRY-ROSE. THIMBLE-BERRY.)—Rocky banks and woods, various provinces N of Coastal Plain, Ga. to Mich. and N. S.—Sum.

22. **RUBUS** [Tourn.] L. Perennial erect or trailing shrubs. Leaf-blades simple or 3–7-foliolate. Flowers solitary or variously disposed. Petals white to purple. Carpels borne on a convex or conic receptacle. Fruit hemispheric or elongate, composed of drupelets.—About 200 species, most abundant in the north temperate regions.—Spr.—RASPBERRIES. BLACKBERRIES. BRAMBLES.—Spr. or early sum.—The stems are biennial in our species. The shoots of the season, called turions, arise from the scaly subterranean buds.—The following treatment is based on that of Per Axel Rydberg in North American Flora.

Drupelets united into a thimble-like aggregate fruit which falls away from the dry receptacle.—RASPBERRIES. — I. IDAEI.

Drupelets united and on the fleshy receptacle or falling off together with the receptacle, or falling away separately.—BLACKBERRIES.

- Shoots of the season (turions) erect: stems erect, arching, or recurved.
  - Blades of the leaflets white-tomentose beneath. — II. DISCOLORES.
  - Blades of the leaflets not white-tomentose beneath. — III. ARGUTI.
- Shoots of the season (turions) and stems prostrate, only floral branches erect.
  - Inflorescence not prickly: leaves deciduous, except in *R. hispidus* in which the leaflets are obovate.
    - Stem prickly and prickles confined to the angles of the stem. — IV. PROCUMBENTES.
    - Stem with usually numerous bristles which are not confined to the angles. — V. HISPIDI.
  - Inflorescence with flattened prickles: leaves persistent: blades of the leaflets oblanceolate or elliptic. — VI. TRIVIALES.

I. IDAEI

Corolla white; petals erect or ascending.

- Inflorescence corymbiform: fruits black: leaves, when with more than 3 leaflets, pedately compound. — 1. *R. occidentalis.*
- Inflorescence racemose: fruits red: leaves, when with more than 3 leaflets, pinnately compound. — 2. *R. carolinianus.*

Corolla rose or purple; petals incumbent, appressed to the stamens: stem densely hispid, but not glandular. — 3. *R. phoenicolasius.*

II. DISCOLORES

Blades of the lateral leaflets cuneate to obovate: blade of the terminal leaflet entire near the base. — 4. *R. cuneifolius.*

Blades of the lateral leaflet broadly ovate: blade of the terminal leaflet toothed to the base. 5. *R. Linkianus.*

III. ARGUTI

Inflorescence densely clothed with long-stalked glands. 6. *R. nigrobaccus.*
Inflorescence glandless, or the sessile glands, if present, hidden in the other pubescence.
Blades of the leaflets markedly pubescent beneath.
Inflorescence elongate-ramose: young branches more or less distinctly angled: prickles stout: blades of the leaflets coarsely pubescent beneath. 7. *R. argutus.*
Inflorescence short-corymbiform: young branches terete: prickles at least on the branches curved and flattened: leaflets very finely pubescent beneath. 8. *R. floridus.*
Blades of the leaflets glabrous, or merely pubescent on the veins beneath.
Prickles strongly hooked and flattened, at least on the floral branches. 9. *R. betulifolius.*
Prickles, if present, straight and terete.
Stems stout, 1–5 m. tall, angled, usually unarmed. 10. *R. canadensis.*
Stems slender, 1 m. tall or less, terete or nearly so, sparingly retrorse-prickly: erect forms of 14. *R. Enslenii.*

IV. PROCUMBENTES

Blades of the leaflets markedly pubescent beneath.
Prickles strongly flattened and curved. 11. *R. rhodophyllus.*
Prickles terete or nearly so, rather weak.
Blades of the leaflets light-green and firm, shining above, regularly toothed. 12. *R. invisus.*
Blades of the leaflets dark-green and very thin, irregularly toothed. 13. *R. Baileyanus.*
Blades of the leaflets glabrous or sparingly pubescent on the veins beneath.
Leaflets of the flowering branches thin, the blades crenate-serrate with ovate teeth: stem with weak prickles. 14. *R. Enslenii.*
Leaflets of the flowering branches firm, the blades serrate with lanceolate teeth: stem with firm prickles. 15. *R. flagellaris.*

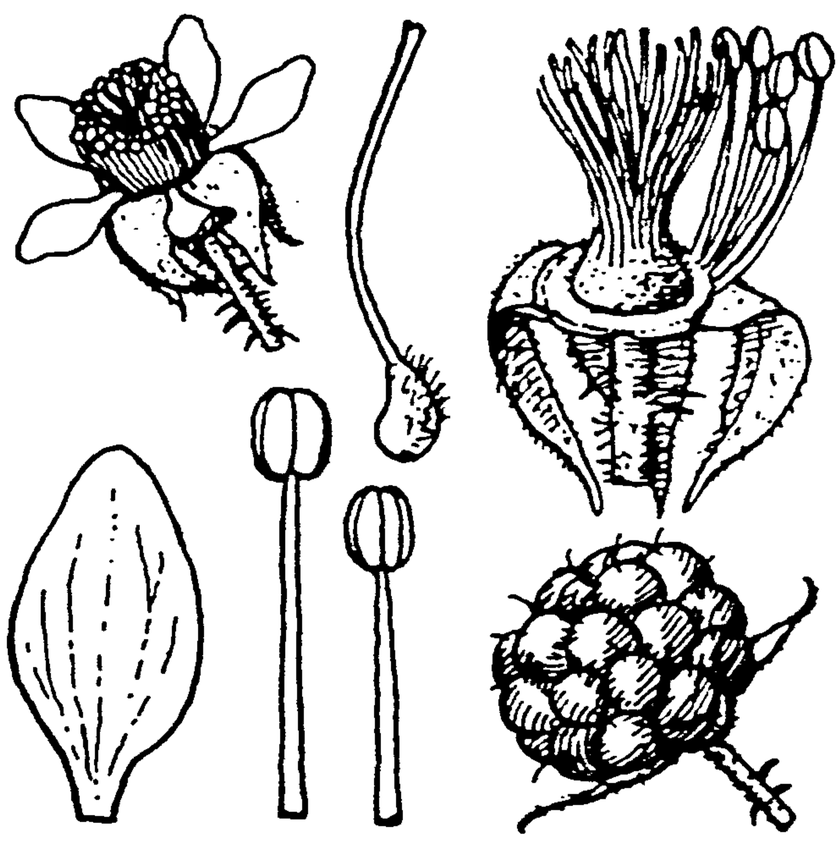
V. HISPIDI

Plant with slender, prostrate, often elongate stems: blades of the leaflets thin, but firm, shining above. 16. *R. hispidus.*

VI. TRIVIALES

Blades of the leaflets of turions ovate, elliptic or lanceolate, simply serrate with triangular teeth.
Inflorescence usually several-flowered: stems decidedly prickly, but not at all bristly. 17. *R. lucidus.*
Inflorescence usually 1-flowered: stems usually bristly as well as prickly. 18. *R. trivialis.*
Blades of the leaflets of turions oval or obovate, doubly toothed with ovate teeth.
Leaflets comparatively thin, turions obtuse or acute. 19. *R. continentalis.*
Leaflets firm and thick, turions short-acuminate. 20. *R. rubrisetus.*

1. R. occidentalis L. Stems arching, 3 m. long or less, often rooting at the tip, glaucous, the prickles somewhat flattened, recurved: leaves of the turions 3-foliolate or individually pedately 5-foliolate, deciduous; leaflet-blades ovate, 5–8 cm. long, double serrate, sometimes lobed, abruptly acuminate, dark-green above, white-tomentose beneath, rounded or cordate at the base: leaves 3-foliolate; leaflet-blades similar to those of the stem but smaller: corymbs terminal, few-flowered: peduncles and pedicels prickly, tomentose: petals shorter than the ovate-lanceolate sepals: fruit hemispheric, dark bluish-purple, with a bloom: drupelets many, tomentose.—(BLACK-RASPBERRY. BLACK-CAP. THIMBLEBERRY.)—Woods and thickets, various provinces, in Coastal Plain only northward, Ga. to Colo., Minn., and N. B.



2. **R. carolinianus** Rydb. Stems erect or ascending, 3 m. long or less, densely bristly and hispid, with most of the bristles gland-tipped: leaves of the turions 3–7-foliolate, mostly 5-foliolate, deciduous; leaflet-blades ovate or ovate-lanceolate, 5–8 cm. long, long-acuminate at the apex, doubly-serrate, glabrate above, densely white-tomentose beneath, rounded or acute at the base: leaves of the floral branches mostly 3-foliolate: leaflet-blades more incised than those of the stem-leaves: racemose flower-clusters terminal and in the upper leaf-axils: peduncle and pedicels densely glandular-bristly: petals about ½ as long as the ovate sepals: fruit hemispheric, red: drupelets numerous, pubescent. [*R. strigosus* (Fl. SE. U. S.)]—(RED-RASPBERRY. WILD RED-RASPBERRY.)—Thickets and open woods, Blue Ridge, N. C. and Tenn.

3. **R. phoenicolasius** Maxim. Stems 2–2.5 m. long, covered like the branches and petioles, with reddish or purplish gland-tipped bristly hairs and scattered prickles: leaflets 3; blades broadly ovate or oval to suborbicular, 3–9 cm. long, acute or short-acuminate, crenate and usually shallowly lobed, green above, densely white-tomentulose beneath: hypanthium densely glandular-bristly: petals about 1/3 as long as the linear-lanceolate sepals: fruit ovoid, cherry-red, about 1 cm. broad.—(WINEBERRY.)—Thickets, fence-rows, and roadsides, various provinces, nearly throughout E U. S.—Nat. of Japan.—Spr.

4. **R. cuneifolius** Pursh. Stems erect, 0.5–1.5 m. high, more or less tomentose, the prickles straight or somewhat recurved: leaves of the turions pedately 3–5-foliolate; leaflet-blades obovate or cuneate-obovate, thick, dark-green and sparingly pilose or glabrate above, white-tomentose beneath, finely serrate except towards the acute or cuneate base: floral branches 1–3 dm. long: leaves 1–3-foliolate; leaflet-blades 2–4 cm. long, more cuneate or cuneate-oblanceolate: corymbs 2–7-flowered, tomentose and prickly: sepals white-tomentose on both sides: petals obovate to elliptic, 8–12 mm. long: fruit black, rather dry, but well-flavored, short-ellipsoid, 10–12 mm. long.—(LATE-BLACKBERRY. BRIER-BERRY. SAND-BLACKBERRY.)—Sandy woods, thickets, and fields, Coastal Plain and adj. provinces, Fla. to La. and Conn.—Two species of this relationship have been proposed by Bailey: *R. inferior* from pen. Fla. has fruiting stems ultimately lying on the ground, with small, short-acute leaflets, and flowers on long erect pedicels; *R. probabilis*, ranging from Fla. to Md., has erect or diffuse fruiting stems with relatively large taper-pointed leaflets and flowers in open corymb-like clusters.

5. **R. Linkianus** Ser. Stem erect, 1–2 m. tall, finely soft-pubescent, the prickles flat, more or less recurved: leaves of the floral branches 3-foliolate or individually 1-foliolate; leaflet-blades ovate, oval, or obovate, green and glabrous above, white-tomentulose beneath, rounded or subcordate at the base: flowers in paniculate cymes: sepals densely white tomentose on both sides: petals obovate, 7–10 mm. long: fruit black.—Woods, roadsides, and waste-places, locally escaped from cult., Fla. to Md. Nativity unknown.—The flowers are frequently double.

6. **R. nigrobaccus** Bailey. Stems erect, 3 m. tall or less, usually arching, furrowed and angled, villous when young, the prickles stout, flat, usually somewhat curved: leaves of the turions pedately 5-foliolate; petioles and petiolules villous, glandular-hispid, and with recurved prickles: leaflet-blades ovate, 4–20 cm. long, more or less pilose above, paler and densely soft-pubescent beneath, abruptly acuminate, doubly serrate: floral branches short: leaves 3-foliolate; leaflet-blades smaller and less acuminate than the others: corymbs raceme-like, somewhat leafy-bracted: peduncles and pedicels villous and glandular-hispid: petals oval or elliptic, 10–15 mm. long: fruit black, thimble-shaped, sometimes short, mostly 1–1.5 cm. long. [*R. villosus* (Chapm. Fl.)]—Open woods and thickets, various provinces, N. C. to Ark., Ill., and N. S.

7. R. argutus Link. Stems erect or arching, 2 m. long or less, glabrous, angled and furrowed, the prickles stout, spreading, flattened: leaves of the turions pedately 5-foliolate, deciduous; leaflet-blades ovate, 3–10 cm. long, short-acuminate, doubly serrate, dark-green above, softly and rather densely pubescent beneath, sometimes almost velutinous, rounded or subcordate at the base: floral branches 1–2 dm. long, densely villous and rarely slightly glandular; leaves 3-foliolate or some of the upper ones 1-foliolate; leaflet-blades ovate or oval: racemes few-flowered, short and represented by single flowers in the upper leaf-axils: peduncles and pedicels copiously pubescent and with curved prickles: petals orbicular to oval, about 1 cm. long, much exceeding the sepals: fruit slightly elongate, 10–12 mm. long, black.—(HIGHBUSH-BLACKBERRY.)—Thickets and woods, various provinces, N. C. to La., Kans., and N. S.—A related plant from Buncombe Co., N. C., with 5-foliolate leaves on the turions, and firm leaflets with less coarsely toothed blades, has been described as *R. crux* Ashe. Another from Tallahassee, Fla., with erect or ascending inflorescence-branches, instead of spreading, has been described as *R. tallahasseanus* Bailey. *R. ostryifolius* Rydb. may be a hybrid between *R. argutus* × *Ensleni*.

8. R. floridus Tratt. Stems erect, 2–5 m. high, or the branches decumbent, more or less angled, the prickles stout, flat, strongly curved: leaves of the turions 3–5-foliolate: petioles and petiolules pilose and sparingly prickly: leaflet-blades elliptic-lanceolate or ovate-lanceolate, 5–10 cm. long, sparingly pubescent above, pale and more densely puberulent beneath, but in age nearly glabrous except the veins, sharply double-serrate: floral branches short: leaves 3-foliolate or the upper unifoliolate; leaflet-blades smaller, more glabrate, elliptic to rhombic-oval: corymbs rather few-flowered, more or less leafy; peduncles and pedicels densely pubescent, sometimes with few scattered glands, but not armed: petals elliptic-obovate, 12–15 mm. long: fruit thimble-shaped, about 1 cm. long, black.—Pinelands and fields, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Va.—*R. frondosa* Bigel. with nearly terete straight prickles and broadly cordate leaflets, appears not to range south of Va.

9. R. betulifolius Small. Stems glabrous, angled, the prickles recurved and strongly flattened, erect or recurved-spreading: leaves of the turions 5-foliolate; leaflet-blades elliptic-lanceolate, evenly serrate, thin, glabrous on both sides: petioles, petiolules, and midveins with very flat recurved prickles, glabrous or nearly so: flowering branches 1–2 dm. long, with recurved prickles: leaves 3-foliolate; leaflet-blades oval or elliptic, thin, glabrous, evenly serrate, shining above: corymbs somewhat leafy-bracted below, sparingly pubescent and armed with recurved prickles: petals elliptic-obovate, 12–15 mm. long: fruit rounded or slightly elongate, black.—Swamps and wet sandy woods, Coastal Plain and adj. provinces, Fla. to Miss., Ill., and Va.—A related plant from Uceta, Fla., with the blades of the leaflets of the turions very broad, that of the terminal one cordate or subcordate, has been described as *R. ucetanus* Bailey.

10. R. canadensis L. Stems erect or arching, 4 m. long or less, glabrous, with rounded angles and furrows, unarmed or with few straight weak prickles: leaves of the turions pedately 5-foliolate, deciduous; leaflet-blades ovate to obovate, mostly 6–15 cm. long, abruptly long-acuminate, thin, sharply serrate, glabrous or with few scattered hairs above, glabrous or pubescent on the veins beneath, rounded or subcordate at the base: floral branches with usually 3-foliolate leaves; leaflet-blades oval or nearly so, mostly 5–10 cm. long; raceme several-flowered, terminal, often leafy below: peduncles and pedicels pilose or villous: petals oval, 10–15 mm. long: fruit roundish, 1–1.5 cm. long, black. [*R. Millspaughii* Britton.]—(SPINELESS-BLACKBERRY.)—Woods and cliffs, Blue Ridge and more N provinces, N. C. to Mich. and Newf.—*R. Randii* (Bailey) Rydb., with terete herbaceous stems, is not definitely known from our range.

11. R. rhodophyllus Rydb. Stems decumbent, terete, pubescent or in age glabrate, the prickles recurved, flattened only at the base; leaves of the turions not seen: flowering branches 1 dm. long or less, villous: leaves 3-foliolate; leaflet-blades broadly obovate or ovate, finely and simply serrate with broad triangular teeth, closely villous-tomentose beneath, sparingly hairy or glabrate above: corymb few-flowered: sepals ovate, mucronate, villous or tomentose without, tomentulose within: petals obovate, 10–12 mm. long.—Dry woods and fields, Coastal Plain, E Fla. to S Miss.

12. R. invisus (Bailey) Britton. Stems decumbent or ascending, 1–2 m. long or less, glabrous, terete, the prickles weak and straight: leaves of the turions pedately 5-foliolate; blades of the leaflets ovate to orbicular-ovate, 4–10 cm. long, abruptly short-acuminate, thin, glabrous or sparingly pubescent on both sides, coarsely and rather evenly serrate, rounded or subcordate at the base, or those of the narrower lateral leaflets acute at the base: floral branches 1.5–2.5 dm. long; leaves 3-foliolate or individually 1-foliolate; leaflet-blades ovate or oval: flowers solitary in the upper axils or 1, 2, or 3 together at the ends of the branches: peduncles and pedicels villous and more or less glandular-hispid: petals elliptic, 1–1.5 cm. long: fruits hemispheric, 1.5–2 cm. in diameter, black.—Open woods, fields, and clearings, various provinces N of Coastal Plain, N. C. to Ont. and Conn.

13. R. Baileyanus Britton. Stems decumbent, trailing, 1–2 m. long, glabrous, sparingly armed with small, recurved prickles: leaves of the turions 3-foliolate, or rarely 5-foliolate, deciduous: leaflet-blades softly pubescent, membranous, mostly ovate, doubly serrate with broad teeth: leaves of the erect flowering branches 3-foliolate with oval or ovate, doubly toothed, and somewhat lobed blades, or 1-foliolate and with an orbicular-ovate or cordate often 3-lobed blade: flowers solitary in the axils of the upper leaves, one, or sometimes 2 or 3, at the ends of the branches, the peduncles villous pilose: petals elliptic, 10–14 mm. long: fruit hemispheric, black, 10–15 mm. in diameter, the drupelets glabrous.—Hillsides and thickets, various provinces N of Coastal Plain, N. C. to Okla., Kans., Ont., and Mass.—*R. roribaccus* Rydb. appears to be a hybrid between *R. Baileyanus* × *flagellaris*.

14. R. Enslenii Tratt. Stems glabrous, ultimately prostrate or ascending, 1.5 m. long or less, sparingly retrorse-prickly: leaves of the turions 3-foliolate: leaflet-blades glabrous or sparingly pubescent on the veins, and ciliate, membranous, lanceolate or rhombic-lanceolate, doubly serrate, green: leaves of the flowering branches 3-foliolate, with blades similar to those of the other leaves but smaller and relatively broader or 1-foliolate: flowers mostly solitary at the ends of the branches: pedicels glabrous or nearly so: petals elliptic-obovate, 12–18 mm. long: fruit hemispheric, black.—Sandy soil, Coastal Plain extending into adj. provinces, Fla. to Tex., Mo., and Mass.—A related plant, from the mountains of N. C. with the turions, petioles, and pedicels bearing stalked glands and two kinds of prickles on the turions, has been described as *R. Boyntonii* Ashe. *R. immanis* Ashe, from Watauga Co., N. C., a plant of this relationship, is described as being 2–4 m. tall and growing in dense clumps, the stems glabrous, the leaflets rough-pubescent beneath, the racemes 4–8-flowered.

15. R. flagellaris Willd. Stem prostrate, often greatly elongate, glabrous, with scattered, rather weak, recurved prickles: leaves of the turions 3–5-foliolate; leaflet-blades pubescent on both sides, often only on the veins beneath, firm-membranous, broadly ovate or rhombic-ovate, coarsely doubly serrate: leaves of the flowering branches 3-foliolate with blades usually obovate to oblanceolate: flowers solitary in the upper axils or rarely 2–4 together; pedicels sparingly villous: petals elliptic-obovate, 10–15 mm. long: fruit hemispheric

to conic, black. [*R. canadensis* (Chapm. Fl.) *R. procumbens* (Fl. SE. U. S.) *R. subuniflorus* Rydb.]—Dry often stony hillsides and old fields, various provinces, Ala. to Mo., Minn., and Me.; reported also from Fla.

16. R. hispidus L. Stems prostrate and trailing, 2 m. long or less slender, glabrous, retrorsely bristly: leaves of the turions 3-foliolate or rarely pedately 5-foliolate, persistent; leaflet-blades broadly ovate to rhombic-obovate, thickish, mostly acute or abruptly short-acuminate, glabrous, dark-green and shining above, coarsely doubly serrate with mucronate teeth: floral branches erect, their leaves 3-foliolate or individually 1-foliolate: leaflet-blades obovate, usually rounded at the apex: flowers few together at the ends of the branches and sometimes 1 or 2 in the upper leaf-axils: peduncles and pedicels tomentulose-puberulent and bristly or unarmed: petals obovate, about 8 mm. long: fruit globular or irregular, 1 cm. in diameter or less, dark-red or purple, the drupelets few.—(SWAMP-DEWBERRY.)—Low woods and wet meadows, often in acid soil, various provinces, Ga. to Mich. and N. S.

17. R. lucidus Rydb. Stems trailing, 1–2 m. long, terete, rather slender, the prickles recurved, flattened: leaves of the turions mostly 5-foliolate, persistent, somewhat leathery in age; leaflet-blades lanceolate, acute, glabrous on both sides, regularly serrate, dark-green and shining above, paler beneath: floral branches 1–2 dm., rarely 3 dm. long, erect, sparingly pubescent or glabrate: leaves 3-foliolate; leaflet-blades oblanceolate: flowers in terminal 2–6-flowered corymbs: peduncles and pedicels sparingly pubescent and decidedly prickly: petals obovate, 12–15 cm. long: fruit elongate, rather dry. [*R. persistens* Rydb.]—Open woods, Coastal Plain, Fla. to Miss. and S. C.

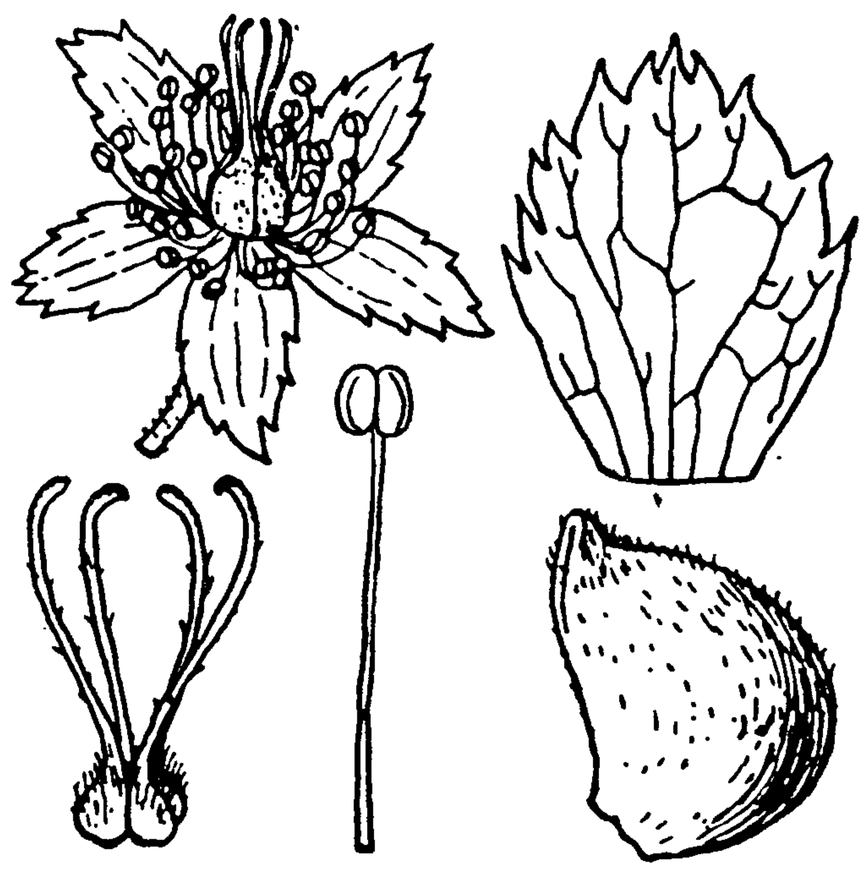
18. R. trivialis Michx. Stems prostrate and trailing, 5–20 dm. long, slender, terete, more or less hispid and with small, slightly flattened prickles: leaves of the turions 3–5-foliolate, persistent; leaflet-blades glabrous, subcoriaceous, ovate or oblanceolate, sharply serrate, dark-green and shining above, paler and duller beneath: leaves of the erect flowering branches 3-foliolate; leaflet-blades smaller, more elliptic or oval, rounded, obtuse, or acute at the apex: flowers terminal, mostly solitary: peduncles 2–5 cm. long, more or less tomentulose and prickly: petals white, obovate, 10–15 mm. long: fruit usually ellipsoid, black, 10–15 mm. long.—(SOUTHERN-DEWBERRY.)—Thickets, open woods, and fields, Coastal Plain, Fla. to Tex., Okla., and Va.—An infusion made from the herbage is used by the Seminoles in cases of stomach trouble.—A segregate of this species, *R. mississippianus* Bailey, from the coastal region of Mississippi, has narrower leaflets on the turions, the blades being mostly elliptic to elliptic-lanceolate and acuminate.

19. R. continentalis (Focke) Bailey. Stems biennial or perennial, 2 m. long or less, procumbent or trailing, bristly and armed with small, flat, recurved prickles: leaves of the turions or trailing stems 5-foliolate; blades thin, elliptic or elliptic-obovate, glabrous, doubly serrate with rather blunt teeth, acute or obtuse at both ends: leaves of the prickle-armed flowering branches 5-foliolate below, 3-foliolate above; blades relatively broader than those of the stem-leaves; flowers solitary or 2–4 at the ends of the branches: pedicels slightly glandular-hispid and armed with weak, flat, recurved prickles: petals white, oval, about 1 cm. long: fruit usually somewhat elongate, 1–2 cm. long. [*R. carpinifolius* Rydb. not Weihe & Nees.]—River-banks, bottom lands, and marshes, Coastal Plain and adj. provinces, Fla. to Tex., Okla., and Ill.—A related plant from the shores of Lake Okeechobee, Fla., with the flowers long-stalked on cane-like, foliose shoots, and leaves with very broad cordate or subcordate, individually undivided leaflets, has been described as *R. okeechobeus* Bailey. Two plants differing from *R. trivialis* and *R. okeechobeus*, in being devoid of bristles, but with flat-based prickles, have been described by

Bailey: *R. ictus*, ranging from Fla. to Miss., has small flowers on weakly armed pedicels and narrow leaflets on the young shoots; *R. mirus*, from Fla. has very large flowers on stout-armed pedicels and broad leaflets on the new shoots.

20. R. rubrisetus Rydb. Stems biennial, 2–4 m. long procumbent or trailing, glandular-hispid with red or purplish bristles and armed with weak prickles, also reddish: leaves of the turions or trailing stems 5-foliolate; blades thick and evergreen, oval, obovate or lanç̣e-ovate, glabrous except the veins beneath; acute at the base, short acuminate at the apex, irregularly serrate: leaves of the flowering-branches 3–5-foliolate; leaflets more obtuse than those of the turions; flowers 3–7 in small terminal corymbs, somewat leafy-bracted below: peduncles and pedicels glandular-bristly and sometimes with small prickles, both prickles and bristles red; sepals tomentulose on both sides, ovate, short-acuminate with subulate tips: petals white, oval, 1 cm. long: fruit 1.5–2 cm. long, ellipsoid, very sweet and juicy, the drupelets numerous.—River banks, ditches, marshes and lowlands, Coastal Plain, La. to Mo.

23. NEVIUSIA A. Gray. Shrubs. Leaf-blades simple, toothed. Flowers many, borne in open cymes. Calyx corolloid. Sepals 5, whitish, toothed, much larger than the flattish hypanthium. Petals wanting. Stamens numerous; filaments white, conspicuous. Carpels 2–4, the bodies pubescent: style elongate: stigma minute, introrse. Achene drupe-like.—One species.



1. N. alabamensis A. Gray. Stems and branches 6–15 dm. tall: leaf-blades ovate to ovate-lanceolate, or somewhat rhombic, 2–7 cm. long, doubly serrate: sepals elliptic to ovate, 8–12 mm. long, incised-serrate above the middle: achenes ovoid, 4–5 mm. long.—(SNOW-WREATH.)—Shale and limestone cliffs, Appalachian Valley and Plateau, Ala.—Spr.

24. KERRIA DC. Shrubs. Leaf-blades simple, toothed, often somewhat incised. Flowers solitary or several together. Hypanthium hemispheric. Calyx herbaceous: sepals 5, broad, not toothed. Petals 5, yellow. Stamens numerous. Carpels 4–6, the bodies glabrous: style filiform: stigma minute. Achene drupe-like, 5 together or often solitary, very turgid.—One species.

1. K. japonica DC. Stem and branches arching and spreading: leaf-blades lanceolate to ovate, 2.5–6 cm. long, acuminate, doubly serrate or somewhat incised, pubescent: sepals elliptic to ovate or obovate, becoming 9–11 cm. long, erose at the apex: petals yellow, ovate to orbicular-ovate or suborbicular, 20–28 mm. long: achene obliquely ovoid, 4.5–5.5 mm. long.—(GLOBE-FLOWER. JAPANESE-ROSE.)—Roadsides and fence-rows, eastern S. C.—Nat. of Japan.—Spr.—The Japanese-rose is the double-flowered form.

25. ROSA [Tourn.] L. Prickly shrubs, sometimes vine-like. Leaf-blades unequally pinnate. Flowers solitary or in corymbs, often showy. Hypanthium urceolate. Sepals more or less foliaceous. Petals 5, broad. Stamens many. Achenes long, enclosed in the pulpy hypanthium. Many species, perhaps more than 100, widely distributed in the Northern Hemisphere.—Spr.-sum.—ROSES. —The following treatment is based on that of Per Axel Rydberg in North American Flora.

Styles much exserted, united, about equalling the stamens: stipules adnate: sepals reflexed. I. SYNSTYLAE.
Styles not exserted or only slightly so; stigmas aggregated into a head which closes the mouth of the hypanthium.
  Stipules almost free from the petiole: naturalized climbing or trailing plants.
    Leaflets 3–5: branches glabrous: stipules small, entire. II. LAEVIGATAE.
    Leaflets 5–9: branches pubescent: stipules pectinate. III. BRACTEATAE.
  Stipules adnate to the petiole: erect, or rarely climbing plants.
    Achenes borne both in the inner walls and in the bottom of the hypanthium which is glabrous or glandular-hispid only at the base: prickles rarely infrastipular. IV. CANINAE.
    Achenes borne in the bottom of the glandular-hispid hypanthium: infrastipular prickles borne on the stem, the shoots usually bristly. V. CAROLINAE.

I. SYNSTYLAE

Stipules pectinate. 1. *R. multiflora.*
Stipules entire or denticulate.
  Leaves of the flowering branches with 5–7 leaflets: petals white. 2. *R. moschata.*
  Leaves of the flowering branches with 3, or rarely 5, leaflets: petals pink.
    Blades of the leaflets glabrous or slightly pubescent on the veins beneath, dark-green and shining above. 3. *R. setigera.*
    Blades of the leaflets velutinous beneath, rather dull above. 4. *R. rubifolia.*

II. LAEVIGATAE

Leaflet-blades narrowed at the apex: hypanthium and fruit bristly. 5. *R. laevigata.*

III. BRACTEATAE

Leaflet-blades rounded at the apex: hypanthium and fruit puberulent. 6. *R. bracteata.*

IV. CANINAE

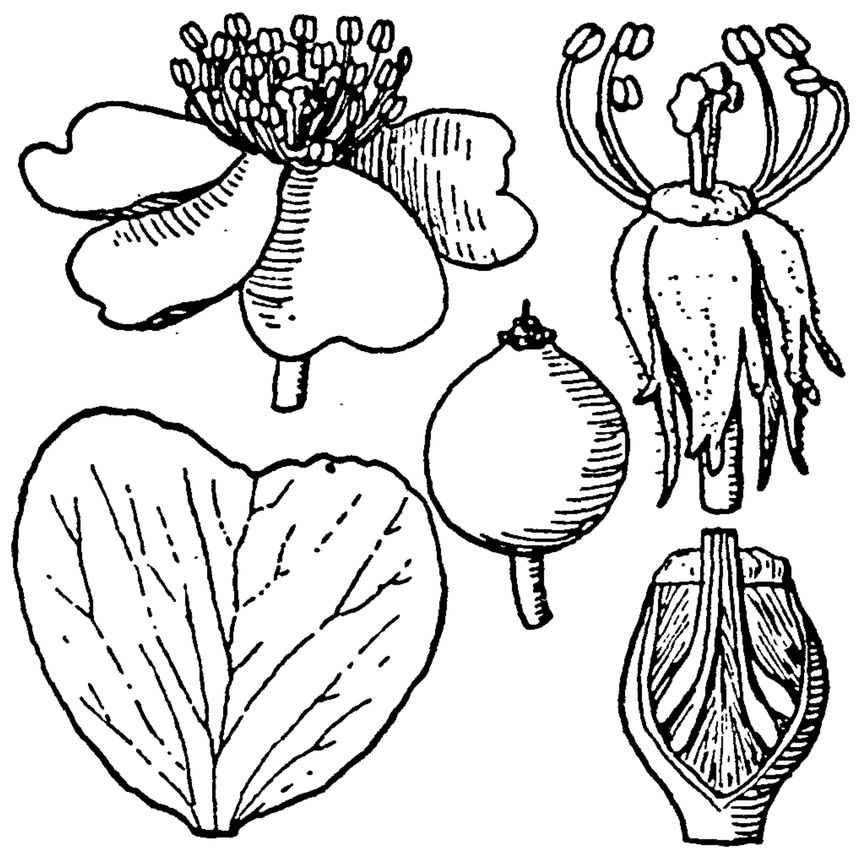
Leaflets glandular-pruinose beneath: blades manifestly doubly serrate with gland-tipped teeth.
  Stem with straight or nearly straight prickles. 7. *R. tomentosa.*
  Stem with strongly curved prickles.
    Blades of the leaflets suborbicular to broadly oval, mostly rounded at the apex: mature hypanthium obovoid or broadly ellipsoid, abruptly contracted at the apex: sepals tardily deciduous or somewhat persistent: styles pubescent. 8. *R. rubiginosa.*
    Blades of the leaflets ovate, acute or short-acuminate: mature hypanthium narrowly ellipsoid, tapering at both ends: sepals rather early deciduous: styles glabrous or nearly so. 9. *R. micrantha.*
Leaflets not glandular beneath; blades singly serrate or somewhat doubly serrate. 10. *R. canina.*

V. CAROLINAE

Infrastipular prickles decidedly curved.
  Blades of the leaflets finely serrulate, elliptic or oblanceolate: prickles short and stout.
    Leaflets mostly 7: flowers usually corymbose on erect branches: mature hypanthium about 12 mm. thick. 11. *R. palustris.*
    Leaflets mostly 5: flowers usually solitary or two together on spreading branches: mature hypanthium 8–9 mm. thick. 12. *R. floridana.*
  Blades of the leaflets coarsely serrate, oval or obovate. 13. *R. virginiana.*
Infrastipular prickles straight or nearly so.

Blades of the leaflets membranous.
  Blades of the leaflets crenate, rounded at the apex: flowers corymbose: stems unarmed or essentially so. 14. *R. obtusiuscula.*
  Blades of the leaflets serrate, acute or acuminate.
    Blades of the leaflets shining above: flowers usually corymbose: prickles stout and flattened at the base. 13. *R. virginiana.*
    Blades of the leaflets not shining: flowers usually solitary, or rarely a few together: prickles slender and terete.
      Blades of the leaflets manifestly pubescent beneath. 15. *R. Lyoni.*
      Blades of the leaflets glabrous, or pubescent only on the veins beneath.
        Leaflets with glandless teeth. 16. *R. carolina.*
        Leaflets with glandular teeth: rachis usually glandular. 17. *R. serrulata.*
  Blades of the leaflets subcoriaceous. 18. *R. lancifolia.*

1. R. multiflora Thunb. Stems 1–2 m. tall, climbing, reddish, the prickles mostly paired, infrastipular, curved, flattened: leaflets 5–9, deciduous; blades obovate or elliptic, 2–3.5 cm. long, obtuse or acute, sharply serrate, dull above, grayish-green beneath, softly pubescent, petiolulate: flowers in pyramidal corymbs, often many together; pedicels softly-pubescent: sepals ovate-lanceolate, 12–15 mm. long, short-acuminate or with lanceolate appendages, densely-pubescent, the outer often lobed, in fruit reflexed and deciduous: petals mostly white, 10–15 mm. long: mature hypanthium globose to ellipsoid, pubescent.—(JAPANESE-ROSE.)—Thickets and roadsides, various provinces, Ala. to Md. Nat. of E Asia.—(*C. A.*)



2. R. moschata Mill. Stem several m. long, sarmentose or climbing, the prickles scattered, somewhat curved, rather strong: leaf-rachis sparingly-glandular: leaflets 5–7; blades oval, elliptic, or lanceolate-elliptic, 1.5–7 cm. long, more or less acuminate, finely-serrate, usually pubescent and paler beneath, more or less persistent: flowers corymbose: pedicels more or less glandular-hispid: sepals narrowly lanceolate, long-acuminate, caudate-attenuate, 15–20 mm. long, glandular and pubescent without, tomentose within, soon reflexed and in fruit deciduous, the outer sometimes lobed: petals white, 15–20 mm. long: mature hypanthium ellipsoid, more or less pubescent and glandular.—(MUSK-ROSE.)—Roadsides, waste-places, and about gardens, Coastal Plain, Ala. Nat. of S Asia.—(*W. I.*)

3. R. setigera Michx. Stems 2–5 m. long, climbing, glabrous, the prickles scattered, curved, flattened: leaflets 3, or on the new shoots sometimes 5, the median long-petiolulate, the lateral ones nearly sessile; blades lanceolate, or rarely ovate, 4–9 cm. long, dark-green, glabrous and shining above, pale and glabrous beneath: flowers corymbose: pedicels glandular-hispid: sepals glandular-hispid on the back: petals 2–3 cm. long, pink: mature hypanthium globose to broadly ellipsoid, more or less glandular-hispid.—(PRAIRIE-ROSE.)—Thickets, low-grounds, and woods, various provinces, N Fla. to Kans., Ky., and N. C.; also naturalized further N E.

4. R. rubifolia R. Br. Stems 2–4 m. long, climbing, glabrous, the prickles curved, flattened, scattered: leaf-rachis glandular and sometimes prickly: leaflets 3 or rarely 5; blades usually ovate, or ovate-lanceolate, 3–7 cm. long, abruptly acuminate, serrate with gland-tipped teeth, glabrous and rather dull above, pale and densely short-villous, almost velutinous beneath: flowers

corymbose: pedicels glandular-hispid: sepals ovate, 12–15 mm. long, abruptly acuminate, glandular as well as pubescent on the back: petals 1.5–2.5 cm. long, pink: mature hypanthium globose or rounded-ellipsoid, glandular-hispid, purple.—Woods, thickets, and fence-rows, various provinces N of Coastal Plain, Ga. to Tex., Wis., and Ont.—Specimens of a representative of the group INDICAE, with distinct exserted syles, have been collected at Mobile, Ala. The plant has small obtuse leaflets and small flowers.

5. **R. laevigata** Michx. Stems 2–5 m. long or more, high-climbing, the prickles stout, recurved, more or less flattened, rarely with some intermixed bristles: leaflets 3 or rarely 5; blades lanceolate or elliptic, finely but sharply serrate, evergreen, subcoriaceous, glabrous, dark-green and shining above, paler and reticulate beneath, petioluled: flowers solitary: peduncle and hypanthium strongly hispid: sepals often more or less glandular-bristly: petals cuneate-obcordate, 3–4 cm. long, white or rarely pink: mature hypanthium pyriform, bristly, 3.5–4 cm. long. [*R. cherokeensis* Donn.]—(CHEROKEE-ROSE.)—Woods, roadsides, and thickets, Coastal Plain and adj. provinces, Fla. to Tex. and N. C. Nat. of China.—(*W. I.*)

6. **R. bracteata** Wendl. Stems greatly elongate, usually decumbent or sarmentose, the prickles usually paired, stout, recurved: leaflets 5–9, persistent; blades coriaceous, glabrous or lightly pubescent on the midvein beneath, dark-green and shining above, paler beneath, obovate to oval, finely serrulate, short-petioluled: flowers solitary or a few together, short-pedicelled: sepals tomentose on both sides: petals white or pink, about 3 cm. long, deeply obcordate: mature hypanthium pyriform, 1.5–2 cm. long, densely tomentose.—(MACARTNEY-ROSE. HEDGE-ROSE.)—Pine woods, prairies, and thickets, Coastal Plain, Fla. to Tex. and Va. Nat. of China.—(*W. I.*)

7. **R. tomentosa** Smith. Stems 2 m. tall or less, often with elongate drooping branches, the prickles straight or nearly straight, often paired, somewhat flattened toward the base: leaf-rachis villous and glandular-hispid, sometimes prickly: leaflets 5–9; blades oval or ovate, 2–4 cm. long, acute or short-acuminate at the apex, rounded at the base, more or less doubly serrate, finely appressed-pubescent above, villous and glandular-pruinose beneath: flowers solitary or few together: pedicels often glandular-hispid: sepals lanceolate, about 2 cm. long, glandular on the margins and on the back, acuminate, usually more or less lobed, tardily deciduous before the ripening of the fruit: petals 18–20 mm. long, pale-pink: mature hypanthium globose or somewhat ellipsoid, 9–13 mm. long, often glandular-hispid at the base.—Rich soil and thickets, Coastal Plain, N. C. and Tex. Nat. of Eu.

8. **R. rubiginosa** L. Stems 2 m. tall or more, climbing or reclining, the prickles strong, flattened, curved, sometimes accompanied by bristles: leaf-rachis glandular-hispid, and prickly; leaflets 5–7; blades suborbicular or broadly oval, 1–3 cm. long, rounded at both ends or acutish at the apex, 1–3 cm. long, doubly serrate with gland-tipped teeth, densely glandular-pruinose beneath: flowers 1–4 together, subtended by foliaceous bracts: pedicels glandular-hispid: sepals lanceolate, 15–18 mm. long, caudate-attenuate, ultimately spreading, tardily deciduous: petals bright-pink, 1.5–2 cm. long: mature hypanthium pyriform or ellipsoid, 12–15 mm. long, orange or scarlet, often bristly at least near the base.—(SWEET-BRIER. EGLANTINE.)—Roadsides, woods, and waste-places, various provinces, Ga. to Miss., Kans., Pacific coast, Ont., and N. S. Nat. of Eu.—The bruised leaves give off the fragrance of ripe apples.

9. **R. micrantha** Smith. Stems 4 m. long or less, climbing or reclining, the prickles uniform, hooked, flattened: leaf-rachis pubescent and glandular-

hispid, rarely prickly: leaflets 5–7; blades broadly ovate, 1–3 cm. long, rounded at the base, short-acuminate at the apex, more or less pubescent on both sides, and densely glandular-pruinose beneath, doubly serrate with gland-tipped teeth: flowers 1–4 together: pedicels glandular-hispid, 1–2 cm. long: sepals lanceolate, caudate-attenuate, 12–18 mm. long, glandular-hispid on the back, tomentose within, more or less lobed: petals 10–15 mm. long, pink: mature hypanthium narrowly ellipsoid, 15–20 mm. long, tapering at both ends, glabrous.—Roadsides, banks, and open woods, various provinces, S. C. to Tex. and Mass.; also Wash. and Ore. Nat. of Eu.

10. R. canina L. Stems erect, 2–3 m. tall, upright, terete, the prickles uniform, stout, curved, flattened: leaf-rachis often glandular-hispid, otherwise glabrous; leaflets 5–7; blades oval or ovate, 1–4 cm. long, acute, glabrous on both sides, shining above, not at all glandular beneath except rarely so on the midrib, sharply-serrate, occasionally with double teeth: flowers 1–3 together; pedicels glabrous, 1–3 cm. long: sepals lanceolate, caudate-attenuate, 15–20 mm. long, glabrous on the back, tomentose within, entire or with linear lobes, in fruit reflexed and deciduous: petals about 2 cm. long, pink: mature hypanthium ellipsoid, 16–20 mm. long, acute at both ends, glabrous, orange, red, or scarlet.—(DOG-ROSE. DOG-BRIER. BRAMBLE-ROSE.)—Waste places, hillsides, and woods, various provinces, Tenn. to D. C. and Mass. Nat. of Eu.

11. R. palustris Marsh. Stems erect, 0.3–2 m. tall, sometimes reddish, glabrous, the prickles strong, but rather short, curved, usually paired, flattened at the base: leaf-rachis pubescent, rarely prickly, not glandular or rarely slightly so: leaflets 7, rarely 9; blades lanceolate-elliptic, or oblanceolate on vigorous shoots, sometimes elliptic, usually acute at both ends, 2–6 cm. long, finely and closely serrulate, with simple non-glandular teeth, dull, dark-green, glabrous or nearly so above, paler and more or less finely appressed-puberulent beneath, at least on the veins, short-petioluled flowers usually corymbose, sometimes solitary: pedicels short, usually glandular-hispid: sepals narrowly lanceolate, caudate-attenuate, 2–2.5 cm. long, sometimes with foliaceous tips, glandular-hispid on the back, tomentose within and on the margins, reflexed or spreading after anthesis, soon deciduous: petals pink, 1.5–2 cm. long: mature hypanthium subglobose or somewhat depressed, 10–12 mm. broad, glandular-hispid, usually acute at the base. [*R. carolina* L. 1762. Not 1753.]—(SWAMP-ROSE.)—Swamps and low grounds, various provinces, Fla. to Miss., Minn., and N. S.

12. R. floridana Rydb. Stems 1 m. tall or less, with spreading branches, reddish, glabrous, the prickles short, curved, somewhat flattened at the base: leaf-rachis glabrous or slightly pubescent, unarmed: leaflets 5; blades elliptic, varying to ovate or obovate, 1–4 cm. long, acute at each end, finely and closely serrulate, with simple, non-glandular teeth, dull and dark-green and glabrous above, somewhat paler and usually glabrous beneath: flowers usually solitary, rarely in pairs: pedicels usually glandular: sepals linear-lanceolate, caudate-attenuate, 2–2.5 cm. long, glandular-hispid on the back, tomentose on the margins, reflexed after anthesis and soon deciduous: petals obcordate, 1.5–2 cm. long, pink: mature hypanthium globose or somewhat depressed, glandular-hispid, 8–9 mm. thick.—Open woods, low-ground, and river-banks, Coastal Plain, E Fla. to N. C.

13. R. virginiana Mill. Stems 2 m. tall or less, glabrous or bristly on the shoots, the prickles stout and straight or slightly curved but often somewhat reflexed, decidedly flattened: leaflets 7–9; blades lanceolate-elliptic, 2–6 cm. long, usually acute at both ends, dark-green and shining, glabrous above, pubescent on the veins or glabrous beneath, serrate with numerous sharp, strongly ascending teeth: flowers corymbose, rarely solitary: hypanthium glandular-hispid: sepals narrowly lanceolate, 2–2.5 cm. long, caudate-attenuate,

after anthesis reflexed and deciduous: petals pink, 2–3 dm. long: mature hypanthium depressed-globose, 1–1.5 cm. long.—Moist thickets, low woods, shores, and swamp-margins, various provinces, Ala. to Ark., Ont., Newf., and Va.

14. R. obtusiuscula Rydb. Stems about 1 m. tall, dark-brown, practically unarmed: leaf-rachis sparingly pubescent, unarmed: leaflets 5 or 7; blades elliptic, 1–4 cm. long, rounded at the apex, crenate, dark-green, glabrous on both sides or sparingly pubescent beneath: flowers 1–4 together: pedicels short, sparingly glandular: sepals lanceolate, caudate-attenuate, 1.5–2 cm. long, rather copiously glandular-hispid, spreading and at last deciduous: mature hypanthium depressed-globose, 8–10 mm. long, sparingly glandular-hispid.—Wooded slopes and river-banks, Appalachian Valley, Tenn.

15. R. Lyoni Pursh. Stems 3–15 dm. tall, glabrous, more or less bristly, especially on the young shoots, the prickles infrastipular, spreading, usually slender and terete, or rarely stouter and then slightly flattened below: leaf-rachis villous, sometimes prickly or glandular-dentate: leaflets 5–7; blades oval to lanceolate-elliptic, 1.5–5 cm. long, usually acute at both ends or rarely obtuse at the apex, regularly serrate, the lateral ones short-petioluled, rather thin and dull, sparingly pubescent or glabrate above, decidedly villous beneath: flowers 2–4 and corymbose or solitary: pedicels glandular-hispid: sepals lanceolate, caudate-acuminate, 1.5–2 cm. long, glandular-hispid on the back, tomentose within, some of them usually with linear or subulate lobes, after anthesis reflexed and soon deciduous: petals pink, 2–2.5 cm. long: mature hypanthium usually depressed-globose, 8–10 mm. long, more or less glandular-hispid or rarely glabrous.—Woods and prairies, various provinces N of Coastal Plain, Ga. to Ark., Kans., Minn., and N. Y.

16. R. carolina L. Stems 3–10 dm. tall, slender, glabrous, usually very bristly when young, the prickles slender, straight, paired, terete, infrastipular: leaf-rachis sparingly pubescent or glabrous, rarely with a few prickles: leaflets usually 5, rarely 7; blades 1–3 cm. long, elliptic or lanceolate-elliptic, rarely oval, or oblanceolate, glabrous, but not very shining above, usually somewhat paler and pubescent on the veins or glabrate beneath, sharply and regularly serrate with ascending teeth, usually acute at both ends or obtuse at the apex, short-petiolulate: flowers usually solitary: pedicels glandular-hispid: sepals lanceolate, caudate-acuminate, 1.5–2 cm. long, usually very glandular on the back, tomentose within, all, or at least the outer ones with linear or subulate lobes, reflexed after anthesis and soon deciduous: petals pink, 2–2.5 cm. long: mature hypanthium globose or a little depressed, about 8 mm. long, glandular-hispid. [*R. humilis* Marsh.]—(Low-rose. Wild-rose. Carolina-rose. Pasture-rose.)—Dry woods, hillsides, thickets, and rocky soil, various provinces, Fla. to Tex., Kans., Minn., and N. S.

17. R. serrulata Raf. Stems 3–10 dm. long, glabrous, but bristly, especially on the young shoots, the prickles slender, infrastipular, straight, terete: leaf-rachis glandular-hispid, otherwise glabrous or nearly so: leaflets usually 5, rarely 3 or 7; blades lanceolate-elliptic or rarely oval, 1–4 cm. long, acute at both ends, light-green, glabrous or nearly so and somewhat shining above, often paler, glabrous or slightly pubescent on the veins and sometimes glandular beneath, sharply serrate with gland-tipped teeth, some of which are often denticulate or glandular-ciliate: flowers solitary: pedicels more or less glandular-hispid: sepals lanceolate, glandular-hispid on the back, tomentose within, caudate-acuminate, 2–2.5 cm. long, some of them usually with lanceolate or subulate appendages, after anthesis reflexed and soon deciduous: petals pink, 1.5–2.5 cm. long: mature hypanthium globose or slightly depressed, 10–15 mm. broad, glandular-hispid.—Roadsides and thickets, various provinces, Fla. to Tex., Ont., and Mass.—(*Mex.*)

18. R. lancifolia Small. Stems 1–2 m. tall, gray, the prickles stout, straight, only slightly flattened: leaf-rachis sparingly strigose: leaflets 3–7; blades lanceolate or elliptic-lanceolate, 2–6 cm. long, acute, subcoriaceous, finely crenate-serrulate, glabrous, somewhat-shining above, sessile: flowers corymbose: pedicels short, glabrous or sparingly glandular: sepals narrowly lanceolate, caudate-attenuate, about 2 cm. long, often with a few subulate lateral lobes, glandular-hispid on the back: petals pink, 1.5–2 cm. long: mature hypanthium somewhat glandular-hispid, globose, in fruit 8–10 mm. thick.—Margins of cypress swamps, pen. Fla.

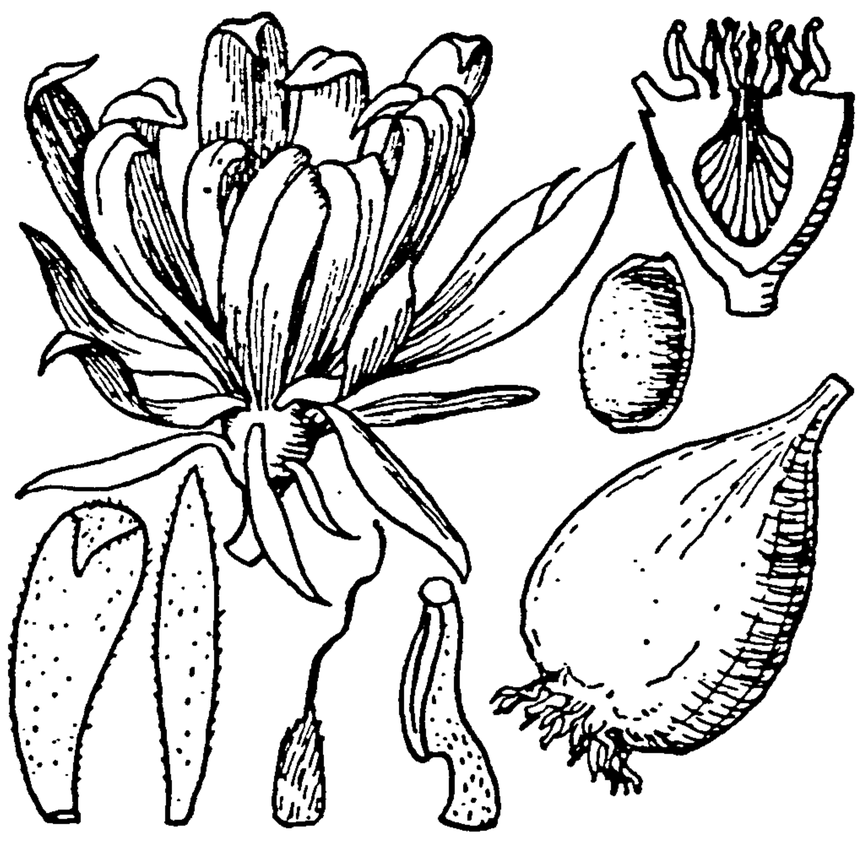
FAMILY 13. CALYCANTHACEAE — STRAWBERRY-SHRUB FAMILY

Shrubs or trees, with an aromatic bark. Leaves opposite: blades usually entire: stipules wanting. Flowers perfect, terminal. Calyx and corolla of several sepals and petals each, borne on the edge of the hypanthium. Androecium of many stamens, the inner reduced to staminodia. Gynoecium of numerous distinct carpels borne on the inside of the hypanthium. Fruit consisting of several achenes enclosed in the capsule-like hypanthium.—Two genera and 6 species, North American and Asiatic.

1. CALYCANTHUS L. Shrubs with opposite branches. Flowers often strawberry scented, the perianth, wholly or mainly, dull purple. Mature hypanthium nodding. [*Butneria* Duham.]—Five species, the following and one Californian.—CAROLINA-ALLSPICES. SWEET-SHRUBS. BUBBY-SHRUBS.

Leaf-blades not tomentose beneath.	
Lower surface of the leaf-blades glabrous, not glaucous.	1. *C. nanus.*
Lower surface of the leaf-blades glaucous.	2. *C. fertilis.*
Leaf-blades tomentose beneath:	
Blades of an ovate type, obtuse or subcordate at the base.	3. *C. Mohrii.*
Blades of an elliptic or oval type, acute or acuminate at the base.	4. *C. floridus.*

1. C. nanus (Loisel.) Small. Shrub 1–3 m. tall: leaf-blades deep-green and scabrous above, slightly paler-green beneath: sepals and petals linear or linear-lanceolate: seed 10–12 mm. long. [*C. laevigatus* Willd.]—Woodlands and banks, Appalachian Plateau, extending into adj. provinces, Ga. to La. and Pa.



2. C. fertilis Walt. Shrub 1–3 m. tall: leaf-blades bright-green and scabrous above, glaucous beneath: sepals and petals linear or nearly so: mature hypanthium glaucous: seed 12–14 mm. long. [*C. glaucus* Willd.]—Woods and banks, Blue Ridge and Appalachian provinces, Ga. to Ala., Ky., and Va.

3. C. Mohrii Small. Shrub 1–2 m. tall: leaf-blades 6–20 cm. long, somewhat toothed: sepals and petals broadly linear to linear-oblanceolate, 2–3 cm. long: mature hypanthium not seen.—Rocky soil, Appalachian Plateau, Ga., Ala., and Tenn.

4. C. floridus L. Shrub 0.5–3 m. tall: leaf-blades 4–14 cm. long, entire: sepals and petals mostly linear or nearly so, 1.5–2 cm. long: mature hypanthium finely tomentose. — (SHRUB. STRAWBERRY-SHRUB. BUBBY-BLOSSOMS.) — Rich woods, hillsides, and stream-banks, Coastal Plain and Piedmont, rarely extending into other provinces, Fla. to Miss. and Va.—Frequently cult. even northward of its natural range as an ornamental.—Spr.

Family 14. **MALACEAE** — Apple Family

Trees or shrubs. Leaves alternate: blades simple and pinnately veined, or pinnately compound. Flowers perfect, regular. Hypanthium adnate to the ovary. Calyx of mostly 5 sepals. Corolla of mostly 5 petals. Androecium of numerous, or rarely few, stamens. Gynoecium of 2–5 wholly or partially united carpels, or rarely of 1 carpel. Fruit a pome. About 20 genera and 500 species of wide geographic distribution.

Endocarp of the mature carpels papery or thin coriaceous.	I. Maleae.
Endocarp of the mature carpels bony, distinct or coherent.	II. Crataegeae.

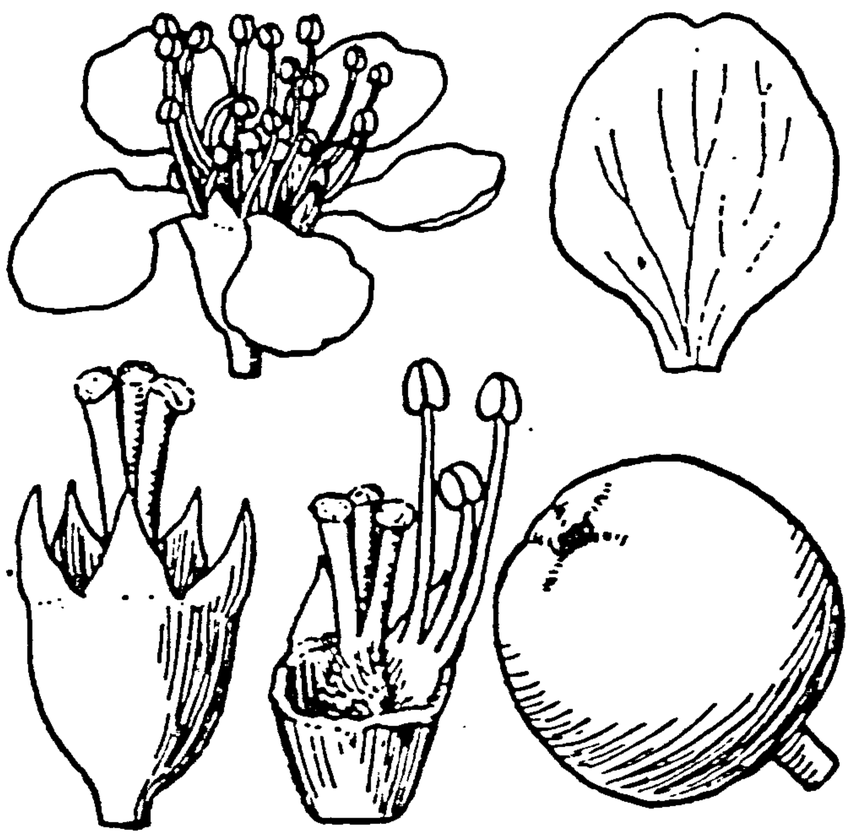
I. Maleae

Leaf-blades pinnately compound.	1. Sorbus.
Leaf-blades simple, entire, toothed, or lobed.	
Cavities of the ovary (carpels) as many as the styles.	
Cyme simple; pome relatively large.	
Pome elongate, broadened upward: flesh with grit-cells: hypanthium-orifice nearly closed by a disk.	2. Pyrus.
Pome depressed, not dilated upward; flesh without grit-cells: hypanthium-orifice open.	3. Malus.
Cyme compound: pome small, berry-like.	4. Aronia.
Cavities of the ovary becoming twice as many as the styles.	5. Amelanchier.

II. Crataegeae

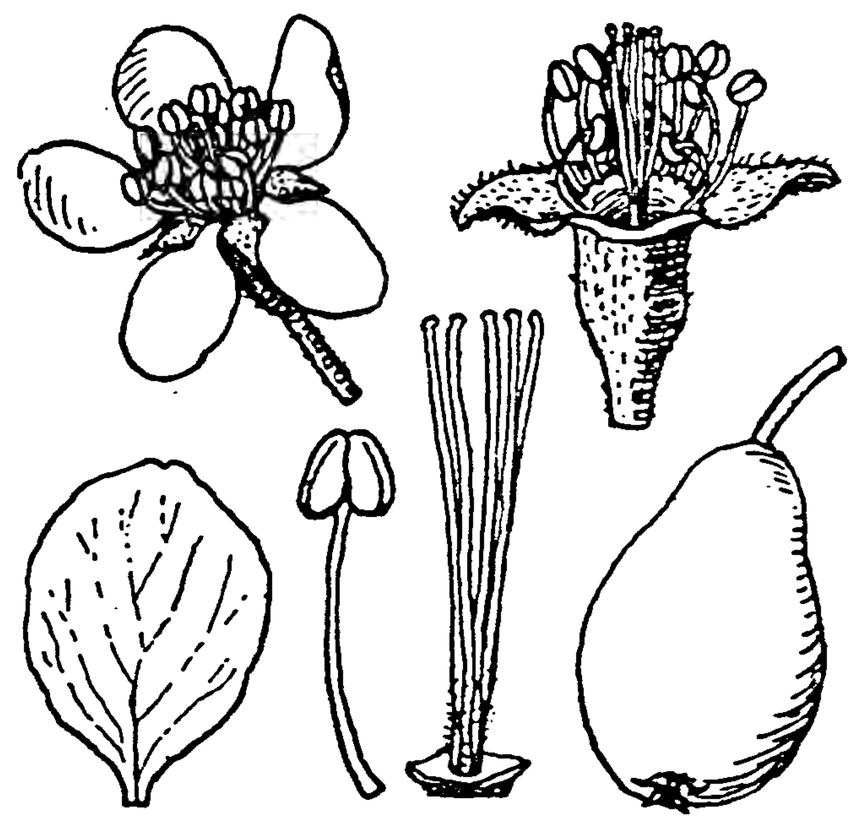
Ovules solitary in each carpel, or, if 2, dissimilar.	6. Crataegus.
Ovules 2 in each carpel, alike.	7. Cotoneaster.

1. SORBUS [Tourn.] L. Leaf-blades pinnate: leaflets toothed. Cyme compound, flat-topped. Hypanthium urceolate, not bracteolate. Corolla white. Pome berry-like, bright-colored, persistent.—About 10 species, natives of the north temperate zone.



1. S. americana Marsh. Small tree, with smooth bark: leaflets 11–17; blades lanceolate, acuminate, glabrous or slightly pubescent when young, 3.5–10 cm. long, sharply serrate with mucronate teeth: cymes 8–15 cm. broad: corolla creamy white, 4–6 mm. broad: pome globose, bright-red, 4–6 mm. in diameter. [*Pyrus americana* DC.]—(Mountain-ash.)—Rocky woods and swamps, often in acid soil, Blue Ridge and more N Provinces, N. C. to Tenn., Man., and Newf.—Spr.

2. PYRUS [Tourn.] L. Leaf-blades simple, usually toothed. Cyme simple. Corolla white. Pome usually tapering to the base.—About 12 species, natives of the Old World.

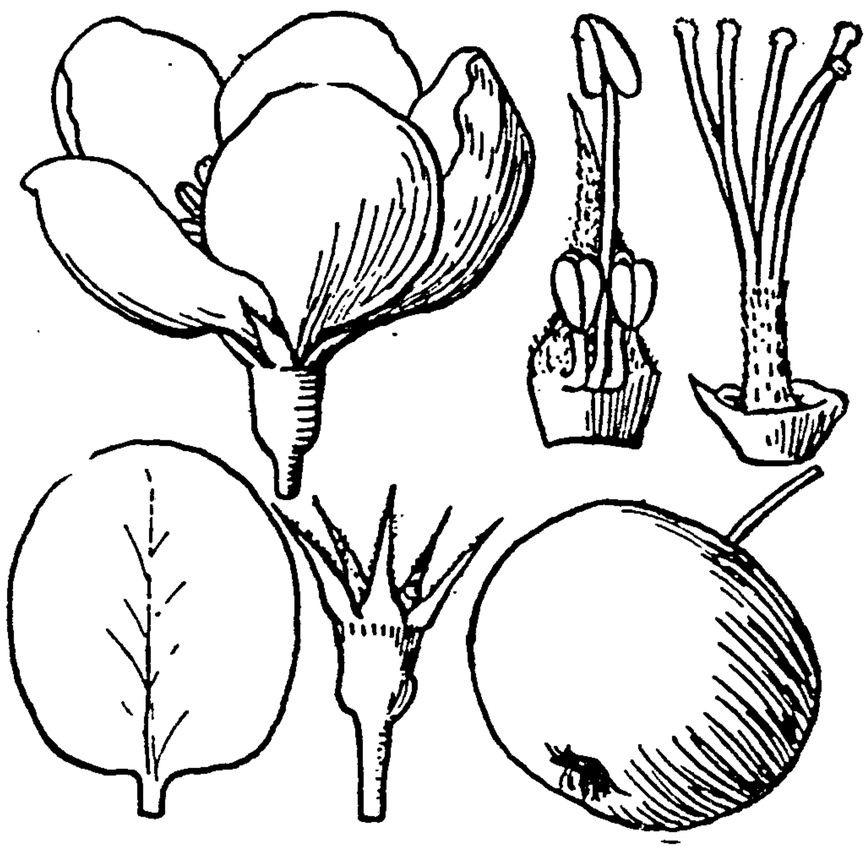


1. P. communis L. Tree, usually thorny: leaf-blades ovate, elliptic, or obovate, slender, petioled, 3–8 cm. long, glabrous or nearly so in age, acute or acuminate: cyme few–several-flowered: pedicels 1.8–5 cm. long: sepals about as long as the hypanthium: corolla creamy white, about 2.5 cm. broad: pome, in the wild form, seldom over 5 cm. long, in the numerous cultivated forms often much larger.—(Pear.)—Woods, thickets, and roadsides, various provinces, Fla. to Tex., Calif., and Me. Nat. of the Old World and cult.—Spr.

3. **MALUS** Mill. Leaf-blades simple, toothed or lobed. Cymes simple. Corolla pink or white. Pome depressed at both ends.—About 15 species, natives of north temperate regions.—Spr.—APPLES. CRAB-APPLES.—Sometimes planted for ornament. The wood is used for tool-handles and other small objects. The fruits are used for preserves.

Leaves glabrous, at least when mature.
  Blades of the leaves on flowering branches acute or acuminate.
    Flowering branches bearing leaves with lobed or incisely serrate blades; leaves of vigorous shoots with prominently lobed blades.
      Leaf-blades rounded or truncate at the base, with the lowest pair of veins remote from the base.
        Blades of the mature leaves glaucescent beneath, thickish. 1. *M. glaucescens.*
        Blades of the mature leaves green beneath, thin. 2. *M. coronaria.*
      Leaf-blades subcordate at the base, with the lowest pair of veins at the base of the blade. 3. *M. glabrata.*
    Flowering branches bearing leaves with serrate blades; leaves of vigorous shoots with shallowly lobed blades.
      Leaf-blades of an ovate or oval type: pome much depressed. 4. *M. platycarpa.*
      Leaf-blades of a lanceolate type: pome subglobose. 5. *M. lancifolia.*
  Blades of the leaves on flowering branches obtuse or merely acutish. 6. *M. angustifolia.*
Leaves permanently pubescent beneath.
  Leaf-blades obtuse or acute at the base: sepals glabrous. 7. *M. bracteata.*
  Leaf-blades rounded or cordate at the base: sepals pubescent. 8. *M. Malus.*

1. M. glaucescens Rehder. Tree up to 4.5 m. tall with a trunk less than 1.5 dm. in diameter, or frequently a gregarious shrub, the branches stiff, branches forming an irregular head, the branchlets red-brown, becoming gray-brown: leaf-blades ovate to triangular-ovate, 2.5–7.5 cm. long, glabrous when old, sharply serrate and often somewhat lobed, obtuse or abruptly acuminate at the apex, rounded or truncate at the base: cymes 5–7 flowered: pedicels 2–3.4 cm. long: flowers very fragrant: corolla rose-colored, 2.5–5 cm. broad: pome 3–3.5 cm. in diameter, greenish-yellow, fragrant.—Open woods and thickets, various provinces, Ala. to Ohio and Ont.



2. M. coronaria (L.) Mill. Tree, sometimes reaching a height of 9 m. the trunk 3 dm. in diameter, the stout spreading branches forming a wide head, the branchlets becoming red-brown: leaf-blades ovate to oval, 5–7.5 cm. long, sharply serrate and often somewhat lobed, acute or acutish at the apex, rounded or truncate at the base: cymes 3–6-flowered: flowers very fragrant: pedicels 3.5–5 cm. long, glabrous: corolla deep-pink, 3–4 cm. broad: pome 2.5–3.5 cm. in diameter, greenish-yellow, fragrant. [*M. coronaria elongata* Rehder.]—Thickets and woods, various provinces, N. C. to Mo. and Ont.

3. M. glabrata Rehder. Tree up to 8 m. tall, the trunk 2–3 dm. in diameter, the branches spreading into a round head, the branchlets becoming purple-brown or red-brown or ultimately grayish: leaf-blades deltoid-ovate or triangular-ovate, 4–8 cm. long, yellowish-green, acute or short-acuminate at the apex, subcordate at the base, serrate and shallowly several-lobed: cymes 4–7 flowered: pedicels 2–3 cm. long: flowers fragrant: corolla pink, 2.5–3 cm. broad: pome 3–3.5 cm. in diameter.—Woods in valleys, Blue Ridge, N. C.

4. **M. platycarpa** Rehder. Tree sometimes 6 m. tall, the trunk up to 1.5 dm. in diameter, the branches spreading, the branchlets brown or purple-brown, becoming grayish: leaf-blades ovate or oval, 4–8 cm. long, yellowish-green, abruptly pointed at the apex, rounded at the base, doubly serrate: cymes 3–6-flowered: pedicels 3–6 cm. long: flowers fragrant: corolla pink, 3–3.5 cm. broad: pome 3–4 cm. in diameter, greenish-yellow.—Woods and stream-banks, Blue Ridge and more northern provinces, N. C. to Ohio and W. Va.—*M. redolens* Ashe, from N Ga. and W N. C., is said to differ from this species in the narrower leaf-blades and smaller fruits.

5. **M. lancifolia** Rehder. Tree sometimes 8 m. tall, the trunk up to 3 dm. in diameter, the spreading branches forming a pyramidal head, the branchlets reddish-brown, and ultimately gray-brown: leaf-blades lanceolate, ovate-lanceolate or elliptic-lanceolate, 3.5–8 cm. long, acute or short-acuminate at the apex, rounded or cuneate at the base, doubly serrate: cymes 3–6-flowered: pedicels 2.5–3.5 cm. long: corolla white or pink, 3–3.5 cm. broad: pome 2.5–3.5 cm. in diameter, green.—Woods and thickets, various provinces, N. C. to Mo. and Pa.—*M. carolinensis* Ashe, N. C. to Ky., is said to differ from this species in the oblong, crenate-serrate leaf-blades.

6. **M. angustifolia** (Ait.) Michx. Tree sometimes 9 m. high, the trunk 3 dm. in diameter, the branches rigid (or pendulous in *M. angustifolia pendula*), the branchlets becoming light-brown and glabrous: leaf-blades elliptic to lanceolate or elliptic-ovate, 2.5–5 cm. long, thick, dark-green above, crenate-serrate, rather obtuse or acutish at the apex, rounded or cuneate at the base: cymes 3–5-flowered: pedicels 2–3 cm. long, slender: flowers fragrant: corolla pink, mostly about 2.5 cm. broad: pome about 2.5–3.5 cm. in diameter, yellow-green.—Thickets and edges of woods, various provinces, W Fla. to La., Ill., and Va.

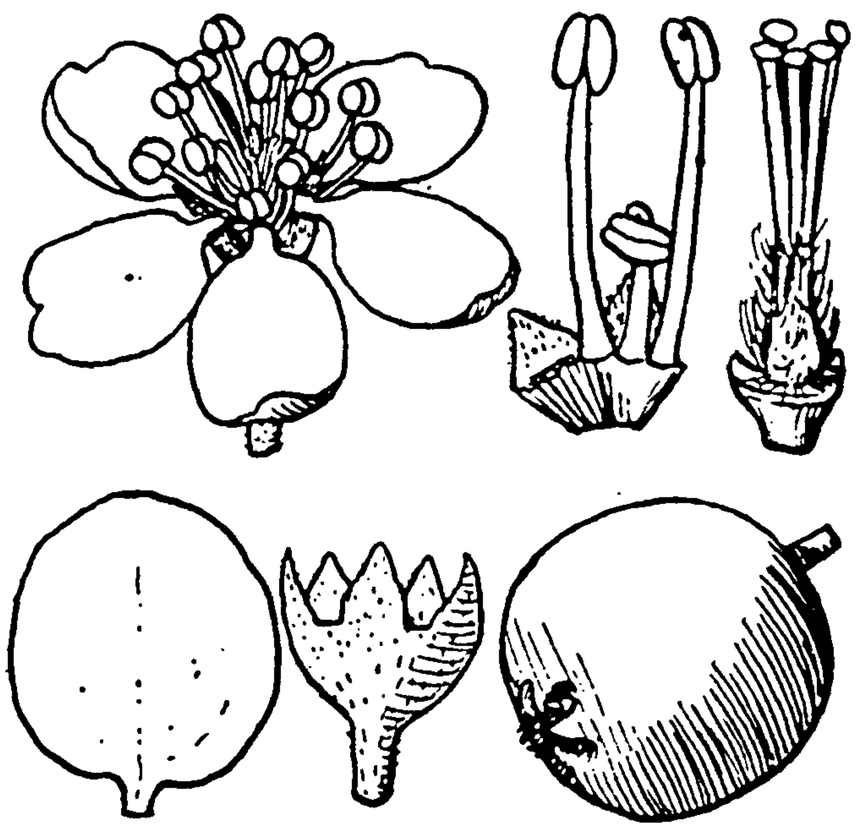
7. **M. bracteata** Rehder. Tree up to 9 m. tall, the trunk 1–1.5 dm. in diameter, the branches stout, spreading into a broad head, the branchlets becoming red-brown, glabrous or somewhat persistently pubescent: leaf-blades ovate to elliptic-ovate, 3.5–7.5 cm. long, thin, yellowish-green above, serrate or somewhat incised, obtuse or acutish at the apex, mostly rounded at the base: cymes 3–5-flowered: pedicels 1.5–2.5 cm. long: flowers fragrant: corolla pink, mostly 2.5–3 cm. broad: pome 2.5–3.5 cm. in diameter, yellowish-green.—Woods and stream-banks, various provinces, M Fla. to Mo. and N. C.

8. **M. Malus** (L.) Britton. Tree with spreading branches, the trunk sometimes reaching a diameter of 1 m. in cultivation: leaf-blades petioled, broadly ovate or oval, 2.5–7.5 cm. long, obtuse or abruptly pointed at the apex, rounded or slightly cordate at the base, dentate or nearly entire, glabrous or nearly so above, pubescent and often woolly beneath, especially when young; pedicels generally tomentose, 2.5–5 cm. long: corolla pink or white, 3.5–7.5 cm. broad: pome depressed-globose or elongated, hollowed at the base, 3.5–7.5 cm. in diameter.—Old fields, thickets, and fence-rows, various provinces, Ga. to Mo. and Ont. Nat. of Eurasia.—Spr.—The common apple, in many varieties, of commerce, frequently escapes from cultivation.

4. **ARONIA** Pers. Leaf-blades simple, shallowly toothed. Cyme compound. Corolla mainly white. Pome berry-like, globular to pyriform.—Following are the only known species.—Spr.—CHOKEBERRIES.—Plants are occasionally grown as ornamentals.

Cymes and lower surfaces of the leaf-blades woolly: fruit red or purple-black.
  Fruit broadly pyriform, bright-red. 1. *A. arbutifolia.*
  Fruit oval or globose, purple-black. 2. *A. atropurpurea.*
Cymes and surfaces of the leaf-blades glabrous: fruit black or purple. 3. *A. melanocarpa.*

1. A. arbutifolia (L.) Ell. Shrub sometimes reaching a height of 3.5 m.: leaf-blades oval, elliptic or obovate, obtuse or abruptly short-pointed at the apex, narrowed or somewhat cuneate at the base, 2.5–7.5 cm. long, serrulate-crenulate: cymes terminal, but at length overtopped by the young sterile shoots: corolla white or purplish-tinged, 8–12 mm. broad: pome 4–6 mm. in diameter, long-persistent. [*Pyrus arbutifolia erythrocarpa* Michx.]—(RED CHOKE-BERRY.)—Bogs and low pinelands, often in acid soil, various provinces, Fla. to La., Minn., and N. S.



2. A. atropurpurea Britton. Shrub reaching a height of 4 m.: leaf-blades and flowers quite similar to those of the preceding species: pome oval to globose, 6–10 mm. long, purple-black.—(PURPLE-CHOKEBERRY.)—Acid swamps and bogs, various provinces, Fla. to N. S.

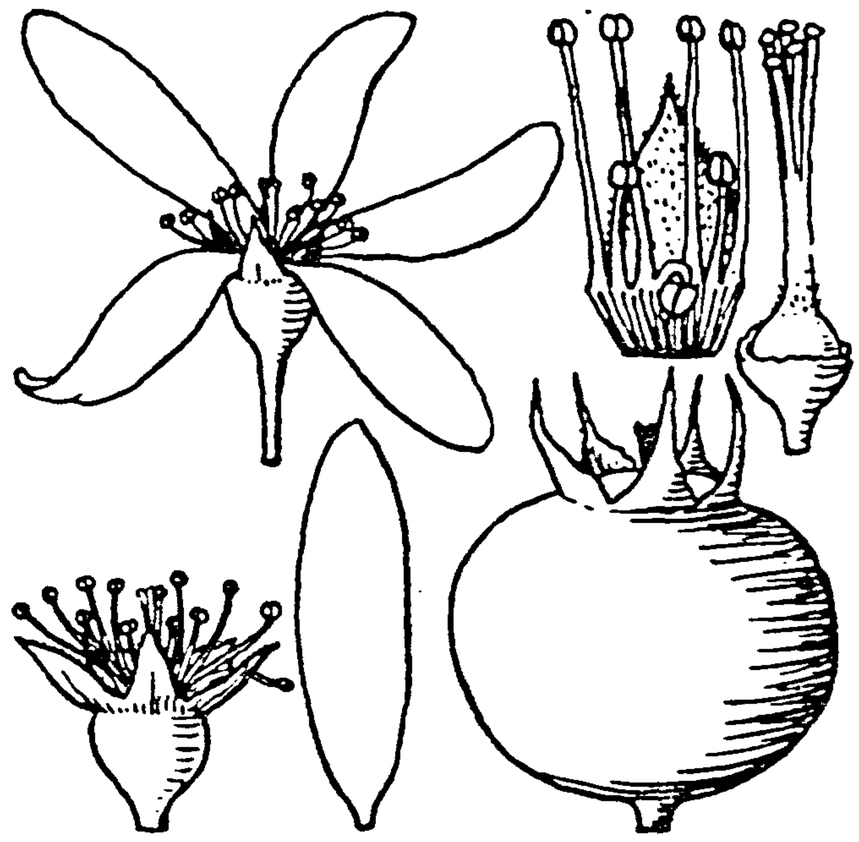
3. A. melanocarpa (Michx.) Ell. Shrub resembling the preceding species, but larger: leaf-blades obovate or oval, obtuse, acute, or abruptly acuminate at the apex, narrowed or cuneate at the base, crenulate: flowers similar to those of the preceding species: hypanthium and pedicels nearly glabrous: pome globose or oval, 6–8 mm. in diameter. [*Pyrus arbutifolia melanocarpa* Michx. *A. nigra* (Willd.) Britton.]—(BLACK CHOKEBERRY.)—Rocky woods and swamps, various provinces, Fla. to Mich. and N. Y.

5. AMELANCHIER Medic. Leaf-blades simple, toothed or rarely entire. Panicles raceme-like, simple. Corolla white. Pome berry-like, globular.—About 25 species, natives of the north temperate zone.—Wint.–spr.—JUNEBERRIES. SERVICE-BERRIES. MAY-CHERRIES.—Grown as ornamentals for their early profusion of flowers. The wood is used for tool handles and other small objects. The fruits which ripen in late spring or early summer in the south are edible.

Leaf-blades with fine teeth (5–12 per cm. on average leaves), and irregular, unequally spaced veins and usually irregular intermediate ones.
- Leaf-blades densely white-tomentose when young, becoming green: panicles with the lower pedicels 10–25 mm. long in fruit.
  - Leaf-blades rounded at the apex or rarely or individually subacute or mucronate: hypanthium 3–5 mm. wide: sepals lanceolate or triangular-lanceolate: petals 7–9 mm. long.
    - Leaf-blades of an elliptic type generally, with 10–15 pairs of veins: hypanthium campanulate: ovary glabrous or nearly so on top. — 1. *A. oblongifolia.*
    - Leaf-blades of an oval type generally, with 7–11 pairs of veins: hypanthium saucer-shaped: ovary woolly on top. — 2. *A. stolonifera.*
  - Leaf-blades acuminate, sometimes abruptly so, or decidedly acute: hypanthium 2.5–3 mm. wide: sepals triangular-ovate or nearly deltoid: petals 10–14 mm. long.
    - Ovary glabrous on top: sepals permanently thin, reflexed, without a midrib. — 3. *A. canadensis.*
    - Ovary pubescent on top: sepals thick in fruit, not reflexed, with a midrib. — 4. *A. alabamensis.*
- Leaf-blades nearly or quite glabrous from the first: panicles with the lower pedicels 30–50 mm. long in fruit. — 5. *A. laevis.*

Leaf-blades with coarse teeth (mostly 3–5 per cm. on average leaves), and usually straight, parallel, close-set veins, with few or no intermediate ones. — 6. *A. sanguinea.*

1. A. oblongifolia (T. & G.) Roemer. Shrub with clustered erect stems, 2–8 m. tall, fastigiately branched, not stoloniferous: leaf-blades of an elliptic type, varying to oval or slightly obovate, mostly 3–5.5 cm. long, rounded at the apex, subacute or mucronate, with sharp teeth extending nearly or quite to the base, rounded or subcordate at the base, slender-petioled: panicles erect, 2.5–6 cm. long, dense in anthesis: sepals lanceolate, 1.5–2.5 mm. long, tomentose within, acute: petals oblanceolate, narrowly obovate, or nearly linear, mostly 7–9 mm. long: pome nearly black under the glaucous coat. [*A. Botryapium* (Fl. SE. U. S.)]—(SHADBUSH. THICKET-SHADBLOW.)—Swamps, low grounds, and woods, Coastal Plain and adj. provinces, Ga. to Pa. and Me.—The leaf-blades when young are densely white-tomentose beneath, glabrous or nearly so at maturity. The fruits are moderately sweet and agreeably flavored.



2. A. stolonifera Wiegand. Shrub with erect stems, 3–12 dm. tall, stoloniferous thus forming colonies: leaf-blades of an oval type, varying to broadly obovate or broadly ovate, or suborbicular on shoots, mostly 2.5–5 cm. long, rounded or mucronate, or sometimes subacute at the apex, with the fine teeth rarely extending to the base, rounded or subcordate at the base, very slender-petioled: panicles erect, 1.5–4 cm. long in anthesis: sepals triangular-lanceolate, 2.5–3 mm. long, tomentose within: petals elliptic-obovate, 7–9 mm. long: pome purplish-black under the glaucous coat. [*A. spicata* (Fl. SE. U. S.)]—(LOW JUNEBERRY.)—Dry rocks, sandy bluffs, river banks, and sandy places, various provinces, N. C. to Mich., and Newf.—The leaf-blades are densely white-tomentose beneath when young, but soon glabrous. The fruits are sweet, juicy, and agreeable.

3. A. canadensis (L.) Medic. Tree up to 10 m. tall, or an irregularly branched shrub with few stems: leaf-blades ovate, oval, elliptic, or obovate, 4–10 cm. long, acuminate or decidedly acute, sharply serrate nearly or quite to the base, rounded or cordate at the base, slender-petioled: panicle nodding, 8–17 cm. long in anthesis: sepals triangular-ovate or nearly deltoid, 2–3 mm. long, tomentose: petals linear or elliptic-linear, 9–14 mm. long: pome maroon-purple.—(JUNEBERRY. SUGAR-PEAR.)—Woods, river-banks, sandy or rocky ridges, and swamps, various provinces, Ga. to La., Kans., Ont., and Newf.—The leaf-blades are white-tomentose when young, less densely so above than beneath, often persistently sparingly hairy. The fruits are rather dry and lack flavor.

4. A. alabamensis Britton. Tree up to 5 m. tall, related to *A. canadensis*, but with relatively thicker, broader, and shallower or inconspicuously toothed leaf-blades: sepals triangular-ovate, thick and with a midrib at maturity, not reflexed: pome purplish-black.—Sandy lands, S of Auburn, Ala.

5. A. laevis Wiegand. Tree up to 13 m. tall, or low and shrubby northward: leaf-blades ovate, elliptic, or oval, varying to obovate or suborbicular, 3–6 cm. long, short-acuminate, acute, or sometimes rounded at the apex, sharply and finely serrate nearly or quite to the base, mostly subcordate or rounded at the base, usually slender-petioled: panicles drooping, 3–7 cm. long, usually many-flowered: sepals triangular-lanceolate to subulate-lanceolate, 3–4 mm. long: petals linear-elliptic, 10–18 mm. long: pome dark-purple or nearly black beneath the glaucous coat.—Wooded slopes, banks, fields, and about swamps, Blue

Ridge and adj. provinces, Ga., Ala., Tenn., and N. C. and various provinces to Kans., Ont., and Newf.—The leaf-blades are glabrous from the first or merely with few silky hairs when young. The fruits are sweet and moderately flavored.

6. **A. sanguinea** (Pursh) DC. Shrub with arching or straggling branches up to 2.5 m. tall, not stoloniferous: leaf-blades oval, varying to ovate or more rarely to obovate, or suborbicular on shoots, 2.5–6 cm. long, rounded or acutish at the apex, rather coarsely dentate-serrate nearly or quite to the base, rounded or subcordate at the base, slender—but often rather short-petioled: panicles drooping, 4–7 cm. long, loosely flowered: sepals lanceolate or narrowly triangular-lanceolate, about 4 mm. long: petals linear or narrowly spatulate, 10–15 mm. long: pome nearly black beneath the glaucous coat. [*A. rotundifolia* (Fl. SE. U. S.)]—Rocky banks, woods, and bluffs, Blue Ridge and adj. provinces, Ga., Ala., and Tenn. and various provinces, to Minn., Ont. and Que. The leaf-blades are densely yellowish-tomentose beneath when young, sometimes retaining some of the pubescence to maturity. The fruits are juicy, sweet, and agreeably flavored.

6. **CRATAEGUS** L.[1] Small trees or shrubs, usually armed with thorns or spines. Leaves alternate: blades simple, petioled. Flowers terminal, cymose or corymbose. Hypanthium cup-shaped or campanulate, adnate to the carpels. Sepals 5, reflexed after anthesis. Corolla white or pink. Petals 5, spreading, inserted on the margin of the disk in the throat of the hypanthium. Stamens 5–25, inserted in 1–3 rows on the edge of the hypanthium: filaments slender, incurved: anthers oblong or subglobose, white, pink, or purple. Ovary inferior, or with its summit free, composed of 1–5 carpels: styles 1–5, free, persistent: stigmas terminal. Fruit globose, pyriform, or oval, yellow, orange-red, blue, or black, containing 1–5 bony carpels, each usually 1-seeded. Seed erect, the testa membranous.—The plants bloom in spring.—HAWS. HOG-APPLES.—Many different kinds of Crataegus were described in the first decade of this century. A large number were admitted into manuals and floras published about that time. For many species not accounted for in this Manual see Flora of the Southeastern United States, pages 532–569.

Leaf-blades not conspicuously cordate-deltoid, often slightly cordate.
  Petioles 4 mm. long or more.
    Leaf-blades not deeply cut.
      Leaf-blades cuneate or abruptly contracted at base, broadest at the middle or towards the apex.
        Leaf-blades prevailingly broadest towards the apex, or varying to orbicular on the same plant.
          Corymbs usually compound, many-flowered.
            Leaf-blades not impressed-veined, usually shining. — I. CRUS-GALLI.
            Leaf-blades with impressed veins above, dull. — II. PUNCTATAE.
          Corymbs simple, few-flowered.
            Pedicels and hypanthium glabrous: petioles and leaves usually not glandular. — III. AESTIVALES.
            Pedicels, or at least calyx-lobes glandular: petioles or leaf-margin glandular. — IX. FLAVAE.
        Leaf-blades prevailingly broadest at the middle, varying to obovate or ovate on the same plant. — IV. MACRACANTHAE.
      Leaf-blades impressed-veined.

[1] Contributed by Ivar Tidestrom.

Leaf-blades not impressed-veined.
Corymbs usually compound, many-flowered: petioles usually glandless.
Sepals glandular-margined. V. ROTUNDIFOLIAE.
Sepals not glandular-margined.
Sepals short-triangular, glabrous: corolla 10–12 mm. broad: fruit bright blue. VI. BRACHYACANTHAE.
Sepals narrower and longer: corolla usually broader: fruit varying from yellow to red. VII. VIRIDES.
Corymbs simple, few-flowered: petioles glandular.
Petioles with small stalked glands. VIII. INTRICATAE.
Petioles with large, sessile glands. IX. FLAVAE.
Leaf-blades broadest at or near the base.
Leaves vivid green to yellowish-green, the base of the blade varying from rounded to cordate.
Sepals 3–5 mm. long, entire or serrate: leaf-blades 2–7 cm. long. X. TENUIFOLIAE.
Sepals 5 mm. long or more, glandular-serrate: leaf-blades 3–9 cm. long. XI. COCCINEAE.
Leaves bluish-green, the base of the blade varying from broadly cuneate to cordate: sepals 3–5 mm. long, entire or serrate. XII. PRUINOSAE.
Leaf-blades deeply cut (only those of the vegetative shoots in *C. spathulata*).
Thorns 6–18 mm. long: leaf-lobes 3–15. XIII. OXYACANTHAE.
Thorns 25 mm. long or more: leaf-lobes 3–7. XIV. MICROCARPAE.
Petioles usually very short, about 2 mm. long or slightly more. XV. PARVIFOLIAE.
Leaf-blades conspicuously cordate-deltoid, varying to broadly ovate, often 3–7-lobed, glabrous. XVI. CORDATAE.

I. CRUS-GALLI

Leaf-blades coriaceous, glandless: petioles 6–20 mm. long: corymbs many-flowered: sepals usually entire: fruit reddish or red, the flesh hard, greenish.

Corymbs, leaves, and branchlets glabrous (at least at maturity).
Leaf-blades toothed above the middle: stamens 7–12. 1. *C. Crus-galli.*
Leaf-blades toothed to near the base: stamens about 20. 2. *C. Mohrii.*
Corymbs, leaves, and branchlets more or less villous.
Leaf-blades toothed above the middle: stamens about 20. 3. *C. berberifolia.*
Leaf-blades serrate or often incised-serrate: stamens 7–12. 4. *C. signata.*

II. PUNCTATAE

Leaf-blades subcoriaceous: petioles 6–12 mm. long: corymbs many-flowered: sepals usually entire: fruit yellow to scarlet, the flesh hard.

Corymbs tomentose or canescent: sepals entire: fruit ellipsoid: leaf-blades dull gray-green. 5. *C. punctata.*
Corymbs pubescent to glabrous.
Sepals entire.
Leaf-blades bright yellow-green: fruit ellipsoid. 6. *C. cuneiformis.*
Leaf-blades dull gray-green: fruit globose. 7. *C. Margaretta.*
Sepals glandular-serrate: fruit villous. 8. *C. collina.*

III. AESTIVALES

Leaf-blades subcoriaceous: petioles usually short, winged: corymbs few-flowered: sepals entire or serrulate: fruit red or orange-red, the flesh usually juicy and acidulous.

Leaf-blades rufous-tomentose to -pubescent beneath, cuneate-oblong or elliptic to obovate, 2–7 cm. long, acute or rounded, crenate-serrulate to few-lobed. 9. *C. aestivalis.*
Leaf-blades glabrous or nearly so (often whitish pubescent when unfolding).
Leaf-blades abruptly contracted at the base. 10. *C. maloides.*
Leaf-blades cuneate-oblanceolate. 11. *C. luculenta.*

IV. MACRACANTHAE

Leaf-blades rhombic-elliptic, rhombic-ovate, obovate, or oval: petioles 6–20 mm. long: corymbs many-flowered, pubescent: sepals lanceolate, glandular-laciniate, villous: fruit red, orange, orange-red to dark-red, the flesh glutinous.

Leaf-blades dark-green, glabrous and shining above, coriaceous. 12. *C. succulenta.*
Leaf-blades gray-green, pubescent and dull above, subcoriaceous. 13. *C. Calpodendron.*

V. Rotundifoliae

Leaf-blades (in our species) ovate-orbicular or obovate: petioles 6–24 mm. long, glandular-serrate: fruit red, the flesh soft. 14. *C. chrysocarpa.*

VI. Brachyacanthae

Leaf-blades oblong-lanceolate to ovate, crenate-serrate: corymbs few-flowered: fruit glaucous-blue, 8–12 mm. thick. 15. *C. brachyacantha.*

VII. Viridis

Leaf-blades membranous, oblong-ovate to oval or rhombic-ovate, dark-green, shining and glabrous above; petioles 6–30 mm. long: corymbs many-flowered: calyx-lobes entire or nearly so: fruit red or orange, the flesh hard, edible. 16. *C. viridis.*

VIII. Intricatae

Leaf-blades subcoriaceous, elliptic to ovate, glandular-toothed: petioles 6–30 mm. long: corymbs 3–7-flowered, the bracts glandular, deciduous: calyx-lobes lanceolate, usually toothed towards the apex: fruit greenish-yellow to reddish-brown, orange, or red, the flesh hard.

Corymbs and hypanthium usually villous or pilose-pubescent: leaves serrate or serrate and incised.
  Sepals not foliaceous, glandular-serrate: leaf-blades usually yellow-green. 17. *C. intricata.*
  Sepals foliaceous, glandular-serrate: leaf-blades dark-green, shining and scabrate above: bracts large and conspicuous. 18. *C. Harbisonii.*
Corymbs and hypanthium usually glabrous or nearly so.
  Leaf-blades cordate to ovate or rhombic-ovate, serrate and incised. 19. *C. populifolia.*
  Leaf-blades oval or slightly obovate, varying to ovate-lanceolate or slightly oblanceolate. 20. *C. mendosa.*

IX. Flavae

Leaf-blades membranous, oval, obovate, orbicular, spatulate, cuneate, or cuneate-spatulate: petioles 6–20 mm. long: corymbs few-flowered: calyx-lobes glandular or glandular-serrate: fruit green to orange or red, the flesh usually soft.

Leaf-blades oval, ovate to obovate or orbicular, 2–5.5 cm. long, crenate-serrate to incised, abruptly contracted into a winged petiole. 21. *C. flava.*
Leaf-blades with a distinctly cuneate base.
  Leaf-blades obovate to spatulate or suborbicular, 1–4 cm. long, rounded or often somewhat truncate, entire, dentate to crenate or lobed, somewhat tomentose and bluish-green. 22. *C. Michauxii.*
  Leaf-blades spatulate or cuneate, 1–4 cm. long, entire to serrate, rounded, pointed or lobed, glabrous at maturity, yellowish-green. 23. *C. floridana.*

X. Tenuifoliae

Leaf-blades membranous, oval or ovate, often slightly pubescent: petioles 12–30 mm. long: young foliage usually bronze-green: corymbs many-flowered: fruit red or pruinose-red, glabrous, the flesh succulent. 24. *C. macrosperma.*

XI. Coccineae (Molles)

Leaf-blades membranous to subcoriaceous, oblong-ovate to broadly ovate: petioles 20–35 mm. long: corymbs many-flowered: fruit usually red and pubescent, the flesh soft, edible.

Hypanthium tomentose or pubescent. 25. *C. mollis.*
Hypanthium glabrous or nearly so. 26. *C. albicans.*

XII. Pruinosae

Leaf-blades membranous to subcoriaceous, broadly ovate, elliptic-ovate, or deltoid, blue-green, glabrous (with some exceptions): petioles 6–30 mm. long: young foliage usually bronze-green: corymbs many-flowered: fruit pruinose. 27. *C. pruinosa.*

XIII. Oxyacanthae

Leaf-blades ovate, 3–15-lobed or cleft: corymbs many-flowered: fruit red: style and nutlet usually solitary: introduced species. 28. *C. monogyna.*

XIV. Microcarpae

Leaf-blades membranous, mostly lobed: corymbs few- to many-flowered: fruit small, usually red.

Leaf-blades of the vegetative shoots only, lobed, the lower spatulate: styles and nutlets 3–5. 29. *C. spathulata.*
Leaf-blades deeply lobed or cut: styles and nutlets 1–3. 30. *C. Marshallii.*

XV. Parvifoliae

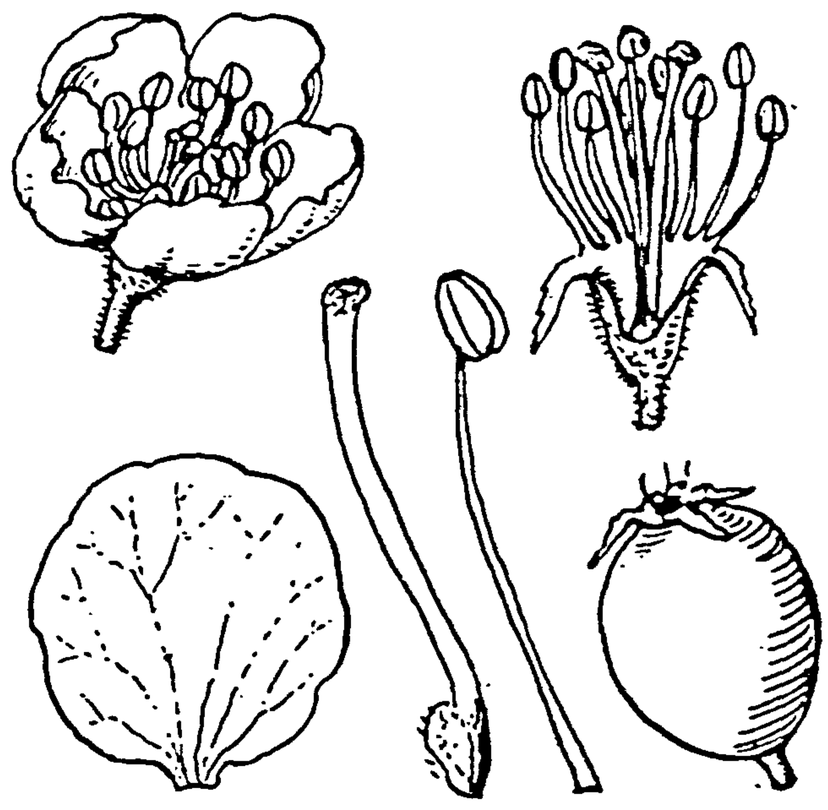
Leaf-blades usually small, subcoriaceous, cuneate to obovate, toothed or shallowly lobed: corymbs few-flowered: fruit globose to pyriform, yellow to red.

Inflorescence pubescent to tomentose. 31. *C. uniflora.*
Inflorescence glabrous. 32. *C. lacrimata.*

XVI. Cordatae

Leaf-blades often conspicuously 3–7-lobed: petioles about 12 mm. long: corymbs many-flowered: fruit small, scarlet: nutlets bare at apex. 33. *C. Phaenopyrum.*

1. C. Crus-galli L. A tree up to 9 m. tall, with a trunk 3–4 dm. in diameter, covered with dark-gray or brownish scaly bark: leaf-blades obovate or oblanceolate, 2–5 cm. long, 1–3 cm. broad, or larger on leading shoots, glabrous, obtuse or pointed, sharply serrate above the middle: sepals 3.5–5 mm. long, linear-lanceolate: corolla 12–14 mm. broad: fruit oval or oblong, or slightly obovoid, 8 mm. thick or more, dull-red when mature: nutlets mostly 2.—Woods, thickets, and fence-rows, various provinces, N Fla. to E Kans., Ont., and Que.



2. C. Mohrii Beadle. A tree sometimes 10 m. tall (rarely a shrub), with dark-gray or brownish scaly bark: leaf-blades obovate-cuneiform to elliptic, or on leading shoots varying to orbicular, 2–5 cm. long, glabrous in age, serrate to near the base: sepals 2–5 mm. long, entire or glandular-serrate: corolla about 15 mm. broad: fruit globose, red or greenish-red: nutlets 3 to 5.—Fields and low woods, Coastal Plain and adj. provinces, NW Ga. to La. and Tenn.

3. C. berberifolia T. & G. A tree often attaining a height of 8 m., with dark-gray scaly bark: leaf-blades oblong-cuneiform or spatulate to obovate-cuneiform, 2–6 cm. long, smooth or scabrous, pale, or sometimes pubescent beneath, toothed above the middle: sepals 3–5 mm. long, serrate or entire: corolla 10–15 mm. broad: fruit globose or nearly so, yellow-orange or red: nutlets 2 or 3.—Low woods and hillsides, Coastal Plain, La.

4. C. signata Beadle. A tree sometimes 7 m. tall, with a trunk 2 dm. in diameter or more, covered with ashy-gray or brownish scaly bark: leaf-blades oval to obovate-cuneiform, 2–6 cm. long, 1–4 cm. broad, rounded or mostly pointed at the apex, serrate or frequently incised-serrate: sepals 4–6 mm. long, entire or glandular-serrate: corolla 13–16 mm. broad: fruit oblong to globose, about 9 mm. thick, mostly red at maturity, more or less pruinose: nutlets 3–5.—Stream-banks, moist copses, and dry slopes, various provinces, Ala. to Tex. and Tenn.

5. C. punctata Jacq. A tree sometimes 9 m. tall, with dark-gray or reddish-brown scaly bark: leaf-blades obovate to oblong, 3–7 cm. long, cuneate or abruptly contracted at base, irregularly serrate, doubly serrate or incised, glabrous in age: sepals 5–7 mm. long, linear-lanceolate, pubescent: corolla about 2 cm. broad: fruit subglobose or oval, 1 to 2 cm. long, red or yellow: nutlets 2 or 3.—Hillsides and in rocky soil, Blue Ridge and adj. provinces, N. C. and Tenn., and more northern provinces to Ia., Minn., and Que.

6. C. cuneiformis (Marsh.) Eggleston. A tree sometimes 8 m. high, with dark-brown scaly bark: leaf-blades obovate-oblanceolate, acute, the base cuneate, serrate or doubly serrate, 2–5 cm. long, glabrous in age: sepals entire: corolla 12–16 mm. broad: fruit ellipsoid, scarlet or red, about 1 cm. thick. '[*C. pausiaca* Ashe].—Limestone hills and low bottom lands, various provinces, SW Va. to C Ill., W N. Y. and Penn. Perhaps immediately beyond our range.

7. C. Margaretta Ashe. A shrub or small tree, sometimes 8 m. high, with dark gray-brown bark: leaf-blades ovate or obovate-oblong, 2–5 cm. long, cuneate or rounded at base, obtuse or acute, serrate or doubly serrate, or lobed, glabrous in age: sepals triangular, entire or slightly serrate: corolla 14–20 mm. broad: fruit globose or short-ellipsoid, 8–16 mm. thick, yellow or red: nutlets usually 2 or 3.—Along streams and in woods, various provinces, Tenn. to Mo. and S Ont.

8. C. collina Chapm. A tree 4–6 m. tall, with dark-gray scaly bark: leaf-blades obovate or oval, 2.5–7 cm. long, acute, narrowed or contracted at base, serrate or doubly serrate with obtuse lobes, nearly entire below: sepals lanceolate, pubescent or glandular: corolla 15–20 mm. broad: fruit globose, 10–14 mm. thick, red or orange-red: nutlets 3–5.—Along streams, in fields and woods, various provinces, Ga. to Miss. and Va.

9. C. aestivalis (Walt.) T. & G. A tree often 9 m. tall, with dark reddish-brown scaly bark: leaf-blades cuneate-oblong to obovate or elliptic, 2–7 cm. long, dentate or crenate-serrate, sometimes lobed, rufous-tomentose or -pubescent beneath, glabrate in age: sepals triangular, entire or serrulate: corolla about 2 cm. broad: fruit depressed-globose, punctate, red: nutlets 3–5.—(MAY-HAW. APPLE-HAW.)—Along streams and in shallow ponds, various provinces, Fla., w to Tex. and S. C.

10. C. maloides Sarg. A tree 4–5 m. tall, or often a large shrub: leaf-blades oval to orbicular or obovate, 1.5–5 cm. long, serrate, doubly serrate or lobed: sepals lanceolate: corolla 2 cm. broad or more: fruit subglobose or oval, red, 8–12 mm. thick: nutlets 3–5. '[*C. rufula* Sarg.]—Along streams, Fla.

11. C. luculenta Sarg. A tree 4–5 m. tall, with gray or dark-reddish bark: leaf-blades spatulate or cuneiform to ovate or elliptic, 2–4 cm. long, irregularly serrate or incised: sepals lanceolate, glabrous: corolla 15 to 18 mm. broad: fruit globose or nearly so, red or orange-red, 8–10 mm. in diameter: nutlets 3–5.—Swampy woods, Fla.

12. C. succulenta Schrader. A tree, sometimes 8 m. tall, with gray scaly bark: leaf-blades obovate or rhombic-ovate, 2–5 cm. long, obtuse or acute, serrate, doubly-serrate or also lobed, glabrous above: sepals lanceolate, acuminate, glandular-laciniate: corolla about 2 cm. broad: fruit subglobose, orange-red to dark-red, villous to glabrate, 6–16 mm. thick: nutlets 3–5.—Along streams, Blue Ridge and adj. provinces, N. C. to Tenn.; and more northern provinces, Va. to Minn., Ont., and N. S.

13. C. Calpodendron (Ehrh.) Medic. A shrub or small tree, sometimes 6 m. tall, with gray or dark-brown bark: leaf-blades rhombic-ovate to oval, rounded or acute, serrate to incisely lobed, pubescent on both faces, permanently so above: sepals lanceolate, pubescent: corolla about 15 mm. broad: fruit pyriform or ellipsoid, red or orange-red, 10–15 mm. long: nutlets 2–3. [*C. tomentosa* Du Roi, not L. *C. Chapmani* Ashe.]—Low ground near watercourses, various provinces, N Ga. to Mo., Minn., and C N. Y.

14. C. chrysocarpa Ashe. A shrub or tree, sometimes 8 m. tall, with dark-brown scaly bark: leaf-blades ovate-orbicular or obovate, the base broadly cuneate, doubly serrate with rather coarse teeth, occasionally lobed, subcoriaceous, pubescent or glabrate: sepals glandular-serrate: corolla 14–18 mm. broad: fruit depressed-globose or short-ovoid, red, about 1 cm. thick: nutlets 3–5. [*C. rotundifolia* Borckh. not Lam.]—Woods, fields, and stream-banks, various provinces, N. C. to N. M., Sask., Ont., and N. B.

15. C. brachyacantha Engelm. & Sarg. A tree, often 9 m. tall, with dark-brown scaly bark: leaf-blades oblong-lanceolate to ovate, 1–5 cm. long, crenate-serrate, glabrous at maturity: sepals short-triangular, glabrous: corolla 10–12 mm. broad: fruit subglobose, bright-blue at maturity, glaucous: nutlets 3–5.—Borders of swamps and streams, Coastal Plain, La. to Tex.

16. C. viridis L. A tree sometimes 10 m. tall, with gray or reddish-brown bark: leaf-blades ovate-oblong to ovate or rhombic-ovate, with the base cuneate to rounded, 2–8 cm. long, serrate, doubly serrate or lobed, usually glabrous: sepals glabrous, entire or nearly so: corolla 10–16 mm. broad: fruit globose or nearly so, bright-red or orange, 5–8 mm. thick: nutlets 4 or 5. [*C. arborescens* Ell.]—Along streams and lakes, mostly in alluvial soil, various provinces, Fla. to Tex. and Kans.

17. C. intricata Lange. A shrub or small tree, 1–7 m. tall, with dark-gray or reddish-brown bark: leaf-blades round-ovate to ovate-oblong, 2–7 cm. long, usually acute, rounded or contracted at base, serrate or incised: sepals glandular-serrate, 4 to 9 mm. long: corolla 2 to 3 cm. broad: fruit globose to oblong, 9–15 mm. thick, yellow, orange or red (at maturity): nutlets 3–5. [*C. triflora* Chapm.]—Rocky woodlands and stream-banks, various provinces, S. C. to Ala., Mo., N. Y. and Va.

18. C. Harbisonii Beadle. A shrub or tree, 3–8 m. tall, with ashy-gray or brownish bark: leaf-blades round-ovate to oval or obovate, the petioles margined, rounded or acute, serrate, brownish-pubescent beneath: sepals lanceolate, 4–10 mm. long, glandular-serrate: corolla about 2 cm. broad: fruit globose or short-oval, red, 10–14 mm. thick; nutlets 3–5.—Limestone hills and ridges, Interior Low Plateaus, Ala. and Tenn.

19. C. populifolia Walt. A shrub or tree, sometimes 7 m. tall, with dark-gray or brownish to nearly black scaly bark: leaf-blades cordate to ovate or rhombic-ovate, serrate to incisely lobed, acute, 2.5–6 cm. long: sepals 3–9 mm. long, usually glabrous or with few hairs: corolla 15–20 mm. broad: fruit depressed-globose to somewhat pyriform, yellowish-green to red, 8–15 mm. thick: nutlets 3–5.—(POPLAR-LEAVED HAW.)—Along streams, in rocky woods and on bluffs, various provinces, S. C. to Ala., Miss., Mich., and Mass.

20. C. mendosa Beadle. A shrub or small tree, 3–6 m. tall, with dark-gray scaly bark: leaf-blades oval, or elliptic to slightly oblanceolate, 3–6 cm. long, rounded or contracted at base, serrate or incisely lobed: sepals 3–4 mm. long, glandular-serrate: corolla 15–18 mm. broad: fruit globose or nearly so, 8–10 mm. thick: red at maturity: nutlets 3–5.—Rocky woods and glades, Appalachian Plateau, Ala.

21. C. flava Ait. A large shrub or tree, sometimes 8 m. tall, with gray or brownish, scaly bark: leaf-blades oval or obovate to orbicular, cordate or truncate to abruptly contracted into a cuneate base, crenate-serrate to dentate or incised: sepals 4 mm. long or more, glandular or glandular-serrate: corolla 15 mm. broad or more: fruit globose to pyriform, 9 mm. thick or more, yellow, orange, or red: nutlets 2–5.—(SUMMER-HAW.)—Margins of swamps, in sandy and rocky soil, various provinces, Fla. to Ala., Tenn., and Ga.

22. C. Michauxii Pers. A shrub or small tree, often 7 m. tall, with dark rough bark: leaf-blades cuneate-spatulate, obovate or orbicular, 1–4 cm. long or more, nearly entire to irregularly dentate, sometimes shallowly lobed, glandular: sepals 4 mm. long or more, glandular-serrate: corolla 15 mm. broad or more: fruit subglobose to oval, 10 mm. thick or more, varying from yellow to red, the flesh usually soft: nutlets 3–5.—Woods, river-banks, clearings, and roadsides, various provinces, Fla. to Miss. and N. C.

23. C. floridana Sarg. A tree, reaching a height of 5 m., with dark gray or nearly black bark: leaf-blades spatulate or cuneate, usually entire below, 2–4 cm. long, entire to lobed above: sepals 3 mm. long or more, glandular-serrate: corolla 15 mm. broad or more: fruit obovoid to globose, orange to reddish: nutlets 3–5.—River banks, woods, and hillsides, Coastal Plain and adj. provinces, Fla. to Ala. and Ga.

24. C. macrosperma Ashe. A shrub or small tree, 1–7 m. tall, with ashy-gray to dark or brownish bark: leaf-blades oval or ovate, truncate or cordate, serrate or lobed and serrate, glabrous: sepals 3–5 mm. long, entire or serrate: corolla 14–17 mm. broad: fruit subglobose to short-oblong, 7–15 mm. thick, red or pruinose-red at maturity: nutlets 2–5.—Wooded slopes and clearings, Blue Ridge and adj. provinces, Ga. to Ala., Tenn., and N. C., and more northern provinces up to Minn. and N. S.

25. C. mollis (T. & G.) Scheele. A tree, often 10 m. tall, with dark-gray or brownish scaly bark: leaf-blades broadly ovate, 4–9 cm. long, rounded, truncate or cordate at base, acute, sharply serrate or incised lobed, pubescent or somewhat tomentose beneath, glabrous or pubescent above: sepals 5 mm. long or more, serrate, glandular, tomentose; corolla 2 cm. broad or more: fruit subglobose, 13 mm. thick or more, red: nutlets 3–5.—(DOWNY-HAW. SCARLET-HAW.)—Moist hillsides and rich woods, Interior Low Plateaus and more northern provinces, Tenn. to Mo. and Mich.

26. C. albicans Ashe. A shrub or small tree, sometimes 6 m. tall: leaf-blades broadly ovate to oblong-ovate, 3–8 cm. long, cordate, truncate or broadly cuneate at base, serrate or doubly serrate and lobed, glabrous or slightly pubescent at maturity: sepals 5 mm. long or more, glandular-serrate: corolla 16 mm. broad or more: fruit subglobose to somewhat pyriform, 10–15 mm. thick, red: nutlets 3–5.—Hillsides and woods, Interior Low Plateaus and more northern provinces, Tenn. to Mich. and W Mass. Perhaps a form of *C. mollis*.

27. C. pruinosa (Wendl.) K. Koch. A shrub or tree, sometimes 6 m. tall, with dark-gray or brownish bark: leaf-blades elliptic-ovate to broadly ovate or deltoid, the base varying from broadly cuneate to cordate, serrate or lobed and serrate, 2–6 cm. long, acute or acuminate, glabrous in age: sepals 3–5 mm. long, entire or serrate: corolla 15–20 mm. broad: fruit globose or subglobose, 7–13 mm. thick, reddish-green to red: nutlets 3–5.—Woods, old fields, meadows, and mountain slopes, Blue Ridge and adj. provinces, Ga. to Ala., Tenn., and N. C.

28. C. monogyna Jacq. A shrub or tree, sometimes 12 m. tall: leaf-blades ovate or broader, sharply 3–15-lobed or -cleft, acute, the lobes serrate, cuneate to truncate at base, glabrous when mature: sepals deltoid, entire: corolla white or pink, about 15 mm. broad: fruit globose or nearly so, red, about 6 mm. thick: nutlets usually 1.—Sparingly escaped from cultivation in the northern states and perhaps also within our area. Nat. of the O. W.

29. C. spathulata Michx. A shrub or small tree, sometimes 8 m. tall, with gray or brown bark: leaf-blades spatulate or oblanceolate, 1–4 cm. long, narrowed into winged petioles, obtuse or acute, crenate or crenate-serrate to incised,

glabrous: sepals triangular, glabrous: corolla 7–10 mm. broad: fruit globose, red, 4–6 mm. thick: nutlets 3–5.—Along streams and in rich moist soil, Coastal Plain and adj. provinces, Fla. to Tex. and Va.

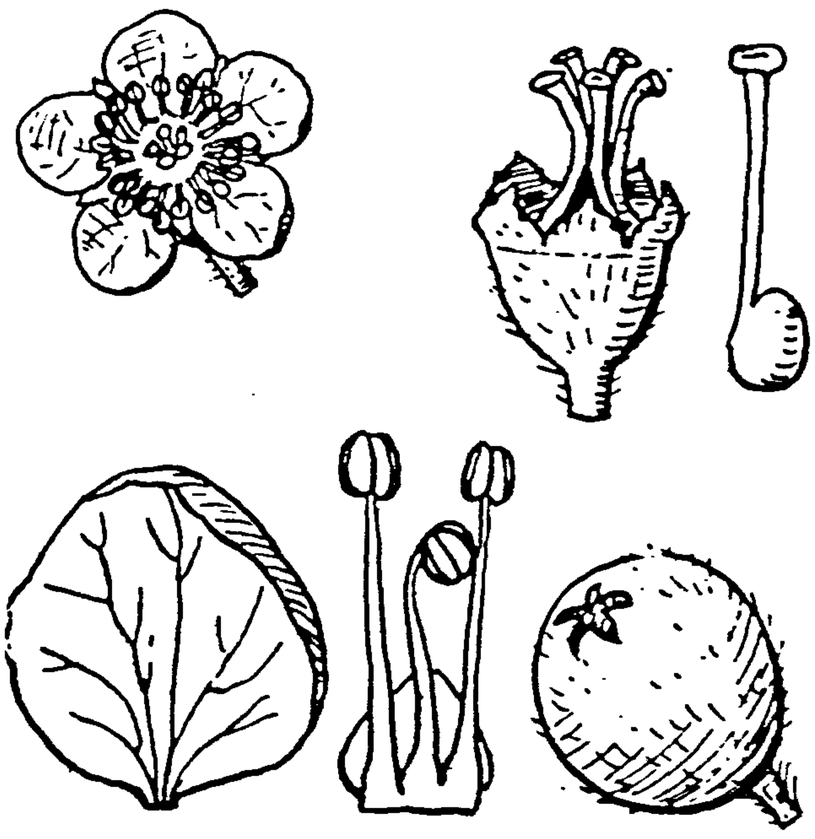
30. **C. Marshallii** Eggleston. A shrub or small tree, often 6 m. tall, with smooth, gray bark: leaf-blades broadly ovate to orbicular, 1–4 cm. long, pinnately and deeply 5–7-lobed, the lobes serrate, pubescent when young: sepals lanceolate, usually glandular-serrate: corolla 10–12 mm. broad: fruit oblong or oval, 4 to 7 mm. long, scarlet: nutlets 1–3. [*C. apiifolia* Michx.]—(PARSLEY-HAW. PARSLEY-LEAVED THORN.)—In low places along swamps and streams, Coastal Plain, Fla. to Texas and Va.

31. **C. uniflora** Muench. A shrub or small tree (?), with light brown bark: leaf-blades obovate or oblong-cuneiform to cuneate, 1–4 cm. long, crenate or crenate-serrate, often shallowly lobed, pubescent beneath, glabrate or pubescent above: sepals lanceolate, serrate to deeply incised, glandular: corolla 10–15 mm. broad: fruit globose to pyriform, 7–14 mm. thick, yellow to red at maturity: nutlets 3 or 4. [*C. yadkinensis* Ashe.]—(DWARF-THORN.)—Fields, sandy flats, woods, and pinelands, Coastal Plain and adj. provinces, Ga. to N. Y.

32. **C. lacrimata** Small. A small tree, sometimes 5 m. tall, with ashy-gray, scaly bark: leaf-blades cuneate-spatulate, 1–2.5 cm. long, glabrous in age, dentate above the middle, glandular, rounded, truncate, or pointed: sepals small, entire or nearly so, glabrous: fruit globose or nearly so, yellow or orange to reddish: nutlets 3–5.—Stream-banks and sandy woods W Fla.

33. **C. phaenopyrum** (L. f.) Medic. A tree, often 10 m. tall, with grayish or brown scaly bark: leaf-blades conspicuously cordate-deltoid to broadly ovate, serrate, often incisely 3–7-lobed, green and glabrous, 2–7.5 cm. long: sepals deltoid, entire: corolla 8–12 mm. broad: fruit depressed-globose, small, scarlet: nutlets usually 5. [*C. cordata* (Mill.) Ait.]—(HEDGE-THORN. RED-HAW. WASHINGTON-THORN.)—Stream-banks, woods, thickets, and fence-rows, various provinces, Ga. to Ark. and N. J.—Native southward, naturalized N.

7. **COTONEASTER** Medic. Shrubs. Leaf-blades simple, toothed or entire. Cymes cluster-like. Pomes small, the carpels becoming bony.—About 50 species, natives of the Old World.



1. **C. Pyracantha** (L.) Spach. Evergreen shrub with slender spines: leaf-blades oval to slightly oblanceolate, 2–5 cm. long, obtuse, crenulate: pedicels and hypanthium white-woolly: sepals ovate: petals white, about 3 mm. long: pomes about 4 mm. high, scarlet, bitter.—(FIRETHORN. SCARLET-FIRETHORN.)—Thickets and cult. grounds, various provinces, Ala. to Tenn. and Pa. Nat. of Eurasia, and cult.—Spr.—Many species of *Cotoneaster* are in cultivation. They are first class ornamentals, not only with attractive foliage, but they are also showy in flower and in fruit. Many of those used in landscape work are of Asiatic origin.

FAMILY 15. AMYGDALACEAE — PLUM FAMILY

Shrubs or trees, commonly with prussic acid in the tissues. Leaves alternate, with free, often early deciduous stipules: blades simple, mostly

toothed. Flowers perfect, in corymbs, cymes, racemes, or panicles, sometimes clustered. Calyx of 5 sepals, borne on the edge of the hypanthium, deciduous. Corolla of 5 petals. Androecium of many stamens. Gynoecium of a single carpel, or rarely of 2 or 3 carpels. Ovary 1-celled: style entire. Fruit a drupe.—About 10 genera and 125 species, most abundant in north temperate regions.

Style basal: ovules erect. — Tribe I. CHRYSOBALANEAE.
Style terminal: ovules pendulous. — Tribe II. PRUNEAE.

I. CHRYSOBALANEAE

Inflorescence axillary: drupe with a fluted stone. — 1. CHRYSOBALANUS.
Inflorescence terminal: drupe with a terete stone. — 2. GEOBALANUS.

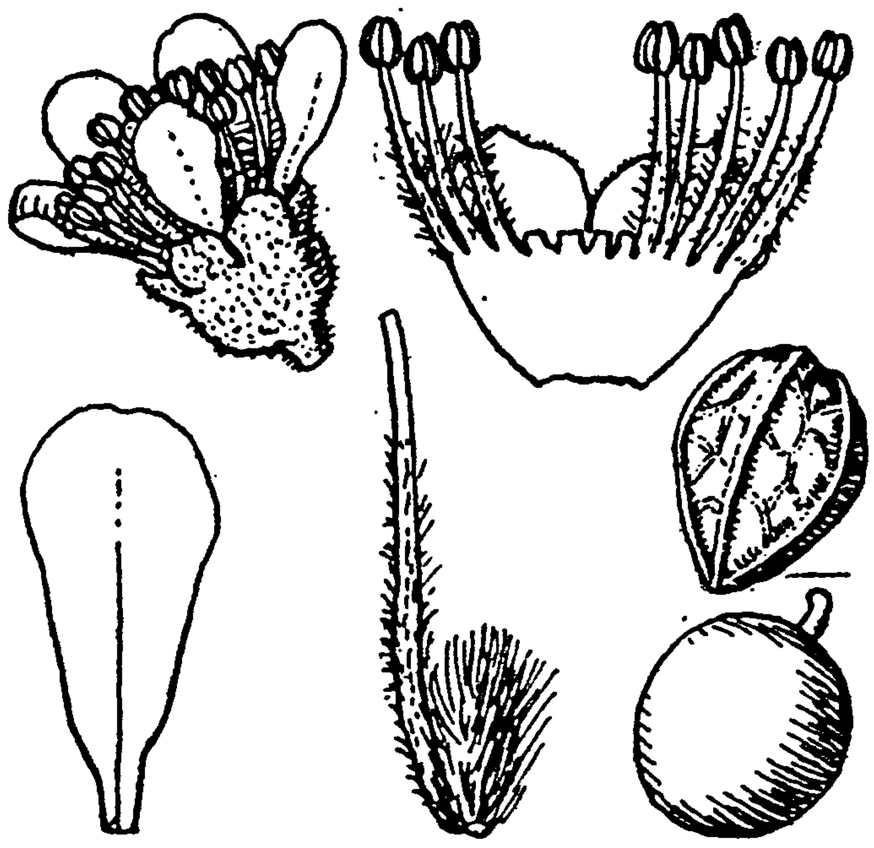
II. PRUNEAE

Drupe with a pulpy exocarp: leaves deciduous: flowers in clusters or terminal racemes.
  Flowers sessile or nearly so: stone coarsely wrinkled and pitted. — 3. AMYGDALUS.
  Flowers manifestly pedicelled: stone neither wrinkled nor grooved.
    Flowers in corymbs from scaly buds of the branches of the preceding year, before the leaves, the corymbs often umbel-like. — 4. PRUNUS.
    Flowers in racemes terminating branches of the year, after the leaves. — 5. PADUS.
Drupe with a dry exocarp: leaves persistent: flowers in axillary racemes. — 6. LAUROCERASUS.

1. CHRYSOBALANUS L. Shrubs or trees. Leaf-blades of an orbicular or obovate type. Cymes axillary. Petals clawed, white. Filaments distinct or nearly so. Stone of the fruit pointed at the base, ridged.—About 3 species, American and African.—COCOA-PLUM.

Drupe globular or spheroidal: petals cuneate. — 1. *C. Icaco.*
Drupe obovoid or oblong-obovoid: petals spatulate. — 2. *C. interior.*

1. C. Icaco L. Shrub, or tree sometimes 10 m. tall, and when growing on the beach, with radially creeping branches: leaf-blades broadly obovate to orbicular-obovate, mostly 4–8.5 cm. long, typically retuse: sepals about 2.5 mm. long: drupe globose or spheroidal, 3–4 cm. long, yellow, red, or purple; stone broadly obovoid, blunt-ridged. — (COCOA-PLUM.)—Beaches, sand-dunes, and coastal hammocks, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—The fruits are used for preserves. Sometimes planted as an ornamental. It thrives far removed from its maritime habitat.



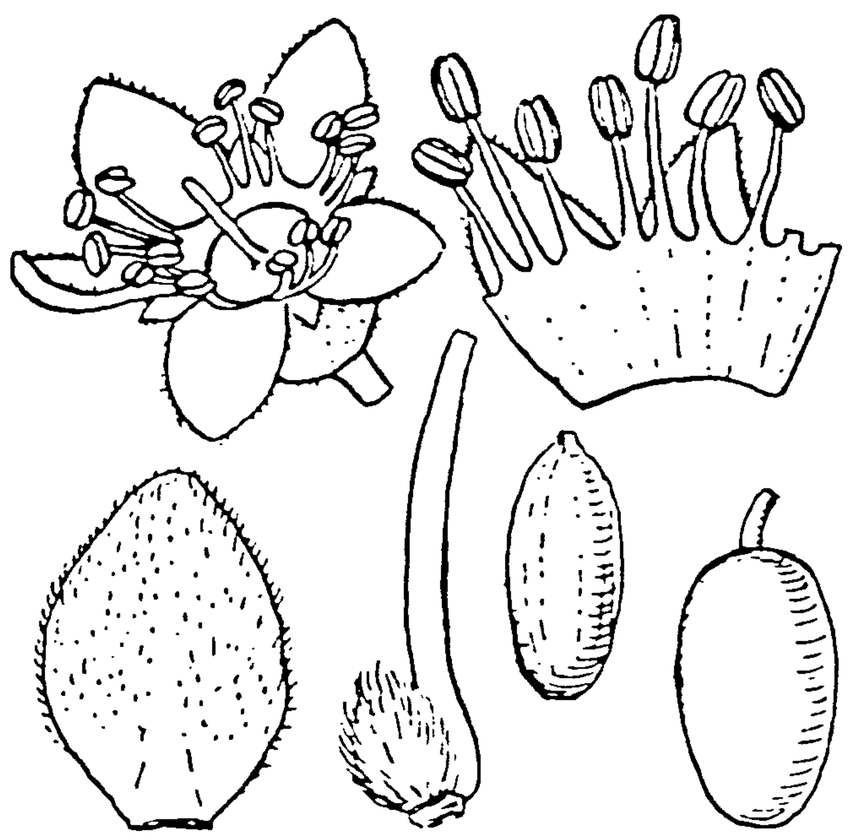
2. C. interior Small. Shrub or small tree: leaf-blades oval, obovate, or orbicular, mostly 2–6 cm. long, typically rounded or abruptly pointed: sepals about 2 mm. long: drupe obovoid or oblong-obovoid, 1.5–2 cm. long, purple: stone ellipsoid or ellipsoid-obovoid, sharp-ridged. [*C. pellocarpus* (Fl. SE. U. S.) not Mey.]—(SMALL-FRUITED COCOA-PLUM. EVERGLADE COCOA-PLUM.)—Hammocks, Everglade Keys, hammock islands in Everglades, and cypress-heads, S pen. Fla.—(*W. I.*)

2. GEOBALANUS Small. Shrubs, with underground stems. Leaf-blades more elongate than in *Chrysobalanus.* Cyme terminal. Petals not

clawed, white. Filaments markedly united. Carpels sometimes 2 or 3. Stone of the fruit terete, not pointed at the base.—Following are the only known species.—GOPHER-APPLES. GROUND-OAKS.

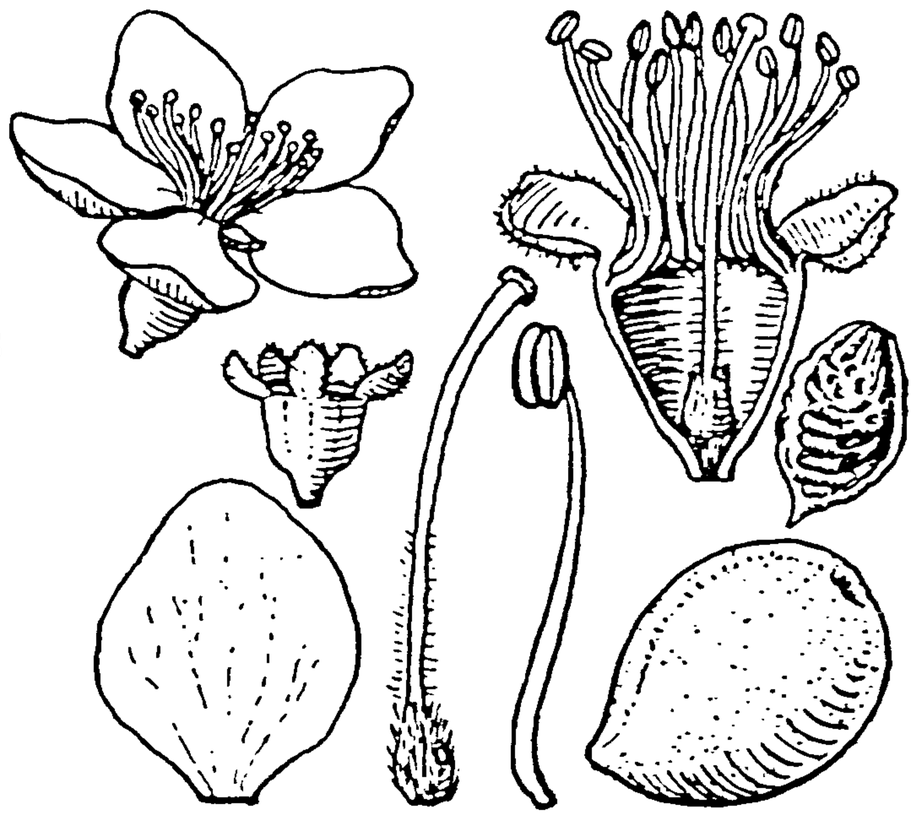
Ovary pubescent: drupe 3–4 cm. long. 1. *G. pallidus.*
Ovary glabrous: drupe 2–2.5 cm. long. 2. *G. oblongifolius.*

1. G. pallidus Small. Similar to *G. oblongifolius* in habit: blades of the upper leaves elliptic, 4–10 cm. long, acute, densely white-tomentose beneath, the hairs partly deciduous: drupe subglobose or oval. —Pinelands, S pen. Fla.—All year S.—The gopher—one of the large land turtles of Florida—is not the only animal that appreciates the fruits of these shrubs. The plants being low hold their fruits within easy reach of turtles and other short-legged animals. The fruits are in such demand that it is often difficult to find one, even in a large colony of the plants.



2. G. oblongifolius (Michx.) Small. Plant 1–3 dm. tall: blades of the upper leaves oblanceolate to elliptic, 3–12 cm. long, glabrous, obtuse or retuse and mucronate: drupe ovoid to obovoid. [*Chrysobalanus oblongifolius* Michx.]—Pinelands, sand-hills, and sand-dunes, Coastal Plain, Fla. to Miss. and Ga.—Spr.

3. AMYGDALUS L. Shrubs or trees. Leaves very strongly impregnated with prussic acid. Flowers sessile or short-pedicelled. Corolla mostly pink. Drupe velvety-pubescent, the stone wrinkled and pitted.—About 5 species, natives of Asia.—PEACHES.



1. A. Persica L. Tree: leaf-blades narrowly elliptic to lanceolate, or rarely elliptic-obovate, shining, sharply serrate: petals pink, 8–20 mm. long: drupe subglobose or ellipsoid, 4–10 cm. long, grooved on one side, velvety. — (COMMON PEACH). — Roadsides, woods, and thickets, various provinces, Fla. to Tex., Calif., and N. Y.—Nat. of Old World.—Spr.—Cult. in many varieties for its fruit.—Two distinct forms of the peach appear as escapes from cultivation; the one has large, conspicuous light-pink flowers, the other has small, inconspicuous reddish-pink flowers. These may represent two of the ancestral species which may be combined in the ordinary cultivated peach.

4. PRUNUS L. Shrubs or trees, sometimes thorny. Leaves occasionally impregnated with prussic-acid, deciduous: blades broad or narrow, membranous or somewhat leathery, more or less toothed. Flowers perfect, in umbel-like or corymb-like clusters from scaly buds, usually rather long-pedicelled. Hypanthium turbinate, campanulate, or hemispheric, deciduous. Sep-

als 5, short. Petals 5, white or nearly so, broad. Stamens 13–20. Pistil solitary. Ovary with 2 ovules. Drupe glabrous, often glaucous, with a fleshy exocarp and a bony stone.—About 100 species, most abundant in the north temperate zone, tropical America, and Asia.—Spr.—PLUMS. CHERRIES.—The fruits of both wild and cultivated trees are extensively used as food, both raw and preserved.

Drupe with a ventral groove: stone more or less flattened.—PLUMS. I. AMERICANAE.

Drupe without a ventral groove: stone very turgid.—CHERRIES.

Flowers corymbose. II. PENNSYLVANICAE.

Flowers in umbel-like corymbs. III. CERASI.

I. AMERICANAE

Flowers, and drupes, distinctly pedicelled.

Teeth of the leaf-blades pointed or acute, mostly not gland-tipped when the leaves unfold: sepals glandless except sometimes for inconspicuous glands in *P. americana.*

Leaf-blades rather abruptly acuminate, rather coarsely and deeply serrate: corollas 18–25 mm. wide: drupes red or reddish-yellow, 18–30 mm. in diameter.

Tree, sprouting from the roots, thus forming thickets: bark scaly on older trunks: leaf-blades glabrous or sparingly pubescent, or rarely tomentose beneath, acuminate, even when they unfold: fruits ripening in July: stone oval. 1. *P. americana.*

Tree, not sprouting from the roots, thus not forming thickets: bark somewhat furrowed on older trunks: leaf-blades usually copiously tomentose beneath, commonly somewhat obtuse when they unfold: drupes ripening in October and November: stone obovoid to merely round. 2. *P. mexicana.*

Leaf-blades gradually acuminate, or merely acute, rather finely serrate: corollas 6–14 mm. wide: drupes purple or rarely red to yellow, about 15 mm. in diameter or less.

Drupe globular: stone subglobose: leaves glabrous. 3. *P. umbellata.*

Drupe oval or ellipsoid: stone somewhat elongate: leaves pubescent.

Twigs glabrous and shining. 4. *P. mitis.*

Twigs closely pubescent. 5. *P. injucunda.*

Teeth of the leaves rounded or obtuse (sometimes apparently acute by the presence of pointed glands), mostly glandular, at least when unfolding: sepals glandular, except in *P. angustifolia,* in which the sepals are ciliate.

Leaf-blades rather thick, ovate to ovate-lanceolate, only slightly lustrous on the upper surface, conspicuously veiny beneath, rather coarsely and irregularly serrate. 6. *P. hortulana.*

Leaf-blades usually rather thin, oblong-lanceolate to oval, lustrous above, not conspicuously veiny beneath, finely and evenly serrate.

Leaf-blades 6–10 cm. long: sepals glandular. 7. *P. Munsoniana.*

Leaf-blades usually 2–6 cm. long: sepals non-glandular. 8. *P. angustifolia.*

Flowers, and drupes, short-pedicelled or nearly sessile. 9. *P. geniculata.*

II. PENNSYLVANICAE

Small tree with reddish-brown branches, acuminate leaf-blades, and small red fruits 5–7 mm. in diameter. 10. *P. pennsylvanica.*

III. CERASI

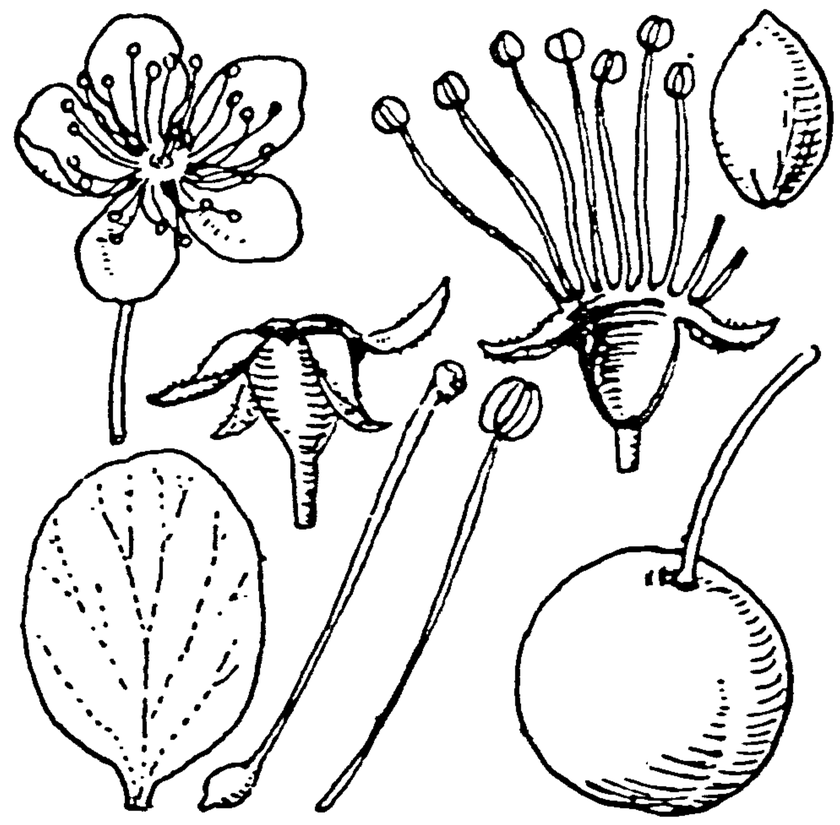
Low shrubs: corolla about 1 cm. broad: leaf-blades appressed-serrate: drupes mostly less than 10 mm. in diameter. 11. *P. cuneata.*

Large trees: corolla 1.5–3 cm. broad: leaf-blades sharply serrate: drupes mostly over 10 mm. in diameter.

Drupe sour: leaves glabrous. 12. *P. Cerasus.*

Drupe sweet: leaves pubescent. 13. *P. Avium.*

1. P. americana Marsh. Tree becoming 10 m. tall, the young twigs chestnut-brown: leaf-blades oval or elliptic-oval to narrowly obovate, 6–10 cm. long, glabrous or sparingly pubescent beneath (densely pubescent in *P. americana lanata*), rather gradually narrowed at the base: flowers 3 or 4 together in nearly sessile umbels: sepals lanceolate or elliptic-lanceolate, usually obscurely glandular on the margins, toothed near the apex, glabrous or inconspicuously pubescent without: petals mostly 8–10 mm. long, sometimes slightly ciliate near the base: drupe subglobose, 2–2.5 cm. long or less, reddish-orange to red, often with bloom: stone oval, 13.5–16 mm. long.—(WILD-PLUM. WILD YELLOW-PLUM. RIVER-PLUM. RED-PLUM. THORN-PLUM.)—Edges of woods, river-banks, thickets, and fence-rows, various provinces, Fla. to Colo., Mont., and N. Y.—Fr. ripe late sum. or fall.



2. P. mexicana S. Wats. Tree becoming 12 m. tall, the young twigs grayish: leaf-blades elliptic-obovate or obovate, 7–10.5 cm. long, pubescent, at least beneath, rounded to subcordate at the base: flowers 2–4 together in nearly sessile umbels: sepals elliptic to ovate-elliptic, obscurely glandular on the margins, toothed at the apex or entire, pubescent without: petals 6 mm. long, or rarely longer, often sparingly pubescent without: drupe globose or very rarely ellipsoid, 18–30 mm. in diameter, dark purplish-red, with bloom: stone obovoid to nearly round, 12.5–16 mm. long.—(BIG-TREE PLUM.)—Open woods, rich bottoms, and upland prairies, Coastal Plain and adj. provinces, Ala. to Tex., Okla., and Ky.—(*Mex.*)—Fr. ripe fall.

3. P. umbellata Ell. Tree 8 m. tall or less, the young twigs dark reddish-brown, glabrous: leaf-blades lanceolate, elliptic-lanceolate, or oval, 4–7 cm. long, acute, glabrous above, pubescent beneath along the midrib, and also sometimes along the veins, narrowed or rarely rounded at the base: flowers 2–4 together: sepals ovate, obtuse, entire or minutely toothed at the apex, obscurely pubscent without: petals 4–6 mm. long: drupe globose, 12–20 mm. in diameter, red, yellow, or more often dark-purple, with bloom: stone oval or nearly globose.—(SLOE. BLACK-SLOE. HOG-PLUM.)—Dry, often sandy woods and river-banks, Coastal Plain, Fla. to La. and S. C.—Fr. ripe sum.

4. P. mitis Beadle. Shrub or small tree, 4–8 m. tall, seldom spiny, with dark-gray or reddish-brown bark and glabrous shining twigs: leaf-blades 2–9 cm. long, elliptic, elliptic-lanceolate or rarely ovate or obovate, acute or acuminate, sharply serrate, narrowed or rounded at the base, finely pubescent on both surfaces and especially along the prominent midrib and veins beneath: sepals triangular, subacute, pubescent without and densely so within: petals 6–8 mm. long: drupe ellipsoid, 10–14 mm. long, dark-purple beneath the bloom: stone ovoid or oval, slightly compressed, about 1 cm. long, pointed at both ends and especially at the apex, crested on one margin.—Dry soil, often in open woods, Coastal Plain and adj. provinces, Ga. and Ala.

5. P. injucunda Small. Shrub or small tree, seldom spiny, the fark dark-gray and on the younger branches covered with a velvety pubescence: leaf-blades 2–6 cm. long, oval or obovate, acute or somewhat acuminate, finely but sharply serrate with apiculate teeth, conspicuously and densely pubescent beneath, inconspicuously pubescent and slightly rugose above: sepals finely ciliate, obtuse: petals 6–8 mm. long; blades oval to orbicular: drupe ellipsoid,

12–15 mm. long, dark-purple, beneath the bloom: stone ovoid, 8–10 mm. long, much compressed, pointed at both ends, crested. [*P. maritima* (Chapm. Fl.).] —(HOG-PLUM.)—Sandy soil, mainly in the granite districts, Piedmont, Ga. and Ala.—Fr. ripe sum.

6. **P. hortulana** Bailey. Tree becoming 9 m. tall, the young twigs dark reddish-brown: leaf-blades elliptic-obovate or elliptic-oval, 7.5–11 cm. long, decidedly acuminate, somewhat lustrous above, pubescent, often sparingly so beneath, rather abruptly rounded at the base: umbels 2–5-flowered: sepals elliptic-ovate, mostly obtuse, glabrous or obscurely pubescent, glandular on the margin: petals 6–8 mm. long, abruptly clawed: drupe globose or slightly ellipsoid, 18–25 mm. in diameter, red to yellow, sometimes with thin bloom: stone mostly oval or ellipsoid, 11–17 mm. long. [*P. hortulana Mineri* Bailey.]—(WILD-GOOSE PLUM.)—Rich bottom lands, various provinces, Ga. to Tex., Mo., and Ill.—Fr. ripe sum.–fall.

7. **P. Munsoniana** Wight & Hedrick. Tree, becoming 6 m. tall or more, the young twigs usually chestnut-brown: leaf-blades lanceolate to elliptic-lanceolate, usually 6–10 cm. long, acute or occasionally somewhat acuminate, shining above, sparingly pubescent especially near the veins beneath, or glabrous, rounded at the base: flowers 2–4 together: sepals elliptic-ovate to elliptic, obtuse, glabrous or sparingly pubescent without, glandular on the margins: petals 6–7 mm. long, entire or slightly erose: drupe globose to oval, 25–30 mm. in diameter, usually bright-red, with light bloom, sometimes yellow: stone elliptic to oval or ovoid, 11–20 mm. long or longer.—Rich soil, often in river-valleys, various provinces, Tenn. to N Tex. and Mo.—Fr. ripe sum.

8. **P. angustifolia** Marsh. Tree 3 m. tall or less or a shrub, the young twigs reddish-brown: leaf-blades lanceolate to oval-lanceolate, 2–5 cm. long, usually acute, shining above, sparingly pubescent beneath or glabrous, narrowed or rarely rounded at the base: flowers 2–4 together: sepals ovate, obtuse, glabrous without, ciliate, eglandular: petals about 4 mm. long, abruptly clawed: drupe subglobose, 13–23 mm. in diameter, red to yellow: stone oval, obovoid, elliptic, or oval, 1–1.5 cm. long. [*P. Chicasa* Michx.]—(CHICKASAW-PLUM. SAND-PLUM.)—Sandy soil, edges of woods, thickets and fence-rows, Coastal Plain, Fla. to Miss. and N. J.—Fr. ripe spr.

9. **P. geniculata** Harper. Shrub with diffusely branched stems, 1.5 m. tall, the numerous zigzag branches somewhat spinescent: leaf-blades elliptic to ovate-elliptic, 1–2.5 cm. long, mucronate, finely crenate-serrate, rather short-petioled: flowers in lateral few-flowered sessile umbels appearing before the leaves: pedicels stout, 2–3 mm. long: corolla white, 1 cm. wide or less: drupe oval or globose-oval, 12–25 mm. long or less.—(SCRUB-PLUM.)—Scrub and dry sandy pinelands, C pen. Fla.—Fr. ripe spr.

10. **P. pennsylvanica** L.f. Tree 11 m. tall or less, the young twigs reddish and somewhat shining: leaf-blades lanceolate or elliptic-lanceolate, 6–15 cm. long, acuminate, glabrous or sometimes sparingly pubescent beneath, narrowed or rounded at the base: flowers 3–7 together in umbel-like or corymb-like clusters: sepals elliptic or ovate-elliptic, obtuse, glabrous, eglandular: petals about 5 mm. long: drupe globular, 5–7 mm. in diameter, red, the flesh thin: stone ovoid to broadly ellipsoid to subglobose.—(BIRD-CHERRY. PIN-CHERRY. PIGEON-CHERRY. WILD RED-CHERRY.)—Rocky woods and clearings, often in acid soil and burned-over land, various provinces N of Coastal Plain, Ga. to Colo., Ont., and Newf.—Fr. ripe sum.

11. **P. cuneata** Raf. Shrub 1.5 m. tall or less, the twigs glabrous: leaf-blades oval, elliptic, elliptic-obovate, or obovate, 3.5–8 cm. long, obtuse or some-

times acute, green above, pale beneath, cuneate or gradually narrowed to the base: flowers usually 3 together: sepals elliptic, obtuse, glabrous, minutely glandular on the margins: petals about 6 mm. long: drupe globose or subglobose, 10–15 mm. in diameter, black, without bloom: stone acute.—(DWARF-CHERRY.)—Moist or rocky woods, various provinces N of Coastal Plain, N. C. to Minn. and N. H.—Fr. ripe sum.

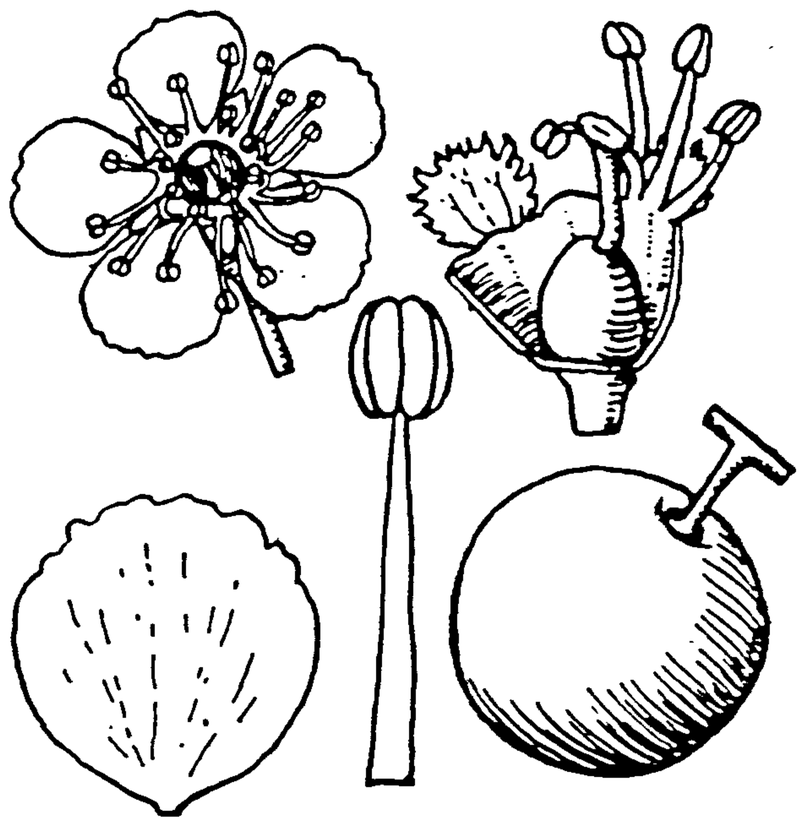
12. **P. Cerasus** L. Small tree: leaf-blades ovate, oval-ovate, or ovate-lanceolate, 4–11 cm. long, abruptly acute or acuminate, finely serrate-dentate, glabrous, resinous when young: corolla 1.5–2.5 cm. broad: drupe nearly globose, 8–10 mm. in diameter, or larger in cultivation, sour, red or black: stone subglobose.—(SOUR-CHERRY. MORELLO-CHERRY.)—Woods and fence-rows, various provinces, N Fla. to Colo. and N. H. Nat. of Eu.—Fr. ripe sum.

13. **P. Avium** L. Large tree leaf-blades ovate to oval or oval-ovate, 5–10 cm. long, abruptly short-acuminate, coarsely doubly serrate, pubescent beneath, sometimes only on the veins: corolla 2.5–3 cm. broad: drupe ovoid-globose, 8–10 mm. in diameter, not acid, usually sweet: stone globular.—(SWEET-CHERRY. MAZZARD.)—Thickets, fence-rows, and edges of woods, various provinces, N Fla. to Mo. and Ont. Nat. of Eurasia.—Fr. ripe sum.

5. **PADUS** Borckh. Shrubs or trees. Leaves deciduous, manifestly impregnated with prussic acid. Flowers in terminal racemes, white. Hypanthium green. Sepals relatively large. Petals rounded. Drupe with a juicy exocarp.—About 15 species, natives of the north temperate regions.—WILD CHERRIES. CHOKE CHERRIES.

Sepals deciduous: leaf-blades mostly serrulate with very slender teeth.	1. *P. nana.*
Sepals persistent: leaf-blades mostly serrulate with relatively coarse teeth.	
Young shoots, raceme-rachis, and pedicels glabrous.	2. *P. virginiana.*
Young shoots, raceme-rachis, and pedicels pubescent.	
Leaf-blades finely and rather sparingly pubescent beneath (except along the midrib), becoming glabrate and glaucous with age.	3. *P. Cuthbertii.*
Drupe red: leaf-blades prevailingly obovate, blunt.	
Drupe purple: leaf-blades ovate or elliptic, acute or acuminate.	4. *P. alabamensis.*
Leaf-blades densely and permanently clothed with tawny or rufous tomentum, not glaucous.	5. *P. australis.*

1. **P. nana** (Du Roi) Roem. Shrub with diffuse branches, or small tree with spreading or drooping branches: leaf-blades thinnish, oval or obovate, 5–10 cm. long, sharply serrulate, usually rounded at the base, glabrous or nearly so on both sides: raceme rather lax, 8–15 cm. long: sepals reflexed, often ovate, glandular-margined: petals 3–4 mm. long: drupe globose, 8–10 mm. in diameter, red or almost black, or rarely yellow, very astringent. [*P. virginiana* Roem. not *Prunus virginiana* L.]—(CHOKE-CHERRY.)—Rocky woods, sand-dunes, and river-banks, various provinces, Ga. to Tex., Man., and Newf.—Spr.



2. **P. virginiana** (L.) Mill. Tree with ascending branches, becoming 35 m. tall: leaf-blades firm, elliptic, varying to obovate, or elliptic-lanceolate, 5–15 cm. long (coriaceous, often lanceolate, whitish beneath, coarsely serrate, and with the racemes few-flowered and divergent in *P. virginiana montana*—on mtn. tops), acumi-

nate or acute at both ends, or rounded at the base, crenate-serrulate with callous-tipped teeth, glabrous or nearly so: sepals ovate, longer than broad: corolla 8–10 mm. broad: drupe globose, 8–10 mm. in diameter, dark-purple or nearly black, sweet but slightly astringent. [*P. serotina* (Ehrh.) Agardh.]—(WILD BLACK-CHERRY. RUM-CHERRY.)—Woods and roadsides, various provinces, Fla. to Tex., N. D., and Ont.—Spr.–sum.—The bark of this and of other species is used in medicine. The wood is used in cabinet-work.

3. P. Cuthbertii Small. Tree 6 m. tall, with tomentose twigs: leaf-blades coriaceous, typically obovate, varying to oval or pandurate, 4–9 cm. long, blunt or notched at the apex, shallowly serrate, not markedly biglandular at the often cuneate base, dull-green above, pale or glaucescent beneath, the midrib and petioles copiously tomentose, the lateral veins slightly so: raceme 5–8 cm. long, the rachis and pedicels pubescent like the twigs: sepals broader than long, obtuse: petals 3–4 mm. long, crisped: drupes subglobose, 8–9 mm. in diameter, red.—Rocky and sandy woods, river-bluffs, and steep-heads, Coastal Plain and Piedmont, Fla. and Ga.—Spr.

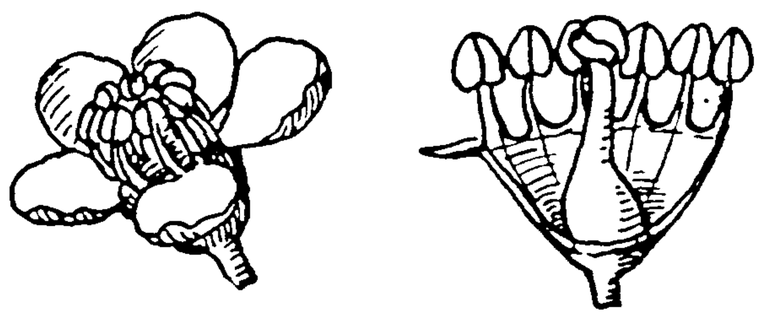
4. P. alabamensis (C. Mohr) Small. Tree rarely over 10 m. tall, the bark rough: leaf-blades coriaceous or thick-membranous, ovate to elliptic, 6–12 cm. long, short-acuminate but sometimes obtuse at the apex, serrate with blunt appressed gland-tipped teeth, paler beneath than above and finely pubescent with simple or forked hairs, rounded or slightly narrowed at the base: raceme 10–15 cm. long, spreading, the rachis and peduncles, like the calyx, pubescent. —Mt. slopes, Appalachian provinces, Ga. and Ala.—Spr.

5. P. australis Beadle. Tree 10–20 m. tall: leaf-blades obovate, oval, or elliptic, 4–10 cm. long, 2–6 cm. wide, abruptly and rather bluntly pointed at the apex, or occasionally obtuse, rounded or obtusely narrowed at the base, finely serrate, dark-green and glabrous above, densely and permanently clothed on the lower surface with tawny or rufous tomentum, not at all glaucous: raceme 8–12 cm. long, the rachis and pedicels, like the young shoots, pubescent: drupe globose, 5–8 mm. in diameter, purple.—Clay soil, Coastal Plain, near Evergreen, Ala.—Spr.

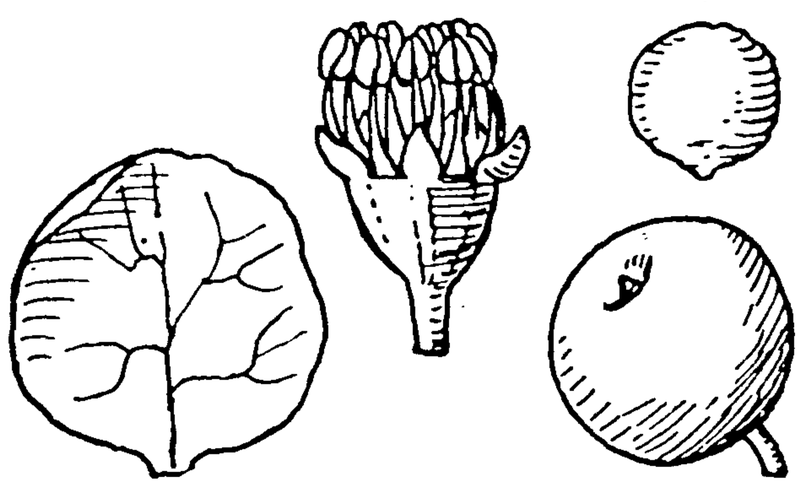
6. LAUROCERASUS Reichenb. Shrubs or trees. Leaves evergreen, copiously impregnated with prussic acid. Flowers in axillary racemes, white. Hypanthium white. Sepals minute. Petals more or less angulate. Drupe with a dry exocarp.—About 20 species, natives of tropical and temperate regions.—CHERRY-LAURELS.

Petals larger than the sepals: drupe subglobose. 1. *L. myrtifolia.*
Petals smaller than the sepals: drupe ellipsoid or oval. 2. *L. caroliniana.*

1. L. myrtifolia (L.) Britton. Shrub or small tree: leaf-blades elliptic: racemes loosely flowered, the pedicels slender: petals slightly angled: drupe 8–12 mm. in diameter: stone spheroidal. [*Prunus sphaerocarpa* Sw. *L. sphaerocarpa* (Sw.) Roem.]—(WEST-INDIAN CHERRY.)—Hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—Fall–wint.



2. L. caroliniana (Mill.) Roem. Shrub or small tree: leaf-blades narrowly elliptic to elliptic-oblanceolate: racemes densely flowered, the pedicels stout: petals saliently angled: drupe 10–13 mm. long: stone ovoid. [*Prunus caroliniana* Ait.]—(MOCK-ORANGE.)—Woods, usually in river banks and hammocks, Coastal Plain, Fla. to Tex. and N. C. —Wint.–spr.—(*W. I.*)—Rare as a native tree, but commoner as an escape from cult.



Family 16. **MIMOSACEAE** — Mimosa Family

Herbs, shrubs, or trees. Leaves alternate: blades compound, usually 2–3-pinnate: stipules sometimes spine-like. Flowers mostly perfect, borne in capitate or elongate usually dense spikes or racemes. Calyx of 3–6 partially united sepals. Corolla of 3–6 equal, distinct or partially united petals. Androecium of 3–6, or many, stamens which are usually conspicuously exserted. Gynoecium 1-carpellary. Fruit a legume.—About 40 genera and 1,500 species, most abundant in the tropics.

Stamens numerous, more than 10.	
Filaments partly united into a tube.	Tribe I. Ingeae.
Filaments distinct.	Tribe II. Acacieae.
Stamens as many as the petals or corolla-lobes or twice as many.	
Anthers without glandular appendages at the top.	Tribe III. Mimoseae.
Anthers, at least in the bud, topped by glandular appendages.	Tribe IV. Adenanthereae.

I. Ingeae

Valves of the pod not separating from the continuous margin.	
Pods with thick-leathery valves: leaves with few (usually 4) leaflets.	1. Pithecolobium.
Pod with membranous or thin-leathery very flat valves: leaves with several or many leaflets.	2. Albizzia.
Valves of the pod separating from the continuous margin.	3. Lysiloma.

II. Acacieae

Ovary stipitate: petals distinct or united, commonly only to below the middle: pod flat, dry, the seeds not in two distinct rows.	4. Acaciella.
Ovary sessile: petals united into a tubular-funnelform, shallowly lobed corolla: pod nearly terete or broader than high, pulpy within, the seeds in two separate rows.	5. Vachellia.

III. Mimoseae

Valves of the pod not separating from the continuous margin.	
Shrubs or trees: seeds transverse in the pod.	6. Leucaena.
Herbs: seeds lengthwise or oblique in the pod.	7. Acuan.
Valves of the pod separating from the continuous margin.	
Pod slightly, if at all, flattened, 4-angled or with a broad margin, beaked, not jointed.	8. Leptoglottis.
Pod flat, jointed, not beaked.	9. Mimosa.

IV. Adenanthereae

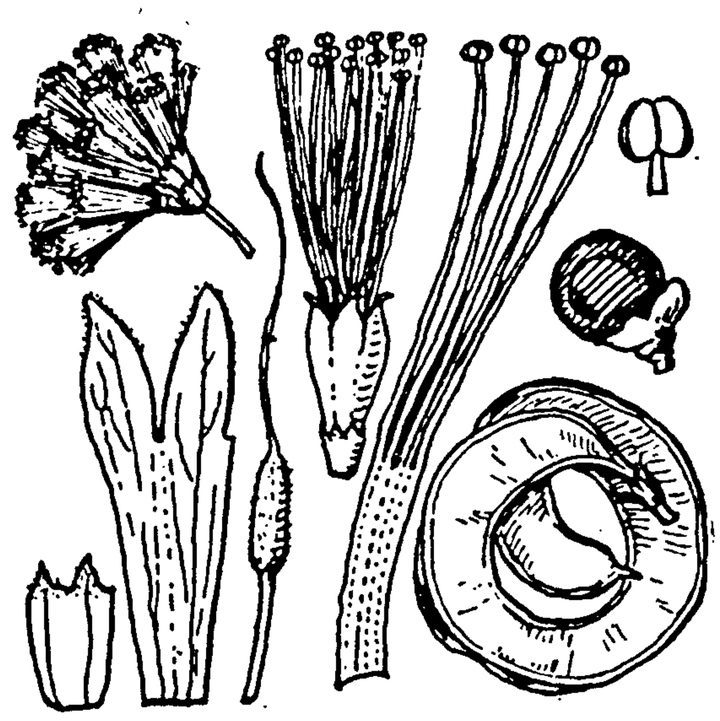
Herbs with prostrate wiry or very slender unarmed branches: spikes uniform, the neutral and perfect flowers the same size: pod short and even.	10. Neptunea.
Shrubs or small trees with erect, spine-armed branches: spikes not uniform, the neutral flowers at the base of the spike much longer than the perfect ones: pod elongate, constricted between the seeds and contorted.	11. Cailleia.

1. PITHECOLOBIUM Mart. Shrubs or trees. Leaves 2-pinnate: leaflets few, often 4. Spikes capitate, white or pink. Calyx-lobes minute. Corolla prominently lobed. Pod narrow, contorted, often pulpy within. Seed with colored arils.—About 100 species, widely distributed in tropical and subtropical regions.—Spr.–sum. or all year.

Ovary glabrous, shorter than the stipe: petioles longer than the petiolules.	1. *P. Unguis-Cati.*
Ovary pubescent, longer than the stipe: petioles shorter than the petiolules.	2. *P. guadelupense.*

1. P. Unguis-Cati (L.) Benth. Armed or rarely unarmed shrub or small tree: blades of the leaflets thinnish, broadly obovate, oval, or suborbicular,

1–4.5 cm. long: calyx 1.5–2 mm. long; lobes wider than long, blunt: corolla 3.5–4.5 mm. long: pod long-stipitate. — (CAT'S-CLAW. BLACK-BEAD.) — Hammocks, Everglade Keys and lower W coast, pen. Fla. and Florida Keys.—(*W. I.*)



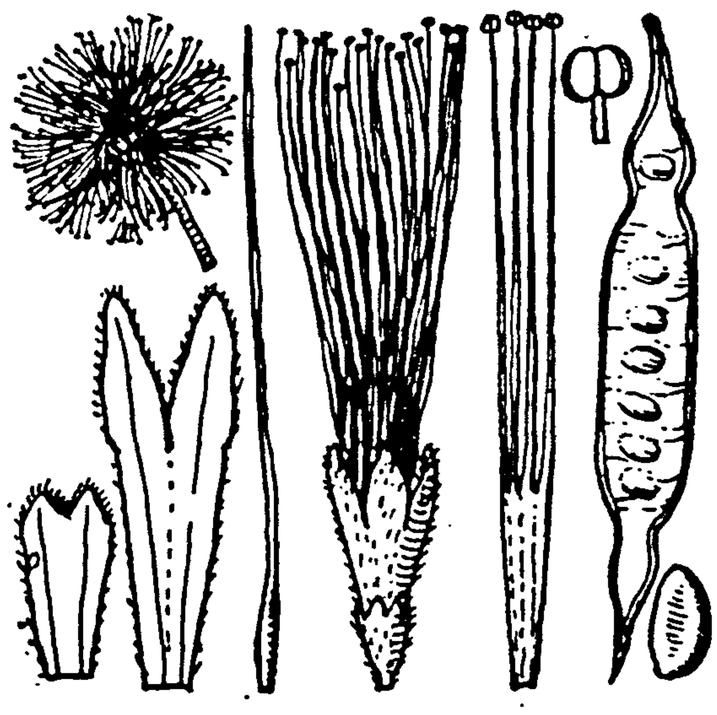
2. P. guadelupense Chapm. Unarmed or rarely armed shrub or small spreading tree: blades of the leaflets leathery, elliptic to cuneate, oval, or suborbicular, 3–7 cm. long: calyx 2.5–3 mm. long; lobes longer than wide, acute: corolla 5–6 mm. long: pod short-stipitate.—(BLACK-BEAD.)—Pinelands, hammocks, and sand-dunes, Everglade Keys and lower E coast, pen. Fla. and Florida Keys.—(*W. I.*)

2. ALBIZZIA Durazz. Shrubs or trees. Leaves 2-pinnate: leaflets numerous. Spikes capitate, white or pink. Calyx-lobes relatively short and small. Corolla about twice as long as the calyx. Pod linear, flat.—About 50 species, natives of the Old World.

Blades of the leaflets acute, the midrib nearly marginal: pod-valves veiny all over. 1. *A. Julibrissin.*

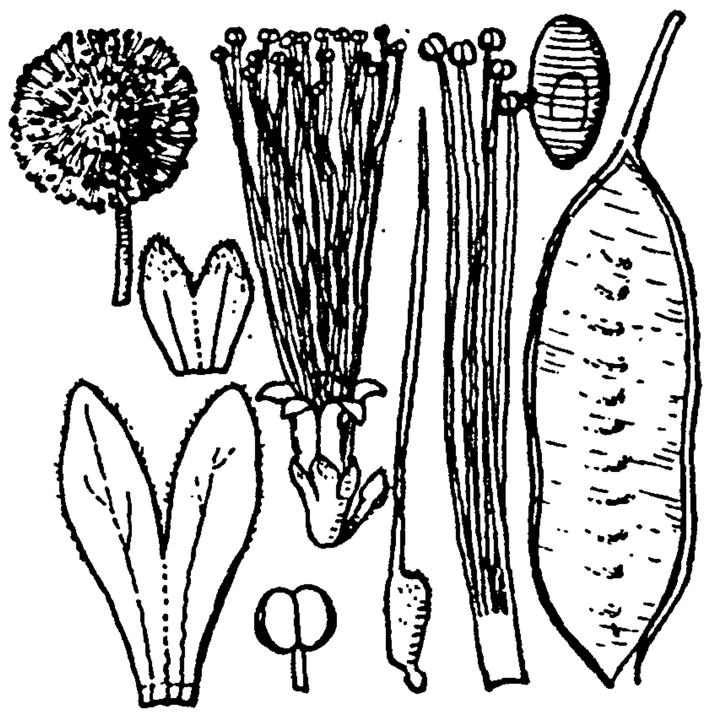
Blades of the leaflets rounded at the apex, the midrib not lateral: pod-valves veiny only over the seeds. 2. *A. Lebbek.*

1. A. Julibrissin (Willd.) Durazz. Shrub or tree becoming 10 m. tall: leaves with 16–24 pinnae; leaflets 5–7, the blades falcate-lanceolate, 7–16 mm. long, obliquely acute: calyx about 2 mm. long: corolla 6–8 mm. long; larger lobes ovate: pod broadly linear, 10–15 cm. long: seed elliptic, 3.5–4.5 mm. wide.—(JUBLIBRISSIN. ACACIA. SILK-TREE.)—Pinelands, hammocks, roadsides, and cult. grounds, Coastal Plain and rarely adj. provinces, Fla. to La. and Md. Nat. of Asia and cult.—(*W. I.*)—Spr.–sum.—The spikes are pink.



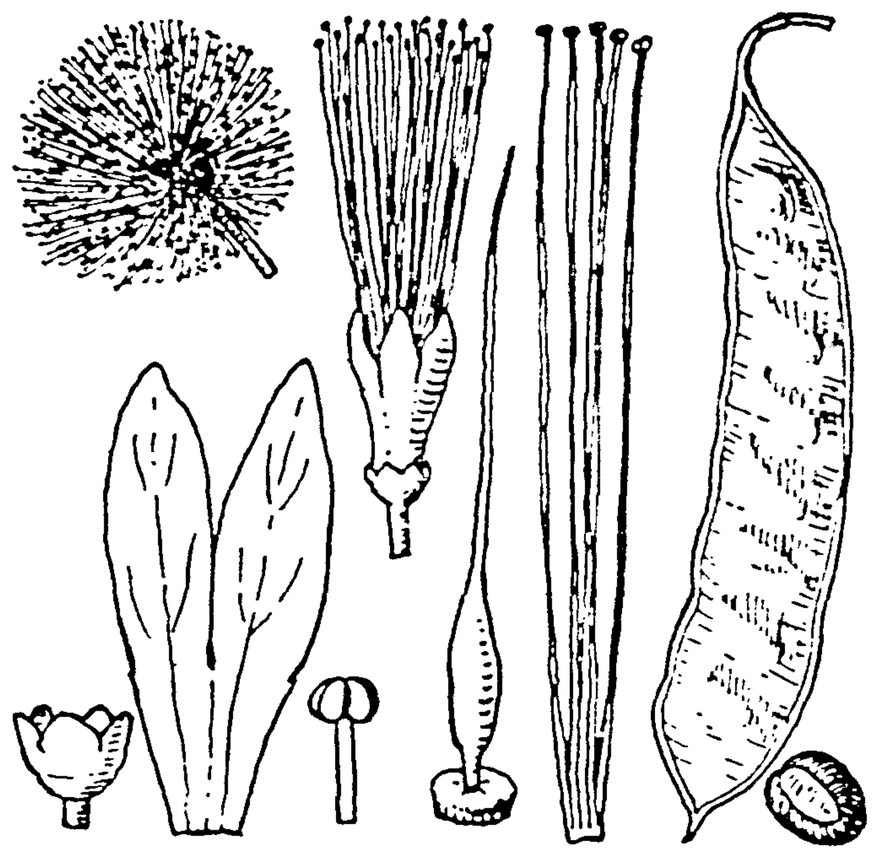
2. A. Lebbek (Willd.) Benth. Tall tree: leaves with 4–8 pinnae; leaflets 10–22, the blades elliptic to elliptic-obovate, 2–5.5 cm. long, acute: calyx about 4 mm. long: corolla 9–11 mm. long; larger lobes lanceolate: pod linear, 15–40 cm. long: seed oval, 6–7 mm. wide.—(LEBBEK. WOMAN'S TONGUE TREE.)—Hammocks and cult. grounds, Florida Keys. Nat. of Africa and cult.—(*W. I.*)—Spr.—The spikes are cream-color.

3. LYSILOMA Benth. Shrubs or trees. Leaves 2-pinnate: leaflets numerous (or few). Spikes capitate (or cylindric), white or greenish-white. Calyx-lobes relatively long. Corolla slightly longer than the calyx. Pod elliptic to linear.—About 10 species, natives of tropical America.



1. L. bahamensis Benth. Tree becoming 20 m. tall, with spreading branches: leaves with 4–8 pinnae; leaflets 20–40, the blades elliptic to elliptic-lanceolate, 8–11 mm. long: calyx about 2 mm. long: corolla 2.5–3 mm. long; lobes ovate: pod elliptic, 8–15 cm. long, long stipitate. [*L. latisiliqua* Chapm. not Benth.]—(WILD-TAMARIND.)—Hammocks, Everglade Keys, pen. Fla. and Florida Keys.—(*W. I.*).

4. **ACACIELLA** Britton & Rose. Shrubs or trees, or sometimes herbs. Leaves mostly 2-pinnate, sometimes reduced to phyllodia: leaflets usually numerous. Spikes capitate or cylindric. Calyx cupulate or resembling the corolla. Petals distinct or partially united. Filaments distinct, or some of them slightly united at the base. Pod flat.—About 50 species, mostly in subtropical or tropical regions.



1. **A. hirta** (Nutt.) Britton & Rose. Shrub with hirsute foliage: leaf-pinnae mostly 10–13: leaflets very numerous; blades elliptic or narrowly elliptic, 4–5 mm. long: spikes white, pinkish, or yellowish: calyx less than 1 mm. long; lobes deltoid, acute: corolla 2–2.5 mm. long: pod linear, 3–7 cm. long, 6–9 mm. wide. [*A. filicioides* (Fl. SE. U. S.)]—(ACACIA.)—Pinelands, pen. Fla.; also various provinces, Tex. to Ariz., Kans., and Mo.—(*Mex.*)—Spr.

5. **VACHELLIA** Wight & Arn. Shrubs or small trees. Leaves 2-pinnate: leaflets numerous, small. Spikes globose. Calyx-lobes minute and relatively short. Corolla about twice as long as the calyx, the lobes short. Filaments distinct. Pod very turgid.—Several species of wide geographic distribution.—Spr.–sum. or all year S.—OPOPANAX. YELLOW-OPOPANAX. POPINACK. HINSACH. CASSIE. SWEET-ACACIA.

Leaflets separated; blades relatively large 4.5–6.5 mm. long, veiny: spikes over 1 cm. in diameter: pod blunt or merely abruptly acute, the suture prominently 2-ridged. 1. *V. Farnesiana.*

Leaflets contiguous; blades relatively small, 1.5–3.5 mm. long, not veiny: spikes less than 1 mm. in diameter: pod beaked or bluntly tapering, the suture inconspicuous.

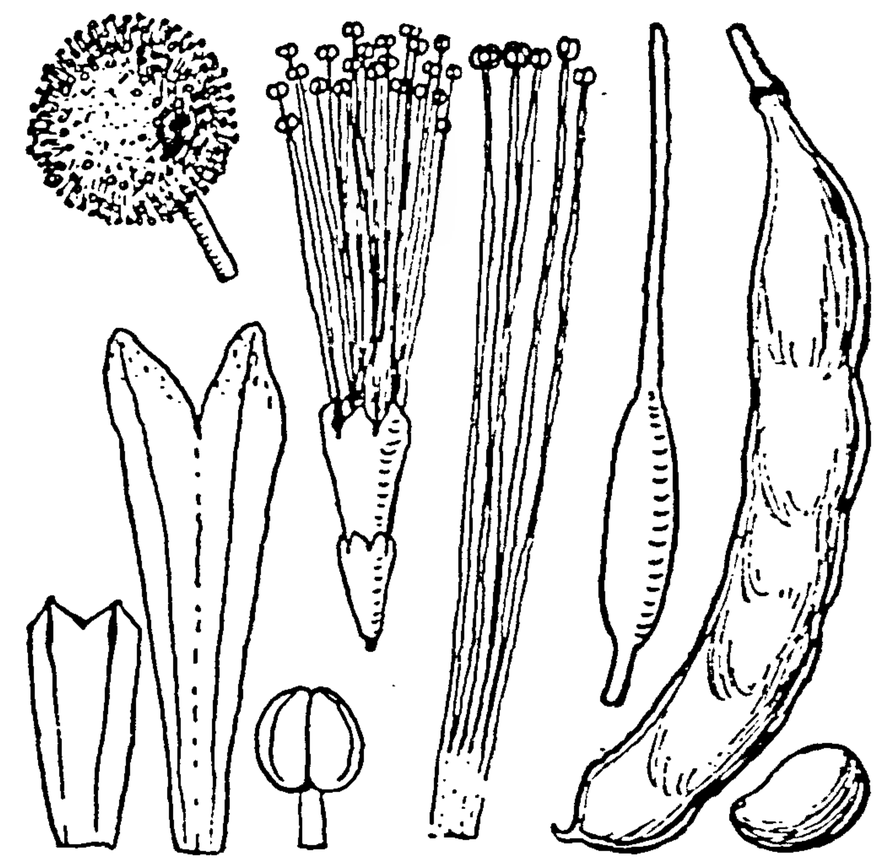
Pod beaked, turgid.

Flower-heads 1–3 together, the peduncles nearly 2 cm. long: terminal mucro of leaf-rachis glabrous or nearly so: spines proportionately slender. 2. *V. peninsularis.*

Flower-heads 1–7 together, the peduncles mostly less than 1 cm. long: terminal mucro of leaf-rachis pubescent: spines proportionately stout. 3. *V. densiflora.*

Pod beakless, not turgid. 4. *V. insularis.*

1. **V. Farnesiana** (L.) Wight & Arn. Stout shrub or small tree, armed with rather short stout spines: leaf-rachis and branches finely puescent: leaflets glabrous, the longer ones of each rachis 4.5–6.5 mm. long: peduncles closely fine-pubescent: spikes fully 1 cm. in diameter: calyx about 2 mm. long: corolla 3–4 mm. long, much exceeding the calyx: pod stout, 3.5–8 cm. long: seeds about 6 mm. long.—Hammocks, pinelands, and waste-places, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)



2. **V. peninsularis** Small. Shrub up to 4 m. tall, armed with slender spines mostly 1–3 cm. long: leaf-rachis glabrous: leaflets glabrous, the larger ones of each rachis 1.5–3.5 mm. long: peduncles nearly 2 cm. long, with few sessile glands and sometimes slightly puberulent: spikes yellow, less than 1 cm. in

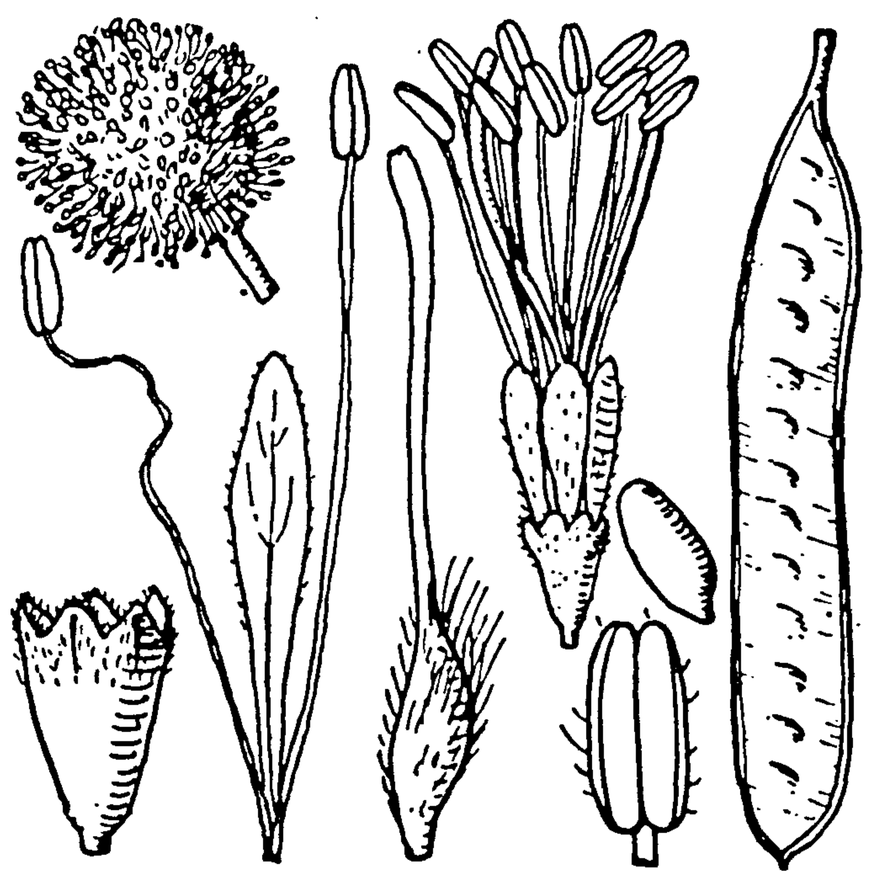
diameter: calyx about 2 mm. long: corolla about 2.5 mm. long, slightly exceeding the calyx: pod stout, inequilaterally ellipsoid, more or less turgid, 3–6 cm. long: seeds 5–5.5 mm. long.—Pinelands and hammocks in the Everglades, S. pen. Fla.—All year.—In the pinelands of the lower Florida Keys there is a dwarf opoponax, usually less than 1 m. tall, the pods are linear, 5–10 cm. long, curved and relatively stout-beaked.

3. **V. densiflora** Alexander. Shrub up to 4 m. tall, armed with short spines mostly less than 1 cm. long: leaf-rachis glabrous, terminal mucro long-pubescent: leaflets glabrous, the larger ones up to 3.5 mm. long: peduncles mostly less than 1 cm. long, rather stout in proportion, with numerous sessile resinous glands, accompanied by some caducous puberulence: spikes deep orange-yellow, less than 1 cm. in diameter: calyx about 2 mm. long: corolla about 2.5 mm. long, slightly exceeding the calyx: pod stout, with a short, stout beak, only slightly turgid, 3–5 cm. long: seeds about 5 mm. long.—Bayou-banks, fills, and waste-fields, along and near the Gulf Coast, W Fla. to Tex.—Spr.

4. **V. insularis** Small. Shrub up to 3 m. tall, armed with pale spines 1–2.5 cm. long: leaf-rachis glabrous: leaflets glabrous, the longer ones of each rachis 1.5–3 mm. long: peduncle glabrous or with small sessile glands: spikes less than 1 cm. in diameter: calyx about 2 mm. long: corolla about 2.5 mm. long, slightly exceeding the calyx: pod narrow, stout, but not inflated, 2.5–7 cm. long, acute, but not beaked.—Hammocks and pinelands, Fla. Keys.—All year.

6. **LEUCAENA** Benth. Shrubs or trees. Leaves mostly 2-pinnate: leaflets often small and numerous. Spikelets capitate. Calyx-lobes minute. Petals distinct, or rarely slightly coherent. Filaments distinct or nearly so. Pod linear, flat.—About 10 species, mostly in tropical America.

1. **L. glauca** (L.) Benth. Shrub, or tree becoming 10 m. tall: leaflets 6–12 mm. long; blades narrowly elliptic to lanceolate, over 1.5 mm. wide: spikes white or pinkish: calyx 2–2.5 mm. long or rarely shorter: petals 4–4.5 mm. long: pod 10–15 cm. long. — (LEAD-TREE.) — Hammocks, Coastal Plain, Fla. and Tex.—(*W. I., Mex., C. A., S. A.*)—All year.

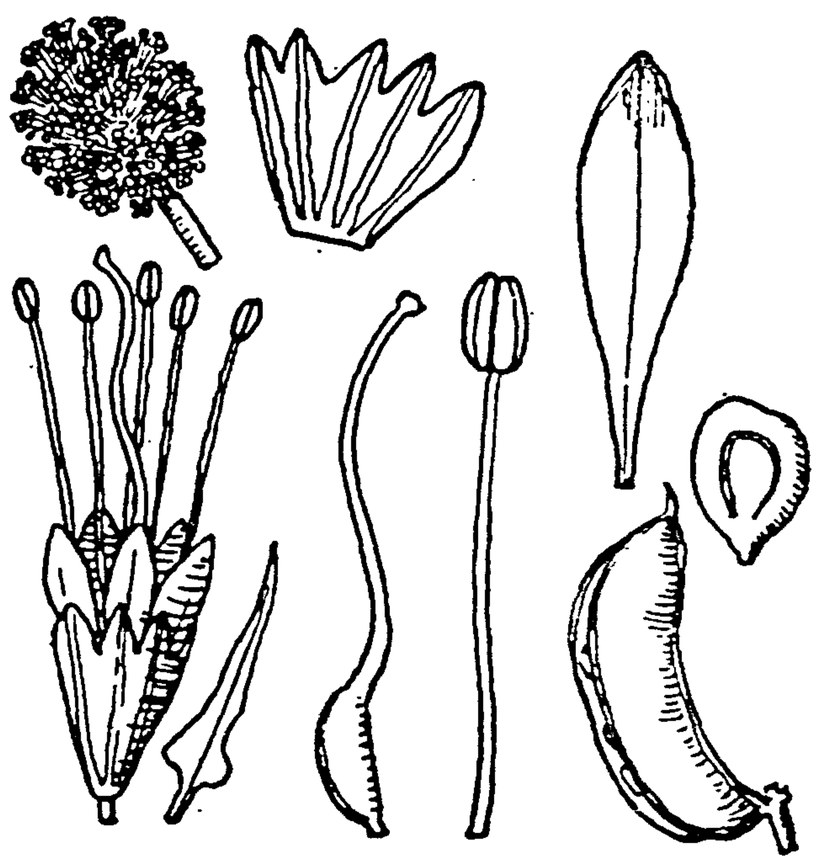


7. **ACUAN** Medic. Perennial herbs, often somewhat woody near the base. Leaves 2-pinnate: leaflets small, numerous. Spikes capitate, white or greenish. Calyx-lobes minute. Petals distinct, sometimes clawed. Filaments distinct. Pod flattish. [*Desmanthus* Willd.]—About 10 species, most of them in tropical America.

Stamens 5: pods flat, broad, curved, in a dense-head: seeds few. 1. *A. illinoense.*
Stamens 10: pods turgid, narrow, straight, spreading: seeds several.
  Gland between the lower pair of pinnae orbicular: pod 3–5.5 cm. long. 2. *A. depressum.*
  Gland between the lower pair of pinnae elliptic: pod 6–8 cm. long. 3. *A. virgatum.*

1. **A. illinoense** (Michx.) Kuntze. Plant 3–12 dm. tall, glabrous or nearly so: leaves with 20–28 pinnae; blades of the leaflets lanceolate to linear-elliptic,

2.5–3.5 mm. long: calyx about 1.5 mm. long: petals 2.5–3 mm. long: ovary broad: pod about 1.5 cm. long. [*D. brachylobus* (Willd.) Benth.]—(PRICKLE-WEED.) — Rich soil and river banks, various provinces, Fla. (?), Ala. to Tex., Colo., Minn., and Ohio.—Spr.–fall.



2. A. depressum (H. B. K.) Kuntze. Stem 3–8 cm. long: blades of leaflets narrowly elliptic, 2–5 mm. long: calyx 1.5–2 mm. long: petals 2.5 mm. long; blades spatulate: pod 3–5.5 mm. long. [*D. depressus* H. B. K.]—Pinelands and open sandy places, S pen. Fla. and the Keys, and Tex.—(*W. I., Mex., C. A., S. A.*).—All year S.

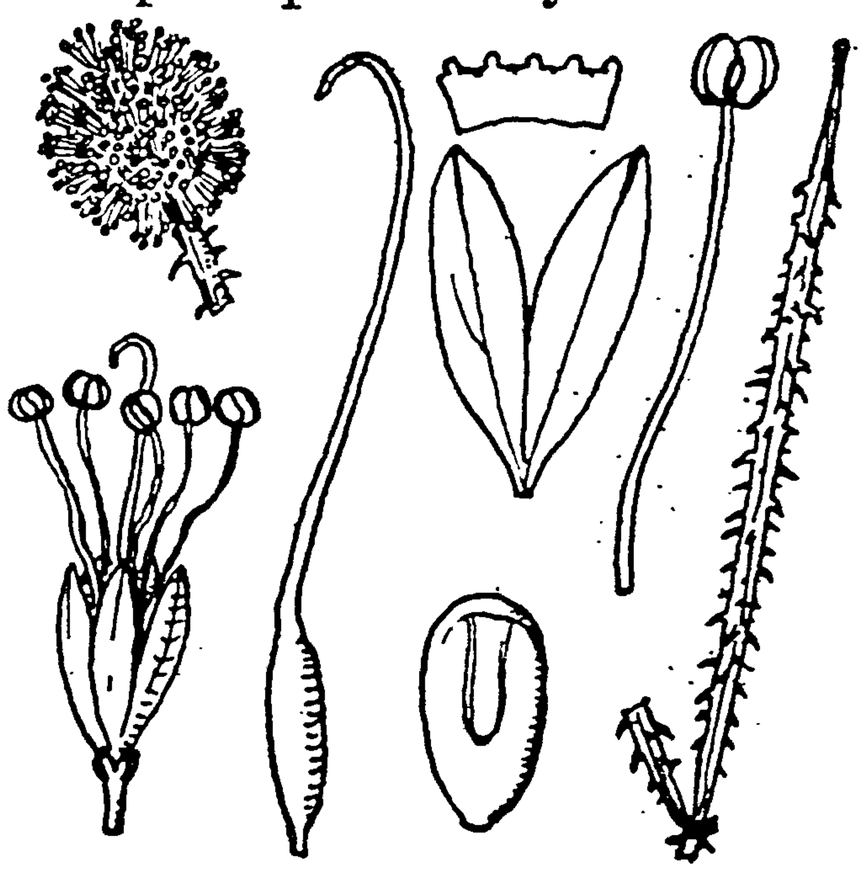
3. A. virgatum (L.) Medic. Stem 3–11 dm. long: blades of the leaflets linear to elliptic, 4–8 mm. long: calyx about 2.5 mm. long: petals about 3 mm. long; blades spatulate: pod 6–8 cm. long. [*D. virgatus* (L.) Willd.]—Hammocks and cultivated grounds, Florida Keys.—(*W. I.*)—All year.

8. LEPTOGLOTTIS DC. Perennial herbs or partly woody plants, with spreading or prostrate angled prickly stems. Leaves 2-pinnate, sensitive: leaflets numerous, entire. Spikes globular, bright-pink or rose-purple. Calyx-lobes minute. Petals united to the middle or above it. Filaments distinct or nearly so. Pod narrow, stout-subulate or linear, prickly, beaked. [*Schrankia* Willd. *Morongia* Britton.]—About 10 species, most of them in tropical and temperate America.—Spr.–sum.—SENSITIVE-BRIARS. SENSITIVE-PLANTS.

Blades of the leaflets prominently veined beneath.
- Blades of the leaflets obtuse or acutish; pod elongate, over 1 dm. long. — 1. *L. floridana.*
- Blades of the leaflets cuspidate: pod short, less than 1 dm. long. — 2. *L. Nuttallii.*

Blades of the leaflets not prominently veined beneath.
- Pod slender, long-beaked, not densely prickly: prickles of the peduncles mostly not very wide at the base.
  - Blades of the leaflets 3.5–7 mm. long: pod mostly 9–15 cm. long, 3–4 mm. thick. — 3. *L. microphylla.*
  - Blades of the leaflets 2.5–3.5 mm. long: pod mostly 6–7 cm. long, about 2 mm. thick. — 4. *L. angustisiliqua.*
- Pod stout, short-beaked, densely prickly: prickles of the peduncles mostly much widened at the base. — 5. *L. Chapmanii.*

1. L. floridana (Chapm.) Small. Stem with the prickles wide at the base: leaflets with the midrib ending at or below the apex: pod mostly 11–15 cm. long, armed with broad-based prickles, long-beaked: seed about 3 mm. long. [*S. floridana* Chapm. *M. uncinata* (Fl. SE. U. S.)]—Pinelands, Fla.—Spr.–sum.



2. L. Nuttallii DC. Stem with the prickles little, if at all, dilated at the base: leaflets with the midrib excurrent as a terminal cusp: pod mostly 3–7 cm. long, armed with slender prickles, slender-beaked: seed 3.5–4 mm. long. — Dry woods and pinelands, Coastal Plain and more northern provinces, Ala. to Tex., S. Dak., Ill., and S. C.—Sum.–fall.—This, the most widely distributed of our species of *Leptoglottis,* has usually passed under the specific name of *uncinata.*

3. L. microphylla (Dryand.) Britton. Stem with rather slender curved prickles: blades of the leaflets narrowly elliptic to linear-elliptic, 3.5–7 mm. long: upper peduncles mostly shorter than the leaves: pod mostly 9–15 cm. long, much longer than the peduncle: seed fully 4 mm. long. [*S. angustata* T. & G. *M. angustata* Britton *M. microphylla* Britton]—Dry woods and pinelands, various provinces, Fla. to Tex., Tenn., and Va.—Spr.–fall.

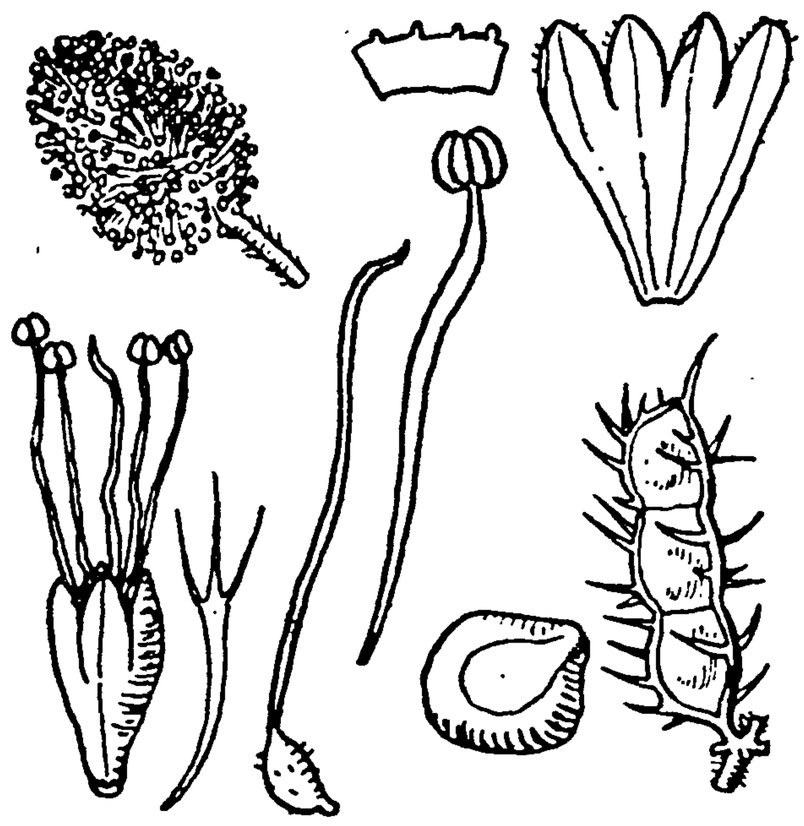
4. L. angustisiliqua Britton & Rose. Stem with weak rather distant prickles: blades of the leaflets linear-elliptic, 2.5–3.5 mm. long: peduncles shorter than the leaves: pod 6–7 cm. long, nearly or quite as long as the peduncle: seed about 3 mm. long.—Pinelands, S pen. Fla.—All year.

5. L. Chapmanii Small. Stem and leaflets as in *L. microphylla:* upper peduncles mostly longer than the leaves: pod mostly 3.5–8 cm. long, about as long as the peduncle or somewhat longer: seed fully 3 mm. long. [*S. angustata brachycarpa* Chapm.]—Pinelands, Coastal Plain, Fla. to Tex. and N. C.—Spr.–sum.

9. MIMOSA L. Shrubs or trees, or herbs, usually prickly. Leaves 2-pinnate: leaflets few or numerous, often sensitive. Spikes globose or cylindric. Calyx-lobes minute. Petals united to the middle or above it, or rarely distinct. Filaments distinct or nearly so. Pods clustered, flat, jointed.—About 325 species, mostly natives of warm and tropical regions.—Spr.–sum. or all year S.

Peduncles shorter than the leaves: stamens as many as the corolla-lobes with spine-like bristles in the margins, the faces glabrous. 1. *M. pudica.*
Peduncles as long as the leaves or longer: stamens twice as many as the corolla-lobes: pod bristly-pubescent all over. 2. *M. strigillosa.*

1. M. pudica L. Plant usually partly woody, the branches with loosely spreading hairs, sometimes densely hirsute: leaves with 2 approximate pairs of pinnae or rarely with a single pair; leaflets mostly 6–12 mm. long, with long appressed stiff hairs: spike rose-purple: calyx minute: corolla about 3 mm. long: pod mostly 1–2 cm. long, 3–4 mm. wide, decidedly constricted between the joints: seed 2–2.5 mm. long.—Waste-places, cult. grounds, and roadsides, Coastal Plain, Fla. to Tex. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A., O. W.*)



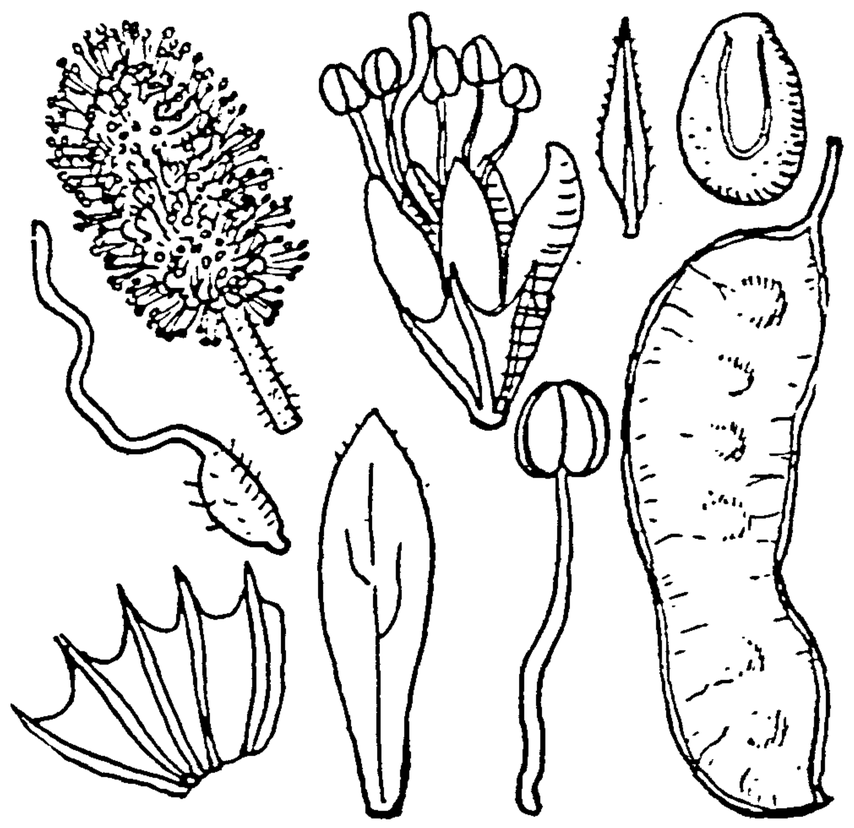
2. M. strigillosa T. & G. Plant herbaceous, the branches with appressed hairs: leaves with 5–8 pairs of pinnae; leaflets smaller than those of *M. pudica,* with minute hairs or glabrous: spike deep-pink: calyx nearly 0.5 mm. long: corolla about 2 mm. long: pod mostly 2–3 cm. long, 8–11 mm. wide, sometimes slightly constricted on the central suture, about 5 mm. long.—Stream-banks, hammocks, pinelands, and meadows, Coastal Plain and rarely adj. provinces, Fla. to Tex., Ark., and Ga.—(*Mex.*)

10. NEPTUNIA Lour. Perennial unarmed diffuse, prostrate, or floating plants. Leaves 2-pinnate: leaflets numerous, small. Spikes globose or ellipsoid, yellow or greenish-yellow. Calyx-lobes shorter than the tube. Petals distinct or partly united. Filaments distinct or nearly so. Ovary short-stipitate. Pod oblique, sometimes only slightly so.—About 10 species, natives of America, Asia, and Australia.

Calyx-lobes deltoid: pod-body somewhat rhombic-elliptic, usually very inequilateral, sometimes curved, pubescent. 1. *N. lutea.*

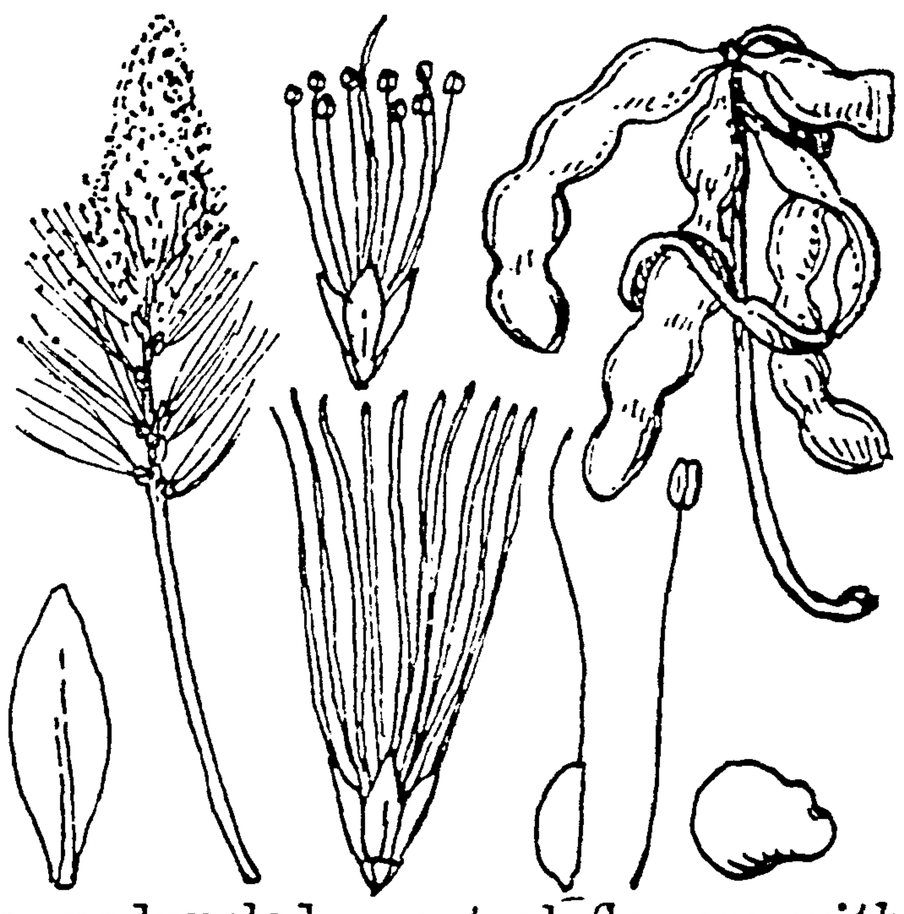
Calyx-lobes lanceolate: pod-body broadly linear to linear-elliptic, only slightly inequilateral, straight. 2. *N. floridana.*

1. N. lutea (Leavenw.) Benth. Stem and branches short-villous: leaflets numerous; blades broadly linear, ciliate: spikes very dense, terminating pubescent peduncles: pod 3–5 cm. long, the body relatively broad, long-stipitate: seed oval or orbicular. [*Desmanthus luteus* Benth.]—Moist soil, often on prairies, various provinces, Fla. to Tex. and Kans.—Spr.–sum.



2. N. floridana Small. Stem and branches sparingly pubescent or glabrous: leaflets very numerous; blades narrowly linear to linear-lanceolate, ciliolate: spikes lax, terminating glabrous peduncles: pod 2.5–3.5 cm. long, the body relatively narrow, short-stipitate: seed elliptic. — Pinelands, hammocks, and sea-shores, Coastal Plain, Fla. to La.—(*W. I.*)—Spr.–fall or all year S.

11. CAILLEIA Guill. & Perr. Shrubs with thorn-armed branches. Leaves 2-pinnate: leaflets very numerous, small. Spikes cylindric, the lower part of neutral flowers with long staminodia, the upper with perfect flowers, the two kinds of flowers of different colors. Calyx-lobes much shorter than the tube. Petals united to above the middle. Filaments distinct or nearly so. Ovary short-stipitate. Pod linear, more or less constricted between the seeds and twisted.—About 7 species, natives of tropical Africa, Asia and Australia.



1. C. glomerata (Forsk.) Macbride. Shrub with pubescent twigs: leaves very numerous: leaflets close together; blades linear, 3–4.5 mm. long, finely pubescent: spikes very dense, peduncled: neutral flowers with slender pink or rose-purple staminodia: perfect flowers with bright yellow stamens: calyx about 1 mm. long; lobes broadly deltoid: corolla greenish-white, 2.5–3 mm. long; lobes lanceolate to ovate-lanceolate: pod 5–7 cm. long, clustered: seeds ellipsoid.—Pinelands, S Fla. Nat. of Africa.—(*W. I.*)—All year.

Family 17. CASSIACEAE—Senna Family

Trees, shrubs, or herbs. Leaves alternate: blades compound, 1–2-pinnate, rarely 1-foliolate. Flowers perfect, polygamous, monoecious, or dioecious, more or less irregular. Calyx of 3–5, usually slightly united, sepals, sometimes borne on the edge of a well developed hypanthium. Corolla of 3–5 unequal distinct petals. Androecium of 6–10 distinct or nearly distinct stamens. Gynoecium 1-carpellary. Fruit a legume.—About 90 genera and 1000 species, mostly tropical.

Sepals, and petals, usually 5: stamens 5 or 10, sometimes partly represented by staminodia.
Corolla apparently papilionaceous: leaves with 1-foliolate blades. Tribe I. Bauhinieae.

Corolla more or less irregular: leaves with pinnately compound blades.
  Leaves with 1-pinnate blades. — Tribe II. CASSIEAE.
  Leaves with 2-pinnate blades. — Tribe III. CAESALPINIEAE.
Sepals 4: petals 3, and usually accompanied by 2 rudiments: stamens 3. — Tribe IV. TAMARINDEAE.

I. BAUHINIEAE

Shrubs or small trees with broad leaflets and clusters of bright flowers. — 1. CERCIS.

II. CASSIEAE

Corolla nearly regular, the 5 petals slightly unequal: calyx-lobes obtuse: pod not elastically dehiscent.
  Pod tetragonal or nearly terete.
    Shrub: pod indehiscent or opening irregularly: leaflets 6 or more. — 2. ADIPERA.
    Herb: pod dehiscent by both sutures: leaflets 6 or fewer. — 3. EMELISTA.
  Pod flat.
    Valves of the pod coriaceous, not impressed between the seeds. — 4. DITREMEXA.
    Valves of the pod chartaceous, impressed between the seeds. — 5. PEIRANISIA.
Corolla quite irregular, one of the lateral petals (standard) and the lowest petal large, the other 3 petals often greatly reduced: calyx-lobes acuminate: pod elastically dehiscent. — 6. CHAMAECRISTA.

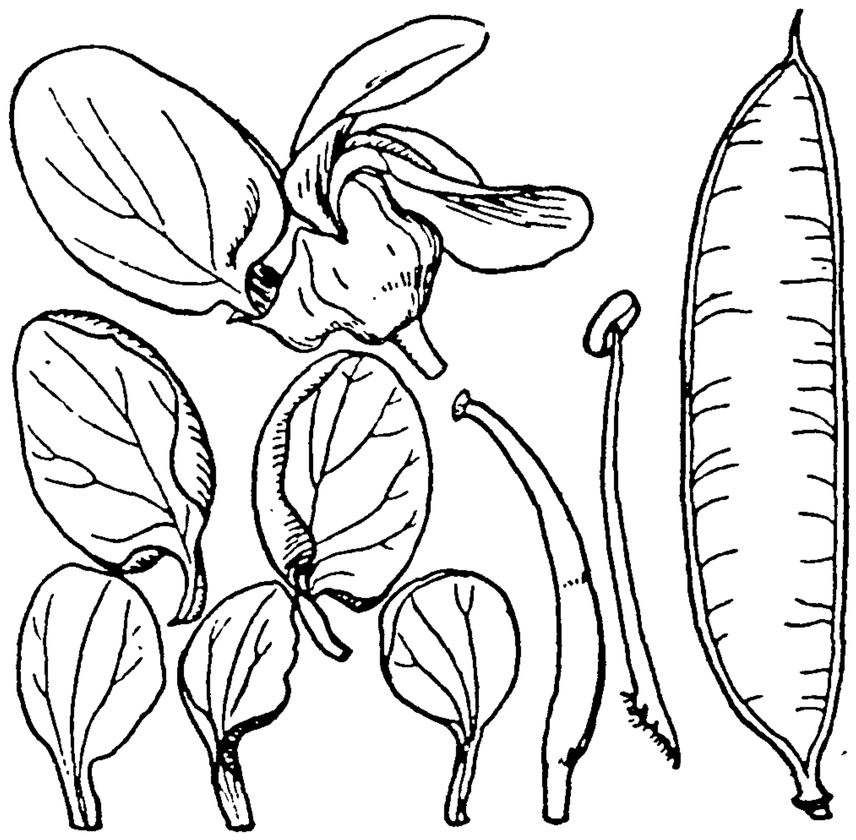
III. CAESALPINIEAE

Flowers dioecious or polygamous.
  Flower with a very small receptacle: stamens surpassing the petals: pod leathery. — 7. GLEDITSIA.
  Flower with a long receptacle: stamens shorter than the sepals: pod woody. — 8. GYMNOCLADUS.
Flowers perfect.
  Pod long, smooth: standard with a suborbicular or reniform blade.
    Leaf with a very short petiole which ends in a spine, each division with a long flat phyllode-like rachis. — 9. PARKINSONIA.
    Leaf with a decided petiole, the rachises not phyllode-like.
      Calyx-lobes valvate. — 10. DELONIX.
      Calyx-lobes imbricate, the lower one cucullate.
        Petals long-clawed: stamens greatly elongate. — 11. POINCIANA.
        Petals, except the standard, sessile or with very short claws: stamens short. — 12. CAESALPINIA.
  Pod short, prickle-armed: standard with a cuneate or spatulate blade. — 13. GUILANDINA.

IV. TAMARINDEAE

Tree with numerous fine leaves, pale flowers, and thick pod with sour pulp. — 14. TAMARINDUS.

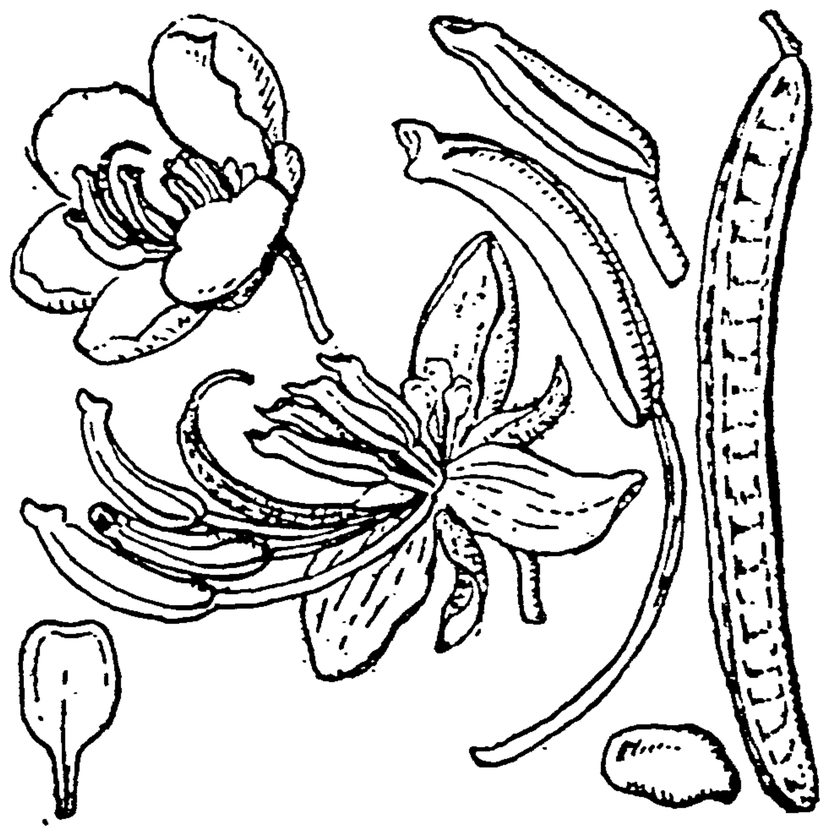
1. CERCIS L. Shrubs or trees. Leaves 1-foliolate: leaflet broad. Calyx shallowly lobed: tube gibbous. Corolla pink-purple: keel-petals of the apparently papilionaceous corolla longer than the others. Anthers short, opening lengthwise. Pod very flat.—About 7 species, natives of North America, Europe, and Asia.



1. C. canadensis L. Small tree, with curved trunk, smoothish bark, and brown heart-wood: leaf-blades broadly cordate to reniform: pedicels mostly less than 1.5 cm. long: sinuses of the calyx nearly as broad as the lobes: corolla light pink-purple (or white in *C. canadensis alba*): larger petals 12–13 mm. long; blades ovate: pod linear-oblong, 6–9 cm. long.—(RED-BUD. JUDAS-TREE.)—Dry rich woods, often in calcareous

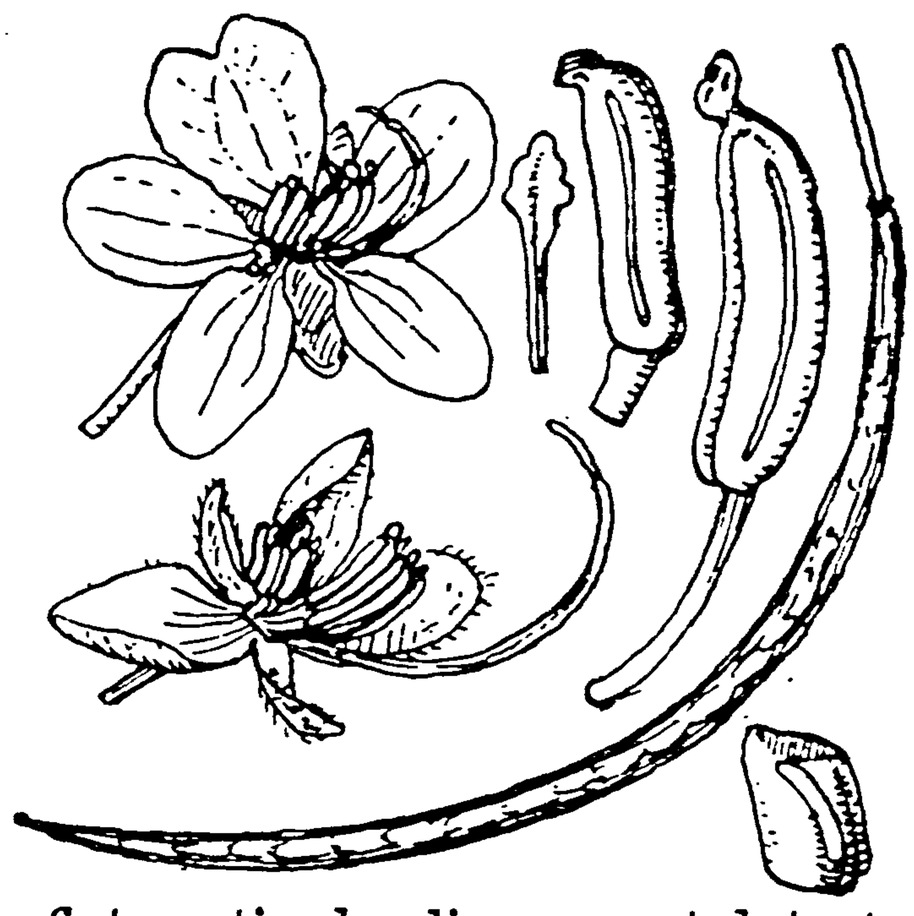
regions, various provinces, Fla. to Tex., Nebr., Ohio, and Conn.—(*Mex.*)—Spr.—Often grown as an ornamental tree.

2. **ADIPERA** Raf. Shrubs. Leaflets few: blades of a lanceolate or elliptic type. Flowers borne in terminal panicles. Petals 5, nearly equal. Perfect stamens often 7, accompanied by often 3 staminodia: larger anthers with stout disk-like tips. Pod stoutish, thick, indehiscent. Seeds transversely or obliquely placed.—About 8 species, mostly natives of tropical America.



1. **A. corymbosa** (Lam.) Small. Shrub 2–4 m. tall: leaflets mostly 6; blades lanceolate to linear-elliptic or elliptic-lanceolate, 2–5 cm. long, glabrous: panicle-branches ending in corymbs: flowers bright-yellow: petals obovate, about 1 cm. long: pod 7–15 cm. long, with convex sides and furrowed sutures. [*Cassia corymbosa* Lam.]—(GOLDEN-SHOWER.)—Woods, waste-places, and roadsides, Coastal Plain, Ga. to La. and Tenn. Nat. of Argentina.—Spr.–fall.—Widely cult. on account of its numerous clusters of bright-yellow flowers.—A second species, *A. bicapsularis* (L.) Britton & Rose, with obovate or cuneate leaflet-blades, has been collected in S Fla. It is widely distributed in the tropics.

3. **EMELISTA** Raf. Herbs. Leaflets few: blades of an obovate type. Flowers solitary or clustered in the axils or aggregated in a terminal cluster. Petals 5, nearly equal in size, but unequal in shape. Perfect stamens 6 or 7, accompanied by 3 or 4 staminodia: larger anthers with a terminal disk-like appendage. Pod slender, tetragonal or nearly terete, dehiscent along both sutures. Seed longitudinally placed.—About 7 species, mostly natives of tropical America.



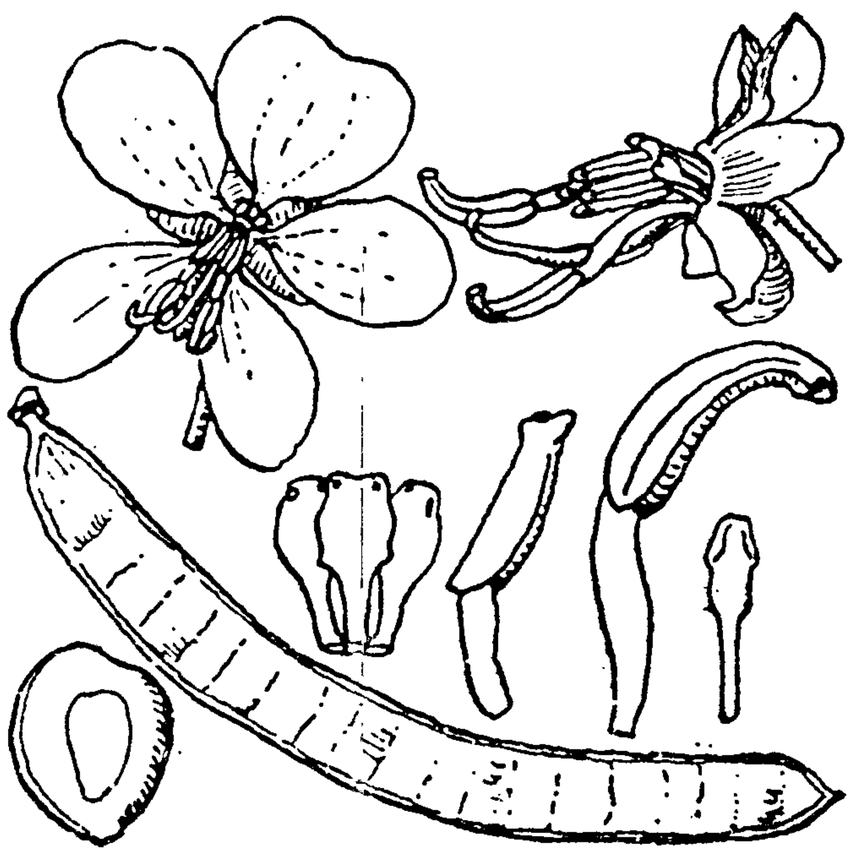
1. **E. Tora** (L.) Britton & Rose. Plant annual, 4–15 dm. tall, nearly glabrous: leaflets 4–6; blades obovate or cuneate-obovate, very slightly cuspidate, the terminal pair much the largest, 3–5 cm. long: petiolar gland elongate, between the lower pairs of leaflets: stipules linear-spatulate to setaceous: flowers yellow: sepals 7–9 mm. long, the larger ones ovate: petals 13–15 mm. long, very diverse in shape: pod falcate, more or less tetragonal, 3–4 mm. wide. [*Cassia Tora* L.]—(COFFEE-WEED. SICKLE-POD.)—Pinelands, waste grounds, fields, and roadsides, various provinces, Fla. to Tex., Kans., and Va. Nat. of trop. Am.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)—Sum.–fall, or all year S.

4. **DITREMEXA** Raf. Herbs, shrubs, or trees. Leaflets several: blades mostly of an ovate, elliptic, or lanceolate type. Flowers in axillary clusters or the upper clusters borne in an erect thyrsoid panicle, yellow. Petals 5,

mostly equal in size, but unequal in shape. Perfect stamens usually 7, accompanied by 3 staminodia: larger anthers unappendaged. Pod mostly flat, dehiscent along both sutures. Seeds transversely placed or oblique.—More than 100 species, natives of tropical and temperate regions.—NIGGER-COFFEES. COFFEE-WEEDS.—The seeds of some species are used as a coffee-substitute.

Blades of the leaflets of a lanceolate, ovate type, acute or acuminate.
  Leaflets with broad blades: gland near the base of the petiole globular: pod thick-margined. 1. *D. occidentalis.*
  Leaflets with narrow blades: gland near the base of the petiole elongate. 2. *D. ligustrina.*
Blades of the leaflets of an elliptic type, exceptionally elliptic-lanceolate, prominently mucronate.
  Ovary long-hairy: pod-valves with divisions fully as long as wide. 3. *D. marylandica.*
  Ovary short-hairy: pod-valves with divisions much shorter than wide. 4. *D. Medsgeri.*

1. D. occidentalis (L.) Britton & Rose. Plant annual, 5–15 dm. tall, nearly glabrous: leaflets 8–12; blades ovate to ovate-lanceolate, somewhat acuminate, 3.6–5 cm. long; stipules broadly lanceolate: sepals 11–14 mm. long: petals 15–19 mm. long: pod linear, glabrous, with the septa externally prominent, 8–13 cm. long, 6 mm. wide. [*Cassia occidentalis* L.]—(COFFEE-WEED. COFFEE-SENNA. NIGGER-COFFEE. STYPTIC-WEED.)—Pinelands, cult. grounds, and waste-places, various provinces, Fla. to Tex., Kans., and Va. Nat. of trop.—(*W. I., Mex., C. A., S. A., O. W.*)—Sum. or all year S.



2. D. ligustrina (L.) Britton & Rose. Plant partly woody, 6–20 dm. tall, nearly glabrous: leaflets 12–16; blades lanceolate often narrowly so or linear-lanceolate, 2–6 cm. long: stipules linear-lanceolate: sepals 9–12 mm. long, the larger ones obovate: petals 13–16 mm. long: pod curved, flat, prominently margined, 7–8 mm. wide. [*Cassia ligustrina* L.]—Hammocks, pen. Fla.—(*W. I.*)—All year.

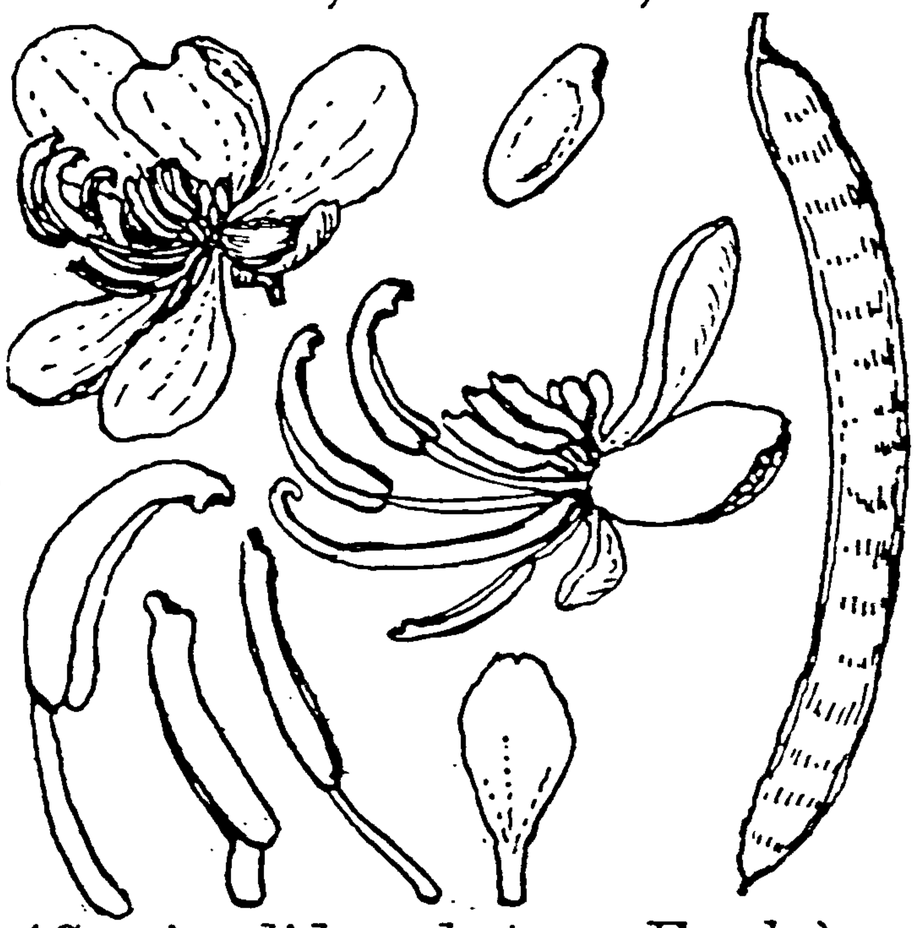
3. D. marylandica (L.) Britton & Rose. Plant perennial, 8–20 dm. tall, sparingly pubescent; leaflets 12–20; blades elliptic to elliptic-lanceolate, mucronate, 4–5 cm. long: petiolar gland obconic, stipitate, near the base of the rachis: sepals 6–8 mm. long: petals 10–12 mm. long, cuneate to spatulate: pod curved, somewhat hispid, 10–12 cm. long: seed flat, nearly as wide as long. [*Cassia marylandica* L.]—(WILD-SENNA.)—Moist stream-banks and alluvial soil, various provinces, N. C. to Tenn., Ind., and Mass.—Sum.

4. D. Medsgeri (Shafer) Britton & Rose. Plant perennial, similar to *D. marylandica* in habit: leaflets 8–16; blades elliptic to elliptic-lanceolate, 3–6 cm. long, mucronate: petiolar gland subglobose, near the base of the rachis: stipules linear-lanceolate: sepals 5–8 mm. long: petals 9–11 mm. long, obovate to broadly spatulate: pod falcate, glabrous, 6–10 cm. long, 8–11 mm. wide. [*Cassia Medsgeri* Shafer.]—(WILD-SENNA.)—Woods, and roadsides, various provinces, Fla. to Tex., Kans., Ia., and Pa.—Sum.–fall.—**Ditremexa Nashii** Britton & Rose, closely related to *D. Medsgeri*, but with the leaflets more nearly approaching a lanceolate type, occurs in central pen. Fla.

5. **PEIRANISIA** Raf. Shrubs or trees. Leaflets several or many: blades broadest above the middle or below it. Flowers in axillary clusters or

in terminal cluster-like panicles, yellow. Petals 5, unequal in size and in shape. Stamens usually 7, with 2 or 3 of the lower ones beaked, accompanied with usually 3 staminodia: larger anthers with a snout-like appendage: pod elongate, flat, dehiscent along both thickened sutures. Seed transversely placed.—About 25 species, natives of tropical America.

1. **P. bahamensis** (Mill.) Britton & Rose. Shrub 2 m. tall or less: leaflets 6–10; blades subcoriaceous, ovate or elliptic-ovate to lanceolate, mucronate, 1.5–4 cm. long: petiolar gland depressed, between lower pair of leaflets or near it: stipules ovate to lanceolate: sepals 7–12 mm. long: petals 10–15 mm. long, or sometimes smaller: pod flat, with lateral depressions between the seeds, 9–11 cm. long, 5 mm. wide. [*Cassia bahamensis* Mill.] — Pinelands, Everglade Keys, S pen. Fla. and the Keys.—(*W. I.*)—All year. A shrub or small tree, **Psilorhegma suffruticosa** (König) Britton (*Cassia suffruticosa* König) from S Asia and Australia, with numerous leaves, and clusters of showy yellow flowers, related to *Ditremexa* and *Peiranisia*, but with ten perfect stamens, is naturalized in and about Brickell hammock, Miami, Fla. A very showy shrub, **Chamaesenna didymobotrya** (*Cassia didymobotrya* Forsk.), a native of Africa, with racemes of large yellow flowers, glandular leaves, and thin flat pods, occurs in vacant lots in Miami, Fla.



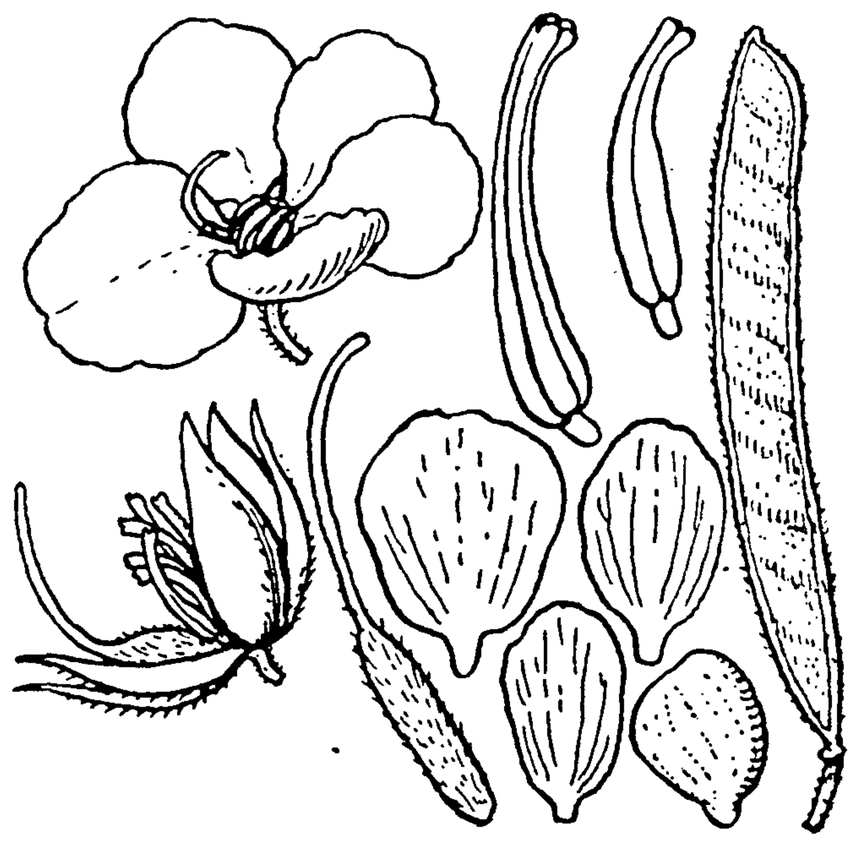
Cassia biflora was first recorded from Florida by Chapman in 1860 on an imperfect specimen of *Peiranisia bahamensis* collected on Key West.

6. **CHAMAECRISTA** Moench. Herbs or shrubs. Leaflets few or numerous, with 1, 2, or 3 glands near the lower pair. Flowers clustered in leaf-axils. Sepals nearly distinct, membranous. Petals mainly yellow or whitish, sometimes marked at the base. Pod flattish, linear, promptly dehiscent, the valves elastic.—About 100 species, widely distributed in tropical and temperate regions.—SENSITIVE-PEAS. SENSITIVE-PLANT. DWARF-SENNAS. HONEY-CUPS. BEE-BLOSSOMS. PARTRIDGE-PEAS.

Corolla conspicuous, more than 1 cm. wide, one petal slightly larger than the other four: stamens 10: pedicel 7 mm. long or more.
Plant perennial.
Leaflets 8–14, pubescent: petiolar gland small: pod 4.5 cm. long or less, pubescent with incurved hairs. 1. *C. keyensis.*
Leaflets 24–40, glabrous: petiolar gland large (1–2 mm. wide): pod 6.5 cm. long or more, sparsely appressed-pubescent. 2. *C. Deeringiana.*
Plant annual.
Petiolar gland depressed, 1.5–2.5 mm. wide: leaflets mostly more than 24. 3. *C. brachiata.*
Petiolar gland not depressed, 1.5 mm. wide or less: leaflets usually fewer than 24.
Leaflets glabrous or occasionally slightly puberulent.
Stems and pedicels with incurved hairs: pod appressed-pubescent with short hairs. 4. *C. fasciculata.*
Stems and pedicels hirsute: pod hirsute.
Leaflets 18–36, large, 15–20 mm. long: corolla mostly 3–4 cm. wide. 5. *C. robusta.*

Leaflets 12–20, small, 8–12 mm. long: corolla about 2.5 cm. wide. — 6. *C. depressa.*
Leaflets pubescent with incurved or spreading hairs.
Pod and pedicel pubescent with incurved hairs. — 7. *C. mississippiensis.*
Pod and pedicel pubescent with spreading hairs. — 8. *C. littoralis.*
Corolla inconspicuous, less than 1 cm. wide: one petal much larger than the other four: stamens 5–9: pedicel 1 mm. long or more.
Petiolar gland with a discoid head much wider than the stalk-like base: corolla with the odd petal twice as long as the others: pod pubescent with incurved hairs.
Leaflets glabrous: sepals puberulent: pod finely appressed-pubescent. — 9. *C. procumbens.*
Leaflets pubescent: sepals hirsute: pod hirsute. — 10. *C. Mohrii.*
Petiolar gland with the head scarcely wider than the stalk: corolla with the odd petal less than twice as long as the others: pod hirsute. — 11. *C. aspera.*

1. C. keyensis Pennell. Rootstock short and usually contorted: stems solitary or several together, 1–8 dm. tall, closely gray-hirsute: leaves gray-pubescent, the larger ones 2.5–3.5 cm. long: petiolar gland saucer-shaped, about 0.5 mm. wide: leaflets 4–9 pairs, 4–9 mm. long; blades oval, elliptic, linear, or obovate: sepals 8–9 mm. long, or rarely larger, hirsute: petals deep-yellow, 9–10 mm. long: anthers reddish-purple, 8 mm. long or less: pod 4–5 mm. wide, gray: seed about 3 mm. long. [*C. grammica* (Fl. SE. U. S.)]—Rocky pineland, Big Pine Key, Fla.—All year.



2. C. Deeringiana Small & Pennell. Rootstock horizontal: stems solitary or few together, 3–9 dm. tall, green, glabrous or nearly so: leaves green, the larger ones 4–10 cm. long: petiolar gland depressed-discoid, 1–1.5 mm. wide: leaflets 12–20 pairs, 8–18 mm. long; blades linear or nearly so, acute or mucronate: sepals 10–12 mm. long, glabrous or nearly so: petals bright-yellow, 14–21 mm. long: anthers yellow or reddish, 8 mm. long or more: pod 5–6 mm. wide, green: seed about 4 mm. long.—Rocky pineland, Everglade Keys, Fla., and lower Florida Keys.—Spr.–sum.

3. C. brachiata Pollard. Stem 8–24 dm. tall, often widely branched: stipules eciliate: petiolar gland single or sometimes 2 or 3, discoid or saucer-shaped, 1.5–2.5 mm. wide: leaflets 10–25 pairs, 10–20 mm. long; blades linear to linear-lanceolate, acute-mucronate: pedicels glabrous or nearly so: sepals 10–12 mm. long, reddish or purplish: pod 6–10 cm. long—Pinelands, Coastal Plain, Fla. and Ala.—All year.—A decoction made with cold water is used by the Seminoles in cases of nausea.

4. C. fasciculata (Michx.) Greene. Stem 3–9 dm. tall, often much-branched: stipules ciliate: petiolar gland single, saucer-shaped, mostly about 1 mm. wide, thin-edged: leaflets 6–12 pairs or rarely more, 9–20 mm. long; blades linear-elliptic to linear, obtuse to acute, mucronate: pedicels pubescent with incurved hairs: sepals 9–12 mm. long, pubescent on the midrib: petals 10–17 mm. long: anthers 8–10 mm. long, yellow or rarely reddish: pod 4–5 cm. long, finely appressed-pubescent. [*Cassia Chamaecrista* (Chapm. Fl.) *Chamaecrista bellula* Pollard.]—(PARTRIDGE-PEA. SLEEPING-PLANT.)—Hillsides, open woods, and fields, various provinces, Fla. to C Tex., Kans., Minn., and Mass.—Sum.–fall.

5. C. robusta Pollard. Stem erect, 6–16 dm. tall, somewhat branched, hirsute: stipules 10–14 mm. long: petiolar gland saucer-shaped, 1–1.5 mm. wide, thick-

edged: leaflets 9–18 pairs, 15–20 mm. long; blades linear-elliptic to linear or linear-lanceolate: pedicels hirsute: sepals 14–17 mm. long, hirsute on the midrib: petals 15–21 mm. long: anthers 7–11 mm. long, often reddish: pod 5–7 cm. long, hirsute.—Bottom lands and alluvial banks, various provinces, N Fla. to La., Mo., and S Ohio.—Sum.—The flowers are sometimes white.

6. **C. depressa** (Pollard) Greene. Stem and branches diffusely spreading, 1–3 dm. tall, hirsute: stipules 7–9 mm. long: petiolar gland saucer-shaped, 1–1.5 mm. wide, often uneven: leaflets 6–10 pairs, 8–12 mm. long; blades linear-elliptic to broadly linear: pedicels hirsute, and also with some shorter incurved hairs: sepals 9–13 mm. long, hirsute on the midrib: petals 13–17 mm. long: pod 4–6 cm. long, hirsute. [*C. chamaecristoides* (Fl. SE. U. S.)]—Pinelands and Apalachicola River hills, Coastal Plain, Fla. and Ala.—Sum.

7. **C. mississippiensis** Pollard. Stem erect, 2–6 dm. tall, often diffusely branched, pubescent with fine incurved hairs: stipules ciliate: petiolar gland single, depressed saucer-shaped, less than 1 mm. wide: leaflets 6–15 pairs, 5–12 mm. long; blades elliptic to linear-elliptic or broadly linear, acutish to acute-mucronate: pedicels with incurved hairs: sepals 5–10 mm. long, appressed-pubescent: petals 8–15 mm. long: anthers 7–9 mm. long, yellow: pod 3–5 cm. long, appressed-pubescent. [*C. Tracyi* Pollard.]—Pinelands, Coastal Plain, Ala. to Tex.—Sum.

8. **C. littoralis** Pollard. Stem erect, 4–8 dm. tall, more loosely pubescent than in the next preceding species: stipules sparingly ciliate: petiolar gland saucer-shaped, mostly 0.5–1 mm. wide: leaflets 8–18 pairs, 7–15 mm. long; blades linear-elliptic to broadly linear: pedicels hirsute: sepals 10–12 mm. long: petals 12–15 mm. long: anthers yellow: pod 2.5–4 cm. long, hirsute.—Sand-dunes and pinelands, Coastal Plain, W Fla. to E Tex.—Sum.

9. **C. procumbens** (L.) Greene. Stem erect, 1–4 dm. tall, branched, minutely pubescent with incurved hairs: stipules finely ribbed, 5–8 mm. long, ciliate: petiolar gland single, the disk narrowed into the obconic base: leaflets 9–18 pairs or more, 7–15 mm. long; blades linear, slenderly mucronate, ciliate: sepals 3–4 mm. long, minutely puberulent on the midrib: petals 3–8 mm. long: anthers 2 mm. long: pod 2.5–4 cm. long, appressed-pubescent. [*Cassia nictitans* L.]—(WILD SENSITIVE-PLANT.)—Sandy roadsides, fields, slopes, and open woods, various provinces, rarely Coastal Plain, Fla. to Tex., Kans., and S Vt.—Sum.–fall.—**Chamaecrista multipinnata** Pollard [*C. multipinnata Nashii* Pollard], with often narrower and more numerous leaflets (15–26 pairs), ranging from Fla. to Miss. and S. C., may be specifically distinct from *C. procumbens*.

10. **C. Mohrii** (Pollard) Small. Stem 3–6 dm. tall, widely branched, rather coarsely pubescent with incurved hairs: stipules strongly ribbed, 8–10 mm. long, ciliate: petiolar gland a large disk abruptly contracted into a slender columnar base: leaflets 16–23 pairs, 9–12 mm. long; blades broadly linear, strongly mucronate: sepals 6–7 mm. long, hirsute, especially on the midrib: petals 3–7 mm. long: pod 3–4.5 cm. long, hirsute.—Sandy fields and pine woods, Coastal Plain, Ga. to La. and Ark.—Sum.–fall.

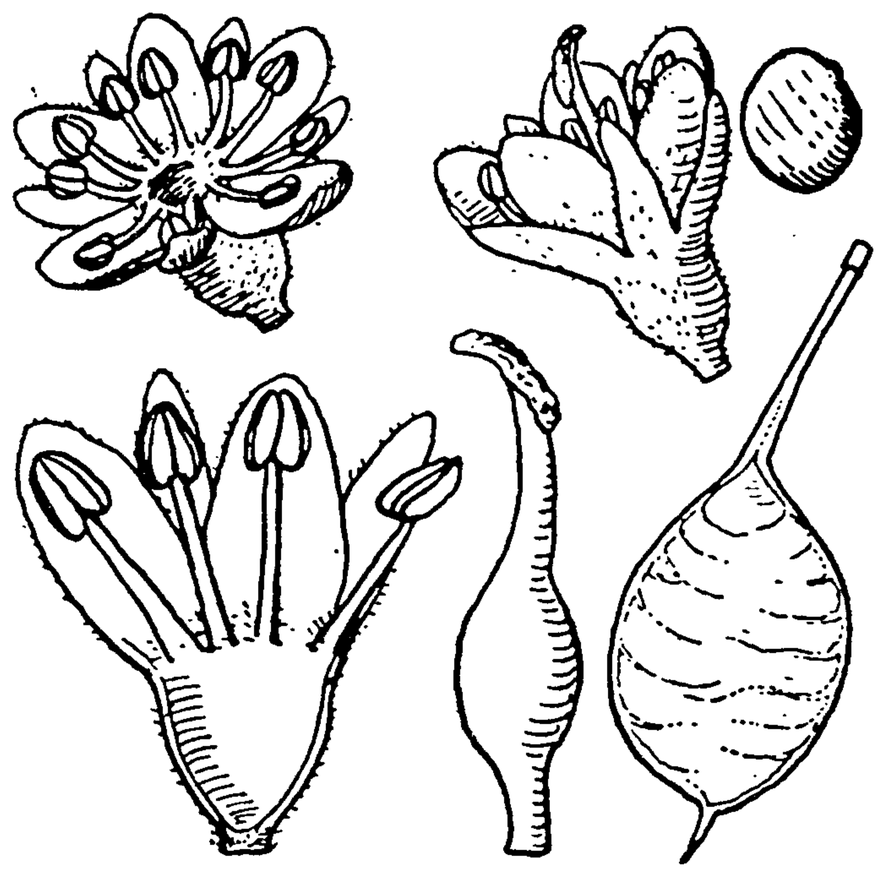
11. **C. aspera** (Muhl.) Greene. Stem erect, 3–7 dm. tall, usually branched, hirsute, (diffuse or prostrate and with fewer and smaller leaflets in *C. aspera Simpsonii*): stipules 8–11 mm. long: petiolar gland single, stalked, the apex scarcely wider than the stalk: leaflets 15–27 pairs, 8–15 mm. long; blades strongly mucronate, eciliate: pedicels appressed-pubescent: sepals 3–5 mm. long, hirsute on the midrib: petals 3–7 mm. long: anthers 2 mm. long, yellow: pod 1.5–2.5 cm. long, hirsute. [*Cassia nictitans aspera* Chapm.]—Hammocks, pinelands, and sand-dunes, Coastal Plain, Fla. to S. C.—Sum.–fall.

Chamaecrista rotundifolia (Pers.) Greene, with radially prostrate branches and leaves with cordate stipules, glandless petioles and one pair of obovate leaflets, has been found along the railroad south of Orlando, Fla. Nat. of W. I.

7. **GLEDITSIA** L. Trees with simple or branched thorns. Leaves relatively small, 2-pinnate: stipules present. Racemes narrow, closely-flowered. Flowers green or greenish-white. Calyx-lobes obtuse, about as long as the petals. Pod flat.—About 6 species, natives of eastern North America and Asia.—Spr.

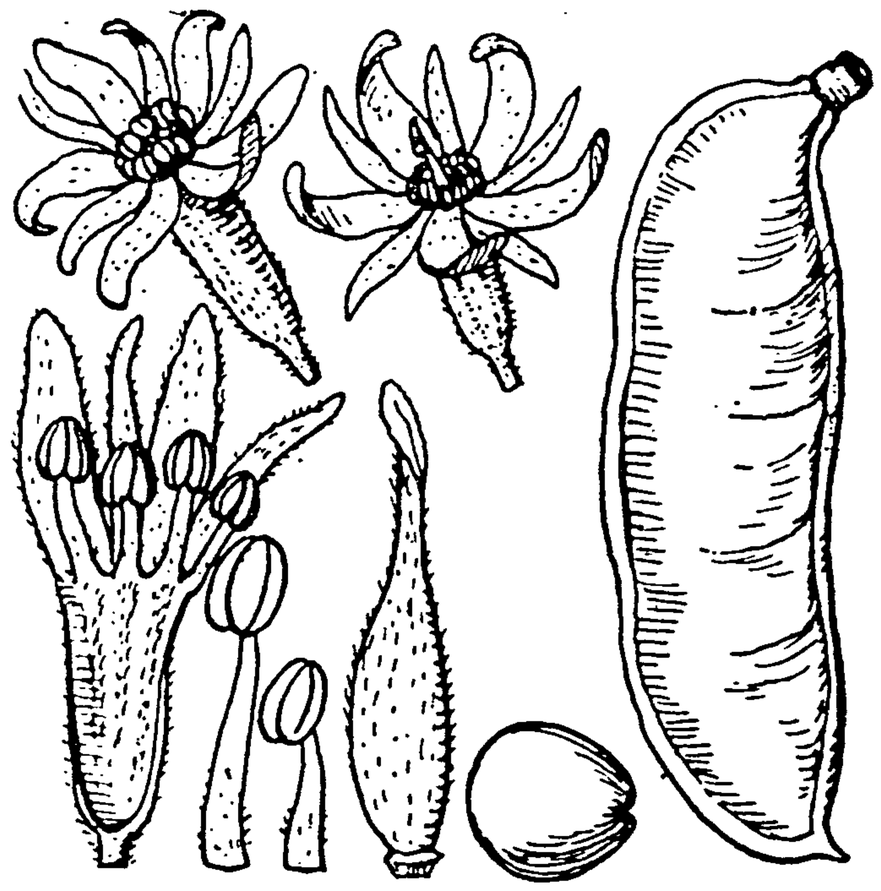
Ovary glabrous: pod oval or elliptic, 1-seeded, or rarely 2-seeded. 1. *G. aquatica.*
Ovary pubescent: pod linear or elliptic-linear, many-seeded. 2. *G. triacanthos.*

1. G. aquatica Marsh. Tree becoming 20 m. tall: leaflets 2–4.5 cm. long: blades oblong to ovate or elliptic-lanceolate: sepals lanceolate to elliptic-lanceolate: pod oblique, 3–5 cm. long, not pulpy within. — (WATER-LOCUST.) — River swamps and low hammocks, Coastal Plain and rarely adjoining provinces, Fla. to La., Mo., and S. C.



2. G. triacanthos L. Tree becoming 40 m. tall: leaflets 1–2.5 cm. long; blades ovate-lanceolate varying to elliptic: sepals narrowly elliptic to lanceolate: pod black and lustrous, pulpy within.—(HONEY-LOCUST. SWEET-BEAN. THREE-THORN ACACIA.)—Rich woods, various provinces, Fla. to Tex., Kans., and Ont.—As in the case of the preceding species, the trunk and branches are armed with compound thorns (or unarmed in *G. triacanthos inermis*). The wood, hard and durable, is used where strength is required. The tree is widely cultivated.

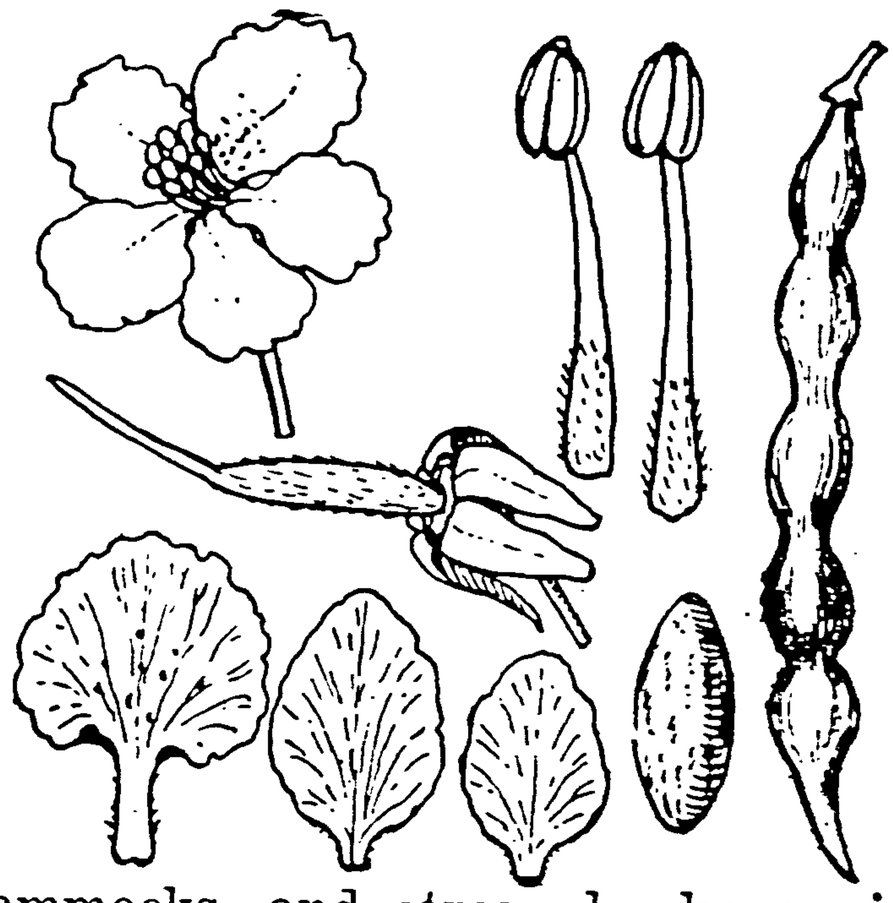
8. **GYMNOCLADUS** Lam. Unarmed trees. Leaves very large, 2-pinnate: stipules wanting. Panicle loosely flowered. Calyx-lobes acuminate, markedly shorter than the petals. Pod turgid.—One species.



1. G. dioica (L.) Koch. Tree becoming 30 m. tall, the bark furrowed: leaves with 5–9 pinnae; leaflets 2–7 cm. long; blades ovate or oval, acuminate: panicles 1–3 dm. long: flowers greenish-white: sepals linear-lanceolate, 5–6.5 mm. long, glandular-margined: petals elliptic: pod elliptic, 1–2 dm. long: seed nearly 2 cm. broad.—(KENTUCKY COFFEE-TREE. LUCK-BEAN.)—Rich woods, various provinces N of Coastal Plain, Tenn. to Okla., Nebr., Minn., Ont., and Pa.—Spr. —The tree is widely cult. as an ornamental. The wood is sometimes used in cabinet-making. The seeds were formerly used as a coffee-substitute.

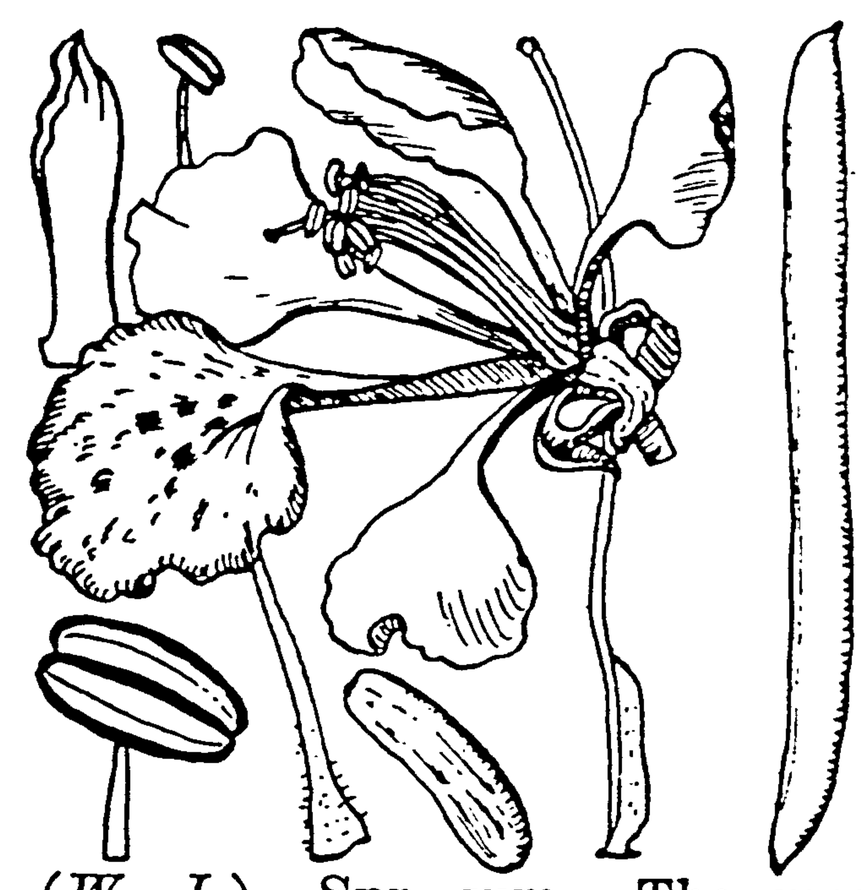
9. **PARKINSONIA** [Plum.] L. Shrubs or trees, with simple or branching thorns. Leaflets numerous, borne on the phyllode-like rachis. Blades of

the short-clawed petals mainly of an ovate type. Pod markedly torulose, the swollen portions nearly terete.—Three species, natives of tropical and subtropical America and Africa.



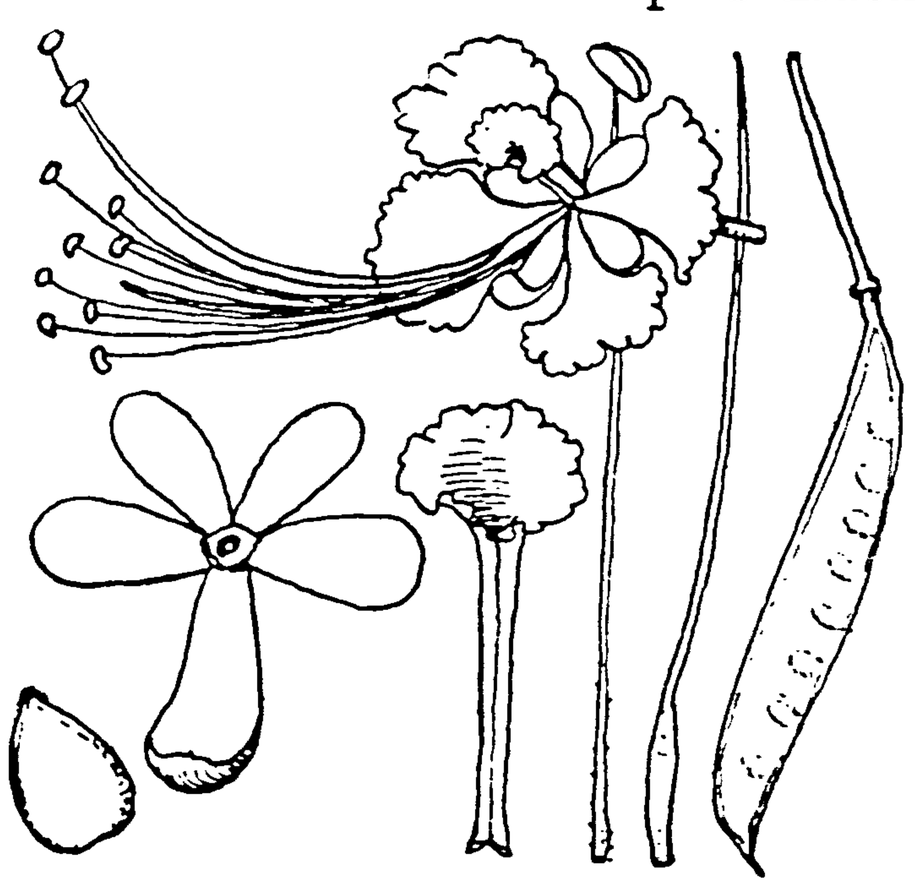
1. P. aculeata L. Shrub or small tree: leaves 2–4 dm. long, the rachis winged; leaflets numerous, distant, the blades linear to linear-oblanceolate, 1–10 mm. long: sepals elliptic, 8–10 mm. long: petals 10–17 mm. long, bright-yellow; blades except that of the standard, oval or ovate: pod 5–10 cm. long, acuminate.—(HORSEBEAN. CROWN-OF-THORNS. JERUSALEM-THORN.)—Roadsides, hammocks, and stream-banks, various provinces, Fla. to Tex. and Calif. Nat. of trop. Am. and cult.—(*W. I., Mex., C. A., S. A.*)—Spr.–sum.—Extensively grown as an ornamental and as a hedge-plant. Now naturalized far beyond its natural geographic limits.

10. DELONIX Raf. Unarmed shrubs or spreading trees. Leaflets relatively small and numerous: blades narrow. Sepals much shorter than the petals. Blades of the petals mainly flabellate, all long-clawed. Pod elongate-linear, flat, the valves woody.—Three species, natives of Africa.



1. D. regia (Boj.) Raf. Shrub or tree with a wide top: larger leaves with 20–50 pinnae: leaflets numerous, the blades linear-elliptic, 4–10 mm. long: sepals 22–26 mm. long: petals 5–7 cm. long, red or orange; blades broader than long, crisped: pod linear, commonly 3–5 dm. long.—(ROYAL-POINCIANA. FLAME-TREE. PEACOCK-FLOWER.)—Hammocks and pinelands, S pen. Fla. and the Keys. Nat. of Madagascar and cult.—(*W. I.*)—Spr.–sum.—The most gorgeous of our trees when in bloom. The massive clusters of large crimson or orange-colored flowers are conspicuous before the leaves unfold.

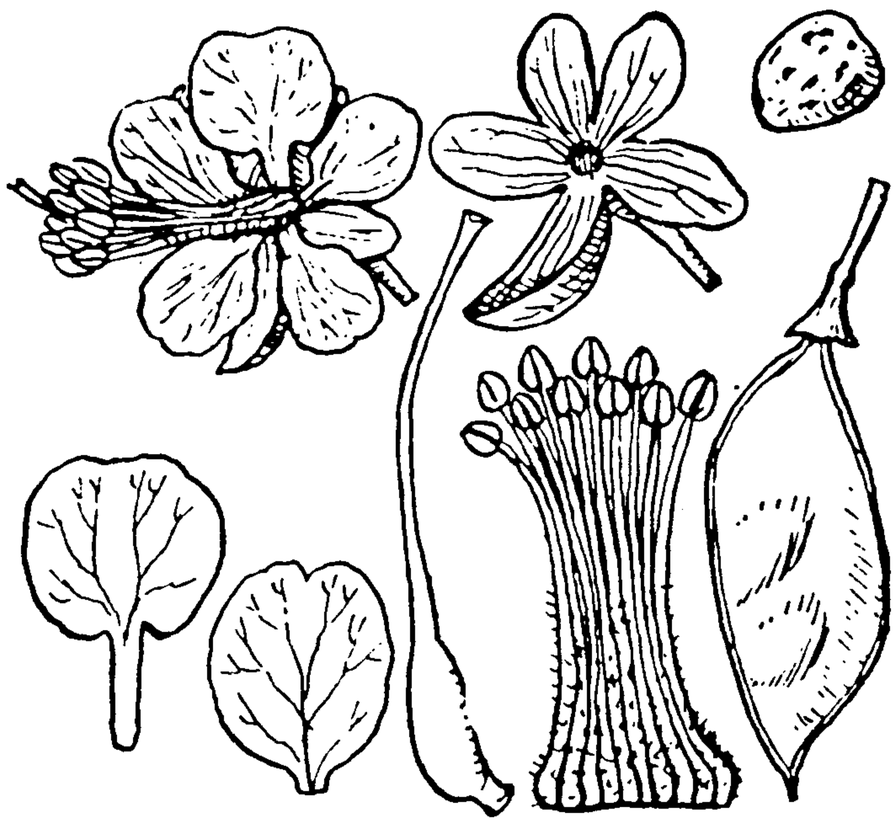
11. POINCIANA [Tourn.] L. Erect mostly unarmed shrubs or trees. Leaflets usually few and relatively large: blades rather broad. Sepals much shorter than the petals. Blades of the petals, except the standard, flabellate. Pod flat, narrow, the valves thick-coriaceous. Seed flattened.—About 6 species, of tropical and subtropical regions.



1. P. pulcherrima L. Shrub or small tree: leaflets numerous; blades elliptic to cuneate, 15–25 mm. long: sepals 15–16 mm. long: corolla mainly red or yellow; standard 25–27 mm. long: filaments 40–45 mm. long: pod 9–13 cm. long.—(BARBADOS-FLOWER. DWARF-POINCIANA. FLOWER-FENCE.)—Hammocks and pinelands, S pen. Fla. and the Keys.

Nat. of W. I.—All year.—Extensively grown as an ornamental for its continuous flowering habit. The pods are elastically dehiscent.

12. **CAESALPINIA** L. Erect unarmed or slightly armed shrubs or trees. Leaflets usually few and relatively large: blades broad. Sepals slightly shorter than the petals. Blades of the petals, except the standard, not flabellate, often obovate. Pod flat, narrow, the valves thin-coriaceous. Seed flattened.—About 35 species of tropical and subtropical regions.



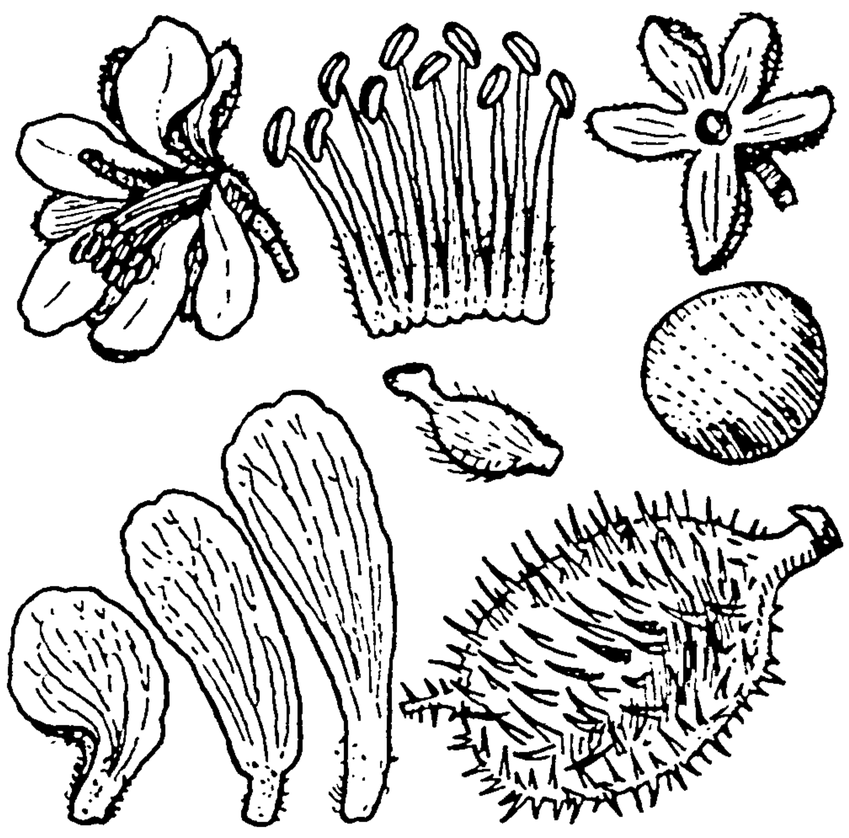
1. **C. pauciflora** (Griseb.) C. Wright. Shrub 2 m. tall or less: leaflets glabrous, mostly 6–12 on each pinna; blades elliptic to obovate, 6–12 mm. long: sepals 8–10 mm. long: corolla mainly yellow; standard 8–10 mm. long: filaments 8–11 mm. long: pod elliptic, 2–3.5 cm. long.—Pinelands, lower Florida Keys.—(*W. I.*)—Sum.

Ticanto Nuga (L.) Medic. A tough woody vine with greatly elongate stems and branches, bipinnate leaves with coriaceous leaflets, racemes or panicles of bright-yellow flowers, and flat, oblique, indehiscent pods, is a native of the East Indies, cultivated and locally naturalized in S Fla.

13. **GUILANDINA** L. Reclining or spreading prickly shrubs. Leaflets relatively few or numerous and large: blades broad. Sepals as long as the petals or nearly so. Blades of the narrow petals mainly spatulate. Pod nearly as wide as long, turgid. Seed turgid.—About 12 species, mostly West Indian. —NICKERS. HOLD-BACKS. WAIT-A-BIT VINES.—The pods are rather tardily dehiscent.

Leaves with foliaceous stipules: seed gray or lead-colored. 1. *G. Crista.*
Leaves without stipules: seed yellow.
  Leaflet-blades neither rounded nor retuse: corolla 2.5 cm. wide or more. 2. *G. Bonduc.*
  Leaflet-blades rounded or retuse: corolla 1.5 cm. wide or less. 3. *G. ovalifolia.*

1. **G. Crista** (L.) Small. Straggling or spreading shrub: leaflets numerous; blades ovate, elliptic-ovate, or nearly elliptic, 1.5–3.5 cm. long, mucronate: racemes or panicles 1–4 dm. long: sepals 9–11 mm. long, mostly obtuse: petals dull-yellow, the narrower ones 10–13 mm. long, truncate and 3-toothed at the apex: pod oval or oval-elliptic, 5–7 cm. long.—(GRAY-NICKER.)—Low hammocks, and coastal sand-dunes, S pen. Fla. and the Keys.—(*W. I.*) —The seeds are sometimes persistently green.

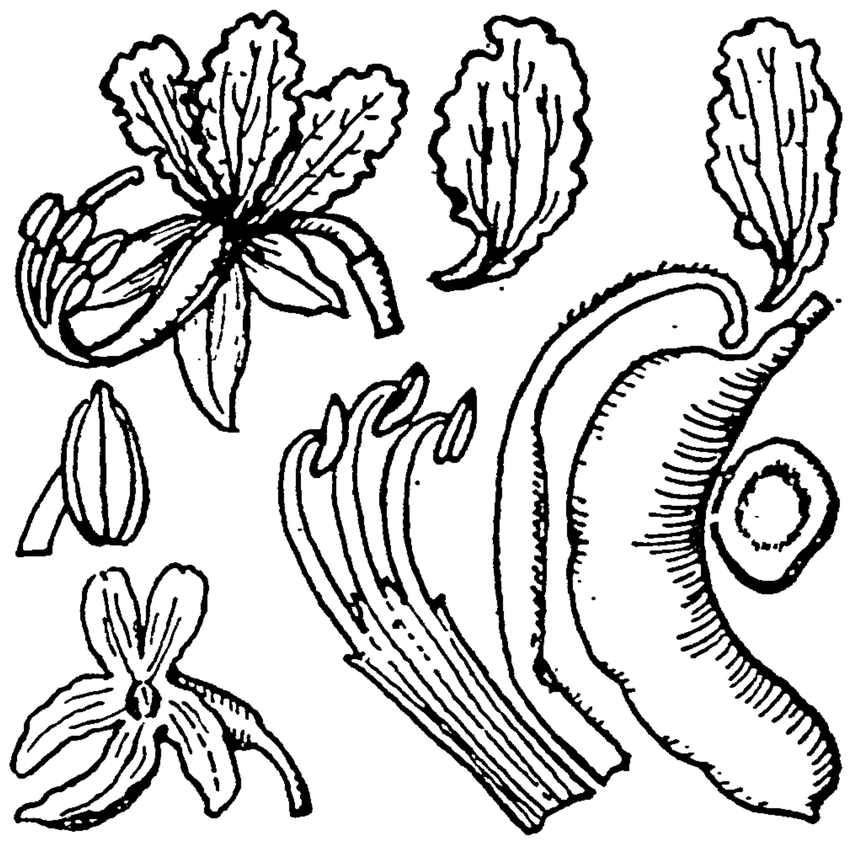


2. **G. Bonduc** L. Plant similar to *G. Crista* in habit, but leaflets relatively larger: sepals mostly acute: narrower yellow petals rounded and merely uneven at the apex.—(YELLOW-NICKER.)—Coastal sand-dunes and shore-hammocks, S pen. Fla. and the Keys. —(*W. I.*)

3. **G. ovalifolia** (Urban) Britton. Straggling shrub with curved or hooked prickles; leaflets numerous, the blades oval or suborbicular, varying to ovate or

obovate, mostly 1–2 cm. long, rounded or retuse and mucronate at the apex: racemes, 1.5–2 dm. long: bracts spreading: corolla light-yellow, less than 1.5 cm. wide: pod obovate, 6–8 cm. long, prickly all over: seed yellow or yellowish.—Hammocks, S Fla.—(*W. I.*)

14. **TAMARINDUS** [Tourn.] L. Unarmed trees. Leaves relatively small: leaflets numerous. Sepals 4. Petals 3, often with 2 additional rudiments. Stamens 3, the filaments united to about the middle, alternating with 3 minute staminodia. Ovary elongate. Pod indehiscent, succulent within.—One species.

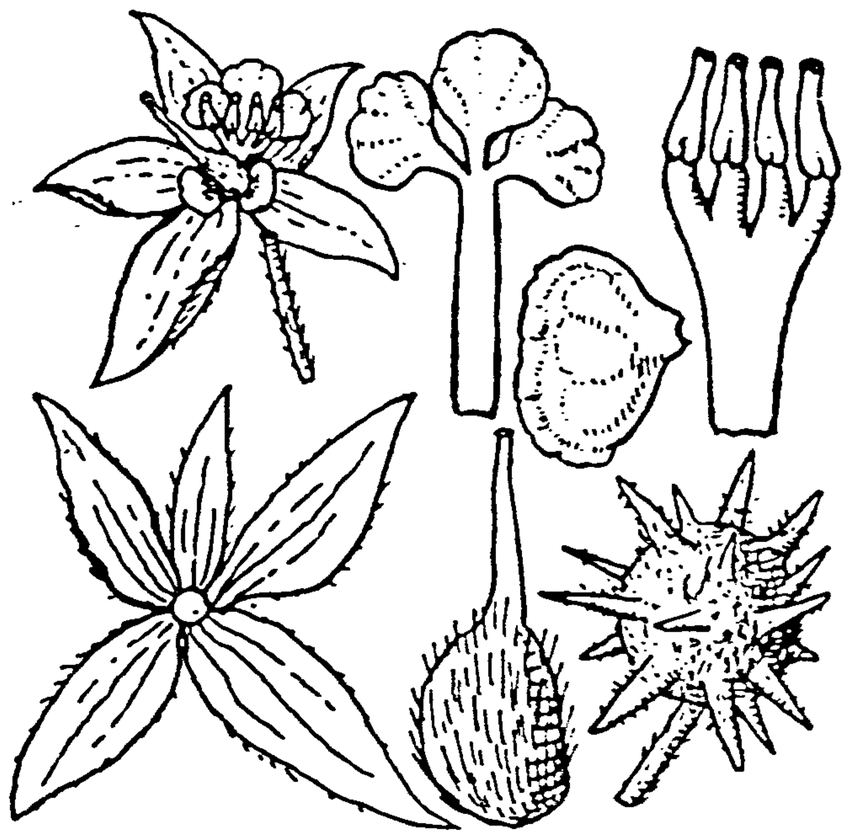


1. T. indica L. Tree with spreading branches: leaflets 18–36, 1–2 cm. long, the blades elliptic to linear-elliptic, becoming reticulate: sepals 10–12 mm. long: petals yellowish or reddish, 13–16 mm. long, crisped: pod thick, 6–13 cm. long, more or less curved, the edges rounded.—(TAMARIND.)—Hammocks and cult. grounds, Everglade Keys, Fla. and Florida Keys. Nat. of E. I. and cult.—(*W. I., Mex., C. A., S. A.*)—Spr.–sum.—The green fruit is used to make an acid drink and the ripe fruit may be eaten.

FAMILY 18. KRAMERIACEAE — RHATANY FAMILY

Shrubs or perennial herbs. Leaves alternate: blades simple or rarely 3-foliolate. Flowers very irregular. Calyx of 4 or 5 unequal sepals. Corolla of 2 scale-like and 3-clawed partially united petals. Androecium of 3 or 4 stamens with partially united filaments, the anther-sacs opening by terminal pores. Gynoecium 1-carpellary, the ovary pubescent and echinate. Fruit indehiscent, spine-armed.—Comprises the following genus.

1. **KRAMERIA** Loefl. Herbs with prostrate stems, or spinescent shrubs. Calyx with petaloid inner sepals. Fruit woody.—About 20 species, American. The flowers, mainly red or yellowish, have a superficial resemblance to some orchids, and are frequently fragrant.



1. K. spathulata Small. Stem shaggy-pubescent: blades of the upper stem-leaves short-pointed, narrowly linear, often elongate: flowers purplish: common claw of the 3 partially united petals usually much longer than the blades: fruit with rather short and stout brown spines, the body globular. [*K. secundiflora* (Fl. SE. U. S.)]—(SANDBUR.)—Sandy pinelands and sand hills, Coastal Plain, Fla. and Ga. The color of the foliage of the prostrate branches usually renders the plants scarcely distinguishable from the sand in which they grow. The plants, however are readily seen when in flower on account of the decided purple of the petals.

Family 19. **FABACEAE** — Pea Family

Herbs, shrubs, trees, or vines. Leaves alternate: blades 1-compound, sometimes 1-foliolate, or rarely simple. Flowers mostly perfect, irregular. Calyx of 5 more or less unequal partially united sepals. Corolla of 5 (or of 1 petal in *Amorpha*) unequal distinct or nearly distinct petals comprising 2 keel-petals, 2 wings and 1 standard which surrounds the others. Androecium of 10 monadelphous, diadelphous, or rarely distinct stamens, or rarely 9 or 5. Gynoecium 1-carpellary. Ovary superior. Fruit a dehiscent or indehiscent legume or a loment.—About 325 genera and 5,000 species, most abundant in warm and temperate regions.

Stamens 10; filaments distinct.
- Leaflets pinnate. — Tribe I. Sophoreae.
- Leaflets digitate, 1-foliolate or simple. — Tribe II. Podalyrieae.

Stamens 10 or fewer: filaments monadelphous or diadelphous.
- Leaf-rachis terminated by a leaflet, at least not produced into a tendril or spine.
  - Fruit 2-valved or indehiscent, but not a loment.
    - Foliage glabrous or pubescent, but not glandular-dotted.
      - Anthers of 2 kinds: filaments monadelphous: leaflets digitate: calyx 2-lipped. — Tribe III. Genisteae.
      - Anthers all alike: filaments usually diadelphous (the upper filament is sometimes united with the others near the middle): calyx merely 5-lobed or obscurely 2-lipped, except in *Bonaveria*.
        - Blades of the leaflets toothed (in our species). — Tribe IV. Trifolieae.
        - Blades of the leaflets entire.
          - Filaments, at least 5 (alternately) dilated above: flowers solitary or in umbel-like clusters. — Tribe V. Loteae.
          - Filaments all filiform.
            - Herbs, shrubs, or trees: if woody vines the keel of the corolla neither coiled nor much curved.
              - Pod dehiscent.
                - Wing-petals with a spur or pocket in the base of the blade: anther-connective produced into a small appendage. — Tribe VII. Indigofereae.
                - Wing-petals without a spur or pocket in the base of the blade: anther-connective not produced.
                  - Leaf-blades pinnately several-foliolate. — Tribe VIII. Galegeae.
                  - Leaf-blades 3-foliolate and usually with stipules (except in *Galactia Elliottii*). — Tribe X. Phaseoleae.
              - Pod indehiscent. — Tribe IX. Dalbergieae.
            - Herbaceous vines: keel of the corolla much curved or coiled. — Tribe X. Phaseoleae.
    - Foliage glandular-dotted or warty. — Tribe VI. Psoraleae.
  - Fruit a loment, breaking up transversely into 1-seeded sections. — Tribe XI. Hedysareae.
- Leaf-rachis terminated by a tendril or by a spine or a bristle. — Tribe XII. Vicieae.

I. Sophoreae

- Inflorescence racemose: pod moniliform. — 1. Sophora.
- Inflorescence paniculate: pod flattened. — 2. Cladrastis.

II. Podalyrieae

- Ovary sessile or nearly so: pod flat. — 3. Thermopsis.
- Ovary manifestly stalked: pod inflated or turgid. — 4. Baptisia.

III. GENISTEAE

Herbs: calyx-lips, at least the lower one, with long lobes.
  Stipules at least the upper ones, decurrent: pod inflated. 5. CROTALARIA.
  Stipules not decurrent: pods flat. 6. LUPINUS.
Shrubs: calyx-lips with very small lobes. 7. CYTISUS.

IV. TRIFOLIEAE

Pod curved or coiled.
  Standard with a broad blade: pod coiled. 8. MEDICAGO.
  Standard with a narrow blade: pod curved. 9. TRIGONELLA.
Pod straight.
  Pod centrally beaked; valves leathery. 10. MELILOTUS.
  Pod obliquely beaked; valves membranous. 11. TRIFOLIUM.

V. LOTEAE

Calyx slightly irregular but not 2-lipped: pod not beaked, dehiscent.
  Leaflets 5: stipules foliaceous: flowers in umbel-like clusters. 12. LOTUS.
  Leaflets 1–3: stipules gland-like: flowers solitary. 13. ACMISPON.
Calyx 2-lipped: pod long-beaked, indehiscent. 14. BONAVERIA.

VI. PSORALEAE

Petals free from the staminal-tube: filaments borne on the edge of the hypanthium.
  Shrubs: ovary 2–6-ovuled: pod 1- or 2-seeded: corolla with the standard only. 15. AMORPHA.
  Herbs: ovary 1-ovuled: pod 1-seeded: corolla with standard, wings, and keel.
    Pod indehiscent.
      Leaves 1–3-foliolate, the pod finely warty: seed adnate to the pericarp.
        Blades of the leaflets coarsely toothed: pod with a short persistent beak, the body prominently warty. 16. CULLEN.
        Blades of the leaflets entire: pod with a long flat deciduous beak, the body not conspicuously warty. 17. ASPHALTHUM.
      Leaves digitately compound, if pinnately 3-foliolate or 1-foliolate in *O. virgatum,* the pod with few large wart-like projections: seed not adnate to the pericarp.
        Leaves pinnately 3-foliolate. 18. ORBEXILUM.
        Leaves digitately compound. 19. RHYTIDOMENE.
    Pod circumscissile or irregularly bursting, sharply beaked. 20. PEDIOMELIUM.
Petals, except the standard, adnate to or borne on the staminal tube.
  Stamens 10 or 9: wings and keel-petals borne near the middle of the staminal tube. 21. PAROSELA.
  Stamens 5: wings and keel-petals borne near the top of the staminal tube.
    Spike not subtended by an involucre: calyx-lobes narrow or broad but shorter than the tube: standard blade much wider than the other petals. 22. PETALOSTEMON.
    Spike subtended by an involucre: calyx-lobes bristle-like, much longer than the tube: standard-blade slightly wider than the other petals, long-clawed. 23. KUHNISTERA.

VII. INDIGOFEREAE

Firm-tissued or partly woody herbs with pink or salmon-pink corollas and stout or slender often curved pods. 24. INDIGOFERA.

VIII. GALEGEAE

Shrubs or trees, or woody vines.
  Vines with high climbing woody stems: pod turgid. 25. KRAUNHIA.
  Shrubs or trees: pod flat. 26. ROBINIA.
Herbs. Or sometimes woody
  Leaf-blades equally pinnate.
    Pods wingless, more or less compressed, but very thick in *Sesban.*
      Pod several–many-seeded, with thick margins, seeds not in a bladdery envelope.
        Standard broad and longer than the keel petals: calyx with acute or acuminate lobes. 27. SESBAN.

Standard narrow and shorter than the keel petals: calyx with broad, low lobes. — 28. AGATI.
Pod 2-seeded, the margins thin: seeds remaining in the bladdery inner part of the pod when the valves fall away. — 29. GLOTTIDIUM.
Pods 4-sided and 4-winged. — 30. DAUBENTONIA.
Leaf-blades unequally pinnate.
Leaf-blades with parallel veins running from midrib to margin. — 31. CRACCA.
Leaf-blades not thus parallel-veined.
Pod 2-celled, with a perfect partition.
Pod fleshy, indehiscent, at least the first year. — 32. GEOPRUMNON.
Pod membranous, leathery or woody, dehiscent. — 33. ASTRAGALUS.
Pod 1-celled, the partition, if any, rudimentary.
Both sutures inflexed, each valve of the pod almost circular in cross-section. — 34. HOLCOPHACOS.
Upper suture prominent, the pod obcordate in cross-section.
Pod with a false partition arising from the dorsal suture. — 35. TIUM.
Pod without a false partition. — 36. PHACA.

IX. DALBERGIEAE.

Leaf-blades 1-foliolate: pod flat.
Pod suborbicular: calyx not 2-lipped: standard-blade orbicular-reniform. — 37. ECASTOPHYLLUM.
Pod oval to elliptic: calyx 2-lipped: standard-blade elliptic or obovate. — 38. AMERIMNON.
Leaf-blades pinnately several-foliolate: pod broadly 4-winged or drupaceous.
Pod winged, elongate. — 39. ICHTHYOMETHIA.
Pod drupaceous, subglobose. — 40. ANDIRA.

X. PHASEOLEAE

Keel of the corolla neither coiled nor strongly incurved.
Style glabrous or sparingly pubescent below or near the stigma.
Standard not spurred at the base.
Corolla yellow.
Pod 1- or 2-seeded.
Flowers solitary or occasionally 2 or 3 together, sessile or short-stalked in the axils of the leaves: wing-petals with a slender reflexed spur at the base of the blade. — 41. PITCHERIA.
Flowers few to many in peduncled lax or glomerate racemes: wing-petals angled, lobed, or broadly spurred at the base of the blade.
Calyx not 2-lipped; lobes nearly equal, the 2 upper scarcely more united than the 3 lower: pod scimitar-shaped. — 42. DOLICHOLUS.
Calyx 2-lipped, the lobes of the upper lip partly united: pod elliptic or rhombic, often inequilateral.
Corolla much exceeding the calyx: blade of the wing-petals auricled on one side: calyx not accrescent. — 43. LEUCOPTERUM.
Corolla mostly exceeded by the calyx: blade of the wing-petals auricled on both sides: calyx accrescent. — 44. RHYNCHOSIA.
Pod several-seeded. — 45. CAJAN.
Corolla blue, purple, scarlet, or white.
Pod terete, torulose: corolla scarlet.
Calyx scarcely 2-lipped: keel-petals and wings about equal in length. — 46. ERYTHRINA.
Calyx prominently 2-lipped: keel-petals much longer than the wings. — 47. MICROPTERYX.
Pod flattened, not torulose: corolla blue, purple, or white.
Standard much shorter than the keel.
Pod even or slightly wrinkled: seed with a scar-like hilum: herbaceous vines. — 48. STIZOLOBIUM.
Pod transversely ridged: seed with a band-like hilum: woody vines. — 49. MUCUNA.
Standard nearly or quite as long as the keel.
Calyx subtended by 2 bractlets.

Standard and the filament opposite, partly adnate. 50. DIOCLEA.
Standard and the filament opposite, free from each other. 51. GALACTEA.
Calyx without bractlets.
Calyx-tube campanulate; lobes longer than the tube: wings and keel-petals with blades longer than the claws. 51a. PUERARIA.
Calyx-tube cylindric; lobes shorter than the tube: wings and keel-petals with blades shorter than the claws. 52. FALCATA.
Standard spurred at the base. 53. BRADBURYA.
Style bearded along the upper side.
Leaves several foliolate: pod-valves flat, ribless. 54. CLITORIA.
Leaves 3-foliolate: pod-valves convex or with a prominent midrib. 55. MARTIUSIA.
Keel of the corolla coiled or curved.
Keel spirally twisted.
Leaflets not stipellate, 5 or more. 56. GLYCINE.
Leaflets stipellate, 3. 57. PHASEOLUS.
Keel incurved.
Inflorescence capitate.
Pods flattened. 58. STROPHOSTYLES.
Pods nearly terete. 59. VIGNA.
Inflorescence racemose or paniculate.
Standard-blades somewhat reniform: blades of the keel-petals sickle-shaped: pod flat, with beaded edges. 60. DOLICHOS.
Standard-blade suborbicular: blades of the keel-petals curved: pod turgid, with smooth edges. 61. CANAVALI.

XI. HEDYSAREAE

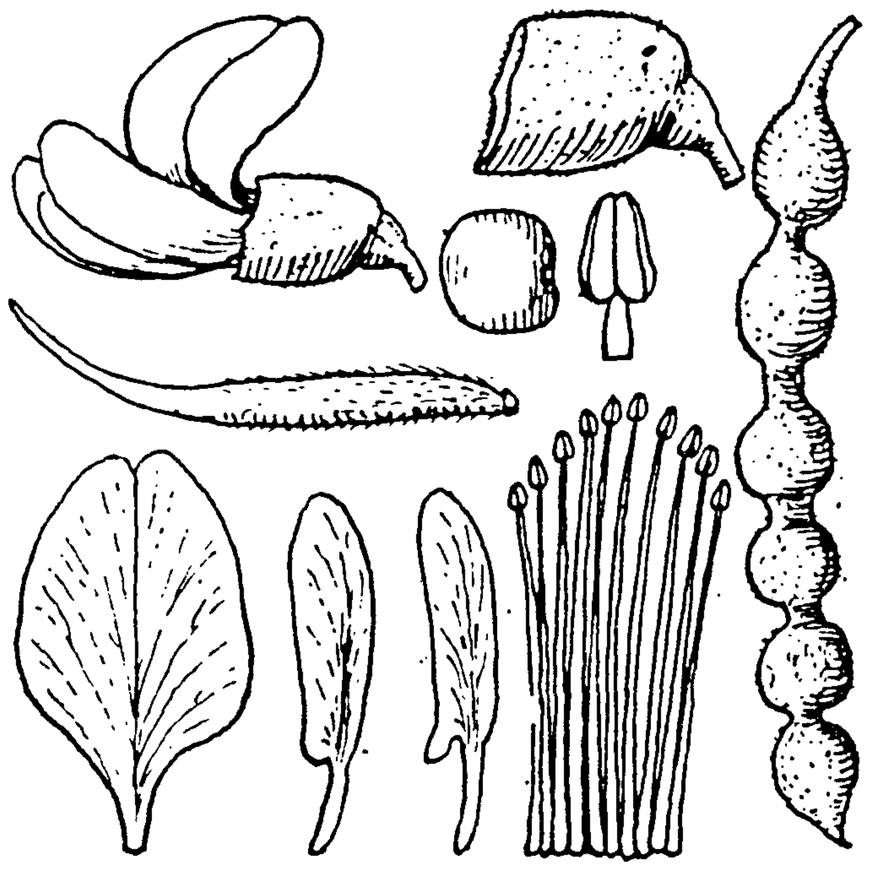
Corolla yellow.
Flowers perfect.
Leaf-blades unequally compound: stamens diadelphous (5 and 5).
Calyx spathe-like, the 2 long lobes minutely toothed at the apex: standard-blade longer than wide, cuneate at the base: wings and keel-petals sessile or short-clawed, minutely auricled at the base. 62. AESCHYNOMENE.
Calyx not spathe-like, the short lips prominently lobed: standard-blades as wide as long or wider, cordate at the base: keel- and wing-petals slender-clawed, prominently auricled. 63. SECULA.
Leaf-blades equally compound: stamens monadelphous.
Leaves pinnate: calyx-tube greatly elongate. 64. ARACHIS.
Leaves digitate: calyx-tube not elongate. 65. ZORNIA.
Flowers monoecious, at least some of them sterile, others fertile.
Anthers of 2 kinds. 66. STYLOSANTHES.
Anthers alike. 67. CHAPMANIA.
Corolla white, blue, violet or purple.
Leaflets stipellate: loments of several joints.
Loment-joints flat, usually thin.
Flowers in racemes or panicles. 68. MEIBOMIA.
Flowers in solitary or 2–4 together in axillary clusters or opposite the leaves. 69. SAGOTIA.
Loment-joints subterete or turgid and fleshy. 70. ALYSICARPUS.
Leaflets not stipellate: loments of 1–2 joints. 71. LESPEDEZA.

XII. VICIEAE

Herbs, diffuse or climbing by the tendrils that terminate the leaf-rachis: seeds dull-colored, not persistent.
Style terete, with a tuft of hairs at the apex. 72. VICIA.
Style flattened, pubescent along the inner side. 73. LATHYRUS.
Partly woody vine with twining branches: leaf-rachis terminating in a spine: seed scarlet except the black base, somewhat persistent on the pod-valves. 74. ABRUS.

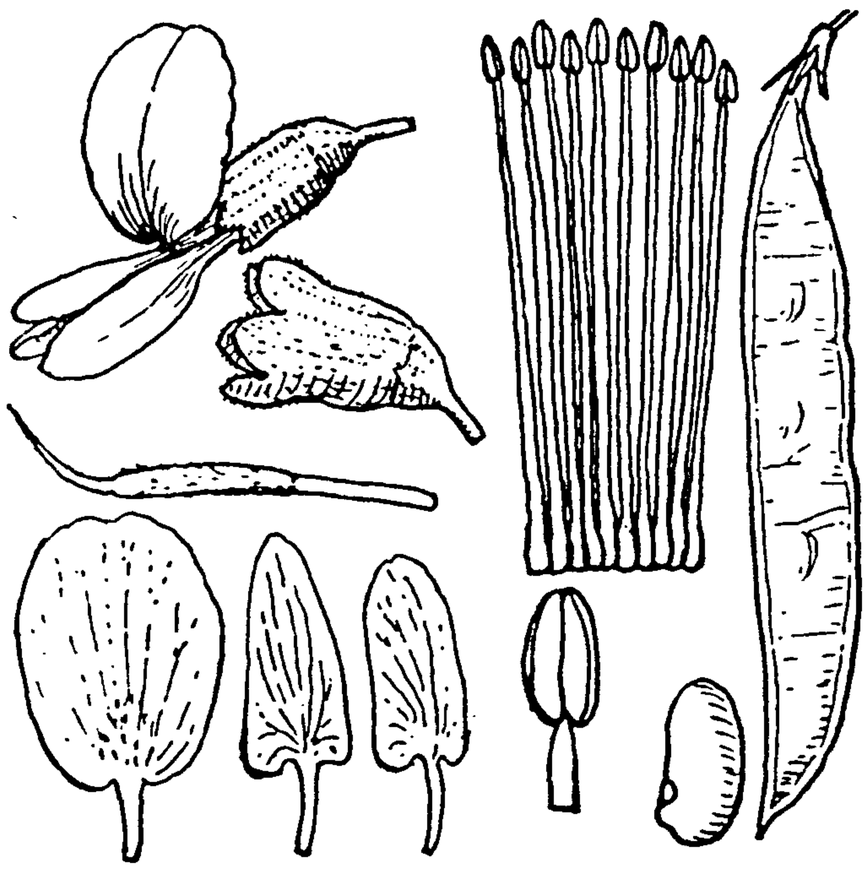
1. **SOPHORA** L. Shrubs, trees, or herbs. Leaf-blades several-foliolate. Racemes erect. Calyx nearly equally 5-lobed or truncate. Standard markedly

clawed. Wings and keel-petals auricled on one side. Pod thick. Seed thick.—About 25 species, of warm and tropical regions.



1. S. tomentosa L. Shrub, with copiously pale-pubescent foliage: blades of the leaflets elliptic, elliptic-ovate, or oval, or rarely spatulate, 2.5–6 cm. long, finely pubescent beneath: calyx 5–8 mm. long, the limb undulate: corolla yellow, 18–25 mm. long: blades of the wings and the keel-petal narrowly elliptic: pod 5–11 cm. long, torulose. —(NECKLACE-POD.)—Coastal sand-dunes and shore-hammocks, S pen. Fla. and the Keys, and S Tex.—(*W. I.*)—All year.

2. CLADRASTIS Raf. Trees. Leaves with obsolete stipules and many-foliolate blades. Panicles drooping. Calyx nearly tubular, about equally 5-lobed. Wings and keel-petals about equally auricled, oblong. Pod flat, thick-margined. Seed flat.—One species.



1. C. lutea (Michx.) Koch. Tree, becoming 17 m. tall: leaves 2–4 dm. long; blades of the leaflets oval, elliptic, ovate, or suborbicular: panicles many-flowered: calyx 8–10 mm. long; lobes rounded: petals white, or the standard with a yellow blotch, 16–20 mm. long: pod linear to narrowly linear-elliptic, 4–8 cm. long.—(YELLOW-WOOD. YELLOW-ASH. VIRGILIA.)—Rich woods and bluffs, various provinces N of Coastal Plain, Ala. to Mo., Ky., and W N. C.—Spr.–sum.—Often grown for ornament outside of its natural range. The hard, close-grained wood is used for various objects and yields a yellow dye.

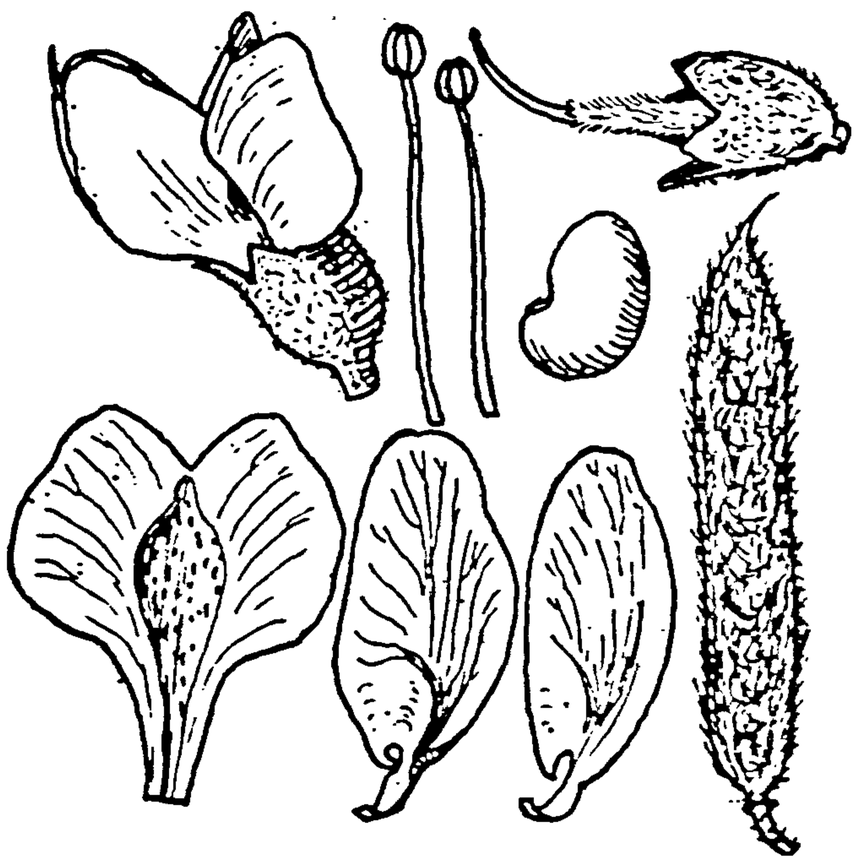
3. THERMOPSIS R. Br. Perennial herbs. Leaves with large stipules and 3 leaflets. Calyx with an entire or slightly lobed upper lip and a 3-lobed lower lip. Corolla yellow or rarely purple: standard broad: blades of the wings and the keel-petals ovate, elliptic, or obovate, auricled on one side. Style usually shorter than the ovary. Pod sessile or nearly so.—About 20 species, natives of North America and Asia.

Stem virgate: raceme dense, spike-like: pod erect and appressed: blades of the leaflets not rhombic. — 1. *T. caroliniana.*

Stem widely branched: raceme lax: pod spreading: blades of the leaflets somewhat rhombic.

- Bracts surpassing the pedicels during anthesis: calyx pubescent without.
  - Pod broadly linear; stipe 1/5–1/6 as long as the body. — 2. *T. mollis.*
  - Pod narrowly linear; stipe 1/10 as long as the body or less. — 3. *T. Hugeri.*
- Bracts shorter than the pedicels: calyx glaucous without. — 4. *T. fraxinifolia.*

1. T. caroliniana M. A. Curtis. Stem 6–16 dm. tall, often sparingly tufted: blades of the leaflets oblanceolate to elliptic: raceme-rachis woolly: calyx



woolly; lower lobes deltoid, about ½ as long as the tube: pod 4–6 cm. long, tomentose.—(AARON'S-ROD.)—Woods, Blue Ridge and Appalachian provinces, Ga. to Tenn. and N. C.—Spr.—Often grown as a garden plant.

2. **T. mollis** (Michx.) M. A. Curtis. Stem pubescent, 3–9 dm. tall: raceme-rachis tomentulose: calyx densely pubescent without: lower calyx-lobes triangular, shorter than the tube: ovary tapering: pod 2–4 cm. long.—(BUSH-PEA.)—Dry soil, mostly in woods, Blue Ridge to Appalachian Plateau, Ala. to Va.

3. **T. Hugeri** Small. Stem pubescent, 3–7 dm. tall: raceme-rachis thinly pubescent: calyx more or less pubescent without: lower calyx-lobes lanceolate, mostly about as long as the tube: ovary linear: pod 5–9 cm. long.—Woods and thickets, Blue Ridge, Ga. to N. C.—Spr.

4. **T. fraxinifolia** (Nutt.) M. A. Curtis. Stem glabrous, 3–9 dm. tall: raceme-rachis mostly glaucous: calyx glabrous without: lower calyx-lobes deltoid, mostly less than ½ as long as the tube: ovary very narrowly linear: pod 7–11 cm. long.—Dry woods and thickets, Blue Ridge to Appalachian Plateau, Ala. to Tenn. and N. C.—Sum.

4. **BAPTISIA** Vent. Perennial herbs with rootstocks, the foliage often blackening in drying. Stipules not decurrent on the stem, sometimes deciduous. Leaflets mostly 3, digitate, usually broadest above the middle. Calyx somewhat 2-lipped. Corolla white, cream-colored, yellow, or blue. Style subulate, usually longer than the short ovary. Pod globose or elongate, often inflated, beaked, stipitate.—About 24 species, North American.—FALSE-INDIGOS. WILD-INDIGOS.—In the first group the leaves are simple.

Leaf-blades simple, rarely lobed: stipules wanting. — I. SIMPLICIFOLIAE.
Leaf-blades 3-foliolate: stipules present.
  Plant bushy-branched: flowers axillary to leaves towards the ends of the branches or in terminal panicles.
    Flowers scattered in the leaf-axils towards the ends of the branches, sometimes the main branches terminated by a cluster of few flowers. — II. TINCTORIAE.
    Flowers in terminal panicles, the lateral branches of the panicles with bractlets, but usually without flowers. — III. CALYCOSAE.
  Plant not bushy branched: flowers in nearly naked or conspicuously bracted racemes.
    Flowers in bracted racemes which are apparently lateral by the prolongation of a leafy shoot. — IV. BRACTEATAE.
    Flowers in erect terminal racemes which are naked by the early falling of the small bracts. — V. ALBAE.

I. SIMPLICIFOLIAE

Leaves with perfoliate blades: flowers axillary. — 1. *B. perfoliata.*
Leaves with sessile blades: flowers racemose. — 2. *B. simplicifolia.*

II. TINCTORIAE

Stipules foliaceous, more or less adnate to the leaflets towards the ends of the branches. — 3. *B. microphylla.*
Stipules minute, free from the leaflets.
  Keel less than 1.5 cm. long: leaflets small (1–3 cm.); blades of an obovate or cuneate type.
    Pod-body oval or ellipsoid, gradually beaked. — 4. *B. tinctoria.*
    Pod-body globular or globose-ovoid, abruptly beaked. — 5. *B. Gibbesii.*

Keel more than 1.5 cm. long: leaflets large (4–10 cm.); blades of an oblanceolate or elliptic type.
Standard-blade broadly reniform: pod-body subglobose to globose-ovoid, somewhat didymous, short-beaked. 6. *B. lanceolata.*
Standard-blade orbicular-reniform: pod-body narrowly ovoid or ellipsoid-ovoid, with lateral ridges, long-beaked. 7. *B. elliptica.*

III. CALYCOSAE

Calyx-lobes about as long as the tube, not foliaceous. 8. *B. LeContei.*
Calyx-lobes several times longer than the tube, foliaceous.
Foliage glabrous or nearly so: calyx-lobes sparingly ciliate or ultimately eciliate. 9. *B. calycosa.*
Foliage copiously hirsute: calyx-lobes permanently shaggy-ciliate. 10. *B. hirsuta.*

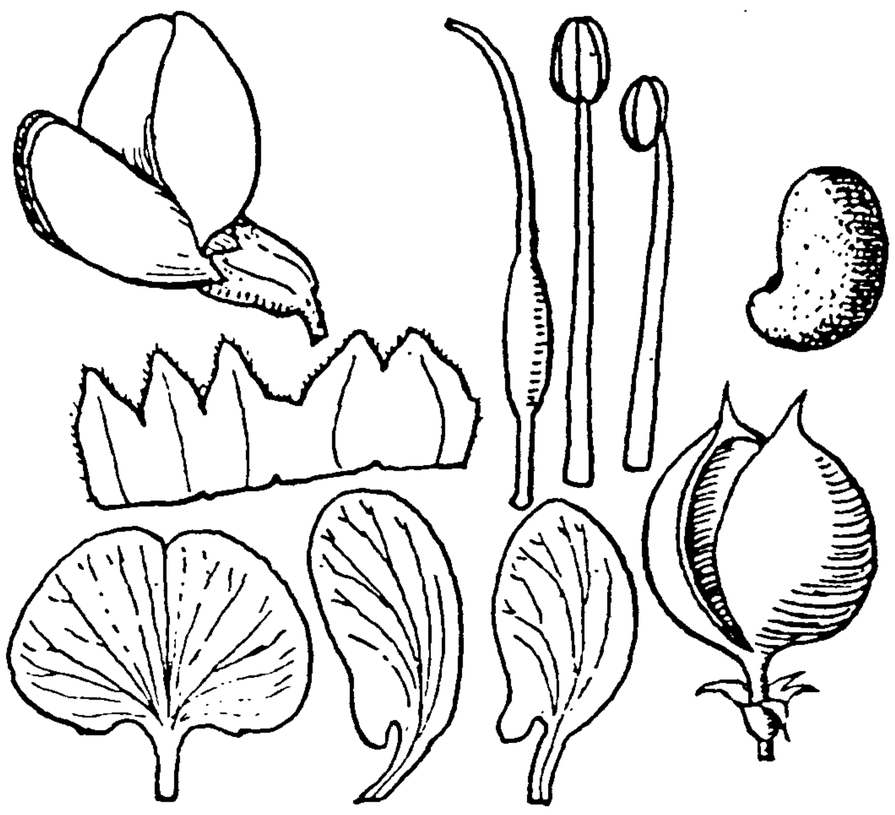
IV. BRACTEATAE

Plant with horizontal or nearly horizontal branches, the racemes borne on the under side of the branches, sometimes nearly or quite on the ground. 11. *B. bracteata.*

V. ALBAE

Corolla white or yellow.
Corolla yellow.
Calyx pubescent: ovary silky: pod decidedly acuminate. 12. *B. villosa.*
Calyx glabrous, except the ciliolate edges: ovary glabrous: pod abruptly pointed.
Pod ellipsoid or oval: corolla over 1.5 cm. long: blades of the leaflets mostly of an elliptic type. 13. *B. megacarpa.*
Pod cylindraceous: corolla less than 1.5 cm. long: blades of the leaflets of an obovate or oblanceolate type. 14. *B. Serenae.*
Corolla white.
Corolla 1–1.5 cm. long: pod-body cylindraceous, 1 cm. thick or less.
Inflorescence-rachis and pedicels pubescent. 15. *B. albescens.*
Inflorescence-rachis and pedicels glabrous. 16. *B. alba.*
Corolla 2 cm. long or more: pod-body oval, between 1.5 and 2 cm. thick. 17. *B. leucantha.*
Corolla blue. 18. *B. australis.*

1. B. perfoliata (L.) R. Br. Plant with several stiff, arching branches, less than 1 m. tall: leaves perfoliate, mostly vertical; blades orbicular, oval, or ovate, 5–10 cm. long, rounded at both ends or notched at the apex: flowers solitary in the leaf-axils, short-pedicelled: calyx glabrous without; lower lobes ovate; lobes of the upper lip deltoid; standard-blade reniform: ovary glabrous: pod-body oval to ovoid, 1–1.5 cm. long, short-beaked.—(CATBELLS. GOPHER-WEED.) — Sandhills, Coastal Plain, C Fla. to S. C.—Spr. Plants dry green.



2. B. simplicifolia Croom. Plant 1 m. tall or less, usually much-branched: leaves spreading; blades ovate to oval, 3–10 cm. long, obtuse or notched at the apex, sessile: flowers in terminal racemes, short-pedicelled, yellow: calyx glabrous without; lower lobes narrowly ovate; upper lip broad, entire or minutely notched: standard globose-reniform: ovary pubescent: pod-body ellipsoid or ovoid, less than 1 cm. long, long-beaked.—(SCARE-WEED.)—Pinelands, M Fla.—Sum.—Plants dry black.

3. B. microphylla Nutt. Plant 1 m. tall or less, the usually numerous branches glabrous: leaves 3-foliolate, with foliaceous stipules; leaflets 1–5 cm. long, the blades obovate to cuneate, or individually elliptic: flowers axillary to 3-foliolate or 1-foliolate leaves, yellow: calyx glabrous without; lower lobes deltoid or often longer than wide; upper lip notched: standard-blade suborbicular or wider than long: pod-body oval or subglobose, about 1 cm. long or less, short-beaked. —Sandhills, Coastal Plain, Fla. to Ala. and S. C.—Spr.–sum.—Plants dry green.

4. **B. tinctoria** (L.) R. Br. Plant very bushy, with slender branches, mostly 1 m. tall or less, glabrous: leaflets 1–3 cm. long; blades obovate to spatulate-cuneate: calyx becoming 4–5 mm. long; lower lobes deltoid, acuminate: corolla yellow; wings 12–14 mm. long; blade of the standard 7–9 mm. wide; pod-body 8–11 mm. long, longer than the slender stipe.—(HONESTY-WEED. RATTLE-WEED. SHOO-FLY. YELLOW WILD-INDIGO.)—Dry woods, hillsides, and roadsides, often in acid soil, various provinces, N. C. to La., Minn., and N. H.—Sum.—Plants dry black. Southern mountain folk use the plant both for dye and as a fly-brush.

5. **B. Gibbesii** Small. Plant similar to *B. tinctoria* in habit: leaves smaller, the blades more cuneate: flowers yellow: pod-body 6–7 mm. long, about as long as the stipe or shorter.—Sandy woods, Coastal Plain, S. C.—Spr.–sum.

6. **B. lanceolata** Walt. Plant mostly less than 1 m. tall, the stem finely pubescent, or glabrous in age, with ascending zigzag branches: leaflets 4–9 cm. long; blades spatulate to oblanceolate or almost broadly linear, finely reticulate: calyx-lobes much shorter than the tube, the lower ones short-triangular, acuminate: corolla yellow; standard-blade over 1.5 cm. wide; keel-petals 17–20 mm. long: pod-body as wide as long, or nearly so, more or less 2-lobed, short-stipitate, the valves somewhat woody, glabrous in age.—Dry pinelands, Coastal Plain, Ala. to N. C.—Spr.

7. **B. elliptica** Small. Plant 1 m. tall or less, the stem finely pubescent, with ascending or spreading zigzag branches: leaflets 5–11 cm. long; blades elliptic, varying to slightly broader above the middle or below it, or those of the lower leaves oblanceolate, all finely reticulate in age: calyx-lobes somewhat shorter than the tube, the lower ones deltoid, acute: corolla yellow; standard-blade over 1.5 cm. wide; keel-petals fully 2 cm. long or rarely shorter, with very broad blades: pod-body much longer than thick, not lobed, long-stipitate, the valves parchment-like, copiously pubescent.—Pinelands, N Fla.—Spr.

8. **B. LeContei** T. & G. Plant bushy, 1 m. tall or less, with strigillose branches: leaves 3-foliolate, with minute stipules; leaflets 1–4 cm. long, the blades oblanceolate, spatulate, or narrowly cuneate, sparingly pubescent: flowers in terminal panicles with lanceolate bracts and minutely bracted flower-stalks: calyx finely pubescent; lower lobes lanceolate or subulate-lanceolate; upper lip mostly entire: corolla yellow; standard-blade suborbicular: ovary pubescent: pod-body ellipsoid, less than 1 cm. long, narrowed at both ends, short-beaked, finely pubescent.—Pinelands and scrub, Coastal Plain, Fla. and Ga.—Spr.–sum. —Plants dry green.

9. **B. calycosa** Canby. Plant usually less than 1 m. tall, with many straight glabrous branches: leaves with elliptic or lanceolate stipules mostly 1–2 cm. long; leaflets 3, the blades spatulate to narrowly cuneate, 1–3 cm. long, sparingly pubescent: bracts and bractlets lanceolate to elliptic, foliaceous: calyx glabrous except the sparingly ciliate lobes; lobes foliaceous, all five nearly equal: corolla yellow; standard-blade suborbicular: ovary glabrous: pod-body narrowly ovoid or ellipsoid, about 1 cm. long, glabrous, slender-beaked.—Pinelands, E Fla.—Spr.–sum.—Plants dry black.

10. **B. hirsuta** Small. Plant about 1 m. tall or less, with numerous straight hirsute branches: leaves with spatulate to lanceolate foliaceous stipules; leaflets 3, the blades spatulate, oblanceolate, or narrowly cuneate, 1–3 cm. long, hirsute: bracts and bractlets similar to the stipules: calyx hirsute; all five lobes foliaceous, the upper two (upper lip) united for about half their length: corolla yellow; standard-blade suborbicular: ovary hirsute: pod-body broadly ovoid, nearly 1 cm. long, pubescent, long-beaked. [*B. calycosa villosa* Canby.] —Dry sandy pinelands, W Fla.—Spr.—Plants dry green.

11. **B. bracteata** Muhl. Plant less than 1 m. tall, the stout pubescent stem with widely spreading branches: leaflets 5–10 cm. long; blades oblanceolate to obovate, or elliptic-obovate, finely reticulate in age: racemes stout, 1–3 dm. long, declined: bracts lanceolate or ovate-lanceolate: calyx-lobes as long as the tube or slightly shorter, the lower ones triangular or lanceolate: corolla cream-colored; standard-blade fully 1.5 cm. wide, with brown spots; keel-petals over 2 cm. long: pod-body ellipsoid, 4–5 cm. long, short-stipitate, long-beaked.—(CREAM WILD-INDIGO.)—Oak woods, Coastal Plain and Piedmont, Ga. and N. C. —Spr.—Plants dry black.

12. **B. villosa** Ell. Plant less than 1 m. tall, the stout pubescent stem with spreading zigzag branches: leaflets 4–12 cm. long; blades elliptic to rhombic-elliptic, or individually oblanceolate or obovate, coriaceous, reticulate: racemes 2–4 dm. long, erect or spreading, stout, naked: calyx-lobes shorter than the tube, the lower ones triangular to ovate: corolla yellow; standard-blade about 2 cm. wide; keel-petals about 2 cm. long: pod-body ellipsoid or nearly so, 2.5–3 cm. long, long-stipitate, slender-beaked.—Sandy woods, often on sandhills, Coastal Plain, S. C. and N. C.—Spr.

13. **B. megacarpa** Chapm. Plant more than 1 m. tall or less, the stout stem terminating in a long raceme and with spreading branches which bear short lateral racemes: leaflets 4–8 cm. long; blades elliptic, varying to broadest above the middle or below it, thinnish, minutely pubescent beneath or merely glaucous: terminal raceme many-flowered: calyx-lobes much shorter than the tube, the lower ones deltoid or deltoid-ovate: corolla pale-yellow; standard-blade about 1.5 cm. wide; keel-petals nearly 2 cm. long: pod-body ellipsoid or nearly so, 3.5–5 cm. long, parchment-like, slender-stipitate, very short-beaked.—Rich soil, mostly on river-banks, Coastal Plain, M Fla. and S Ga. (to Ala?).—Spr.—Plants dry green.

14. **B. Serenae** M. A. Curtis. Plant about 1 m. tall or less, the slender stem with several or many ascending leafy branches which often terminate in short racemes, the main terminal raceme elongate: leaflets 1–3 cm. long or rarely longer; blades obovate, cuneate-obovate, or spatulate-oblanceolate, glabrous, pale beneath: raceme slender: calyx-lobes shorter than the tube, the lower ones triangular or ovate-triangular: corolla bright-yellow; standard-blade less than 1.5 cm. wide; keel-petals less than 1.5 cm. long; pod-body cylindraceous, 1.5–2 cm. long, slender-stipitate.—Sandhills, Coastal Plain, Ga. and S. C.—Spr.

15. **B. albescens** Small. Plant mostly 1 m. tall or less, rather slender, the stem green, with ascending branches and a short raceme: leaflets 3–6 cm. long; blades elliptic to elliptic-oblanceolate, deep-green, sparingly pubescent beneath: raceme short; few-flowered: calyx-lobes shorter than the tube, the lower ones ovate or deltoid-ovate: corolla white; standard-blade 15–18 mm. wide; keel-petals mostly more than 1.5 cm. long: pod-body cylindric, 3–3.5 cm. long. —(SPIKED-INDIGO.)—Woods, Blue Ridge and adjoining provinces, Ga., Tenn. and N. C.—Spr.—Leaves dry green. The stem and calyx are usually purple.

16. **B. alba** (L.) R. Br. Plant about 2 m. tall or less, slender, the stem green or purple with horizontal branches and a slender virgate erect raceme: leaflets 2–5 cm. long; blades narrowly elliptic to elliptic-spatulate, light-green: racemes, at least the main one, often conspicuously elongate, many-flowered, slender: calyx-lobes much shorter than the tube, the lower ones deltoid, or broader than long: corolla white; standard-blade 11–13 mm. wide; keel-petals less than 1.5 cm. long: pod-body cylindric, 2.5–3 cm. long or rarely shorter, short-stipitate.—Rich woods, often in pinelands, Coastal Plain and occasionally adj. provinces, Fla. to N. C.—Spr.–sum.—Foliage dries green. The pod is erect.

17. B. leucantha T. & G. Plant 1.5 m. tall or less, stout, the stem glaucous, with ascending branches: leaflets 2.5–6.5 cm. long; blades obovate, cuneate, cuneate-obovate, or nearly elliptic, deep-green: racemes stout: calyx-lobes shorter than the tube, the lower ones deltoid or ovate-deltoid: corolla white; standard-blade 1.5–1.8 cm. wide; keel-petals fully 2 cm. long: pod-body oval, 2.5–4 cm. long, rather slender-stipitate. — (WHITE WILD-INDIGO. PRAIRIE-INDIGO.)—River-banks, woods, pinelands, and prairies, various provinces, N only west of the Blue Ridge, N Fla. to Tex., Minn., Ont., and N. C.—Spr.–sum.—The pods are drooping.

18. B. australis (L.) R. Br. Plant 1.5 m. tall or less, stout, the stem glaucous, with ascending simple or sparingly branched branches: leaves relatively few, with slender petioles; leaflets 4–8 cm. long, the blades cuneate to oblanceolate, cuneate-elliptic, or elliptic: calyx glabrous; lower lobes deltoid to ovate, much shorter than the tube: corolla indigo-blue; blade of the standard about 1.5 cm. wide; keel-petals mostly about 2 cm. long; pod-body ellipsoid, 3–3.5 cm. long, short-beaked.—(BLUE WILD-INDIGO.)—Rich woods and river-banks, various provinces N of Coastal Plain, Ga. to Tenn. to Pa.—Spr.—Foliage blackens in drying. Often grown in gardens, outside its natural range, for the brilliant blue inflorescence.

5. **CROTALARIA** [Dill.] L. Herbs. Stipules often decurrent on the stem or branches. Leaflets 3 or 1. Calyx with a prominently 2-lobed upper lip and a deeply 3-lobed lower lip. Corolla yellow in our species: standard with a pair of callosities near the base of the blade: wings with the scarcely auricled blades broadened upward: blades of the keel-petals broadly scythe-shaped. Pod globular to cylindric.—About 250 species, mainly of tropical regions.—Spr.–fall or all year S.—RATTLE-BOXES.—Some of the large-flowered species are grown as garden plants.

Leaves with 1-foliolate blades.
- Standard shorter than the calyx or about equalling it: blades of the upper leaflets linear, elliptic, oval, or lanceolate: stipules more or less decurrent. — I. SAGITTALES.
- Standard much longer than the calyx: blades of the upper leaflets of a spatulate or oblanceolate type: stipules not decurrent. — II. RETUSAE.

Leaves with 3-foliolate blades. — III. INCANAE.

I. SAGITTALES

Leaflets with orbicular or oval blades predominating: stems prostrate or decumbent.
- Stems, branches, and peduncles with relatively long loose or spreading hairs. — 1. *C. rotundifolia.*
- Stems, branches, and peduncles with short appressed hairs. — 2. *C. maritima.*

Leaflets with linear, lanceolate, or elliptic blades predominating; stems erect or ascending.
- Stems appressed-pubescent: calyx inconspicuously strigose.
  - Calyx 7–9 mm. long, the pubescence tawny: pod narrow, not inflated. — 3. *C. Linaria.*
  - Calyx 1 cm. long or more, the pubescence pale: pod very thick, turgid. — 4. *C. Purshii.*
- Stems loosely pubescent: calyx loosely pubescent. — 5. *C. sagittalis.*

II. RETUSAE

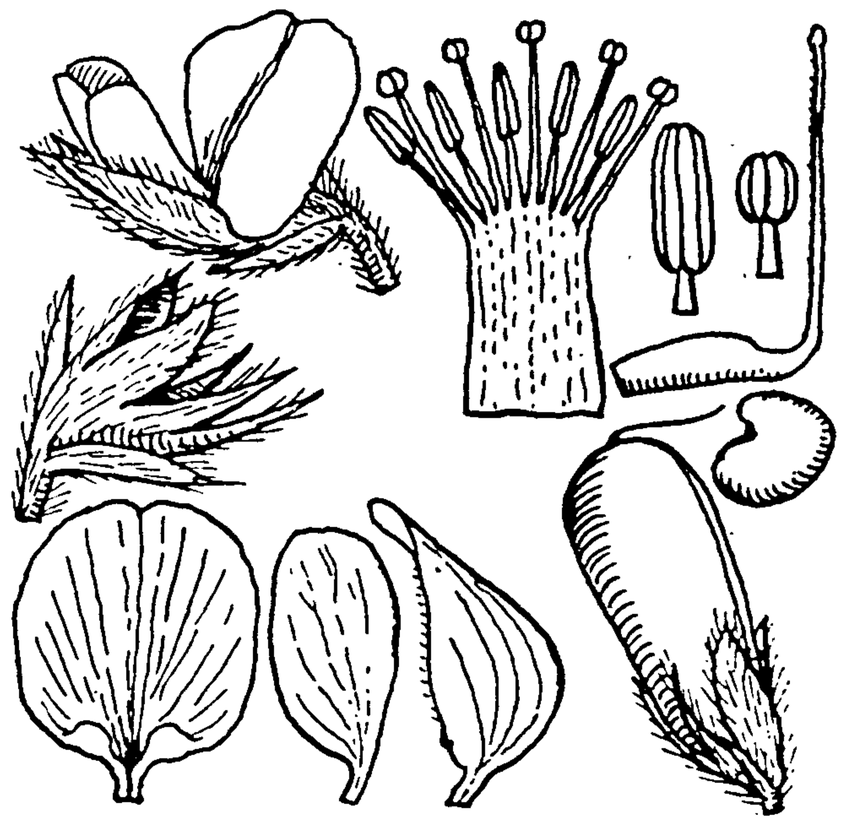
Flowers subtended by minute caducous bracts. — 6. *C. retusa.*
Flowers subtended by ovate, cordate, persistent bracts. — 7. *C. Retzii.*

III. INCANAE

Plant annual: pod 2.5–4.5 cm. long.
- Racemes short and stout: calyx-lobes lanceolate: keel with a short blunt beak. — 8. *C. incana.*
- Racemes long and slender: calyx-lobes subulate-tipped: keel with a slender acute beak. — 9. *C. striata.*

Plant perennial: pod 1–1.5 cm. long. — 10. *C. pumila.*

1. **C. rotundifolia** (Walt.) Poir. Stems radiating from the stout root: blades of the lower leaflets orbicular to obovate; of the upper ones oval, oval-ovate, or broadly elliptic: calyx loosely pubescent: standard 11–14 mm. long: pod ellipsoid-obovoid, 2–2.5 cm. long.—(RABBIT-BELLS.)—Pinelands, dry woods, and sandy places, Coastal Plain and occasionally adj. provinces, Fla. to La. and Va.—(*Mex.*, *C. A.*, *S. A.*)



2. **C. maritima** Chapm. Stems radiating from a stout root: blades of the lower leaflets suborbicular to oval; or of the upper ones narrower: calyx strigose: standard 9–12 mm. long: pod ellipsoid, 2–3 cm. long.—Pinelands, Coastal Plain and rarely adj. provinces, Fla. to La. and N. C.—(*W. I.*)—An infusion made from the pods is used by the Seminoles as a cure for sore-throat. There is much variation in the leaflets. Although typically of a broad type, those on elongate branches often have narrow blades.

3. **C. Linaria** Small. Plant 1–3 dm. tall, the wiry stems tawny-strigose, often clustered on the woody root: blades of the leaflets linear, often narrowly so, or those of the lower leaves sometimes linear-elliptic or oblanceolate, all pubescent like the stem: stipules wanting: calyx strigose: corolla bright-yellow: pod narrowly cylindric, 1.5–2 cm. long.—Pinelands, hammocks, and shell-mounds, near or along the coast, pen. Fla. and the Keys.—Plants are perennial. Stems are often numerous on the woody root. The very narrow blades of the leaflets and small purple calyx are distinctive characters. Stipules may rarely be present.

4. **C. Purshii** DC. Plant 1–5 dm. tall, the stems solitary or clustered on the stout root, strigose: blades of the lower leaflets spatulate, oblanceolate, linear-elliptic, or oval, those of the upper ones lanceolate to linear: calyx strigose: corolla light–yellow: pod slightly obovoid, turgid, 2–3 cm. long.—Pinelands, prairies, sand-dunes, and grassy woods, Coastal Plain, Fla. to Tex. and Va.—Plants are perennial. Stipules are usually present, but often very small.

5. **C. sagittalis** L. Plant 1–5 dm. tall, the stem villous-hirsute: blades of the leaflets elliptic to lanceolate or linear-lanceolate: stipules conspicuous: calyx loosely-pubescent: corolla pale-yellow: pod ellipsoid, 2.5–4 cm. long.—(WILD-PEA.)—Dry woods and sandy banks, various provinces, Fla. to Tex., S. D., and Mass.—(*W. I.*, *Mex.*)—Plants are annual or at the South often perennial. Stipules are usually present, and conspicuously decurrent on the stem, thus inverse-sagittate.

6. **C. retusa** L. Plant 4–9 dm. tall, minutely pubescent: blades of the leaflets cuneate to oblanceolate, not bristle-tipped: stipules minute: calyx 12–14 mm. long; lower lip shorter than the tube: standard with a suborbicular or orbicular-reniform blade 22–26 mm. wide: pod nearly cylindric, 3–5 cm. long.—Pinelands and sandy soil, waste-places and roadsides, S pen. Fla. and the Keys. Nat. of E. I.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)

7. **C. Retzii** A. Hitchc. Plant erect, up to 1 m. tall, finely pubescent: blades of the leaflets elliptic to cuneate, often bristle-tipped: stipules broad: calyx 16–18 mm. long; lower lip longer than the tube; lobes lanceolate: corolla yellow; standard with a suborbicular blade about 2 cm. in diameter: pod slightly broadened upward, 3–5 cm. long. [*C. spectabilis* Roth.]—Cult. grounds and roadsides, pen. Fla. and the Keys. Nat. of E. I.—(*W. I.*)

8. C. incana L. Plant erect, the stem finely and loosely pale-pubescent, 3–8 dm. tall: blades of the leaflets oval to obovate: calyx becoming 10–12 mm. long: keel 14–16 mm. long: ovary pubescent: pod cylindric-ellipsoid, 2.5–4 cm. long.—Pinelands, cult. grounds, and waste-places, pen. Fla. and the Keys. Nat. of tropics.

9. C. striata DC. Plant erect, mostly 1.5 m. tall or less: blades of the leaflets oval, elliptic, or obovate, 2.5–7 cm. long, minutely pubescent beneath: calyx becoming 5.5–6.5 mm. long; lobes slender-tipped, longer than the tube: keel 12–14 mm. long: ovary minutely pubescent: pod turgid, cylindric-clavate, 3.5–4.5 cm. long, stout-beaked.—Waste-places, pinelands, and roadsides, pen. Fla. Nat. of E. I.—(*W. I., S. A., O. W.*)

10. C. pumila Ortega. Plant decumbent: blades of the leaflets cuneate to elliptic-cuneate: calyx becoming 4–5.5 mm. long: keel 8–10 mm. long: ovary pubescent: pod oval or ellipsoid, 1–1.5 cm. long.—Hammocks, pinelands, and coastal sand-dunes, pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)

6. LUPINUS [Tourn.] L. Annual, biennial, or perennial herbs, or woody plants. Stipules not decurrent. Leaflets several-many or rarely 1. Calyx with a lobed upper lip and an entire or slightly 3-lobed lower lip. Corolla variously colored or white: standard without callosities: wings with blunt auricles: keel-petals scythe-shaped. Pod ellipsoid to linear.—About 120 species, natives of temperate and warm regions.—LUPINES.

Leaves not evergreen; blades palmately several-foliolate: foliage glabrous or inconspicuously pubescent. — I. DIGITATI.
Leaves evergreen; blades 1-foliolate: foliage copiously and conspicuously pubescent. — II. SIMPLICIFOLII.

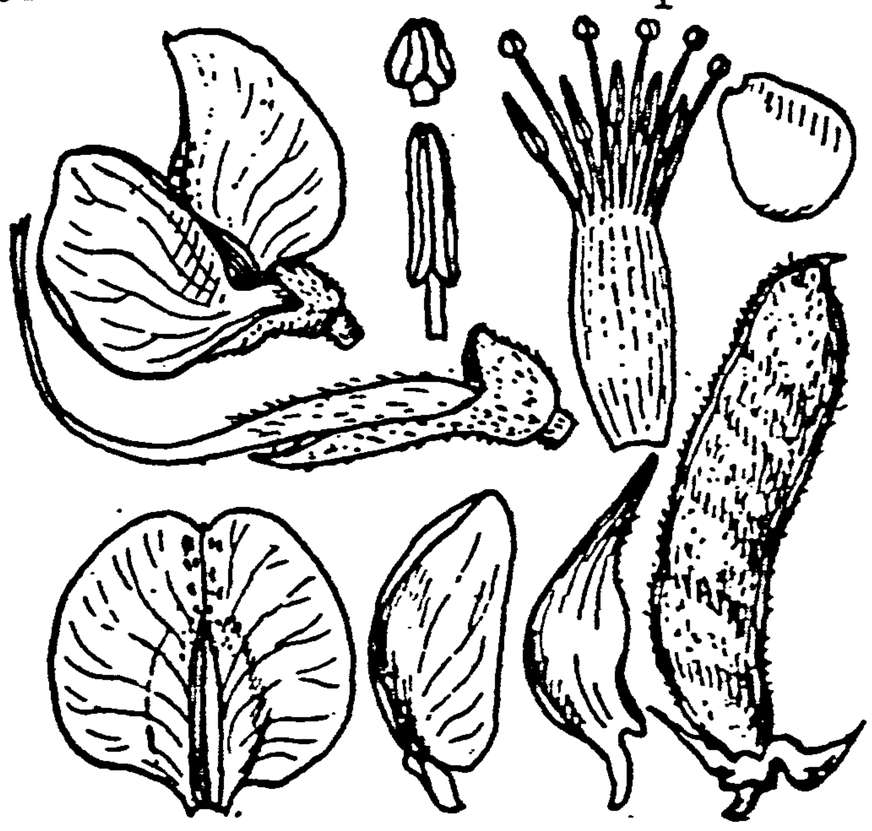
I. DIGITATI

Upper calyx-lip half-orbicular, with a shallow notch and 2 deltoid lobes. — 1. *L. perennis.*
Upper calyx-lip deltoid, with a deep notch and 2 lanceolate lobes. — 2. *L. Nuttallii.*

II. SIMPLICIFOLII

Blade of the standard with a white spot.
  Standard-blade orbicular-reniform: stems prostrate or decumbent. — 3. *L. diffusus.*
  Standard-blade ovate: stems erect. — 4. *L. cumulicola.*
Blade of the standard with a red-purple spot.
  Blades of the keel-petals with a sharp basal auricle: hairs of the pistil much shorter than the ovary: pod elliptic, about 2.5 cm. long. — 5. *L. Westianus*
  Blades of the keel-petals with a broad basal auricle: hairs of the pistil longer than the ovary: pod broadly linear, 3.5–4.5 cm. long. — 6. *L. villosus.*

1. L. perennis L. Plant 2–6 dm. tall, the stipules early deciduous: leaflets 7–11; blades oblanceolate to elliptic, obtuse or mucronulate: lower lip of the calyx with the middle lobe acute and projecting beyond the others: corolla blue or purplish-blue: pod 7–8 mm. wide, long-pedicelled. — (SUNDIAL-LUPINE.) — Open woods and fields, in acid sandy soil, various provinces, Fla. to La., Minn., and Me.—Spr.



2. L. Nuttallii S. Wats. Plant smaller and more slender than in *L. perennis*, but with the stipules persistent and the leaflets fewer, their blades narrow, mostly spatulate and acute: lower lip of the calyx with the middle lobe obtuse and about equalling the others: corolla blue: pod mostly 9–10 mm. wide,

short-pedicelled.—(SANDHILLS-LUPINE.)—Pinelands, Coastal Plain, Fla. to Miss. and Ga.—Spr.

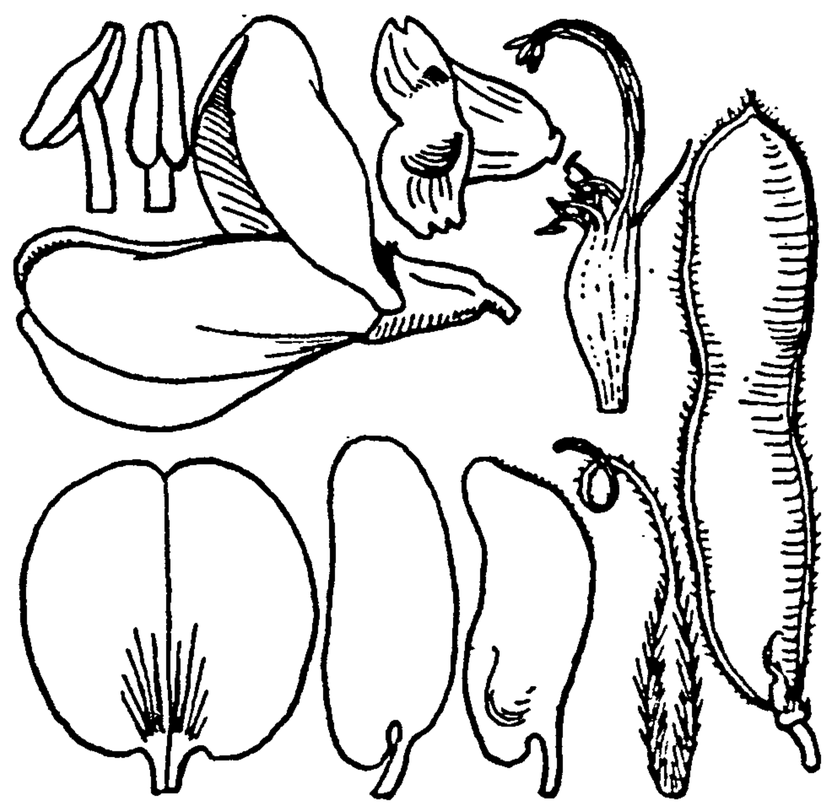
3. **L. diffusus** Nutt. Stems and branches several to many, close-together at the top of the root, prostrate or decumbent, terminating in erect panicles: leaf-blades oblanceolate, narrowly obovate, or elliptic, 4–10 cm. long; corolla deep-blue, except the white center of the standard: standard as wide as long or wider: blade of wing-petals nearly as wide as long: pod broadly linear, rather flat, 3.5–4 cm. long, silky, the beak nearly straight.—Pinelands and oak ridges, Coastal Plain, Fla. to Miss. and N. C.—Spr.-sum.

4. **L. cumulicola** Small. Stem usually solitary, erect, 1.5–15 dm. tall, branched above, the branches terminating in erect panicles: leaf-blades oval or elliptic, varying to broadest above the middle or below it, 3–15 cm. long: corolla sky-blue, except the white center of the standard: standard longer than wide: blade of wing-petals much longer than wide: pod linear, turgid, 4–5 cm. long, silky, the beak curved upward.—(SKY-BLUE LUPINE.)—Scrub and sandhills, pen. Fla.—Wint.-spr.

5. **L. Westianus** Small. Stem usually solitary, erect, 3–12 dm. tall, branched above, the branches terminating in erect panicles: leaf-blades elliptic or nearly so, 4.5–9 cm. long: corolla bright-blue, except the red-purple spot in the center of the standard: standard with an orbicular-ovate blade: pod elliptic, turgid, about 2.5 cm. long closely shaggy-villous, the beak nearly central.—Sand-dunes along or near the coast, M and W Fla.—Spr.

6. **L. villosus** Willd. Stem and branches close together at the top of the root, often radiating, prostrate and terminating in erect, stout, dense panicles: leaf-blades elliptic, elliptic-lanceolate, or linear-elliptic, or sometimes oblanceolate, 4–15 cm. long: corolla deep-lilac or purple, except the deep-purple or red-purple center of the standard: standard with a suborbicular blade: pod broadly linear, flattish, 3.5–4 cm. long, shaggy with more or less tangled long hairs, the beak lateral.—(LADY-LUPINE.)—Dry pinelands and sandy barrens, Coastal Plain, Fla. to Miss. (or La.?), and N. C.—Spr.

7. **CYTISUS** [Tourn.] L. Shrubs with much-branched stems, sometimes broom-like. Leaflets 3 or 1: blades narrow or broad, mostly entire, or obsolete. Calyx with an obscurely lobed upper lip and a minutely 3-lobed lower lip. Corolla mostly yellow: standard with a broad blade: wings with broad auricles: keel-petals with broad blades. Pod rather narrow.—About 45 species, natives of the Old World.—BROOMS.



1. **C. scoparius** (L.) Link. Plant with many stiff erect sharp-angled branches, 1–1.5 m. tall, the younger parts finely pubescent: leaflets 3, or 1 in the upper leaves; blades obovate to elliptic, 5–15 mm. long, obtuse or acute, entire: raceme leafy-bracted: calyx about 4 mm. long: corolla bright-yellow; standard suborbicular, 1.5–2 cm. long: pod broadly linear, 4–5 cm. long, long-ciliate.—(BESOM. GINSTER. SCOTCH-BROOM.)—Roadsides, banks, and fields, various provinces, rarely Coastal Plain, Ga. to N. S. Nat. of Eu.—Sum.—In part parasitic on oak roots.

8. **MEDICAGO** [Tourn.] L. Annual or perennial herbs, or partly woody plants. Leaflets 3, pinnate. Racemes capitate or slightly elongate. Calyx-lobes nearly equal, about as long as the tube or longer. Corolla yellow, blue, or violet: wings with a hooked auricle at the base of the blade. Style very short, at least shorter than the ovary.—About 50 species, natives of the Old World.—MEDICS.

Corolla violet or blue: standard with an elliptic or cuneate blade: perennial upright plant. I. SATIVAE.
Corolla yellow; standard with a blade about as broad as long: annual spreading or prostrate plants. II. LUPULINAE.

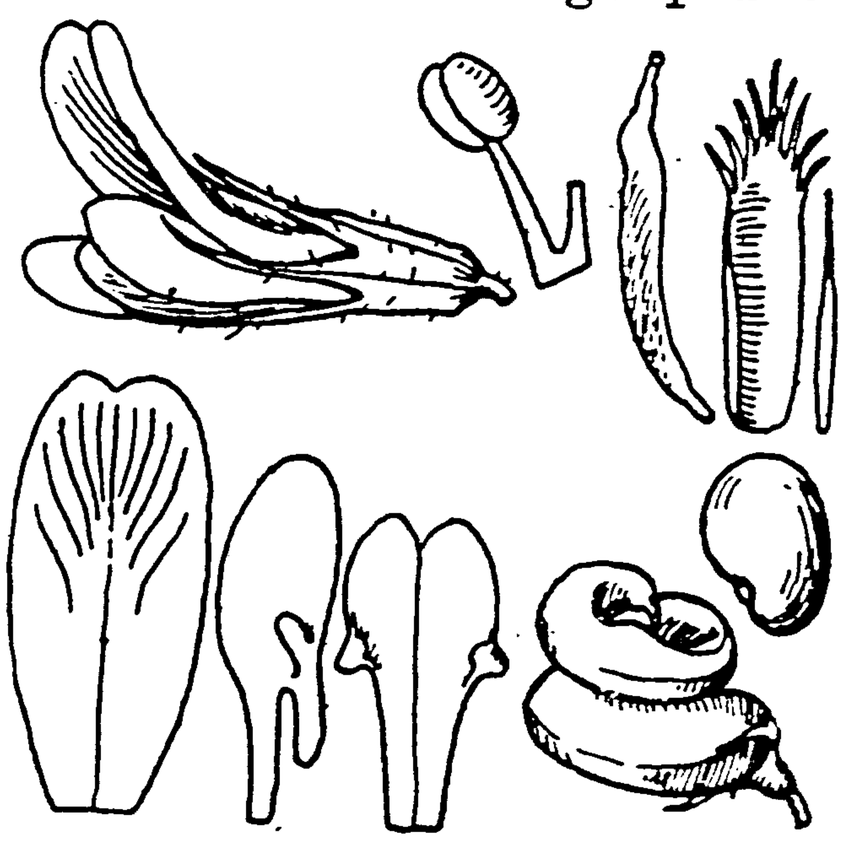
I. SATIVAE

Stem often bushy branched: flower-clusters conspicuous: pod twisted. 1. *M. sativa.*

II. LUPULINAE

Pod unarmed, 1-seeded: blade of the keel-petals longer than the claw. 2. *M. lupulina.*
Pod prickle-armed, several-seeded: blade of the keel-petals shorter than the claw.
  Stem and branches downy-villous: stipules entire or toothed. 3. *M. minima.*
  Stem and branches glabrous or nearly so: stipules incised.
    Pod loosely coiled, not furrowed on the edge between the prickles: style very short. 4. *M. hispida.*
    Pod tightly coiled, furrowed on the edge between the prickles: style slender. 5. *M. arabica.*

1. **M. sativa** L. Leaflets 8–16 mm. long; blades cuneate-obovate to cuneate or oblanceolate: calyx 4–6 mm. long: standard 8–10.5 mm. long: pod 3–4 mm. broad.—(ALFALFA. LUCERNE.)—Fields and waste-places, various provinces, nearly throughout U. S. and Can. Nat. of Eu.—Spr.–sum.—Extensively grown as a fodder.



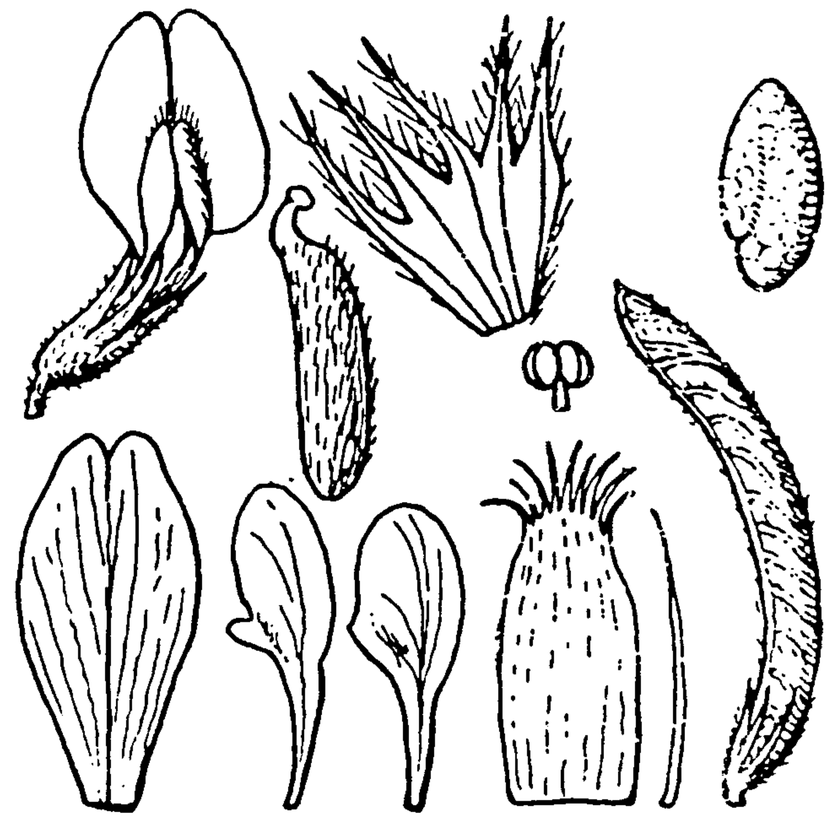
2. **M. lupulina** L. Leaflets 5–15 mm. long; blades obovate or rhomboidal: calyx 1.5–2 mm. long: standard 1.5–2 mm. long: pod 2–3 mm. broad; strongly curved.—(NONESUCH. BLACK-MEDIC. HOP-MEDIC.)—Waste-places and roadsides, various provinces, U. S. and S Can. Nat. of Eu.—Spr.–sum.

3. **M. minima** L. Leaflets 0.5–1.5 cm. long; blades broadly or narrowly cuneate, rounded or truncate at the apex, denticulate: calyx pubescent, 2.5–3 mm. long; lobes as long as the tube or longer: corolla yellow, 3–4 mm. long: pod closely twisted into 4 or 5 coils, 5–8 mm. broad, the edges armed with toothed prickles.—Roadsides, waste-places, and cult. grounds, Coastal Plain and adj.. provinces, Fla. to Tex. and N. C. Nat. of Eu.—Spr.–sum.

4. **M. hispida** Gaertn. Leaflets 5–15 mm. long; blades cuneate to oval, green: calyx 2.5–3 mm. long: keel-petals mostly shorter than the broad wings: pod with 2 or 3 coils, 5–8 mm. broad. [*M. denticulata* Willd.]—(BUR-CLOVER.)—Waste-places, fields, and roadsides, various provinces, Fla. to Tex. and N. S.; also Pacific States. Nat. of Eurasia.—(*W. I., Mex., C. A., S. A.*)

5. **M. arabica** All. Leaflets 10–25 mm. long; blades broadly cuneate to obovate, usually with a brown spot in center: calyx 2–2.5 mm. long: keel-petals mostly longer than the wings: pod with 3 or 4 coils, 6–9 mm. broad. [*M. maculata* Sibth.]—(SPOTTED-MEDICK.)—Waste-places, roadsides, fields, and cult. grounds, various provinces, M Fla. to La. and N. B. Nat. of Eu.—(*S. A.*)

9. TRIGONELLA L. Annual or rarely perennial herbs, with erect or spreading stems. Leaflets 3: blades broadened upward, toothed, commonly sharply so. Flowers perfect, in short racemes or panicles, or clustered. Calyx-lobes nearly equal, narrow. Corolla yellow, blue, or white: standard with an obovate or cuneate sessile blade: wings elliptic or ovate, longer than the rounded keel. Style very short or subulate. Pod curved, narrow, indehiscent or nearly so.—About 50 species, mostly of the Old World temperate regions.

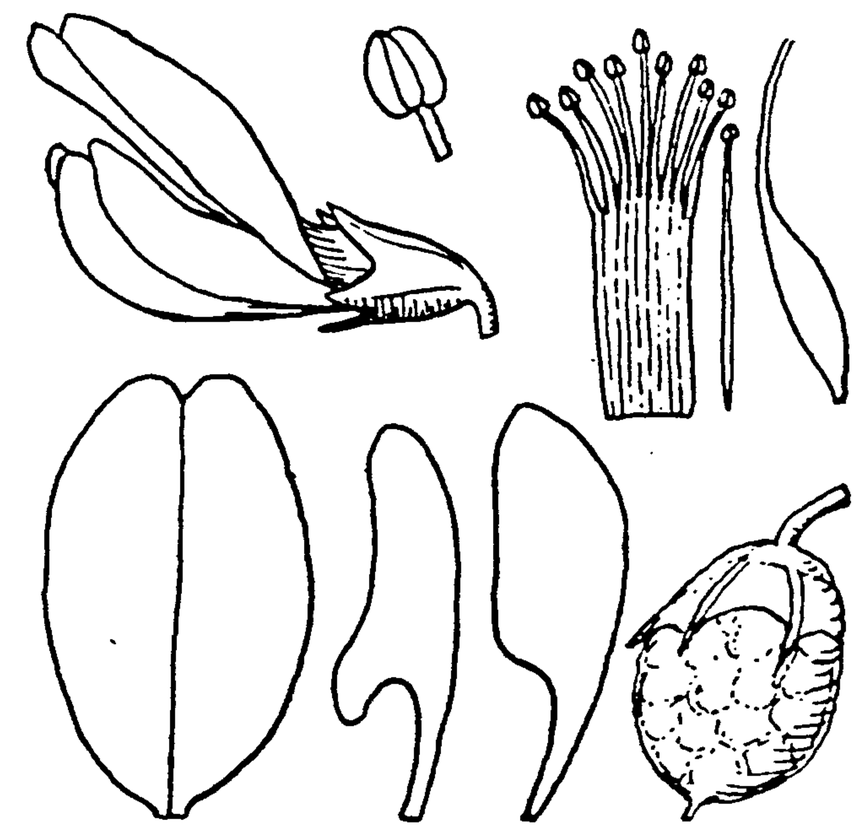


1. T. monspeliaca L. Plant finely pubescent: stem simple or branched, 0.5–4 dm. long: leaflets 3, the blades cuneate to obovate, 3–11 mm. long, sharply toothed above the middle: flowers clustered: calyx 2–2.5 mm. long; lobes subulate, slightly shorter than the tube: corolla yellow, about ⅓ longer than the calyx; standard cuneate, 3–3.5 mm. long, emarginate: pod linear, curved, 11–15 mm. long, reticulate, finely pubescent.—Dry soil, fields, and hillsides, Coastal Plain, Ala. Nat. of Eu.—Sum.

10. MELILOTUS [Tourn.] Juss. Annual or biennial herbs. Leaflets 3-pinnate. Racemes greatly elongate and ultimately interrupted. Calyx-lobes nearly equal, shorter than the tube. Corolla yellow or white: wings with a slender auricle at the base of the blade. Style long. Pod stout, straight.—About 20 species, natives of the Old World.—Sum.—SWEET-CLOVERS. MELILOTS.

Corolla 4–9 mm. long: pod 3–4 mm. long.
  Corolla white: standard surpassing the wing-petals. 1. *M. alba.*
  Corolla yellow: standard shorter than the wing-petals. 2. *M. officinalis.*
Corolla 2.5 mm. long or less: pod about 2 mm. long. 3. *M. indica.*

1. M. alba Desv. Leaflets 1–3 cm. long; blades linear-elliptic, oblanceolate, or elliptic: racemes 4–15 cm. long, or becoming longer: calyx-lobes slightly shorter than the tube: keel-petals about equal to the wings: ovary sessile: pod 3–3.5 mm. long, glabrous.—(WHITE-MELILOT. WHITE SWEET-CLOVER.)—Waste-places, fields, cult. grounds, and river banks, especially in calcareous regions, various provinces, nearly throughout U. S. and S Can. Nat. of Eu.



2. M. officinalis (L.) Lam. Leaflets 1–3 cm. long; blades narrowly elliptic, oblanceolate, or oval: racemes 2–12 cm. long: calyx-lobes about ½ as long as the tube: keel-petals much shorter than the wings: ovary stipitate: pod about 4 mm. long, pubescent.—(YELLOW-MELILOT.)—Waste-places, cult. grounds, and roadsides, often in calcareous soils, various provinces, nearly throughout U. S. and S Can. Nat. of Eu.

3. M. indica (L.) All. Leaflets 0.5–2 cm. long; blades elliptic, oval, cuneate, or obovate: racemes 1–2 cm. long: corolla yellow: pod about 2 mm. long.—

(INDIAN-CLOVER.)—Waste-places, fields, and roadsides, Coastal Plain, Fla. to Tex., and locally northward to E Canada; also Pacific States, and rarely in the interior. Nat. of Eurasia.

11. TRIFOLIUM [Tourn.] L. Annual or perennial herbs. Leaflets 3, digitate or pinnate, or rarely 5 or 7. Calyx-lobes nearly equal, or the 2 upper longer than the 3 lower ones and some times partly united. Corolla variously colored or white: standard elliptic or obovate, or elongate and clawed: other petals with long claws, the wings with an angle or a rounded auricle at the base of the blade.—About 275 species, natives mainly of the north temperate zone.—CLOVERS. TREFOILS.—Various species, particularly *T. pratense* and *T. hybridum*, are grown for fodder.

Corolla white or colored but not yellow.
- Racemes peduncled: claw of the standard shorter than the blade, except in *T. lappaceum*, which has the corolla shorter than the calyx.
  - Calyx not 2-lipped.
    - Corolla shorter than the calyx.
      - Standard with the blade longer than the claw: mature racemes ellipsoid: corolla white. — I. ARVENSIA.
      - Standard with the blade shorter than the claw: mature racemes globular: corolla pink. — II. LAPPACEA.
    - Corolla longer than the calyx.
      - Calyx-lobes plumose: raceme cylindric. — III. INCARNATA.
      - Calyx-lobes not plumose: raceme globular.
        - Plant annual or biennial: calyx-lobes several times longer than the tube. — IV. REFLEXA.
        - Plant perennial: calyx lobes and tube about equal in length. — V. REPENTIA.
  - Calyx 2-lipped. — VI. CAROLINIANA.
- Racemes sessile: claw of the standard longer than the blade. — VII. PRATENSIA.

Corolla yellow. — VIII. AGRARIA.

I. ARVENSIA

Plant with grayish-pubescent foliage and silky-plumose racemes. — 1. *T. arvense.*

II. LAPPACEA

Plant with glabrous foliage and sparingly hairy racemes. — 2. *T. lappaceum.*

III. INCARNATA

Plant erect: flowers ascending or ultimately spreading, in cylindric somewhat plumose racemes. — 3. *T. incarnatum.*

IV. REFLEXA

Plant with several to many radially spreading stems at maturity: flowers ultimately strongly reflexed, forming a depressed flat-topped head. — 4. *T. reflexum.*

V. REPENTIA

Calyx-lobes subulate, not dilated, the sinuses pubescent.
- Upper calyx-lobes slightly united: blades of the keel-petals longer than the claws. — 5. *T. stoloniferum.*
- Upper calyx-lobes distinct: blades of the keel-petals shorter than the claws. — 6. *T. hybridum.*

Calyx-lobes lanceolate or triangular with dilated bases, the sinuses glabrous.
- Leaflets not prominently veined, serrulate; terminal leaflet longer-stalked than the lateral. — 7. *T. repens.*
- Leaflets prominently veined, spinulose-serrate: terminal leaflet not longer-stalked than the lateral. — 8. *T. saxicola.*

VI. CAROLINIANA

Slender depressed herb with slender peduncled small capitate racemes: corolla white, pink, or purplish; standard abruptly pointed. — 9. *T. carolinianum.*

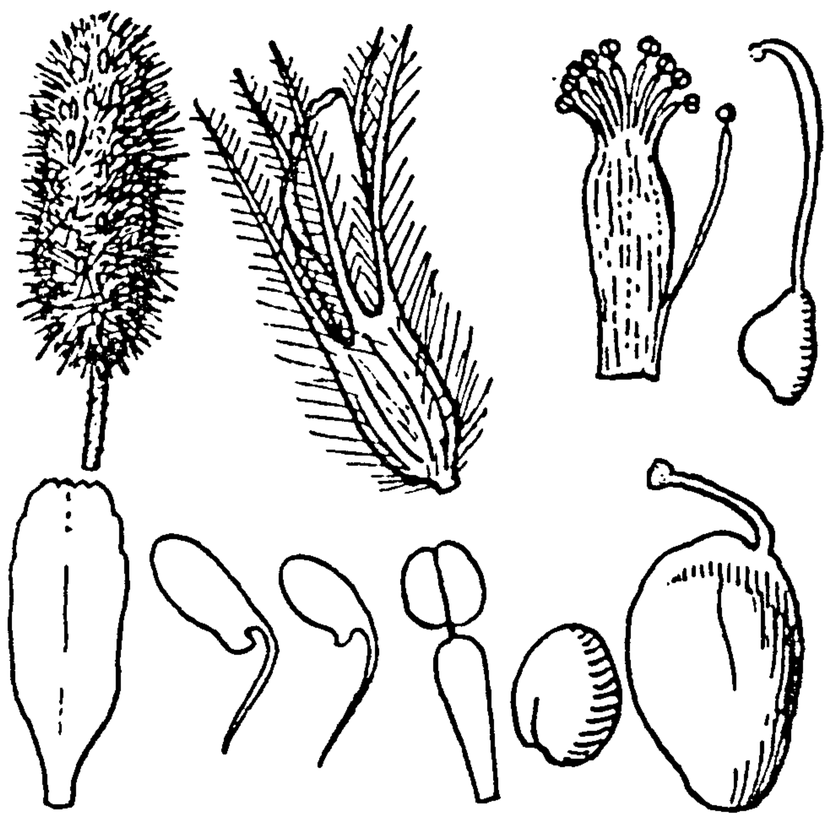
VII. PRATENSIA

Coarse erect herb with sessile large capitate racemes: corolla red or magenta, or rarely white; standard obtuse or nearly truncate at apex. — 10. *T. pratense.*

VIII. AGRARIA

Terminal leaflet longer-stalked than the lateral ones: standard entire.
Racemes 8–12-flowered, much less than 1 cm. long. 11. *T. dubium.*
Racemes 20–40-flowered, about 1 cm. long. 12. *T. procumbens.*
Terminal leaflet not longer-stalked than the lateral ones: standard with toothed edges. 13. *T. agrarium.*

1. **T. arvense** L. Stem 1–4 dm. tall, villous-lanuginous: leaflets 1–2.5 cm. long; blades linear to oblanceolate, entire or nearly so: racemes 1–3 cm. long: calyx 4.5–5 mm. long; lobes subulate, plumose: standard 3–3.5 mm. long, the blade nearly elliptic, white.—(OLD-FIELD CLOVER. RABBIT-FOOT CLOVER. STONE-CLOVER.)—Dry banks, fields, and roadsides, various provinces, Fla. to Mo., Ont., and Que. Nat. of Eurasia.—Sum.



2. **T. lappaceum** L. Stem glabrous: leaflets 1–2 cm. long; blades cuneate to obovate, finely toothed: racemes 1–2 cm. in diameter: calyx 6–7 mm. long; lobes filiform-subulate, with separated long spreading hairs: standard 5–6 mm. long, the blade ovate, pink.—Waste-places, and roadsides, Coastal Plain, Ala. and Miss. Nat. of Mediterranean reg.

3. **T. incarnatum** L. Stem 2–9 dm. tall, like the branches appressed-pubescent, or somewhat villous: leaflets 1–4 cm. long; blades obovate to orbicular-obovate or broadly cuneate, denticulate, finely veined; raceme cylindric, 3–8 cm. long: calyx densely strigillose, obscurely 2-lipped; lobes setaceous, longer than the tube, those of the upper lip slightly longer than those of the lower lip: corolla crimson; standard 11–13 mm. long, linear-spatulate.—(CRIMSON-CLOVER. ITALIAN-CLOVER.)—Fields, waste-places, and roadsides, various provinces, N. C. to Ark. and Me. Nat. of Eu., and cult.—Sum.—*T. angustifolium* L. of the Mediterranean reg., with linear leaflet-blades and slightly exserted corollas has been found in Montgomery Co., Ala.

4. **T. reflexum** L. Stem decumbent or spreading, villous or downy: leaflets 1.5–3 cm. long; blades elliptic, elliptic-obovate, or suborbicular, denticulate: calyx 7–8 mm. long; lobes lanceolate-subulate, ciliate: standard oval, 10–12 mm. long, red or purple.—(BUFFALO-CLOVER.)—Dry fields and sandy woods, various provinces, northward only W of Blue Ridge, Fla. to Tex., Nebr., Ont., and W N. Y.—Spr.

5. **T. stoloniferum** Muhl. Stem widely spreading, glabrous: leaflets 1–3 cm. long; blades obovate, broadly cuneate, or nearly orbicular, denticulate: calyx 5–6 mm. long; lobes much longer than the tube: standard oval or oval-ovate, 10–12 mm. long, white tinged with purple.—(BUFFALO-CLOVER. RUNNING-CLOVER.)—Woods and prairies, various provinces, Tenn. to Mo., Nebr., and Ohio.—Spr.–sum.

6. **T. hybridum** L. Stem erect or decumbent: leaflets 1–2.5 cm. long: blades oval to elliptic, varying to ovate or obovate, or suborbicular, denticulate: calyx 3.5–4 mm. long; lobes about as long as the tube: standard elliptic, 7–9 mm. long, pink or rarely nearly white: style mostly shorter than the ovary.—(ALSIKE-CLOVER. SWEDISH-CLOVER. ALSATIAN-CLOVER.)—Fields, roadsides, and waste-places, various provinces, nearly throughout U. S., and S Can. Nat. of Eu. and cult.—(*W. I.*)—Spr–fall.

7. **T. repens** L. Stem creeping: leaflets 9–15 mm. long; blades obovate to orbicular-obovate or oval: calyx about 5 mm. long; shorter lobes abruptly acuminate from dilated bases: standard elliptic, 7–8 mm. long, white: style mostly longer than the ovary.—(WHITE-CLOVER. DUTCH-CLOVER.)—Roadsides, fields, woods, and waste-places, various provinces, U. S. and S Can.—Flourishes on the highest mts. and in the coastal region of the Gulf of Mexico; persists for some time when naturalized in S Fla.—Sum. or all year S.

8. **T. saxicola** Small. Stem creeping: leaflets 3–8 mm. long; blades cuneate to obdeltoid: calyx about 3 mm. long; shorter lobes triangular or triangular-lanceolate: standard elliptic, 6–7 mm. long, white; keel-petals with claws usually shorter than the blades: style mostly shorter than the ovary.—Granite rocks, Stone Mt. on the Piedmont of Ga.—Spr.–sum.

9. **T. carolinianum** Walt. Stem ascending or decumbent, pubescent: blades of the leaflets obovate to cuneate: calyx pubescent; lower lobes much shorter than the linear-lanceolate lateral ones: standard white, pink, or purplish: free portion of the filaments 1 cm. long or less.—Dry woods and sandy soil, various provinces, N pen. Fla. to Tex., Kans., and Md. Introd. further N.—Spr.–fall.—*T. nigrescens*, Viv. of S Eu. with glabrous foliage and calyx and corolla twice as long as the calyx and *T. resupinatum* L., of W Eu. and Mediterranean reg., with an inflated calyx, at maturity, have been found about Snow Hill, Ala.

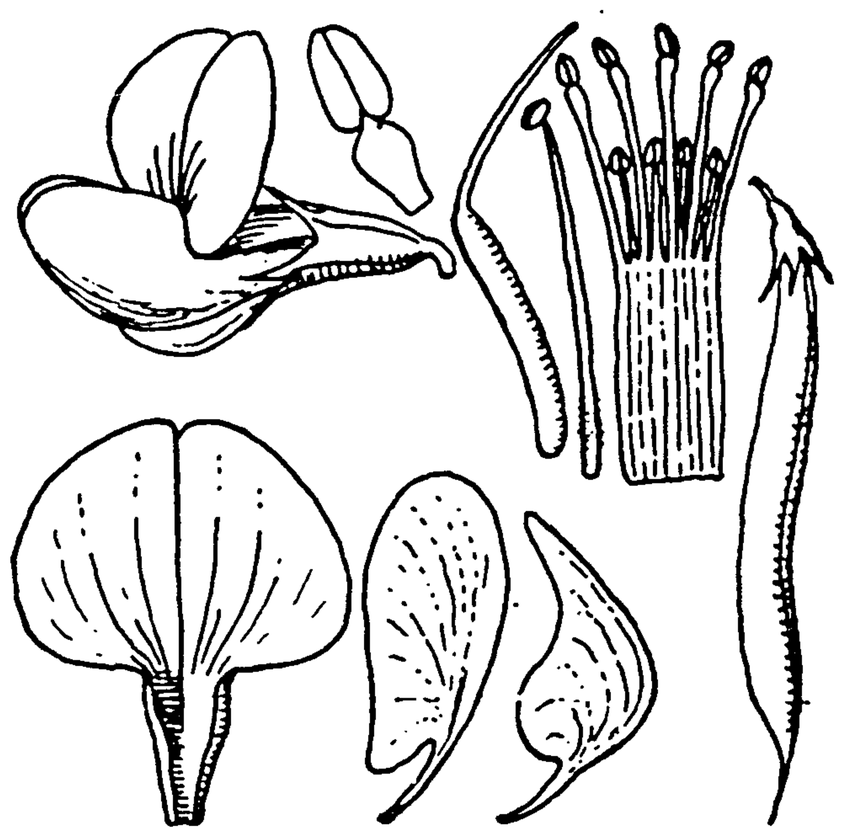
10. **T. pratense** L. Stem 2–7 dm. tall, pubescent: leaflets 1–4 cm. long; blades elliptic or oval: calyx about 8 mm. long; lobes filiform, the longest one much longer than the tube: corolla red, purple, or white: standard 12–14 mm. long, the claw very broad.—(RED-CLOVER. PURPLE-CLOVER.)—Fields, waste-places, roadsides, and woods, various provinces, U. S. and S Can. Nat. of Eu. and cult.—Sum.—Flourishes best at moderate altitudes in the mts.; somewhat persistent when introduced in S Fla.—*T. glomeratum* L., with globular racemes less than 1 cm. in diameter, short-petioled, small leaves and short broad-based spreading calyx-lobes; and *T. suffocatum* L., with long petioled leaves; both glabrous and from the Mediterranean reg., have been found at Snow Hill, Ala.; also *T. striatum* L., with small cylindric racemes and calyx-lobes shorter than the tube, from the Mediterranean region, has been found near Bowman, Ga.

11. **T. dubium** Sibth. Plant erect or ascending, diminutive: leaflets 4–8 mm. long: racemes loosely 8–12-flowered: calyx mostly less than 2 mm. long: wing-petals 2–2.5 mm. long.—(SHAMROCK.)—Waste-places and fields, various provinces, Fla. to Tex., B. C., and Mass. Nat. of Eu.

12. **T. procumbens** L. Plant prostrate or procumbent, diffuse: leaflets 6–12 mm. long: racemes rather densely 20–40-flowered: calyx mostly over 2 mm. long: wing-petals 3–4 mm. long.—(LOW HOP-CLOVER.)—Fields, roadsides, and waste-places, various provinces, N. Am., except the extreme N. Nat. of Eu.

13. **T. agrarium** L. Plant erect or nearly so: leaflets mostly 10–16 mm. long; racemes densely many-flowered: calyx 2.5–3 mm. long: wing-petals 4–5 mm. long.—(HOP-CLOVER. YELLOW-CLOVER.)—Thickets, fields, and waste-places, various provinces, Ga. to Ia., Ont., and N. S. Nat. of Eu.

12. **LOTUS** [Tourn.] L. Herbs with diffusely spreading branches. Leaflets 3: blades entire. Flower-clusters long-peduncled. Calyx obscurely 2-lipped: lobes slightly unequal, long and narrow. Corolla yellow or reddish: standard with a broad blade: other petals slender-clawed, the blades of the wings prominently auricled: keel-petals strongly curved, very broad.—About 70 species, widely distributed in the Old World.

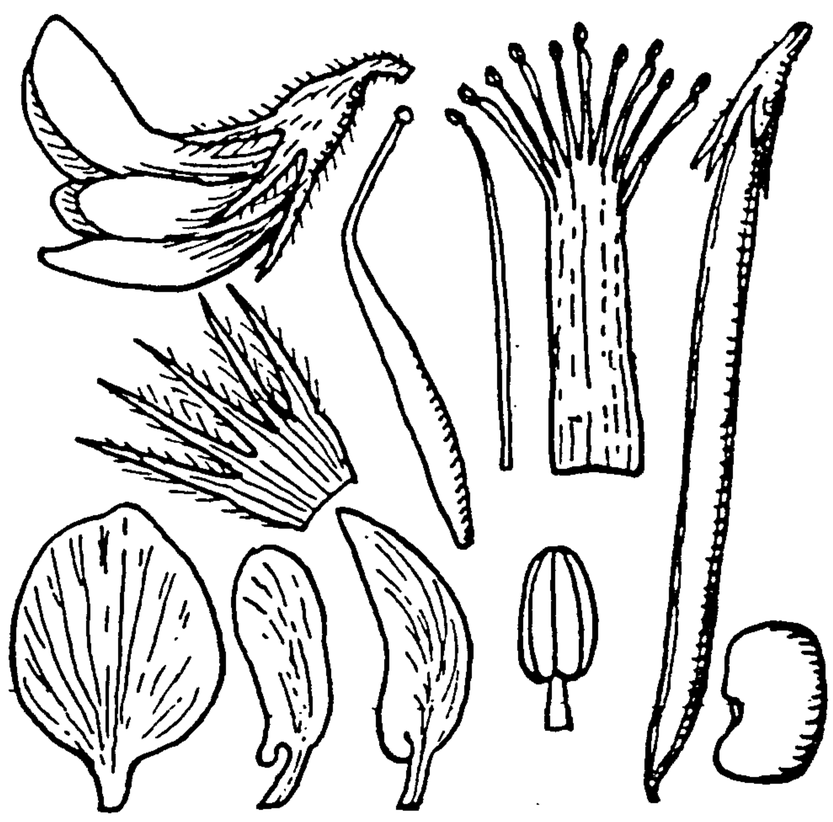


1. L. corniculatus L. Plant perennial, with several or many decumbent or ascending branches, 1–6 dm. long: leaflets 3; blades obovate to elliptic, 6–17 mm. long: calyx 8–9 mm. long; lobes subulate, the larger ones as long as the tube or nearly so: corolla bright-yellow, or partly reddish; standard 11–13 mm. long; blade cuneate to reniform: pod 2–2.5 cm. long, the body narrowly linear, with a slender-subulate beak.—(BIRD'S-FOOT TREFOIL. CAT-CLOVER. GROUND-HONEYSUCKLE.)—Waste-places and ballast, Coastal Plain, Atlantic and Gulf States. Nat. of Eurasia.

13. ACMISPON Raf. Annual or perennial herbs or woody plants. Leaflets 3, pinnate, or solitary. Flowers solitary, axillary. Calyx-lobes nearly equal, usually elongate. Corolla usually pinkish; standard with a broad blade and a short claw: other petals with distinct claws, the blades slightly auricled: keel-petals scythe-shaped.—Six or 8 species, mostly in western North America.

Calyx-lobes less than twice as long as the tube, not surpassing the wings. 1. *A. Helleri.*

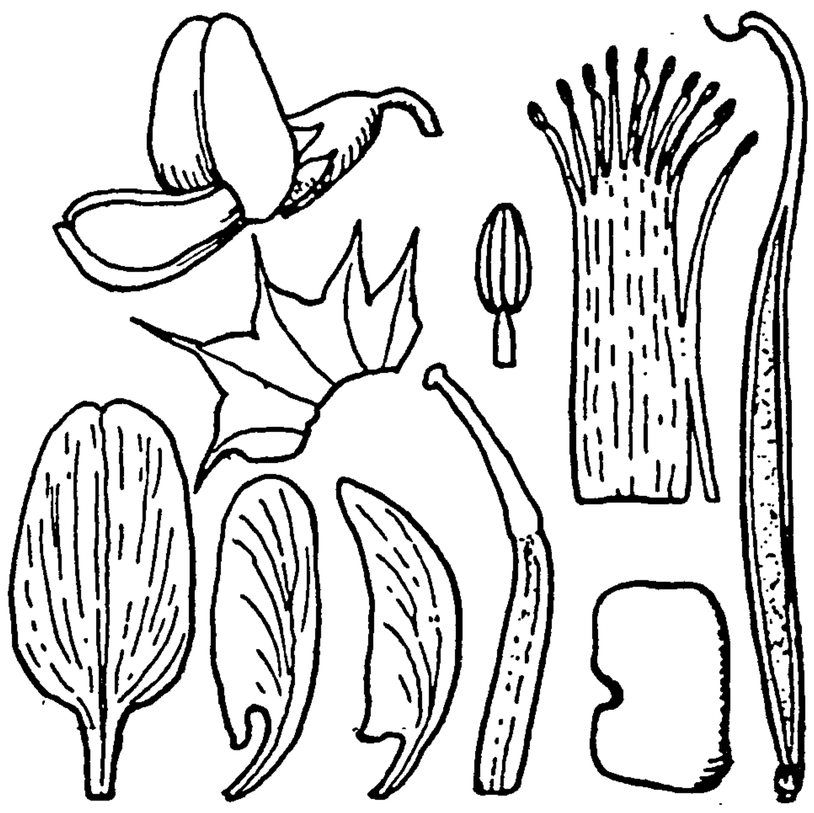
Calyx-lobes fully twice as long as the tube, surpassing wings. 2. *A. americanum.*



1. A. Helleri (Britton) Small. Plant 2–6 dm. tall, the branches glabrous or minutely pubescent: leaflets 5–15 mm. long; blades mostly linear to linear-elliptic: calyx-tube glabrous: claws of the keel-petals about ⅓ as long as the blades. [*Hosackia Purshiana* (Chapm. Fl.)]—Pinelands, Piedmont, S. C. and N. C.—Sum.

2. A. americanum (Nutt.) Rydb. Plant 2–6 dm. tall, the branches villous: leaflets 8–25 mm. long; blades mostly elliptic to ovate: calyx-tube densely pubescent: claws of the keel-petals about ¼ as long as the blade.—Dry soil, various provinces, Tex. to Calif., Wash., and Minn., eastward to Ala.—Sum.–fall.

14. BONAVERIA Scop. Herbs with diffuse branches and nearly glabrous foliage. Leaflets several, pinnate: blades entire. Flowers in peduncled heads. Calyx short, the lobes about as long as the tube, the 2 upper ones decidedly united. Corolla yellow: standard broad, longer than the other petals, clawed: wings longer than the incurved keel. Pod elongate, falcate, flat, slender-beaked.—One species.



1. B. Securidàca Scop. Plants mostly 1 m. tall or less: leaflets 1–2.5 cm. long; blades cuneate to elliptic-cuneate, rounded, or truncate and apiculate at the apex: peduncles pubescent near the base: calyx 2.5–3 mm. long; lobes of the lower lip lanceolate-acuminate: standard oval, 6–8.5 mm. long: pod 6–9 cm. long, the slender beak hooked

at the apex.—Waste-places and roadsides, Coastal Plain, S. C. Nat. of Eu.—Spr.–sum.

15. **AMORPHA** L. Shrubs. Leaflets several or many, dotted: blades entire or nearly so. Racemes spike-like. Calyx 2-lipped, sometimes obscurely so. Standard erect, the broad blade folded around the androecium and gynoecium. Wings and keel-petals wanting. Filaments united at the base. Style pubescent, straight. Pod turgid, nearly indehiscent. About 20 species, North American.—LEAD-PLANTS. PLUME-LOCUSTS.—Several species are grown as ornamentals.

Calyx-lobes lanceolate to subulate, at half as long as the tube. I. CANESCENTES.
Calyx-lobes short, the upper deltoid or half-round.
  Branches, petioles, leaf-rachis, peduncle, and upper surface of the leaflets glabrous or nearly so.
    Calyx-lobes very short, almost obsolete, separated by broad sinuses. II. GLABRAE.
    Calyx-lobes prominent, the upper broad, the lower narrow. III. CAROLINIANAE.
  Branches, petioles, leaf-rachis, peduncle, and leaflets manifestly pubescent, at least when young.
    Petioles very short, less than the width of the leaflets, the lowest pair of leaflets therefore close to the stem: pod 5 mm. long or less. IV. HERBACEAE.
    Petioles longer than the width of the leaves: pod 6 mm. long or more.
      Pod nearly straight on the back: leaflets mostly subcoriaceous or membranous in *A. Bushii*. V. VIRGATAE.
      Pod curved on the back: leaflets membranous. VI. FRUTICOSAE.

I. CANESCENTES

Calyx-lobes fully half as long as the tubes: leaflets canescent beneath: racemes clustered. 1. *A. canescens.*
Calyx-lobes fully as long as the tube: leaflets brown-villous beneath: racemes single or two together. 2. *A. Schwerini.*

II. GLABRAE

A glabrous or sparingly pubescent shrub with broad leaflets and a short campanulate calyx. 3. *A. glabra.*

III. CAROLINIANAE

Pod curved, narrow, scarcely punctate: blades of the leaflets broadest below the middle, pubescent beneath. 4. *A. nitens.*
Pod straight on the back, broad, conspicuously punctate: blades of the leaflets broadest at the middle or above it, glabrous.
  Calyx with numerous conspicuous glands: pod 4–7 mm. long.
    Corolla bluish: blades of the leaflets elliptic, rounded or obtuse at both ends: racemes mostly single: pods glandular throughout.
      Lower calyx-lobes lanceolate or subulate-lanceolate: standard truncate and retuse at the apex: pod with a lateral beak. 5. *A. cyanostachya.*
      Lower calyx-lobes deltoid: standard rounded at the apex: pod with a nearly centric beak. 6. *A. Dewinkeleri.*
    Corolla white: blades of the leaflets linear-elliptic, acute, at least at the base: racemes usually clustered: pod glandular above the middle. 7. *A. crenulata.*
  Calyx with few inconspicuous glands: pod 7–8 mm. long. 8. *A. Curtissii.*

IV. HERBACEAE

Calyx-tube densely pubescent: pod straight on the dorsal suture. 9. *A. herbacea.*
Calyx-tube glabrous: pod curved on the dorsal suture. 10. *A. floridana.*

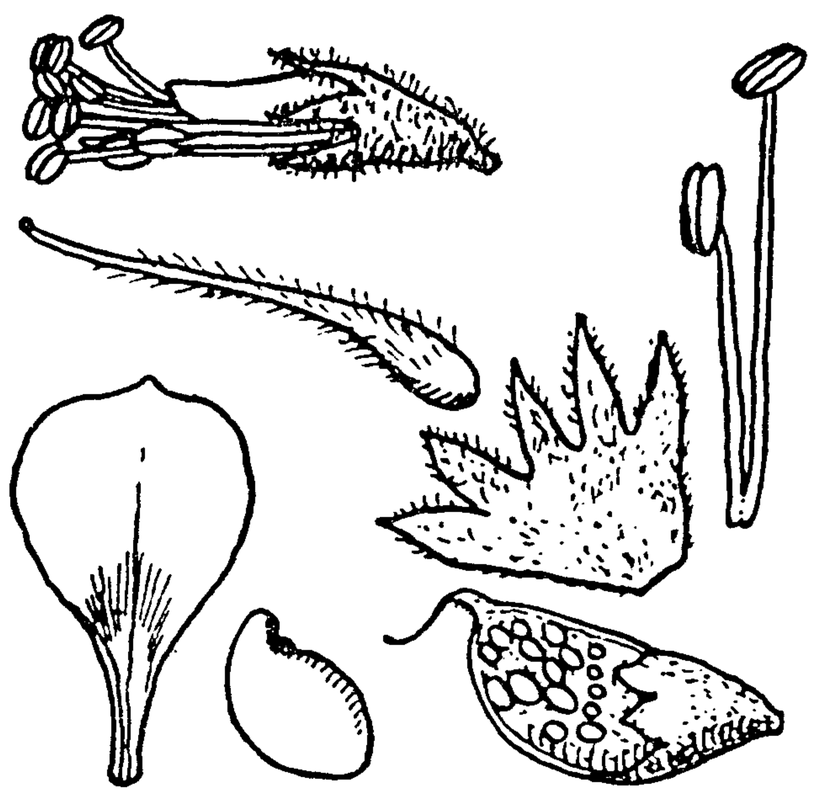
V. VIRGATAE

Blades of the leaflets coriaceous, shining above, reticulate at maturity. 11. *A. virgata.*
Blades of the leaflets membranous, dull, not reticulate. 12. *A. Bushii.*

VI. FRUTICOSAE

Pod narrow, about 2 mm. wide, slightly curved. 13. *A. tennesseensis.*
Pod broad, about 3 mm. wide, strongly curved.
  Foliage sparsely pubescent with gray hairs. 14. *A. fruticosa.*
  Foliage copiously pubescent, especially when young, with orange or yellow hairs. 15. *A. croceolanata.*

1. A. canescens Pursh. Stem 3–9 dm. tall, white-canescent: leaflets 15–47; blades oval to ovate-lanceolate, 0.9–1.8 cm. long, subacute: racemes dense, clustered, 5–18 cm. long, the flowers on very short pedicels: calyx about 5 mm. long; lobes subulate-lanceolate, nearly equal, 2–2.5 mm. long: standard obovate or broadly spatulate, about 5 mm. long, light-blue: pod 3–4 mm. long, densely tomentose.—Dry prairies, various provinces, Tenn. to Tex., N. M., Man., and Ind.—Sum.



2. A. Schwerini C. K. Schneid. Stem 1–2 m. tall, with densely fine-pubescent branches: leaflets 11–23; blades elliptic to ovate-elliptic, 0.8–3 cm. long, rounded or notched at both ends, copiously soft-pubescent beneath: racemes solitary or two together, 4–6 cm. long, copiously pubescent: calyx 4.5–5.5 mm. long; lobes pubescent, subulate, longer than the tube; standard obovate, 4 mm. long, purplish: pod 5–5.5 mm. long, the dorsal edge straight. [*A. densiflora* F. E. Boynton.]—Rocky woods, Piedmont, N. C.—Sum.

3. A. glabra Desf. Stem 1–2 m. tall: leaflets 9–19; blades ovate, elliptic-ovate, or oval, 2–5 cm. long, glabrous on both surfaces, obtuse, often emarginate, rounded or subcordate at the base: racemes usually clustered, 6–15 cm. long, glabrous: calyx campanulate, about 3 mm. long; lobes very shallow and sparsely ciliate: standard orbicular, short-clawed, about 7 mm. long, purple: pod 7–8 mm. long, rounded on the ventral edge, nearly straight on the dorsal, light-brown, marked with few small glands. [*A. montana* F. E. Boynton.]—(MOUNTAIN-INDIGO.)—Dry soil and swamp-margins, various provinces, Ga. to Ala., Tenn., and N. C.—Spr.

4. A. nitens F. E. Boynton. Stem 1.5–3 m. tall, with glossy twigs: leaflets 7–19; blades elliptic-ovate or ovate, 2–6 cm. long, sparsely pubescent or glabrate beneath: racemes slender, usually solitary, 12–25 cm. long: calyx obconic, about 3 mm. long; lobes short and rounded or the three lower short-pointed, ciliate on the margins: standard purple: pod 5–7 mm. long, narrow, much-curved and nearly glandless. Swamps near Waynesboro, in the Coastal Plain of Ga.—Sum.

5. A. cyanostachya M. A. Curtis. Stem 1–2 m. tall: leaflets numerous; blades elliptic, usually broadly so, 0.9–1.8 cm. long, rounded at both ends, dotted with dark glands: racemes one or several, 9–20 cm. long, nearly glabrous: calyx about 3 mm. long; lobes ciliate, the two upper deltoid, the lower subulate-pointed: standard purple: pod 4–5 mm. long, rounded on the ventral edge, nearly straight on the dorsal, marked with numerous large dark glands. [*A. glabra* F. E. Boynton not Desf. *A. caroliniana* Rydb. not Croom.]—Stream-banks, woods, and dry ridges, various provinces, Fla. to Okla., N. D., and Ky.—Spr.–sum.

6. A. Dewinkeleri Small. Stem 1.5–2.5 m. tall: leaflets numerous; blades elliptic or nearly so, sometimes narrowly so, 1.5–2.5 cm. long, usually emarginate at the apex, with small glandular-dots: racemes mostly solitary, 1–1.5 dm. long, glabrous: calyx about 4 mm. long; lobes ciliolate, the two upper half-orbicular, the lower deltoid: standard dark-purple: pod about 6 mm.

long, rounded on the ventral suture, nearly straight on the dorsal, marked with rather numerous small dark glands.—Pinelands, hammocks, and prairies, S W pen. Fla.—Spr.

7. **A. crenulata** Rydb. Stem 1–1.5 m. tall, glabrous: leaflets 25–33; blades elliptic to linear-elliptic, 1.5–3.5 cm. long, acute, at least at the base, glandular-dotted beneath: racemes loosely clustered, 9–20 cm. long: calyx about 4 mm. long, the two upper lobes triangular-ovate, acuminate, the three lower lanceolate and subulate-tipped: standard cuneate-spatulate, about 6 mm. long, white: pod 6–7 mm. long, nearly straight on the dorsal suture, conspicuously glandular-dotted above the middle.—Pinelands and edges of hammocks, Everglade Keys, Fla.—Spr.–sum.

8. **A. Curtissii** Rydb. Stem 1–3 m. tall, glabrous: leaflets 11–21; blades elliptic or ovate, 1.8–4.5 cm. long, rounded and mucronate at the apex, reticulate, minutely glandular-punctate beneath: racemes clustered, 5–15 cm. long: calyx 3.5–4 mm. long, the two upper lobes rounded, the three lower lobes triangular, acute: standard broadly obovate, about 5 mm. long, purplish-blue: pod 7–8 mm. long, nearly straight on the dorsal side, conspicuously glandular-dotted.—River-banks and low grounds, Coastal Plain, Fla. to N. C.?—Sum.

9. **A. herbacea** Walt. Stem 3–8 dm. tall, grayish-pubescent: leaflets 11–37; blades elliptic or elliptic-ovate, 0.8–1.6 cm. long, obtuse: racemes clustered. 4–30 cm. long: calyx about 4 mm. long, the two upper lobes broader and shorter than the acute lower ones: standard broadly spatulate, 4–5 mm. long, varying from violet-purple to white: pod 4–5 mm. long, strongly curved on the ventral and nearly straight on the dorsal suture, marked with numerous small dark glands.—Pinelands, Coastal Plain, Fla. to N. C.—Sum.

10. **A. floridana** Rydb. Stem about 1 m. tall, sparingly short-villous: leaflets 27–41; blades elliptic or linear-elliptic, 0.9–2 cm. long, rounded at both ends, strongly reticulate, conspicuously glandular-dotted beneath: racemes clustered, 5–15 cm. long: calyx about 3 mm. long, the two upper lobes broadly triangular, acute, the three lower lobes triangular-lanceolate: standard broadly obovate-spatulate, 4 mm. long, light-purple or lavender: pod 4–5 mm. long, strongly curved on both sutures, marked with few large glands.—Sandy pinelands and about hammocks, N Fla.—Spr.–sum.

11. **A. virgata** Small. Stem 1–2 m. tall: leaflets 11–19; blades elliptic, elliptic-ovate, or ovate, 2–5 cm. long, nearly smooth above, sparsely pubescent beneath: racemes one or several, 8–15 cm. long: calyx about 3 mm. long, sparsely pubescent; lobes triangular, acute standard orbicular, about 6 mm. long, abruptly narrowed at the base, purple: pod 6–7 mm. long, rounded on the ventral edge, nearly straight on the dorsal, dark-brown, marked with small glands.—(MOUNTAIN-INDIGO.)—Dry woods, Coastal Plain to Appalachian Valley, N pen. Fla. to Ala. and Tenn.—Sum.

12. **A. Bushii** Rydb. Stem 1–2 m. tall, puberulent or glabrous in age: leaflets 15–25; blades elliptic to oval, 2.5–6 cm. long, rounded or retuse at the apex, finely pubescent beneath: racemes usually few together, 18–20 cm. long: calyx about 3 mm. long, the two upper lobes short, rounded, the three lower triangular, acute: standard purple: pod 6–7 mm. long, straight on the dorsal suture, inconspicuously glandular-punctate.—Banks of the Chattahoochee River, Fla.—Sum.

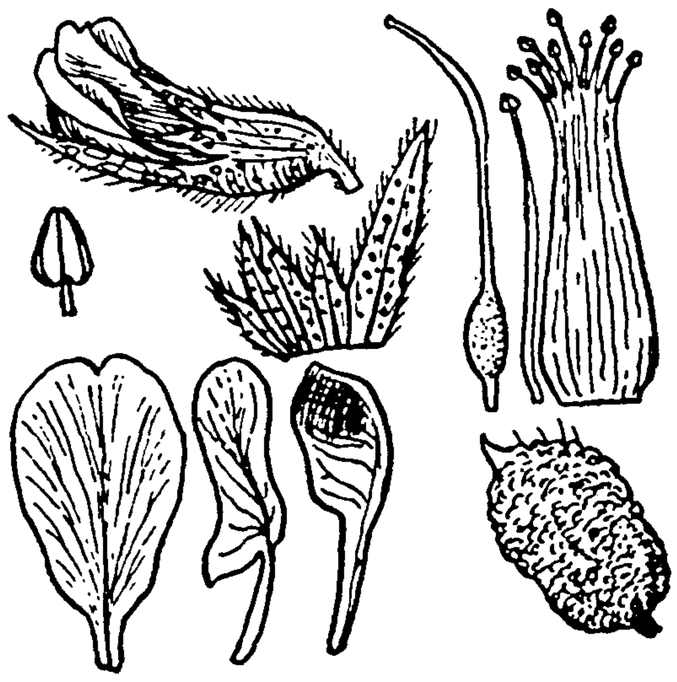
13. **A. tennesseensis** Shuttlw. Stem 1.5–6 m. tall: leaflets 13–35; blades elliptic to elliptic-ovate, 0.5–2 cm. long: racemes mostly clustered, 7–15 cm. long: calyx about 3 mm. long, the two upper lobes rounded, the three lower ones triangular, acute, the middle one a little longer than the others: standard obovate, narrowed into a claw-like base, about 4.5 mm. long, purple: pod 6–8 mm. long, slightly curved, marked with many raised glands.—(TENNESSEE-

INDIGO.)—Banks of streams, various provinces, rarely E of Blue Ridge, Ga. to La., Mo., and N. C.—Spr.

14. **A. fruticosa** L. Stem 1.5–6 m. tall: leaflets 11–25; blades elliptic-ovate, oval, or elliptic, 1.5–4 cm. long: racemes usually clustered, 7–15 cm. long: calyx about 3.5 mm. long, the two upper lobes rounded, the three lower ones triangular, acute, the middle one a little longer than the others: standard round-obovate, emarginate, abruptly narrowed at the base, about 6 mm. long, purple: pod 7–8 mm. long, usually much curved, conspicuously marked with large amber-colored, raised glands,—(INDIGO-BUSH.)—Swamps and banks, especially in calcareous regions, various provinces, Fla. to La., Minn., and Conn.—Sum.

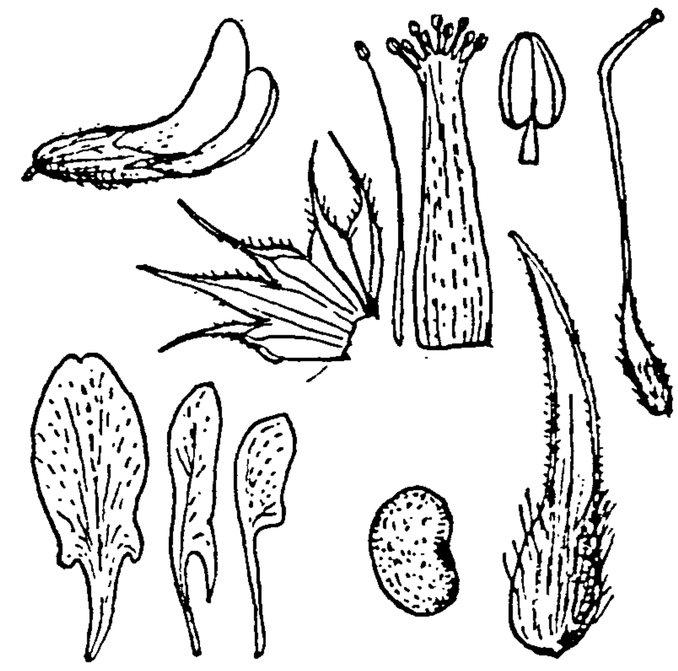
15. **A. croceolanata** Wats. Stem 1–2 m. tall, or rarely more, densely pubescent with orange-colored hairs: leaflets 19–29; blades elliptic to lanceolate-elliptic, 1.8–5 cm. long, rounded at each end, sometimes mucronate at the apex, softly pubescent with yellowish or orange-colored hairs, at least when young: racemes usually 2–4 together, 7–18 cm. long: calyx 3.5–4 cm. long, the two upper lobes short and rounded, the three lower lobes triangular, acute: standard broadly obovate-cuneate, 4–6 mm. long, retuse, blue: pod 7–9 mm. long, more or less curved on the dorsal suture, conspicuously glandular-dotted.—Stream-banks, borders of lakes, hammocks, and low woods, Coastal Plain, Fla. to La. and Ga.—Spr.-sum.—Rarely grows as a small tree in pen. Fla.

16. **CULLEN** Medic. Annual or perennial herbs, sometimes partly woody at the base. Leaflets 1 or 3: blades coarsely toothed, glandular-dotted. Spikes axillary, peduncled. Calyx glandular-punctate: tube campanulate: lobes 5, the lowest lobe the longest. Corolla scarcely longer than the calyx: wings about equalling the standard. Pod short, glandular-warty, the short erect beak persistent.—Three species, natives of the Old World.



1. **C. americanum** (L.) Rydb. Stem 6–12 dm. long, pubescent: leaflets 3; blades suborbicular or rhombic-orbicular in outline, crenate, 1.5–3.5 cm. long: upper calyx-lobes broadly lanceolate; lower lobe conspicuously longer and broader than the lateral ones: corolla mainly white; standard 4–5.5 mm. long, the blade obovate, purple-spotted at the apex: pod elliptic or ovate, about 3 mm. long. [*Psoralea americana* L.]—Waste-places, Coastal Plain, Fla. to Miss. Nat. of Madeira and Spain.—The species name was given through error.

17. **ASPHALTHIUM** Medic. Perennial glandular-dotted herbs. Leaflets 3: blades rather narrow, entire. Spikes head-like, long-peduncled. Calyx obscurely glandular-punctate: tube campanulate: lobes narrow, the lower one longer than the others. Corolla about twice as long as the calyx: wings shorter than the standard. Pods not conspicuously warty, the long flat beak ultimately deciduous.—About 3 species, natives of Eurasia.



1. **A. bituminosum** (L.) Kuntze. Stem 4–11 dm. tall, sometimes decumbent, strigose: leaflets 4–6 cm. long, blades lanceolate, veined, acute: spikes 15–25 cm. long: calyx strigose; lobes subulate-lanceolate, the lower one much longer than the tube: corolla lilac or pink,

and the keel usually purple-tipped; standard 12–17 mm. long, the blade narrowly obovate: pod 12–14 mm. long, lanceolate in outline. [*Psoralea bituminosum* L.]—Waste-places, Coastal Plain, Fla. to La. Nat. of O. W.—Sum.–fall.

18. **ORBEXILUM** Raf. Perennial herbs with rootstocks or fusiform roots, rarely woody at the base. Leaflets 1 or 3 or rarely 5: blades entire. Spikes or racemes long-peduncled. Calyx usually glandular-dotted: tube campanulate: lobes narrow or broad, the lower one often the longest. Corolla longer than the calyx, mostly blue or purple: standard with a broad blade: wings longer than the standard. Pod short, not included, cross-wrinkled, the beak incurved.—Eight species, North American.

Pod obliquely ovoid: plants with rootstocks: blades of the leaflets of the upper leaves ovate to ovate-lanceolate. I. MACROPHYLLA.
Pod subglobose: plants with fusiform roots: blades of the leaflets of the upper leaves linear to linear-lanceolate, lanceolate, or narrowly elliptic. II. VIRGATA.

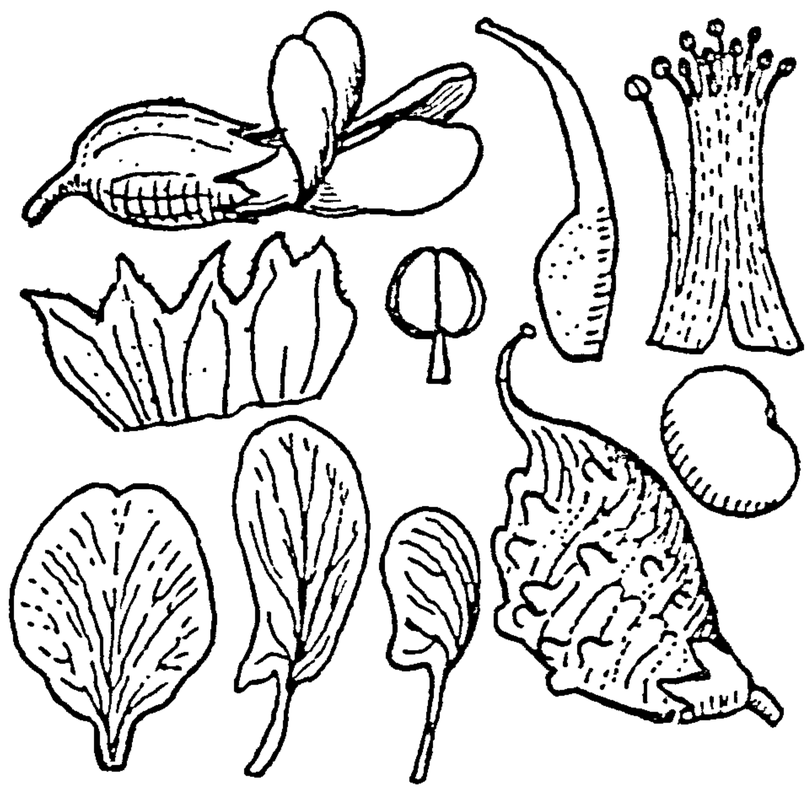
I. MACROPHYLLA

Blades of the leaflets rounded at the base: wing-petals 6–7 mm. long. 1. *O. Onobrychis.*
Blades of the leaflets cordate or truncate at the base: wing-petals 8–9 mm. long. 2. *O. macrophyllum.*

II. VIRGATA

Leaves mostly 1-foliolate. 3. *O. virgatum.*
Leaves 3-foliolate.
  Bracts lanceolate: corolla 7–9 mm. long. 4. *O. simplex.*
  Bracts broadly ovate: corolla 4–6 mm. long.
    Calyx obscurely glandular-dotted; upper lobes lanceolate, longer than the tube. 5. *O. pedunculatum.*
    Calyx conspicuously glandular-dotted; upper deltoid, shorter than the tube. 6. *O. gracile.*

1. O. Onobrychis (Nutt.) Rydb. Plant 9–20 dm. tall: leaflets 3; blades ovate to ovate-lanceolate, 3–12 cm. long: calyx-lobes ovate or deltoid, obtuse, shorter than the tube: standard 3–4 mm. long: ovary glabrous: pod 8–10 mm. long, sharp-beaked, reticulate.—[*Psoralea Onobrychis* Nutt.]—Along streams, interior provinces, Tenn. to Mo. and Ohio.—Sum.



2. O. macrophyllum (Rowlee) Rydb. Plant 5–9 dm. tall: leaflets 3; blades broadly ovate, 6–10 cm. long: calyx-lobes lanceolate, acuminate, longer than the tube: standard 8–9 mm. long: ovary pubescent: pod not seen.—[*Psoralea macrophylla Rowlee*]—Woods, Tryon Mt. in the Blue Ridge, N. C.—Spr.–sum.

3. O. virgatum (Nutt.) Rydb. Plant 3–7 dm. tall, strigillose: leaflets mostly 1; blade linear, often narrowly so, or the lower ones elliptic or ovate-elliptic, 5–8 cm. long: lateral calyx-lobes lanceolate to elliptic-lanceolate, acuminate; lower lobe slightly longer and narrower: corolla purplish; standard 5–6 mm. long, the blade broadly cuneate: pod about 4 mm. long, much exceeding the calyx, the minute beak lateral. [*Psoralea virgata* Nutt.]—Pinelands, Coastal Plain, Fla. and Ga.—Spr.–sum.

4. O. simplex (Nutt.) Rydb. Plant 3–9 dm. tall, softly strigillose: leaflets 3; blades linear-lanceolate to linear or narrowly linear-elliptic, 2–7 cm. long: lateral calyx-lobes ovate, acute; lower lobe longer and broader: corolla purple; standard 7–9 mm. long, the blade broadly cuneate, inequilateral: pod about

4 mm. long, about equalling the calyx, the minute beak eccentric. [*Psoralea simplex* Nutt.]—Moist woods and thickets, Coastal Plain and rarely adj. provinces, Ala. to Tex. and Okla.—Sum.

5. **O. pedunculatum** (Mill.) Rydb. Plant 3–8 dm. tall: leaflets 3; blades lanceolate to narrowly elliptic, or those of the lower ones obovate, oval, elliptic, or elliptic-lanceolate, 3–7 cm. long: calyx strigose-hirsute; upper lobes lanceolate, longer than the tube: corolla purplish; standard 5–7 mm. long, the blade ovate, rounded: pod about 4 mm. long, less than twice as long as the calyx. [*Psoralea pedunculata* Vail]—CONGO-ROOT. SAMPSON'S SNAKEROOT.)—Dry woods, various provinces, Fla. to Tex., Kans., Ind., and Va.—Spr.–sum.

6. **O. gracile** (Chapm.) Rydb. Plant 2–7 dm. tall: leaflets 3; blades lanceolate to elliptic-lanceolate, or some of the lower ones narrowly elliptic or broadened upward, 1.5–5 cm. long: calyx slightly strigillose; upper lobes deltoid or triangular-ovate, shorter than the tube: corolla purplish; standard 4–5 mm. long; blade suborbicular: pod about 4 mm. long, more than twice as long as the calyx. [*Psoralea gracilis* Chapm.]—Pinelands, Coastal Plain, Fla., and Ga.—Spr.–sum.

19. **RHYTIDOMENE** Rydb. Perennial herbs with rootstocks and gland-dotted foliage. Leaflets 5 or 7: blades very slender. Racemes axillary, long-peduncled, lax. Calyx with 5 lobes, all broad except the lower one. Corolla blue or violet, longer than the calyx: standard with a very broad blade: wings slightly longer than the standard. Pod crescent-shaped, exserted, somewhat twisted, obliquely cross-wrinkled, short-beaked.—One species.

1. **R. Lupinellus** (Michx.) Rydb. Plant 2–6 dm. tall, glabrous or obscurely pubescent about the stem-nodes: leaflets 5–7; blades linear-filiform, 3–8 cm. long: upper calyx-lobes deltoid; lower one lanceolate, twice as long as the others: standard 4.5–6 mm. long, the blade suborbicular: pod about 10 mm. long. [*Psoralea Lupinellus* Michx.]—Sandhills and dry pinelands, Coastal Plain, C Fla. to N. C.—Spr.–sum.

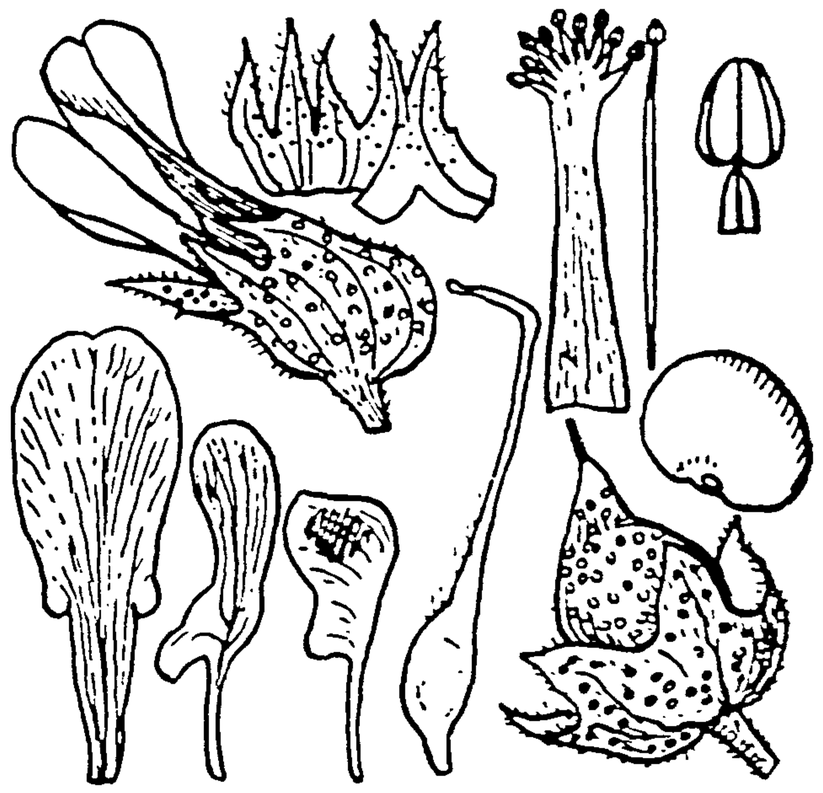
20. **PEDIOMELUM** Rydb. Perennial herbs with deep-seated tuberous roots. Leaflets 3–7, digitate: blades glandular-punctate. Spikes or racemes dense, peduncled. Calyx somewhat 2-lipped: tube campanulate, gibbous at the base on the upper side: lobes 5, the lower one the longest: corolla blue or purple, longer than the calyx: standard with a broad blade: wings much shorter than the standard. Pod exserted from the calyx, the body broad, compressed, beaked.—About 22 species, North American.

Stem erect, elongate, with alternate branches: blades of the leaflets broad: standard with a pair of callous spurs at the base of the blade: pod glabrous. 1. *P. canescens.*

Stem very short, a mere caudex on which the leaves and flower-stalks are clustered: blades of the leaflets narrow: standard without spurs: pod strigose. 2. *P. subacaulis.*

1. **P. canescens** (Michx.) Rydb. Plant 3–9 dm. tall, bushy-branched, canescent: leaflets 1 or 3; blades obovate or oval to suborbicular, 1.5–6 cm. long:

upper calyx-lobes lanceolate or elliptic-lanceolate, acuminate; lower lobe longer than the others, narrow, longer than the tube: corolla blue, turning greenish; standard 8–11 mm. long, the blade obovate: pod 9–11 mm. long; body reticulate. [*Psoralea canescens* Michx.] —Dry pineland and oak ridges, Coastal Plain, C Fla. to Ala. and N. C.—Spr.–sum.

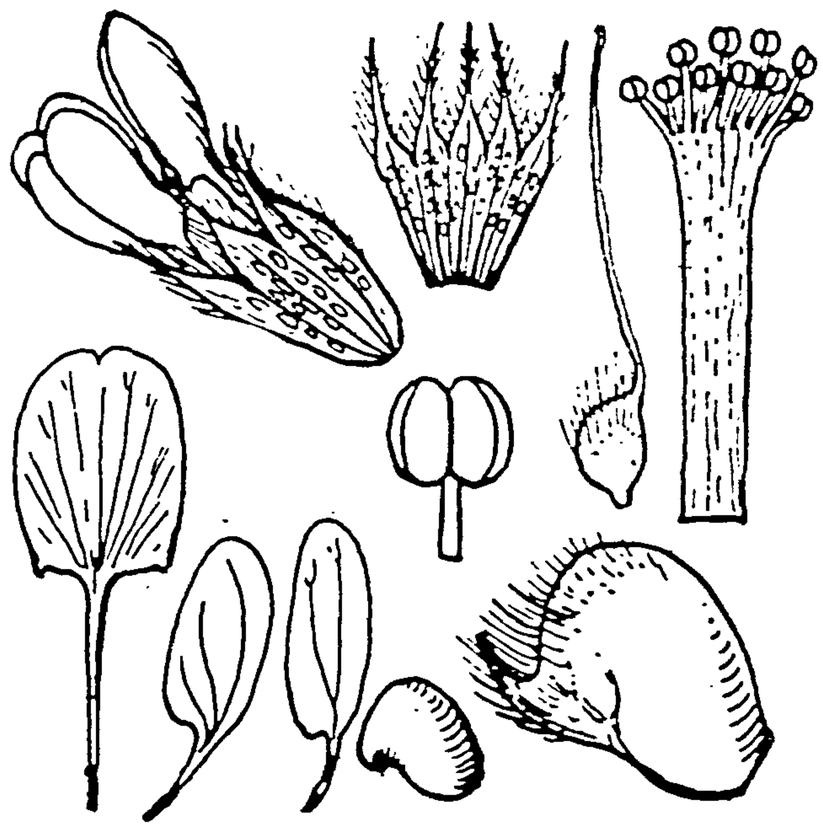


2. P. subacaulis (T. & G.) Rydb. Plant 1–2 dm. tall, hirsute: leaflets 5–7; blades narrowly elliptic or elliptic-oblanceolate to obovate-elliptic, 1.5–3 mm. long: upper calyx-lobes ovate to deltoid, acute; lower lobe dilated, obtuse; all shorter than the tube: corolla blue or purple; standard 12–15 mm. long, the blade narrowly obovate: pod 8–9 mm. long; body not reticulate. [*Psoralea subacaulis* T. & G.]—Rocky limestone soil, cedar glades, in the Interior Low Plateau, Tenn.—Spr.—The plants of *P. canescens* have the habit of species of *Baptisia;* those of *P. subacaulis* that of species of *Lupinus.*

21. PAROSELA Cav. Shrubs or herbs. Leaflets numerous, few or 3. Spikes slender or stout. Calyx nearly regular or the lower lobe elongate. Petals purple or yellow, or white. Standard with a broad, often cordate blade. Wings and keel-petals with broad blades auricled on one side. Filaments united nearly to the top. Pod oblique, mostly included in the calyx.—About 150 species, American.

Plant annual: calyx-lobes shorter than the tube. 1. *P. alopecuroides.*
Plant perennial: calyx-lobes longer than the tube.
  Herb with a tap-root: spikes elongate: blades of the leaflets narrow: calyx plumose at maturity. 2. *P. enneandra.*
  Shrub: spikes short and thick: blades of the leaflets broad: calyx not plumose. 3. *P. floridana.*

1. P. alopecuroides (Willd.) Rydb. Plant 2–10 dm. tall: leaflets 15–41; blades elliptic, cuneate, or oblanceolate, 3–8 mm. long: spikes continuous: bracts ovate to lanceolate: calyx-lobes shorter than the tube: corolla white, tinged with rose or lilac; standard 5–6 mm. long, the blade ovate, shorter than the claw: pod obovoid, 2–2.5 mm. long. [*Dalea alopecuroides* Willd. *P. Dalea* (Fl. SE. U. S.)]—Dry soil, stony hills, sandy bottoms, roadsides, and waste-places, various provinces, Ala. to N. M., S. D., and Ill.—Spr.–fall.



2. P. enneandra (Nutt.) Britton. Plant 3–12 dm. tall, glabrous: leaflets 5–11: blades linear-elliptic to cuneate-oblanceolate, 5–10 mm. long: bracts suborbicular, copiously glandular: calyx-lobes long-hairy: corolla white; standard 6–7 mm. long, the blade about 4 mm. wide: stamens 9: pod about 3 mm. long, longer than wide. [*Dalea enneandra* Nutt.]—Prairies and stony hills, various provinces, Miss. to N. M., N. D., and La.—Spr.–sum.

3. P. floridana Rydb. Plant 8–30 dm. tall, velvety-pubescent: leaflets 13–15; blades oval, elliptic, obovate, or cuneate, 4–8 mm. long, or rarely longer:

bracts ovate, sparingly glandular: calyx-lobes short-hairy: corolla white or yellowish, or pink, turning deeper; standard 4–5 mm. long, the blade about 3 mm. wide: stamens 10: pod about 2 mm. long, as wide as long. [*P. domingensis* (Fl. SE. U. S.)]—Hammocks and adj. pinelands, Everglade Keys, pen. Fla.—All year.

22. **PETALOSTEMON** Michx. Herbs. Leaflets few or numerous. Spikes dense. Calyx-lobes broad, or broad at the base. Standard with a short broad blade. Filaments united to above the middle. Pod short, oblique, included in the calyx.—About 50 species, North American.—Some of the species are very showy when in flower and are frequently to be seen in gardens.

Calyx glabrous, or the lobes merely ciliate.
  Cauline leaves with 3–11 leaflets.
    Standard-blade elliptic to orbicular: calyx not strongly 10-ribbed. — I. CARNEI.
    Standard-blade cordate or reniform: calyx strongly 10-ribbed. — II. CANDIDI.
  Cauline leaves with 11–37 leaflets. — III. FOLIOSI.
Calyx densely pubescent, at least on the angles and the lobes. — IV. PURPUREI.

I. CARNEI

Spikes ellipsoid or cylindric: bracts nearly or quite as long as the calyx.
  Corolla white.
    Stem and elongate branches decumbent: leaves remote, not clustered, shorter than the internodes: spikes inconspicuously bracted, the bracts about equalling the calyces. — 1. *P. gracilis.*
    Stem and branches erect or ascending: leaves more numerous, usually equalling the internodes, with clustered secondary ones in their axils: spikes conspicuously bracted, the bracts exceeding the calyces. — 2. *P. albidus.*
  Corolla rose or deep-pink. — 3. *P. carneus.*
Spikes globose: bracts much shorter than the calyx. — 4. *P. Feayi.*

II. CANDIDI

Conspicuously leafy plant, with narrowly cylindric spikes, the main one often elongate, the bracts with dilated bodies and slender tips. — 5. *P. candidus.*

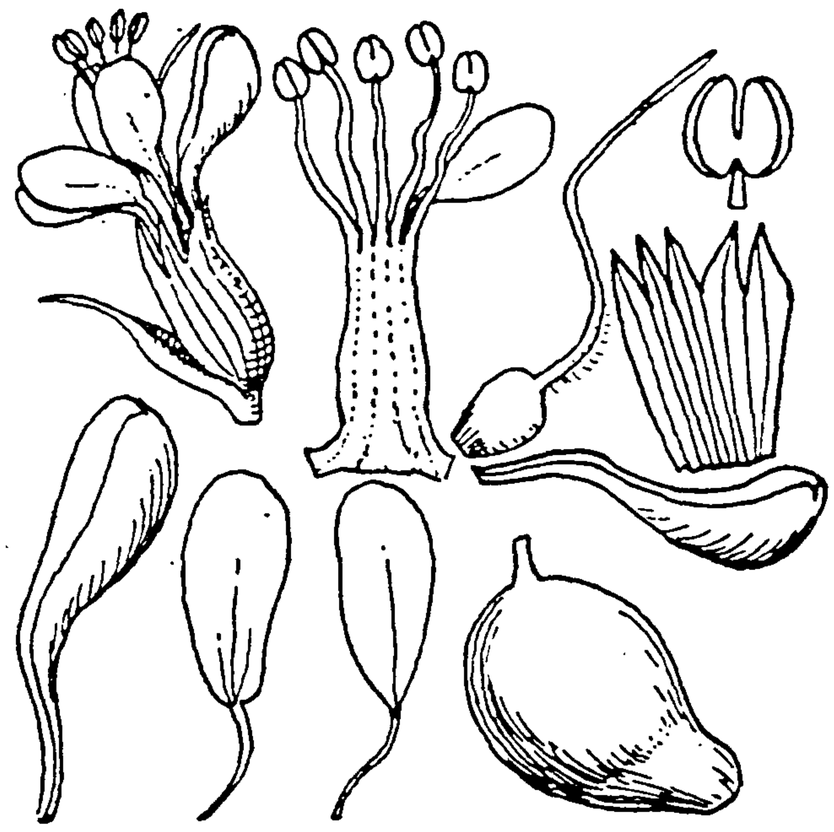
III. FOLIOSI

Copiously leafy plant, with stout cylindric spikes, the bracts slightly dilated above the stipe-like base and terminated by caudate tips. — 6. *P. foliosus.*

IV. PURPUREI

Calyx appressed-pubescent: spikes compact: bracts with narrow bases and pubescent acuminate tips. — 7. *P. purpureus.*
Calyx loosely pubescent: spikes not compact: bracts with broad bases and caudate pubescent tips. — 8. *P. Gattingeri.*

1. P. gracilis Nutt. Plant 3–6 dm. tall: leaflets 5–7; blades linear or linear-elliptic, or rarely elliptic-oblanceolate, 6–12 mm. long: calyx-lobes acute, about ½ as long as the tube: standard about 3 mm. long; blade obovate to cuneate: gynoecium glabrous or nearly so: pod less than 2 mm. long, glabrous.—Sandy pinelands, Coastal Plain, Fla. to Miss.—Spr.–sum.



2. P. albidus (T. & G.) Small. Plant 6–10 dm. tall: leaflets 5–7; blades elliptic to oblanceolate, 4–8 mm. long, acute: calyx-lobes acute, about ½ as long as the tube: standard about 4 mm. long; blade ovate to orbicular-ovate, notched: gynoecium pubescent: pod over 2 mm. long, pubescent.—Dry sand and pinelands, Coastal Plain, Fla., Ala. and Ga.—Sum.

3. **P. carneus** Michx. Plant 3–10 dm. tall: leaflets 5–9; blades linear, linear-elliptic, or linear-oblanceolate, 5–10 mm. long: calyx 3–3.5 mm. long: corolla rose or deep-pink: standard about 4 mm. long; blade oval or orbicular-ovate: gynoecium pubescent: pod curved, about 3 mm. long, exserted beyond the calyx-tube, pubescent at the apex. [*P. roseum* Nutt.]—Pinelands, scrub, and sand-dunes, Coastal Plain, Fla., Ala., and Ga.—Spr.–fall.

4. **P. Feayi** Chapm. Plant 2–5 dm. tall: leaflets mostly 3–11; blades linear, but strongly involute, 8–18 mm. long: calyx 3.5–4 mm. long: corolla deep-pink or lavender: standard about 4 mm. long; blade broadly ovate: gynoecium glabrous: pod straight, about 3 mm. long, exserted beyond the calyx-lobes, glabrous.—Dry pinelands and scrub, Coastal Plain, C pen. Fla. and S Ga.—Spr.–sum.

5. **P. candidus** (Willd.) Michx. Plant 3–7 dm. tall: leaflets 7–9; blades linear, elliptic, oblanceolate, or obovate-oblanceolate, 9–30 mm. long: lower calyx-lobes more than ½ as long as the tube: standard 4–5 mm. long; blade suborbicular or orbicular-reniform, cordate at the base: gynoecium sparingly pubescent: pod curved, 2–2.5 mm. long, sparingly pubescent.—(WHITE-PRAIRIE-CLOVER. WHITE TASSELS.)—Dry soil, prairies, various provinces, Miss. to Tex., Sask., and Ind.—Sum.

6. **P. foliosus** A. Gray. Plant 3–9 dm. tall: leaflets 13–31; blades elliptic to elliptic-oblanceolate, 3–11 mm. long: calyx about 4 mm. long; lobes lanceolate or triangular-lanceolate, acute: corolla rose-purple: standard 4.5–5.5 mm. long; blade suborbicular or ovate-orbicular: gynoecium glabrous: pod straight, 2 mm. long, turgid on the upper side, glabrous.—River banks, Interior Low Plateau, Tenn. to Ill.—Sum.

7. **P. purpureus** (Vent.) Rydb. Plant 3–9 dm. tall: leaflets 3–5; blades narrowly linear or slightly broadened upward, 8–20 mm. long: calyx about 4 mm. long; lobes triangular to lanceolate, slightly acuminate: corolla violet or rose-purple: standard 5–6 mm. long; blade orbicular-reniform: gynoecium minutely pubescent: pod nearly as wide as long, 2–2.5 mm. long, minutely pubescent.—(PURPLE-TASSELS.)—Prairies, plains, and hills, various provinces, Ala, to N. M., Sask., and Tenn.—Sum.

8. **P. Gattingeri** Heller. Plant 2–5 dm. tall: leaflets 5–7; blades narrowly linear to linear-elliptic, 9–20 mm. long: calyx nearly 4 mm. long, villous-pilose; broader lobes triangular, acute, narrower ones lanceolate: corolla rose-purple; blade of the standard orbicular-reniform: gynoecium coarsely pubescent: pod ovate, about 2.5 mm. long, pilose. [*P. decumbens* (Chapm. Fl.)]—Rocky calcareous prairies, cedar-glades, and grassy hillsides, Interior Low Plateau, Ala. and Tenn.—Spr.–sum.

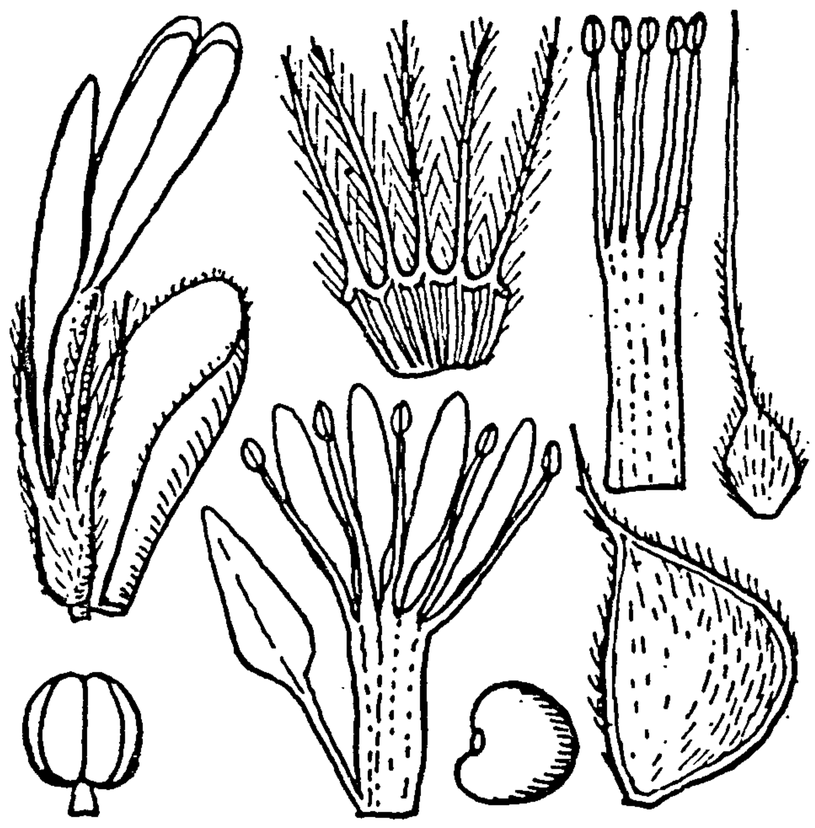
23. **KUHNISTERA** Lam. Perennial herbs. Leaflets few or several. Spikes mostly depressed-corymbose, resembling heads of *Carduaceae.* Flowers white. Calyx-lobes setaceous. Standard with a narrow tapering blade. Filaments united to below the middle. Pod as in *Petalostemon.*—Three species.—Sum.–fall.—The fruiting heads, persistent into the winter, are gray as a result of the copiously pubescent calyx-lobes.

Blades of the leaflets linear-clavate to filiform, acute: involucres 6–7 mm. high. — 1. *K. pinnata.*

Blades of the leaflets elliptic to elliptic-oblanceolate or obovate, or sometimes spatulate, obtuse: involucres narrowly 9–11 mm. high.

- Inner bracts of the involucre elliptic or elliptic-oblanceolate, mucronate, copiously ciliate. — 2. *K. truncata.*
- Inner bracts of the involucre lanceolate, acuminate, sparingly ciliate. — 3. *K. adenopoda.*

1. **K. pinnata** (Walt.) Kuntz. Plant 3–12 dm. tall: leaflets 3–7; blades linear-clavate to filiform, finely glandular-dotted, 5–12 mm. long: spikes usually several or many: bracts ciliate, the inner oval to elliptic, 5–6 mm. long: calyx-lobes filiform-setaceous, much longer than the tube, plumose: standard 6–8 mm. long; blade lanceolate: pod about 2 mm. long. [*Petalostemon corymbosus* Michx. *P. corymbosus trifoliatus* Chapm.]—(SUMMER-FAREWELL.)—Dry pinelands and sandhills, Coastal Plain, Fla. to Miss. and N. C.



2. **K. truncata** Small. Plant 7–10 dm. tall: leaflets mostly 5–7; blades narrowly elliptic to elliptic-obovate or obovate, coarsely glandular-dotted, 3–6 mm. long: heads few: involucre 10–11 mm. thick; bracts copiously ciliate, the inner elliptic or elliptic-oblanceolate, 7–8 mm. long, mucronate: standard blade elliptic-cuneate: pod 2.5 mm. long.—Pinelands and scrub, E pen. Fla.

3. **K. adenopoda** (B. L. Robinson) Rydb. Plant 5–10 dm. tall: leaflets mostly 5; blades elliptic to obovate, 4–10 mm. long, coarsely glandular-dotted, 4–10 mm. long: heads few: involucre 9–10 mm. thick; bracts sparingly ciliate, the inner lanceolate, 7–8 mm. long, acuminate: standard-blade elliptic: pod 2.5 mm. long.—Pinelands, Tampa Bay region, Fla.

24. **INDIGOFERA** L. Herbs or partly-woody plants. Leaflets several to many or rarely 3, or rarely solitary. Flowers in spikes or racemes. Calyx-lobes nearly equal, shorter than the tube, or elongate. Corolla often pink or salmon-pink: standard broad, scarcely clawed: wings with blades dilated at the apex and auricled at the base, short-clawed: keel-petals scimitar-shaped, gibbous or spurred on the side, clawless.—About 275 species, of temperate and tropical regions.—INDIGO-PLANTS.

Plant perennial.
  Calyx less than half the length of the corolla; lobes lanceolate to deltoid, not exceeding the tube in length.
    Pod ellipsoid or ovoid, turgid: seeds 2 or 3. I. DISPERMAE.
    Pod linear, curved or straight: seeds 3–12. II. TINCTORIAE.
  Calyx more than half the length of the corolla: lobes subulate or subulate-tipped, twice as long as the tube or more.
    Leaflets manifestly petioluled; blades rounded at the base. III. MUCRONATAE.
    Leaflets subsessile; blades acute at the base. IV. LEPTOSEPALAE.
Plant annual. V. PARVIFLORAE.

I. DISPERMAE

Tall slenderly branched herb with numerous thin leaflets and lax racemes. 1. *I. caroliniana.*

II. TINCTORIAE

Standard mostly between 4 and 5 mm. long: pod stout-linear, strongly curved, less than 2 cm. long. 2. *I. suffruticosa.*
Standard mostly between 5 and 6 mm. long: pod slender-linear, straight or slightly curved, over 2 cm. long. 3. *I. tinctoria.*

III. MUCRONATAE

Diffuse plant, the several stems spreading from the tap root: racemes elongate: pods deflexed. 4. *I. keyensis.*

IV. LEPTOSEPALAE

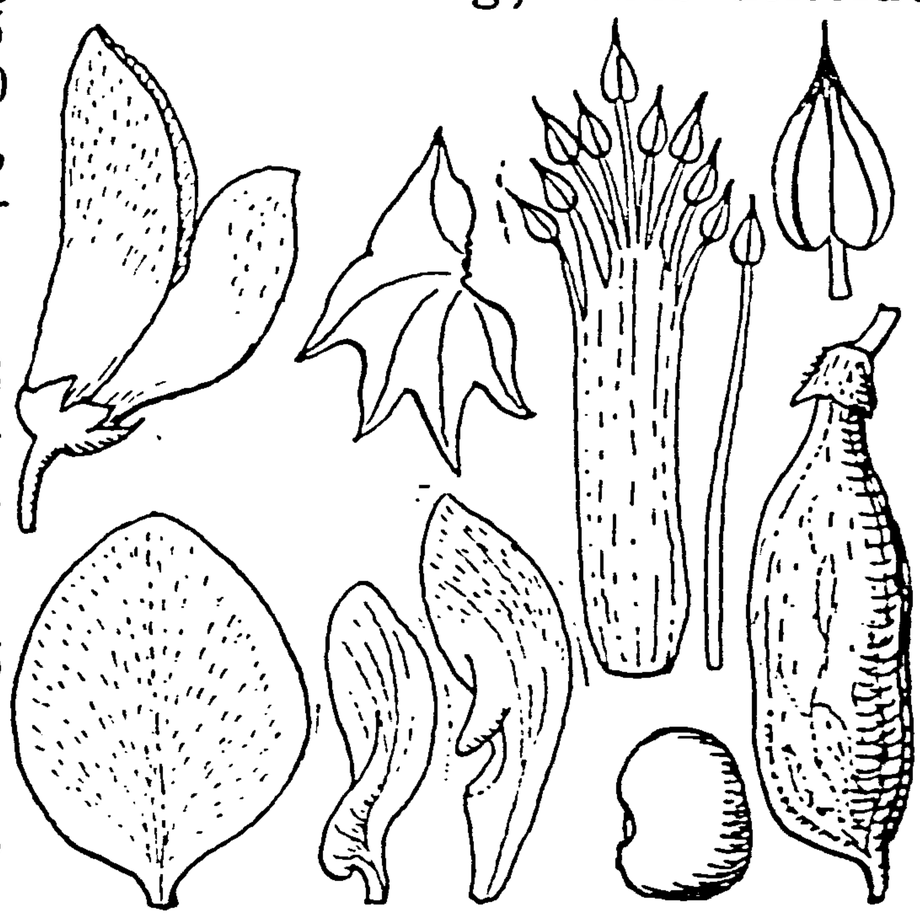
Racemes many-flowered: keel 9–11 mm. long: pod with a long, slender beak. 5. *I. leptosepala.*

Racemes few-flowered: keel 4–6 mm. long: pod with a short, stout beak. 6. *I. miniata.*

V. PARVIFLORAE

Herb with virgate branches, and small cluster-like axillary racemes: pods deflexed, curved at the beak. 7. *I. parviflora.*

1. I. caroliniana Mill. Stem erect, 0.5–2 m. tall: leaflets 9–15; blades elliptic, oval, cuneate, obovate, or oblanceolate: calyx 1–1.5 mm. long; lobes deltoid: corolla yellowish-brown; standard 5–6.5 mm. long; wing usually shorter: pod 5–10 mm. long.—Dry sandy pinelands and scrub, Coastal Plain, Fla. to La. and N. C.—Spr.–fall.



2. I. suffruticosa Mill. Stem erect 0.5–2 m. tall: leaflets 7–15; blades elliptic, oblanceolate, or obovate: calyx 1.5–2 mm. long; lobes deltoid to triangular-lanceolate: corolla orange; standard 4–5 mm. long; wing often slightly longer: pod linear, 1–1.5 cm. long. [*I. Anil* L.]—Pinelands, cult.-grounds, and hammocks, Coastal Plain, Fla. to Tex. and N. C. Nat. of Asia.—(*W. I., S. A.*)—Sum.–fall, or all year.

3. I. tinctoria L. Stem erect, 1–2 m. tall: leaflets 7–15; blades elliptic, oval, or obovate: calyx 1.5–2 mm. long; lobes deltoid to triangular-lanceolate: corolla reddish-yellow; standard 5–6 mm. long; wings about the same length: pod linear, 2.5–3 cm. long.—(INDIGO.)—Cult. grounds and waste-places, various provinces, Fla. to La. and N. C. Nat. of S Asia.—Extensively cult. by the early colonists, in the Carolinas, Ga., and Fla., for making indigo.—(*W. I.*)—Sum.–fall or all year.

4. I. keyensis Small. Stem decumbent, 3–9 dm. long: leaflets 7–9; blades elliptic-obovate to cuneate: calyx 2–3 mm. long; lobes subulate: corolla reddish; standard 3–4 mm. long, very broad; wings mostly 3–4 mm. long: pod linear, 3–3.5 m. long. [*I. subulata* (Fl. SE. U. S.)]—Hammocks, upper Florida Keys.—All year.

5. I. leptosepala Nutt. Stem decumbent, 3–10 dm. long: leaflets 7–9; blades elliptic-obovate to cuneate: calyx 4.5–5 mm. long; lobes subulate: corolla pink; standard 8–10 mm. long; wings mostly 7–8 mm. long: pod linear, 3–3.5 m. long.—Dry soil, prairies and plains, Coastal Plain and adj. provinces, N Fla. to Tex., Kans., and Ga.—(*Mex.*)—Sum.–fall.

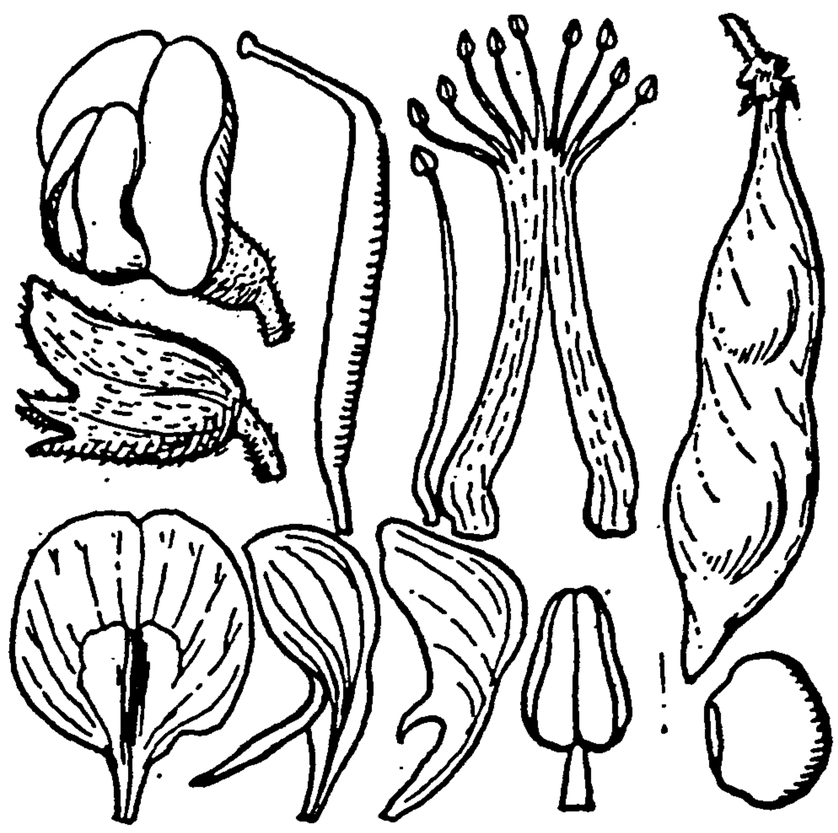
6. I. miniata Ortega. Stems several or many from a tough root, prostrate: leaflets 5–9; blades linear-elliptic to narrowly oblanceolate: calyx 3–5 mm. long; lobes subulate or lanceolate-subulate: corolla red; standard 7–8 mm. long or rarely smaller; wings usually longer: pod elliptic-linear or linear, 1–2 cm. long.—Pinelands and sandy places, Everglade Keys, pen. Fla., and Florida Keys. Introd. into Coastal Plain of other Gulf States.—(*W. I., Mex.*)—All year.

7. I. parviflora Heyne. Annual: stem 3–12 dm. tall: leaflets 7–9; blades linear to narrowly oblanceolate, 1–2 cm. long, acute at both ends: calyx 2–2.5 mm. long; lobes subulate: corolla lilac; standard 3–4 mm. long; wings about as long: pod narrowly linear, 2.5–4 cm. long, slightly curved at the abruptly acute beak.—Waste-places and ballast, Coastal Plain, Ala. Nat. of E. I.—Spr.–fall.

25. KRAUNHIA Raf. Woody vines. Leaflets several: blades entire. Flowers borne in drooping racemes or panicles. Calyx 2-lipped. Corolla blue, violet, purple, or white: standard clawed, the broad blade with 2 appendages at the base. Wings and keel-petals with long slender auricles at the base and slender claws. Pod turgid, torulose. [*Bradleia* Adans. *Wisteria* Nutt.]—About 5 species, North American and Asiatic.—Spr.—WISTERIAS.

Leaflets 4–7 pairs: calyx tubular-campanulate: blade of the wing-petals with a long slender spur: flowers on short stout pedicels: ovary glabrous.
  Calyx 8–10 mm. long; lower lobe shorter than the tube: lower spur of the wings much shorter than the claw. 1. *K. frutescens.*
  Calyx 11–14 mm. long; lower lobe as long as the tube or longer: lower spur of the wings about as long as the claw. 2. *K. macrostachya.*
Leaflets 7–9 pairs: calyx open campanulate: blade of the wing-petals with a short blunt spur: flowers on long slender pedicels: ovary pubescent. 3. *K. floribunda.*

1. K. frutescens (L.) Britton. Stem twining: leaves 1–2.5 dm. long; leaflets 1.5–6 cm. long, the blades mainly elliptic or narrowly ovate, acute or obtuse at the base: racemes stout, 4–12 cm. long: standard 15–18 mm. long: pod 5–10 cm. long, glabrous. [*W. frutescens* DC. *Bradleia frutescens* Britton]—(AMERICAN-WISTERIA.)—Banks of creeks and rivers, and swampy borders of woods, Coastal Plain and rarely adj. provinces, Fla. to Ala. and Va.—The contrast in color of the early foliage and the purple flower-clusters is a pigmentary perfection even Nature rarely attains.



2. K. macrostachya (T. & G.) Small. Larger than *K. frutescens* throughout: leaves 2–3 dm. long; leaflets 3–7 cm. long, the blades ovate, often broadly so, rounded or cordate at the base: racemes slender, 2–3 dm. long: standard 19–23 mm. long: pod 7–14 cm. long, glabrous. [*Bradleia macrostachya* Small]—(KENTUCKY-WISTERIA.)—Swamps and low woods, Coastal Plain and occasionally adj. provinces, La. to Tex., Mo., and Tenn. (or Ind.?)

3. K. floribunda (Willd.) Taub. Stem becoming very large: leaves 2–4 dm. long; leaflets 5–9 cm. long, the blades elliptic to elliptic-ovate, acuminate: racemes elongate and lax: lower calyx-lobes triangular: standard 15–20 mm. wide: pod mostly 6–10 cm. long, pubescent.—(JAPANESE-WISTERIA. CHINESE-WISTERIA.)—Woods, roadsides, thickets, and abandoned homesteads, Fla. to La. and S. C. Nat. of E Asia and cult.

26. ROBINIA L. Shrubs or trees, often with stipular spines. Leaflets several, thin. Flowers racemose. Calyx markedly 2-lipped, the 2 upper lobes wholly or partially united. Corolla pink or purplish, or white: standard glabrous: blades of the wings auricled on one or both sides: keel-petals with a rounded auricle at the base of the blade. Pod flat, sometimes bristly or prickly.—About 20 species, North American.—LOCUSTS.

Corolla white: racemes drooping: pod smooth and glabrous, broadly wing-margined on the seed-bearing suture: calyx-lobes broad. I. PSEUDO-ACACIAE.
Corolla pink, rose-violet, or rose-purple: racemes erect or spreading: pod prickly, hispid or hirsute: calyx-lobes narrow.

Racemes with small narrow caducous bracts: branches and peduncles with rather long bristles bearing inconspicuous glands, or not armed with bristles. — II. HISPIDAE.
Racemes with large conspicuous caudate-acuminate bracts: branches and peduncles densely beset with sessile or short-stalked conspicuous glands. — III. VISCOSAE.

I. PSEUDO-ACACIAE

Tree with rough bark and thorn-like stipules. — 1. *R. Pseudo-Acacia.*

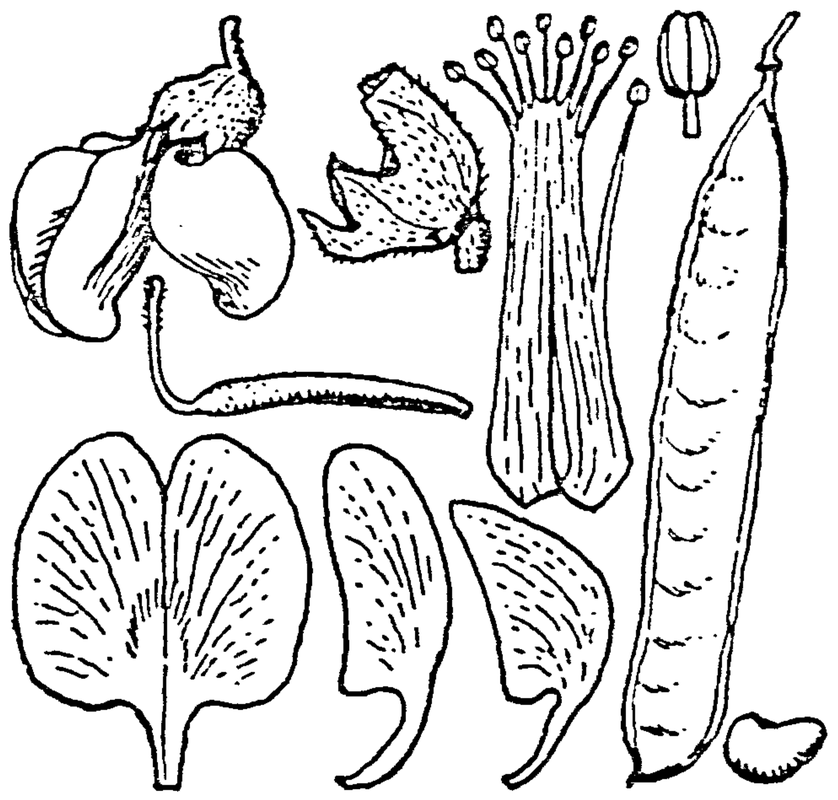
II. HISPIDAE

Branches not bristly: peduncles sometimes with short hairs.
  Blades of the leaflets oval or elliptic to elliptic-ovate.
    Branches, peduncles, and lower leaflet-surfaces short-villous, and somewhat canescent when young: peduncles not glandular-hispid. — 2. *R. Elliottii.*
    Branches, peduncles, and lower leaflet-surfaces finely puberulent when young, glabrate in age: peduncles somewhat glandular-hispid.
      Shrub over 1 m. tall: calyx-lobes not longer than the tube. — 3. *R. Boyntonii.*
      Shrub less than 1 m. tall: calyx-lobes longer than the tube. — 4. *R. nana.*
  Blades of the leaflets lanceolate or elliptic-lanceolate. — 5. *R. Kelseyi.*
Branches and peduncles bristly hispid.
  Branches with rather few short glandular bristles. — 6. *R. longiloba.*
  Branches usually copiously glandular-bristly with long hairs.
    Branch, leaf-rachis, and peduncle rather densely or copiously pubescent.
      Blades of the leaflets broadly oval, rounded at the apex. — 7. *R. grandiflora.*
      Blades of the leaflets ovate or elliptic-ovate, acute or obtuse.
        Blades of the leaflets permanently villous beneath. — 8. *R. speciosa.*
        Blades of the leaflets glabrate on both sides or sparingly pubescent beneath. — 9. *R. pallida.*
    Branch, leaf-rachis, and peduncle merely hispid or with only a few scattered hairs.
      Blades of the leaflets oval, elliptic-oval, or suborbicular, rounded at the apex.
        Branches with bristles 1–2 mm. long: stipular spines usually present: pod hispid. — 10. *R. pedunculata.*
        Branches with bristles 3–5 mm. long: stipular spines usually wanting: pod glandular. — 11. *R. hispida.*
      Blades of the leaflets lanceolate or ovate, acute. — 12. *R. fertilis.*

III. VISCOSAE

Blades of the leaflets puberulent or glabrate: branches and peduncles with subsessile glands, not densely puberulent. — 13. *R. viscosa.*
Blades of the leaflets densely villous beneath: branches and peduncles with stalked glands and also densely puberulent. — 14. *R. Hartwigii.*

1. R. Pseudo-Acacia L. Tree becoming 30 m. tall, with furrowed bark: stipular-spines subulate, often stout: leaflets 9–19; blades elliptic, oval, or ovate, 2.5–5 cm. long, sparingly pubescent or glabrous in age: racemes numerous, 1–2 dm. long, slender-peduncled: flowers very fragrant: calyx finely pubescent; lateral lobes deltoid or triangular, or the lowest one lanceolate, acute: standard 1.5–2 cm. wide: pods broadly linear, 5–11 cm. long, somewhat veiny when dry.—(BLACK-LOCUST. COMMON-LOCUST. FALSE-ACACIA. LOCUST-TREE. SWEET-ROBIN.)—Rich woods and river-banks, various provinces, Ga. to La., Okla., and Pa., and escaped from cult. as far north as S Can.—Spr.—The wood is hard and very durable in contact with the soil.—Although naturally of a moist climate, this is used as a shade tree in desert regions.



2. **R. Elliottii** (Chapm.) Ashe. Shrub up to 2 m. tall, with virgate stem and short branches above: stipular-spines stout: leaflets 9–15; blades thin, oval to elliptic, 1.5–5 cm. long, villous-canescent beneath when young: racemes 5–10 cm. long: calyx villous-canescent and often with a few bristles; lateral lobes deltoid and subulate-tipped, shorter than the tube: standard-blade less than 2 cm. wide: pod linear, hispid. [*R. hispida Elliottii* Chapm.]—Pinelands and sandhills, Coastal Plain and adj. Piedmont, Ga. to Ala. and N. C.; also in Md.—Late spr.

3. **R. Boyntonii** Ashe. Shrub up to 2 m. tall, with ascending branches: stipular-spines short, stout: leaflets 9–13; blades elliptic to elliptic-ovate, mostly 2–4 cm. long: racemes 7–9 cm. long: calyx with few short-stalked glands; lateral lobes ovate, short-acuminate, about as long as the tube: standard-blade about 2 cm. wide, slender-clawed: pod glandular-hispid.—Woods, Blue Ridge and to Appalachian Plateau, Ga. and Ala. to Tenn. and N. C.—Spr.—Hybridizes with *R. Pseudo-Acacia* = × *R. albicans*.

4. **R. nana** (Ell.) Spach. Shrub 2–3 dm. tall, with slightly branched stems: stipular-spines short or obsolete: leaflets 7–11, or rarely 13; blades elliptic or nearly so, 3–4 cm. long: racemes nodding, few-flowered: calyx pilose or sparingly hispid; lateral lobes narrowly triangular-lanceolate, caudate-acuminate, fully as long as the tube: standard-blade fully 2.5 cm. wide.—Sandy ridges and banks, Coastal Plain and Piedmont, S. C. and N. C.—Spr.

5. **R. Kelseyi** Cowell. Shrub 1–3 m. tall, with spreading stems: stipular-spines subulate: leaflets 9–13; blades narrowly elliptic to lanceolate or elliptic-lanceolate, 2–4 cm. long, glabrous: racemes 5–8-flowered: calyx with few rather short-stalked glands; lateral lobes deltoid and subulate-tipped, longer than the tube: standard-blade less than 1.5 cm. wide: pods broadly linear or linear-elliptic, 4–6 cm. long, very densely glandular bristly.—Woods, Blue Ridge, N. C.—Spr.

6. **R. longiloba** Ashe. Shrub 4–6 dm. tall, the branches pubescent with curved hairs and short-stalked glands: stipular-spines short or obsolete: leaflets 7–17; blades oval, ovate, or elliptic, 3.5–5 cm. long, silky-canescent beneath: racemes 9–21-flowered: calyx with long slender tips, much longer than the tube: standard-blade fully 2.5 cm. wide: pods not seen.—Woods, Blue Ridge and Piedmont, S. C. and N. C.—Spr.—Suspected of being a hybrid between *R. Boyntonii* and *R. grandiflora*.

7. **R. grandiflora** Ashe. Shrub 1–5 dm. tall, the branches appressed-pubescent and glandular-hispid: stipular-spines rarely developed: leaflets 7–17; blades oval, 2–5 cm. long, glabrous at maturity or somewhat silky beneath: racemes 5–18-flowered: calyx grayish-puberulent or short-villous, and glandular-hispid; lateral lobes ovate and with a long filiform tip, much longer than the tube: standard-blade about 3 cm. wide: pod narrowly ellipsoid, 6–8 cm. long, hispid with short gland-tipped hairs.—Woods, Blue Ridge to Appalachian Plateau, Ga. to Ala. and N. C.—Spr.

8. **R. speciosa** Ashe. Shrub mostly 1–2 m. tall, the branches densely puberulent, sparingly bristly: spines wanting: leaflets mostly 9–13; blades ovate to elliptic-ovate, 3–5 cm. long, villous beneath: racemes 5–8-flowered: calyx mainly villous-puberulent; lateral lobes ovate-acuminate, shorter than the tube: standard-blade fully 2 cm. wide: pods not seen.—Woods, Blue Ridge, N. C.—Spr.

9. **R. pallida** Ashe. Shrub up to 2 m. tall, the branches densely puberulent or glabrate in age, sparingly bristly: leaflets 9–15; blades ovate or elliptic-ovate, 4–5.5 cm. long, pale and glabrous or sparingly pubescent beneath: racemes 5–9-flowered: calyx grayish-pubescent and sparingly bristly; lateral lobes broad and abruptly acuminate: standard-blade about 1.5 cm. wide: pod not seen.—Blue Ridge, N. C.—Spr.

10. R. pedunculata Ashe. Shrub up to 4 m. tall, the branches puberulent and with short glandular bristles: stipular-spines often present, subulate, about 1 cm. long: leaflets 7–13; blades oval, 3–4.5 cm. long, glabrous or nearly so; raceme 7–12-flowered, glandular-hispid: calyx pubescent and glandular; lateral lobes ovate and abruptly acuminate, about as long as the tube: standard-blade about 2.5 cm. wide: pod ellipsoid, 3–5 cm. long, densely hispid.—Woods, Blue Ridge, Tenn.—Spr.—Suspected of being a hybrid between *R. hispida* and *R. Boyntonii.*

11. R. hispida L. Shrub up to 2 m. tall with erect or diffuse usually densely hispid and somewhat pilose branches: stipular-spines short or wanting: leaflets 7–13 or rarely 15; blades suborbicular, ovate, or elliptic, mostly 2–5 cm. long, glabrous or with scattered hairs on the veins beneath: racemes 3–5-flowered: calyx hispid with numerous long-stalked glands; lateral lobes broadly lanceolate, acuminate, about as long as the tube or longer: standard-blade nearly 2.5 cm. wide: pod 5–8 cm. long, densely hispid.—(Moss-locust. Rose-acacia.)—Dry slopes, various provinces N of Coastal Plain, Ga. to Ala., Ill., and Va.; escaped from cult. N.—Spr.–early sum.—Hybridizes with *R. Pseudo-Acacia* = × *R. Margaretta.*

12. R. fertilis Ashe. Shrub up to 1 m. tall, the branches puberulent and more or less hispid: stipular-spines slender, or wanting: leaflets 7–19; blades lanceolate to ovate, 1.5–4 cm. long, glabrous, or sparingly pubescent beneath: racemes 3–5-flowered: calyx more or less hispid; lateral lobes deltoid-lanceolate, acuminate, about as long as the tube: standard-blade nearly 3 cm. wide: pod linear-ellipsoid, 5–6 cm. long, densely glandular-hispid.—Woods, Blue Ridge, Ga.? and N. C.—Spr.

13. R. viscosa Vent. Shrub or small tree with spreading branches: stipular-spines short-subulate or wanting: leaflets 11–27; blades elliptic, oval, or narrowly ovate, 2.5-5 cm. long: racemes 6–15-flowered: calyx copiously fine-pubescent and usually with few stalked glands; lateral lobes triangular-lanceolate, acuminate, about as long as the tube: standard-blade 1.5–2 cm. wide: pod linear, 4–8 cm. long, copiously glandular-bristly.—(Clammy-locust. Red-locust. Rose-robin.)—Rocky woods, Blue Ridge to Appalachian Plateau, Ala. to N. C. and Pa.; escaped from cult. in NE N. A.—Spr.—Hybrids between this and *R. Pseudo-Acacia* appear as two forms, × *R. dubia* and × *R. bella-rosea.*

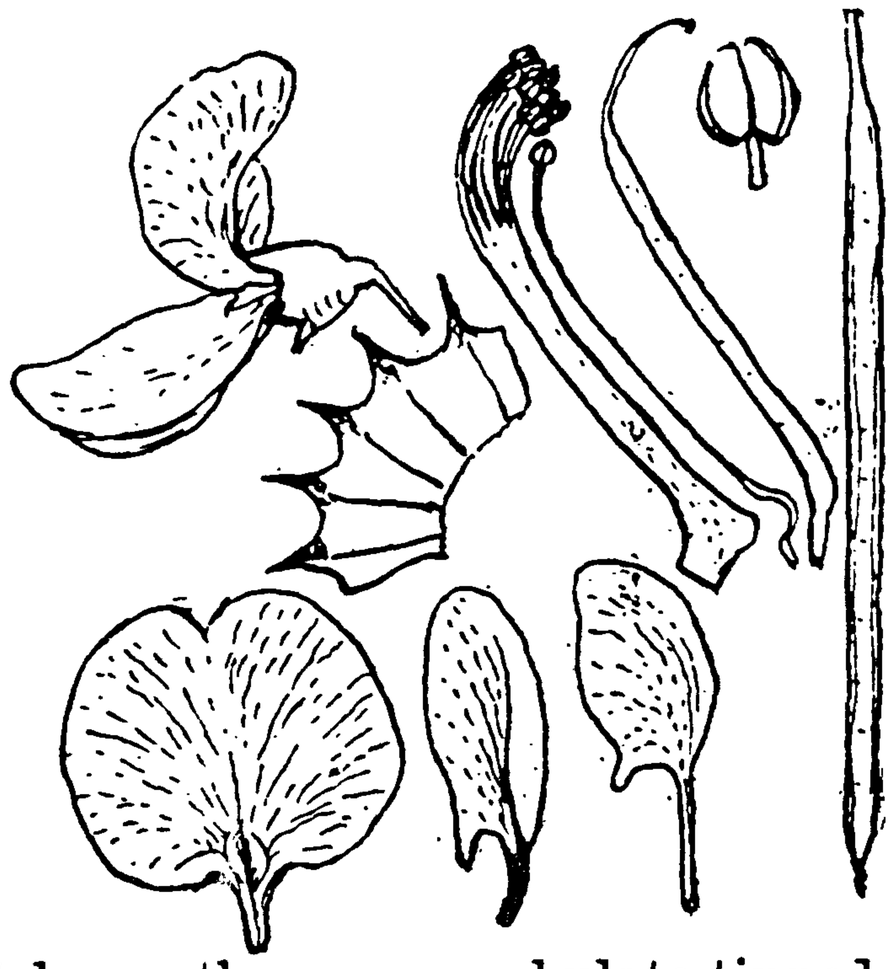
14. R. Hartwigii Koehne. Shrub up to 3 m. tall, the branches densely puberulent and with short-stalked glands: stipular-spines small or rarely 2–3.5 cm. long, leaflets 13–23; blades elliptic, oval, or ovate, 1.5–5 cm. long, villous on both sides or glabrous above: racemes dense: calyx villous-puberulent; lateral lobes triangular, acute, about as long as the tube: standard-blade over 2 cm. wide: pod linear 6–11 cm. long, densely glandular-hispid.—Woods, Blue Ridge and Piedmont, Ga. and Ala. to N. C.—Spr.

27. SESBAN Adans. Annual or perennial herbs, or shrubs. Leaflets numerous. Racemes several-flowered. Calyx slightly 2-lipped, the 5 prominent lobes nearly equal. Corolla yellow, sometimes with purple dots: standard with **a suborbicular blade:** wings nearly straight, short-clawed, with an angle or slender basal auricle curved: blades of the keel-petals angled or auricled at the base, long-clawed. Pod greatly elongate, curved. — About 15 species, natives of warm and tropical regions.—Sum.–fall.

Standard 2 cm. wide or more: wing-petals with a slender deflexed spur at the base of the blade. 1. *S. Emerus.*
Standard 1.5 cm. wide or less: wing-petals with a small blunt angle at the base of the blade. 2. *S. exaltatus.*

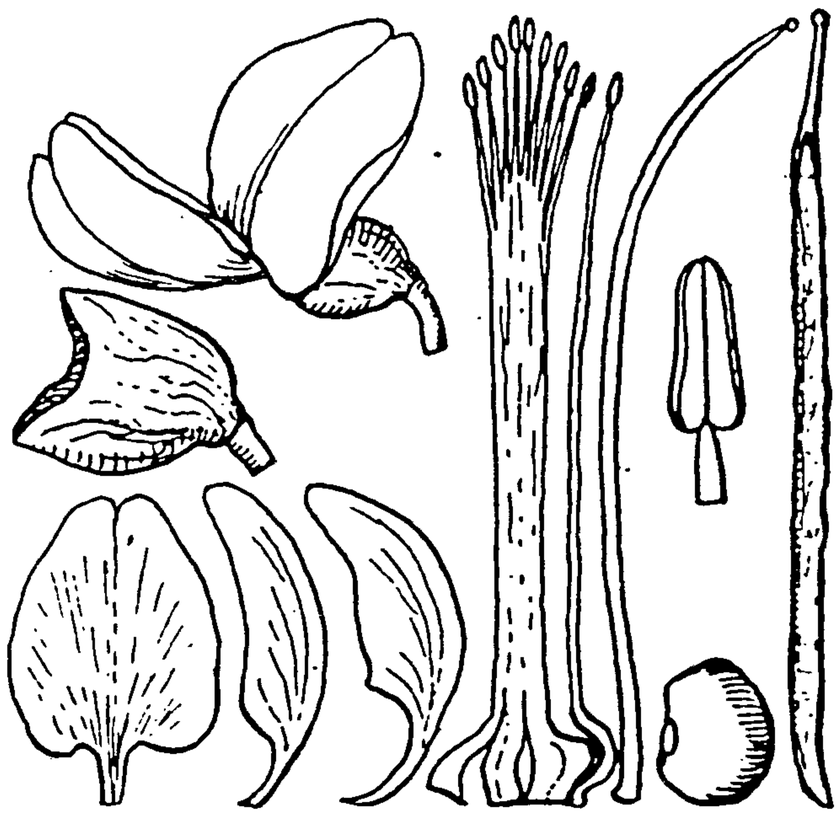
1. S. Emerus (Aubl.) Britton & Wilson. Plant 1–5 m. tall: leaves 7–18 cm. long; leaflets 20–50, the blades elliptic, elliptic-cuneate, or broadly linear, 1–3

cm. long, somewhat glaucous beneath: calyx 6–7 mm. long, the lobes acuminate: standard 2 cm. long or more: keel about 2 cm. long, with a reflexed auricle at the base of the nearly straight blades: pod 1.5–2 dm. long. [*Sesbania macrocarpa* Muhl.]—Moist soil, waste-places, and hammocks, Fla.—(*W. I., Mex., C. A.*)—Original natural range not known. One of our very vigorous annuals. The woody stems with the naked branches supporting dangling pods persist through the winter.



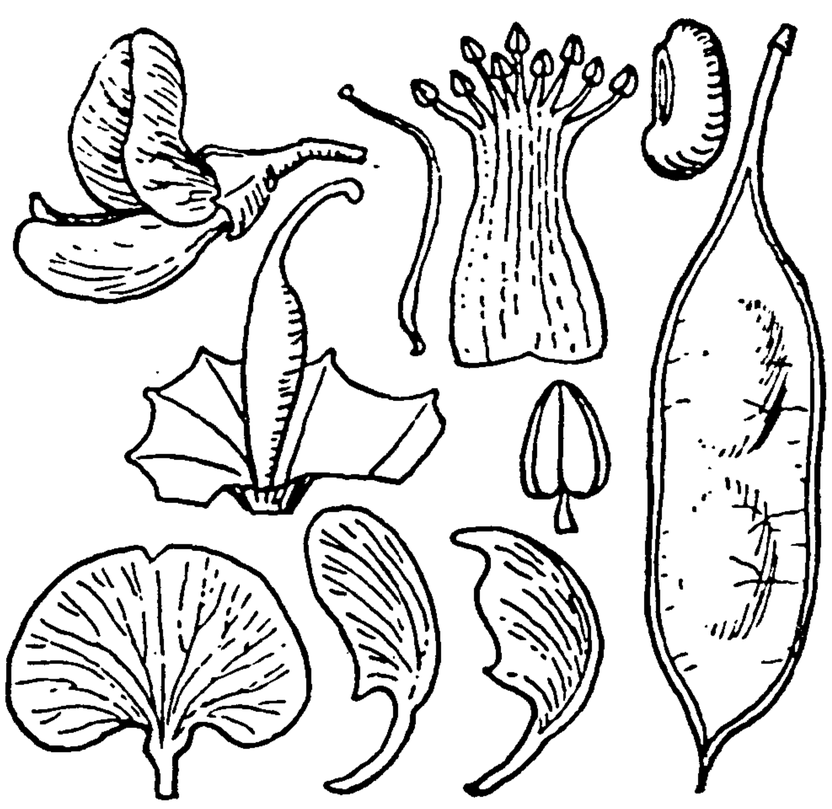
2. S. exaltata (Raf.) Rydb. Plant 1–4 m. tall: leaves 12–30 cm. long; leaflets 30–70, the blades linear-elliptic to linear, 1–2.5 cm. long, often glaucescent beneath: calyx nearly similar to that of *S. Emerus*, but the lobes rather more subulate-tipped: standard 1.5 cm. long or less: keel 11–13 mm. long, with an angular lobe at the base of the strongly curved blades: pod rather longer than that of the preceding species.—Low grounds, stream-banks, and fields, Coastal Plain and adj. provinces, Miss. to Tex., Okla., and Mo.

28. AGATI Adans. Trees or shrubs, but short-lived. Leaflets numerous. Racemes 2–4 flowered. Calyx slightly 2-lipped, but usually with obscure, very broad lobes. Corolla large, pinkish or red: standard with an oblong or ovate blade: wings not auricled: keel-petals merely angular at the base of the blade. Pod greatly elongate, straight or nearly so.—One species.



1. A. grandiflora (L.) Desv. Shrub or small tree: leaves 1–3 dm. long; leaflets numerous, the blades elliptic to linear-elliptic, 2–4 cm. long: calyx 2–2.5 cm. long: standard 6–10 cm. long, the blade ovate: pod elongate-linear, 2–4 dm. long.—(AUSTRALIAN CORKWOOD-TREE.)—Hammocks and cult. grounds, Key West, Fla. Native of East Indies.—(*W. I.*)—Spr.–sum.

29. GLOTTIDIUM Desv. Herbs, but often woody-stemmed. Leaflets numerous. Racemes several-flowered. Calyx slightly 2-lipped, the 5 lobes acute. Corolla yellow, reddish, or purple: standard with a reniform blade: wings and keel-petals more or less angular at the base of the blade. Pod short, wingless.—One species.



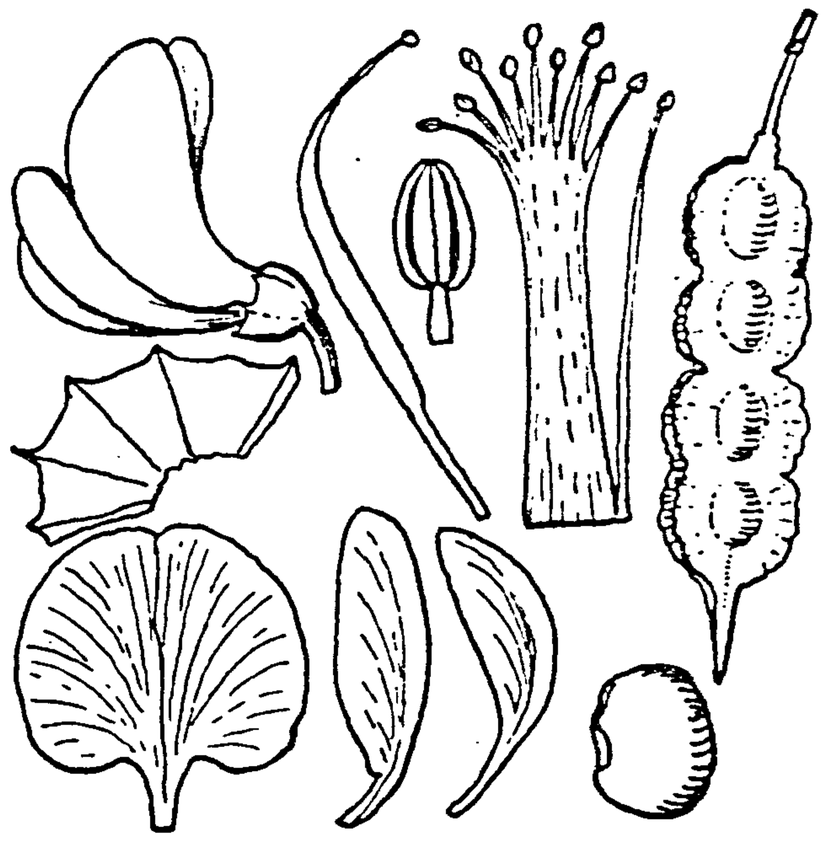
1. G. vesicarium (Jacq.) Harper. Plant 1–4 m. tall, annual but rather woody: leaflets 24–52; blades elliptic, 1.5–4 cm. long, mucronate: calyx-lobes shorter than the tube: corolla yellow (or black-purple in *G. vesicarium atrorubrum*): blade of the standard reniform: pod ellipsoid, 5–8 cm. long, acuminate at both ends. [*Sesbania vesicaria* DC.]—(BLADDER-POD.)—Rich damp

soil and waste-places, Coastal Plain, Fla. to Tex. and N. C.—Sum.—Evidently introduced.—(*W. I.*)—A very vigorous annual. The firm woody stems, sometimes in large colonies, with the bladdery pods dangling from the branches, usually persist throughout the winter.

30. **DAUBENTONIA** DC. Shrubs or trees. Leaflets numerous. Racemes several-flowered. Calyx minutely 5–lobed and scarcely 2-lipped. Corolla yellow to crimson and vermilion: standard with an orbicular-reniform blade: wings and keel-petals not auricled. Pod relatively long, the body winged.—About 5 species, mostly American.

Calyx-lobes acute: corolla yellow: keel-petals with the blades abruptly narrowed into the claw: pod long-stipitate. 1. *D. Drummondii.*
Calyx-lobes, except the lower one, obtuse: corolla deep-rose to crimson: keel-petals with the blades tapering into the claw: pod short-stipitate. 2. *D. punicea.*

1. **D. Drummondii** Rydb. Shrub: leaflets 12–60; blades narrowly elliptic to linear-elliptic, 1–2.5 cm. long, mucronate: calyx-lobes acute: racemes loosely flowered, rather slender: standard-blade 15–18 mm. wide; wings and keel-petals 15–18 mm. long: pod 6–9 cm. long, the stipe 1–1.5 cm. long.—(RATTLE-BUSH. RATTLE-BOX.)—Sandy waste-places and cult. grounds, Coastal Plain, Fla. to Tex.—(*Mex.*)—Spr.–fall.



2. **D. punicea** (Cav.) DC. Shrub or small tree: leaflets 12–40: blades linear-elliptic, rounded or truncate at the apex and mucronulate: calyx-lobes broad, except the lower one, obtuse: racemes densely flowered, stout: standard-blade about 2.5 cm. wide; wings and keel-petals 20–22 mm. long: pod 6–8 cm. long, the stipe less than 1 cm. long. [*Sesbania punicea* Benth.]—(PURPLE-SESBAN.)—Waste-places, roadsides, and fence-rows, Coastal Plain, Fla. to La. Nat. of trop. Am.—(*S. A.*)—Spr.–fall.

31. **CRACCA** L. Perennial long-rooted herbs or woody plants. Leaflets several or many, thick. Flowers in racemes or spike-like panicles. Calyx somewhat 2-lipped, the upper lobes usually shorter than the others and partially united. Corolla pink, purple, or red, or white: standard pubescent: wings auricled on one side at the base of the blade: keel-petals usually with an angular auricle. Pod flat or flattish. [*Tephrosia* Pers.]—HOARY-PEAS. About 130 species, natives of warm and tropical regions.—Sum. or spr.–fall S.

Stem monopodial: panicles terminal and axillary, not opposite the leaves.
  Leaflets 11–37; blades of an elliptic tpye. I. VIRGINIANAE.
  Leaflets 3–11; blades of an obovate type. II. RUGELIANAE.
Stem sympodial: panicles theoretically terminal, but apparently opposite the leaves, by the development of a branch in the uppermost axil, which elongates and produces another terminal panicle and so on.
  Petioles very short, 3 mm. long or less. III. CHRYSOPHYLLAE.
  Petioles longer, 5 mm. long or more.
    Corolla more than 12 mm. long. IV. SPICATAE.
    Corolla less than 12 mm. long. V. PURPUREAE.

I. Virginianae

Calyx-lobes lanceolate: foliage pubescent with lax more or less spreading hairs. — 1. *C. virginiana.*
Calyx-lobes ovate to ovate-lanceolate: foliage silky or strigose, the hairs strictly appressed.
  Calyx-lobes ovate, the upper ones shorter than the tube: blades of the leaflets broadly elliptic or obovate. — 2. *C. latidens.*
  Calyx-lobes ovate-lanceolate, the upper ones longer than the tube: blades of the leaflets narrowly elliptic. — 3. *C. Mohrii.*

II. Rugelianae

Stems clustered on top of a stout woody root: foliage copiously and conspicuously pubescent. — 4. *C. Rugelii.*

III. Chrysophyllae

Stem loosely pubescent.
  Panicles shorter than the leaves. — 4. *C. Rugelii.*
  Panicles longer than the leaves. — 5. *C. chrysophylla.*
Stem finely appressed-pubescent.
  Corolla fully 1 cm. long: pod 3.5–4.5 cm. long: blades of the leaflets obovate. — 6. *C. Carpenteri.*
  Corolla less than 1 cm. long: pod 2 cm. long: blades of the leaflets elliptic. — 7. *C. Chapmanii.*

IV. Spicatae

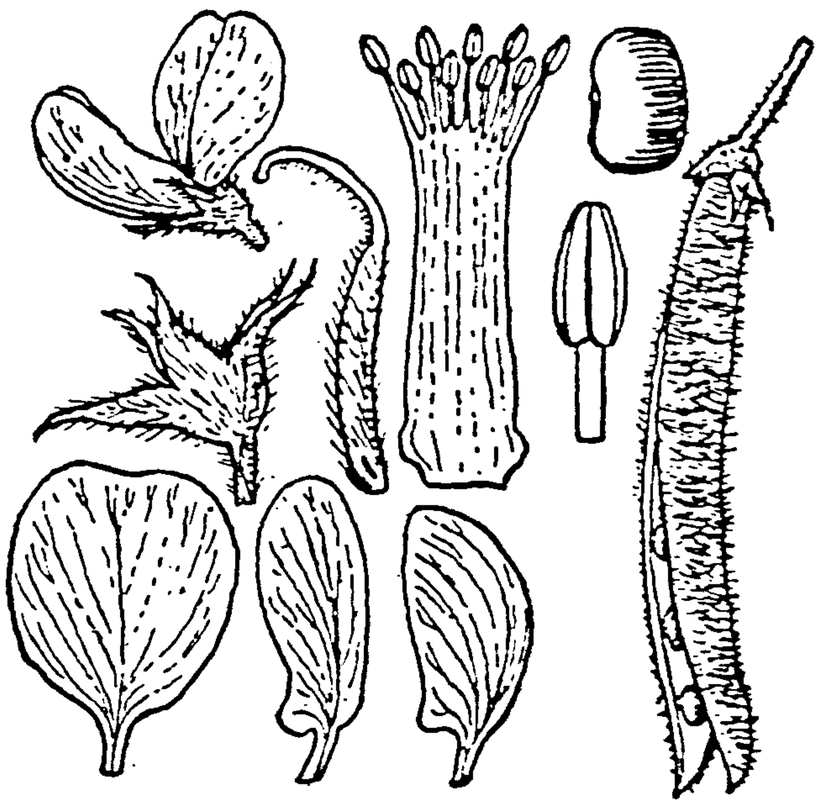
Panicles few-flowered, with 1 or 2 flowers at each node and mostly near the tip of the peduncle.
  Pubescence of the stem of spreading hairs.
    Leaflets spreading; blades elliptic to obovate, that of the terminal leaflets nearly similar to those of the lateral.
      Stem and leaflets densely pubescent with long lax hairs. — 8. *C. spicata.*
      Stem sparsely pubescent with short hairs: leaflets appressed-pubescent. — 9. *C. intermedia.*
    Leaflets reflexed; blades linear, that of the terminal one much longer than those of the lateral. — 10. *C. flexuosa.*
  Pubescence of the stem of appressed hairs.
    Petioles not much longer than the lower leaflets: blades of the leaflets of an elliptic type. — 11. *C. hispidula.*
    Petioles much longer than the lower leaflets: blades of the leaflets of an oblanceolate, cuneate or linear type.
      Blades of the leaflets oblanceolate to cuneate or obovate. — 12. *C. ambigua.*
      Blades of the leaflets linear, varying to linear-subulate or slightly broadened upward. — 13. *C. gracillima.*
Panicles elongate, many-flowered, with the flowers often 2–4 at each node.
  Leaflets 19–25; blades narrowly elliptic or slightly broadened upward: leaf-rachis hirsute. — 14. *C. onobrychoides.*
  Leaflets 13–19; blades linear-oblanceolate to linear-elliptic or linear: leaf-rachis strigillose. — 15. *C. angustifolia.*

V. Purpureae

Stem with spreading pubescence: leaflets velvety-pubescent. — 16. *C. corallicola.*
Stem with appressed pubescence: leaflets strigillose or silky.
  Calyx-lobes about equalling the tube.
    Blades of the leaflets oblanceolate, narrowly cuneate, or linear-cuneate, rounded or retuse at the apex. — 17. *C. Curtissii.*
    Blades of the leaflets narrowly linear, acute or acuminate. — 18. *C. angustissima.*
  Calyx-lobes manifestly longer than the tube.
    Standard less than 1 cm. wide: calyx-lobes slightly longer than the tube. — 19. *C. purpurea.*
    Standard over 1 cm. wide: calyx-lobes nearly or quite twice as long as the tube. — 20. *C. cinerea.*

1. **C. virginiana** L. Stem 3–6 dm. tall, loose-pubescent: leaflets 11–21; blades of the lateral ones 10–30 mm. long, elliptic; rachis mostly villous: calyx 9.5–

10.5 mm. long; lobes with very slender tips, the upper ones much longer than the tube: standard 18–24 mm. long, pale-yellow: wings and keel pink or purplish; pod 3–5 cm. long. —(CAT-GUT. GOAT'S-RUE. DEVIL'S SHOE-STRINGS. DOLLY-VARDEN. RABBIT'S-PEA.)— Dry, usually acid sandy soil, various provinces, Fla. to La., Man., and Me.



2. C. latidens Small. Stem 2–5 dm. tall, strigose: leaflets mostly 19–37; blades of the lateral ones broadly elliptic or obovate, 9–20 mm. long: calyx 5.5–6.5 mm. long; lobes with broadly ovate bodies: petals nearly similar to those of *C. virginiana*, but keel-petals scarcely auricled at the base.— Pinelands, pen. Fla.

3. C. Mohrii Rydb. Stem 2–3 dm. tall, strigose: leaflets 11–21; blades of the lateral ones narrowly elliptic, acute, 6–18 mm. long, glabrous above, strigose beneath, the rachis strigillose: calyx about 5 mm. long; lobes ovate-lanceolate, longer than the tube: corolla yellowish and rose-tinged; standard about 1 cm. long: pod about 5 cm. long.—Pinelands, Fla.

4. C. Rugelii (Shuttlw.) Heller. Stem more or less diffuse, up to 7 dm. long, finely loose-pubescent with bronze-colored hairs: leaflets 3–11; blades of the lateral ones obovate, 8–17 mm. long: calyx about 5 mm. long; lobes subulate: corolla white, turning purple; standard 1.5–2 cm. long: pod somewhat falcate, 3.5–4 cm. long.—Pinelands, S pen. Fla.

5. C. chrysophylla (Pursh) Kuntze. Stem copiously loose-pubescent, the hairs somewhat viscid and tawny: leaflets 3–9; blades of the lateral ones cuneate-obovate, 13–30 mm. long: calyx 5.5–7 mm. long; lobes of the upper lip lanceolate, about as long as the other lobes: corolla white, turning purple; standard 17–20 mm. long: pod 5–6 mm. wide.—Pinelands, Coastal Plain, Fla. to Miss. and Ga.

6. C. Carpenteri Rydb. Stem strigose: leaflets 5–7; blades of the lateral ones obovate, 9–15 mm. long: calyx about 4 mm. long; lobes of the upper lip deltoid-ovate, acute: corolla white or pale-pink, turning purple; standard 10–12 mm. long: pod about 4 mm. wide.—Pinelands, W Fla. and La.

7. C. Chapmanii (Vail) Small. Stem loosely appressed-pubescent: leaflets 3–7; blades of the lateral ones elliptic to obovate, 6–15 mm. long: calyx 3–3.5 mm. long; lobes of the upper lip deltoid, shorter than the tube: corolla white or pink, becoming purple; standard 7–12 mm. long: pod 3–4 mm. wide.—Dry soil, N Fla.

8. C. spicata (Walt.) Kuntze. Stem copiously loose-pubescent: leaflets 5–15; blades of the lateral ones oval, elliptic, or cuneate-elliptic, 10–25 mm. long, mucronulate: calyx 7–8 mm. long; lobes of the upper lip subulate; lower and lateral lobes subulate, nearly equal: corolla white, turning reddish or purple; standard 16–19 mm. long: pod 5–6 mm. wide.—Pinelands and dry woods, various provinces, Fla. to La., Tenn., and Del.

9. C. intermedia Small. Stem sparingly loose-pubescent, and somewhat sticky: leaflets 5–13; blades of the lateral ones elliptic to elliptic-obovate, 10–32 mm. long, apiculate: calyx 5.5–7 long; lobes of the upper lip shorter than the other lobes or nearly as long: corolla pink turning purple; standard 16–18

mm. long: pod 4–5 mm. wide.—Woods and pinelands, Coastal Plain, Fla. to La., Ala., and Ga.

10. C. flexuosa (Chapm.) Heller. Stem loose-pubescent: leaflets 3–17; blades of the lateral ones linear or nearly so, 12–53 mm. long, acute or short-acuminate, sometimes reflexed: calyx 7–8 mm. long; lobes of the upper lip subulate; lower and lateral lobes narrow, much longer than the tube: corolla pale-pink; standard 12–15 mm. long: pod not seen.—Pinelands, Coastal Plain, Fla. to Ala.

11. C. hispidula (Michx.) Kuntze. Stem finely-pubescent: leaflets 7–15; blades of the lateral ones elliptic, oval-elliptic, or linear-elliptic, 8–20 mm. long, acutish, obtuse, or abruptly pointed: calyx 5–6 mm. long; lobes of the upper lip lanceolate; lower and lateral lobes broad, about as long as the tube: corolla white to pink; standard 16–18 mm. long: pod 4–5 mm. wide.—Pinelands, Coastal Plain, Fla. to La. and N. C.

12. C. ambigua (M. A. Curtis) Kuntze. Stem loose-pubescent: leaflets 7–13; blades of the lateral ones oblanceolate, cuneate, or obovate, 20–60 mm. long, or rarely more, truncate or mucronate: calyx 4.5–5 mm. long; lobes of the upper lip subulate; lower and lateral lobes subulate, nearly equal: corolla purple; standard 16–18 mm. long: pod about 5 mm. wide.—Pinelands, Coastal Plain, Fla. to La. and N. C.

13. C. gracillima (B. L. Robinson) Heller. Stem minutely appressed-pubescent: leaflets 9–13 remote; blades linear varying to linear-subulate or slightly broadened upward, 9–30 mm. long, abruptly acute: calyx 3.5–4 mm. long; lobes of the upper lip lanceolate; lower lobe much narrowed and longer than the lanceolate lateral ones: corolla purple, at least becoming so; standard 12–14 mm. long: pod 4–5 mm. wide.—Pinelands, E coast of pen. Fla.

14. C. onobrychoides (Nutt.) Kuntze. Stem copiously loose-pubescent: leaflets 11–23; blades of the lateral ones narrowly elliptic to slightly broadened upward, 18–50 mm. long: calyx 5–6 mm. long; lobes of the upper lip subulate; lower lobe much longer than the lateral ones, 4.5–5 mm. long: corolla white, tinged with purple, turning red; standard 19–23 mm. long: pod 5–6 mm. wide.—Dry soil, often in pinelands, Central Plain and rarely adj. provinces, Ala. to Tex. and Okla.

15. C. angustifolia (Featherman) Pennell. Stem 5–11 dm. tall, strigose and often with longer spreading hairs: leaflets 13–19; blades linear-oblanceolate, linear-elliptic or linear, 18–40 cm. long, veiny above, grayish and reticulate beneath: calyx 6–7 mm. long; lobes of the upper lip triangular-lanceolate, the middle lobe of the lower lip narrower and longer than the others: corolla pale rose-purple or nearly white when young; standard 15–18 mm. long: pod about 4 mm. wide.—Prairies, pinelands, open places, Coastal Plain, Ala. to Tex.—Spr.–sum.—A related species, *C. texana* Rydb., with more strigose and broader leaflets is said to have been found near Mobile, Ala.

16. C. corallicola Small. Stem copiously loose-pubescent, or glabrate in age: leaflets 11–15; blades linear to linear-elliptic, 7–13 mm. long: calyx 4–5 mm. long; lobes of the upper lip lanceolate; lower and lateral lobes lanceolate, about equal in length: corolla light-purple or deep-pink; standard 7–10 mm. long: pod 2–4 mm. wide.—Pinelands, Everglade Keys, Fla.

17. C. Curtissii Small. Stem minutely appressed-pubescent when young, glabrous in age: leaflets 7–17; blades of the lateral ones oblanceolate, narrowly cuneate, or linear-cuneate, 9–30 mm. long, truncate or retuse, or mucronate: calyx 3–4 mm. long; lobes of the upper lip deltoid; lower lobe narrowly lanceolate, longer than the ovate or triangular-lanceolate lateral ones: corolla pur-

plish, pale when opening; standard 9–12 cm. long: pod about 4 mm. wide.—Sand ridges, eastern coast, Fla.

18. C. angustissima (Shuttlw.) Kuntze. Stem glabrous: leaflets 11–17; blades of the lateral ones narrowly linear or very narrowly linear, 13–45 mm. long: calyx 4–5 mm. long; lobes of the upper lip lanceolate; lower lobe lanceolate, much longer than the lateral ones: corolla usually pale, turning reddish-purple; standard 9–11 mm. long: pod about 3 mm. wide.—Pinelands, Everglade Keys, Fla.

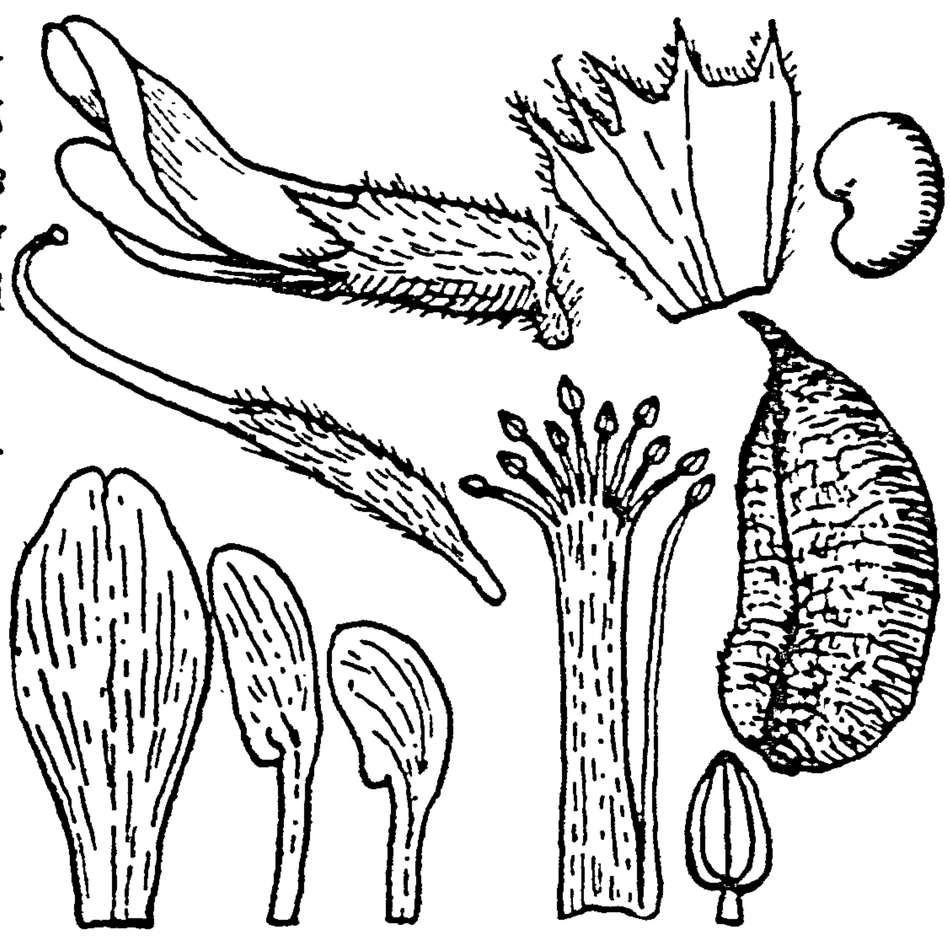
19. C. purpurea L. Stem diffuse or vine-like, sparingly strigillose: leaflets 9–21; blades of the lateral ones linear to linear-cuneate, 9–25 mm. long, abruptly pointed: calyx about 6 mm. long; lobes of the upper lip lanceolate-subulate: corolla white or pinkish; standard 9–10 mm. long: pod 3.5–4 mm. wide, usually curved.—Prairie, Big Cypress Swamp, S pen. Fla.—(*W. I., Mex., C. A., S. A.*)—A decoction made from this plant is used by the Seminoles as a specific for nose-bleed.

20. C. cinerea (L.) Morong. Stem lax, copiously strigose: leaflets 9–17; blades of the lateral ones linear to elliptic-oblanceolate, 19–50 mm. long; obtuse or acutish: calyx 5–6 mm. long; lobes of the upper lip subulate-tipped, those of the lower lip subulate: corolla purplish; standard 10–15 mm. long: pod 4–5 mm. wide.—Waste-places and cult. ground, Coastal Plain, Ala. Nat. of trop. Amer.—(*W. I., Mex., C. A., S. A.*)

32. GEOPRUMNON Rydb. Perennial tufted herbs. Leaflets numerous; blades usually not notched. Corolla purple or white or rarely ochroleucous: wings much longer than the keel-petals. Pod globular to ovoid or ellipsoid, fleshy, becoming spongy, the partition formed by the intruded and modified lower suture meeting the upper suture.—Six species, natives of central North America.—Spr.–sum.

Pod pubescent, obliquely ovoid, sometimes narrowly so, beaked.	
Calyx-lobes about ⅓ as long as the tube: pod curved, over 2 cm. long, coarsely wrinkled, gradually pointed.	1. *G. tennesseense.*
Calyx-lobes over ½ as long as the tube: pod straight, less than 2 cm. long, finely wrinkled, abruptly pointed.	2. *G. plattense.*
Pod glabrous, globose or ellipsoid-globose, beakless.	3. *G. crassicarpum.*

1. G. tennesseense (A. Gray) Rydb. Plant villous-hirsute: leaflets 15–33; blades elliptic to oval, 12–14 mm. long: peduncles about as long as the accompanying leaves: calyx-lobes long-hairy: standard 16–19 mm. long: keel abruptly curved upward: ovary pubescent: pod 3–3.5 cm. long, gradually beaked. [*Astragalus plattensis tennesseensis* A. Gray]—Rocky glades, interior provinces, Ala. to Mo. and Tenn.



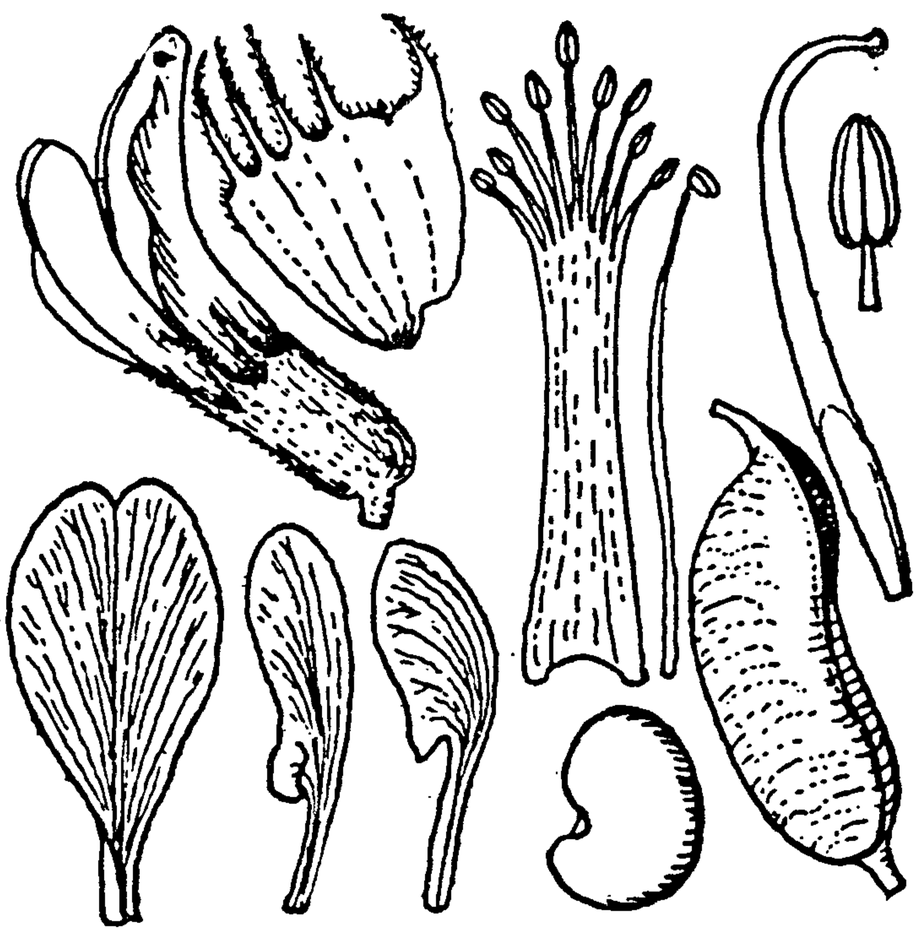
2. G. plattense (Nutt.) Rydb. Plant hirsute or somewhat strigose: leaflets 13–23; blades elliptic to obovate or cuneate, 5–15 mm. long: peduncles shorter than the accompanying leaves: calyx-lobes short-hairy: standard 15–18 mm. long: keel gradually curved upward: ovary pubescent: pod 1–1.5 cm. long, abruptly beaked.—Prairies, various provinces, Ala. to Tex. and Ind.

3. **G. crassicarpum** (Nutt.) Rydb. Plant strigillose: leaflets 13–27; blades elliptic, to elliptic-lanceolate, 8–20 mm. long: calyx 7–8.5 mm. long; lobes lanceolate to subulate-lanceolate: corolla purple: ovary glabrous: pod 2–2.5 cm. long. [*Astragalus caryocarpus* Ker.]—Prairies, various provinces, Tenn. to Tex., Man., and Minn.

33. **ASTRAGALUS** L. Perennial or annual herbs. Leaflets numerous or several: blades sometimes notched. Flowers in long racemes. Corolla variously colored, ours cream-colored or somewhat greenish: wings and keel-petals about equal in length. Pod coriaceous, ovoid or ellipsoid, turgid, but scarcely inflated, perfectly 2-celled, the septum formed by the intruded lower suture which meets the upper one. About 500 species, most abundant in Asia. —Spr.–sum.

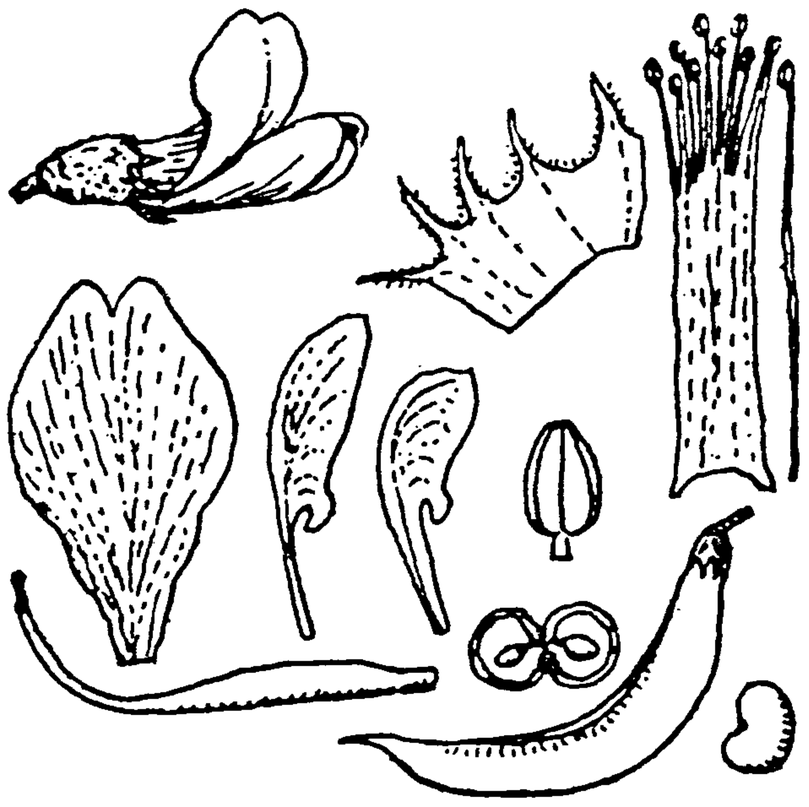
Calyx-lobes more than ½ the length of the tube: pod ascending when mature. 1. *A. carolinianus.*
Calyx-lobes less than ½ the length of the tube: pod spreading or reflexed when mature. 2. *A. Halei.*

1. **A. carolinianus** L. Stem up to 1 m. tall, glabrous, or sparingly pubescent above: leaflets 15–31; blades elliptic or elliptic-lanceolate, 2–4 cm. long: racemes elongate: calyx-lobes ⅔–¾ as long as the tube: standard 11–13 mm. long: keel gradually turned upward; blades narrow: pod narrowly ellipsoid, 12–16 mm. long, nearly straight, the beak straight or slightly curved. — (RATTLE-VETCH.) — Dry woods and river-banks, various provinces, Ga. and Ala. to Tenn., W. Va., and Md.



2. **A. Halei** Rydb. Stem up to 5 dm. tall, pubescent: leaflets 13–27; blades elliptic to elliptic-ovate, 1–3.5 cm. long: racemes short: calyx-lobes about ⅓ as long as the tube: standard 15–17 mm. long: keel abruptly curved upward; blades broad: pod 10–14 mm. long, curved, the beak hooked. —Woods and fields, Coastal Plain, Ala. to La.

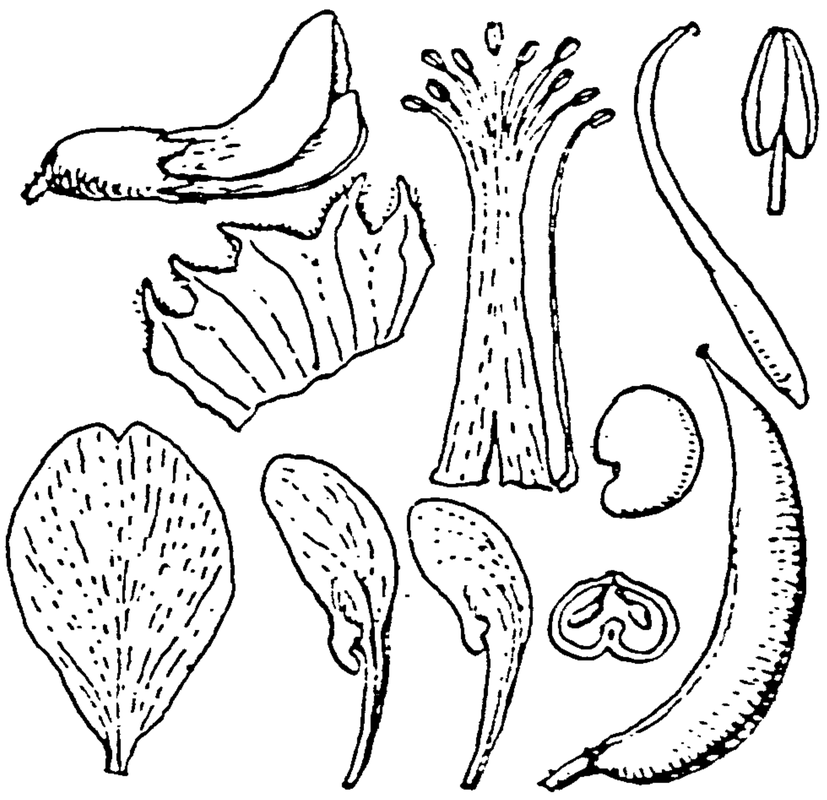
34. **HOLCOPHACOS** Rydb. Perennial low spreading herbs. Leaflets numerous, the blades entire, mostly truncate or notched. Flowers few in short racemes. Corolla pink or purplish: standard with a broad deeply notched blade: wings slightly longer than the keel-petals. Pod linear or ellipsoid, coriaceous, deeply sulcate along both sutures, but 1-celled, without even a partial partition. About 12 species, North American.



1. **H. distortus** (T. & G.) Rydb. Stem glabrous or sparingly pubescent, branched at the base, the branches ascending or prostrate, 1–4 dm. long: leaflets 17–23; blades oval, obovate, or cuneate, 3–10 mm. long: peduncles about as long as the subtending leaves or longer: racemes ovoid or cylindric: calyx-lobes lanceolate, shorter than the tube, erect: corolla purplish-blue, 8–10 mm. long: pod crescent-

shaped, 2–2.5 cm. long, short-beaked. [*Astragalus distortus* T. & G.]—Woods and hillsides, various provinces, Miss. to Tex., Ia., and W. Va.—Spr.–sum.

35. **TIUM** Medic. Perennial erect, virgate herbs. Leaflets numerous: blades mostly obtuse. Calyx campanulate with short lobes. Corolla white or purple: wings as long as the standard or nearly so. Pod narrow, short-stipitate, with a deep narrow groove along the ventral suture which is produced within into a partial false partition, ridged along the dorsal suture.—About 60 species, mostly natives of North America and Asia.

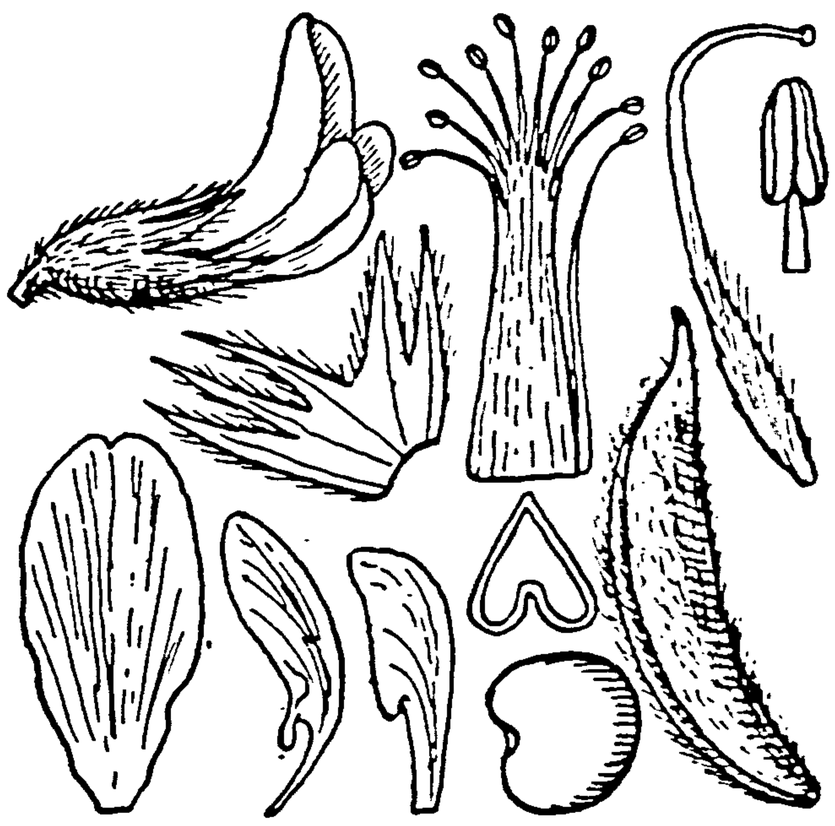


1. **T. Michauxii** (Kuntze) Rydb. Plant glabrous in age: leaflets 15–25; blades linear or nearly so, 9–20 dm. long: calyx 4–5 mm. long; lobes deltoid or triangular-lanceolate, 1–1.5 mm. long: corolla white; standard 13–16 mm. long: pod 2–4 cm. long, slightly curved, glabrous. [*Astragalus glaber* Michx. *Psoralea multijuga* Ell. *Tium apilosum* Rydb.]—Sandhills and dry pinelands, Coastal Plain, Fla. to N. C.—Spr.

36. **PHACA** L. Perennial or annual diffuse herbs with several or many stems from the top of the root. Leaflets numerous: blades broad, often notched. Calyx campanulate or cylindric-campanulate, with rather narrow lobes. Corolla blue, purple, or yellow. Pod sessile, narrow, curved, with a deep wide shallow groove along the ventral suture and a ridge along the dorsal, without a false partition.—About 20 species, North American.—Spr.

Pod pubescent: calyx-lobes longer than the tube. 1. *P. intonsa.*
Pod glabrous: calyx-lobes shorter than the tube. 2. *P. obcordata.*

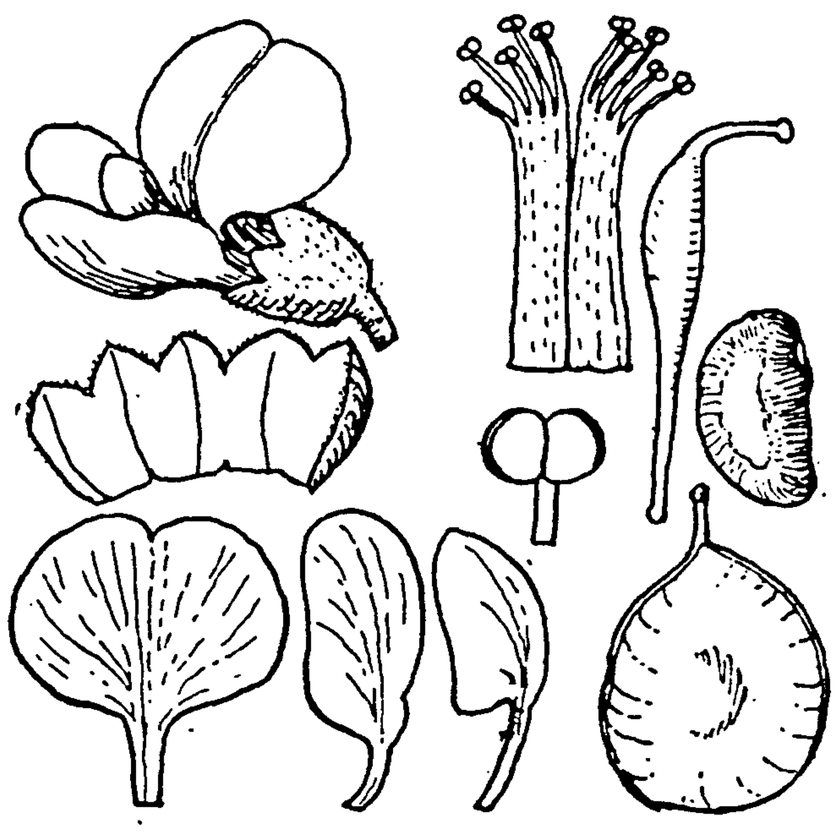
1. **P. intonsa** (Sheldon) Rydb. Plant villous: leaflets 9–15; blades elliptic, obovate, or suborbicular, 3–10 mm. long; calyx 9–10 mm. long; lobes lanceolate-subulate, 4.5–5.5 mm. long: corolla dull-yellow: standard 9–11 mm. long: pod about 2 cm. long, villous. [*Astragalus villosus* Michx. *Tium intonsum* Rydb.]—Pinelands, riverbanks, and roadsides, Coastal Plain, Fla. to Ala. and S. C.



2. **P. obcordata** (Ell.) Rydb. Plant glabrous in age or nearly so: leaflets 15–25; blades obcordate to oblong-cordate, 3–8 mm. long: calyx 5–6 mm. long; lobes narrowly lanceolate, 2.5–3 mm. long: corolla purple or blue; standard 8–10 mm. long: pod 3–3.5 cm. long, veiny. [*Astragalus obcordatus* Ell. *Tium obcordatum* Rydb.—Pinelands, Coastal Plain, Fla. and Ga.

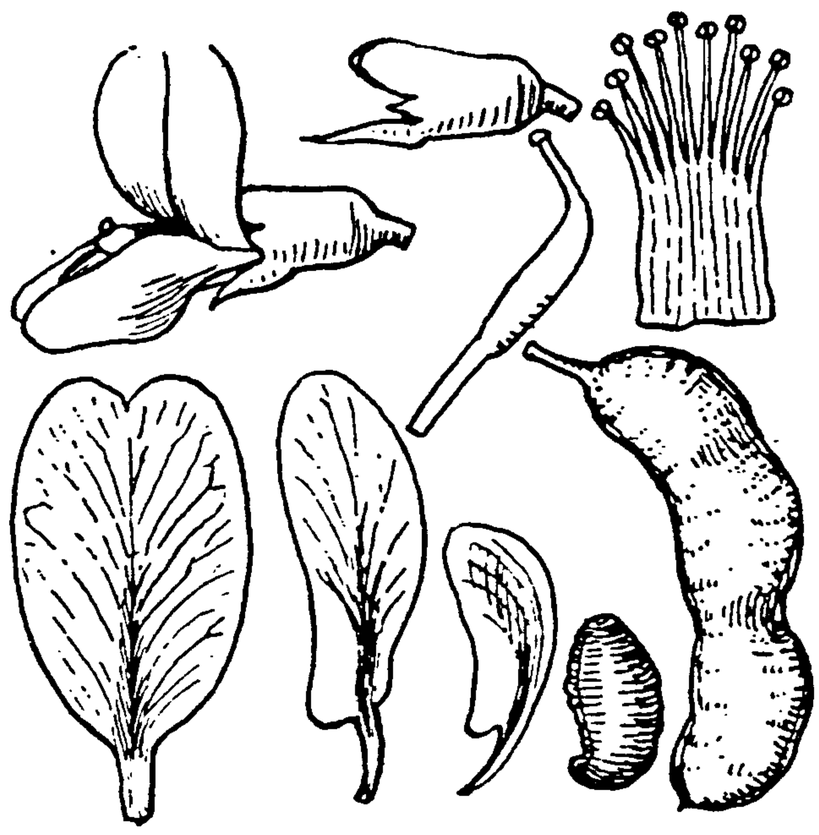
37. **ECASTOPHYLLUM** L. Shrubs. Leaflets solitary: blades broad. Racemes short. Calyx not 2-lipped, the 5 broad lobes short. Corolla white or

pink: standard with a suborbicular or reniform blade and a long claw. Free portions of the filaments long. Pod lenticular.—About 5 species, natives of tropical and subtropical America.



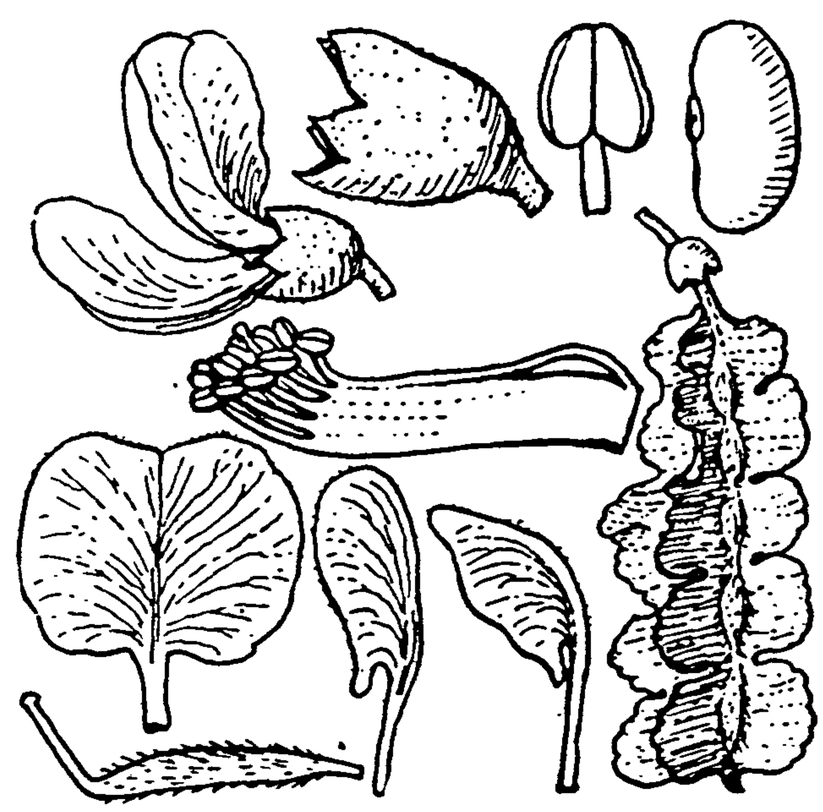
1. E. Ecastophyllum (L.) Britton. Shrub with wide-spreading or trailing branches: leaflets 5–15 cm. long; blades ovate or elliptic: calyx campanulate, becoming 3.5–4 mm. long: corolla white or pink; standard 3–9 mm. long, the blade suborbicular: pod suborbicular, 2–3 cm. in diameter. [*E. Brownei* (Chapm. Fl.).—*Dalbergia Brownei* (Fl. SE. U. S.)]—Coastal sand-dunes and shore hammocks, S pen. Fla. and Keys.—(*W. I., Mex., C. A., S. A., O. W.*)—In marshes behind sand-dunes the branches form almost impenetrable jungles.

38. AMERIMNON Jacq. Shrubs. Leaflets solitary. Racemes short. Calyx 2-lipped: upper lip with 2 broad lobes: lower lip with 2 short lateral lobes and a long middle one. Corolla white or pink: standard with an obovate or cuneate blade and a short claw. Filaments and ovary as in *Ecastophyllum*. Pod more or less elongate, stipitate.—About 12 species, tropical American.



1. A. Brownei Jacq. Shrub with reclining or trailing branches: leaflets thickish, the blades 6–12 cm. long, ovate to elliptic-ovate, obtuse or acutish, glabrous in age: racemes short: calyx 4–5 mm. long; upper lip with 2 broad lobes; lateral lobes of the lower lip ovate, the middle lobe lanceolate: corolla white or pink; standard 8–10 mm. long, the blade obovate or cuneate: pods oval, oblong, or linear-oblong, 1–3.5 cm. long.—Shore hammocks, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—The greatly elongate, often rope-like branches, frequently form almost impenetrable entanglements on the edges of hammocks.

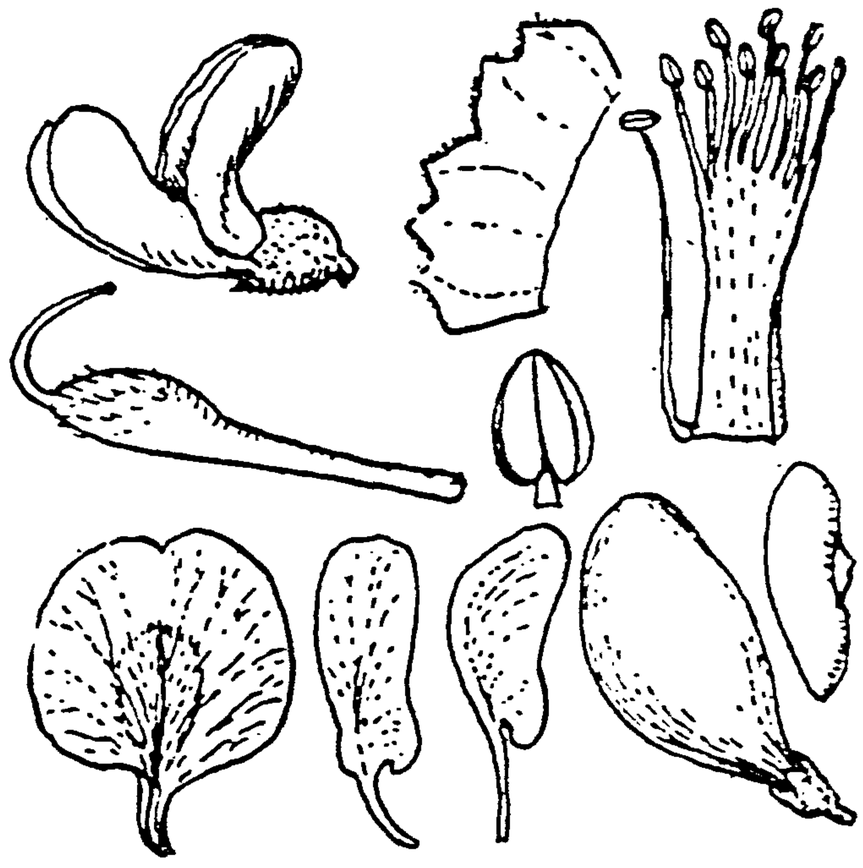
39. ICHTHYOMETHIA P. Br. Trees. Leaflets several, pinnate. Panicles thyrsoid. Calyx slightly 2-lipped, the upper lip notched: lower lip of three broad lobes about equal in length. Corolla white or partially colored: standard with a broad blade cordate at the base, and a short claw. Pod narrow, 4-winged.—About 6 species, natives of tropical and subtropical America.



1. I. piscipula (L.) A. Hitchc. Medium-sized tree: leaflets 7–9; blades oval or obovate, or nearly ovate, 2–10 cm. long, undulate or shallowly toothed: calyx campanulate, 6–7 mm. long: petals white and partially striped with red: standard 14–16 mm. long, the blade suborbicular: pod 5–10 cm. long,

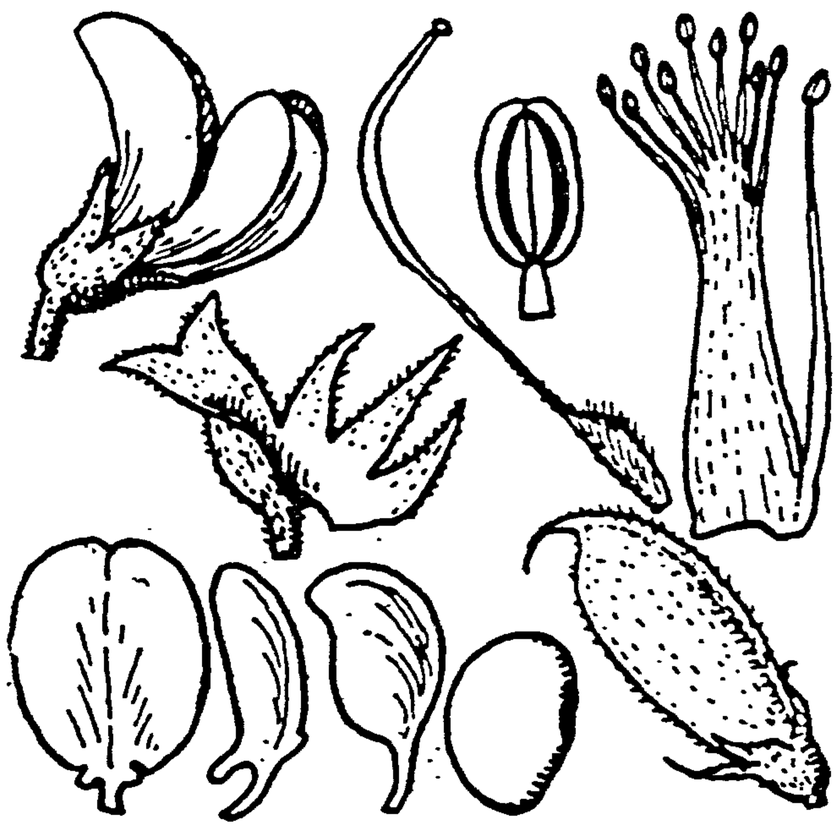
the wings undulate or incised. [*Piscidia Erythrina* L.]—(JAMAICA-DOGWOOD.)—Hammocks, coastal region, S pen. Fla., Everglade Keys, and Florida Keys.—(*W. I.*)—Spr. The hard durable wood is valued for boat-building. The bark of the roots and powdered other parts of the tree were formerly used to stupefy fish.

40. **ANDIRA** Lam. Trees. Leaflets several. Panicle terminal, ample. Calyx slightly 2-lipped, the upper lip notched: lower lip of three broad acute lobes. Corolla purple or reddish: standard with a broad blade. Pod thick, drupaceous, subglobose or somewhat elongate.—About 20 species, most abundant in tropical America.



1. **A. jamaicensis** (W. Wright) Urban. Tree with wide spreading branches and finely pubescent twigs and inflorescence: leaves 1–3 dm. long; leaflets mostly 9–13, the blades elliptic or oval, varying to ovate or obovate, 3.5–8 cm. long, abruptly acuminate, short-petioluled: panicle many-flowered, much-branched: flowers purplish: calyx campanulate; lobes wider than long, the lower ones acute: standard 9–10 mm. long; the blade suborbicular: pod subglobose, oval, or obovoid, mostly 5–7.5 cm. long.—Hammocks, Bahia Honda Key, Fla.—(*W. I.*)—Sum.—Living specimens collected on Bahia Honda Key were grown on the former Deering reservation at Buena Vista, Fla., where they flowered in 1924.

41. **PITCHERIA** Nutt. Perennial erect wiry herbs. Leaflets 3: blades coriaceous. Flowers axillary, solitary. Calyx 2-lipped, the lobes elongate, the 2 upper well united. Corolla yellow: blade of the standard broadened upward: blade of the wing-petals with a slender auricle at the base: blade of the keel-petals broad, strongly curved. Pod flat, short, margined, the small beak nearly or quite central at the rounded tip.—One species.



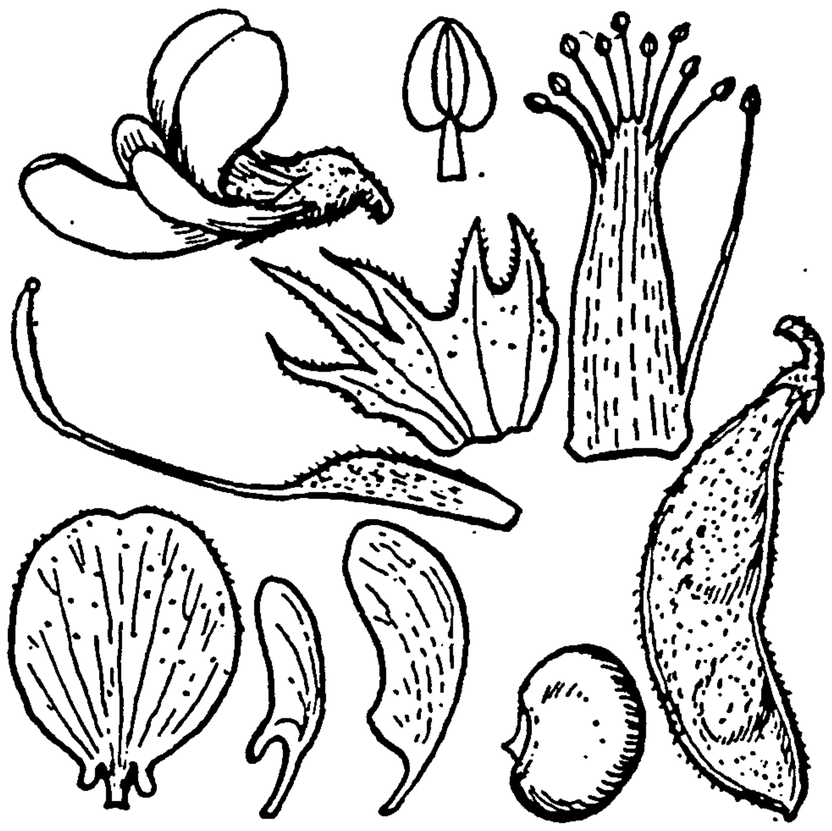
1. **P. galactioides** Nutt. Plant 6–12 dm. tall, widely branched: leaves short-petioled; leaflets 5–20 mm. long; blades oval or obovate-oval, reticulate and resinous-dotted: lower calyx-lobes lanceolate, long-acuminate, 5–7 mm. long: standard 7–9 mm. long; blade obovate: pod elliptic-obovate, 15–22 mm. long. [*Rhynchosia galactioides* Endl.]—Dry sandy pinelands, Coastal Plain, Fla. to Miss.—Spr.–sum.

42. **DOLICHOLUS** Medic. Perennial herbaceous vines. Leaves long-petioled, leaflets 3; blades thin, not reticulate. Flowers in interrupted axillary racemes. Calyx slightly 2-lipped, the 2 upper lobes scarcely more united than the others. Corolla yellow: blade of the standard broadened upward:

blade of the wing-petals auricled at the base: blades of the keel-petals rather narrow, curved. Pod flat, scimitar-shaped, slightly margined, the beak eccentric.—Few species, mostly tropical.

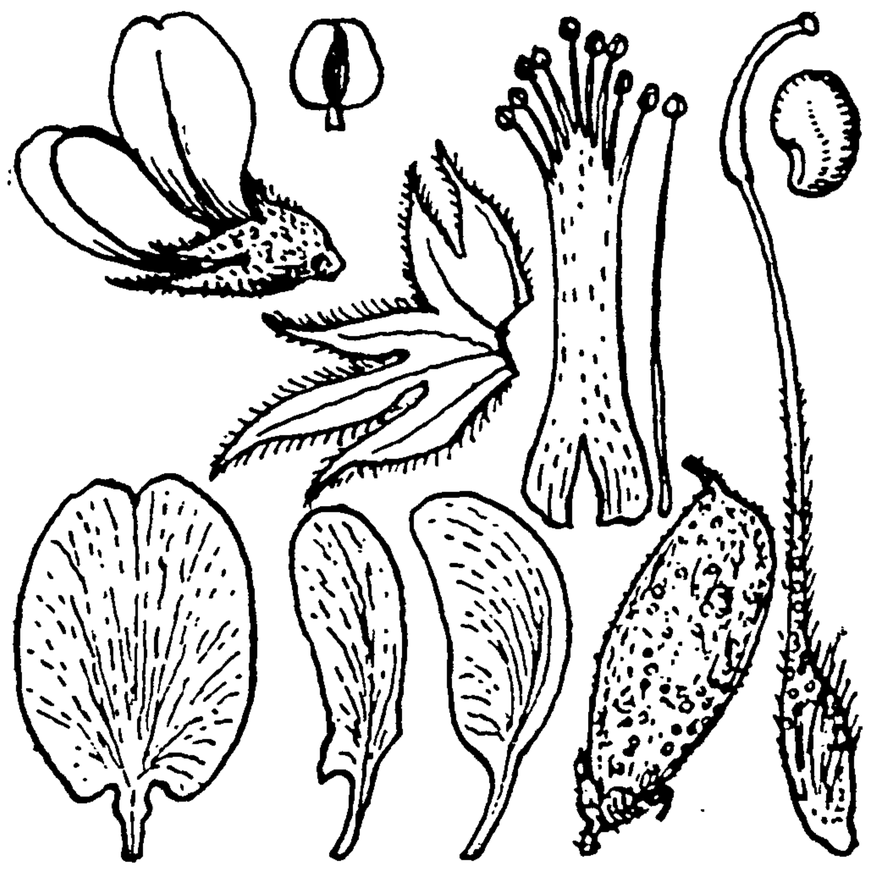
Racemes several-flowered: blades of the leaflets of a rhombic type: pod 1–1.5 cm. long. 1. *D. minimus.*
Racemes 2–4-flowered: blades of the leaflets of an ovate type: pod 2.5–4 cm. long. 2. *D. Swartzii.*

1. D. minimus (L.) Medic. Stem minutely retrorse-pubescent: leaflets 0.8–4 cm. long; blades of the lateral ones semirhombic, that of the terminal one rhombic-orbicular, sparingly pubescent: calyx-lobes narrowly lanceolate, longer than the tube: standard 5–6 mm. long; blade orbicular-cuneate: auricles of the wings acute: pod 10–15 mm. long. [*Rhynchosia minima* DC.].—Pinelands and edges of hammocks, Coastal Plain, Fla. to Tex. and S. C.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall or all year S.



2. D. Swartzii Vail. Stem finely retrorse-pubescent: leaflets 3–6 cm. long; blades ovate, acuminate, softly pubescent: calyx-lobes broadly lanceolate, shorter than the tube: standard 6.5–8 mm. long: pod 25–40 mm. long. [*Rhynchosia caribaea* DC.]—Hammocks, S pen. Fla. and the Keys.—(*W. I.*)—All year.

43. LEUCOPTERUM Small. Herbaceous vines. Leaves long-petioled: leaflets 3: blades rather broad, thickish. Flowers few, in peduncled axillary racemes. Calyx 2-lipped, not accrescent, the lobes of the upper lip well united, the middle lobe of the lower lip much longer than the lateral ones. Corolla yellow: blade of the standard broadened upward: blade of the wing petals with a rounded lobe at the base: blade of the keel petals rather broad, slightly curved: ovary short-stipitate: style elongate, hairy and glandular near the base, much swollen near the apex. Pod broad, nearly equilateral, the beak eccentric and oblique. One species.



1. L. parvifolium (DC.) Small. Stem grayish-tomentose: leaflets 1.5–3.5 cm. long; blades elliptic to elliptic-lanceolate or sometimes broader: lower calyx-lobe linear-lanceolate: standard 7–8 mm. long; blade suborbicular: lobe of the wings obtuse: pod elliptic, 13–17 mm. long. [*Rhynchosia parvifolius* DC. *Dolicholus parvifolius* Vail]—Pinelands, S pen. Fla. and the Keys.—(*W. I.*)—Spr.–fall or all year S.

44. RHYNCHOSIA Lour. Perennial herbs with erect or climbing stems. Leaves long-petioled: leaflets 3 or 1; blades broad, often wider than long. Flowers in short-stalked axillary congested racemes. Calyx 2-lipped, accrescent: lobes of the upper lip well-united: middle lobe of the lower lip longer

than the lateral. Corolla yellow, about as long as the calyx or shorter: blade of the standard suborbicular to orbicular-obovate: blade of the wing-petals with a salient auricle on each side at the base: blades of the keel-petals broad, strongly curved. Pod flat, short, the beak very eccentric.—About 150 species, in tropical and temperate regions.

Stem prostrate or climbing. — I. LATIFOLIAE.
Stem erect. — II. ERECTAE.

I. LATIFOLIAE

Leaves unifoliolate, or rarely the uppermost trifoliolate: racemes axillary. — 1. *R. Michauxii.*
Leaves trifoliolate.
  Racemes very short-peduncled or sessile.
    Stem and branches prostrate, cinereous: pod broad at each end; beak lateral. — 2. *R. cinerea.*
    Stem and branches generally climbing, retrorse-hirsute: pod narrowed at each end: beak oblique. — 3. *R. tomentosa.*
  Racemes peduncled, or the uppermost short-peduncled, elongating. — 4. *R. Lewtonii.*

II. ERECTAE

Leaves unifoliolate, the leaflets with reniform blades. — 5. *R. simplicifolia.*
Leaves trifoliolate or some of the basal ones unifoliolate.
  Racemes terminal and axillary, never long-peduncled and elongate.
    Stem 1–2 dm. tall: median lobe of the lower calyx-lip subulate: inflorescence strigose-hirsute. — 6. *R. intermedia.*
    Stem 2–8 dm. tall: median lobe of the lower calyx-lip lanceolate: inflorescence strigose-sericious. — 7. *R. erecta.*
  Racemes mainly terminal or a few of them axillary, commonly much elongate. — 8. *R. mollissima.*

1. R. Michauxii Vail. Stem densely gray-pubescent: leaflets 2.5–5 mm. long; blades broader than long, soft-hirsute beneath: calyx 12–17 mm. long; lobes abruptly acuminate: standard 12–14 mm. long; blade cuneate: pod 11–16 mm. long, obliquely beaked. [*Rhynchosia menispermoidea* (Chapm. Fl.) *Dolicholus Michauxii* Vail.]—Pinelands, Fla.—Spr.–fall.

2. R. cinerea Nash. Stem cinereous-pubescent: leaflets 1–3 cm. long; blades obliquely orbicular to ovate-orbicular or the terminal one reniform, thick: lateral calyx-lobes lanceolate, markedly shorter than the lower one; lobes of the upper calyx-lip lanceolate: standard 6–7 mm. long: pod 14–15 mm. long. [*Dolicholus cinereus* Vail] — Pinelands, pen. Fla. and the Keys.—Spr.–fall or all year S.

3. R. tomentosa (L.) H. & A. Stem retrorse-hirsute: leaflets 3–6 cm. long; blades ovate to ovate-rhombic, or the terminal one wider than long, thinnish, softly pubescent: lateral calyx-lobes nearly linear, about equalling the lower one; lobes of the upper calyx-lip subulate; standard 7–8 mm. long: pod 16–20 mm. long. [*Dolicholus tomentosus* Vail]—Pinelands, Coastal Plain and rarely adj. provinces, Fla. to La. and Va.—Sum.–fall.

4. R. Lewtonii (Vail) Small. Stem soft-pubescent: leaflets 3–6 cm. long; blades obovate-elliptic to obovate-orbicular, or the terminal one wider than long: calyx 10–12 mm. long; lower lobe narrow and longer than the lateral ones: standard 8–9 mm. long; blade broadly obovate. [*Rhynchosia reticulata* (Chapm. Fl.) *Dolicholus Lewtonii* Vail]—Pinelands, pen. Fla.

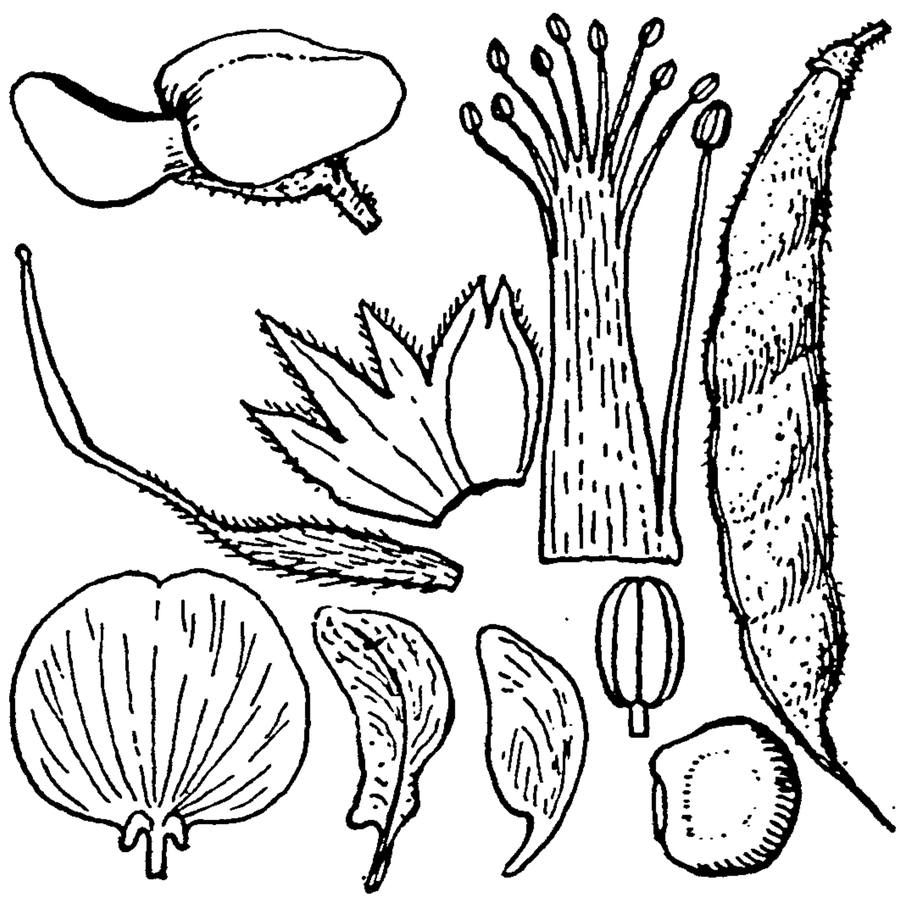
5. R. simplicifolia (Walt.) Wood. Stem hirsute: leaflets 2–5 cm. long; blades depressed-orbicular or reniform, hirsute on the veins beneath, strongly reticulate: calyx 8–10 mm. long; upper lobes typically ovate, lower lobe about equalling the lateral ones: standard 6.75 mm. long; blade broadly obovate or suborbicular: wings about as long as the standard: pod 15–17 mm. long, elliptic; beak nearly lateral. [*Rhynchosia reniformis* (Pursh) DC. *Dolicholus simplicifolius* Vail]—(DOLLAR-WEED.)—Pinelands, open woods, and fields, Coastal Plain and rarely adj. provinces, Fla., and La. and Va.—Spr.–fall.

6. R. intermedia (T. & G.) Small. Stem tomentose: leaflets 2–5 cm. long; blades suborbicular and often somewhat rhombic, or ovate-orbicular, or those of the lateral ones ovate or oval: lower calyx-lobes various, the lateral ones lanceolate-subulate, the median one subulate, slender-tipped; upper lobes subulate-lanceolate: standard 7–8 mm. long; blade nearly elliptic or elliptic-obovate: wings much shorter than the standard: pod 15–18 mm. long, narrowly elliptic. [*Dolicholus intermedius* Vail]—Pinelands, Coastal Plain, Fla., Ala. and Ga.—Spr.–sum.

7. R. erecta (Walt.) DC. Stem 2–8 dm. tall, softly pubescent: leaflets 2.5–5 cm. long; blades oval, elliptic or elliptic-oval, velvety beneath: lower calyx-lobes narrowly lanceolate; lobes of the upper calyx-lip lanceolate, shorter than the tube: standard 5–6.5 mm. long; blade suborbicular: ovary short-hairy: pod 14–16 mm. long, elliptic; beak eccentric. [*Dolicholus erectus* Vail]—Dry soil, especially in pinelands, Coastal Plain, and rarely adj. provinces, Fla. to La., Tenn., and Del.

8. R. mollissima (Ell.) S. Wats. Stem 3–6 dm. tall, closely and silvery soft-pubescent: leaflets 2.5–4.5 cm. long; blades oval or oval-elliptic: calyx hispidulous; lower lobes narrowly lanceolate, the middle one the longest: standard 6.5–7.5 mm. long; blade obovate: ovary hispidulous: pod 19–21 mm. long, slightly curved; beak lateral. [*Dolicholus mollissimus* Vail]—Pinelands, Coastal Plain, Fla. and adj. Ga. to Miss.—Spr.–fall.

45. CAJAN Adans. Partially woody herbs. Leaflets 3. Racemes few-several-flowered. Calyx somewhat 2-lipped, the upper lobes partially united. Corolla yellow or mainly so: blade of the standard suborbicular, sharp-auricled at the base: blades of the wings rather prominently, but unequally auricled on each side: blades of the keel-petals obtuse at the apex. Pod turgid, elongate.—One species.



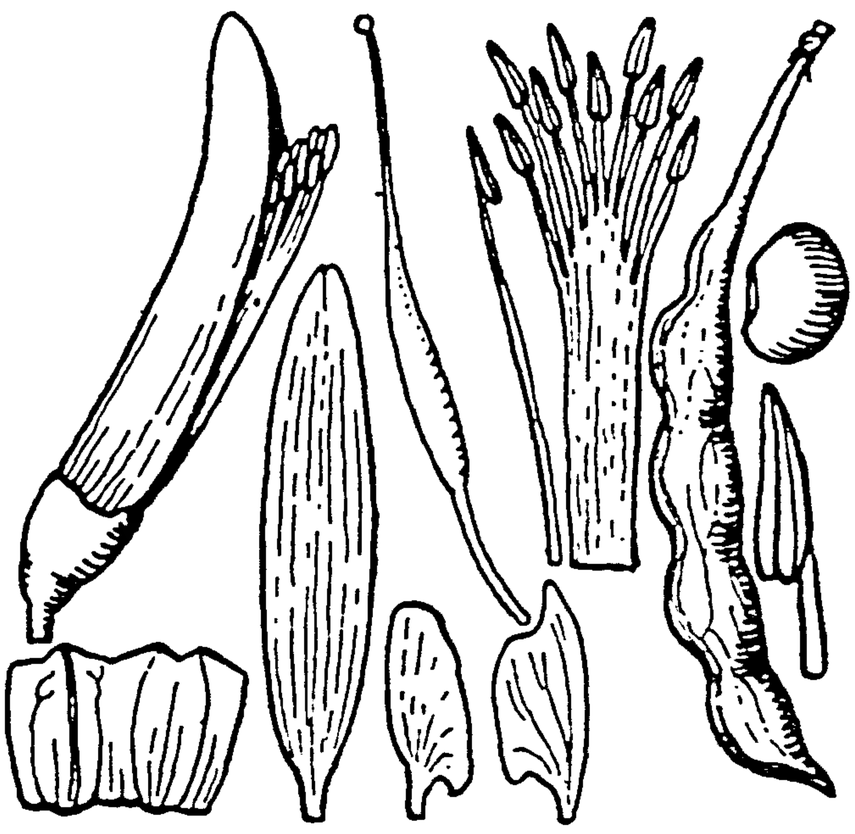
1. C. Cajan (L.) Millsp. Plant 9–30 dm. tall, velvety-tomentose: leaflets mainly 4–12 cm. long; blades narrowly elliptic, acute or short-acuminate, pale and prominently veined beneath: calyx 8–14 mm. long: standard-blade 16–20 mm. long: pod narrowly elliptic to linear-oblong.—CONGO-PEA. PIGEON-PEA. —Pinelands, cult. grounds, and hammocks, S pen. Fla., and the Keys.—Nat. of Old World Tropics and cult.—(*W. I.*)—All year.—Grown extensively for its pea-like seeds which are boiled and eaten or used for feeding poultry.

46. ERYTHRINA L. Herbs, shrubs, or trees. Leaflets 3. Racemes several-many-flowered. Calyx obliquely truncate. Corolla red, scarlet, or crim-

son: standard conspicuous, erect, narrowed upward: wings and the keel-petals very small, nearly equal in size, the blades short-clawed. Androecium exserted: filaments united to about the middle and slightly above it. Ovary long-stipitate. Pod torulose.—About 20 species, natives of tropical and warm-temperate regions.—Wint.-spr.—CORAL-BEANS. CHEROKEE-BEANS. DRAGON'S-TEETH. SNAKEWEEDS.—An infusion, made from the leaves, is used by the Seminoles in canine diseases.

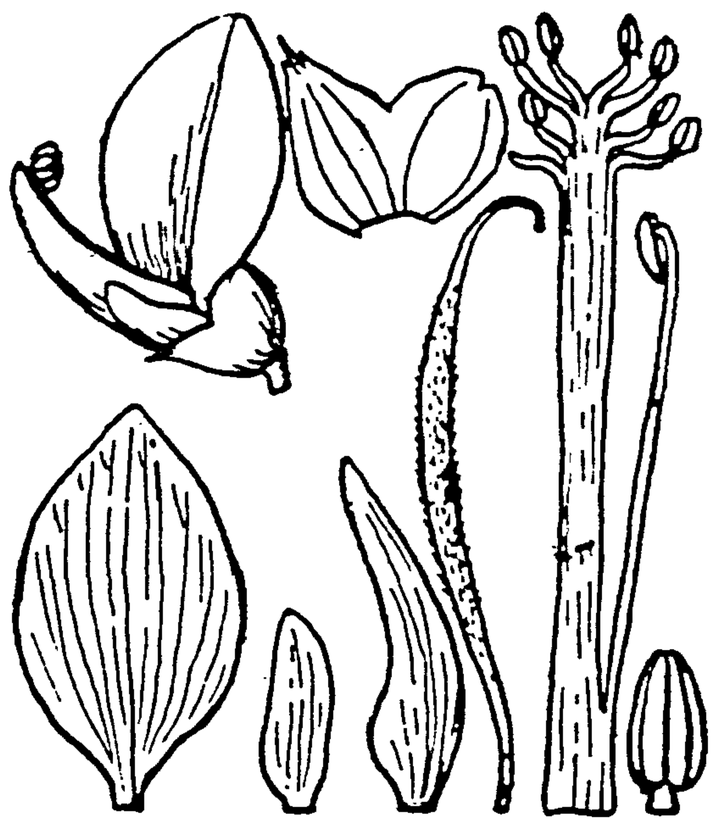
Herb: stem annual: standard elliptic. 1. *E. herbacea.*
Shrub or tree: stems perennial, very woody: standard lanceolate. 2. *E. arborea.*

1. E. herbacea L. Herbs 6–12 dm. tall: leaflets 3–9 cm. long; blades deltoid to hastate: racemes many-flowered: calyx campanulate: standard 45–50 mm. long; blade about 2 cm. wide: wing-petals 15–17 mm. long.—(CARDINAL-SPEAR.)—Pinelands, hammocks, thickets, and edges of woods, Coastal Plain, Fla. to Tex. and N. C.



2. E. arborea (Chapm.) Small. Shrub or tree 3–8 m. tall, or a woody vine: leaflets 3.5–10 cm. long; blades deltoid to hastately 3-lobed: racemes few-flowered: calyx cylindric: standard 35–40 mm. long; blade about 1 cm. wide: wing-petals 11–12 mm. long: pod drooping, 8–15 cm. long. [*E. herbacea arborea* Chapm.]—(RED-CARDINAL.)—Hammocks, S pen. Fla., and the Keys.—The brilliantly colored seeds are often gathered and used as beads.

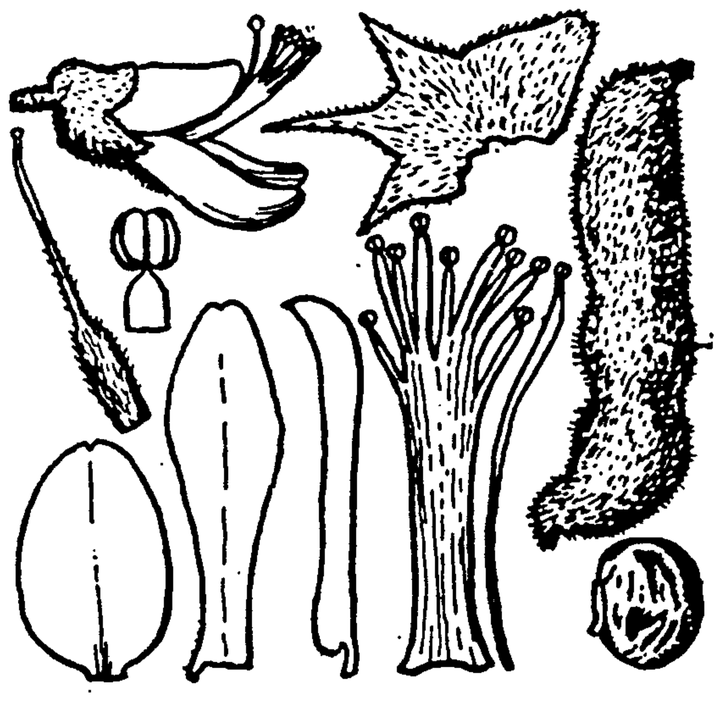
47. MICROPTERYX Walp. Shrubs or trees. Leaflets 3. Flowers clustered in the axils or in elongate panicles. Calyx 2-lipped, but with shallow lobes. Corolla crimson: standard conspicuous, spreading, broadened upward: wings and keel-petals very unequal in size, the former short, the latter elongate, clawless. Androecium included in the keel: filaments united to near the tip. Ovary short-stipitate. Pod cylindric.—About 6 species, tropical.



1. M. Crista-galli (L.) Walp. Shrub or small tree, often prickle-armed: leaflets 5–14 cm. long; blades elliptic, oval, or ovate, glabrous: racemes several-flowered: calyx 13–15 mm. long: standard obovate, 40–45 mm. long: wings 9–11 mm. long: keel-petals lanceolate, 30–35 mm. long: pod 18–25 mm. long. [*Erythrina Crista-galli* L.]—Waste-places, Coastal Plain, Gulf States. Nat. of S. A., and cult.

48. STIZOLOBIUM P. Br. Leaflets 3. Racemes or panicles erect, usually few-flowered. Calyx 2-lipped: upper lip often slightly notched; lower lip 3-lobed. Corolla red or purple: standard much shorter than the other petals,

the blade longer than broad: blades of the wings auricled on one side: keel-petals scythe-shaped. Pod turgid.—About 20 species, mostly in tropical regions.

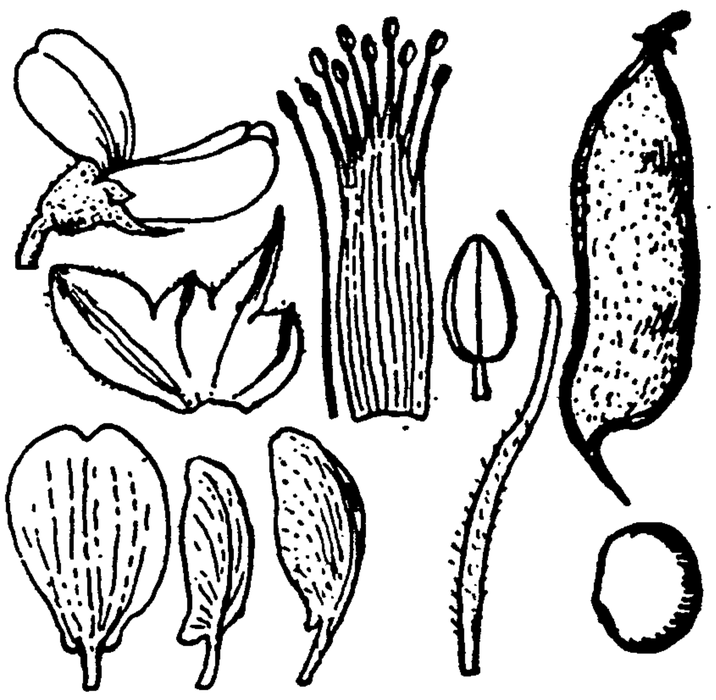


1. **S. Deeringianum** Bort. Herbaceous vine: leaflets 7–16 cm. long; blades sparingly pubescent, those of the lateral ones very obliquely ovate, that of the terminal one rhombic or ovate-rhombic; lower calyx-lobes triangular or triangular-lanceolate: standard 23–26 mm. long, the blade ovate; wings broadened at the apex; keel-petals narrowed at the bent apex: pod 5–9 cm. long, coarsely pubescent. [*Mucuna Deeringiana* Small]—(VELVET-BEAN. FLORIDA-BEAN.)—Pinelands, hammocks, citrus groves, and old-fields, pen. Fla. Nat. of Asia.—Extensively grown as a ground-cover.

49. MUCUNA Adans. Woody vines. Leaflets 3. Racemes pendent, head-like, the several flowers borne in a radiating cluster. Calyx 2-lipped, the upper lip entire, the lower lip prominently 3-lobed. Corolla greenish-yellow: standard much shorter than the other petals: keel-petals scythe-shaped. Pod thick, but flattish, with prominent transverse corrugations.—About 25 species, mostly tropical.

1. **M. Sloanei** Fawc. & Rendle. Vigorous woody vine: blades of the leaflets ovate (the lateral ones oblique and inequilateral), thinnish, 7–15 cm. long, more or less acuminate, silvery-hairy beneath: calyx 1.5–2 cm. long, the upper lip broad: corolla lemon-yellow, 5–7 cm. long; standard about half as long as the keel, enfolding the other petals at the base: pod drooping, somewhat woody, elliptic, but often irregular from the unequal development of the seeds, with irregular transverse crests and brown stinging hairs.—(COWITCH-VINE. SEA-BEAN.)—Hammocks, Everglade Keys, pen. Fla.—(*W. I., S. A.*)—All year.—The hairs of the pod are exceeding irritating to the skin—hence "cowitch." The seeds are used as beads and ornaments for watch-chains.

50. DIOCLEA H. B. K. Vines or woody plants. Leaflets 3. Panicle raceme-like, long-peduncled. Calyx 2-lipped, the lobes, except the middle lower one, short. Corolla blue or purple, or white: standard reflexed, narrowed at the base. Ovary sessile or nearly so. Pod flat.—About 16 species, mostly natives of tropical America.



1. **D. multiflora** (T. & G.) C. Mohr. Plant pubescent: leaflets 5–15 cm. long; blades oval, suborbicular, or reniform: calyx 5–7 mm. long; lower lobes lanceolate: corolla purple; standard 12–15 mm. long, the blade suborbicular: pod elliptic, 5–6 cm. long. [*D. Boykinii* A. Gray]—River banks, Coastal Plain, and occasionally adj. provinces, Ga. to La., Ark., and Ky.—Sum.

51. GALACTIA P. Br. Vines with prostrate or twining stems, or erect partially woody plants. Leaflets 3, or rarely 1, 5 or 7. Panicles raceme-like.

Calyx 2-lipped, the lobes relatively long. Corolla violet, red, or white: standard erect or spreading: wings and keel-petals with relatively short claws. Ovary sessile or nearly so. Pod turgid, elongate, or the subterranean ones, when present, short.—About 70 species, natives of warm and tropical regions. —Sum.–fall or all year S.—MILK-PEAS.—The corollas are mainly purple.

Stem erect: leaf-rachis not prolonged beyond the lateral leaflets: flower-clusters sessile or nearly so in the axils. I. ERECTAE.
Stem prostrate or twining: leaf-rachis prolonged: panicles elongate, continuous or interrupted.
  Plant with decumbent or prostrate stems and branches. II. DIFFUSAE.
  Plant with twining stems and branches. III. VOLUBILES.

I. ERECTAE

Plant with solitary or clustered, wiry, somewhat zigzag stems. 1. *G. erecta.*

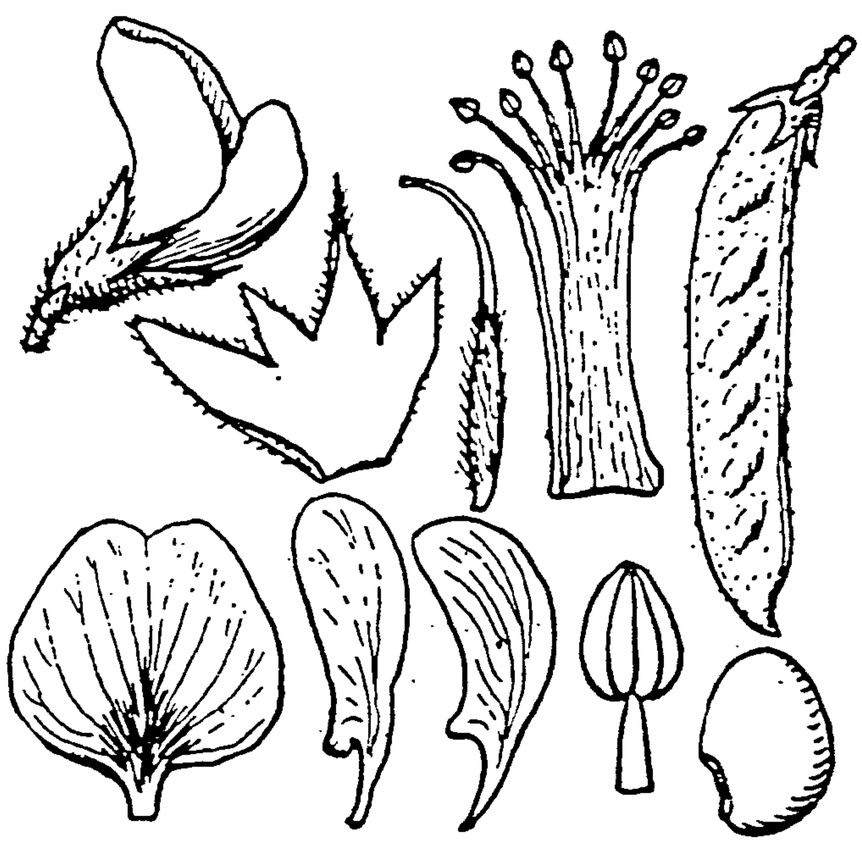
II. DIFFUSAE

Panicles shorter than the leaves, at least, in anthesis: flower-clusters approximate.
  Calyx coarsely hirsute.
    Panicles usually with one flower-cluster: leaflets of the upper leaves narrow. 2. *G. brachypoda.*
    Panicles with several flower-clusters: leaflets broad. 3. *G. floridana.*
  Calyx glabrous or glabrate. 4. *G. regularis.*
Panicles exceeding the leaves: flower-clusters separated.
  Blades of the leaflets oval or elliptic: calyx 6–9 mm. long.
    Panicle at least half as long as the peduncle. 5. *G. brevipes.*
    Panicle much shorter than the peduncle. 6. *G. prostrata.*
  Blades of the leaflets mostly linear-lanceolate to linear: calyx 10–16 mm. long. 7. *G. pinetorum.*

III. VOLUBILES

Leaves with 3 leaflets: corolla violet.
  Panicles several (2–7) in a leaf-axil, the rachis zigzag. 8. *G. fasciculata.*
  Panicles solitary (rarely 2) in a leaf-axil.
    Peduncle shorter than the panicle-rachis, shorter or somewhat longer than the leaves.
      Standard not striped: upper calyx-lobe triangular to lanceolate.
        Leaflets of the upper leaves with ovate, oval, or elliptic-ovate blades: standard mostly less than 11 mm. long. 9. *G. volubilis.*
        Leaflets of the upper leaves with linear or nearly linear blades: standard over 11 mm long. 10. *G. parvifolia.*
      Standard striped: upper calyx-lobe broadly ovate.
        Panicles sessile or nearly so; leaflets coriaceous. 11. *G. spiciformis.*
        Panicles long-peduncled: leaflets membranous. 12. *G. striata.*
    Peduncle much longer than the panicle-rachis and leaves. 13. *G. mollis.*
Leaves with 7–9 leaflets: corolla white. 14. *G. Elliottii.*

1. G. erecta (Walt.) Vail. Stem glabrous or nearly so: leaflets 2.5–4 cm. long; blades elliptic to linear: calyx 5–6 mm. long; lateral lobes longer than the tube: keel-petals 6–7 mm. long: pod 1.5–2 cm. long. [*G. sessiliflora* T. & G.]—Pinelands, Coastal Plain, W Fla. to Ala., (La.?), and N. C.



2. G. brachypoda T. & G. Stem puberulent or nearly glabrous: leaflets 2–3.5 cm. long; blades elliptic to linear-elliptic: calyx 4.5–5 mm. long; lateral lobes acute: keel-petals 5–6 mm. long: pod not seen.—Pinelands, Fla.

3. G. floridana T. & G. Stem hoary-pubescent: leaflets 1.5–4.5 cm. long (smaller and on petioles less than 1 cm. long in *G. floridana microphylla* Vail): blades oval or elliptic-oval: flowers scattered nearly the

length of the rachis (or borne 2–4 together at regular intervals above the middle of the rachis in *G. floridana longiracemosa* Vail): calyx 7–8 mm. long; lateral lobes acuminate: keel-petals 10–11 mm. long: pod 4–5 cm. long.—Pinelands, Coastal Plain, Fla. and Ala.

4. **G. regularis** (L.) B. S. P. Stem minutely retrorse-pubescent: leaflets 2–4.5 cm. long; blades elliptic or ovate-elliptic: calyx 7–9 mm. long; lobes obscurely scarious-margined: keel-petals 11–13 mm. long: pod 2.5–4.5 cm. long. [*G. glabella* Michx.]—Pinelands and sandhills, and edges of hammocks, Coastal Plain, and occasionally adj. provinces, Fla. to La., Tenn., and N. Y.

5. **G. brevipes** Small. Stem closely pubescent with short crisped hairs and somewhat clammy: leaflets 2–4 cm. long; blades oval or nearly so: calyx 6–7 mm. long; lateral lobes several times longer than the tube: keel-petals 11–13 mm. long: pod not seen.—Pinelands, near Trader's Hill, on the Coastal Plain of Ga.

6. **G. prostrata** Small. Stems finely pubescent with short straight appressed or ascending hairs: leaflets mostly 1.5–3 cm. long, or rarely longer; blades elliptic or oval varying to ovate or obovate: calyx 8–9 mm. long: standard 15–17 mm. long: pod not seen.—Pinelands, Everglade Keys, pen. Fla.—All year.

7. **G. pinetorum** Small. Stem finely pubescent: leaflets 1.5–5 cm. long; blades typically linear-lanceolate or linear, or rarely broader: calyx 11–16 mm. long: standard 15–20 mm. long: pod 4.5–6 cm. long.—Pinelands, Everglade Keys, Fla.—All year.

8. **G. fasciculata** Vail. Stem retrorsely canescent: leaflets 1.5–3 cm. long; blades suborbicular to elliptic-orbicular: calyx 8–9 mm. long; lateral lobe lanceolate, about as long as the tube: keel-petals 11–12 mm. long: no subterranean pod.—Sandy soil, Tampa, Fla.

9. **G. volubilis** (L.) Britton. Stem finely retrorse-hirsute: leaflets 2–5 cm. long; blades ovate, oval, or elliptic-ovate, or lanceolate-elliptic: calyx 5–6 mm. long; lobes ciliate: keel-petals 9–11 mm. long: pod 3–5 cm. long. [*G. pilosa* Ell.]—Pinelands and dry thickets, Coastal Plain and occasionally adj. provinces, Fla. to Tex., Okla., Mo., and N. Y.—A form occurs on the Everglade Keys with a very numerously—and densely—flowered panicle.

10. **G. parvifolia** A. Rich. Stem minutely pubescent: leaflets mostly 1–4 cm. long; blades various, linear, varying to broadest above or below the middle, or those of the lower leaves broader, varying from ovate or oval to obovate, all thin or thinnish, usually faintly veined: calyx 5–8 mm. long: keel-petals 6.5–8 mm. long: pod 3.5–4.5 cm. long. [*G. filiformis* (Chapm. Fl.)]—Pinelands and hammocks. Everglade Keys, pen. Fla. and the Keys.—All year.

11. **G. spiciformis** T. & G. Stem retrorse-pubescent: leaflets 2.5–8 cm. long; blades elliptic or elliptic-oval: calyx 5–6 mm. long: standard 9–10 mm. long; blade auricled at the base: keel-petals 8–9 mm. long: pod 4–5 cm. long. [*G. cubensis* (Fl. SE. U. S.)] Hammocks and pinelands, S Fla.—(*W. I.*)—The sessile panicles have short internodes and the flower-clusters are close together.

12. **G. striata** (Jacq.) Urban. Stem loosely fine-pubescent: leaflets mostly 2.5–8.5 cm. long; blades elliptic or oval, varying to ovate: calyx 7–8 mm. long: standard 9–10 cm. long; blade truncate at the base: keel-petals 9–10 mm. long: pod 4–8 cm. long.—Hammocks and thickets, S pen. Fla.—(*W. I., Mex., C. A., S. A.*)—The peduncled panicles have long internodes and the flower-clusters are often widely separated.

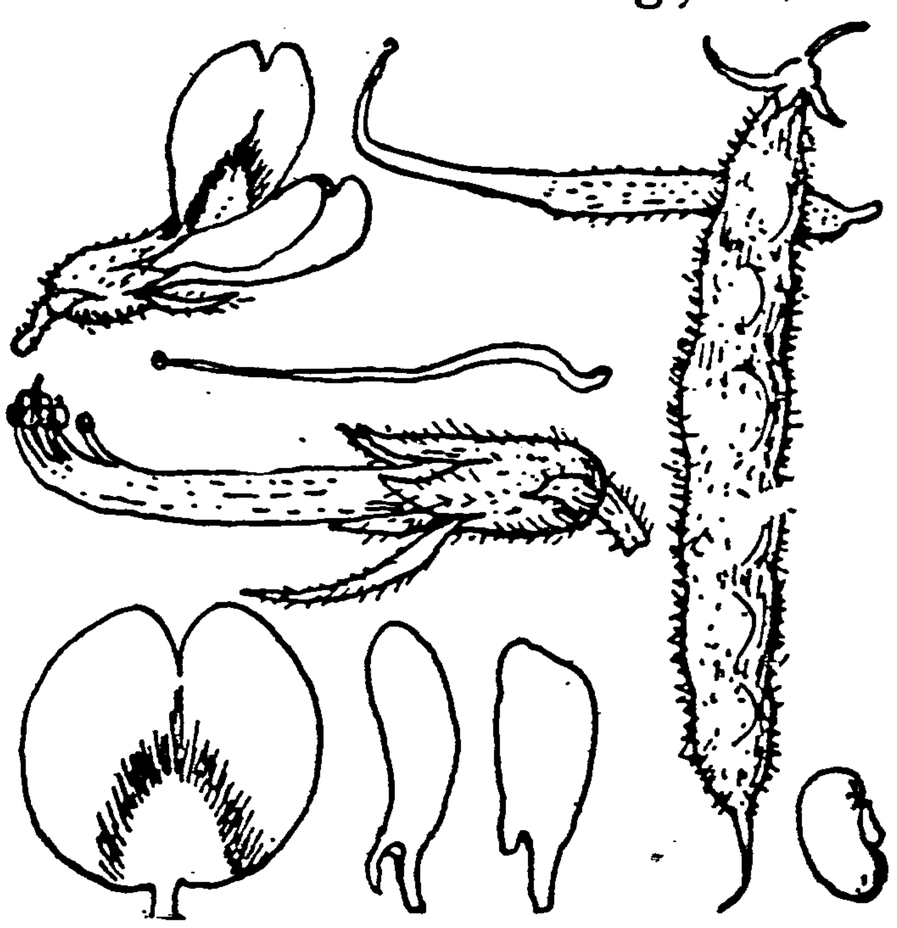
13. **G. mollis** Michx. Stem villous or somewhat hoary: leaflets 2.5–5 cm. long; blades oval or elliptic: calyx 5–6 mm. long: standard 7–8 mm. long;

blade not auricled: keel-petals 5–6 mm. long: pod 2.5–4 cm. long—Pinelands, swamps, and river-banks, Coastal Plain, Fla. to N. C.—Sum.—*G. mollis Nashii* Vail has stem only lightly pubescent.

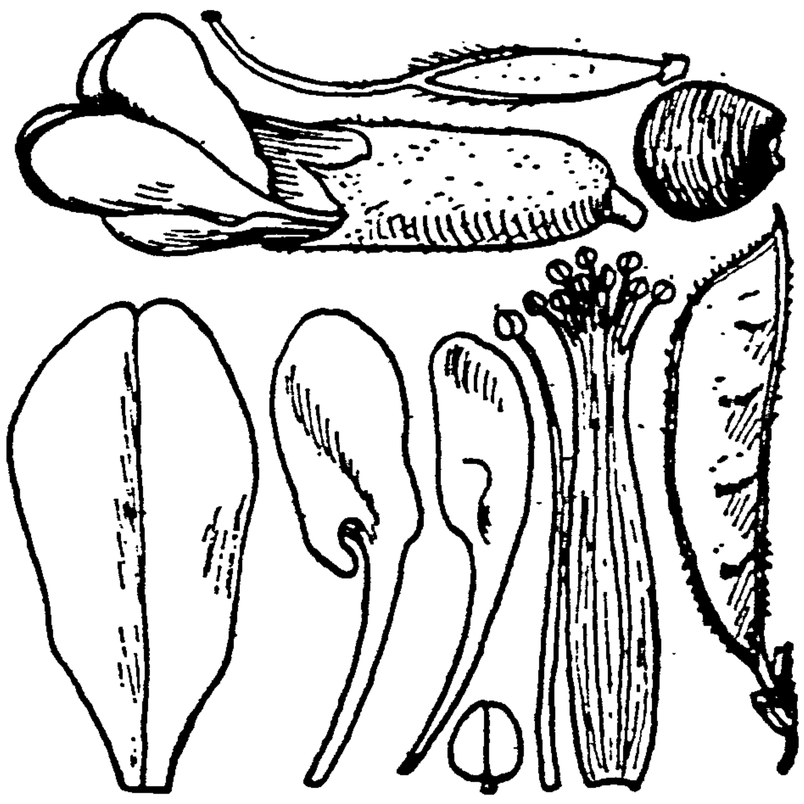
14. G. Elliottii Nutt. Stem retrorse-hirsute (or silky in *G. Elliottii Leavenworthii* T. & G.): leaves evergreen or nearly so; leaflets 2–3 cm. long; blades elliptic: calyx 7–10 mm. long; the upper lip and lower lobe conspicuously longer than the lateral lobes: standard 11–13 mm. long; keel-petals 10–12 mm. long: pod elliptic, 3–4 cm. long.—Low pinelands, Coastal Plain and occasionally adj. provinces, Fla. to Tenn. and N. C.—Sum.

51.a PUERARIA DC. Woody vines. Leaflets 3. Panicles raceme-like, dense, stiff. Calyx 2-lipped: the lobes longer than the campanulate tube. Corolla showy, purple or purplish: blade of the standard suborbicular: wings and keel-petals with rather short claws. Ovary short-stipitate. Pods flat, narrow, rather long.—About 10 species, Asiatic. The following is widely cultivated.

1. P. Thunbergiana (S. & Z.) Benth. Stem and branches hirsute, becoming woody and glabrous, greatly elongate: leaflets 3–6 inches long; blades rhombic or ovate-rhombic, more or less lobed, abruptly acuminate, short-petioluled; panicles short-peduncled, raceme-like, mostly 1–2.5 dm. long; flowers pedicelled; calyx campanulate, 9–11 mm. long, purple-tinged; lobes longer than the tube, the lower lobe the longer: corolla mainly dull reddish-purple; standard about 2 cm. long, the blade suborbicular, with a yellow blotch at the base: blades of the keel-petals longer than the claws: pod linear, 4–5 cm. long, shaggy-pubescent.—(KUDZU VINE.)—Roadsides, fence-rows, and woods, various provinces, E U. S. generally. Nat. of E. Asia.—Sum.–fall.



52. FALCATA Gmel. Herbaceous vines. Leaflets 3. Racemes or panicles several–many-flowered. Calyx 2-lipped, the upper lip broader than the lobes of the lower lip which are shorter than the tube. Corolla not showy, blue, violet, or white: blade of the standard obovate: wings and keel-petals with elongate claws. Ovary stipitate. Pod rather flat, short. [*Amphicarpa* Ell.]—About 7 species, natives of North America and Asia.



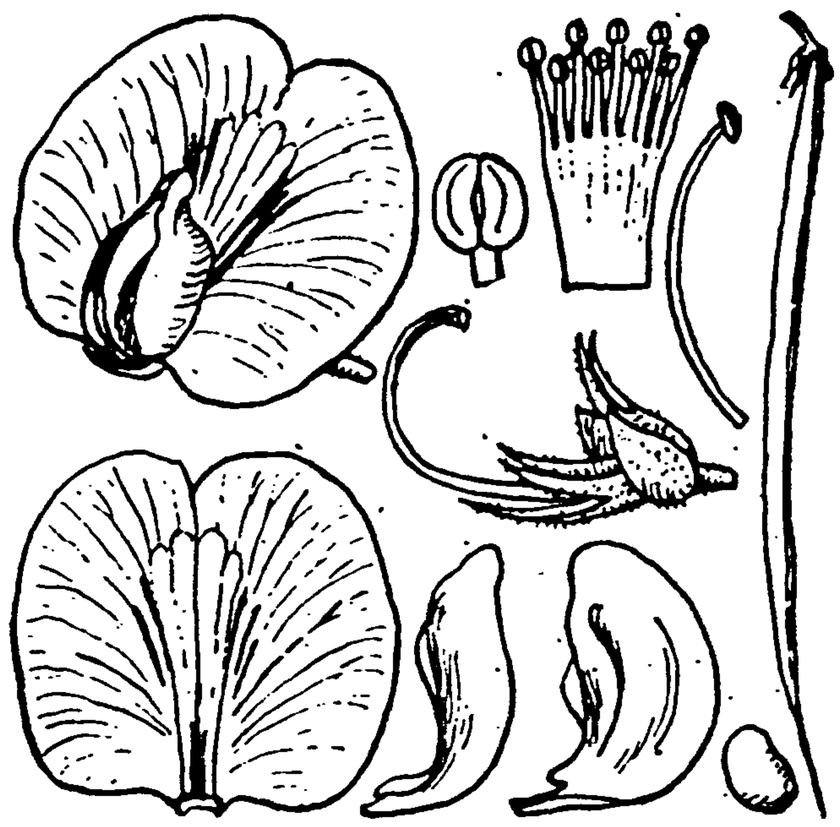
1. F. comosa (L.) Kuntze. Leaflets 3–10 cm. long; blades ovate to ovate-lanceolate: calyx 6–8 mm. long; upper lip deltoid; lower lobes triangular-subulate, less than ½ as long as the tube: blades of the keel-petals much shorter than the claws: pod 2.5–3 cm. long. [*A. monoica* Nutt.]—Meadows, thickets, and rich or damp woods, various provinces, Fla. to La., Nebr., Minn., and N. B.—Sum.—*F. Pitcheri*, originally described from Ark., differing in the longer calyx-lobes and shorter claws (slightly longer than the blades) of

the wings and keel, may occur east of the Mississippi River. Subterranean 1- or 2-seeded pods are often produced after the manner of the peanut of commerce. These are known as HOG-PEANUTS.—Sum.

53. **BRADBURYA** Raf. Vines. Leaflets 3, or 5 or 7. Racemes few-flowered. Calyx 2-lipped, the upper lip shorter than the lobes of the lower lip, which are much longer than the tube. Corolla pink, blue, violet, or white: blade of the standard suborbicular or reniform spurred above the base on the outside: wings and keel-petals with short claws, the blades of the latter strongly curved, narrower than those of the former, and with a prominent auricle at the base. Pod elongate, long-beaked, its margins thickened. [*Centrosema* Benth.]—About 30 species, American.—BUTTERFLY-PEAS.—The corollas of our species are mainly violet.

Lateral lobes of the lower calyx-lip as long as the median one: upper lobes subulate: bracts acuminate. 1. *B. virginiana.*
Lateral lobes of the lower calyx-lip much shorter than the median one: upper lobes lanceolate: bracts acute.
  Blades of the leaflets cordate or subcordate at the base: lateral lobes of the lower calyx-lip much longer than the lobes of the upper lip. 2. *B. arenicola.*
  Blades of the leaflets rounded at the base: lateral lobes of the lower calyx-lip about as long as the lobes of the upper lip. 3. *B. floridana.*

1. B. virginiana (L.) Kuntze. Leaflets 3–11 cm. long; blades linear, often narrowly so and elongate, to ovate, with distinct scalloped marginal veins: upper calyx-lobes nearly as long as the lower ones, like the lateral ones of the lower lip, setaceous-subulate: blade of the standard 21–25 mm. wide or larger: pod slender-linear, 7–14 cm. long, 3.5–4 mm. wide: seed ellipsoid-cylindric, 2.5–3.5 mm. long. [*C. virginiana* Benth.]—Pinelands, hammocks, sandy fields, and scrub, usually in acid soil, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and N. J.

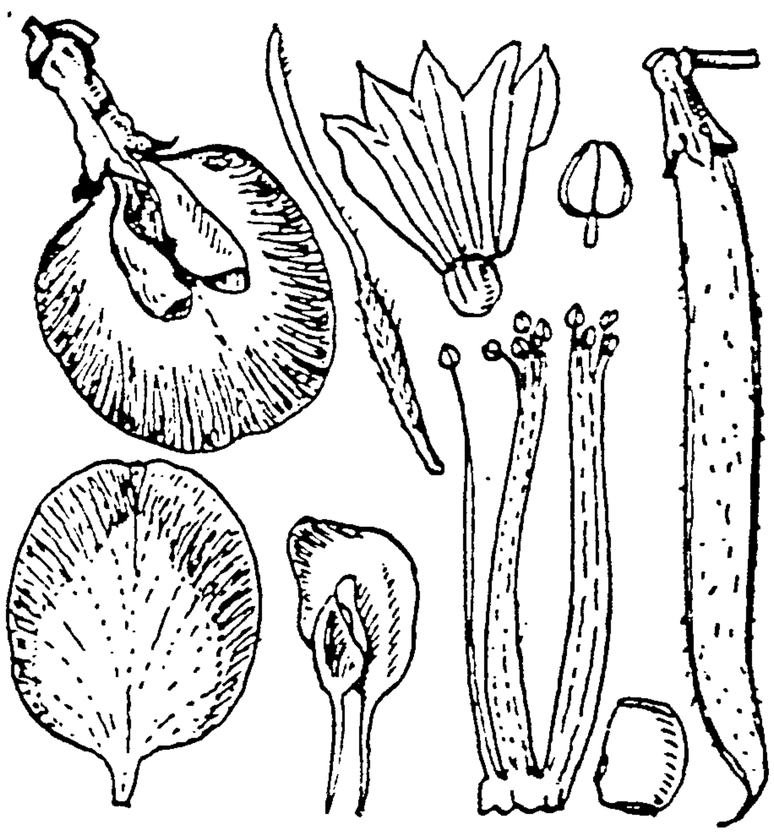


2. B. arenicola Small. Leaflets 2–5 cm. long; blades ovate to elliptic-ovate, retuse, blunt, or minutely apiculate at the apex, cordate or subcordate at the base: bracts ovate: upper calyx-lip much shorter than the lower one, its lobes and the lateral lobes of the lower lip lanceolate: blade of the standard 25–30 mm. wide: pod not seen.—Pinelands, C pen. Fla.—Sum.

3. B. floridana Britton. Plant similar to *B. arenicola* in habit: leaflets 2–8 cm. long; blades lanceolate to oval, obtuse or acutish at the apex, rounded at the base: bracts ovate: calyx similar to that of *B. arenicola,* but somewhat smaller, but the corolla larger: pod 8–15 cm. long, 5–6 mm. wide; seed subcylindric, 6–7.5 mm. long.—Pinelands, Fla.

54. **CLITORIA** L. Vines. Leaflets several. Racemes or panicles 1-several-flowered. Calyx 2-lipped, the lobes of the upper lip partly united, resembling the lateral lobes of the lower lip, but often shorter. Corolla blue, purple, red, or white: standard erect, the blade suborbicular: blades of the

wings and the keel-petals long-clawed, often adherent, those of the former not auricled, those of the latter very small. Style curved, pubescent. Pod narrow, somewhat flattened.—About 6 species, natives of the Old World tropics.

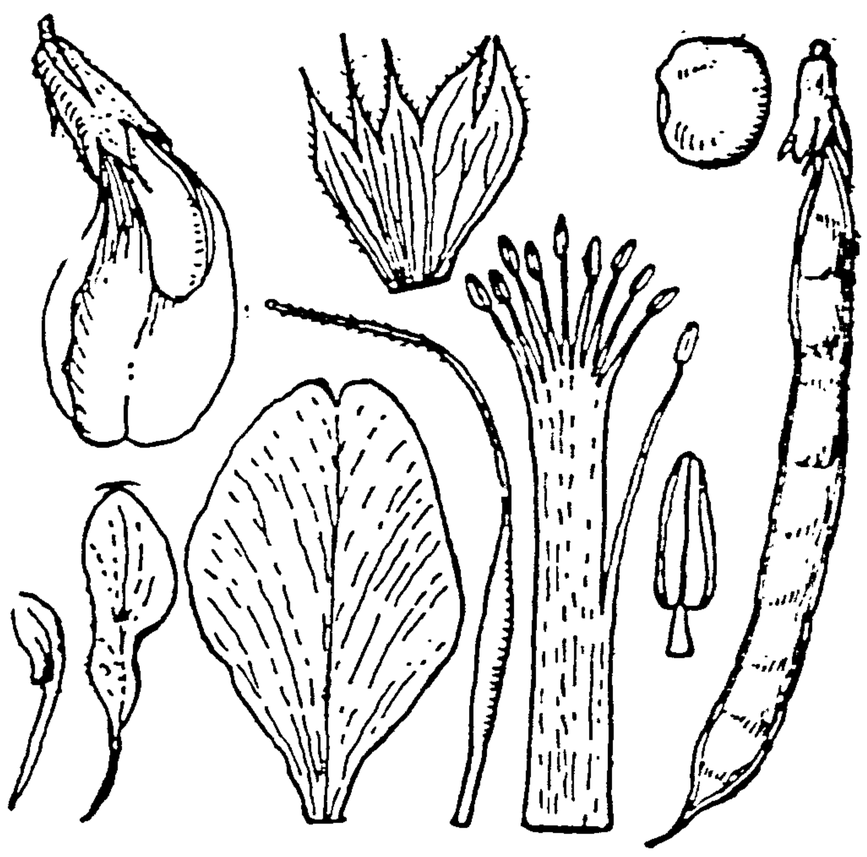


1. C. Ternatea L. Stem and branches high-twining: leaflets 5–7 cm. long; blades ovate, oval, or orbicular: calyx 16–19 mm. long; lobes of the upper lip acute: standard 40–50 mm. long; blades of the keel-petals longer than the claws: pod 8–11 cm. long.—(BLUE-PEA.)—Pinelands and hammocks, Everglade Keys, Fla., and Florida Keys.—Grown extensively, as an ornamental vine. The deep-blue, or rarely white, flowers are very conspicuous. Nat. of E. I.—(*W. I.*)—All year.

55. **MARTIUSIA** Schult. Erect or diffuse herbs with long roots. Leaflets 3. Racemes few-flowered. Calyx 2-lipped, the lobes of the upper lip slightly united. Corolla violet-blue or blue: standard erect, the blade obovate or rhombic: blades of the wings and keel-petals long-clawed, those of the former small, auricled at the base. Style curved. Pod narrow, turgid.—About 8 species, all American,—BUTTERFLY-PEAS. PIGEON-WINGS.

Leaflets of the upper leaves with ovate, elliptic-ovate, or ovate-lanceolate blades: pod with a stipe shorter than the calyx. 1. *M. mariana.*
Leaflets of the upper leaves with linear or linear-elliptic blades: pod with a stipe longer than the calyx. 2. *M. fragrans.*

1. M. mariana (L.) Small. Stem 3–12 dm. long, diffuse, or rarely twining, green: leaflets of the upper leaves 2.5–7 cm. long; blades ovate, elliptic-ovate, or ovate-lanceolate, not reticulate, green: calyx 21–23 mm. long; median lobe of the lower lip much longer than the lateral ones: corolla mainly pale-blue: standard 5–6 cm. long: blades of the keel-petals shorter than the claws: anthers ellipsoid: pod 4–7 cm. long, or rarely shorter, green, short-stipitate. [*Clitoria mariana* L.]—Woods, riverbanks, and pinelands, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and N. Y.—Sum. or spr. S.

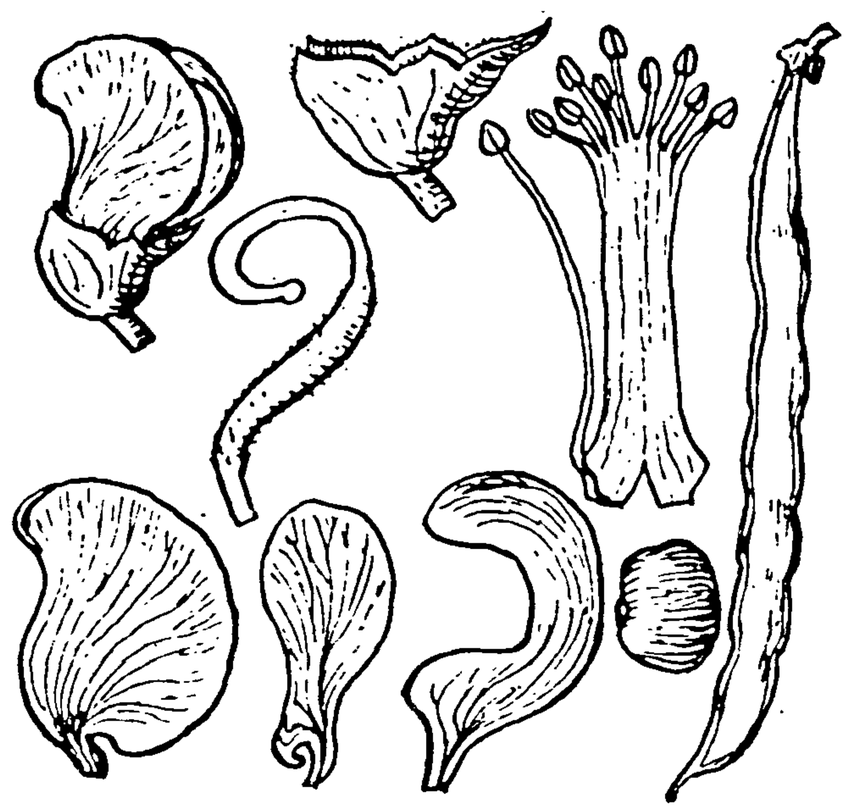


2. M. fragrans Small. Stem 1–5 dm. tall, erect, often sparingly branched, glaucous: leaflets of the upper leaves 2–5 cm. long; blades linear or linear-elliptic, reticulate, glaucous: calyx 14–16 mm. long; median lobe of the lower lip slightly longer than the lateral ones: corolla pale-purple: standard 4.5–5 cm. long: blades of the keel-petals about as long as the claws: anthers oval: pod 6–8 cm. long, glaucous, long-stipitate. [*Clitoria fragrans* Small]—Scrub and sandhills, S. part of lake region, Fla.—Spr.

56. **GLYCINE** L. Vines with tuberous rootstocks. Leaflets 5–9. Racemes or panicles many-flowered, dense. Calyx 2-lipped: upper lip broad, often 2-lobed: lower lip 3-lobed. Corolla red, purple, or chocolate-colored: standard reflexed, the blade often broader than long: blades of the wings and keel-petals short-clawed, the former auricled at the base, those of the latter spiral. Style spiral, glabrous. Pod turgid. [*Apios* Moench.]—Five species, natives of North America and Asia.

Corolla brownish-purple or chocolate-colored: standard with the blade rounded or retuse at the apex: lower calyx-lobe ovate. 1. *G. Apios.*
Corolla greenish-white, tinged near the apex with rose-purple or magenta: standard with the blade produced into a spongy appendage at the apex: lower calyx-lobe subulate. 2. *G. Priceana.*

1. **G. Apios** L. Rootstock bearing numerous fleshy oblong, oval, or globose tubers 1–2 cm. thick: leaflets 5–7, or rarely 3; blades ovate to lanceolate, 3–10 cm. long: calyx 4–5 mm. long: standard 9–13 mm. long: pod 6–12 cm. long. [*Apios tuberosa* Moench.]—(GROUNDNUT.)—Thickets, meadows, river-banks, and low grounds, various provinces, Fla. to Tex., Minn., and N. B.—Sum.–fall.—The tubers were an important aboriginal food.

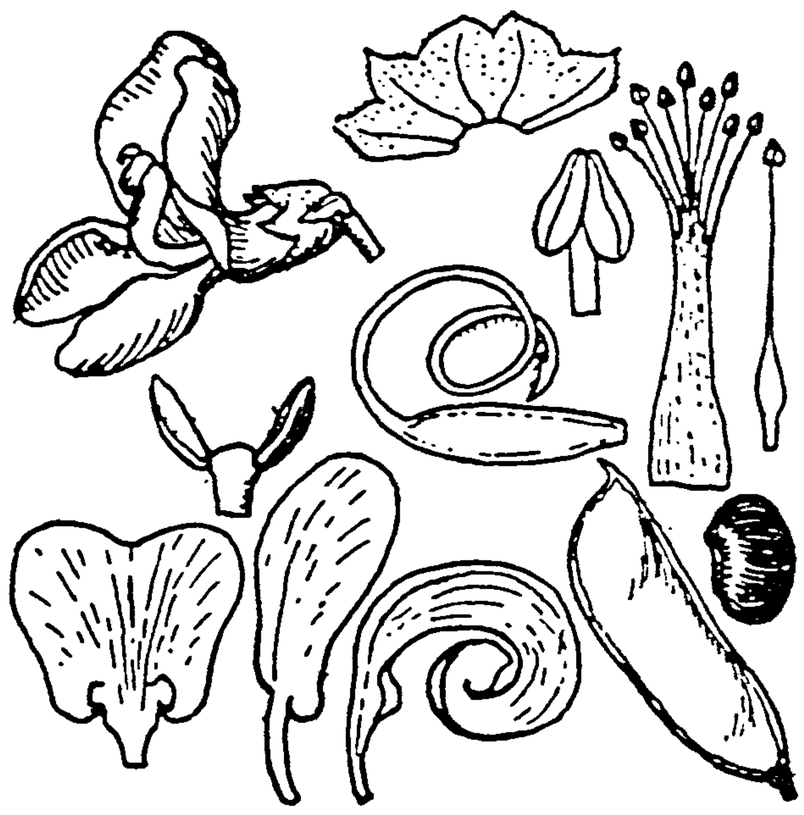


2. **G. Priceana** (B. L. Robinson) Britton. Rootstock bearing an obovoid-spheroidal tuber mostly 12–20 cm. thick: leaflets 5–9, rarely 3; blades ovate to ovate-lanceolate: calyx 8–10 mm. long: standard 25–30 mm. long: pod 12–15 cm. long. [*Apios Priceana* B. L. Robinson]—Rocky woods, Interior Low Plateaus, Tenn. and Ky.—Sum.

57. **PHASEOLUS** [Tourn.] L. Vines or diffuse plants. Leaflets 3 or rarely 1. Racemes or panicles simple or branched. Calyx short and very broad, 2-lipped, the upper lip entire or broadly 2-lobed, the lower lip 3-lobed. Corolla variously colored: blades of the wings much smaller than that of the standard, short-clawed: blades of the keel-petals not dilated at the base, short-clawed. Style curved. Seed with rounded ends.—About 470 species, natives of warm and temperate regions.—BEANS. PHEASANT-FLOWERS.—The various species and varieties furnish a great variety of beans for human food.

Perennial native plants: ovary glabrous.
  Stem trailing: leaflets mostly broader than long. 1. *P. sinuatus.*
  Stem climbing: leaflets mostly longer than broad.
    Blade of the terminal leaflet not hastate. 2. *P. polystachyus.*
    Blade of the terminal leaflet hastate. 3. *P. smilacifolius.*
Annual introduced plants: ovary pubescent.
  Standard-blade 7–14 mm. wide: wings 8–15 mm. long.
    Calyx 5–6 mm. long: pod turgid: seeds tumid.
      Stem glabrous or puberulent: pod broad, over 1 cm. wide, 12–20 cm. long. 4. *P. vulgaris.*
      Stem retrorse-hirsute: pod narrow, less than 1 cm. wide, 7–9 cm. long. 5. *P. angularis.*
    Calyx 3–4 mm. long: pod flat: seeds flat. 6. *P. lunatus.*
  Standard blade 20–30 mm. wide: wings 30–34 mm. long. 7. *P. adenanthus.*

1. **P. sinuatus** Nutt. Stem glabrous or nearly so, trailing, 1–4 m. long, branching; leaflets 3; blades deltoid-ovate in outline with 3 more or less



prominent lobes, 2–4 cm. long, reticulate, mucronulate, truncate or very broadly cuneate at the base: racemes several times longer than the subtending leaves, simple; rachis wire-like: pedicels 5–10 mm. long: calyx campanulate, 2.5–3 mm. long; lobes rounded or apiculate: corolla pale-purple; standard with a blade nearly 1 cm. wide: pod somewhat scimitar-shaped, 3.5–4 cm. long.—(WILD-BEAN.)—Dry pinelands and hammocks, Coastal Plain, Fla. to Miss. and N. C.—Sum. or all year S.

2. P. polystachyus (L.) B. S. P. Stem minutely pubescent, climbing, 1–4 m. long, branching: leaflets 3, the blades ovate to orbicular-ovate, 4–10 cm. long, acuminate, often conspicuously nerved, rounded or subcordate at the base: racemes or panicles slender, surpassing the subtending leaves, simple or compound, short-peduncled: pedicels 4–8 mm. long: calyx campanulate, 2.5–3 mm. long; lobes rounded or somewhat triangular: corolla purple or whitish: pod scimitar-shaped, 4–8 cm. long, often glaucous. [*P. perennis* Walt.]—(BEAN-VINE.)—Woods, stream-banks, and thickets, often in alluvial soil, various provinces, Fla. to Tex., Neb., Minn., Ont., and Me.—Sum.–fall.

3. P. smilacifolius Pollard. Stem minutely pubescent, twining, 1–4 m. long, branching: leaflets 3, the blades very thin, ovate in outline, 4–8 cm. long, acute, more or less distinctly 3-lobed, soon glabrous: racemes usually shorter than the subtending leaves: pedicels slender, 5–15 mm. long: calyx glabrous, campanulate, 2.5–3 mm. long; lobes rounded: standard pink or white; blade about 1 cm. wide: wings 12–14 mm. long; pod 5–6 cm. long.—Hammocks, pen. Fla.—Spr.–fall.

4. P. vulgaris L. Stem erect or climbing: petioles glabrous or puberulent: leaflets 5–12 cm. long; blades broadly ovate or that of the terminal one rhombic-ovate or orbicular-ovate, mostly acuminate: panicles cluster-like, few-flowered: middle lobe of the lower calyx-lip triangular-lanceolate: standard white to purple; blade 12–16 mm. wide: wings 14–17 mm. long: pod linear, straight or slightly curved: seed 12–20 mm. long.—(STRING-BEAN. POLE-BEAN. KIDNEY-BEAN.)—Pinelands, hammocks, and waste-places, various provinces, Fla. to Tex.—Sum.–fall or all year S. Nat. of Eu. and cult.

5. P. angularis (Willd.) W. F. Wight. Stem erect, 1 m. tall or less, usually branched: petioles retrorse-hirsute: leaflets 3; blades 5–11 cm. long, rhombic-ovate or that of the terminal one rhombic, somewhat hastately lobed, those of the lateral ones usually only on one side: lobes of the upper calyx-lip broadly rounded, glabrous or nearly so, those of the lower lip deltoid, long-hirsute: standard yellowish; blade reniform, 12–15 mm. wide: wings about 1 cm. long: pod narrowly linear, turgid, mostly 7–9 cm. long, often slightly curved near the apex: seed 4–6 mm. long.—(ADZUK-BEAN. SELF-PERPETUATING PEA.)—Fields, roadsides, and stream-banks, Coastal Plain, S Miss. and S La. Nat. of Asia.—Sum.

6. P. lunatus L. Stems twining or rarely erect: leaflets 3, the blades 4–9 cm. long, triangular or rhombic, mostly acute: panicles elongate, raceme-like, many-flowered: middle lobe of the lower calyx-lip broadly deltoid: standard greenish-white; blade 7–10 mm. wide: wings 8–10 mm. long: pod broad, scimitar-shaped.—(LIMA-BEAN.)—Hammocks and cult. grounds, Fla.—Sum. or all year S. Nat. of Eu. and cult.

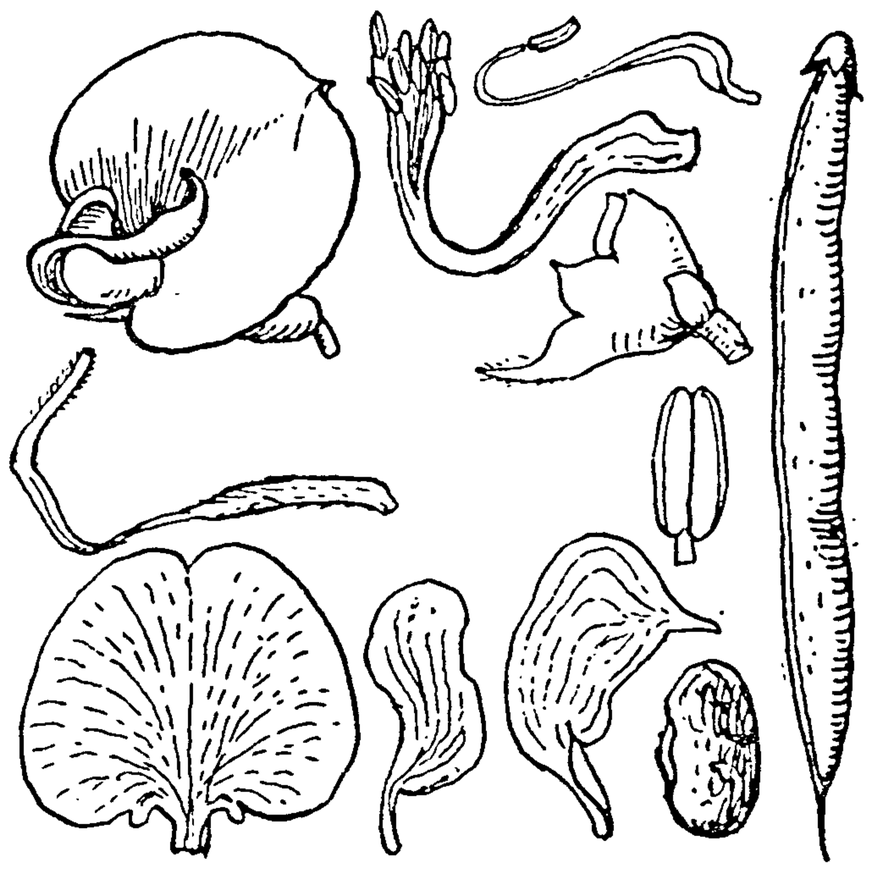
7. P. adenanthus G. W. F. Meyer. Leaflets 2.5–6 cm. long; blades ovate to elliptic-ovate, mostly acute: panicles slightly elongate, several-flowered: lobes of the lower calyx-lip triangular-lanceolate: standard yellow, tinged with purple; blade 20–30 mm. wide; wings 30–34 mm. long, purple-striped: pod linear, curved.—Pinelands, S pen. Fla. Nat. of trop. Am. and cult.—Sum.–fall or all year S.

58. STROPHOSTYLES Ell. Vines or trailing plants. Leaflets 3. Racemes or panicles cluster-like. Calyx similar to that of *Phaseolus*, but the lower lip with a longer middle lobe. Corolla mainly pink-purple or white: blades of the keel-petals widely dilated at the base. Style spiral. Seed with truncate ends. About 6 species, American.—WILD-BEANS. SAND-BEANS. TRAILING-BEANS.

Calyx gaping; tube glabrous; lateral lobes much smaller than the others: ovary and pod glabrous.
- Perennial plant: blades of the wing-petals cuneate. 1. *S. umbellata.*
- Annual plants: blades of the wing-petals not cuneate. 2. *S. helvola.*

Calyx not gaping; tube hirsute; lateral lobes not much smaller than the others: ovary and pod densely pubescent. 3. *S. pauciflora.*

1. S. umbellata (Muhl.) Britton. Stem trailing: leaflets 1–4 cm. long; blades elliptic-lanceolate, varying to ovate or lanceolate: corolla pink or pale-purple, often fading yellowish; blade of the standard reniform, 1–2 cm. broad: pod 2.5–5 cm. long. [*Phaseolus helvolus* (Chapm. Fl.)]—Dry sandy fields and woods, Coastal Plain and adj. provinces, Fla. to La., Mo., and N. Y.—Sum.–fall.



2. S. helvola (L.) Ell. Stem trailing: leaflets 2–4 cm. long; blades rhombic-oval, often 3–lobed: corolla purple or purplish, fading greenish; blade of the standard suborbicular, emarginate: pod 6–10 cm. long. [*Phaseolus diversifolius* (Chapm. Fl.)]—River shores and damp thickets, various provinces, Fla. to Tex., S. D., and Que.—Sum.–fall.

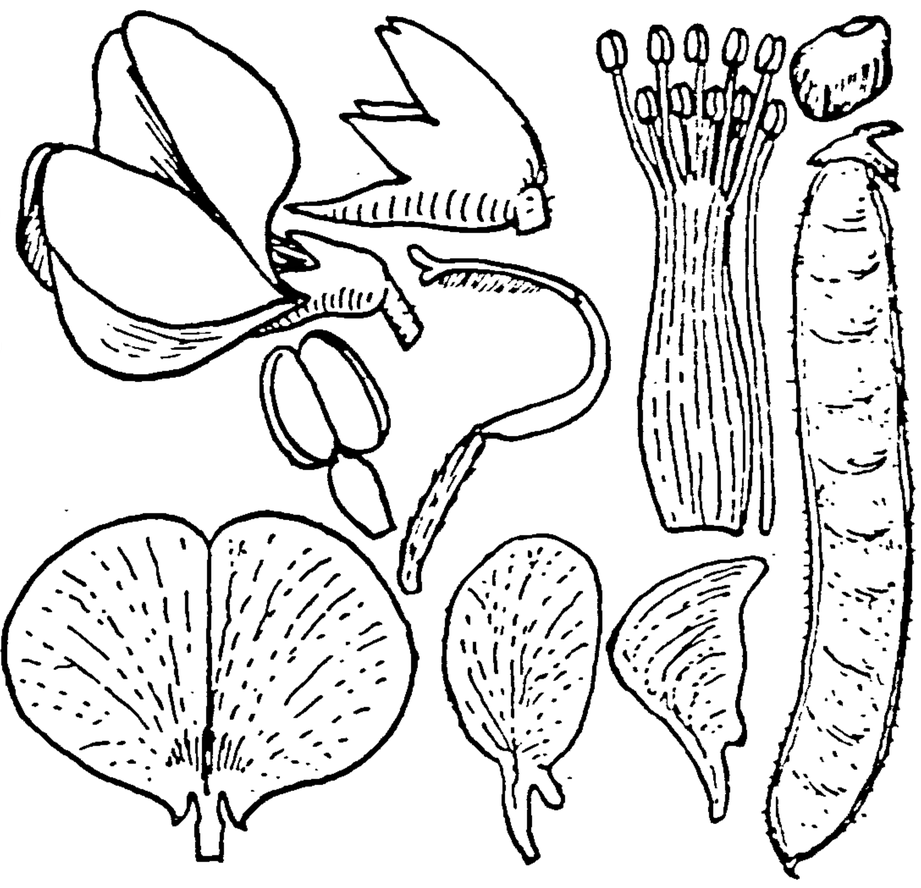
3. S. pauciflora (Benth.) S. Wats. Stem diffuse or trailing: leaflets 1.5–3.5 cm. long; blades linear to lanceolate: corolla pale-purple; blade of the standard 5–8 mm. broad: pod 2–3 cm. long. [*Phaseolus pauciflorus* Benth.]—River banks, various provinces, Miss. to Tex., Colo., S. D., and Ind.—Sum.–fall.

59. VIGNA Savi. Vines. Leaflets 3. Racemes or panicles cluster-like. Calyx slightly 2-lipped, the upper lip broad, shorter than the lower lip, the middle lobe of the lower lip slightly longer than the lateral ones. Corolla yellow or purple: blades of the wings and the keel-petals very broad, with an angular or reflexed auricle at the base. Pod narrow.—About 30 species, natives of warm and tropical regions.

Corolla mainly yellow: pod 6.5 cm. long or less: seeds irregular turgid, round-cubic, nearly or quite as thick as high: plant pubescent.
- Blades of the leaflets acute or acuminate at the apex: lower lobes of the calyx acute or acuminate. 1. *V. repens.*
- Blades of the leaflets rounded and emarginate at the apex: lower lobes of the calyx obtuse. 2. *V. marina.*

Corolla mainly purple or violet: pod 12 cm. long or more: seeds reniform, flattened, much thinner than high; plant glabrous. 3. *V. sinensis.*

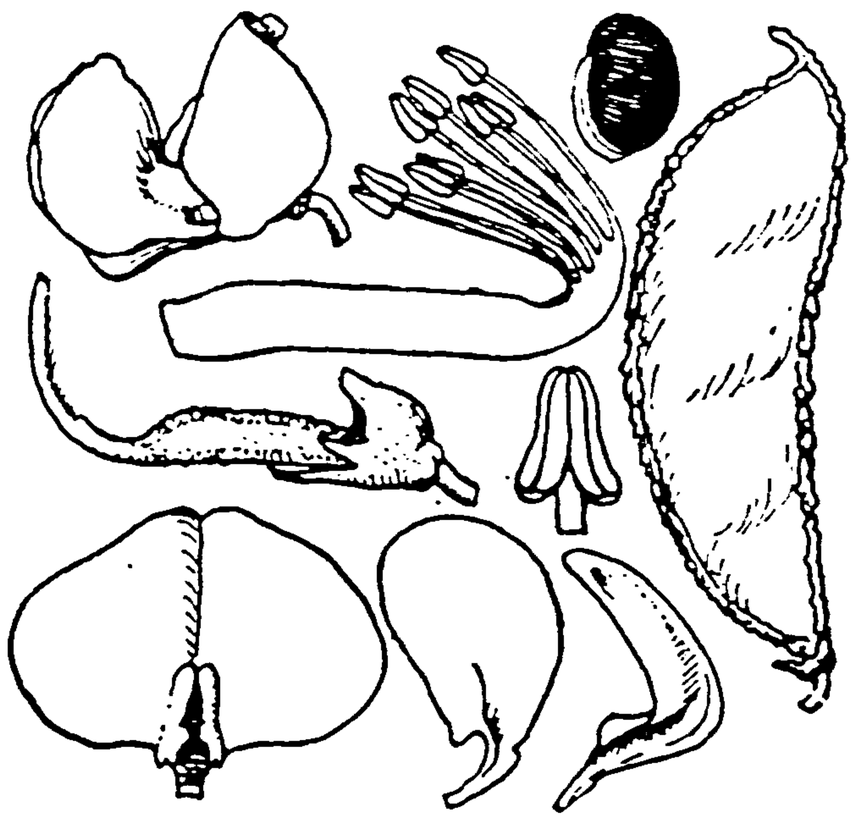
1. V. repens (L.) Kuntze. Stem usually pubescent throughout: leaflets 2–8 cm. long; blades ovate to lanceolate or linear-lanceolate: calyx about 5 mm. long; lower lobe subulate, much longer than the lateral ones; lateral lobes longer than wide: standard 18–23 mm. wide: keel 16–19 mm. long: pod 4–6.5 cm. long. [*V. luteola* (Jacq.) Benth.]—Cult. grounds waste-places, woods, and thickets, Coastal Plain, Fla. to Tex. and N. C.—(*W. I., Mex., C. A., S. A.*)—All year.



2. V. marina (Berm.) Merrill. Stem pubescent mainly near the nodes: leaflets 3–11 cm. long; blades broadly ovate or orbicular-ovate, suborbicular, or orbicular-obovate: calyx about 4 mm. long; lower lobe deltoid, not longer than the tube; lateral lobes wider than long: corolla nearly as in *V. repens:* pod 4–6 cm. long.—Shores and waste-places, S. Fla.—(*W. I., O. W.*)—Spr.–fall.

3. V. sinensis (L.) Endl. Stem glabrous: leaflets 8–15 cm. long; blades ovate to ovate-hastate or hastate: calyx 7–9 mm. long; lower lobe much shorter than the tube, abruptly narrow from a broad base; lateral lobes gradually narrowed from the base: standard 2.5–3.5 cm. wide: pod 12–20 cm. long or more.—(COW-PEA. CHINA-BEAN.)—Waste-places, fields, and thickets, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and N. C. Nat. of Asia.—Sum.–fall.

60. DOLICHOS L. Herbs resembling *Phaseolus*, and with a similar calyx. Corolla with a prominently appendaged standard, very broad wings and narrow keel-petals which are bent at right-angles, but not coiled. Pod linear to scimitar-shaped.—About 30 species, all tropical.

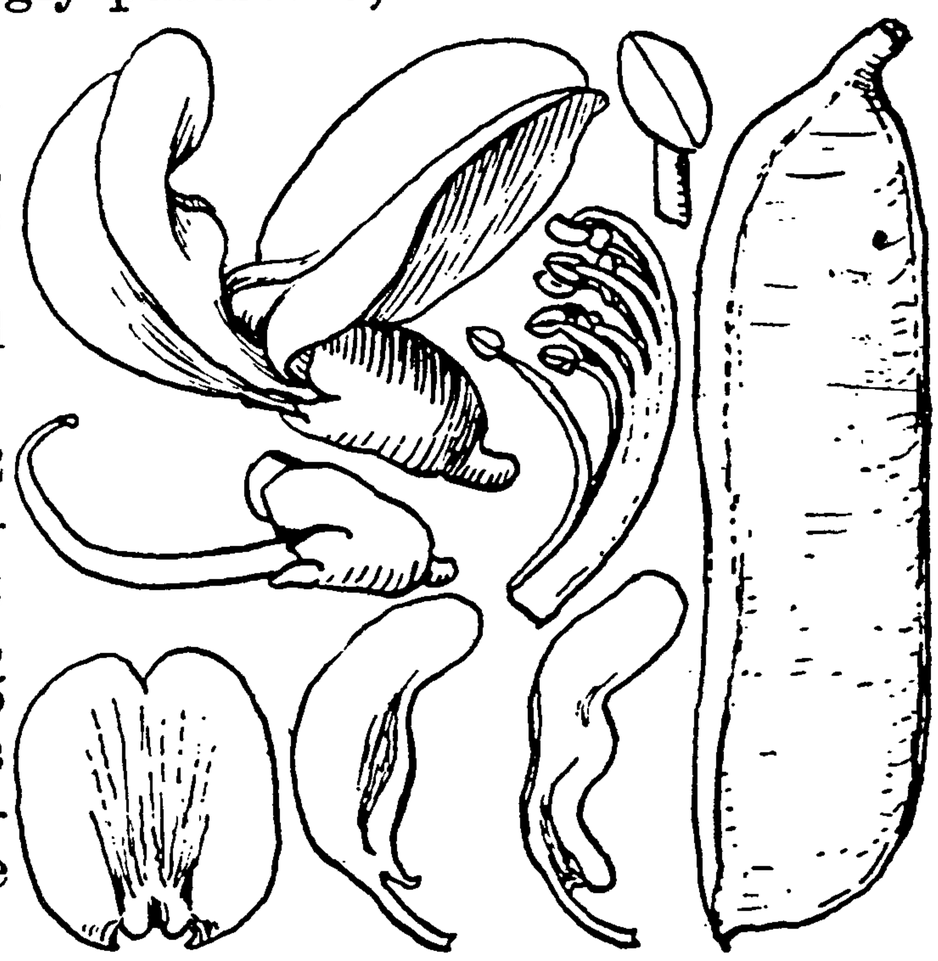


1. D. Lablab L. Leaflets 5–13 cm. long; blades broadly ovate, or that of the terminal one ovate-reniform, acute or short-acuminate: bracts ribbed: calyx 9–11 mm. long; lobes of the lower lip lanceolate or elliptic-lanceolate: corolla purple, violet, or white; blade of the standard 16–21 mm. wide; wings 17–21 mm. long: pod elliptic, 6–8 cm. long, toothed-margined: seed 10–13 mm. long, with a white scar.—(HYACINTH-BEAN. BLACK-BEAN. EGYPTIAN-BEAN.)—Pinelands, hammocks, and waste-places, pen. Fla., and the Keys. Nat. of E. I., and cult.—(*W. I.*)—Frequently grown as an ornamental vine. The erect panicles of white or tinted flowers are conspicuous. One-half the stamen-tube is illustrated.

61. CANAVALI Adans. Vines. Leaflets 3. Racemes or panicles mostly erect. Calyx prominently 2-lipped, the upper lip very broad, longer than the lower lip, the 2 lobes broadly rounded, the lower lip with 3 small lobes. Corolla variously colored or white, often conspicuous: blades of the wings and keel-petals narrow, those of the latter with a prominent curved auricle at the base. Pod broad.—About 15 species, natives of tropical and subtropical regions.

Blades of the leaflets obtuse or retuse at the apex: pod mostly less than 15 cm. long: seed brown. 1. *C. lineata.*
Blades of the leaflets abruptly acute or acuminate: pod mostly over 15 cm. long: seed red or white. 2. *C. gladiata.*

1. C. lineata (Thunb.) DC. Leaflets 4–10 cm. long; blades fleshy-coriaceous, suborbicular to oval or obovate: calyx sparingly pubescent; lower lobes obtuse: corolla pink or rose-purple: pod 10–12 cm. long. [*C. obtusifolia* (Lam.) DC.]—(BAY-BEAN. JUNE-BEAN.)—Coastal sand-dunes, Fla. and Tex., and sandy shores of Lake Okeechobee, Fla.—(*W. I., Mex., C. A., S. A., O. W.*)—All year.—The stem and branches trail.

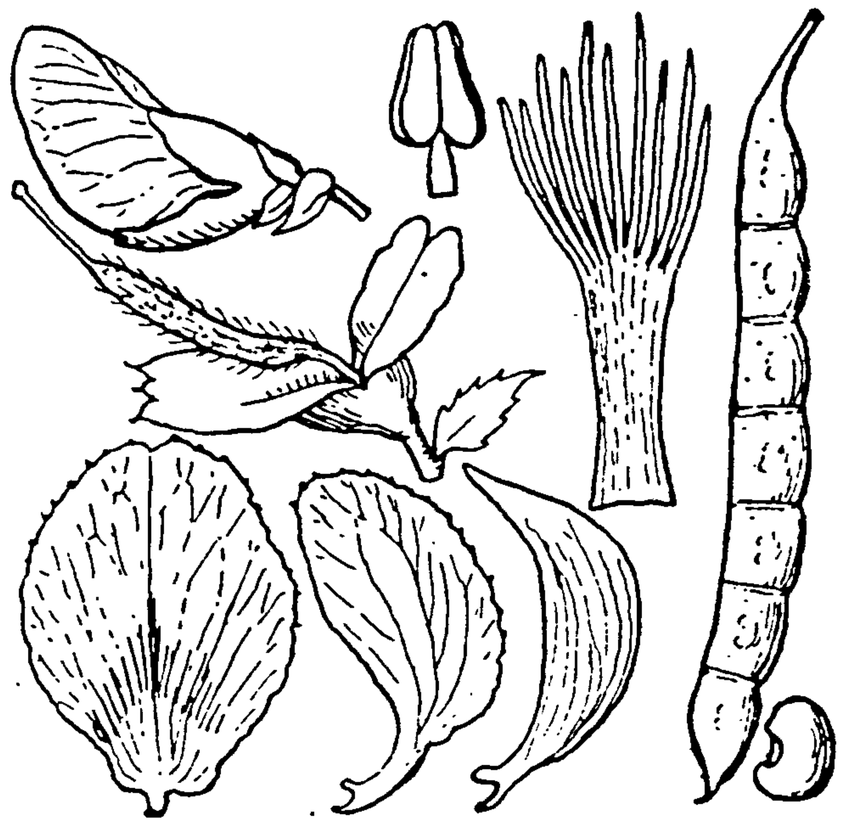


2. C. gladiata (Savi.) DC. Leaflets 5–12 cm. long; blades ovate, oval, or elliptic-ovate, chartaceous: calyx glabrous (?); lower lobes acute: corolla white or purple, sometimes tinged with yellow: pod 15–25 cm. long.—(HORSE-BEAN.)—Waste-places and cult. grounds, Fla. Nat. of E. I.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.—The stem and branches climb.

62. AESCHYNOMENE L. Annual erect or diffuse plants. Leaflets several or many. Racemes several-flowered. Calyx spathe-like, the lips respectively minutely 2-lobed and 3-lobed. Corolla yellow or reddish: standard with a broad blade: wings and keel-petals with narrow curved blades which are auricled at the base. Ovary bent, sparingly muricate. Loment several-jointed, the sections oval or quadrate.—About 55 species, widely distributed in warm and tropical regions.—SENSITIVE JOINT-VETCHES. SHY-LEAVES.

Standard-blade oval or ovate: pod with nearly quadrate sections. 1. *A. virginica.*
Standard-blade suborbicular: pod with hemispheric or oval sections.
  Leaflets separated; blades entire; pod-sections about 6 mm. wide. 2. *A. pratensis.*
  Leaflets nearly contiguous; blades ciliate-denticulate near the apex: pod-sections about 3 mm. wide. 3. *A. americana.*

1. A. virginica (L.) B. S. P. Plant 2–15 dm. tall: leaflets mostly 25–55: blades linear to elliptic-linear, 3–12 mm. long: calyx-lips 3–3.5 mm. long: blades of the keel-petals and wing-petals very narrow above the auricle: pod almost straight-edged, the valves not reticulate. [*Ae. hispida* Michx.]—Swamps, river-banks, ditches, and low grounds, Coastal Plain, and occasionally adj. provinces, Fla. to Tex., Pa., and N. J.—(*W. I., Mex.*)—Sum.–fall.



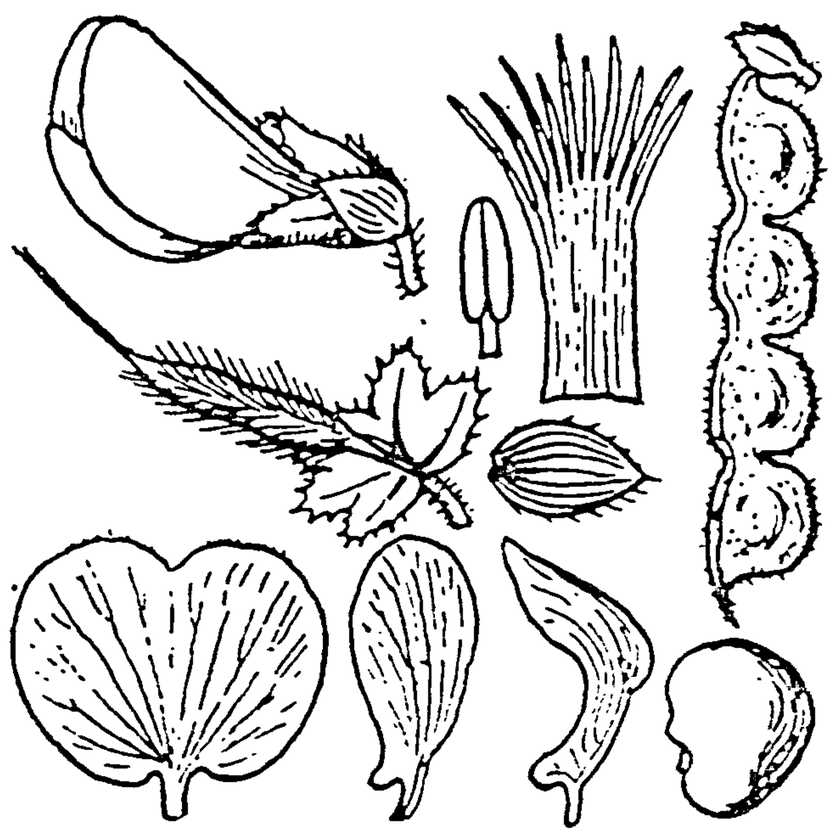
2. A. pratensis Small. Plant 9–20 dm. tall: leaflets mostly 15–25; blades narrowly elliptic, 5–6 mm. long: calyx-lips 4.4.5 mm. long: blade of the standard suborbicular, 10–13 mm. wide; blades of the keel and wing-petals slightly narrowed above the auricles: pod scalloped-edged, the sections oval,reticulate.—Everglades, S pen. Fla.—All year.—The lower part of the stem is usually thickly coated with spongy tissue.

3. **A. americana** L. Plant up to 2 m. tall: leaflets mostly 21–61; blades nearly linear, 3–9 mm. long, mucronate and ciliate-denticulate near the apex: calyx-lips about 4 mm. long; blades of the keel-petals and wing-petals somewhat obovate above the auricle: pod straight on one edge, scalloped on the other, the sections nearly half-orbicular, pubescent and often warty on the faces.—Waste-places, road-sides, and ditches, M pen. Fla.—Spr.–sum.

63. **SECULA** Small. Herbs with prostrate stems and branches. Leaflets few. Panicles few-flowered. Calyx 2-lipped; upper lip with 2 broad lobes; lower lip with 3 lobes. Corolla yellowish or purplish: standard with a very broad blade: wings and keel-petals auricled on one side, the keel-petals with the narrower blades and abruptly bent. Loment few-jointed, the sections half-orbicular.—About 10 species, most abundant in tropical America.-—Spr.–fall.

Leaflets mostly 5–7; blades prominently reticulate beneath: loment viscid-pubescent; joints about 5 mm. long. 1. *S. viscidula.*
Leaflets mostly 17–25; blades not reticulate: loment not viscid; joints about 3 mm. long. 2. *S. Hystrix.*

1. **S. viscidula** (Michx.) Small. Plant sticky-pubescent, the branches 1–12 dm. long, with many short spreading hairs: leaflets 5–7, or rarely more; blades obovate to cuneate, 3–12 mm. long, prominently reticulate and sparingly pubescent beneath with stiff hairs: lateral lobes of the lower calyx-lip obtuse: standard 5–6 mm. long: ovary copiously pubescent: loment-joints about 5 mm. long and 4 mm. wide, pubescent with short viscid hairs and long stiff hairs. [*Aeschynomene viscidula* Michx.]—Pinelands, sandhills, and sandy woods, Coastal Plain, Fla. to Miss. and S. C.

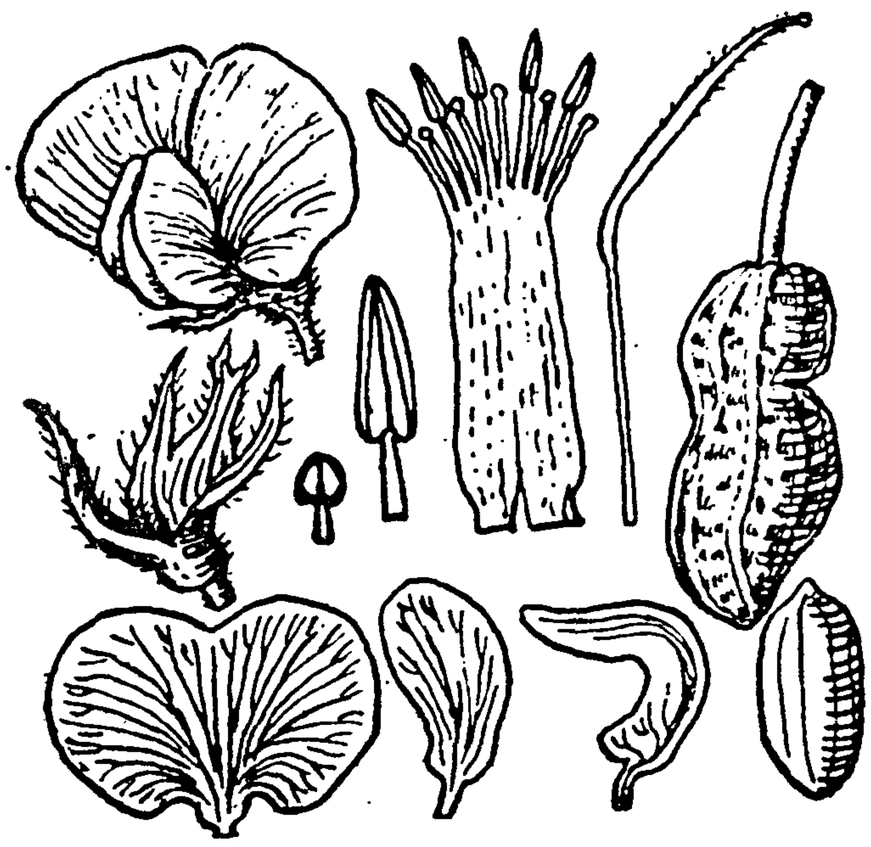


2. **S. Hystrix** (Poir.) Small. Plant fine-pubescent, the branches mostly less than 1 m. long, closely pubescent with minute hairs and with fewer long spreading hairs: leaflets 17–25 or rarely fewer; blades narrowly elliptic to linear-elliptic, 3–5 mm. long, not reticulate, copiously pubescent beneath with lax hairs: lateral lobes of the lower calyx-lip acute: standard 4.5–5 mm. long: ovary sparingly pubescent: loment-joints about 3 mm. long and 2.5 mm. wide, pubescent with short crisped hairs.—Waste-places and road-sides, W Fla. Nat. of trop. Am.

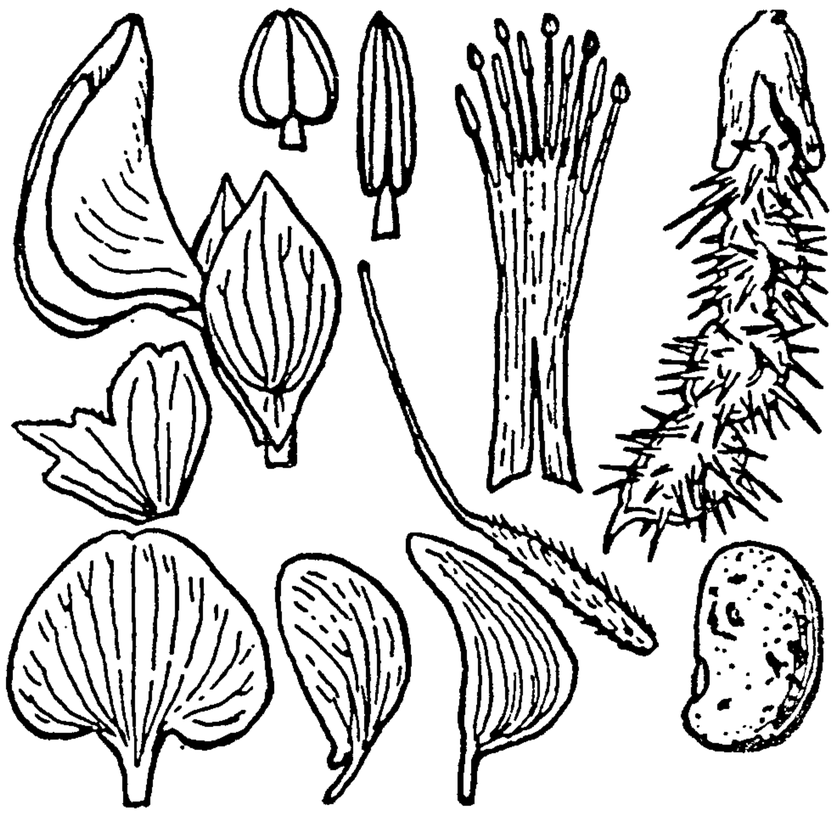
64. **ARACHIS** L. Perennial low herbs. Leaflets few: blades entire. Flowers solitary in the lower leaf-axils. Calyx 2-lipped, the upper lip broad, 3-lobed at the apex, the lower lip narrow and elongate. Corolla yellow or whitish: standard very broad, notched at the apex: wings with relatively large and broad blades: keel-petals much smaller than the wings, auricled. Pod subterranean, turgid, constricted between the seeds.—Six or seven species, mostly South American.

1. **A. hypogaea** L. Stem and branches decumbent: leaves rather numerous; stipules linear-lanceolate, acuminate; leaflets usually 4, the blades elliptic to

obovate, 1.5–5 cm. long, finely pubescent: flowers slender-pedicelled: calyx 9–11 mm. long: corolla yellow; standard 12–15 mm. long, the blade suborbicular; keel much shorter than the wings: pod 2–8 cm. long, reticulate.—(PEANUT. PINDERS. GOOBER NUT.)—Waste-places, old fields, roadsides, and hammocks, pen. Fla. Nat. of S. A. and cult.—Sum.–fall or all year S.—Grown, commercially, in many tropic and temperate countries for its seeds—"nuts"—which are used as a food and a confection. Although only locally escaped in most regions, in others, especially in south-eastern N. C., it is abundantly established.



65. **ZORNIA** Gmel. Annual or perennial herbs. Leaflets 2 or 4. Spikes conspicuously bracted. Flowers of one kind. Corolla yellow or variously colored: standard with a broad blade: blades of the wings broadened upward, auricled on one side: blades of the keel-petals lunate, not auricled. Loment with several indehiscent joints.—About 12 species, all American.



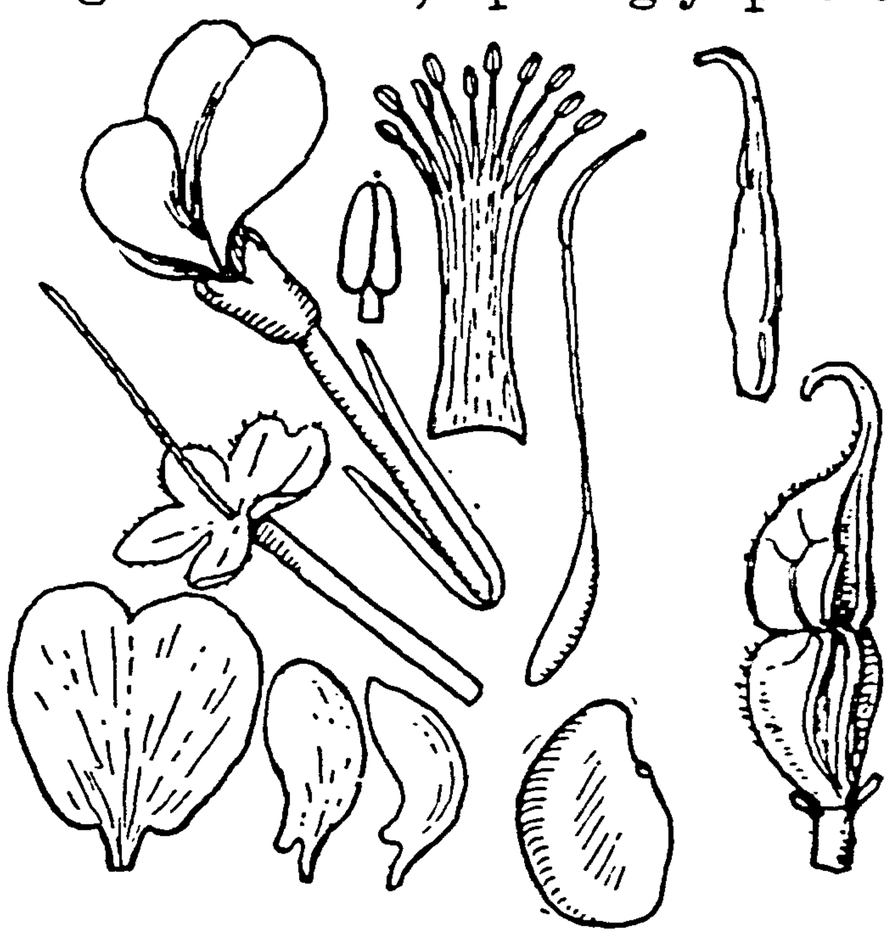
1. **Z. bracteata** (Walt.) Gmel. Stem 1–7 dm. tall, strigillose: leaflets often 4; blades oval to elliptic or nearly linear: spikes few-flowered; bracts 7–11 mm. long, reticulate, auricled: calyx-lobes ciliate, the lower one about as long as the tube: corolla yellow; standard 9–12 mm. long: pod 1–2 cm. long, 3–4-jointed. [*Z. tetraphylla* Michx.]—Pinelands, and sandy roadsides, Coastal Plain, Fla. to Tex. and Va.—(*Mex.*)—Spr.–sum.

66. **STYLOSANTHES** Sw. Perennial tufted herbs. Leaflets 3; blades veiny. Flowers of two kinds, the one complete, but sterile, the other without perianth, but fertile. Corolla yellow or orange: standard with a very broad blade: blades of the wings and the keel-petals auricled, the latter incurved. Loment turgid, 1- or 2-jointed, the lower joint empty, the upper one veiny, opening at the apex.—About 30 species, natives of warm and temperate regions.—PENCIL-FLOWERS.

Flower accompanied by an appendage within the bract: standard scarcely clawed: calyx of complete flower less than 3 mm. long: pod slender-beaked.
- Pod with soft, silky hairs mostly on the lower joint; upper joint curved into a hook. 1. *S. hamata.*
- Pod with stiff white hairs all over both joints; beak straight or curved at the apex. 2. *S. calcicola.*

Flower not accompanied by an appendage within the bract: standard decidedly clawed: calyx of complete flower about 4 mm. long: pod stout-beaked.
- Blades of the leaflets prevailingly narrow, narrowly elliptic to lanceolate or oblanceolate: calyx with middle lobe of lower lip lanceolate: terminal joint of pod with the beak lateral. 3. *S. biflora.*
- Blades of the leaflets prevailingly broad, oval to broadly oblanceolate or cuneate-obovate: calyx with middle lobe of lower lip ovate: terminal joint of pod with the beak nearly axial. 4. *S. riparia.*

1. S. hamata (L.) Taub. Stem stout, ascending or decumbent: blades of the leaflets elliptic to elliptic-obovate, 1–2 cm. long or shorter, sparingly pubescent, acute: lobes of the calyx-lips in the complete flower obtuse: style in the incomplete flower, as long as the ovary or longer: terminal joint of the pod obliquely ovoid, with few cross-ribs, the beak as long as the body or nearly so, hooked.—Hammocks, Florida Keys and locally in the peninsula.—All year.

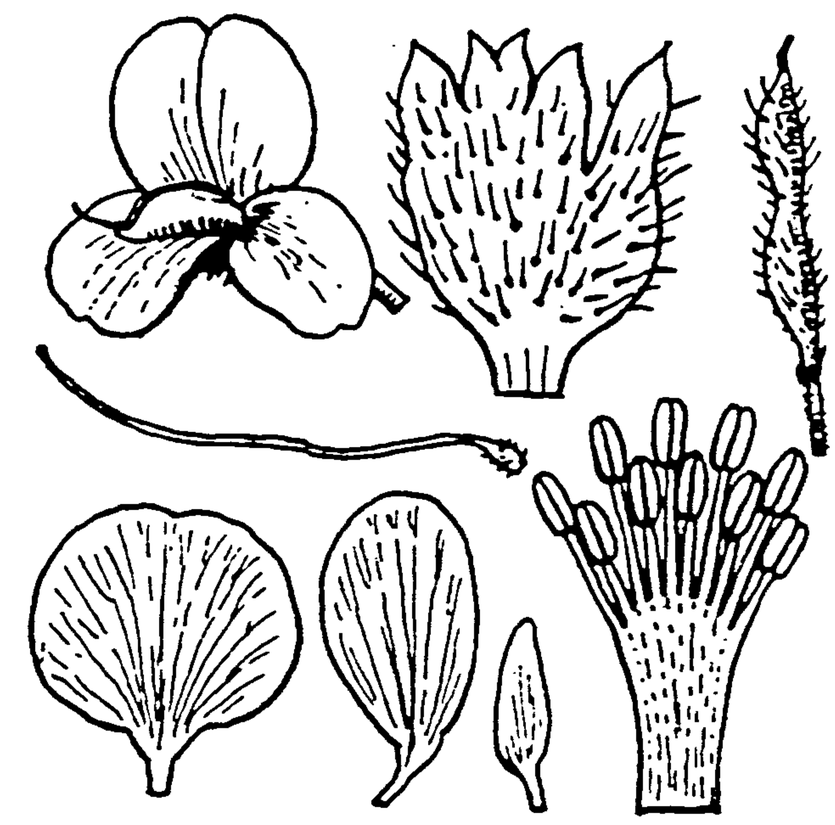


2. S. calcicola Small. Stem slender, decumbent or prostrate: blades of the leaflets linear-elliptic, or slightly broadest above the middle, to linear-subulate, mostly 1 cm. long or less, glabrous, slenderly acuminate: lobes of the calyx-lips in the complete flower usually acutish or acute: style in the incomplete flower much shorter than the ovary: terminal joint of the pod ellipsoid, with several cross-ribs, the beak much shorter than the body, curved.—Pinelands, Everglade Keys, S Fla.—All year.

3. S. biflora (L.) B. S. P. Stem and branches upright, usually stiff, finely pubescent, (more or less hispid in *S. biflora hispidissima*): leaflets 0.9–3.5 cm. long; blades prevailingly narrowly elliptic varying to lanceolate or oblanceolate, or sometimes nearly linear: terminal joint of the pod very inequilateral, mostly 4–5 mm. long, the beak lateral. [*S. elatior* Sw. *S. hispida procumbens* Pursh.]—Dry sandy soil, often in woods, various provinces, Fla. to Tex., Kans., and N. Y.—Sum.—*S. floridana* Blake has less hispid inflorescence.

4. S. riparia Kearney. Stem and branches decumbent, sometimes long and pliable, finely pubescent: leaflets 1–1.8 cm. long; blades prevailingly oval to broadly oblanceolate or cuneate-obovate: terminal joint of the pod slightly inequilateral, mostly 3–4 mm. long, the beak nearly axial.—Sandy soil, often on grassy banks, various provinces, Fla. to Tex., Mo., and Pa.—Sum.—Forms with rather narrow leaflets, except on the lower parts of the branches, occur in the range.

67. **CHAPMANNIA** T. & G. Perennial herbs. Leaflets 5–7. Flowers of two kinds, the one perfect but not fruit-producing, the other imperfect and fruit-producing. Calyx 2-lipped; upper lip with 4 short lobes; lower lip with 1 longer lobe. Corolla yellow, fugaceous: standard with an elliptic suborbicular blade: wings and keel-petals dissimilar in shape, neither auricled. Loment nearly terete, 1–4-jointed.—One species.



1. C. floridana T. & G. Plant 2–11 dm. tall, hirsute, virgately branched: leaflets 5–7; blades narrowly elliptic, oblanceolate, cuneate, or obovate, 5–20 mm. long: calyx becoming 7–10 mm. long: standard 10–13 mm. long: pod 1–3 cm. long, the sections longitudinally striate, hispid.—(ALICIA.)—Dry pinelands, pen. Fla.—Spr.-sum.

68. **MEIBOMIA** Heister. Herbs or shrubs, sometimes vines. Leaflets 3, or rarely 1 or 5. Racemes simple or compound. Calyx 2-lipped, sometimes obscurely so, the middle lobe of the lower lip often smaller or narrower and longer than the lateral ones. Corolla variously colored or white: standard with a broad blade: blades of the wings and the keel-petals auricled on one side, short-clawed. Loment few–several-jointed, usually with hooked hairs. [*Desmodium* (Fl. SE. U. S.)]—About 160 species, natives of temperate and tropical America, Asia, and Australia.—Sum.–fall or all year in S Fla.—The corollas of our species are purple or violet, or rarely white.—TICK-TREFOILS. STICK-TIGHTS. TICK-CLOVERS.—Species are grown for fodder.

Loment constricted into nearly separate rhomboidal, half-rhomboidal, or half-orbicular joints.
  Loment straight above, deeply constricted below, long-stalked.
    Peduncle arising from the base of the plant: pod long-stipitate. — I. NUDIFLORAE.
    Peduncle terminating the stem: pod short-stipitate. — II. GRANDIFLORAE.
  Loment constricted both above and below, but usually much more deeply below than above.
    Constrictions deeper below than above.
      Stem and branches trailing or reclining. — III. ROTUNDIFOLIAE.
      Stem and branches erect or ascending. — IV. PANICULATAE.
    Constrictions equally deep on both edges of the loment. — V. PURPUREAE.
Loment not constricted into separate joints, straight above, merely undulate below. — VI. SUPINAE.

I. NUDIFLORAE

Leaves approximate at the top of the sterile stem: flowering stem (peduncle) leafless. — 1. *M. nudiflora.*

II. GRANDIFLORAE

Leaves more or less clustered at the base of the peduncle: corolla purple. — 2. *M. acuminata.*
Leaves scattered, distant, along the stem: corolla white. — 3. *M. pauciflora.*

III. ROTUNDIFOLIAE

Blades of the leaflets narrow, elliptic to linear. — 4. *M. polymorpha.*
Blades of the leaflets broad, suborbicular to ovate.
  Leaflets with suborbicular blades, or if narrower, the racemes axillary.
    Leaflets mostly less than 2.5 cm. long, leathery, the blades glabrate. — 5. *M. arenicola.*
    Leaflets mostly over 2.5 cm. long, the blades membranous, pubescent. — 6. *M. Michauxii.*
  Leaflets with ovate or oval blades: racemes terminal as well as axillary.
    Corolla cream-colored or ochroleucous: stipules ovate: racemes mostly simple. — 7. *M. ochroleuca.*
    Corolla purple: stipules subulate: racemes mostly paniculate. — 8. *M. glabella.*

IV. PANICULATAE

Petioles wanting or very short. — 9. *M. sessilifolia.*
Petioles manifest.
  Leaflets with narrowly linear blades.
    Joints of the pod with a nearly straight or a depressed back, somewhat triangular in outline. — 10. *M. stricta.*
    Joints of the pod with a rounded back, not triangular in outline. — 11. *M. tenuifolia.*
  Leaflets with lanceolate to ovate or rhomboidal blades, not linear, except in No. 17.
    Joints of the loments manifestly longer than broad.
      Bracts subtending the flowers small and inconspicuous: blades of the leaflets reticulate. — 12. *M. canescens.*
      Bracts subtending the flowers conspicuous, mostly over 1 cm. long: blades of the leaflets not reticulate.
        Leaves pubescent: bracts ciliate and pubescent. — 13. *M. longifolia.*
        Leaves glabrous: bracts not ciliate and otherwise glabrous. — 14. *M. grandiflora.*
    Joints of the loments barely longer than broad.

Loment-joints predominantly more than 3.
Loment long-stipitate.
Leaflet-blades glabrous or sparingly pubescent beneath, but not velvety.
Leaflet-blades green beneath.
Loment-joints rounded or angled on the dorsal suture, thus scalloped.
Leaflet-blades thin, not reticulate, glabrous or finely pubescent beneath.
Blades of the leaflets-broad, of an elliptic, ovate or lanceolate type.
Stem glabrous or nearly so: joints of the loment rounded on the ventral side, curved on the dorsal. 15. *M. paniculata.*
Stem puberulent or finely pubescent: joints of the loment prominently angled on the ventral side, somewhat angled on the dorsal. 16. *M. pubens.*
Blades of the leaflets narrow, of a linear or linear-lanceolate type. 17. *M. Chapmanii.*
Leaflet-blades thick, reticulate-veined rather stiffly pubescent beneath. 18. *M. rhombifolia.*
Loment-joints straight on the back, the dorsal suture thus nearly even. 19. *M. Dillenii.*
Leaflet-blades glaucous beneath. 20. *M. laevigata.*
Leaflet-blades velvety beneath. 21. *M. viridiflora.*
Loment sessile or short-stipitate. 22. *M. canadensis.*
Loment-joints predominantly fewer than 3.
Leaflet-blades scabrous or pubescent and ciliate.
Terminal leaflet usually twice as long as wide. 23. *M. rigida.*
Terminal leaflet little longer than wide. 24. *M. ciliaris.*
Leaflet-blades smooth and glabrous. 25. *M. marylandica.*

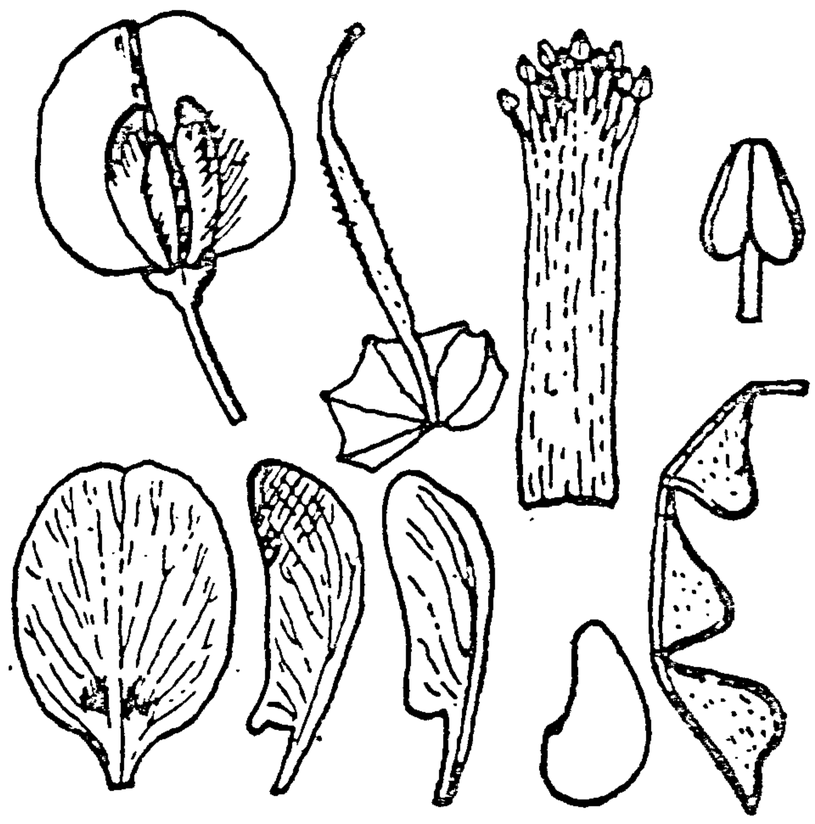
V. PURPUREAE

Tall light-green plant, with slender spreading branches. 26. *M. purpurea.*

VI. SUPINAE

Depressed, prostrate, or reclining dark-green plant. 27. *M. cana.*

1. M. nudiflora (L.) Kuntze. Leaves clustered on the short decumbent or ascending stem: leaflets 2–8 cm. long, the blades oval or ovate: standard 8–10 mm. long: wings not auricled on the lower side: joints of the loment 3–3.5 mm. wide. [*D. nudiflorum* DC.]—Woodlands and hillsides, various provinces, Fla. to La., Kan., Ont., and Me.



2. M. acuminata (Michx.) Blake. Leaves clustered at the end of the short erect stem: leaflets 8–13 cm. long, the blades broadly ovate to orbicular-ovate: standard 7–9 mm. long: wings minutely auricled on the lower side: loment-joints 4.5–6 mm. wide. [*D. acuminatum* Kuntze.] — Woodlands and thickets, various provinces, Fla. to Tex., Minn., Que., and Me.

3. M. pauciflora (Nutt.) Kuntze. Stem decumbent or ascending: leaflets 3; blades ovate or rhombic-ovate, 2.5–8 cm. long: corolla white: standard 4–5 mm. long; wings and keel-petals very narrow, diverging; loment-joints 5–5.5 mm. wide. [*D. pauciflorum* Nutt.]—Rich woods, various provinces, Fla. to Tex., Kans., Ont., and N. J.

4. M. polymorpha (A. Gray) Small. Stem spreading: stipules subulate or with a lanceolate base: leaflets 1–3; blades linear to elliptic, 1–3 cm. long: lateral calyx-lobes deltoid, acute: standard mostly over 4.5 mm. long: loment-joints half-rhombic, 3–3.5 mm. wide. [*M. arenicola polymorpha* Vail.]—Pinelands, Coastal Plain, Fla. to La.

5. M. arenicola Vail. Stem prostrate: stipules lanceolate: leaflets 1–5; blades ovate-orbicular to suborbicular, 1–2.5 cm. long: lateral calyx-lobes ovate, obtuse or acutish: standard mostly less than 4.5 mm. long: loment-joints elliptic or oval, but inequilateral, 2–2.5 mm. wide. [*D. lineatum* (Michx.) DC.]—Sandy soil, often in pine woods, Coastal Plain and adj. provinces, Fla. to La. and Md.

6. M. Michauxii Vail. Stem prostrate: stipules ovate: leaflets 3; blades suborbicular, 3–6 cm. long: lateral calyx-lobes lanceolate, longer than the tube, acuminate: standard 9–11 mm. long: loment-joints rounded on one side, half-rhombic on the other, about 3 mm wide. [*D. rotundifolium* (Michx.) DC.]—(DOLLAR-LEAF.)—Open woods and pinelands, various provinces, Fla. to La., Minn., Ont., and Mass.

7. M. ochroleuca (M. A. Curtis) Kuntze. Stem decumbent: leaflets 3; blades rhombic-ovate, yellowish-green, 2–5 cm. long: lower calyx-lobes lanceolate, longer than the tube, the middle one slightly the longest: standard 4–6 mm. long: keel-petals distinctly clawed: loment-joints oval to suborbicular, the sides glabrous.—Woods, Coastal Plain and adj. provinces, Fla. to Mo. and N. J.

8. M. glabella (Michx.) Kuntze. Stem procumbent: leaflets 2.5–8 cm. long; blades ovate or oval, bright-green: lower calyx-lobes lanceolate, longer than the tube, the middle one the largest: standard 7–9 mm. long: keel-petals not auricled, the blade extending to the base: loment-joints half-rhombic, the sides pubescent. [*D. glabellum* DC. *D. humifusum* DC.]—Sandy soil, often in rocky places, various provinces, rarely Coastal Plain, Ala. to Mass.

9. M. sessilifolia (Torr.) Kuntze. Stem erect: stipules linear: leaflets 2–5 cm. long; blades linear or linear-elliptic, reticulate, pubescent beneath: lateral calyx-lobes deltoid, the markedly longer lower one triangular-lanceolate: standard 5–6 mm. long: wings dilated near the tip: loment-joints obliquely half-obovate, 3–3.5 mm. wide.—Woods, open slopes, and river shores, various provinces, Miss. to Tex., Kans., Mich., and Mass.

10. M. stricta (Pursh) Kuntze. Stem erect: stipules setaceous: leaflets 2–5 cm. long; blades linear, reticulate, glabrous: lateral calyx-lobes deltoid, the much longer lower one linear-subulate: standard 5–6 mm. long: wings not dilated at the apex: loment-joints obliquely half-obovate, 2–2.5 mm. wide. [*D. strictum* DC.]—Woods and pinelands, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and N. J.

11. M. tenuifolia (T. & G.) Kuntze. Stem lax: stipules subulate: leaflets 3–8 cm. long; blades linear: lateral calyx-lobes mostly shorter than the tube, the lower lobe not much longer: standard 3–4 mm. long, broadly obovate: androecium 3–4 mm. long: loment-joints obliquely obovate, about 2 mm. wide. [*D. tenuifolium* T. & G.]—Sandhills and pinelands, Coastal Plain, Fla. to La. and N. C.

12. M. canescens (L.) Kuntze. Stem erect: stipules ovate: leaflets 3–10 cm. long; blades ovate to ovate-rhomboid: lateral calyx-lobes lanceolate, longer than the tube, acute, the lower lobe longer and slender-tipped: standard 9–12

mm. long, narrowly obovate: androecium 9–11 mm. long: loment-joints half-rhombic, 4.5–5.5 mm. wide. [*D. canescens* DC.]—Fence rows, thickets, and edges of woods, various provinces, Fla. to Tex., Minn., Ont., and Mass.

13. **M. longifolia** (T. & G.) Vail. Stem erect: stipules ovate-lanceolate: leaflets 5–11 cm. long; blades lanceolate, lanceolate-ovate, or ovate, acuminate: lateral calyx-lobes subulate, the lower lobe much longer: corolla lilac-purple; standard elliptic-obovate, 7–9 mm. long: loment-joints inequilaterally rhombic, the one side very prominent.—Low woods, and stream-banks, various provinces, Ala. to La. and Ill.

14. **M. grandiflora** (Walt.) Stem erect: stipules lanceolate: leaflets 5–15 cm. long; blades ovate to ovate-lanceolate, cuspidate or long-acuminate: lateral calyx-lobes lanceolate, the lower lobe slightly longer: standard broadly obovate, 8–10 mm. long: loment-joints half-rhombic, the one side somewhat more prominent than the other. [*D. cuspidatum* Hook. *M. bracteosa* (L.) Kuntze.]—Barren hills, thickets, and clearings, various provinces, Fla. to Tex., Minn., Ont., and Me.

15. **M. paniculata** (L.) Kuntze. Stem glabrous or nearly so: stipules subulate: leaflets 3–9 cm. long; blades mainly elliptic to lanceolate, obtuse or acutish: lateral calyx-lobes triangular, sometimes deltoid, acute, the lower lobe decidedly longer and attenuate: standard cuneate or cuneate-obovate, 4.5–5.5 mm. long: keel-petals about as long as the standard: loment-joints 4–5 mm. wide, the ventral side prominently rounded, the dorsal side curved. [*D. paniculatum* DC.]—Dry soil, often in woods, various provinces, Fla. to Tex., Minn,. Ont., and Me.

16. **M. pubens** (T. & G.) Young. Stem puberulent or finely pubescent: stipules subulate: leaflets 2–7 cm. long; blades mainly ovate-elliptic to elliptic-lanceolate, mostly twice or thrice as long as wide: lateral calyx-lobes triangular to ovate-triangular, the lower lobe slightly longer than the lateral ones: standard cuneate, 6–7 mm. long: keel-petals mostly longer than the standard: loment-joints 3–4 mm. wide, the ventral side rather prominently angled, the dorsal side angled. [*D. paniculatum pubens* T. & G.]—Woods and river-banks, Coastal Plain and rarely adj. provinces, Fla. to Tex., Okla., and Ark.

17. **M. Chapmanii** (Britton) Small. Stem puberulent or nearly glabrous: stipules subulate: leaflets 3–11 cm. long; blades linear or linear-lanceolate, several times longer than wide: lateral calyx-lobes deltoid or ovate-deltoid, the lower lobe much longer: standard obovate, 4–6 mm. long: keel-petals longer than the standard: loment-joints 4–5 mm. wide, the dorsal side prominently angled, the ventral side rounded. [*D. paniculatum angustifolium* T. & G. *M. paniculata Chapmanii* Britton]—Woods or low grounds, Coastal Plain and occasionally adj. provinces, Fla. to Tex., Ark., and Va.

18. **M. rhombifolia** (Ell.) Vail. Stem pubescent: stipules subulate: leaflets 5–9 cm. long; blades ovate to ovate-lanceolate, pubescent beneath: lateral calyx-lobes lanceolate, the lower lobe scarcely longer: standard 6–9 mm. long: keel-petals mostly shorter than the standard: loment-joints 3.5–4 mm. wide, the ventral side abruptly rounded. [*D. floridanum* Chapm.]—Pinelands and open woods, Coastal Plain and adj. provinces, Fla. to La. and Va.

19. **M. Dillenii** (Darl.) Kuntze. Stem glabrous or sparingly pubescent: stipules subulate: leaflets 4–10 cm. long; blades elliptic or elliptic-ovate, not scabrous: lateral calyx-lobes lanceolate, the lower lobe longer but about as wide: corolla bright-purple; standard narrowly obovate, 5–6 mm. long: loment-joints obliquely rhombic, much longer than wide. [*D. Dillenii* Darl.]—Thickets and woods, various provinces, Fla. to Tex., Minn., Ont., and Me.

20. **M. laevigata** (Nutt.) Kuntze. Stem often glaucous: stipules subulate: leaflets 4–11 cm. long; blades ovate to ovate-elliptic, glabrous and glaucous beneath: lateral calyx-lobes lanceolate, the lower lobe decidedly longer: standard 8–9 mm. long: keel-petals mostly longer than the standard: loment-joints 2.5–3 mm. wide, the ventral side gradually rounded. [*D. laevigatum* (Nutt.) DC.]—Pinelands and dry woods, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and N. J.

21. **M. viridiflora** (L.) Kuntze. Stem downy: stipules lanceolate: leaflets 4–9 cm. long; blades elliptic to ovate or ovate-oblong, densely pubescent beneath: lateral calyx-lobes deltoid, shorter than the tube, the lower lobe lanceolate, longer and narrower; corolla pale-purple, turning green; standard broadly obovate, 6–9 mm. long: loment-joints about as wide as long, obliquely obovate. [*D. viridiflorum* Beck.]—Dry woods, various provinces, Fla. to Tex., Mo., Mich., and N. Y.

22. **M. canadensis** (L.) Kuntze. Stem pubescent: stipules lanceolate-linear: leaflets 4–10 cm. long; blades elliptic or elliptic-lanceolate, pubescent beneath: upper calyx-lip deeply notched; lateral calyx-lobes subulate-lanceolate, longer than the tube, the lower one scarcely longer: standard narrowly obovate, 8–10 mm. long: loment-joints obliquely obovate. [*D. canadense* (L.) DC.]—(BUSH TICK-CLOVER.)—River banks, woods, various provinces, rarely Coastal Plain, N. C. to Okla., Kans., Ont., and N. B.

23. **M. rigida** (Ell.) Kuntze. Stem minutely pubescent: leaflets 2.5–8 cm. long; blades ovate-elliptic or elliptic, pubescent and reticulate beneath: lateral calyx-lobes deltoid, acute, the lower lobe triangular: standard 4–5 mm. long: stipe of the loment much less than ½ as long as the joints. [*D. rigidum* DC.] —Dry thickets, various provinces, Fla. to Tex., Nebr., Mich., and Mass.

24. **M. ciliaris** (Muhl.) Blake. Stem hirsute or minutely pubescent: leaflets 1–2.5 cm. long; blades orbicular-ovate or oval, sparingly pubescent beneath: lateral calyx-lobes deltoid, acute, the lower lobe lanceolate: standard 4–5 mm. long: stipe of the loment ½ as long as the joint.—Dry soil, often on hillsides, and sandy fields, various provinces, Fla. to Tex., Nebr., Mich., and Ont.—(*Mex.*)

25. **M. marylandica** (L.) Kuntze. Stem glabrous or rarely with scattered hairs: stipules subulate: leaflets 1–2.5 cm. long; blades ovate or sometimes suborbicular or elliptic, glabrous or nearly so: lateral calyx-lobes ovate, obtuse, the lower lobe scarcely longer: standard 3.5–4.5 mm. long: loment-joints oblique. [*D. marylandicum* Boott *M. obtusa* (Muhl.) Vail]—Woods, thickets, and hillsides, various provinces, Fla. to La., Mo., Mich., and Mass.

26. **M. purpurea** (Mill.) Vail. Stem pubescent, 1–3.5 m. tall: stipules ovate: leaflets 2–11 cm. long; blades ovate, ovate-elliptic, or elliptic, pubescent, and often reticulate beneath: lateral calyx-lobes linear-lanceolate: standard 3.5–4 mm. long, cuneate at the base: keel-petals obliquely pointed: loment-joints suborbicular, over 2.5 mm. wide. [*D. tortuosum* (Sw.) DC.]—(FLORIDA-BEGGARWEED.)—Roadsides, fields, and hammocks, Coastal Plain, Fla. and Ga.—(*W. I., Mex., C. A., S. A., O. W.*)

27. **M. cana** (Gmel.) Blake. Shrub with glabrous or nearly glabrous stems: stipules lanceolate or ovate-lanceolate: leaflets about 2 cm. long; blades oval or elliptic: lateral calyx-lobes lanceolate: standard 5–6 mm. long, truncate or subcordate above the short claw: androecium 5–6 mm. long: loment-joints 1–1.5 mm. wide, much longer. [*D. incanum* DC. *M. supina* (Sw.) Britton] —Hammocks, S Fla.—(*W. I., Mex., C. A., S. A., O. W.*)

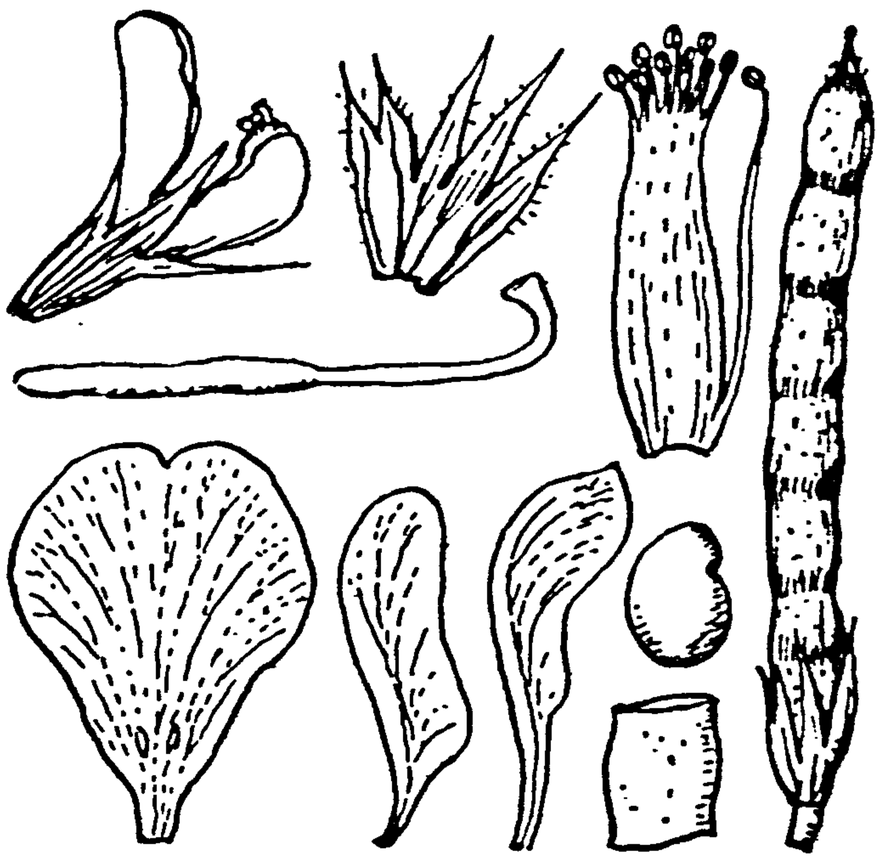
69. **SAGOTIA** Duch. & Walp. Perennial diffuse or prostrate herbs. Leaflets 3. Racemes much reduced, of 2–4 flowers in a cluster, axillary to or opposite a leaf, or flower solitary. Calyx 2-lipped, the upper lobes partly united. Corolla blue, purple, or white: standard with a broad long-clawed blade: blades of the wing-petals angled at the base. Loment few-jointed.—Three species, natives of the Old World, the following perhaps also native in the New.

1. **S. triflora** (L.). Duch. & Walp. Stem procumbent or trailing, pubescent, the branches more or less elongate, but closely creeping: leaflets 3–12 mm. long; blades broadly obovate or broadly cuneate; lateral calyx-lobes lanceolate-subulate: standard 3–4 mm. long, purplish-pink, cunately narrowed into a long claw: androecium 3–4 mm. long: loment-joints 2–2.5 mm. wide, scarcely longer. [*Desmodium triflorum* DC. *Meibomia triflora* Kuntze]—Pinelands, roadsides, and cult. grounds, pen. Fla.—(*W. I., Mex., C. A., S. A.*)—Resembles *Lespedeza striata* in habit. Used as a lawn-cover.

70. **ALYSICARPUS** Neck. Herbs. Leaflet 1. Racemes terminal, few-flowered. Calyx narrow, 2-lipped; lobes narrow, the 2 of the upper lip more united and shorter than the 3 of the lower lip. Corolla purple or blue: standard with a broad blade longer than the claw: blades of the keel- and wing-petals with a rounded shoulder at the base, that of the keel the less prominent, rather long-clawed. Ovary slender. Loment, several-jointed, with or without constrictions.—About 16 species, natives of the Old World tropics.—Sum.–fall or all year S.

Calyx-lobes acuminate, those of the upper lip united about half-way: loment with parallel sutures. 1. *A. vaginalis.*
Calyx-lobes acuminate, those of the upper lip united to near the tips: loment deeply constricted between the joints. 2. *A. rugosus.*

1. **A. vaginalis** (L.) DC. Stem often branched at the base, the slender branches more or less diffuse, up to 1 m. long: blades of the leaflets of various shapes, often orbicular to linear on the same plant, mostly 1–5 cm. long, finely reticulate: calyx 4.5–5.5 mm. long; lower lobes narrowly lanceolate, finely striate, acuminate: corolla purple; standard broadly cuneate-obovate, 5.5–6.5 mm. long: loment 1.5–2.5 cm. long linear, acute or the joints truncate, reticulate, slightly longer than wide.—(FALSE-MONEYWORT.)—Low pinelands and waste-places, pen. Fla.—(*W. I., S. A., O. W.*).



2. **A. rugosus** (Willd.) DC. Stem more or less diffusely branched, up to 1 m. tall: blades of the leaflets elliptic to lanceolate or linear-lanceolate, 2–7 cm. long, reticulate: calyx 6–7 mm. long; lower lobes lanceolate,

rather coarsely striate, narrowly acute: corolla purplish; standard obovate-cuneate, 5–6 mm. long: loment 1–2 cm. long, constricted at the nodes, the joints very turgid, suborbicular, coarsely transverse-wrinkled.—Waste-places and roadsides, S pen. Fla. Nat. of trop. regions.

71. **LESPEDEZA** Michx. Herbs or shrubs. Leaflets 3 or rarely 1. Flowers perfect, but sometimes partially apetalous. Calyx 2-lipped, the 2 upper lobes more or less united. Corolla pink, purple, yellow, or white: standard with a broad blade: bladés of the wings and the keel-petals auricled on one side, long-clawed. Loment with 1 or 2 joints. About 40 species, natives of eastern North America, Asia, and Australia.—Sum.–fall.—BUSH-CLOVERS.

Plant annual: stipules ovate: calyx-lobes about as wide as long. — I. STRIATAE.
Plant perennial: stipules subulate, calyx-lobes much longer than wide.
  Flowers of 2 kinds, petaliferous and apetalous: calyx-lobes shorter than the pod: corolla purple or purplish. — II. VIOLACEAE.
  Flowers all alike, petaliferous: corolla whitish or yellowish (or purple or white in *L. bicolor*).
    Panicles open: calyx-lobes much shorter than the pod. — III. BICOLORES.
    Panicles congested, usually capitate: calyx-lobes fully as long as the pod. — IV. CAPITATAE.

I. STRIATAE

Low diffuse slender plant: leaflets mostly less than 2.5 cm. long. — 1. *L. striata.*

II. VIOLACEAE

Flower-clusters slender-peduncled, mostly surpassing the leaves.
  Petaliferous flowers in spike-like or head-like clusters.
    Stem branched at the base: branches trailing or procumbent.
      Foliage glabrous or pubescent with appressed hairs.
        Pod 3–4 mm. long: stem pubescent. — 2. *L. repens.*
        Pod 5–6 mm. long: stem essentially glabrous, at least below. — 3. *L. texana.*
      Foliage downy or woolly. — 4. *L. procumbens.*
    Stem upright. — 5. *L. Nuttallii.*
  Petaliferous flowers in loose or close panicles. — 6. *L. violacea.*
Flower-clusters of both kinds sessile or nearly so.
  Leaflets with suborbicular, oval or elliptic blades.
    Calyx 5.5–6.5 mm. long; lobes as long as the pod or longer. — 7. *L. simulata.*
    Calyx 2–3 mm. long; lobes much shorter than the pod.
      Foliage glabrate, or pubescent with appressed hairs. — 8. *L. frutescens.*
      Foliage downy. — 9. *L. Stuvei.*
  Leaflets with linear or elliptic-linear blades.
    Foliage downy. — 10. *L. neglecta.*
    Foliage finely appressed-pubescent or glabrate. — 11. *L. virginica.*

III. BICOLORES

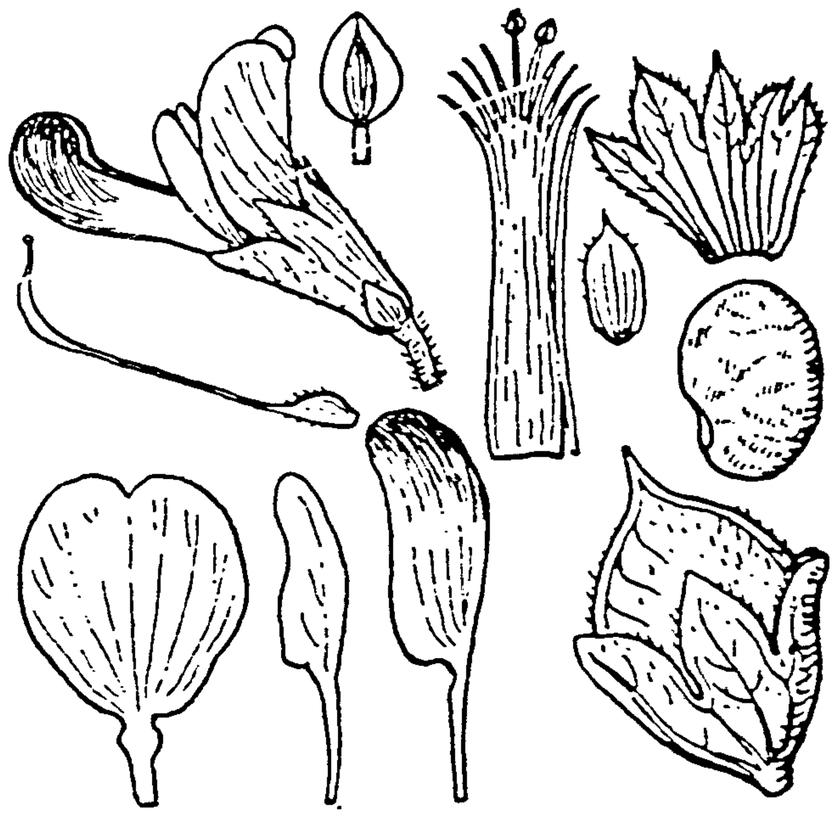
Tall perennial plant, with slender branches, sparingly pubescent leaflets, and lax panicles or purple or white flowers. — 12. *L. bicolor.*

IV. CAPITATAE

Leaflets with suborbicular, oval, ovate, or elliptic blades.
  Peduncles longer than the leaves: spike cylindric. — 13. *L. hirta.*
  Peduncles shorter than the leaves: spike subglobose. — 14. *L. capitata.*
Leaflets with linear to linear-elliptic blades.
  Bracts and calyx-lobes conspicuously long-tipped: calyx about 8 mm. long. — 15. *L. longifolia.*
  Bracts and calyx-lobes not conspicuously long-tipped: calyx about 6 mm. long. — 16. *L. angustifolia.*

1. **L. striata** (Thunb.) H. & A. Plant erect or diffuse, 1–4 dm. tall: leaflets 8–25 mm. long; blades elliptic to elliptic-obovate: calyx 2–2.5 mm. long;

lobes ovate: standard purple or pinkish, often striped with white: keel-petals 5–7 mm. long: pod somewhat longer than the calyx. — (JAPANESE-CLOVER.) — Roadsides, fields, and woods, various provinces, Fla. to Tex., Mo., and N. J.—Nat. of Asia.—Frequently overruns pastures, fields, and roadsides, especially in poor soil, where it is grazed by horses and cattle.



2. **L. repens** (L.) Bart. Plant procumbent: leaflets 6–15 mm. long: blades oval or obovate: calyx 4–5 mm. long; lower lobes longer than the tube, subulate, acuminate: corolla white and pink; keel-petals 6–7 mm. long: pod 3.5–4.5 mm. long.—Dry places and roadsides, various provinces, Fla. to Tex., Minn., and Conn.

3. **L. texana** Britton. Plant similar to *L. repens* in habit: leaflets 10–26 mm. long; blades elliptic to elliptic-obovate: calyx 2–2.5 mm. long; lower lobes shorter than the tube, lanceolate to deltoid, acute: keel-petals 5–6 mm. long: pod several times longer than the calyx.—Dry soil and prairies, Coastal Plain, Miss. to Tex.

4. **L. procumbens** Michx. Plant procumbent: leaflets 10–25 mm. long; blades oval or elliptic, or sometimes obovate: calyx 4–5.5 mm. long; lobes subulate, about twice as long as the tube: keel-petals 4.5–5.5 mm. long, or sometimes longer: style mostly glabrous: pod 4–5 mm. long.—Dry banks and roadsides, various provinces, Fla. to Tex., Mo., and N. H.

5. **L. Nuttallii** Darl. Plant 5–10 dm. tall, often copiously pubescent: leaflets 8–20 mm. long; blades obovate, oval, or suborbicular: calyx 3.5–4.5 mm. long; lobes linear-lanceolate, somewhat longer than the tube: ovary copiously pubescent: pod 6–8 mm. long.—Thickets and woods, various provinces, Fla. to Kans., Mich., and N. H.

6. **L. violacea** (L.) Pers. Plant 3–9 dm. tall, diffuse, sparingly pubescent: leaflets 9–20 mm. long; blades elliptic or oval: calyx 4–4.5 mm. long: pod short-beaked, mostly 5–6 mm. long, with short scattered hairs.—Dry banks and thicket-margins, various provinces, Fla. to La., Kans., Minn., and N. H.

7. **L. simulata** Mackenzie & Bush. Plant 6–9 dm. tall, pubescent: leaflets 12–20 mm. long; blades elliptic to linear-elliptic, silvery-pubescent: calyx 5.5–6.5 mm. long; lobes of the upper lip united to below the middle: standard 6.5–7.5 mm. long; blade elliptic: pod 4.5–5.5 mm. long.—Stony soil, often in woods or on plains, various provinces, Tex. to Mo., Conn., and Pa.

8. **L. frutescens** (L.) Britton. Plant 3–10 dm. tall, appressed pubescent or glabrate: leaflets 10–35 mm. long; blades oval or elliptic, slightly pubescent beneath: calyx 3–4 mm. long: standard about 5 mm. long: pod oval or oval-ovate, 6–7 mm. long.—Dry soil, often in rocky woods, various provinces, Fla. to Tex., Minn., Ont., and Me.

9. **L. Stuvei** Nutt. Plant 6–12 dm. tall, velvety or downy: leaflets 9–20 mm. long, or rarely longer; blades elliptic, oval, or suborbicular, densely pubescent: calyx 2–3 mm. long; lobes subulate, those of the upper lip united to below the middle: standard 5–6 mm. long; blade suborbicular: pod beaked, 4–6 mm. long, copiously pubescent.—Rocky shores and woods, various provinces, Ala. to Tex., Ark., Mich., and Vt.

10. L. neglecta (Britton) Mackenzie & Bush. Plant similar to *L. Stuvei* in habit and pubescence, but smaller: blades of the leaflets linear to linear-elliptic: calyx 2.5–3 mm. long; lobes lanceolate, those of the upper lip united mostly to above the middle: pod oval, 6–7 mm. long, short-beaked.—Dry soil, Coastal Plain and occasionally adj. provinces, Ga. to Tex., Mo., and N. J.

11. L. virginica (L.) Britton. Plant 3–11 dm. tall, appressed-pubescent: leaflets 12–35 mm. long; blades linear to linear-elliptic, sometimes finely pubescent beneath: calyx 3–4.5 mm. long: pod elliptic to ovate, 5–6 mm. long, minutely pubescent.—Dry woods and barrens, various provinces, Fla. to Tex., Minn., Ont., and N. H.

12. L. bicolor Turcz. Plant up to 3 m. tall, finely appressed-pubescent: leaflets 11–65 mm. long; blades obovate, oval, elliptic, or ovate, pubescent beneath, especially on or near the midrib: calyx 5–6 mm. long: pod elliptic to oval, narrowed at both ends, 7–8 mm. long, reticulate and strigillose.—Roadsides, waste-places, and woods, Fla. to N. C. Nat. of Japan.

13. L. hirta (L.) Ell. Plant 5–12 dm. tall, the stem villous: leaflets 12–40 mm. long; blades oval to suborbicular: calyx 6–6.5 mm. long; lobes 3–4 times as long as the tube: style glabrous: pod 7–8 mm. long.—Dry woods, pinelands, and fields, various provinces, Fla. to Tex., Minn., Ont., and Me.

14. L. capitata Michx. Plant 5–16 dm. tall, the stem usually velutinous with short spreading hairs: leaflets 25–35 mm. long; blades elliptic to oval, sericeous, especially beneath: calyx about 9 mm. long: corolla 7–8 mm. long, yellowish-white: style pubescent: pod elliptic, 5–5.5 mm. long.—(DUSTY-CLOVER.)—Dry, often sandy soil in woods, various provinces, Fla. to La., Nebr., Minn., and Mass.

15. L. longifolia DC. Plant 5–12 dm. tall, the stem densely velutinous; leaflets 25–60 mm. long; blades linear to linear-elliptic, somewhat sericeous, especially beneath: calyx about 8 mm. long: corolla 8–9 mm. long, white: pod elliptic, about 6 mm. long.—Open woods and fields, various provinces, Ala. to La., Ia., and Ky.

16. L. angustifolia (Pursh) Ell. Plant 6–10 dm. tall, the stem closely fine-pubescent, the hairs more or less appressed: leaflets 10–35 mm. long; blades linear to narrowly linear-elliptic, those of the lower leaves often wider than those of the upper, pale-strigillose beneath: calyx about 6 mm. long: corolla 6–7 mm. long, whitish or cream-color: pod oval to suborbicular, about 4 mm. long.—Dry soil, open wood and pinelands, various provinces, Fla. to La., Mich., and Mass.

72. VICIA [Tourn.] L. Trailing or climbing herbs. Leaflets few or many: blades entire, or toothed at the apex. Racemes few–many-flowered, usually 1-sided. Calyx more or less 2-lipped: lobes of the lower lip usually longer than those of the upper. Corolla variously colored or white: blades of the wings more prominently auricled than those of the keel-petals. Filaments usually united to near the tips. Style with a tuft of hairs at the apex, or pubescent on the side opposite the keel. Pod relatively flat. About 130 species, of wide geographical distribution.—Spr.–sum. or all year S.—VETCHES. TARES. PEA-VINES.—Some species are grown as fodder-plants, others for their edible seeds—"beans." Some species are used as ornaments.—The corollas of our species are mostly purple or pale-lavender.

Peduncle well-developed, sometimes exceeding the leaves.
  Plant annual: standard 2–5 mm. long. — I. HIRSUTAE.
  Plant perennial: standard 5–12 mm. long.
    Raceme densely very many-flowered. — II. CRACCAE.
    Raceme loosely few–several-flowered or 1-flowered. — III. MICRANTHAE.
Peduncle wanting or very short. — IV. SATIVAE.

I. HIRSUTAE

Leaflets 12–18: pod pubescent: seeds 2: corolla whitish. — 1. *V. hirsuta.*
Leaflets 8–12: pod glabrous: seeds 3–8: corolla bluish. — 2. *V. tetrasperma.*

II. CRACCAE

Very diffuse plant: corolla deep-blue or purple. — 3. *V. Cracca.*

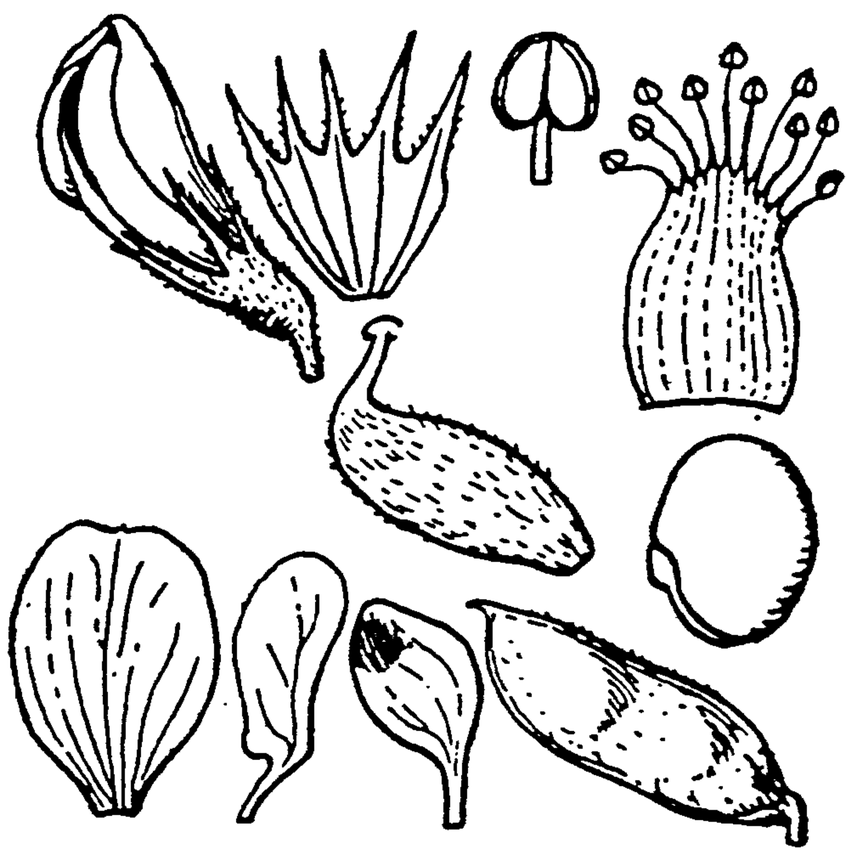
III. MICRANTHAE

Racemes 8–18-flowered.
  Leaflets with blades of an elliptic type. — 4. *V. caroliniana.*
  Leaflets with blades of a linear type.
    Corolla 5–6 mm. long: calyx 1.5 mm. long: pod less than 2.5 cm. long. — 5. *V. Hugeri.*
    Corolla 7–8 mm. long: calyx 2 mm. long: pod over 2.5 cm. long. — 6. *V. acutifolia.*
Racemes 1–6-flowered.
  Peduncles longer than the leaflets.
    Leaflets 4–6. — 7. *V. floridana.*
    Leaflets 6–12.
      Leaflets about 5 times as long as broad. — 8. *V. texana.*
      Leaflets less than 3 times as long as broad. — 9. *V. ludoviciana.*
  Peduncles shorter than the leaflets. — 10. *V. micrantha.*

IV. SATIVAE

Corolla mostly over 1.5 cm. long: leaflets of the upper leaves inclined to be elliptic. — 11. *V. sativa.*
Corolla mostly less than 1.5 cm. long: leaflets of the upper leaves inclined to be linear. — 12. *V. angustifolia.*

1. V. hirsuta (L.) Koch. Leaflets 12–18; blades linear to elliptic, 6–15 mm. long, truncate or notched: calyx-lobes subulate, ciliate, longer than the tube: standard and keel 2–3 mm. long: ovary pubescent: pod 6–8 mm. long.—(HAIRY-VETCH. TARE.)—Waste-places, roadsides, and fields, various provinces, Ga. to Ohio and N. B. Nat. of Eu.



2. V. tetrasperma (L.) Moench. Leaflets 8–12; blades linear to linear-elliptic, 8–20 mm. long, acute or mucronate: calyx-lobes lanceolate, mainly shorter than the tube, not ciliate: standard and keel 4–5 mm. long: ovary glabrous: pod 9–12 mm. long.—(LENTIL-TARE.)—Waste-places, fields, and roadsides, Blue Ridge and more northern provinces, N. C. to Ont. and N. S. Nat. of Eu.

3. V. Cracca L. Leaflets 18–24; blades linear to elliptic-linear, 9–20 mm. long, acute or mucronate: calyx 5–6 mm. long; upper lobes deltoid; lower lobes lanceolate, about as long as the tube: corolla blue or purple; standard pandurate, 10.5–11.5 mm. long: keel 8–8.5 mm. long: pod 2–2.5 cm. long.—(CANADA-PEA. COW-VETCH.)—Fields and waste-places, Blue Ridge and more northern provinces, N. C. to B. C., S Ont., and Newf. Nat. of Eu.

4. V. caroliniana Walt. Leaflets 8–16; blades elliptic to oval-elliptic, 1–2 cm. long, mucronate: calyx 2.5–3 mm. long; lobes triangular: corolla white, except the blue-tipped keel; standard 9–10 mm. long: keel 5–6 mm. long: pod 2.5–3 cm. long.—(WOOD-VETCH. DEVIL'S-SHOESTRING.)—Woods and thickets, various provinces, Ga. to Kan., Minn., Ont., and W N. Y.

5. **V. Hugeri** Small. Leaflets usually 10–12; blades linear, 2–3.5 cm. long, mucronulate: calyx-lobes triangular, the lower narrower than the lateral ones, but not longer: standard 5–6 mm. long: keel about 4 mm. long: pod about 2 cm. long.—(VETCHLING.)—Open woods, Piedmont, Ga. and Ala.

6. **V. acutifolia** Ell. Leaflets 2–6, usually 4; blades linear to linear-elliptic, acute or mucronate: calyx-lobes triangular, the lower one longer than the lateral ones: standard 7–8 mm. long: keel about 6 mm. long: pod 2.8–3 cm. long.—(SAND-VETCH.)—Low calcareous hammocks, swamps, and ditches, Coastal Plain, Fla. to Ala. and Ga.

7. **V. floridana** S. Wats. Leaflets 4–6; blades elliptic to elliptic-oblanceolate, 0.5–1.5 cm. long, mucronulate: calyx-lobes triangular, the lower one narrow and slightly longer than the deltoid lateral ones but much shorter than the tube: standard narrowly obovate, 5–6 mm. long: ovary glabrous: pod about 1.5 cm. long.—Sandy soil, Fla.

8. **V. texana** (T. & G.) Small. Leaflets 6–10; blades linear, mucronulate: calyx-lobes filiform-subulate, the lower one as long as the tube, all copiously ciliate; standard 5–6 mm. long; keel about 4 mm. long: pod 2–2.5 cm. long.—Dry prairies and plains, Coastal Plain, Miss. to Tex. and Ark.

9. **V. ludoviciana** Nutt. Leaflets 6–12: blades elliptic to oval, sometimes varying to broadest above or below the middle, or rarely linear-elliptic, 7–23 mm. long: calyx lanceolate, the lower one shorter than the tube: standard 6–7 mm. long; keel 4–5 mm. long: pod 2.5–3 cm. long.—(DEER-PEA.)—Low grassy places, various provinces, Fla. to Tex., Kans., and Mo.

10. **V. micrantha** Nutt. Leaflets of the lower leaves with obovate or oval blades, 5–12 mm. long, those of the upper leaves narrowly elliptic to linear, 9–35 mm. long: calyx-lobes triangular, much shorter than the tube: standard 5 mm. long: keel about 4 mm. long: pod about 1 cm. long.—Thickets and shaded banks, Coastal Plain and occasionally adj. provinces, Ala. to Tex., Mo., and Tenn.

11. **V. sativa** L. Leaflets 8–14; blades linear, linear-lanceolate, or elliptic, 1–4 cm. long: calyx 10–12 mm. long: corolla purple or deep-pink: standard and wings mostly over 15 mm. long: pod 4–8 cm. long.—(COMMON-VETCH.)—Waste-places, fields, and roadsides, various provinces, Ga. and Ala. to Minn. and Me. Nat. of Eurasia.

12. **V. angustifolia** Roth. Leaflets 8–16; blades linear varying to lanceolate or oblanceolate, 1–3.5 cm. long: calyx 7–9 mm. long: standard and wings mostly less than 15 mm. long.—Waste-places and fields, various provinces, Fla. to N. S.; also locally in the interior. Nat. of Eu.

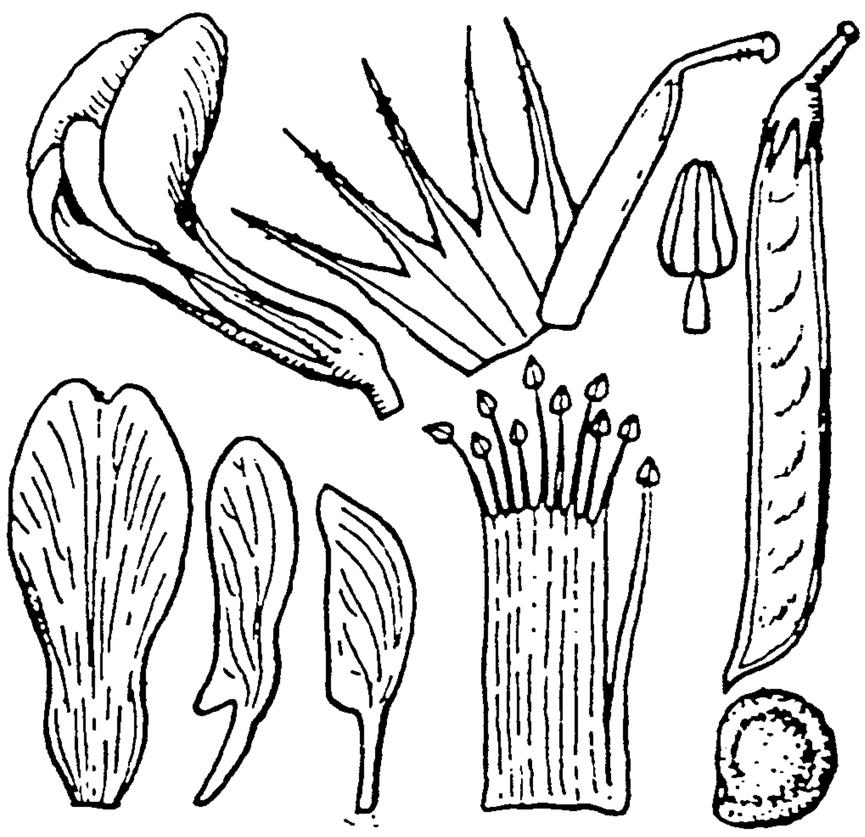
73. **LATHYRUS** L. Plants similar to *Vicia* in habit, but usually larger: filaments usually less united: style pubescent on the side opposite the standard: pod more turgid.—About 110 species, natives of the Northern Hemisphere and South America.—Spr.–sum.—VETCHLINGS. EVERLASTING-PEAS.—Some species are cultivated for their edible fruits, others for fodder-plants. Sweet-peas are cultivated varieties of *L. ornatus.*

Plant annual: stem winged: leaflets 2: keel-petals less than 1 cm. long.
- Standard-blade elliptic or obovate: calyx-lobes twice as long as the tube: pod glabrous. 1. *L. pusillus.*
- Standard-blade suborbicular: calyx-lobes as long as the tube or slightly longer: pod pubescent. 2. *L. hirsutus.*

Plant perennial: stem ridged or angled: leaflets 4 or more: keel-petals over 1 cm. long.

Racemes several- (10–20) flowered: leaflets mostly 8–12; blades ovate to oval. 3. *L. venosus.*
Racemes few- (2–6) flowered: leaflets mostly 4–6; blades elliptic or nearly so. 4. *L. myrtifolius.*

1. L. pusillus Ell. Stem 2-winged, glabrous: leaflets 1–5 cm. long; blades narrowly linear to linear-elliptic or sometimes elliptic: peduncle mostly shorter than the leaves, often 1-flowered: calyx 5–7 mm. long; lobes subulate-lanceolate, attenuate: standard 9–10 mm. long: ovary glabrous: pod narrowly linear, 1.5–4 cm. long.—Stream-banks, low woods, and prairies, Coastal Plain and more northern provinces, Fla. to Tex., Kans., and N. C.

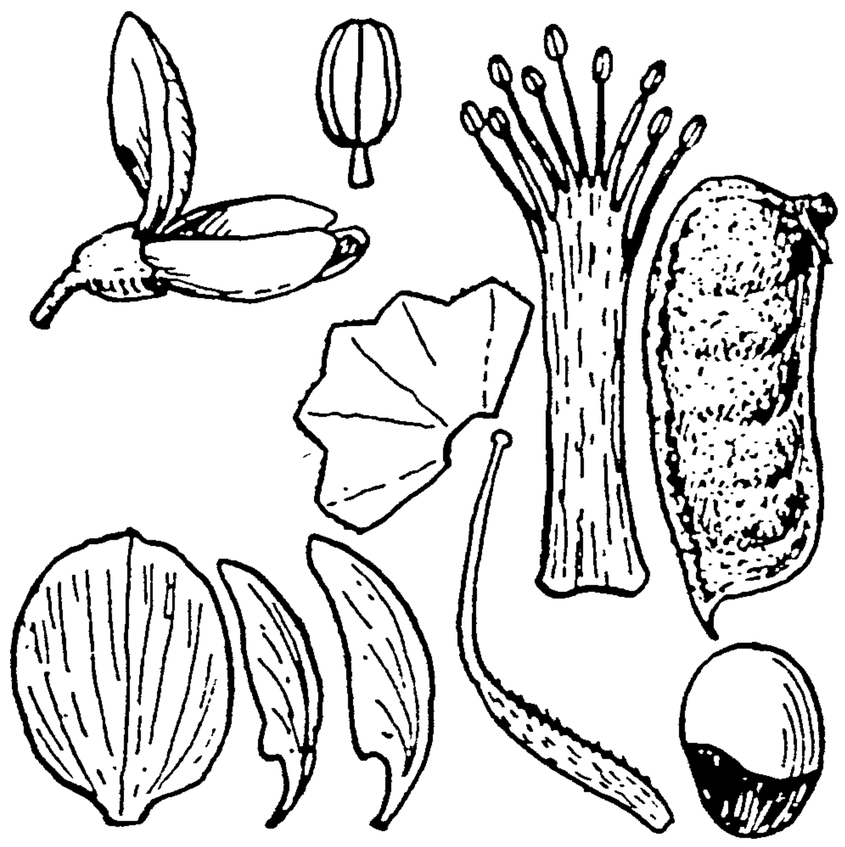


2. L. hirsutus L. Similar to *L. pusillus* in habit, but leaves usually larger: peduncles mostly longer than the leaves, often few-flowered: calyx 5–7 mm. long; lobes ovate to ovate-lanceolate, rather abruptly acuminate: standard 8–10 mm. long: ovary pubescent: pod broadly linear, 3–4 cm. long.—Waste-places, fields, and roadsides, M Miss. Nat. of Eu.

3. L. venosus Muhl. Stem angled, pubescent: leaflets 3–6 cm. long; blades ovate or oval: calyx 9–10 mm. long, pubescent; longer lobes lanceolate, ciliolate, slightly longer than the erect shorter lobes: standard cuneate-obovate, 14–18 mm. long: pod 3.5–4.5 cm. long.—(BUSH-VETCH.)—Woods and river-banks, various provinces, rarely Coastal Plain, Ga. to La., Ont., Sask., and N. J.

4. L. myrtifolius Muhl. Stem ridged, glabrous; leaflets 2.5–4 cm. long; blades elliptic or nearly so: calyx 7.5–8.5 mm. long, glabrous; longer lobes lanceolate, eciliate, much longer than the spreading shorter lobes: standard broadly cuneate-spatulate, 13–16 mm. long: pod 4–6 cm. long.—Swamps, dry rocky woods, and stream-banks, various provinces on Coastal Plain only N, N. C. to Tenn., Man., and Que.

74. ABRUS L. Vines with partly woody stems and branches. Leaflets numerous, relatively small: blades rather narrow. Panicle narrow, raceme-like. Calyx with 5 rounded lobes. Corolla white or pink: standard spreading; blade rounded or inconspicuously auricled at the base: wings auricled at the base of the blade: keel-petals longer than the wings, not auricled. Pod flat, relatively small, short and broad.—Five species, natives of tropical regions.



1. A. Abrus (L.) W. F. Wight. Stems slenderly elongate. Leaflets light-green, numerous; blades elliptic to elliptic-cuneate, 9–15 mm. long, obtuse or mucronulate: panicles dense, mostly 2–5 cm. long: calyx about 3 mm. long, the lobes rounded: corolla mostly pink: standard 13–15 mm. long; blade oval or orbicular-oval: keel-petals longer than the wings: pods clustered, rhombic-elliptic, 2.5–3.5 cm. long, slender-beaked, closely pubescent: seed oval, 6–7 mm. long, scarlet except the black

base.—(CRAB'S-EYE. INDIAN-LICORICE. LICORICE-VINE. ROSARY-PEA. WEATHER-VINE.)—Woods, thickets and roadsides, pen. Fla. Nat. of Eu.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)—The bright-colored seeds, designed, perhaps, to attract birds, are used as beads in various countries.

ORDER GERANIALES

Herbs, shrubs, or trees. Leaves alternate or opposite: blades simple or compound. Flowers perfect, monoecious, or dioecious, mostly regular. Calyx of distinct sepals. Corolla of distinct or nearly distinct petals, or rarely wanting. Androecium of as many stamens as there are sepals or twice as many, or rarely more. Gynoecium of 2 or several united carpels. Ovary superior. Fruit various.

Plant without secreting glands or cells in their tissues.	
Filaments partially united.	
Styles adnate around a column from which they break at maturity.	Fam. 1. GERANIACEAE.
Styles not united around a central column.	
Sepals unappendaged.	
Stamens twice as many as the sepals.	Fam. 2. OXALIDACEAE.
Stamens as many as the sepals.	Fam. 3. LINACEAE.
Sepals appendaged, each bearing one or two glands on the back. Genera in	Fam. 8. MALPIGHIACEAE.
Filaments distinct.	
Calyx irregular, one sepal spurred or saccate.	
Anthers distinct: carpels 1-ovuled.	Fam. 4. TROPAEOLACEAE.
Anthers united over the top of the gynoecium: carpels several-ovuled.	Fam. 5. BALSAMINACEAE.
Calyx regular, none of the sepals spurred or saccate.	
Style basal, arising from between the nearly distinct carpel-bodies.	Fam. 6. LIMNANTHACEAE.
Style not basal, the carpel-bodies well-united.	
Herbs, shrubs or trees with conspicuously or loosely articulate stems, and opposite or alternate mostly compound leaves, the flower-stalks arising from the axils of the interpetiolar stipules when the leaves are opposite: calyx without glands: anthers with inconspicuous connectives; filaments usually with a scale at the base: gynoecium mostly 4–12-carpellary, and with united styles and 2–several ovules, or rarely a single ovule in each carpel: embryo straight or nearly so.	Fam. 7. ZYGOPHYLLACEAE.
Shrubs, trees, or woody vines with inconspicuously jointed stems and opposite simple leaves: calyx commonly with a gland or a pair of glands on the back of each sepal; anthers mostly with conspicuous connectives; filaments without scales at the base: gynoecium mostly 3-carpellary and with distinct styles and a single ovule in each carpel: embryo usually abruptly bent or coiled.	Fam. 8. MALPIGHIACEAE.
Plants with secreting glands or cells which are often in the leaves, or only in the bark.	
Filaments distinct nearly or quite to the base.	
Leaves punctate by oil glands.	Fam. 9. RUTACEAE.
Leaves not punctate.	
Gynoecium of distinct carpels.	Fam. 10. SURIANACEAE.
Gynoecium of more or less united carpels.	
Bitter-barked shrubs or trees with oil-sacs in the bark.	Fam. 11. SIMARUBACEAE.
Resiniferous shrubs or trees.	Fam. 12. BURSERACEAE.
Filaments united into a cup or tube, wholly or in part.	Fam. 13. MELIACEAE.

Family 1. **GERANIACEAE**—Geranium Family

Herbs, or somewhat woody plants. Leaves typically opposite: blades toothed, lobed, or divided. Flowers perfect, regular or nearly so, cymose. Calyx of 5 persistent sepals. Corolla of 5 deciduous petals. Receptacle with 5 glands. Androecium of 10, or rarely of 5, stamens. Gynoecium of 5 carpels whose styles are adnate to an elongate column from which they separate at maturity, each carpel 2-ovuled but with only 1 seed at maturity. —Twelve genera and 470 species, natives of temperate regions.

Carpel-bodies turgid: carpel-tails (styles) glabrous within and merely recoiling at maturity: anthers usually 10. 1. Geranium.
Carpel-bodies spindle-shaped: carpel-tails (styles) pubescent within and spirally coiled at maturity: anthers 5. 2. Erodium.

1. GERANIUM [Tourn.] L. Annual, biennial, or perennial herbs. Leaf-blades palmately or radially lobed, cleft, or parted. Flowers with equal petals. Sepals usually awn-tipped. Stamens 10 or rarely 5. Carpels thick, rounded at the base.—About 190 species, widely distributed in temperate regions.—Cranesbills. Wild-geraniums.

Plant perennial, with a stout caudex and tough fibrous roots: corolla showy. I. Maculata.
Plant annual or biennial, with a slender tap root; corolla inconspicuous. II. Pusilla.

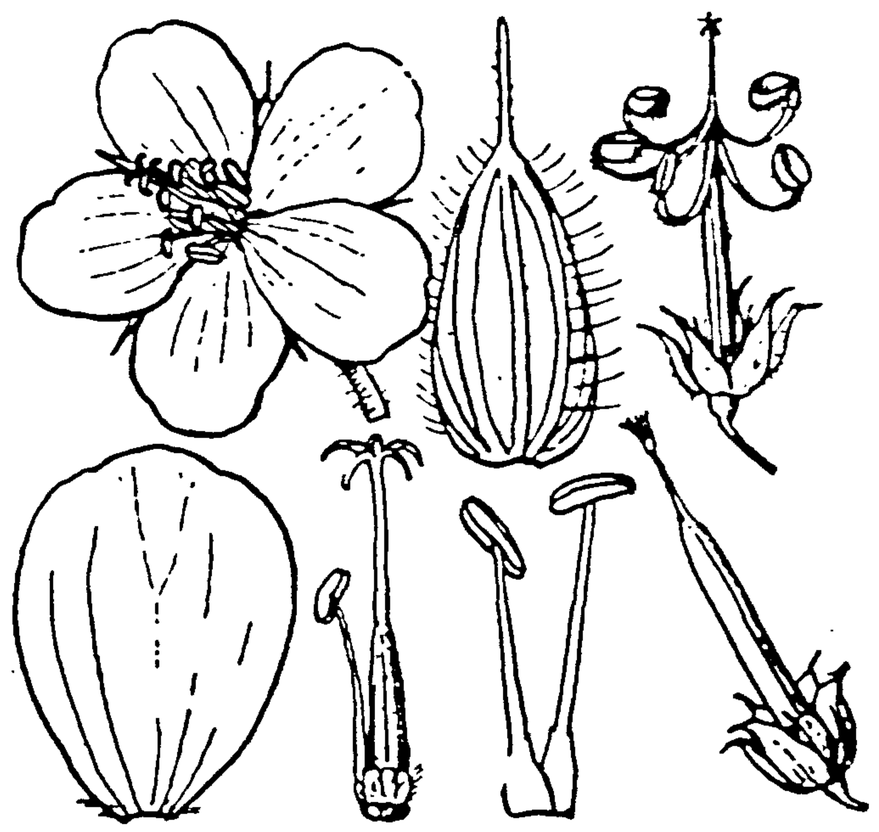
I. Maculata

Stem erect, from the axils of several basal long-petioled leaves: corolla over 2 cm. wide. 1. *G. maculatum.*

II. Pusilla

Sepals without subulate tips: seed smooth.
  Carpel-body wrinkled: stamens 10. 2. *G. molle.*
  Carpel-body strigillose: stamens 5. 3. *G. pusillum.*
Sepals with subulate tips: seed reticulate or pitted.
  Seed pitted: mature sepal-bodies less than 5 mm. long. 4. *G. dissectum.*
  Seed reticulate: mature sepal-bodies over 6 mm. long.
    Pedicels hirsute: calyx partly glandular-pubescent: carpel-body hirsute. 5. *G. carolinianum.*
    Pedicels strigillose: calyx glandless: carpel-body glabrous or nearly so. 6. *G. columbinum.*

1. G. maculatum L. Stem 2–6 dm. tall, retrorse-pubescent: leaf-blades 5–12 cm. wide, the lobes cuneate: sepals 8–10 mm. long, elliptic to elliptic-lanceolate, slender-tipped: petals light-purple, pubescent at the base: style-column pubescent: seed wrinkled.—(Wild-cranesbill.) —Rich woods, banks, and fields, various provinces, on Coastal Plain only N, Ga. to Kans., Man., and Newf.—Spr.–sum.



2. G. molle L. Stem and branches weakly spreading or decumbent, softly pubescent: leaf-blades 2–6 cm. wide, not finely cut: pedicles pubescent with both short and long hairs: sepals orbicular-ovate: petals rose: carpel-body about 2 mm. long, transverse-wrinkled. — (Dove's-foot.) — Fields, roadsides, and lawns, various provinces, N. C. to Ohio, Ont., and Me.; also Wash. to B. C. Nat. of Eu.—Spr.

3. G. pusillum Burm. f. Stem and branches diffuse, glandular-villous: leaf-blades 1.5–5 cm. wide, rather coarsely cut: pedicels pubescent with very short

glandular hairs: sepals ovate or elliptic-ovate: petals purplish: carpel-body about 2 mm. long, strigillose.—Waste-places, cult. grounds, and woods, various provinces, N. C. to Ark., Utah, B. C., and Ont. Nat. of Eu.—Sum.–fall.

4. G. dissectum L. Stem and branches spreading, retrorsely pubescent: leaf-blades 2–4 cm. wide, with narrow spreading segments: sepal-bodies slender-tipped: petals purple: carpel-body less than 3 mm. long, finely-pubescent: seed about 2 mm. long.—Waste-places and cult. grounds, various provinces, S. C. N nearly throughout U. S. and S Can. Nat. of Eu.—Sum.–fall.

5. G. carolinianum L. Stem erect, 2–5 dm. tall, copiously pubescent: leaf-blades 2–6 cm. wide, with rather broad not divergent lobes: cymes rather compact: sepals mostly less than 10 mm. long at maturity, loosely pubescent: petals pinkish or pale-purple: style-column coarsely pubescent, stout-beaked: carpel-body copiously pubescent with long and short hairs.—Dry banks, woods, and cult. grounds, various provinces, Fla. to Calif., B. C., and Ont.—(*W. I.*, *Mex.*) —Spr.

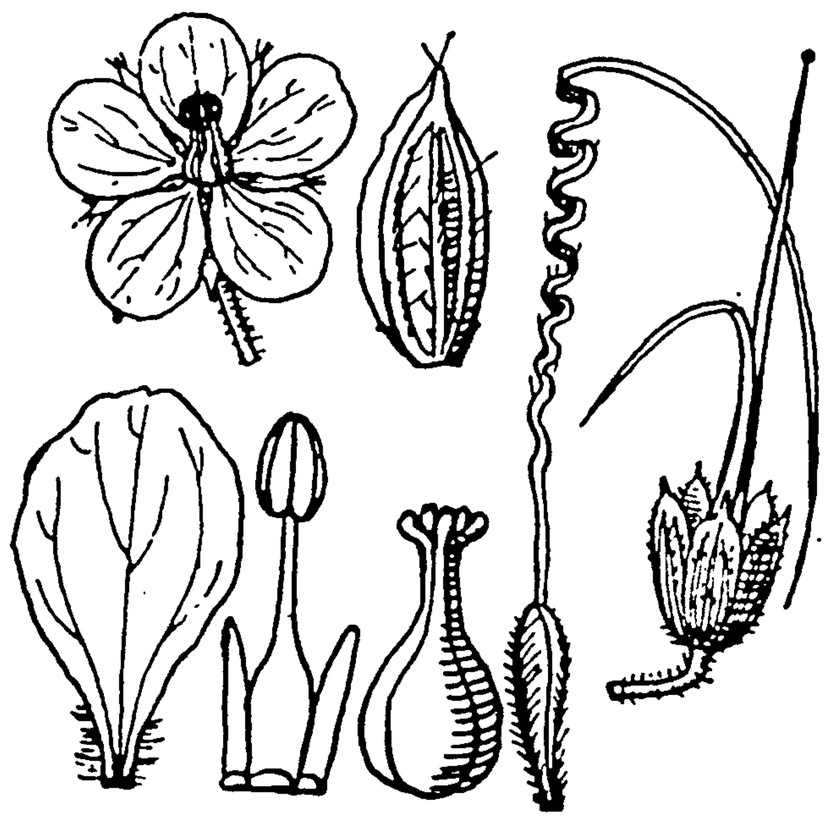
6. G. columbinum L. Stem and branches diffuse, 1–5 dm. long, sparingly pubescent: leaf-blades 2–4 cm. wide, with narrow irregularly divergent lobes: cymes very lax: sepals mostly over 10 mm. long at maturity: petals rose-purple: style-column strigillose, slender-beaked: carpel-body glabrous or with few short appressed hairs.—Roadsides and cult. grounds, various provinces, on Coastal Plain only N, N. C. to S. Dak. and N. J. Nat. of Eurasia.—Spr.

2. ERODIUM L'Her. Annual or perennial herbs. Leaf-blades toothed, pinnatifid, or pinnately parted. Flowers with the upper petals smaller. Sepals awn-tipped, the tips sometimes bristle-appendaged. Stamens 5, accompanied by 5 staminodia. Carpel-body narrow, acute at the base.—About 60 species, widely distributed in warm and temperate regions.

Sepal-tips with 1 or 2 bristle-like appendages: anther-bearing filaments toothless. 1. *E. cicutarium.*

Sepal-tips without bristle-like appendages: anther-bearing filaments 2-toothed. 2. *E. moschatum.*

1. E. cicutarium (L.) L'Her. Branches villous and viscid: leaf-blades elliptic in outline; petioles shorter than the blades: sepals elliptic, 4–5 mm. long: petals hardly longer than the sepals, rose-purple: carpel-body 4–6 mm. long, the beak 2–4 cm. long.—(ALFILERIA. STORKSBILL. PINE-NEEDLES.)—Waste-places, cult. grounds, and roadsides, locally U. S. and S Can. Nat. of Eu.—Spr.–sum.



2. E. moschatum (Burm. f.) L'Her. Branches loosely viscid-pubescent: leaf-blades elliptic in outline: sepals elliptic, 7–9 mm. long: petals slightly longer than the sepals, rose-purple: carpel-body about 5 mm. long, the beak 3.5–4.5 cm. long.—(HERON-BILL.)—Waste-places and roadsides, N Fla.; also Calif. Nat. of Eu.—(*Mex.*)

FAMILY 2. OXALIDACEAE—WOOD-SORREL FAMILY

Herbs or rarely shrubs, the sap sour. Leaves mostly alternate: blades 3-foliolate or 1-foliolate, the leaflets commonly notched at the apex.

Flowers perfect, essentially regular, cymose. Calyx of 5 persistent sepals. Corolla of 5 white or colored petals. Androecium of 10–15 unequal stamens: filaments united at the base. Gynoecium of 5 partially united carpels: styles distinct. Fruit a loculicidal capsule, rarely baccate.—About 15 genera and 300 species, most abundant in the tropics.

Plant acaulescent, with short or long rootstock, succulent: corolla not yellow, except in no. 2. Tribe I. OXALIDEAE.
Plant caulescent, annual or perennial, not succulent: corolla yellow. Tribe II. XANTHOXALIDEAE.

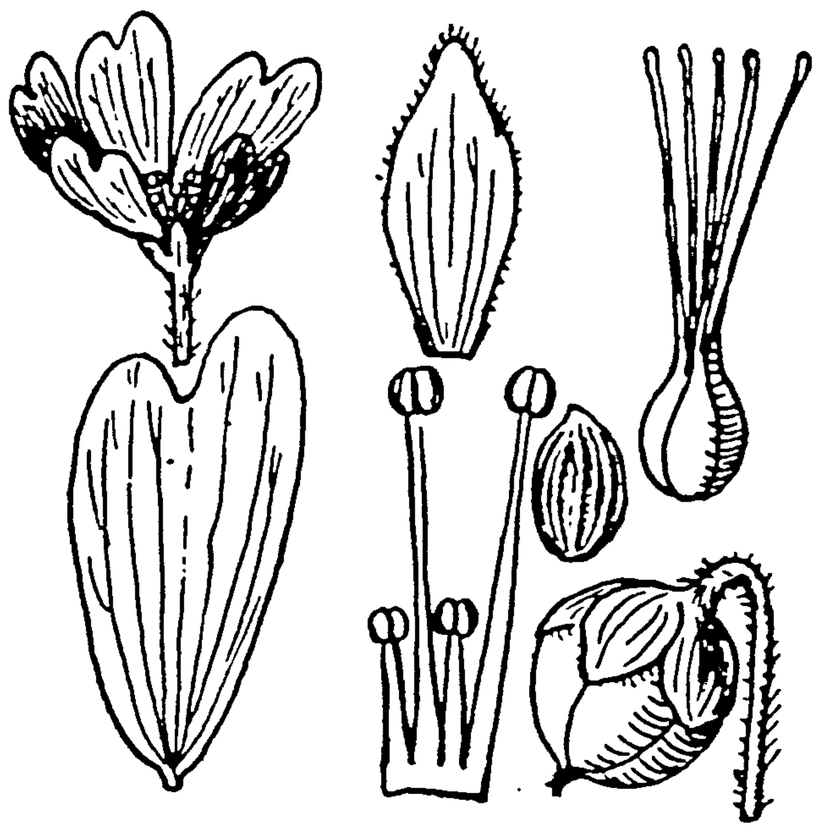
I. OXALIDEAE

Sepals without apical tubercles: rootstocks elongate, merely scaly at the apex. 1. OXALIS.
Sepals with apical tubercles: rootstocks bulblike, solitary or connected, borne at the nodes of a long rootstock.
Plant with a long rootstock which bears bulblets at the nodes. 2. BOLBOXALIS.
Plant with a coated bulb. 3. IONOXALIS.

II. XANTHOXALIDEAE

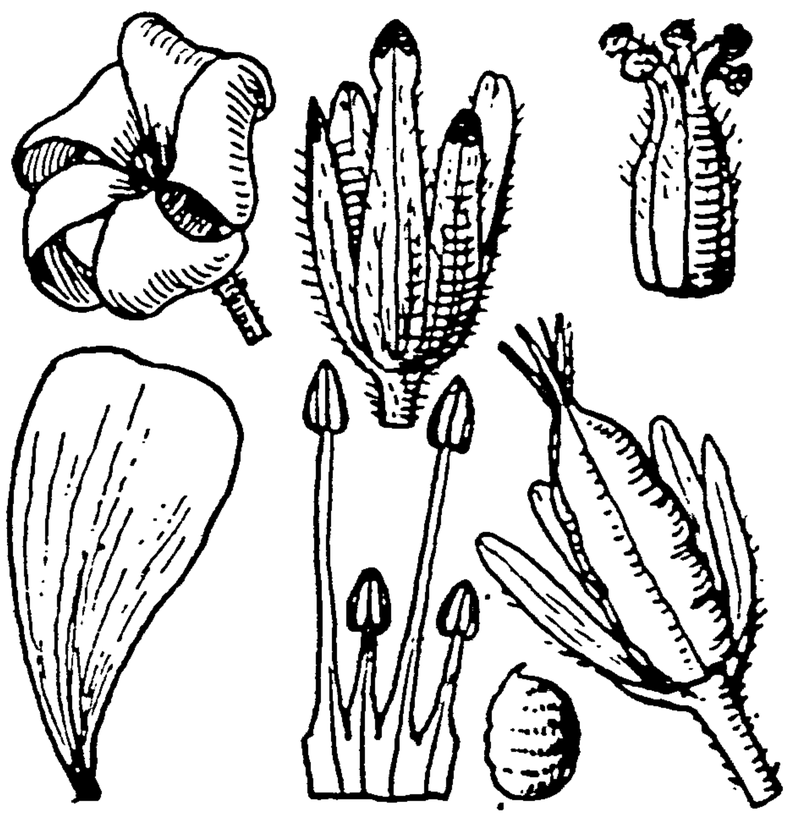
Erect or creeping herbs, the flowers in umbel-like or forking cymes. 4. XANTHOXALIS.

1. **OXALIS** L. Spreading herbs. Leaf-blades palmately 3-foliolate, each usually with a membranous fold in the apical sinus. Flowers commonly solitary. Sepals not tuberculate at the apex. Filaments commonly glabrous. About 6 species, natives of the Northern Hemisphere.



1. **O. montana** Raf. Rootstock scaly at the end: blades of the leaflets obcordate, 10–15 mm. long: scape 5–15 cm. long: sepals elliptic to lanceolate: petals white or pink and delicately veined, 1–1.5 cm. long: capsule ovoid-globose, 2–4 mm. long. [*O. acetosella* (Fl. SE. U. S.)]—(WOOD-SHAMROCK. WOOD-SORREL.)—Cold damp woods, often in acid soil, Blue Ridge and more N provinces, N. C. to Tenn., Man., and N. S.—Spr.–sum.

2. **BOLBOXALIS** Small. Erect herbs with rootstocks which bear bulblets at their nodes. Leaf-blades palmately 3-foliolate: leaflets sessile with broadly obcordate or somewhat obreniform blades. Flowers borne in umbel-like cymes. Sepals 5, each bearing a pair of apical tubercles. Petals yellow, typically large and conspicuous.—Few species natives of southern Africa.

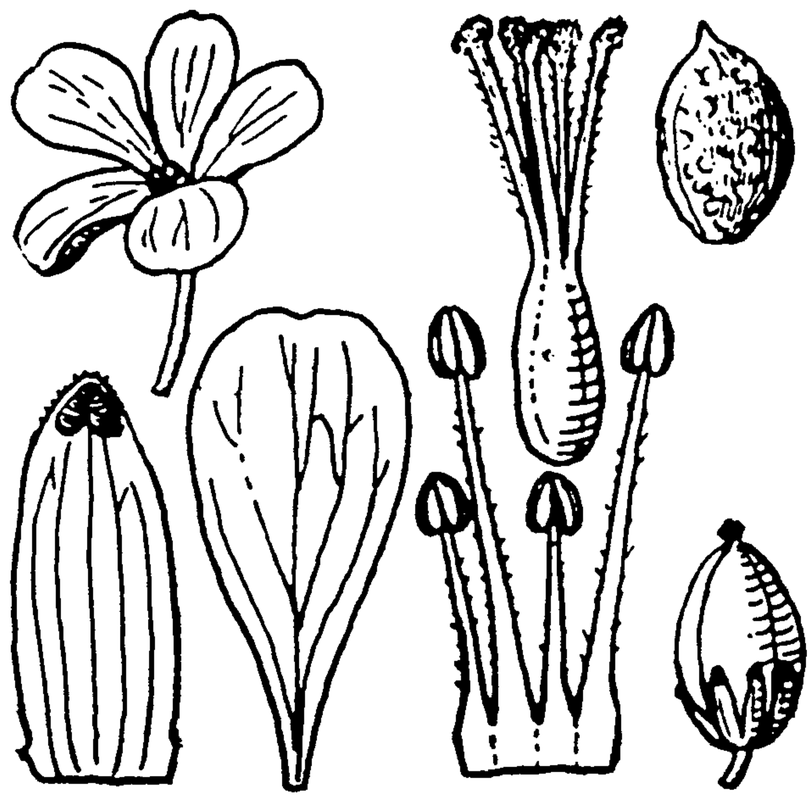


1. **B. cernua** (Thunb.) Small. Plant 1–4 dm. tall, bright-green: blades of the leaflets 2–3.5 cm. broad, very broadly obcordate, glabrous or sometimes pubescent beneath: peduncles surpassing the leaves: sepals lanceolate to linear-lanceolate, 4.5–6.5 mm. long, the outer ones more pubescent than the inner: petals deep-yellow, 2–3 cm. long: filaments glabrous: capsule 5–8 mm. long.—(BUTTERCUP-OXALIS.)—Waste-places and cult. grounds, N Fla. Nat. of S Africa.—Spr.–fall.

3. **IONOXALIS** Small. Erect herbs with coated bulbs, often producing clusters of bulblets. Leaf-blades palmately 3–10-foliolate: leaflets with tubercles in the apical sinus. Flowers usually borne in umbel-like cymes. Sepals tubercled at the apex. Petals violet, blue, red, or white.—About 120 species, natives of North America and South America.

Inflorescence simple.
  Tubercles of the sepals confluent: blades of the leaflets obreniform. 1. *I. violacea.*
  Tubercles of the sepals distinct: blades of the leaflets obdeltoid. 2. *I. intermedia.*
Inflorescence compound. 3. *I. Martiana.*

1. I. violacea (L.) Small. Plant 5–35 cm. tall: leaflets 3; blades 1–2.5 cm. wide: scape glabrous: sepals elliptic to ovate-elliptic: petals rose-purple or rarely white: capsule 4–5 mm. long.—(VIOLET WOOD-SORREL.)—Woods, shaded banks, rocky slopes, and prairies, various provinces, Fla. to Tex., Colo., and Me.—Spr.–fall.



2. I. intermedia (A. Rich.) Small. Plant 1–3 dm. tall: leaflets 3; blades 2–6 cm. wide: scape pubescent: sepals ovate to broadly elliptic: petals violet: capsule columnar, 6–7 mm. long.—Hammocks, S pen. Fla.—(*W. I.*)—All year.

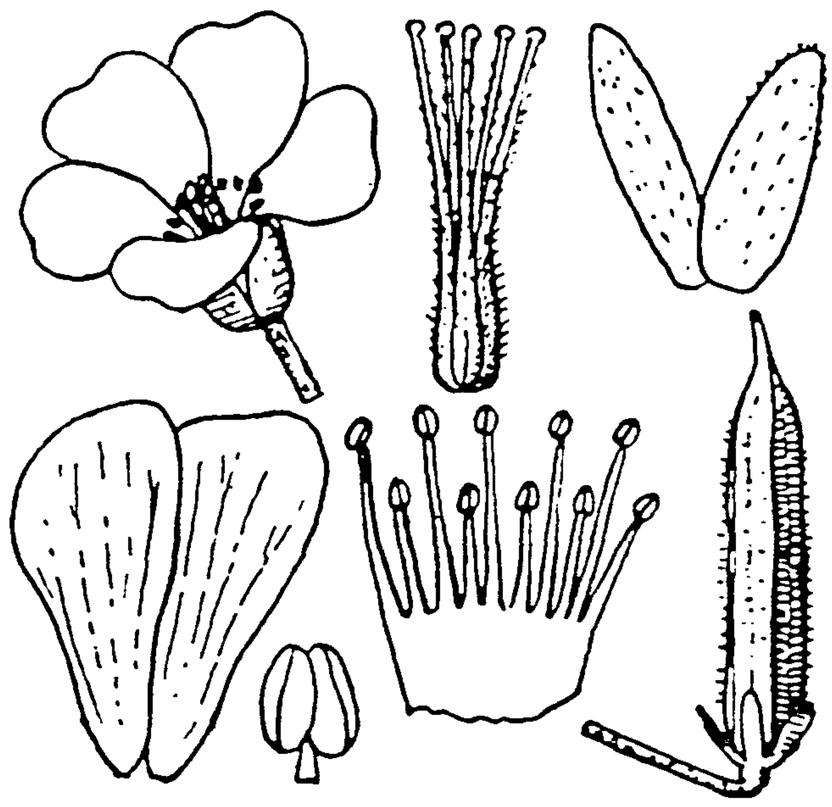
3. I. Martiana (Zucc.) Small. Plant stout, 8–30 cm. tall: blades of the leaflets larger than those of *I. violacea*: scape pubescent: sepals elliptic to narrowly elliptic: petals rose-purple often pale: capsule narrowly ellipsoid, mostly 9–11 mm. long.—Waste-places and cult. grounds, near dwellings, Coastal Plain, Fla. to Tex. and S. C. Nat. of trop. Am. and cult.—Spr.–fall.

4. **XANTHOXALIS** Small. Herbs. Leaf-blades palmately 3-foliolate: leaflets not tubercled at the apical sinus. Flowers in umbel-like or dichotomous cymes. Sepals 5, the inner narrower than the outer ones. Filaments glabrous or the longer ones pubescent. Capsules elongate, erect.—About 50 species, of wide distribution.—SOURGRASSES. YELLOW WOOD-SORRELS.—Oxalic-acid is quite evident to the taste in the tissues of these plants.

Pedicels appressed-pubescent.
  Longer filaments glabrous.
    Stem appressed-pubescent, usually copiously so: capsule pubescent 1. *X. stricta.*
    Stem loosely pubescent: often nearly glabrous: capsule glabrous, except in *X. corniculata.*
      Plants erect.
        Cymes open in fruit: leaves bright-green. 2. *X. Bushii.*
        Cymes cluster-like in fruit: leaves reddish or purplish. 3. *X. rufa.*
      Plants spreading and creeping. 4. *X. corniculata.*
Longer filaments pubescent.
  Petals glabrous.
    Plant creeping. 5. *X. Langloisii.*
    Plant erect, but sometimes with decumbent branches.
      Stem pubescent, but neither villous nor hirsute.
        Corolla pale- or light-yellow; sepals 3–4 mm. long.
          Cymes typically 1-flowered: leaves numerous; leaflets small, mainly 4–8 mm. wide. 6. *X. filipes.*

Cymes typically several-flowered: leaves few; leaflets large, 10–16 mm. wide. 7. *X. Brittoniae.*
Corolla golden-yellow; sepals 5–6 mm. long. 8. *X. macrantha.*
Stem villous or hirsute, sometimes sparingly so.
Corolla light-yellow; petals 8–11 mm. long. 9. *X. colorea.*
Corolla golden-yellow; petals 11–15 mm. long. 10. *X. recurva.*
Petals pubescent. 11. *X. Priceae.*
Pedicels loosely pubescent.
Cyme umbel-like: capsule densely pubescent. 12. *X. hirsuticaulis.*
Cyme dichotomous: capsule glabrous or thinly pubescent.
Capsule-body several times longer than the sepals; leaflets uniformly green. 13. *X. cymosa.*
Capsule-body scarcely twice as long as the sepals; leaflets brown-margined. 14. *X. grandis.*

1. **X. stricta** (L.) Small. Plant pale-green: simple or branched and tufted: leaflets glabrous or with scattered hairs: sepals elliptic to linear-lanceolate, sparingly ciliate, and more or less pubescent on the back: petals pale-yellow: capsule 16–30 cm. long.—Banks, fields, and waste-places, various provinces, Fla. to N. M., Wyo., and N. S.—(*Mex.*)—Spr.–sum.



2. **X. Bushii** Small. Plant bright-green: stems 1–3 dm. tall, loosely-pubescent: leaves few; blades of the leaflets mostly 7–8 mm. wide: cymes umbel-like, usually maturing 1 flower at a time which is accompanied by several drooping buds: petals pale-yellow, 9–12 mm. long: capsule 8–10 mm. long.—Dry soil or thickets, various provinces, Ga. to Ark., Mo., and Mass.—Spr.–sum.

3. **X. rufa** Small. Plant mainly reddish or purplish: stem 1.5–4 dm. tall, loosely-pubescent: leaves usually numerous; blades of the leaflets 8–20 cm. wide: cymes dichotomous, but with short primary branches, maturing several flowers at a time: petals rather bright-yellow, 7–10 mm. long: capsule 7–9 mm. long.—Damp soil or woods, various provinces, Ga. to Minn. and Mass.—Spr.—fall.

4. **X. corniculata** (L.) Small. Plant bright-green or purplish: stem and branches 5–40 cm. long, with spreading hairs: leaflets deep-green; blades 5–12 mm. broad, or larger, ciliate: sepals 3–4 mm. long: petals 7–10 mm. long, bright-yellow.—(CREEPING-OXALIS. LADY'S-SORREL.)—Hammocks, pinelands, waste-places, and cult. grounds, various provinces, Fla. to Tex., Calif., and Ont. Nat. of trop. Am.—Spr.–fall.

5. **X. Langloisii** Small. Plant similar to *X. corniculata* in habit, but relatively smaller throughout and sepals rather broader: petals 5–8 mm. long, pale-yellow.—Woods and waste-places, Coastal Plain and rarely adj. provinces, Fla. to Tex. and Tenn.—(*W. I.*)—All year.

6. **X. filipes** Small. Plant bright-green: stems usually tufted on the slender rootstock: leaves mostly clustered, usually irregularly so; blades of the leaflets mainly 4–8 mm. wide, glabrous or sparingly pubescent: sepals lanceolate to elliptic-lanceolate: petals 5–9 mm. long, light-yellow: capsule slender, 8–12 mm. long.—Sandy woods and thickets, various provinces, Ga. to La., Mo., and N. J.—Spr.–sum.

7. **X. Brittoniae** Small. Plant deep-green: stems 1–4 dm. tall, loosely-pubescent: leaves not clustered; blades of the leaflets 10–16 mm. wide: cymes dichotomous when well developed: sepals 3–4 mm. long, ciliate all around: petals

5–10 mm. long, pale- or light-yellow: capsule 7–12 mm. long.—Woods, fields, and hill-sides, Coastal Plain and rarely adj. provinces, Fla. to Mo. and N. Y.—Spr.–sum.

8. X. macrantha (Trelease) Small. Plant bright-green: stem usually solitary at the nodes of the woody rootstock: leaves scarcely clustered: blades of the leaflets mostly 7–12 mm. wide, pubescent: sepals broadly elliptic to elliptic-lanceolate: petals 10–20 mm. long, deep-yellow: capsule stout, 10–14 mm. long.—Open woods and banks, Coastal Plain, Fla. to Miss., Tenn., and Ga.—Spr.–fall.

9. X. colorea Small. Plant brown or reddish-brown: stem 1–2 dm. tall: leaflets 4–11 mm. wide: cymes umbel-like, the peduncle scarcely overtopping the leaves: sepals 3–4 mm. long, ciliate mainly at the apex: petals 8–11 mm. long, light-yellow: capsule 9–12 mm. long.—Woods, Coastal Plain, Ga. to Miss. and N. C.—Spr.–sum.

10. X. recurva (Ell.) Small. Plant deep-green: stem 1–3.5 dm. tall, villous: leaf-blades 6–11 mm. wide: cymes umbel-like, the peduncles much overtopping the leaves: sepals 4–5.5 mm. long, ciliate all around: petals 11–15 mm. long, golden-yellow: capsule 11–13 mm. long.—Dry woods and rocky soil, Coastal Plain and rarely adj. provinces, Fla. to Miss., Mo., and N. C.—Spr.–sum.

11. X. Priceae Small. Plant deep-green: stem slender, 1–2 dm. tall, loosely but sparingly pubescent: leaflets 8–13 mm. wide: cymes umbel-like: sepals about 7 mm. long: petals pubescent: capsule 14–17 mm. long.—Woods and fields, Interior low Plateaus, Ala. to Ky.—Sum.–fall.

12. X. hirsuticaulis Small. Plant light-green: stem stout, 1–2 dm. tall, villous-hirsute: leaflets 8–17 mm. wide: cymes umbel-like: sepals 5–7 mm. long: petals glabrous: capsule 10–12 mm. long.—Woods, Piedmont to Appalachian Plateaus, Ga. and Tenn.—Spr.–sum.

13. X. cymosa Small. Plant light-green: stem 2–11 dm. tall, loosely pubescent: leaflets 10–27 mm. wide: cymes dichotomous: sepals 3–4 mm. long: petals 7–10 mm. long, deep-yellow: filaments glabrous: capsule slender.—Thickets, cult. grounds, and waste-places, various provinces, Fla. to Tex., Nebr., and Ont.—Sum.

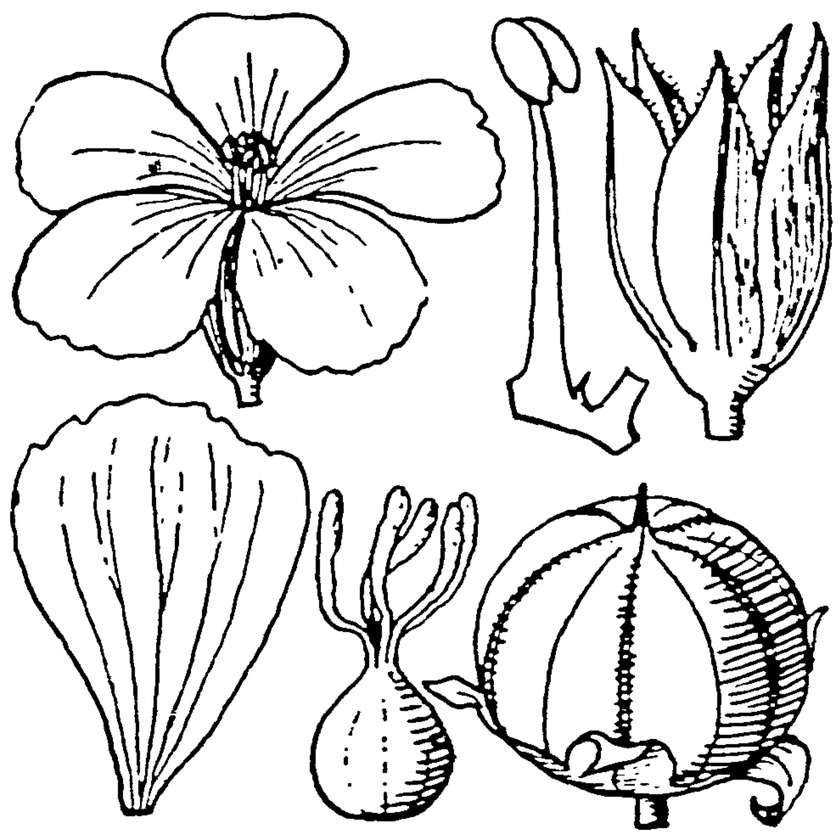
14. X. grandis Small. Plant deep-green: stem 3–12 dm. tall, sparingly loosely pubescent: leaflets 25–40 mm. wide: cymes dichotomous: sepals 4.5–6 mm. long: petals 13–18 mm. long, deep-yellow: longer filaments ciliate: capsule stout.—Shaded banks, various provinces N of Coastal Plain, Ga. to Ala., Ind., and Pa.—Sum.–fall.

Family 3. **LINACEAE**—Flax Family

Herbs or woody plants, the sap bland. Leaves alternate or opposite: blades simple. Flowers perfect, regular. Calyx of 4–6 deciduous or persistent sepals. Corolla of 4–6 ephemeral petals. Receptacle glandular. Androecium of 4–6 stamens, often with staminodia: filaments united at the base. Gynoecium of 2–5 partially united carpels, the styles wholly or partially distinct. Fruit capsular.—About 14 genera and 160 species, widely distributed.

Stigmas introrse and more or less elongate; sepals glandless.	**1. Linum.**
Stigmas terminal and capitate: sepals, at least the inner ones, with marginal glands.	**2. Cathartolinum.**

1. **LINUM** [Tourn.] L. Herbs. Leaves alternate, without stipules. Sepals 5, glabrous, or the inner ones sometimes ciliate. Petals blue or rarely white, unappendaged. Androecium of 5 stamens and 5 short staminodia. Styles 5, distinct. Capsule 5-celled and with incomplete partitions, the carpels ridged on the back.—About 8 species, natives of warm and temperate regions.—FLAXES.



1. L. usitatissimum L. Stem 2–9 dm. tall: leaves relatively few, long and thin: blades long-pointed: corolla blue, 1.5–2 cm. wide: capsule 7–10 mm. long.—(COMMON-FLAX. LINN.)—Fields, roadsides, and railroad embankments, often in acid soils, various provinces, U. S. and S Can. Nat. of Eu. and cult.—Sum.—The bark furnishes flax and linen, and the seeds are the sources of linseed-oil.

2. **CATHARTOLINUM** Reichenb. Herbs. Leaves alternate or occasionally opposite, sometimes with stipular glands. Sepals 5, the inner ones at least with gland-tipped teeth. Petals yellow, sometimes pubescent within near the base. Androecium of 5 stamens, generally without staminodia. Styles 5, distinct or united. Capsule 5-celled, or completely or incompletely 10-celled by false partitions.—About 70 species, of wide geographic distribution.—Sum. or all year S.—YELLOW-FLAXES.

Styles distinct: corolla approximately 1 cm. wide. — I. VIRGINIANA.
Styles more or less united: corolla wider.
  Sepals persistent: capsule without thickenings at the base: stipular glands present: corolla about 1.5 cm. wide. — II. SULCATA.
  Sepals deciduous: capsule with cartilaginous thickenings at the base: stipular glands wanting or obscure: corolla 2–3 cm. wide. — III. RIGIDA.

I. VIRGINIANA

Staminodia wanting.
  Sepals entire at maturity, the inner ones sometimes erose on account of the bases of the deciduous glandular hairs.
    Stem paniculately branched: outer sepals 2–2.5 mm. long at maturity. — 1. *C. striatum.*
    Stem corymbosely branched: outer sepals 3–3.5 mm. long at maturity. — 2. *C. virginianum.*
  Sepals, either those of the inner series, or of the outer, or of both series, glandular-toothed.
    Capsule depressed.
      Outer sepals typically lanceolate: inner sepals abruptly long-pointed. — 3. *C. medium.*
      Outer sepals typically ovate: inner sepals acute or abruptly short-pointed. — 4. *C. Curtissii.*
    Capsule ovoid.
      Outer and inner sepals nearly equal at maturity, shorter than the capsule or about equalling it.
        Outer sepals mostly over 3 mm. long: capsule broadly ovoid, obtuse. — 5. *C. floridanum.*
        Outer sepals less than 3 mm. long: capsule narrowly ovoid, acute. — 6. *C. intercursum.*
      Outer sepals much longer than the inner, all surpassing the capsule. — 7. *C. macrosepalum.*
Staminodia present. — 8. *C. arenicola.*

II. SULCATA

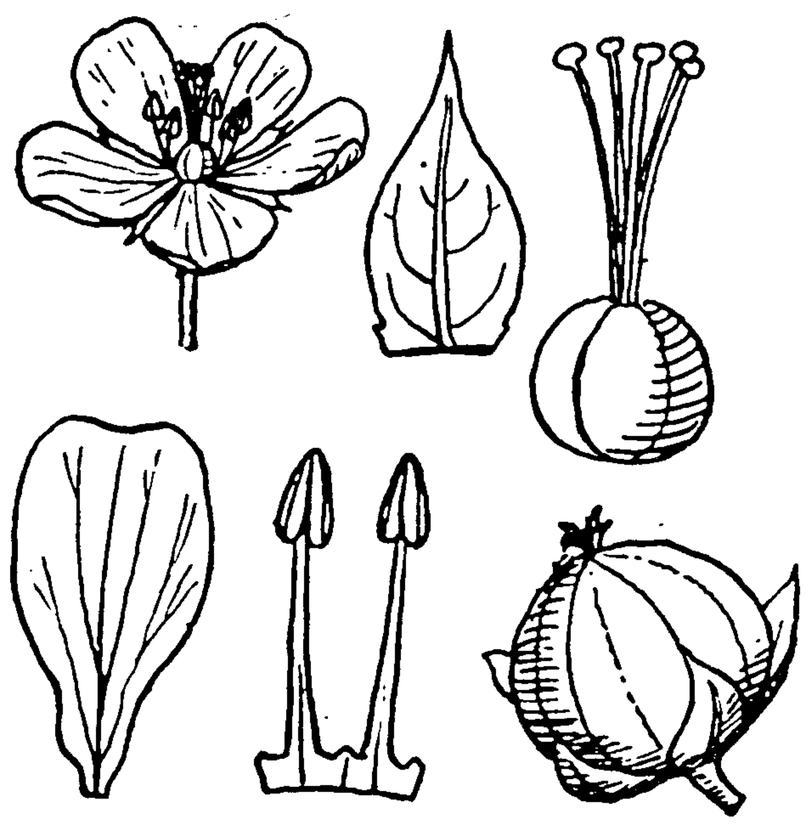
Sepals, especially the outer ones, coarsely and irregularly toothed, elliptic-lanceolate, short-acuminate: capsule narrowly ovoid. — 9. *C. Harperi.*

Sepals, especially the outer ones, finely and regularly toothed, narrowly lanceolate, long-acuminate: capsule globose-ovoid or slightly depressed. 10. *C. sulcatum.*

III. RIGIDA

Plants stout, erect, sparingly branched above: corolla showy, golden-yellow. 11. *C. Carteri.*

1. C. striatum (Walt.) Small. Stem 2–8 dm. tall, paniculate, winged below the nodes: leaves mainly opposite; blades elliptic, 1–3 cm. long: outer sepals lanceolate to elliptic-lanceolate, 2–2.5 mm. long; inner sepals ovate to suborbicular: capsule depressed-globose, 2 mm. broad.—Low grounds, swamps, and wet meadows, various provinces, Fla. to Tex., Man., Ont., and Mass.



2. C. virginianum (L.) Small. Stem 2–6 dm. tall, corymbose above, the branches long: leaves mainly alternate, spreading; blades thinnish, spatulate or oblanceolate to elliptic, 1–3 cm. long: outer sepals lanceolate to elliptic-lanceolate, 3–3.5 mm. long; inner sepals rather broader than the outer: capsule depressed, 2 mm. broad.—Roadsides, thickets, and dry woods, various provinces, Ga. to Ala., Ont., and Me.

3. C. medium (Planch.) Small. Stem 3–6 dm. tall, corymbose above, the branches rigid: leaves mainly alternate, erect or appressed; blades spatulate to linear-elliptic or linear-lanceolate, 0.6–2 cm. long: outer sepals elliptic to lanceolate, 2–4 mm. long: capsule depressed-globose, 2–3 mm. broad.—Hillsides, roadsides, and thickets, various provinces, Fla. to Tex., Ont., and N. Y.

4. C. Curtissii Small. Stem 2–6.5 dm. tall, corymbose above: leaves mainly alternate, ascending or erect; blades elliptic-spatulate to oblanceolate or linear above, 0.5–1.5 cm. long: outer sepals ovate, 2–2.5 mm. long: capsule depressed, 2.5 mm. broad.—Everglades and low pinelands, S pen. Fla.—(*W. I.*)

5. C. floridanum (Planch.) Small. Stem 3–8 dm. tall, corymbose: leaves mainly alternate, nearly erect or appressed; blades oblanceolate to linear-lanceolate or linear above, 0.8–1.8 cm. long: inner sepals ovate to elliptic-ovate, nearly as long as the outer ones: capsule broadly ovoid, 2–2.5 mm. broad.—Low pinelands, Coastal Plain and rarely adj. provinces, Fla. to La., S Ill., and N. C.

6. C. intercursum (Bicknell) Small. Stem 1.5–3 dm. tall, or sometimes taller, corymbose above, sometimes copiously so: leaves erect or ascending; blades oblanceolate, oval, or elliptic, 0.7–2 cm. long: inner sepals ovate or oval-ovate, shorter than the outer ones: capsule narrowly ovoid, 1.5–2 mm. broad.—Dry sandy woods and barrens, various provinces, Ga. and Ala. to Mass.

7. C. macrosepalum Small. Stem 2.5–9 dm. tall, corymbose: leaves alternate, erect-ascending or appressed; blades linear-subulate to subulate, or narrowly linear or linear-spatulate near the base of the stem, 1–1.5 cm. long: inner sepals lanceolate to elliptic-lanceolate, much shorter than the outer ones: capsule ovoid, 2–2.5 mm. broad.—Low grounds and swamps, Coastal Plain, Fla., Ala., and Ga.—Plants with slightly broader capsules have been found in scrub near Naples, Fla.

8. **C. arenicola** Small. Stem or branches 2–7 dm. tall: leaves alternate, early deciduous; blades, at least of the leaves above the base of the stem, subulate to subulate-acicular, mostly less than 1 cm. long, entire: outer sepals broadly elliptic to elliptic-ovate, becoming 2.5–3 mm. long, acuminate: capsule depressed, about 1.5 mm. long.—Low pinelands, Everglade Keys Fla. and lower Florida Keys.

9. **C. Harperi** Small. Stem 3–8 dm. tall: leaves mainly alternate; blades linear-spatulate to narrowly linear, 0.5–2 cm. long: outer sepals lanceolate. 3.5–4 mm. long, sparingly toothed: capsule narrowly ovoid, 2.5 mm. long, obtuse.—Dry pinelands, Coastal Plain, Fla. and Ga.

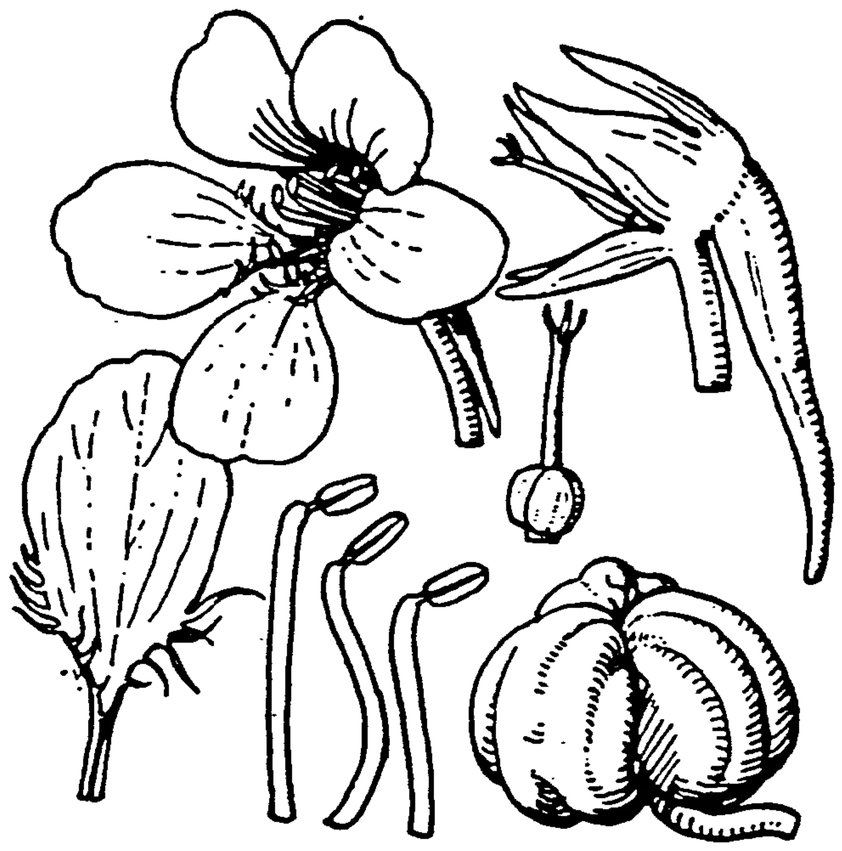
10. **C. sulcatum** (Ridd.) Small. Stem 2–7 dm. tall: leaf-blades linear to linear-lanceolate, 0.8–2.5 cm. long: outer sepals lanceolate, 5–6 mm. long, copiously toothed: capsule globose-ovoid or slightly depressed, about 3 mm. long.—Dry soil, various provinces, rarely Coastal Plain, Ga. to Tex., Man., Ont., and Mass.

11. **C. Carteri** Small. Stem 1–6 dm. tall: leaf-blades narrowly linear tc linear-subulate, mostly 1.5–2.5 cm. long: outer sepals lanceolate to ovate-lanceolate, 6–7 mm. long: capsule about 4 mm. long. [*Linum rigidum* (Chapm. Fl.)]—Pinelands, especially along the Everglades, the Everglade Keys, and Big Cypress Swamp, Fla.—Spr.

Family 4. **TROPAEOLACEAE**—Nasturtium Family

Herbs. Leaves alternate: blades peltate, or palmately lobed or dissected. Flowers perfect, axillary, irregular. Calyx of 5 sepals slightly united at the base, the upper one spurred at the base. Corolla of 5, or fewer, petals, the 2 upper ones more or less different from the lower ones. Androecium of 8 unequal declined stamens. Gynoecium of 3 united carpels. Fruit baccate.

1. **TROPAEOLUM** L. Vines or diffuse plants with succulent stems. Calyx-spur cornucopia-like. Petals narrowed at the base. Berry 3-lobed.—About 35 species, native from Mexico to Chile and cult.



1. **T. majus** L. Plants diffusely climbing: leaf-blades suborbicular, undulate, the veins ending in the notches of the margin: petals mostly red, orange, or purple; claws toothed; blades rounded at the apex: berry 14–19 mm. broad.—(Nasturtium.)—Waste-places and about gardens, various provinces, Atlantic States. Nat. of Peru.—Sum.–fall. Cultivated in many forms, dwarf and vine-like, for the bright-green foliage and the brilliant-colored flowers. The aromatic fruits are used as a flavoring-agent. This species has been in cultivation for a long time, and has been developed into many forms. It is the only species of ten or a dozen, that escapes from cultivation.

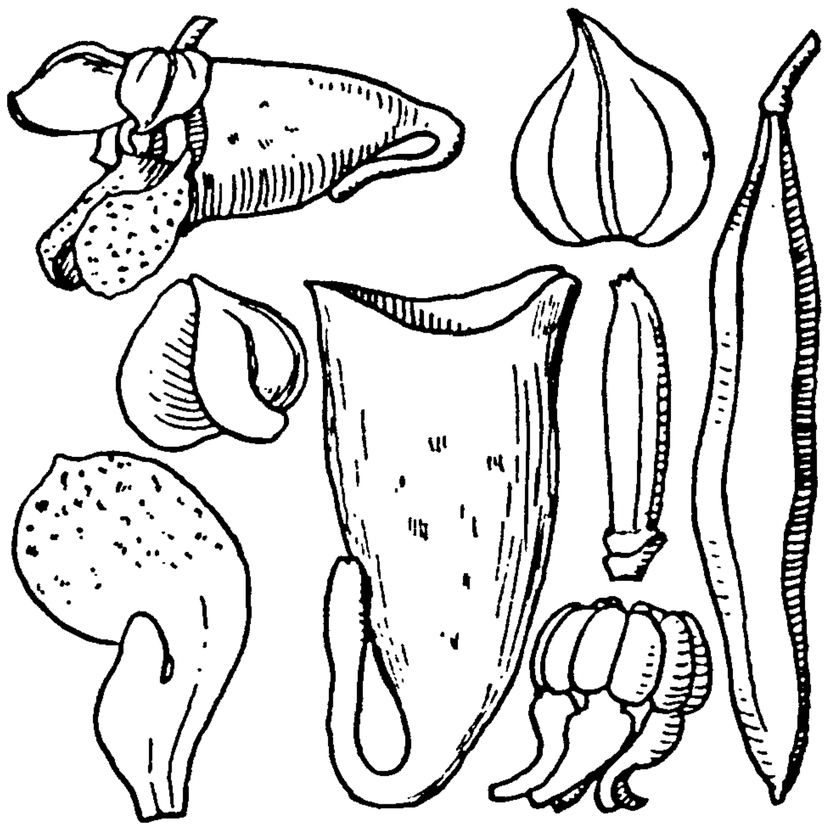
Family 5. **BALSAMINACEAE**—Jewel-weed Family

Herbs with succulent tissues. Leaves mostly alternate: blades simple. Flowers perfect, irregular. Calyx of 3 sepals (2 obsolete), the posterior one petaloid, saccate and spurred, all deciduous. Corolla of 5 petals, the lateral pair on each side united. Receptacle glandless. Androecium of 5 stamens: filaments appendaged and partially united. Gynoecium of 5 united carpels. Styles very short or wanting. Fruit an elastically bursting capsule.—Two genera and 220 species, most abundant in tropical Asia.

1. IMPATIENS [Rivinius] L. Herbs with stems enlarged at the nodes. Capsule drooping.—About 130 species, widely distributed.—Sum–fall.—Touch-me-nots. Snapweeds.—Our species are annuals.

Flowers in peduncled panicles: outer sepals broad: capsule elongate, glabrous.
  Spur incurved, 1/3 as long as the sac, or more: sac longer than broad. 1. *I. biflora.*
  Spur at right angles to the sac, 1/4 as long as the sac, or less: sac as broad as long. 2. *I. pallida.*
Flowers in sessile clusters: outer sepals narrow: capsule short, pubescent. 3. *I. Balsamina.*

1. I. biflora Walt. Plant 1–2 m. tall: leaf-blades ovate to elliptic, 2–12 cm. long, deep-green: flowers conspicuously spotted with black: sepals and petals orange, the saccate sepal conic, heavily spotted, with the spur long and sharply incurved. [*I. fulva* Nutt.]—(Jewel-weed. Spotted-snapweed.)—Swamps and banks of spring-runs, various provinces, Fla. to Mo., Mack., and Newf.—Spr.–fall.



2. I. pallida Nutt. Plant similar to *I. biflora* in habit, but the foliage pale-green or glaucescent: flowers sparingly spotted with black, or sometimes spotless: sepals and petals yellow, the saccate sepal cup-like, scarcely spotted, with the spur very short.—(Pale touch-me-not.)—Rich shaded hillsides and stream-banks, various provinces, on Coastal Plain only northward, Ga. to Kans., Sask., and N. S.—Sum.

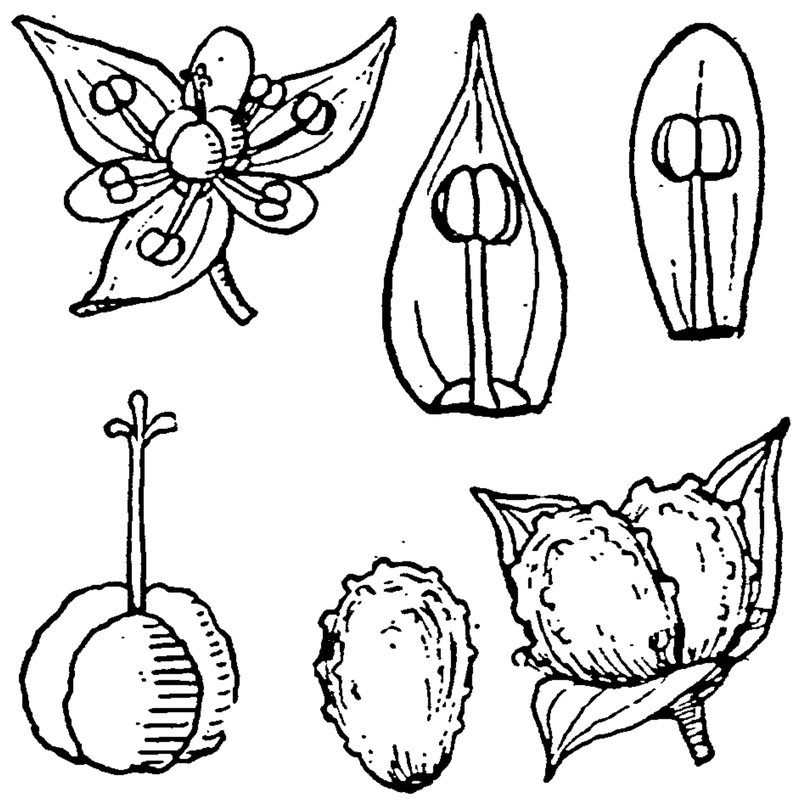
3. I. Balsamina L. Plant 3–6 dm. tall, the stem succulent, finely pubescent: leaf-blades oval or elliptic to elliptic-spatulate, those of the upper leaves larger than the lower ones, more or less acuminate at both ends, rather sharply serrate: flowers variously-colored: capsule ovoid or elliptic-ovoid, 2–3 cm. long, pubescent.—(Garden balsam.)—Waste-places, cult. grounds, and roadsides, various provinces, E U. S. Nat. of S Asia and cult.—(*W. I.*)—Sum.

Family 6. **LIMNANTHACEAE**—False-mermaid Family

Herbs with tender tissues. Leaves alternate: blades pinnately divided. Flowers perfect, axillary. Calyx of 2–5 sepals. Corolla of 2–5 petals. Androecium of 4–10 stamens. Gynoecium of 2–5 carpels united only by their bases and styles. Fruit 2–5-lobed, fleshy, the carpels separating as achenes.—Two genera and about 9 species, natives of North America.

1. FLOERKEA Willd. Annual diffuse herbs. Leaf-segments narrow. Flowers inconspicuous. Sepals 3. Petals 3, white. Stamens 6. Ovary 3-celled.

Achenes 1–3, rough.—Two species, the following and one in the W U. S.



1. F. proserpinacoides Willd. Stems decumbent, 1–4 dm. long: leaves 2–8 cm. long, the segments 3–5, distant: sepals ovate-lanceolate to lanceolate, 3 mm. long: petals white, elliptic-obovate, 1–1.5 mm. wide; achene subglobose, 2–2.5 mm. in diameter.—(FALSE-MERMAID.) — Shaded creek-banks, various provinces, on Coastal Plain only N, Del. to Tenn., N. D., and Que.—Spr.—In favorable localities the plants often grow in dense carpets, especially on moist clay banks.

FAMILY 7. ZYGOPHYLLACEAE—CALTROP FAMILY

Shrubs, trees, or perennial herbs. Leaves opposite or alternate by the suppression of one of each pair: blades compound. Flowers perfect. Calyx of 4–6, mostly 5, sepals. Corolla of 4–6, mostly 5, petals or rarely wanting. Androecium of twice as many stamens as there are sepals. Gynoecium of 2–4-united carpels. Fruit capsular, sometimes baccate at maturity, or again separating into nut-like carpels.—About 20 genera and 160 species, widely distributed in warm and temperate regions.

Herbs: ovary sessile: stigmas lateral: corolla yellow or red. — Tribe I. TRIBULEAE.
Shrubs or trees: ovary stipitate: stigmas terminal, corolla blue. — Tribe II. GUAIACEAE.

I. TRIBULEAE

Fruit armed: ovary 5-celled; carpels septate, 3-seeded. — 1. TRIBULUS.
Fruit unarmed: ovary 10–12-celled; carpels 1-seeded. — 2. KALLSTROEMIA.

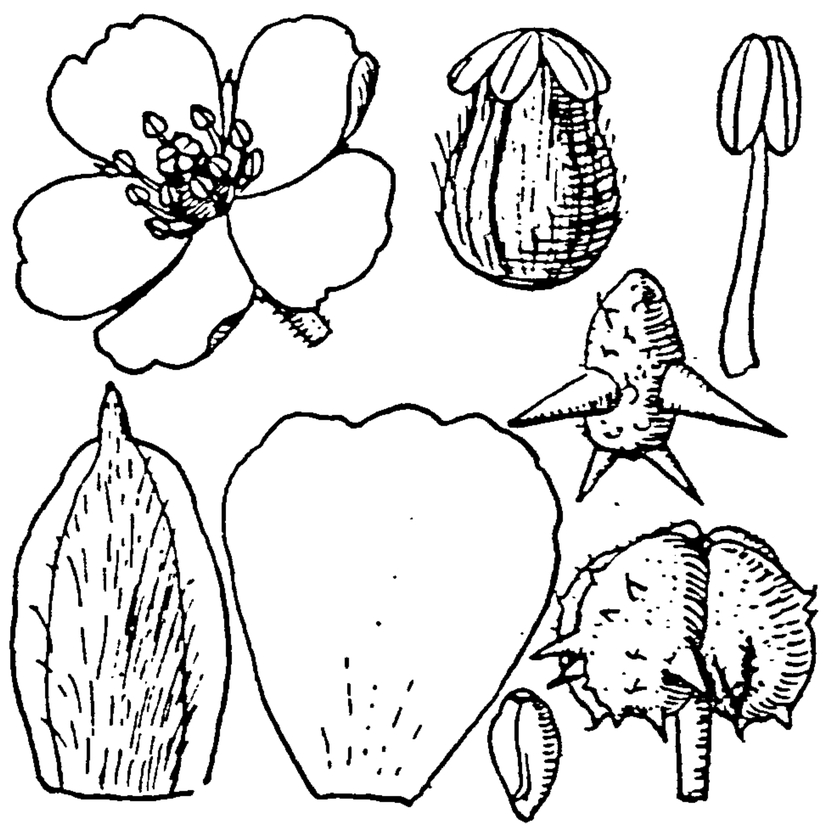
II. GUAIACEAE

Leaves with few leaflets: flowers blue. — 3. GUAIACUM.

1. TRIBULUS L. Diffuse herbs. Leaves pubescent. Sepals 5, deciduous. Petals white or yellow. Filaments unappendaged. Fruit spiny.—About 12 species, natives of warm and temperate regions.—BUR-NUTS. CALTROPS.

Corolla less than 2 cm. wide: peduncles shorter than the leaves: plant annual. — 1. *T. terrestris.*
Corolla over 3 cm. wide: peduncles: plant perennial. — 2. *T. cistoides.*

1. T. terrestris L. Branches 2–11 dm. long; leaves 2–6 cm. long; leaflets 10–14, the blades 3–12 mm. long: sepals 3–5 mm. long, acute: petals about 1 cm. long, yellow: stamens about as long as the petals: mature carpel 6–7 mm. long.—(PUNCTURE-WEED.) — Waste-places, Coastal Plain, Fla. to Tex. and N. Y., and occasional in the interior. Nat. of Old World.—(*Mex.*)—Spr.–fall.

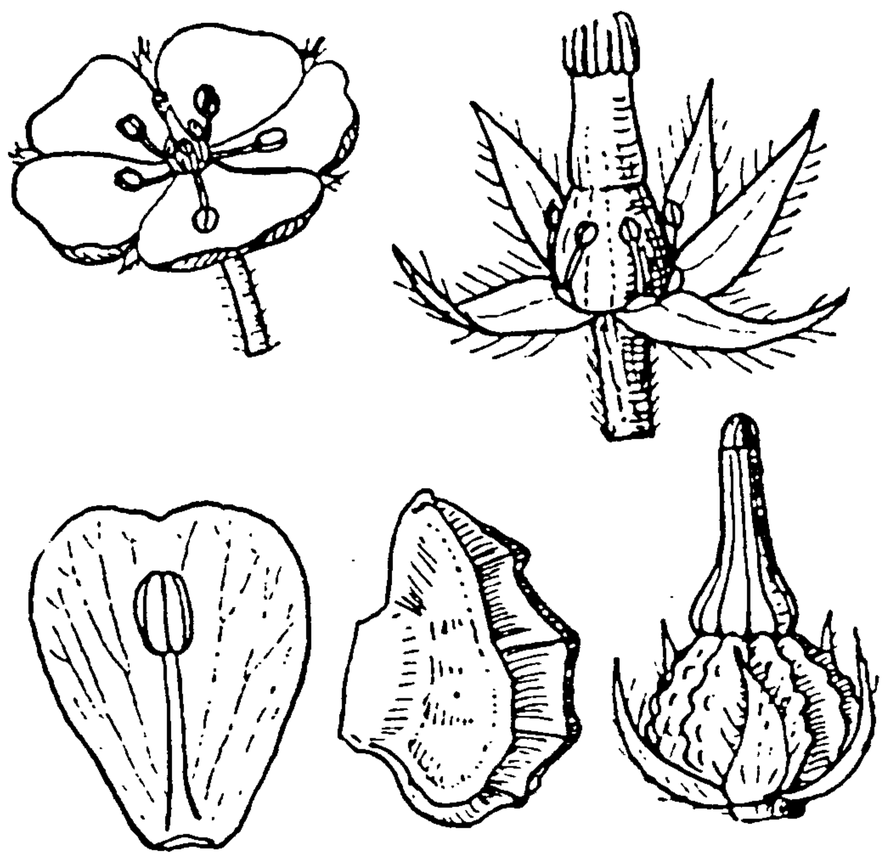


2. T. cistoides L. Branches diffusely procumbent, pubescent: leaves 2–6 cm. long; leaflets 12–16, the blades elliptic: sepals lanceolate, 8–11 mm. long, acuminate: petals broad, 2–2.5 cm. long, bright-yellow: stamens shorter than the petals: mature carpel 8–9 mm. long.—Hammocks and waste-places, Coastal Plain, Fla. to Tex. and Ga.—Nat. of trop. Am.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall, or all year S.

2. KALLSTROEMIA Scop. Herbs resembling *Tribulus*. Sepals 5, persistent. Petals yellow or red. Filaments unappendaged. Fruit uneven or tuberculate.—About 20 species of wide geographic distribution.—CALTROPS.

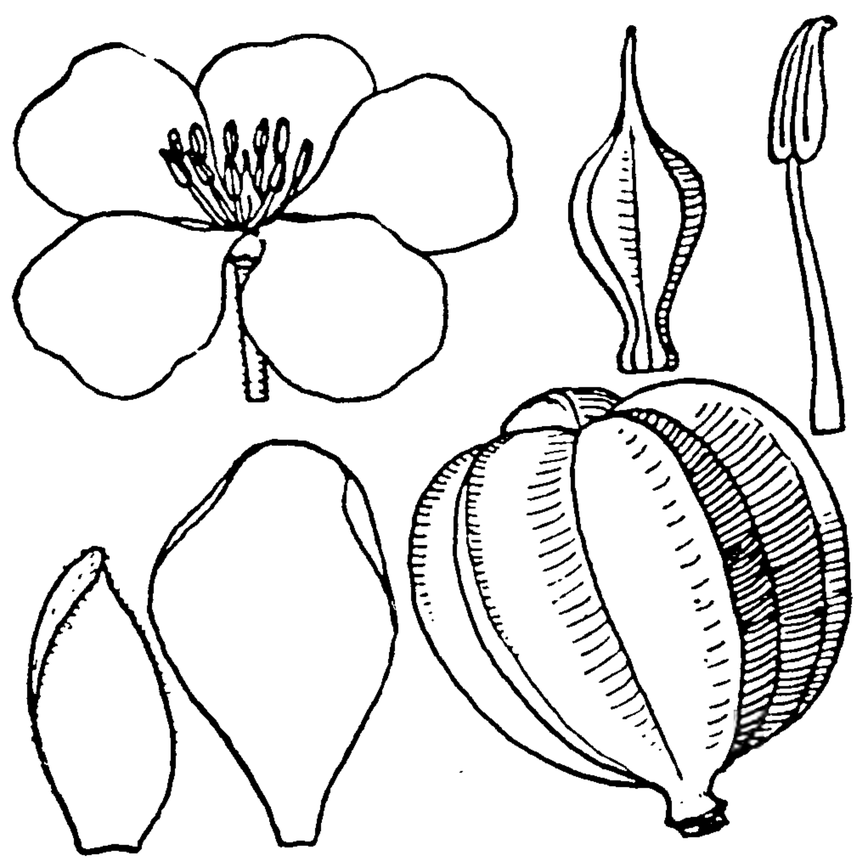
Sepals lanceolate, not hirsute, mainly appressed-pubescent: fruit glabrous. 1. *K. maxima.*
Sepals linear-subulate, bristly hirsute: fruit pubescent. 2. *K. parviflora.*

1. K. maxima (L.) T. & G. Branches prostrate or procumbent, 2–6 dm. long or longer, appressed-pubescent and often somewhat hirsute: leaflets usually 6–8, the blades of the terminal pair 9–18 mm. long, elliptic or oval, often curved: sepals lanceolate, 3–4 mm. long: petals greenish-yellow, obovate, 6–8 mm. long: fruit 7–10 mm. long, the conic beak slightly longer than the body, the carpels tuberculate and cross-ridged.—Waste-places, roadsides, and cult. grounds, Coastal Plain, Fla., Ala., and Ga. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A.*)—All year.



2. K. parviflora Norton. Similar to *K. maxima* in habit: sepals 4.5–6 mm. long: petals yellow: fruit 10–12 mm. long, the slender beak slightly longer than the body.—Dry soil, Coastal Plain and southwestern provinces, Miss. to Ariz.—(*Mex.*)—Spr.–fall.

3. GUAIACUM [Plum.] L. Shrubs or trees. Leaves relatively large, persistent, the leaflets but little longer than wide. Sepals 5 or rarely 4, unequal. Petals blue or purple. Filaments unappendaged. Fruit angled or winged.—About 8 species, natives of tropical America.

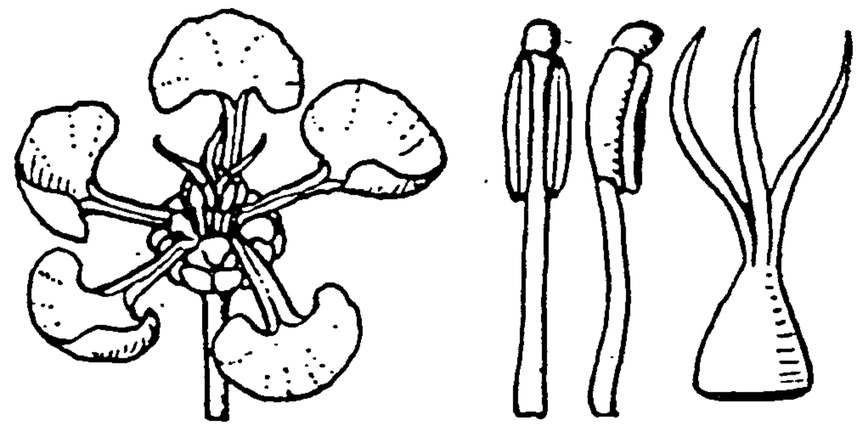


1. G. sanctum L. Shrub or tree sometimes 10 m. tall, with very hard heavy wood, the bark pale: leaves 5–10 cm. long; leaflets 6–8, the blades broadly elliptic to obovate, 2–3 cm. long, bright-green: sepals obovate to elliptic-obovate, 6–7 mm. long: corolla about 2.5 cm. wide; petals blue, broadly obovate: fruit obovoid, 15–17 mm. long, orange.—(LIGNUM-VITAE.)—Hammocks, Florida Keys.—(*W. I.*)—Spr.—The heart-wood contains a resin. It is used for making small objects where hardness, weight, and strength are needed.

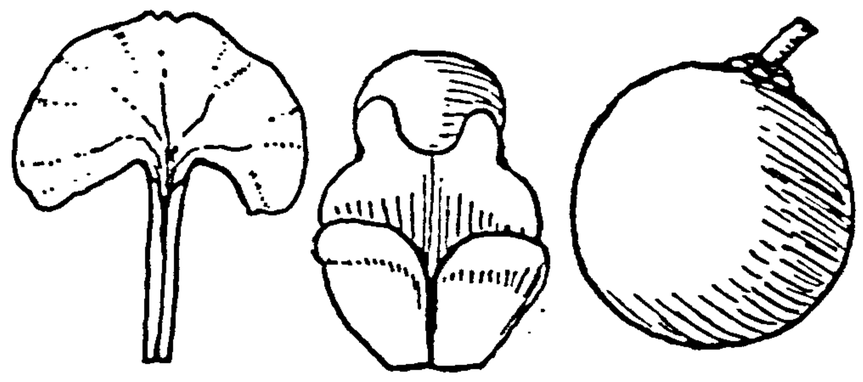
FAMILY 8. MALPIGHIACEAE—MALPIGHIA FAMILY

Shrubs or trees, or partially woody herbs or vines. Leaves opposite: blades simple. Flowers usually perfect, sometimes cleistogamous. Calyx of 5 often gland-bearing sepals. Corolla of 5 usually clawed petals, or wanting. Androecium of 5–10 perfect or partly sterile stamens. Gynoecium of 2–4, usually 3, distinct or united carpels. Fruit drupaceous, capsular, or nut-like.—About 60 genera and 750 species, widely distributed in tropical and subtropical regions.

1. **BYRSONIMA** L. C. Rich. Shrubs or trees. Flowers in terminal racemes or panicles. Petals white, reddish, or purplish, reflexed. Stigmas acute. Carpels permanently united. Cotyledons circinate-coiled. — About 100 species, natives, mainly, of tropical America.



1. **B. cuneata** (Turcz.) P. Wilson. Evergreen shrub or small tree, mostly 3–18 m. tall: leaf-blades spatulate to obovate-spatulate, 2–4 cm. long, lustrous above: racemes 2–4 cm. long: petals pink or white, turning yellowish or rose, 7 mm. long, the blades reniform: drupe 4–6 mm. in diameter. [*B. lucida* (Sw.) DC.] — (LOCUST-BERRY.) — Hammocks and low pinelands, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—All year.



FAMILY 9. **RUTACEAE**—RUE FAMILY

Shrubs or trees or rarely herbs, often prickle-armed, with glandular-punctate tissues. Leaves alternate or opposite: blades simple or pinnately compound, sometimes 1-foliolate. Flowers perfect or polygamous, mostly regular. Calyx of 3–5, or rarely more, sepals, or wanting. Corolla of 3–5, or rarely more, petals. Androecium of as many stamens as there are sepals or petals or rarely thrice as many. Gynoecium of 2–5 distinct or united carpels. Fruit capsular, samaroid, drupaceous, or baccate.—About 110 genera and 950 species, most abundant in Africa and Australia.

Fruit dry, follicular or samaroid.
  Flowers perfect: ovules 5 or more in each carpel: herbs. Tribe I. RUTEAE.
  Flowers dioecious or polygamous: ovules 1 or 2 in each carpel: shrubs or trees.
    Fruit dehiscent: a follicle. Tribe II. ZANTHOXYLEAE.
    Fruit indehiscent: a samara. Tribe III. PTELEAE.
Fruit fleshy, drupaceous or baccate.
  Fruit a drupe: ovary 1-celled. Tribe IV. AMYRIDEAE.
  Fruit a berry: ovary 2–several-celled. Tribe V. CITREAE.

I. RUTEAE

Heavy-scented smooth herbs or partly woody plants with yellow flowers and lobed capsules. 1. RUTA.

II. ZANTHOXYLEAE

Shrubs or trees, often with prickly stems and leaves. 2. ZANTHOXYLUM.

III. PTELEAE

Unarmed shrubs or small trees with greenish-white flowers, the fruits winged all around. 3. PTELEA.

IV. AMYRIDEAE

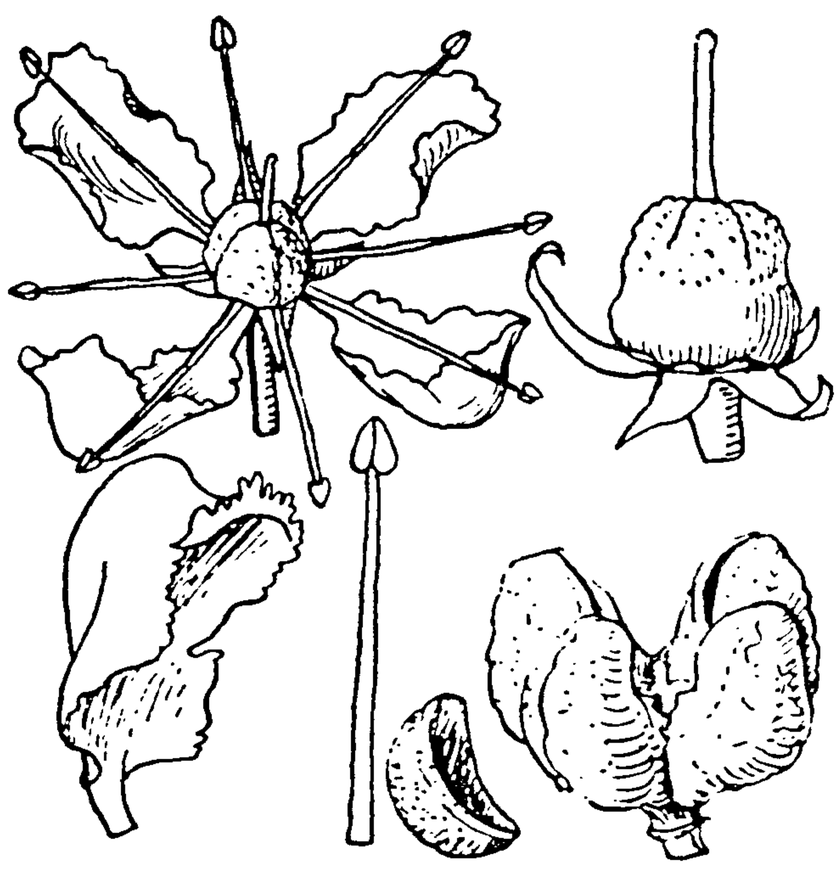
Unarmed aromatic shrubs or trees, with white flowers and erect clusters of dark fruits. 4. AMYRIS.

V. CITREAE

Stamens 6–10: carpels 1-ovuled.
  Styles very short or obsolete, persistent: ovary 5-celled. 5. GLYCOSMIS.
  Styles elongate, deciduous: ovary 3- or 4-celled. 6. TRIPHASIA.
Stamens 20 or more: carpels several-ovuled.
  Leaves 3-foliolate: stamens distinct: fruit densely pubescent. 7. PONCIRUS.
  Leaves 1-foliolate: stamens more or less united: fruit glabrous. 8. CITRUS.

1. **RUTA** L. Herbs, sometimes woody at the base, heavy-scented. Leaf-blades divided. Flowers in corymbose or panicled cymes. Sepals 4 or 5, per-

sistent. Petals 4 or 5: blades involute, toothed or somewhat ciliate, often clawed. Ovary 4–5-celled. Capsule sessile, 4- or 5-lobed, dehiscent at the apex.—About 40 species, natives of the Mediterranean region and Asia.

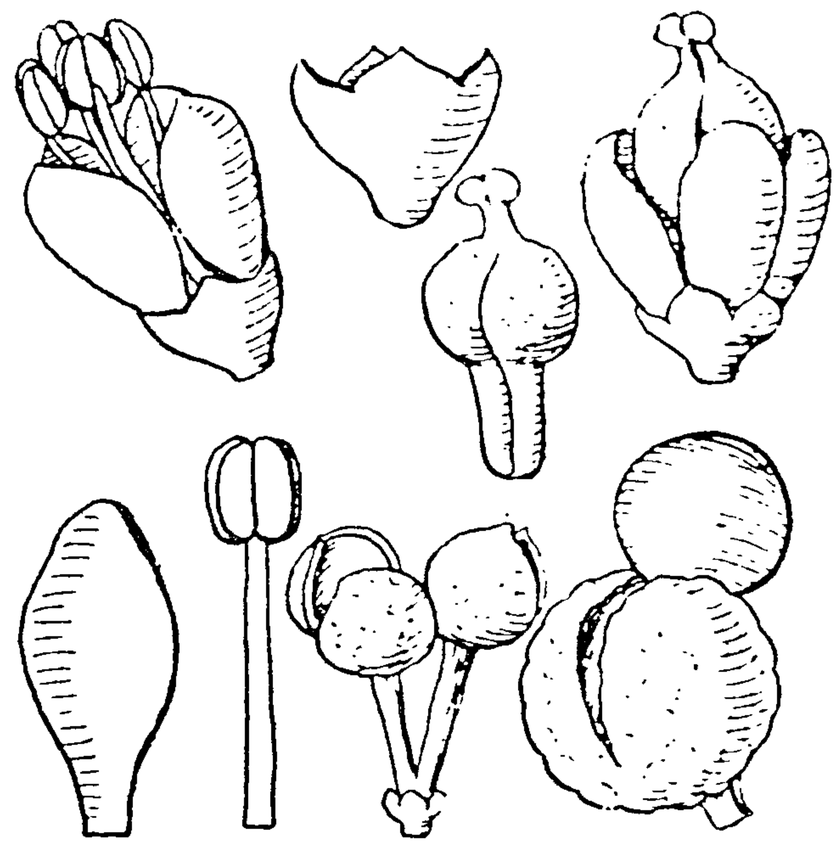


1. R. graveolens L. Plant 2–8 dm. tall: leaf-blades twice ternately divided, the lobes obovate or obovate-cuneate: sepals deltoid or ovate: petals yellow, 5–7 mm. long, the blades involute, denticulate: capsule 8–11 mm. wide.—(RUE.)—Waste-places and cult. grounds, various provinces, E U. S. Nat. of Eu.—Spr.–fall.—Formerly much used in medicine.

2. ZANTHOXYLUM [Catesby] L. Shrubs or trees. Leaf-blades pinnate, sometimes 1-foliolate. Flowers dioecious or polygamous, in axillary spikes or terminal corymb-like or cyme-like panicles. Sepals present or wanting. Petals 4 or 5, mostly erect, white or green. Mature carpels solitary, or 2–5 together. [*Fagara* L.]—About 150 species, natives of temperate and tropical regions.—Spr.–sum. or all year S.

Calyx present: flowers appearing after the leaves.
  Flowers in small axillary spikes: sepals, petals, and stamens 4. 1. *Z. Fagara.*
  Flowers in large terminal cyme-like or corymb-like panicles: sepals, petals, and stamens 3 or 5.
    Sepals, and petals, 5: leaflets herbaceous.
      Sepals triangular or deltoid, partially united, persistent. 2. *Z. flavum.*
      Sepals ovate or ovate-lanceolate, distinct, deciduous. 3. *Z. Clava-Herculis.*
    Sepals, and petals, 3: leaflets leathery. 4. *Z. coriaceum.*
Calyx wanting: flowers appearing before the leaves. 5. *Z. americanum.*

1. Z. Fagara (L.) Sarg. Shrub, or tree sometimes 10 m. tall, the trunk slender, often inclining: leaves 2.5–11 cm. long, the rachis winged; blades of the lateral leaflets mostly obovate to oval, 1–2.5 cm. long, shallowly crenate: mature carpel subglobose, 3.5–4 mm. long. [*Z. Pterota* H. B. K.]—(WILD-LIME.)—Coastal hammocks, southern pen. Fla. and hammocks of the Everglade Keys and Florida Keys.—(*W. I.*)—The heart-wood is heavy and hard, usually brown.



2. Z. flavum Vahl. Shrub, or tree sometimes 12 m. tall, unarmed, the twigs stellate-canescent: leaves 9–25 cm. long, the rachis terete; blades of the lateral leaflets mostly elliptic or ovate, 3.5–10 cm. long: mature carpel obovoid, 5–9 mm. long. [*Z. caribaeum* Lam.]—(YELLOW-WOOD. SATIN-WOOD.)—Hammocks, lower Florida Keys.—(*W. I.*)—The heart-wood, exceedingly hard and heavy, is orange-colored.

3. Z. Clava-Herculis L. Shrub, or tree sometimes 17 m. tall, the prickles raised on corky bases: leaves 1–3 dm. long; blades of the lateral leaflets ovate,

4–5 cm. long, appressed-serrate: mature carpels mostly 2–5 together, about 4–6 mm. long. [*Z. carolinianum* Lam.]—(TOOTHACHE-TREE. PRICKLY-ASH. SEA-ASH. PEPPER-WOOD. HERCULES'-CLUB.)—Woods and hammocks, Coastal Plain, mostly near the coast or in phosphatic soils, Fla. to Tex., Ark., and Va.—The light and soft heart-wood is pale-brown. The bark is used medicinally.

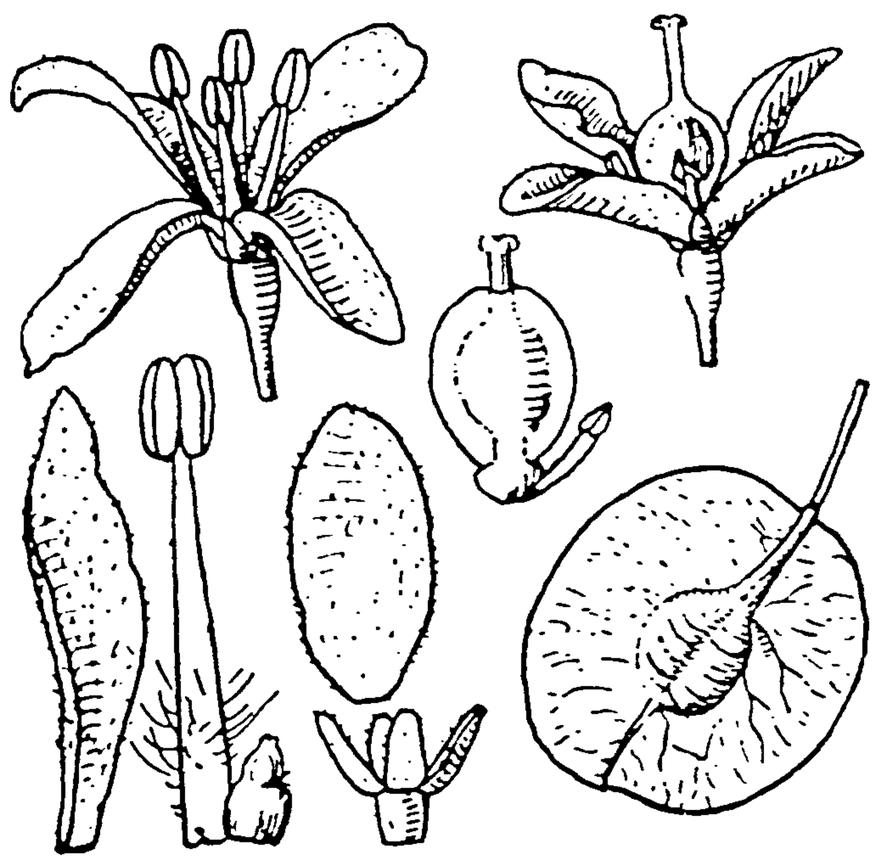
4. **Z. coriaceum** Rich. Shrub, or tree becoming 7 m. tall: leaves 6–15 cm. long; blades of the leaflets leathery, rigid, obovate to cuneate or elliptic with acuminate base, 2–6 cm. long: mature carpel 5–6 mm. long.—(HERCULES'-CLUB.)—Coastal hammocks, S. pen. Fla. and the Keys.—(*W. I.*)

5. **Z. americanum** Mill. Shrub 1–3 m. tall, with prickly branches: leaves 1–3 dm. long; leaflets 4–8 cm. long, the blades ovate, elliptic, or rarely oval: corolla 3–3.5 mm. wide: mature carpel 4–5 mm. in diameter.—(NORTHERN PRICKLY-ASH. TOOTHACHE-TREE.)—River-banks and rocky woods, various provinces, rarely Coastal Plain, Ga. to Nebr., Minn., and Ont.

3. **PTELEA** L. Shrubs or trees. Leaf-blades 3-foliolate or rarely 5-foliolate. Flowers polygamous or sometimes dioecious, in cymes. Sepals 4 or 5. Petals 4 or 5, narrow, white or greenish. Ovary 2–3-celled. Ovules 2 in each cavity, superposed. Samara winged all around.—About 6 species, North American.—SHRUBBY-TREFOILS.—The bark is bitter and is used as a tonic.

Leaflets mostly 6–12 cm. long; blades broad, 2–8 cm. wide; samara-body orbicular to oval.
  Samara suborbicular to oval-orbicular. 1. *P. trifoliata.*
  Samara obovate.
    Leaflets with sharply serrate blades: samara 16–19 mm. long, acute or acutish at the base, the body merely glandular-dotted. 2. *P. serrata.*
    Leaflets with entire blades: samara 8–11 cm. long, rounded or truncate at the base, the body pitted. 3. *P. microcarpa.*
Leaflets mostly 1–3 cm. long; blades narrow, about 1 cm. wide: samara-body elliptic. 4. *P. Baldwinii.*

1. **P. trifoliata** L. Shrub, or tree sometimes 8 m. tall: blades of the leaflets ovate, oval, elliptic, elliptic-lanceolate, or oblanceolate, 4–12 cm. long, glabrous, (or densely pubescent in *P. trifoliata tomentosa*): panicles many-flowered: sepals ovate or elliptic-ovate, 1.5 mm. long: petals nearly elliptic, 4–6 mm. long: filaments 3.5–4 mm. long: anthers ovoid, about 1.5 mm. long: samara suborbicular or oval-orbicular, 2–2.5 cm. long.—(HOP-TREE. WAFER-ASH.)—Rich woods, hammocks, and rocky river-banks, various provinces, Fla. to Ariz., Minn., and Ont.—(*Mex.*)—Spr.



2. **P. serrata** Small. Shrub 1–2 m. tall, with slender, blackish branches: blades of the leaflets thinnish, 2.5–7 cm. long, serrate, mostly acuminate, much paler beneath than above, those of the lateral ones ovate to elliptic-oval, that of the terminal one elliptic or elliptic-obovate: samara pale-green, with the body copiously black-dotted, the wings thin, sparingly dotted.—Granite rocks, in the Piedmont of Ga.—Spr.

3. **P. microcarpa** Small. Shrub 1.5–3 m. tall, with dark-brown branches: blades of the leaflets thickish, 5–10 cm. long, entire, obtuse or acutish, slightly paler beneath than above, those of the lateral ones ovate or ovate-lanceolate, that of the terminal one elliptic or elliptic-obovate: samara brownish, with the body

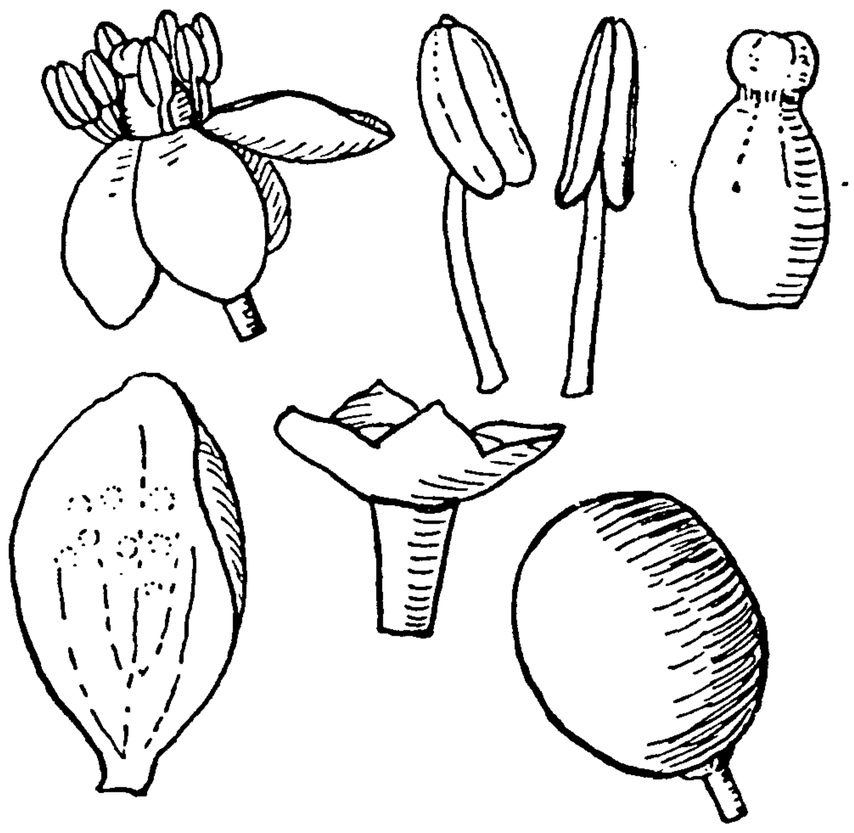
copiously pitted, the wings thickish, sparingly pitted.—Hillsides and limestone ridges, Appalachian provinces, Ga., Ala., and Tenn.—Spr.

4. **P. Baldwinii** T. & G. Low shrub with dark, pustulate branches; blades of the leaflets thinnish, 2–4.5 cm. long, entire, acute or acutish, those of the lateral ones lanceolate to ovate, that of the terminal one elliptic varying to slightly broadest above or below the middle: samara obovate to orbicular-obovate, 1.5–2 cm. long, with the body dotted and wrinkled, the wings thinnish dotted.—Sandy places, NE Fla.—Spr.

4. **AMYRIS** [P. Br.] L. Shrubs or trees. Leaf-blades pinnate, or 1-foliolate, the petiole wingless. Flowers perfect or polygamous, paniculate. Sepals 4 or 5. Petals 4 or 5, broad, white. Ovary 1-celled: style short or wanting. Ovules 2. Drupe with a single seed.—About 15 species, mostly in tropical America.—Spr.–sum. or all year S.—The heavy, hard, and close-grained heartwood is sometimes used in cabinet-work, and yields a balsamic resin.

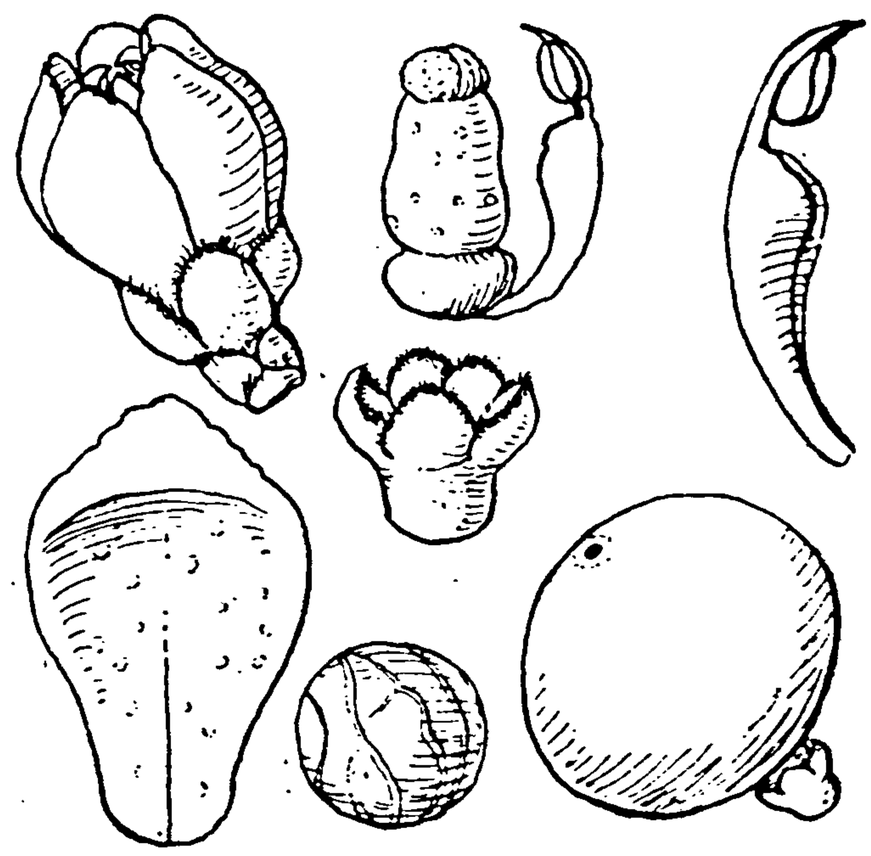
Fruit globose: ovary glabrous: leaflets shining beneath. 1. *A. elemifera.*
Fruit obovoid to elliptic-obovoid: ovary pubescent: leaflets dull beneath. 2. *A. balsamifera.*

1. **A. elemifera** L. Shrub, or tree becoming 17 m. tall: leaflets 3 or 5; blades ovate to rhombic-ovate, 2–8 cm. long: petals 2.5–3.5 mm. long: drupe 4–8 mm. long, black beneath the bloom. [*A. maritima* Jacq.]—(TORCHWOOD.)—Coastal hammocks, pen. Fla., hammocks on the Everglade Keys and Florida Keys.—(*W. I.*)



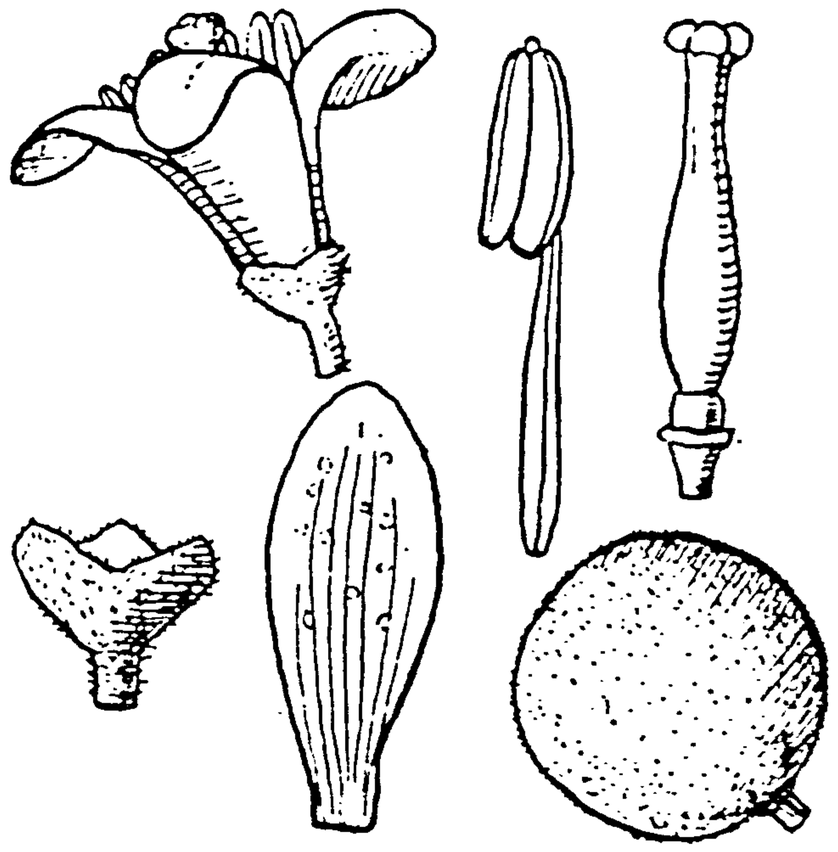
2. **A. balsamifera** L. Shrub, or small tree sometimes 10 m. tall: leaflets 3–5; blades ovate to rhombic-ovate, 5–13 cm. long, dull beneath: drupe obovoid-ellipsoid to obovoid, 6–14 mm. long.—(BALSAM-TORCHWOOD.)—Coastal hammocks, southern pen. Fla.—(*W. I.*)—This plant ranges up the coasts of Florida, on the eastern coast even as far north as the Halifax River. In its northern distribution it is confined to the aboriginal kitchenmiddens, village sites, and burial mounds that lie close to the ocean or the lagoons.

5. **GLYCOSMIS** Correa. Shrubs or trees. Leaf-blades 1–several-foliolate: leaflets mostly entire. Flowers perfect, relatively small. Sepals nearly distinct. Petals 5, elongate, white. Ovary 2–5-celled: styles very short. Ovules solitary in each cavity. Berry globular, the pulp very thin.—Five species, natives of Asia and Australia.



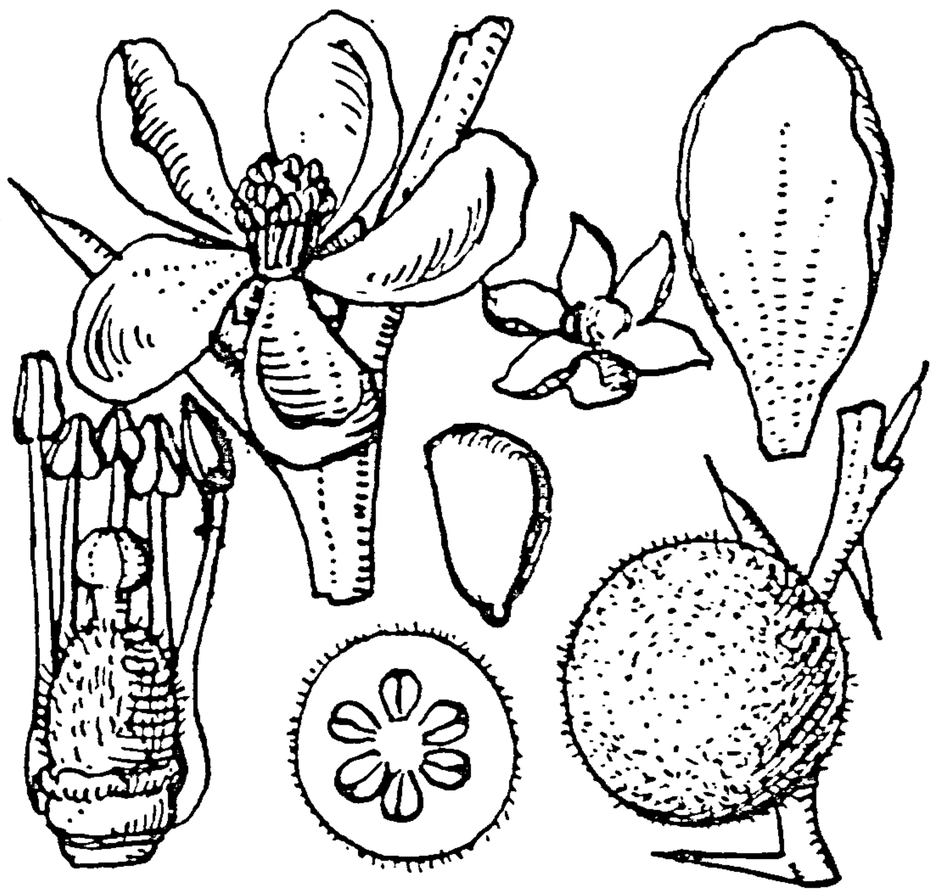
1. **G. citrifolia** (Willd.) Lindl. Shrub 1–4 m. tall or small tree: leaves 1–5-foliolate; leaflets elliptic, or broadest above the middle, 8–16 cm. long, glabrous: sepals orbicular to oval, 1–2 mm. long: petals elliptic, sometimes broadly so, 3–4 mm. long: filaments clavate: berry 7–10 mm. in diameter, white or pink.—(GLYCOSMIS.)—Hammocks, Key West, Fla. Nat. of trop. Asia and cult.—(*W. I.*)—Spr.–sum.

6. **TRIPHASIA** Lour. Shrubs. Leaf-blades 3-foliolate: leaflets with toothed blades. Flowers perfect, relatively large. Sepals united. Petals 3 or 4, narrow, white. Ovary 3- or 4-celled: styles elongate, united. Ovules solitary in each cavity. Berry resembling a small orange.—One species.



1. T. trifolia (Burm. f.) P. Wilson. Shrub mostly 1–2 m. tall: leaflets 3; blades ovate to nearly elliptic, or oval, 1–5 cm. long, shallowly crenate: calyx-lobes acute: petals 12–16 mm. long: berry ellipsoid to globular-ellipsoid, 10–16 mm. long.—(BERGAMOT-LIME. LIME-BERRY.) —Hammocks, fields, and cult. grounds, Coastal Plain, Fla. to Tex. Nat. of E. I. and cult.—(*W. I.*)—Spr.

7. **PONCIRUS** Raf. Shrubs or trees with deciduous leaves. Leaf-blades 3-foliolate, the petiole narrowly winged. Flowers perfect, on the old wood. Sepals nearly distinct. Petals mostly 5, flat, thinnish, white, with claw-like bases. Ovary 6–8-celled, pubescent: styles united, deciduous. Ovules several. Berry many-seeded.—One species.



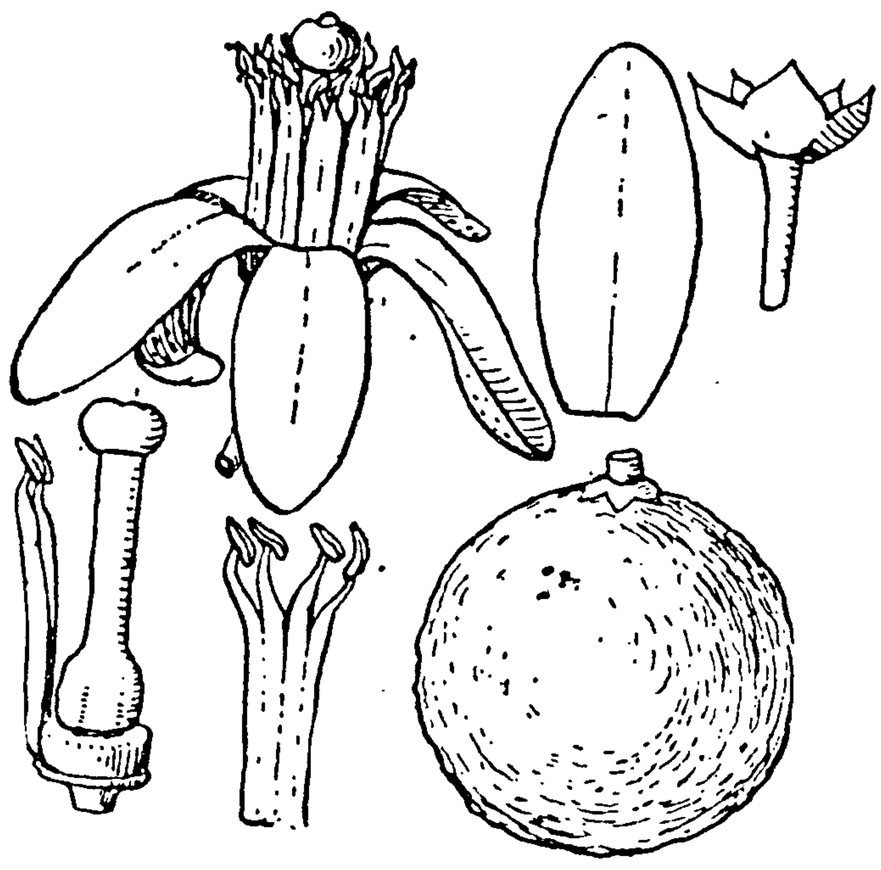
1. P. trifoliata (L.) Raf. Small tree with stout thorns: leaflets 2.5–6.5 cm. long; blades oval or elliptic, varying to ovate or obovate, shallowly toothed, obtuse: sepals ovate to elliptic: petals obovate to spatulate, mostly 1.5–2 cm. long: berry globular, 4–5 cm. in diameter, lemon-yellow.—(TRIFOLIATE-ORANGE.)—Woods and hammocks, Coastal Plain, Fla. to Tex. and Ga. Nat. of China.—Spr.—Extensively used as stock for grafting oranges; also for hedges and ornament. The peel contains a disagreeable-flavored oil and the pulp is scanty, but aromatic.

8. **CITRUS** L. Shrubs or trees with evergreen leaves. Leaf-blades 1-foliolate, the petiole often winged. Flowers perfect, axillary. Sepals united. Petals 5, or 4–8, thick and wax-like, white, not narrowed at the base. Ovary several-celled, glabrous: styles united, deciduous. Ovules several. Berry several-seeded.—Several species, natives of Asia, long cult. and extensively hybridized. Perhaps the earliest fruit trees introduced in America. Seeds brought over by the Spanish expeditioners were sown in the coastal regions of Florida and in the more remote parts. The descendants of these early introductions have since maintained a foothold in the hammocks and in the kitchenmiddens.—Plants flower mainly in spr.

Berry of a globose or subglobose type, not mammilate at the apex.
- Petioles broadly winged: berry with a hollow core. 1. *C. Aurantium.*
- Petioles slightly winged: berry with a solid core. 2. *C. sinensis.*

Berry of an ellipsoid type, commonly mammilate at the apex.
  Berry relatively small, the rind thin, the pulp well-developed with abundant juice and very acid: petioles narrowly winged or wingless.
    Corolla 2–2.5 cm. wide: blades of the leaflets commonly rounded at the apex: berry 3–6.5 cm. long, the pulp greenish. 3. *C. aurantifolia.*
    Corolla 3–5 cm. wide: blades of the leaflets often acute: berry 6–10 cm. long, the pulp light-yellow. 4. *C. Limonum.*
  Berry large, 12–20 cm. long, the rind 3–7 mm. thick, the pulp scant, insipid. 5. *C. Medica.*

1. C. Aurantium L. Thorny shrub or small tree: leaflets ovate to elliptic, 6–12 cm. long, often acuminate, the petioles usually broadly winged: flowers in small cymes: sepals often obtusish: berry dark-orange or reddish, the rind thick, the pulp sour and bitter. [*C. vulgaris* Risso.]—(BITTER-SWEET ORANGE.)—Woods and hammocks, Coastal Plain, Fla. and Ga.—(*W. I.*)



2. C. sinensis Osbeck. Thorny erect, shrub or small tree: leaflets oval, elliptic-ovate, or ovate, 6.5–13 cm. long, often acute or rounded, the petioles usually narrowly winged: flowers in axillary clusters: sepals often acute: berry mostly yellow, the rind usually thin, the pulp sour or sweet. [*C. Aurantium* (Fl. SE. U. S.)]—(SWEET-ORANGE. SEVILLE-ORANGE.)—Woods and hammocks, pen. Fla. and the Keys.—(*W. I.*)

3. C. aurantifolia (Christm.) Swingle. Small tree or straggling shub, with numerous sharp thorns: leaflets oval to elliptic, 6.5–9 cm. long, commonly rounded at the apex, crenulate: petioles narrowly winged: flowers in clusters of 3–10: petals white without and within: berry small, mostly less than 6 cm. long, the rind very thin, the pulp greenish. [*C. Lima* Lunan.]—(LIME.)—Woods, thickets, and hammocks, pen. Fla. and the Keys.—(*W. I.*)

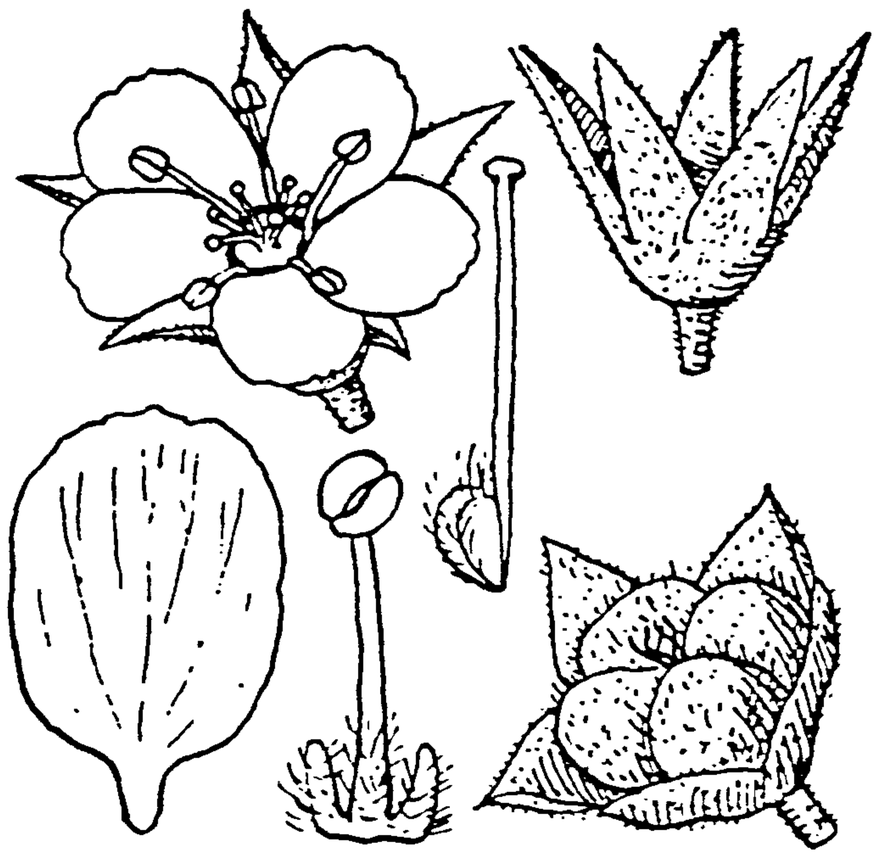
4. C. Limonum (L.) Risso. Small tree or spreading shrub, less thorny than *C. aurantifolia*: leaflets elliptic or ovate-oval, 5–11 cm. long, commonly acute or acuminate at the apex, crenate: petioles winged or wingless: flowers solitary or 2 together: petals purplish without, white within: berry large, mostly over 6 cm. long, the rind relatively thin, the pulp yellowish.—(LEMON.)—Woods and hammocks, pen. Fla. and the Keys.—(*W. I.*)

5. C. Medica L. Small tree or shrub, sometimes with stout thorns: leaflets elliptic, or slightly broadened upward, 12–20 cm. long, rounded and often emarginate at the apex, serrulate-crenate, dull-green: flowers in clusters of 3–10: petals purple-tinged without, white within: berry oblong or oval, usually very large, mostly 12–20 cm. long, often coarsely wrinkled, the rind very thick. —(CITRON.)—Pinelands and hammocks, pen. Fla. and Florida Keys.—(*W. I.*)

FAMILY 10. SURIANACEAE—BAY-CEDAR FAMILY

Shrubs or trees of coastal sands. Leaves alternate: blades entire. Flowers perfect, solitary, or few in terminal clusters. Calyx of 5 persistent sepals. Corolla of 5 clawed petals. Androecium of 8 or 10 stamens, those opposite the petals more or less reduced. Gynoecium of 4 or 5 distinct carpels opposite the petals. Ovules 2, side by side. Fruit achene-like.—The following genus and species comprise the family.

1. SURIANA [Plum.] L. Shrubs with erect stems or trees with wide-spreading branches, the bark flaky. Leaves numerous, fleshy. Fruits seated in the persistent calyx.



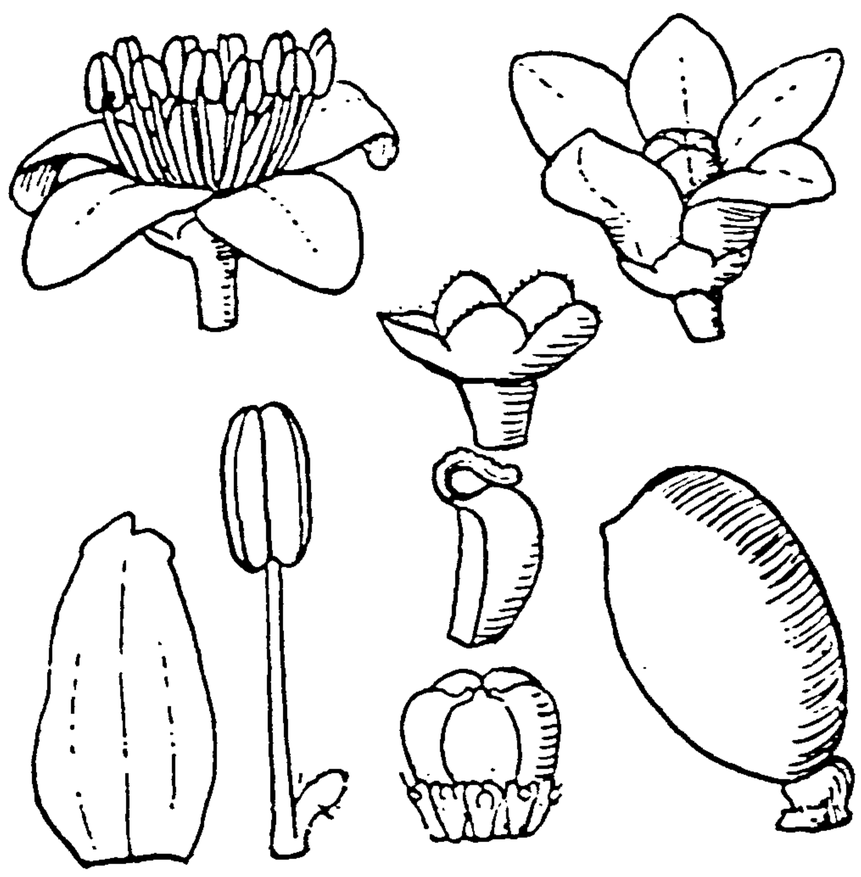
1. S. maritima L. Shrub or tree 8 dm. tall, the wood very hard and heavy: leaves fleshy, appressed-pubescent, approximate; blades linear-spatulate, 1.5–4 cm. long: sepals ovate, 6–8 mm. long: petals yellow, about as long as the sepals: mature carpels 4–4.5 mm. long.—(BAY-CEDAR. THATCH-LEAF.)—Sand-dunes and coastal hammocks, S pen. Fla. and the Keys.—(*W. I.*)—All year. —The heart-wood is reddish-brown, hard, heavy, and close-grained.—The bay-cedar is usually a shrub with many stems, growing in coastal sands, often just back of the tide line. In the shifting sands it gets little chance for a long life. However, on the leeward side of islands, protected from the winds and waves, plants sometimes grow to the size of trees.

FAMILY 11. SIMAROUBACEAE—QUASSIA FAMILY

Shrubs, trees, or rarely herbs. Leaves alternate or rarely opposite: blades pinnately compound, 1–3-foliolate or rarely simple. Flowers polygamous, deciduous, or rarely perfect, solitary, spicate, racemose or paniculate. Calyx of 3–5 sepals. Corolla of 3–5 petals or wanting. Androecium of as many stamens as there are sepals or twice as many, or rarely very many. Gynoecium of 2–5 more or less united carpels. Ovary usually lobed. Stigmas mostly introrse. Fruit a drupe or a samara, or baccate.—About 30 genera and 150 species, most abundant in the tropics.

Fruit drupaceous or baccate.
  Carpels becoming distinct, forming simple fruits: leaf-blades equally pinnate. 1. SIMAROUBA.
  Carpels permanently united, forming a compound fruit: leaf-blades unequally pinnate. 2. PICRAMNIA.
Fruit samaroid.
  Petals present: stamens 10: mature carpels separate. 3. AILANTHUS.
  Petals wanting: stamens 5: mature carpels united. 4. ALVARADOA.

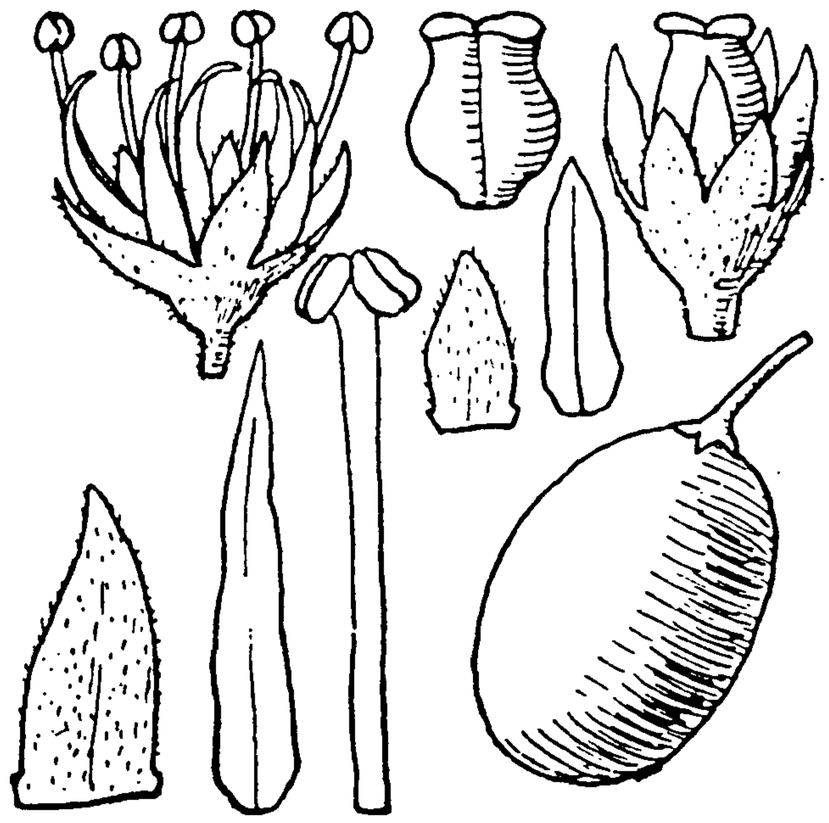
1. SIMAROUBA Aubl. Trees. Leaf-blades abruptly pinnate, the leaflets thick. Flowers monoecious or dioecious, paniculate. Sepals 4 or 5, short. Petals 4 or 5, much larger than the sepals, imbricate. Stamens 8 or 10, each with a fringed appendage at the base. Ovary 4–5-celled, scarcely lobed at the apex: style very short. Fruit a cluster of 5, or fewer, drupes, with the style-base lateral.—About 5 species, tropical American.



1. S. glauca DC. Tree sometimes 16 dm. tall: leaflets 6–12; blades elliptic or nearly so, 4–8 cm. long, entire: flowers yellow or yellowish: drupe oval, about 2 cm. long, scarlet or dark-purple.—(PARADISE-TREE. BITTER-WOOD.)—Hammocks, near the coast,

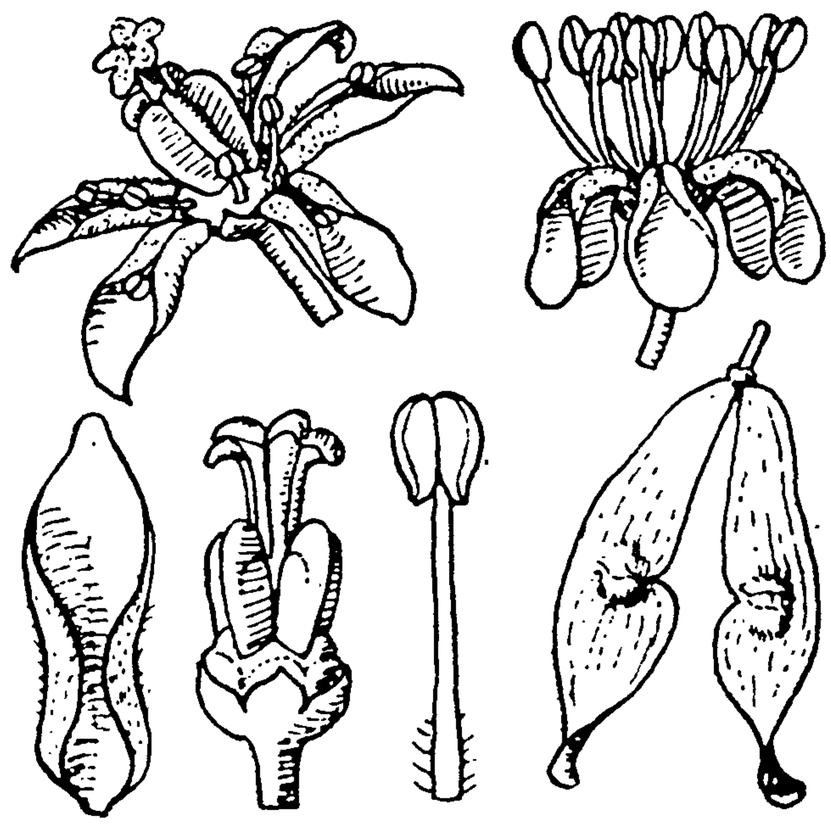
S pen. Fla., Everglade Keys, and Florida Keys.—(*W. I., Mex., C. A., S. A.*)—Spr.—The light-brown heart-wood is close-grained, but soft and light.

2. **PICRAMNIA** Sw. Shrubs or trees. Leaf-blades unequally pinnate, the leaflets thickish. Flowers dioecious, spicate or racemose. Sepals 3–5, short. Petals 3–5, imbricate, white or greenish-white, or wanting. Stamens 3–5, unappendaged. Ovary 2–3-celled, not lobed: style very short. Fruit a berry.—About 30 species, most abundant in tropical America.



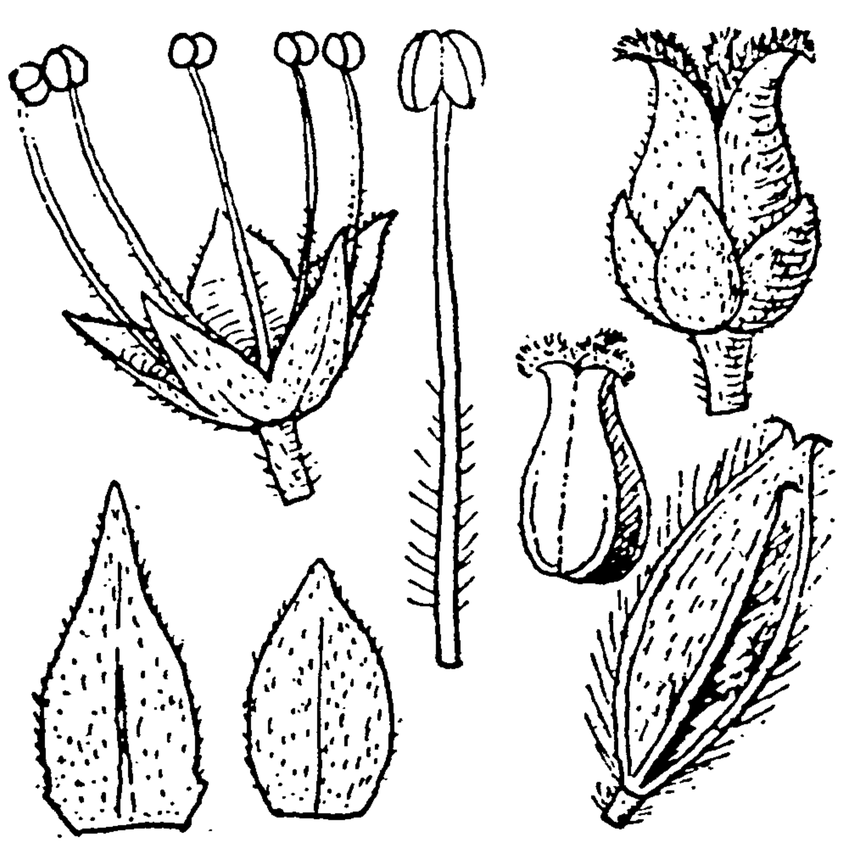
1. **P. pentandra** Sw. Shrub or small tree: leaflets 5–7; blades elliptic, or rarely ovate, 5–10 cm. long, lustrous above: berry ellipsoid, 10–15 mm. long.—(BITTER-BUSH.)—Hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—Wint.–spr.—The heavy and hard wood, like the bark, contains a bitter principle.

3. **AILANTHUS** Desf. Trees. Leaf-blades unequally pinnate, the leaflets thin. Flowers polygamo-dioecious, paniculate. Sepals 5, short. Petals 5, valvate, much larger than the sepals, white or greenish-white. Stamens 10, unappendaged at the base. Ovary 2–5-celled, deeply lobed at the apex: style columnar. Fruit a cluster of 5, or fewer, samaras with the style-bases lateral.—About 3 species, Asiatic.



1. **A. altissima** Swingle. Tree becoming 30 m. tall: leaflets 13–41; blades lanceolate to elliptic-lanceolate, 7–18 cm. long: samaras 4–5 cm. long, linear-elliptic, numerous in drooping panicles, the seed in the middle. [*A. glandulosa* Desf.]—(TREE-OF-HEAVEN. COPEL-TREE.)—Roadsides, woods, and waste-places, various provinces, U. S. and S Can. Nat. of China and cult.—Spr.–sum.

4. **ALVARADOA** Liebm. Shrubs or trees. Leaf-blades unequally pinnate, the leaflets thinnish. Flowers dioecious, borne in spreading or drooping racemes. Sepals 5, short, greenish. Petals wanting. Stamens 5, alternating with 5 staminodia. Ovary flattened or 3-angled, 2–3-celled, apically notched. Fruit samaroid.—About 6 species, tropical American.



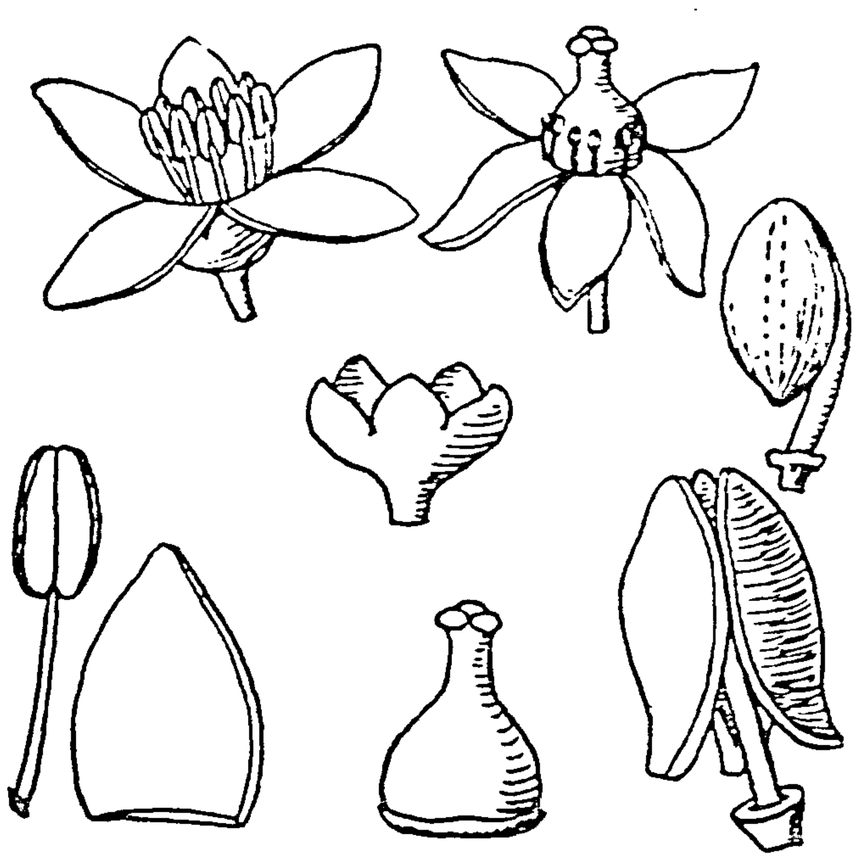
1. **A. amorphoides** Liebm. Shrub or small tree: leaves approximate at the ends of the branches; leaflets numerous, the blades 1–2 cm. long, those of the lateral leaflets mostly elliptic or oval: flowers numerous, slender-pedicelled: sepals ovate, about 1.5 mm. long: filaments pubescent: samara elliptic or ovate-elliptic, 12–14 mm. long, ciliate,

notched.—(ALVARADOA.)—Hammocks, Everglade Keys, Fla.—(*W. I., Mex., C. A.*)—All year.

FAMILY 12. **BURSERACEAE**—TORCHWOOD FAMILY

Trees with a resinous sap. Leaves alternate: blades pinnate, rarely 1–3-foliolate. Flowers perfect or polygamo-dioecious, racemose or paniculate. Calyx of 3–6 sepals. Corolla of 3–6 petals. Androecium of 6–12 stamens. Gynoecium of 2–5 united carpels. Fruit drupaceous, the epicarp sometimes valvate.—About 20 genera and 325 species, mostly of tropical regions.

1. ELAPHRIUM Jacq. Trees. Leaves approximate at the ends of the branches: leaflets thick. Sepals 4–6, imbricate. Petals 4–6, mostly valvate. Stamens 8–12, erect. Ovary 3–5-celled. Drupe with a valvate epicarp. [*Bursera* Jacq.]—About 80 species, mostly of tropical America.



1. E. Simaruba (L.) Rose. Tree, becoming 20 m. tall: with soft wood and smooth reddish bark: leaflets 3–7; blades oval or elliptic, varying to ovate or obovate, 3–5 cm. long, entire: racemes 5–10 cm. long: petals 2–2.5 mm. long, green or brownish-green: drupe elliptic, 8–11 mm. long, or rarely smaller, the epicarp 3-valved.—(WEST-INDIAN BIRCH. GUMBO-LIMBO. GUM-ELEMI.)—Hammocks, along or near the coast, S pen. Fla., Everglade Keys, and Florida Keys.—(*W. I.*)—Wint.–spr.—Conspicuous always by its smooth reddish bark and in winter by its leafless branches. It is the only deciduous-leaved tropical tree among its evergreen associates. A section of a branch or trunk planted will strike root and grow rapidly.

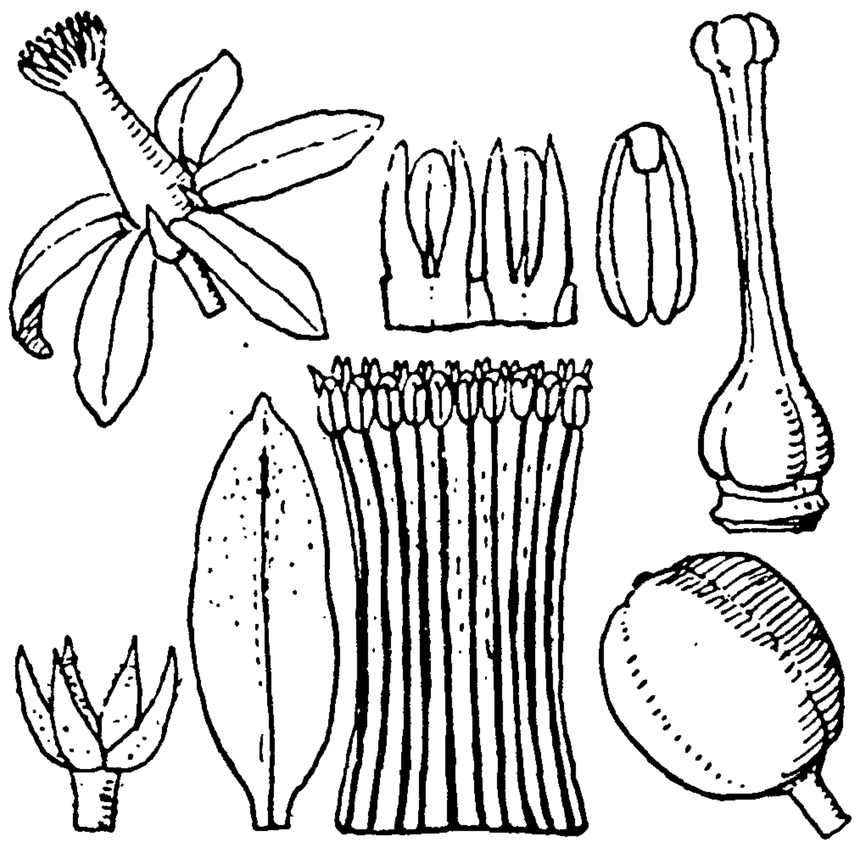
FAMILY 13. **MELIACEAE**—MAHOGANY FAMILY

Shrubs or trees, or partially woody herbs. Leaves alternate: blades pinnately 1–3-compound. Flowers perfect or polygamo-dioecious, paniculate. Calyx of 3–5 sepals. Corolla of 3–5 petals. Androecium of 8–10, or rarely fewer or more, stamens, with the filaments united into a tube. Gynoecium of 3–5 united carpels. Ovary 3–5-celled. Fruit a berry, a capsule, or a drupe.—About 50 genera and 700 species, most abundant in the tropics.

Fruit drupaceous, clustered, drooping: androecium and style elongate. 1. MELIA.
Fruit capsular, solitary, erect; androecium and style short. 2. SWIETENIA.

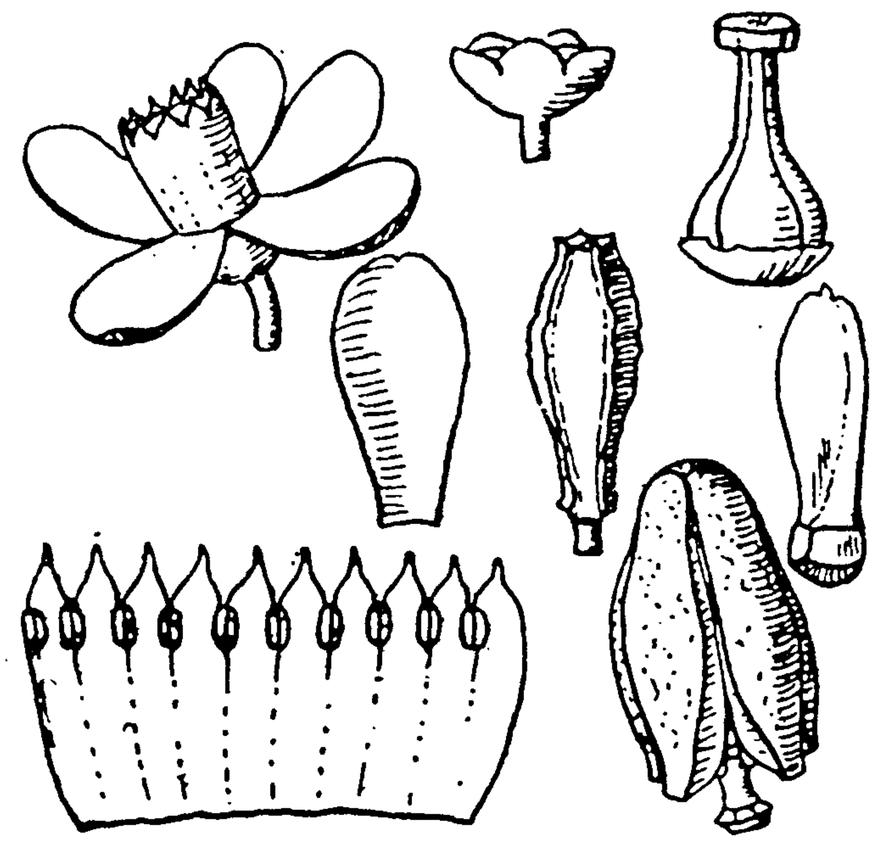
1. MELIA L. Trees with variegated wood. Leaf-blades thrice unequally pinnate. Sepals 5 or 6. Petals 5 or 6. Staminal tube elongate, the lobes

cleft. Anthers sagittate. Stigma 3–6-lobed. Drupe coriaceous-fleshy. Seed not winged.—About 25 species, Asiatic.



1. M. Azedarach L. Tree becoming 15 m. tall (in *M. Azedarach umbraculifera* with an umbrella-like top): leaflets numerous; blades herbaceous, ovate, oval, or elliptic, 3–7 cm. long, incised-serrate or lobed: flowers fragrant: petals lilac-colored, about 1 cm. long: drupe subglobose, 1.5–2 cm. in diameter.—(CHINA-BERRY. CHINA-TREE. PRIDE-OF-INDIA.)—Roadsides, fields, fence-rows, and woods, various provinces, Fla. to Tex., Okla., and N. C. Nat. of Asia and cult.—(*W. I.*) A favorite shade-tree about cabins. Once much used for cabinet-work. Extensively naturalized and very showy when in flower.—Spr.—The leaves are deciduous.

2. SWIETENIA Jacq. Trees, with hard wood. Leaf-blades once equally pinnate. Sepals 5. Petals 5. Staminal-tube short, the lobes entire. Stigma discoid. Capsule woody. Seed winged.—Three species, 2 American and 1 African.



1. S. Mahagoni Jacq. Tree becoming 25 m. tall: leaflets 4–8; blades leathery, ovate to ovate-lanceolate, 3–8 cm. long, entire: petals usually 3–4 mm. long, white or greenish: capsule ovoid, 6–12 cm. long, erect.—(MAHOGANY. MADEIRA-REDWOOD. WEST-INDIAN MAHOGANY.)—Hammocks, Everglade Keys to Cape Sable, pen. Fla. and Florida Keys.—(*W. I., C. A., S. A.*)—Sum.—The source of the mahogany much used in cabinet-work. The leaves are persistent.

ORDER **POLYGALALES** — POLYGALAL ORDER

Herbs, shrubs, or trees. Leaves alternate, opposite, or whorled, sometimes scale-like. Flowers perfect. Perianth mostly irregular, each whorl of 5, or rarely 3 or 4, parts. Androecium of 6, 8, or 10 stamens, the filaments often partially united. Anthers opening by terminal pores or cracks. Gynoecium of 2 united carpels, or rarely of more. Fruit capsular.

FAMILY 1. **POLYGALACEAE** — MILKWORT FAMILY

Herbs, or rarely shrubs or trees. Leaf-blades mostly entire. Flowers solitary, spicate, or racemose, irregular. Calyx of mostly 5 sepals, the 2 inner petaloid. Corolla of 5, or often of 3, small, partially united petals, the lower one keel-like. Androecium of 6–8 stamens, partially coherent with the petals. Anthers 1-celled. Capsule usually 2-seeded.—About 10 genera and 1,000 species, widely distributed.

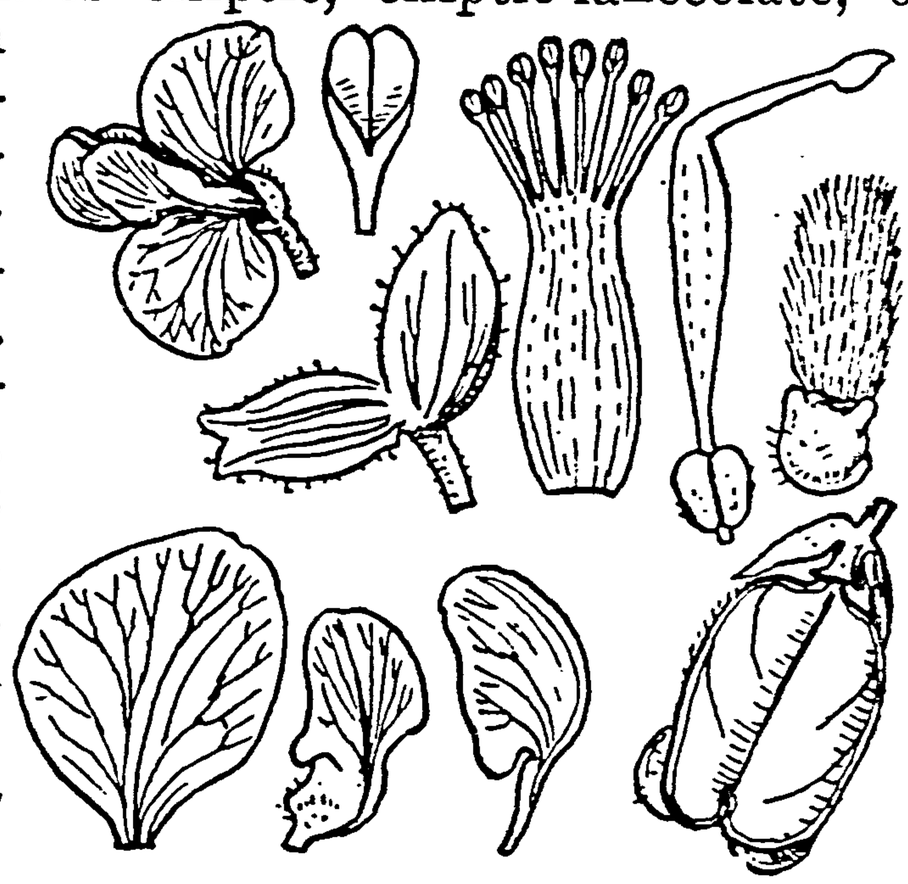
Corolla-keel blunt, crestless and beakless. 1. ASEMEIA.
Corolla-keel appendaged, with a lobed or tufted crest.

- Flowers axillary to leaf-like bracts: perennial plants with slender rootstocks. 2. TRICLISPERMA.
- Flowers in terminal spikes or racemes: annual plants, or perennials with taproots.
  - Sepals and petals not decurrent on the pedicel: pedicels not winged: flowers not yellow: racemes not in cymose-panicles.
    - Wings less than ½ the length of the keel: aril equitant, obscurely lobed. 3. GALYPOLA.
    - Wings equalling the keel or exceeding it: aril 2-lobed. 4. POLYGALA.
  - Sepals and petals decurrent on the pedicel: pedicels winged: flowers yellow or orange, or if white then in cymose panicles. 5. PILOSTAXIS.

1. **ASEMEIA** Raf. Annual or perennial herbs, or shrubs. Leaves often alternate: blades broad or narrow. Raceme narrow, spike-like. Sepals persistent, usually glandular-ciliate, the 2 lower ones wholly or partly united. Wings persistent, petaloid, with broad blades. Keel about as long as the wings, sometimes slightly lobed. Upper petals shorter than the keel, adnate to the filament tube at the base. Capsule broad, wingless, more or less margined. Seeds pubescent, the aril scarcely lobed.—About 20 species, mostly North American.—Spr.–fall or all year S.—CANDYWEEDS. POLYGALAS.

- Capsule much shorter than the wings.
  - Wings green or merely purple-tinged: capsule broadly elliptic, abruptly narrowed at the base: wings slightly inequilateral. 1. *A. grandiflora.*
  - Wings bright-purple: capsule narrowly elliptic, gradually narrowed at the base: wings very inequilateral, very oblique. 2. *A. leiodes.*
- Capsule as long as the wings or longer.
  - Mature wings suborbicular: capsule as long as the wings or slightly longer: keel 3.5–4 mm. long. 3. *A. cumulicola.*
  - Mature wings obovate: capsule much longer than the wings: keel 2–2.5 mm. long. 4. *A. miamiensis.*

1. A. grandiflora (Walt.) Small. Plant 2–5 dm. tall, the stem finely, often closely pubescent: blades of the upper leaves elliptic, elliptic-lanceolate, or lanceolate (or nearly erect and linear in *A. grandiflora angustifolia* [*Polygala coralicola* Small]), loosely ascending or spreading: flowers greenish or sometimes purple-tinged: upper sepal broadly ovate, becoming 2.5–3 mm. long: mature wings 6–7 mm. long: capsule about 5 mm. long, much exceeded by the wings: seed-body cylindric, about 2.5 mm. long. [*Polygala grandiflora* Walt.]—Pinelands, sandy woods, old fields, and sand-dunes, Coastal Plain, Fla. to Miss. and S. C.—A stout copiously pubescent form with bright rose-purple flowers growing mainly in pen. Florida may represent a distinct species.



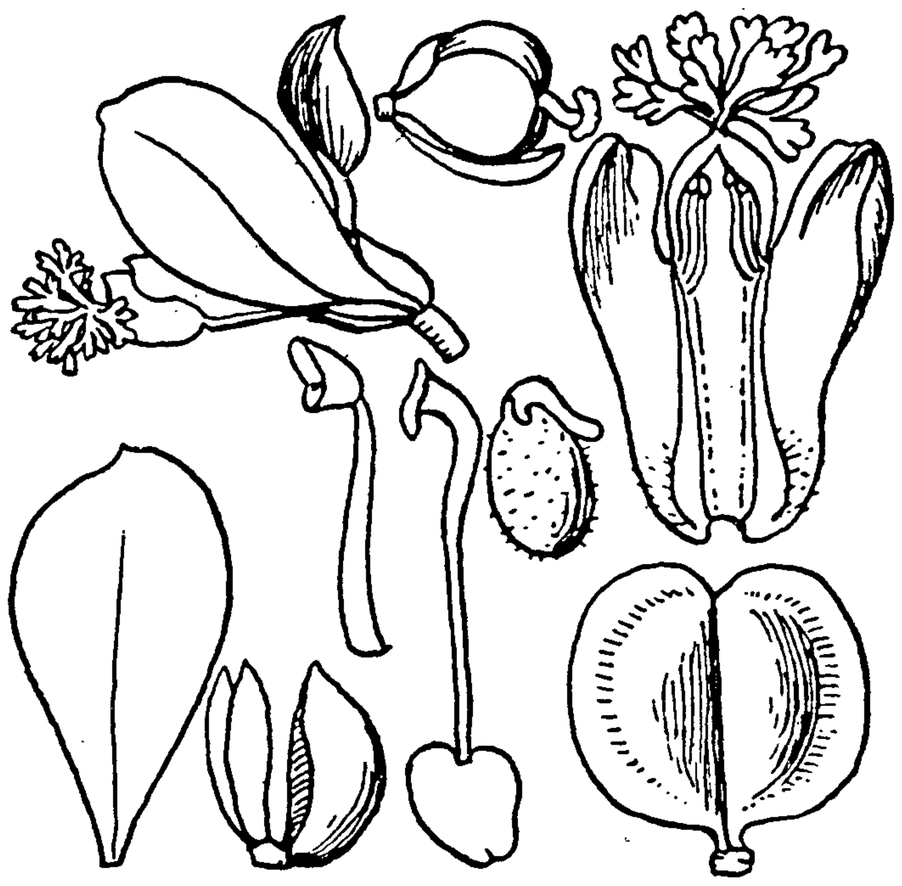
2. A. leiodes (Blake) Small. Plant 2–4.5 dm. tall, the stem usually minutely pustulate: blades of the upper leaves linear, typically narrowly so, or filiform-linear: flowers purple, usually dark-purple: upper sepal becoming less than 2.5 mm. long: mature wings 4.5–5.5 mm. long: capsule 3.5–4 mm. long, much exceeded by the wings: seed-body about 2 mm. long. [*Polygala grandiflora leiodes* Blake.]—Pinelands and adj. Everglades, Everglade Keys, Fla. and Florida Keys.

3. A. cumulicola Small. Plant 3–4 dm. tall, the stem finely and closely pubescent: blades of the lower leaves spatulate to linear-spatulate, those of the upper leaves narrowly elliptic to linear-elliptic or narrowly linear-lanceo-

late: flowers purple, often pale: upper sepal becoming 1.5–2 mm. long: mature wings broadly obovate, 4.5–5 mm. long: capsule 4.5–5.5 mm. long: seed-body about 2 mm. long. [*Polygala Krugii* (Fl. SE. U. S.) *P. cumulicola* Small.] —Coastal sand-dunes, lower eastern coast, pen. Fla.

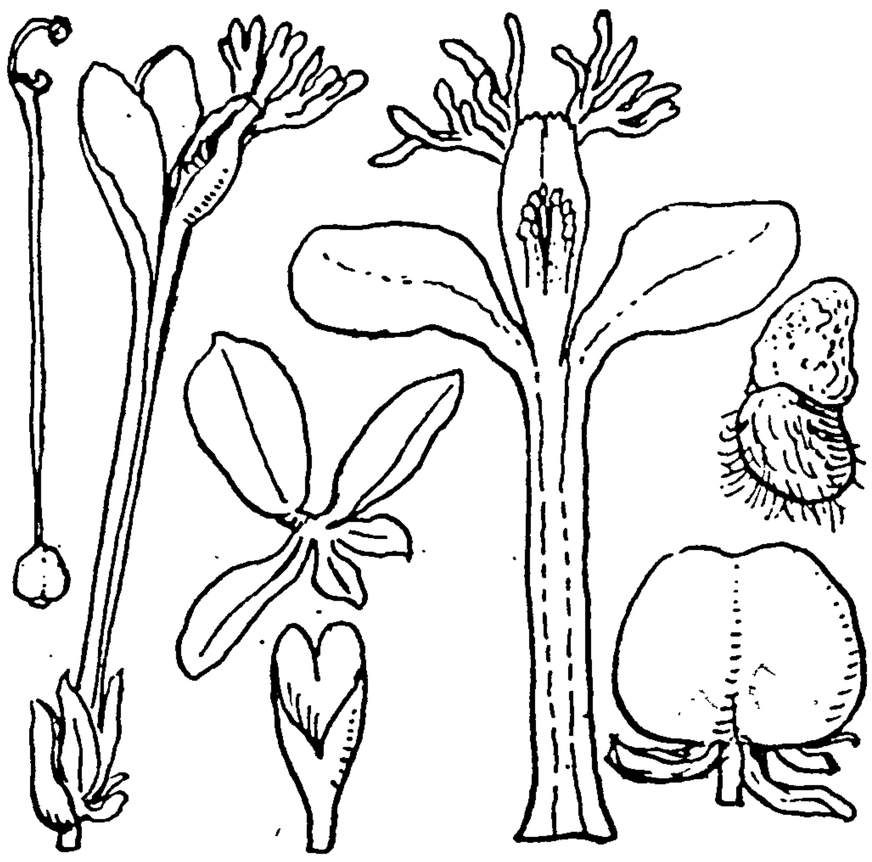
4. **A. miamiensis** Small. Plant 3–4 dm. tall, the stem minutely pubescent: blades of the lower leaves spatulate to elliptic-spatulate, those of the upper leaves linear-elliptic: flowers pale-purple: upper sepal becoming 1–1.5 mm. long: mature wings obovate, 2.5–3 mm. long: capsule 3–3.5 mm. long, exceeding the wings: seed-body about 2 mm. long. [*Polygala miamiensis* Small.]—Everglades near the source of the Miami River, Fla.

2. **TRICLISPERMA** Raf. Perennial caulescent herbs with elongate rootstocks. Leaves alternate, persistent, the lower ones scale-like, the upper larger, approximate. Flowers of two kinds, the petaliferous showy, axillary to leaf-like bracts, rose-purple or rarely white, the cleistogamous inconspicuous, borne on short basal branches. Wings conspicuous. Sepals (and wings) deciduous. Corolla about as long as the wings. Stamens in two distinct groups of three each, but with the filaments adnate to the two posterior petals. Stigma discoid, not lobed. Capsule 2-lobed. Seed with a prominently 3-lobed aril.—One species.



1. **T. paucifolia** (Willd.) Nieuwl. Plant 0.5–2 dm. tall: leaf-blades various, those of the lower leaves scale-like, those of the upper elliptic, oval, or ovate: bracts similar to the upper leaves: flowers rose-colored, rose-purple, or white: sepals 4–6 mm. long: wings spatulate to obovate, 10–18 mm. long: keel about as long as the wings, the claw longer than the body: lateral petals 12–14 mm. long: capsule suborbicular or orbicular-obcordate, 5–8 mm. wide, winged at the notched apex: seed ovoid, the body 2.5–3 mm. long, the linear aril-lobes reaching nearly or quite to the base of the seed. [*Polygala paucifolia* Willd.] —(BIRD-ON-THE-WING. POLYGALA. FLOWERING-WINTERGREEN. FRINGED-POLYGALA. GAY-WINGS.)—Moist woods and ravines, often in subacid soils, various provinces, N of Coastal Plain, Ga. to Ill., Man., Que., and Me.—Spr.–sum.

3. **GALYPOLA** Nieuwl. Annual caulescent, slender, usually simple herbs. Leaves alternate, inconspicuous: blades very narrow, erect. Flowers all alike, borne in a terminal rather dense cylindric spike-like raceme. Wings inconspicuous. Sepals (and wings) persistent. Corolla rose-purple or rarely white, about thrice as long as the wings, the petals united in a slender tube which is cleft at the base. Stamens 8, the filaments adnate, and united to the posterior petals. Stigma prominently 2-lobed. Capsule wingless, obscurely notched at the apex. Seed with an obscurely lobed aril.—One species.



1. **G. incarnata** (L.) Nieuwl. Plant 2–7 dm. tall, the stem glaucous; blades of the upper leaves linear-subulate to subulate: flowers mainly rose-purple, or white: upper sepal becoming 2–2.5 mm. long: mature wings lanceolate to spatulate, 3–4 mm. long: keel 6–8 mm. long, the claw longer than the body: lateral petals 5–7 mm. long: capsule ovoid, 3–3.5 mm. long, notched at the base: seed oval or oval-ovoid, the body about 2 mm. long, capped with the aril.—(PROCESSION-FLOWER. POLYGALA.)—Pinelands, dry woods, and prairies, in rather sterile soil, various provinces, Fla. to Tex., Nebr., Ont., and S N. Y.—(*Mex.*)—Sum. or all year S.

4. **POLYGALA** L. Annual or perennial herbs. Leaves alternate, opposite, or whorled: blades narrow or broad, herbaceous or fleshy. Flowers in slender and spike-like or short and stout racemes. Sepals persistent, distinct. Wings persistent, petaloid, with usually broad blades. Keel about as long as the wings, with a lobed appendage or tufted crest below the apex. Stamens with the filaments united and usually adnate to the posterior petals. Capsule broad, wingless or slightly winged. Seeds usually pubescent, the aril with 2 lateral appressed lobes.—About 400 species, widely distributed.—CANDYWEEDS. POLYGALAS.

Leaves all alternate.
- Racemes elongate, interrupted or continuous: flowers persistent, and persistent fruits, not densely crowded.
  - Wings and corolla white or greenish-white: plant perennial. — I. SENEGAE.
  - Wings and corolla rose-purple: plant annual or biennial.
    - Plant biennial, with basal shoots bearing cleistogamous flowers. — II. POLYGAMAE.
    - Plant annual, without basal shoots: no cleistogamous flowers. — III. LEPTOCAULES.
- Racemes short and stout, not interrupted: flowers and fruits deciduous, leaving an elongate scarred rachis, or a bristly rachis when the bracts are persistent.
  - Leaves reduced to minute scales. — IV. SETACEAE.
  - Leaves not scale-like. — V. MARIANAE.

Leaves, at least at some of the nodes of the stem, whorled.
- Bracts persistent on the raceme-rachis after anthesis. — VI. CRUCIATAE.
- Bracts deciduous from the raceme-rachis after anthesis. — VII. BOYKINIANAE.

I. SENEGAE

Perennial herb with stems tufted on a short caudex and stout root: stems scaly at the base: flowers inconspicuous. — 1. *P. Senega.*

II. POLYGAMAE

Capsule orbicular-ovoid or oval, slightly longer than wide: wings about as long as the capsule or much longer: seed ovoid, sometimes narrowly so.
- Flowers long-pedicelled: pedicels exceeding the bracts: wings much longer than the capsule. — 2. *P. polygama.*
- Flowers short-pedicelled: pedicels shorter than the bracts: wings about as long as the capsule. — 3. *P. aboriginum.*

Capsule elliptic, about twice as long as wide: wings much shorter than the capsule: seed cylindric. — 4. *P. Lewtonii.*

III. LEPTOCAULES

Annual herb with very slender simple or sparingly branched stems and narrow leaf-blades: flowers very small, in narrow continuous racemes. — 5. *P. leptocaulis.*

IV. SETACEAE

Perennial slender herb with almost filiform inconspicuously scaly stem and branches: flowers very small, in pale very dense racemes. — 6. *P. setacea.*

V. MARIANAE

Flowers small: wings becoming 4 mm. long or less: capsule less than 3 mm. long.

Bracts persistent on the raceme-rachis.
Wings broad, oval to ovate: racemes usually acuminate at the tip. — 7. *P. Chapmanii.*
Wings narrow, elliptic, varying to broadest above the middle or below it: racemes blunt or abruptly pointed at the tip.
Mature wings about 2 mm. long: capsule wider than long: seed about 1 mm. long. — 8. *P. Nuttallii.*
Mature wings 3.5–4 mm. long: capsule longer than wide: seed about 1.5 mm. long. — 9. *P. Curtissii.*
Bracts deciduous from the raceme-rachis.
Mature wings not clawed: capsule slightly exceeded by the wings. — 10. *P. mariana.*
Mature wings clawed: capsule much exceeded by the wings. — 11. *P. Harperi.*
Flowers large: wings becoming 5 mm. long or more: capsule over 3 mm. long. — 12. *P. viridescens.*

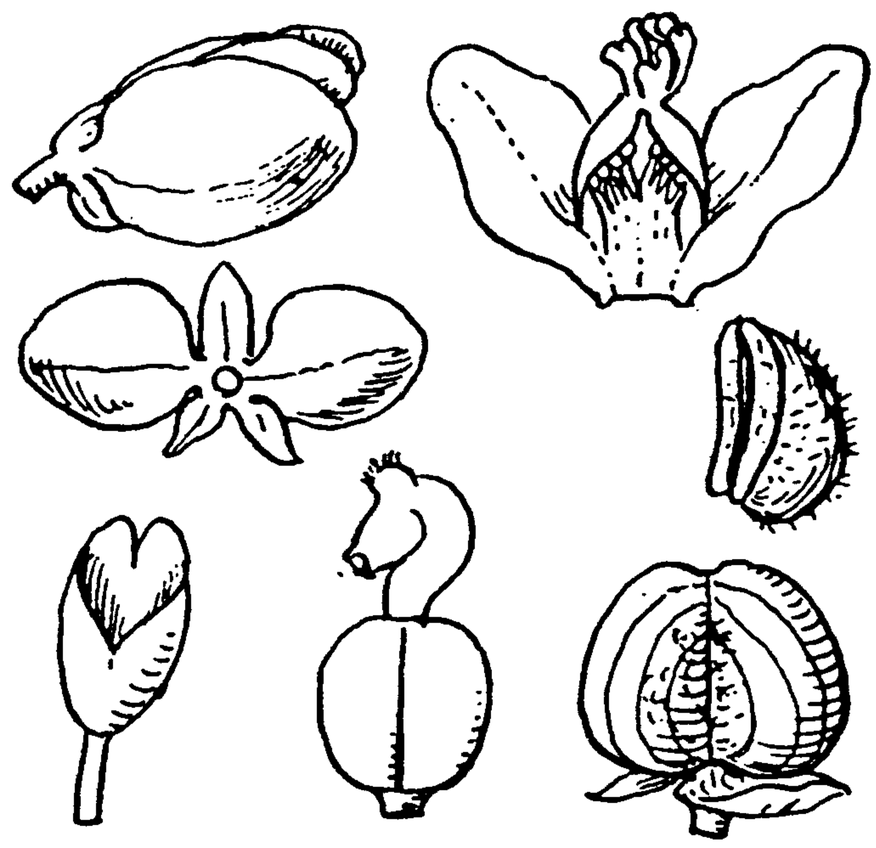
VI. Cruciatae

Raceme loosely and rather sparsely flowered, tapering to the apex: persistent bracts separate. — 13. *P. Hookeri.*
Raceme densely many-flowered, rounded or abruptly narrowed at the apex: persistent bracts close together.
Mature wings ovate, abruptly pointed: sepals obtuse. — 14. *P. brevifolia.*
Mature wings hastate-deltoid, acuminate, sometimes caudate-acuminate: sepals acute.
Raceme manifestly peduncled: mature wings much longer than wide, caudate-acuminate. — 15. *P. ramosior.*
Raceme sessile or nearly so: mature wings about as wide as long, abruptly short-acuminate. — 16. *P. cruciata.*

VII. Boykinianae

Plant perennial.
Leaves whorled, at least up to the middle of the stem.
Seed stout, less than twice as long as thick, rounded at the base. — 17. *P. Boykinii.*
Seed slender, over twice as long as thick, acute at the base. — 18. *P. flagellaris.*
Leaves whorled only near the base of the stem. — 19. *P. praetervisa.*
Plant annual.
Internodes of the stem greatly elongate: seed fusiform, glabrous. — 20. *P. leptostachys.*
Internodes of the stem not greatly elongate: seed ovoid, pubescent.
Raceme elongate, with the fruits persistent on the lower part of the rachis: wings about as long as the capsule: seed-body about thrice as long as thick. — 21. *P. ambigua.*
Raceme conic on account of the prompt falling away of the fruits as they mature: wings shorter than the capsule: seed-body about twice as long as thick.
Capsule about 1 mm. long: seed finely pubescent. — 22. *P. verticillata.*
Capsule about 1.5 mm. long: seed hirsute. — 23. *P. Pretzii.*

1. P. Senega L. Plant 1–5 dm. tall, the stem glabrous or puberulent: blades of the upper leaves linear to lanceolate, more or less serrulate (or ovate and distinctly serrulate and with large capsule and seed in *P. Senega latifolia*): flowers greenish-white: upper sepals becoming 1.5–2 mm. long: wings orbicular-obovate or sub-orbicular, 2–3 mm. long, obtuse: keel about as long as the wings, short-clawed: lateral petals 2–3 mm. long: capsule wider than long, 3.5–4.5 mm. long: seed ovoid, about 2.5 mm. long.—(Seneca-snakeroot.)—Dry woods and rocky soil, often calcareous, various provinces, Miss. to Ark., Alas., N. B., and N. C.—Spr.—The roots are sometimes used medicinally.



2. P. polygama Walt. Plant 1–5 dm. tall, the stem glabrous: leaves not clustered;

blades spatulate to elliptic-oblanceolate or linear: bracts minute: flowers rose-purple to pink, or white: upper sepal becoming 2–2.5 mm. long: mature wings obovate, 3–6 mm. long: keel 3–4 mm. long, the claw shorter than the body: lateral petals 3–4 mm. long: capsule broadly orbicular-ovate, 2–4 mm. long: seed ovoid, about 2.5 mm. long.—Acid sandy soil, pinelands and grassy places, various provinces, Fla. to Tex., Man., and N. S.—Spr.–sum.

3. **P. aboriginum** Small. Plant 1–3 dm. tall, the stem glabrous: leaves alternate; blades elliptic-spatulate to narrowly elliptic: flowers mainly pink, sometimes tinged with purple: upper sepal becoming about 1.5 mm. long: mature wings orbicular or orbicular-oval, 3–4 mm. long: keel about 2 mm. long, the claw shorter than the body: lateral petals about 2.5 mm. long: capsule oval and somewhat quadrate, about 3.5 mm. long: seed narrowly obovoid or slightly cylindric-obovoid, about 3 mm. long.—Hammocks, coastal sand-dunes, S of Coronado, Fla.—Spr.

4. **P. Lewtonii** Small. Plant 1–2 dm. tall, the stem glabrous: leaves in clusters; blades spatulate to linear-spatulate: flowers mainly deep-pink: upper sepal becoming 1.5–2 mm. long: mature wings rhombic-obovate, 4–5 mm. long: keel 3–3.5 mm. long, the claw about as long as the body: lateral petals about 3 mm. long: capsule elliptic, about 5 mm. long: seed cylindric, 3–3.5 mm. long.—Dry scrub, C Fla.—Spr.–sum.

5. **P. leptocaulis** T. & G. Plant 2–6 dm. tall, the stem very slender, the branches almost filiform: upper leaves acicular or filiform: flowers pale-purple or pinkish: upper sepal becoming about 1 mm. long: mature wings spatulate, elliptic-obovate, or elliptic, 1.5–2 mm. long: keel about 1.5 mm. long, the claw much shorter than the body: capsule elliptic, about 1.5 mm. long: seeds elliptic-ovoid, fully 1 mm. long. [*P. paludosa* (Fl. SE. U. S.)]—Sandy swamps, low pinelands, and wet prairies, Coastal Plain, Miss. to Tex.—(*W. I., Mex., C. A., S. A.*)—Spr.–sum.

6. **P. setacea** Michx. Plant 1–5 dm. tall, the stem glabrous, pale-green: leaf-blades mere subulate scales: flowers pinkish or whitish: upper sepal becoming 1–1.5 mm. long: mature wings narrowly obovate, about 2 mm. long, usually abruptly pointed: keel about 2 mm. long: lateral petals 1.5–2 mm. long: capsule deltoid-ovate, about 1.5 mm. long: seed 1 mm. long with a globose-ovoid body, and a slender tip.—Low pinelands, Coastal Plain, Fla. to Miss. and N. C.—Spr.–sum. or all year S.

7. **P. Chapmanii** T. & G. Plant 2–5 dm. tall, the stem glabrous: blades of the upper leaves narrowly linear or linear-subulate: flowers pale-purple or purplish: upper sepal becoming 1.5 mm. long: wings ovate or oval, 2.5–3 mm. long: keel about 2 mm. long, the claw as long as the body or longer: capsule suborbicular, fully 1.5 mm. long: seed 1–1.5 mm. long, with a globose-oval body and a slender tip.—Pinelands, Coastal Plain, Fla. to Miss.—Spr.–sum.

8. **P. Nuttallii** T. & G. Plant 1–2.5 dm. tall, the stem usually finely pubescent below: blades of the lower leaves linear-spatulate, those of the upper ones narrowly linear: flowers purple, purplish, or greenish: upper sepal becoming 1 mm. long: mature wings elliptic or elliptic-lanceolate, 2–2.5 mm. long: keel about as long as the wings: lateral petals about 2 mm. long: capsule about 1.5 mm. long: seed about 1 mm. long, ovoid, with a short stout tip.—Pinelands, sand-dunes, old-fields, and barrens, often in acid soil, various provinces, Ala. to Miss., Pa., Mass., and N. C.—Sum.

9. **P. Curtissii** A. Gray. Plant 1–3 dm. tall, the stem glabrous: blades of the lower leaves spatulate, those of the upper ones linear: flowers rose-purple,

bright-pink, or white: upper sepal becoming 1.5–2 mm. long: mature wings elliptic to ovate-elliptic, 3.5–4 mm. long: capsule about 2.5 mm. long: seed 1.5 mm. long, with an ovoid body and slender tip. [*P. Hugeri* Small.]—(BUTTON-ROSY.)—Woods, rocky banks, ledges, pinelands, and sandy barrens, various provinces, Ga. and Ala. to Ky. and Pa.—Sum.–fall.—Ascends to 4,000 feet in N. C., its size and vigor increasing with the altitude.

10. P. mariana Mill. Plant 1–5 dm. tall, the stem glabrous: blades of the lower leaves spatulate, those of the upper ones linear: flowers pink or purple: upper sepal fully 1 mm. long: mature wings ovate to elliptic, 2.5–3 mm. long: keel nearly as long as the wings: lateral petals about 3 mm. long: capsule about 2 mm. long: seed fully 1 mm. long, with an ovoid body and short stout tip.—Pinelands, woods, savannas, and prairies, various provinces, Fla. to Tex., Ark., and N. S.—Sum.–fall.

11. P. Harperi Small. Plant 1.5–4 dm. tall, the stem glabrous: blades of the lower leaves spatulate, those of the upper ones linear-spatulate to linear or linear-subulate: flowers pink: upper sepal becoming 1.5 mm. long: mature wings elliptic, about 4 mm. long: capsule 1.5–2 mm. long: seed about 1 mm. long, with an ovoid body and short stout tip.—Pinelands, Coastal Plain, Fla. to La. and Ga.—Spr.–sum.

12. P. viridescens L. Plant 1–5 dm. tall, the stem glabrous: blades of the lower leaves spatulate, those of the upper ones linear to linear-elliptic: flowers reddish-purple, green, or white: upper sepal becoming 2 mm. long: mature wings broadly ovate, 5 mm. long or more: keel 2.5–3 mm. long: lateral petals much shorter than the wings: capsule fully 3 mm. long: seed fully 1.5 mm. long, with ovoid bodies and stout tips. [*P. sanguinea* L.]—Dry woods, pastures, meadows, and prairies, various provinces, S. C. to La., Okla., Ont., and N. S.—Sum.

13. P. Hookeri T. & G. Plant 1–3 dm. tall, the stem glabrous: blades of the lower leaves short-spatulate, those of the upper ones linear-spatulate to linear: flowers pink: upper sepal ovate, becoming 1.5 mm. long: mature wings ovate-lanceolate or ovate, about 3 mm. long: capsule about 2 mm. long: seed fully 1 mm. long, ovoid, minutely tipped.—Low pinelands, Coastal Plain, W Fla. to Tex.—Sum.–fall.

14. P. brevifolia Nutt. Plant 1–6 dm. tall, the stem glabrous: blades of the lower leaves obovate, those of the upper ones oblanceolate, linear, or narrowly elliptic: flowers rose-purple: upper sepal suborbicular, becoming fully 1.5 mm. long, ciliate: mature wings ovate to ovate-oblong, 3–4 mm. long, acute or slightly acuminate: capsule orbicular or orbicular-reniform, about 2 mm. long: seed about 1.5 mm. long, ovoid, with a very minute tip.—Acid sandy swamps, Coastal Plain and New England Coast, Fla. to Miss. and R. I.—Spr.–fall.

15. P. ramosior (Nash) Small. Plant 1–5 dm. tall, the stem glabrous: blades of the lower leaves obovate or spatulate, those of the upper ones narrowly spatulate to linear-spatulate, thick: flowers light-purple or dark-purple, or rarely white: upper sepal becoming 1.5 mm. long: mature wings hastate, much longer than wide, 5–6 mm. long, caudate: capsule about 2.5 mm. long: seed oval, less than 1.5 mm. long. [*P. cruciata ramosior* Nash.]—Low pinelands and swamps, Coastal Plain and rarely adj. provinces, Fla. to La. and N. C.—Sum.–fall or all year S.

16. P. cruciata L. Plant 0.5–2 dm. tall, the stem glabrous or nearly so: blades of the lower leaves spatulate or obovate, those of the upper ones spatulate to linear-spatulate, thinnish: flowers rose-purplish or greenish: upper sepal

not ciliate, becoming about 1.5 mm. long: mature wings deltoid or hastate-deltoid, 3.5–4 mm. long, abruptly short-acuminate: capsule 2 mm. long: seed less than 1.5 mm. long, oval-ovoid.—(DRUM-HEADS.)—Acid bogs and wet meadows, various provinces, Ga. to La., Minn., and Mass.—Sum.–fall.

17. **P. Boykinii** Nutt. Plant 2–6 dm. tall: leaf-blades various, those of the lower leaves obovate or elliptic-obovate, those of the upper ones linear-lanceolate to linear: flowers white or greenish-white: upper sepal becoming nearly 1.5 mm. long: mature wings suborbicular, 2.5–3 mm. long: keel 2–2.5 mm. long: capsule suborbicular, about 3 mm. long: seed narrowly ovoid, nearly 2.5 mm. long.—Woods, river-banks, prairies, and pinelands, often in calcareous soils, Coastal Plain and adj. provinces, Fla. to La. and Ga.—Spr.–sum.

18. **P. praetervisa** Chodat. Plant erect, 3–6 dm. tall, or with partly decumbent branches: leaves in few whorls near the base of the stem, the upper scattered; blades of the lower leaves obovate to elliptic, those of the upper ones lanceolate to linear-subulate, often almost scale-like: flowers greenish or greenish-white: upper sepal becoming 1.5 mm. long: mature wings oval to suborbicular-oval, nearly 2.5 mm. long: keel 2–2.5 mm. long: capsule oval-elliptic, about 2 mm. long: seed narrowly ovoid, less than 2 mm. long.—Pinelands and palmlands, lower Florida Keys.—All year.

19. **P. flagellaris** Small. Plant with decumbent or prostrate branches 2–8 dm. long: leaves mostly in whorls, only a few near the inflorescence scattered; blades of the lower leaves spatulate or broadly spatulate, those of the upper ones narrowly so, or linear-spatulate: flowers whitish or pale-green: upper sepal becoming fully 1.5 mm. long: mature wings oval to obovate, 3 mm. long or nearly so: keel 2.5–3 mm. long: capsule elliptic, fully 2.5 mm. long: seed cylindric-ovoid, about 2 mm. long.—Pinelands, Everglade Keys, Fla.—All year.

20. **P. leptostachys** Shuttlw. Plant 1.5 dm. tall: leaves in distant whorls; blades of the lower leaves obovate to linear-spatulate, those of the upper ones linear-subulate or filiform: flowers greenish: upper sepal becoming less than 1 mm. long: mature wings oval to elliptic, about 1.5 mm. long: keel 1–1.5 mm. long: lateral petals mostly 1–1.5 mm. long: capsule elliptic, about 2 mm. long: seed fusiform, about 1.5 mm. long.—Sandhills and pinelands, Coastal Plain, Fla. to Miss.—Spr.–sum.—Seed glabrous or usually so.

21. **P. ambigua** Nutt. Plant 1–3 dm. tall, the branches erect or nearly so: blades of the lower leaves spatulate to linear-spatulate, those of the upper ones linear, usually narrowly so: flowers purplish or greenish-purple: upper sepal becoming about 1 mm. long: mature wings about 1.5 mm. long; blades suborbicular, short-clawed: keel 1.5 mm. long: capsule suborbicular to broadly ovate, fully 1.5 mm. long: seed ovoid, 1.5 mm. long.—Woods, slopes, pastures, and roadsides, various provinces, Ga. to La., Okla., Mich., and Me.—Sum.

22. **P. verticillata** L. Plant 0.5–2 dm. tall, the branches more or less spreading: blades of the lower leaves spatulate, those of the upper ones linear: flowers pinkish-purple or green: upper sepal becoming about 1 mm. long: mature wings 1.2 mm. long; blades ovate to obovate, or orbicular-ovate: keel about 1.5 mm. long: capsule broadly elliptic to ovate-elliptic, 2 mm. long: seed ovoid, nearly 1.5 mm. long.—Banks, fields, roadsides, and woods, various provinces, Fla. to Tex., Man., and Que.—Sum.

23. **P. Pretzii** Pennell. Plant 1–4 dm. tall, the branches virgate, ascending: blades of the lower leaves linear-spatulate to linear, those of the upper ones narrower: flowers mainly white or pinkish: upper sepal becoming 0.6–0.8 mm. long, mature wings about 1.5 mm. long; blades suborbicular, short-clawed: keel

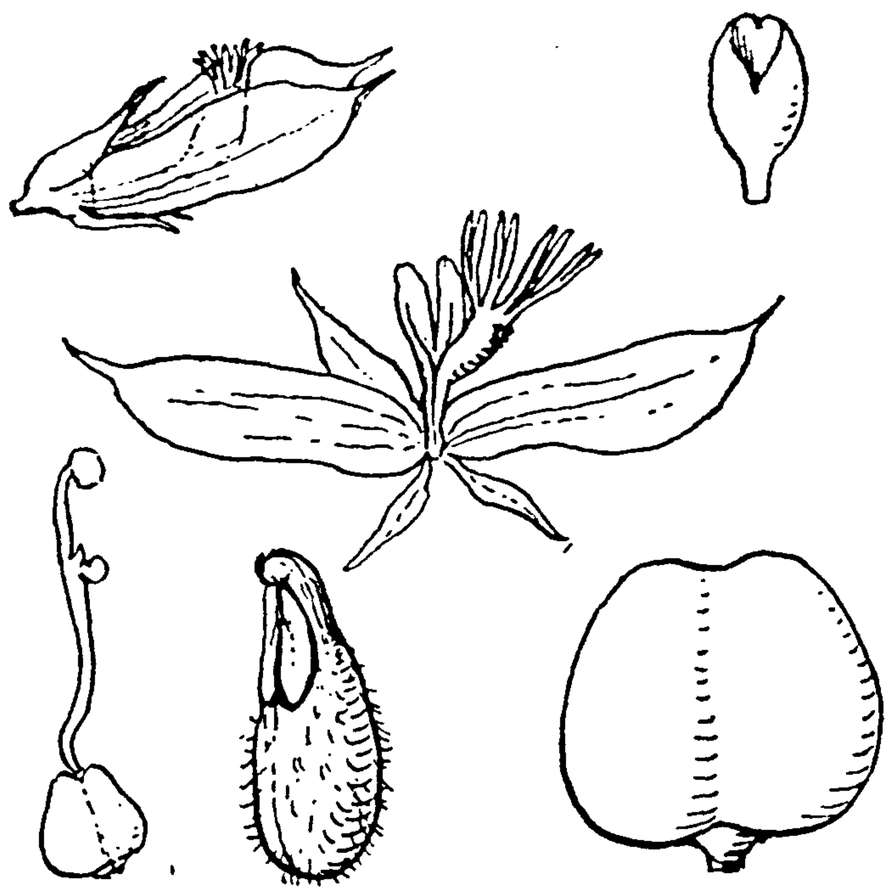
about as long as the wings, often yellowish: capsule ovate, fully 1.5 mm. long: seed narrowly ovoid, about 1.5 mm. long.—Pastures, open woods, and sandy slopes, various provinces, W. Tenn. to Mich. and Me.—Sum.–fall.

5. **PILOSTAXIS** Raf. Annual or biennial caulescent somewhat succulent herbs. Leaves alternate, sometimes mainly basal: blades entire. Flowers all alike, borne in single or corymbosely paniculate dense spike-like racemes, yellow or orange, or rarely whitish or greenish. Wings conspicuous. Sepals (and wings) persistent. Corolla about as long as the wings. Stamens with the filaments united and adnate to the posterior petals. Capsule obovate, suborbicular, or didymous, relatively small, hidden in the persistent perianth. Seed ovoid, oval, or globular, sometimes with an aril.—Represented only by the following species.—POLYGALAS.

Racemes solitary at the end of the stem or terminating branches, not in terminal cymes.
- Wings acuminate: seed with large apical appendages 1/3–1/4 as long as the seed-body: sepals long and narrow.
  - Keel curved over the stamens and pistil, but prolonged as a straight fringe, with the fringes nearly as long as the body: petals shorter than the fringe of the keel. — 1. *P. nana.*
  - Keel arched over the stamens and pistil as a hood, entire: petals as long as the keel or longer. — 2. *P. arenicola.*
- Wings cuspidate or mucronate: seed with minute apical appendages: sepals short and broad.
  - Mature wings 6.5–7.5 mm. long, 3 mm. wide or less: capsule about 1.5 mm. wide: seed less than 1.5 mm. long: raceme orange-yellow. — 3. *P. lutea.*
  - Mature wings 8–9 mm. long, over 3 mm. wide: capsule about 2 mm. wide: seed fully 1.5 mm. long: raceme lemon-yellow. — 4. *P. Rugelii.*

Racemes in terminal compound cymes.
- Racemes yellow.
  - Wings acuminate: upper sepal acuminate: capsule orbicular: seed oval. — 5. *P. ramosa.*
  - Wings cuspidate: upper sepal acute: capsule didymous: seed ovoid-globose. — 6. *P. cymosa.*
- Racemes white or greenish-white.
  - Wings and upper sepal acuminate: capsule less than 1.5 mm. wide: seed less than 0.5 mm. wide. — 7. *P. Baldwinii.*
  - Wings and upper sepal cuspidate: capsule fully 1 mm. wide: seed over 0.5 mm. wide. — 8. *P. Carteri.*

1. **P. nana** (Michx.) Raf. Plant 0.5–1.5 dm. tall: leaf-blades spatulate, often broadly so: raceme green or yellowish: upper sepal lanceolate or ovate-lanceolate, 5–6 mm. long, acuminate: wings elliptic-lanceolate or ovate-lanceolate, 7–8 mm. long, commonly abruptly cuspidate-acuminate: capsule about 1.5 mm. wide: seed usually less than 1.5 mm. long, the body oval, tipped with a stout, curved, beak. [*Polygala nana* (Michx.) DC.]—(BACHELOR'S-BUTTON.)—Pinelands and occasionally upland woods, Coastal Plain and occasionally adj. provinces, Fla. to La., and S. C.—All year.



2. **P. arenicola** Small. Plant 0.2–0.5 dm. tall: leaf-blades oblanceolate to linear-oblanceolate: raceme yellow-green: upper sepal lanceolate, 4–5 mm. long, acuminate: mature wings lanceolate, about 7 mm. long, gradually long-acuminate: capsule about 1.5 mm. wide: seed about 2 mm. long, the body ellipsoid, tipped with

a stout curved beak. [*Polygala arenicola* Small.]—Pinelands, Everglade Keys, Fla.—All year.

3. P. lutea (L.) Small. Plant 1–3 dm. tall: leaf-blades various, those of the lower leaves spatulate, obovate, or ovate, those of the upper leaves oblanceolate to almost linear: upper sepals becoming 2 mm. long, broadly ovate: raceme orange-yellow: mature wings elliptic to obovate-elliptic, 6.5–7.5 mm. long, cuspidate: capsule about 1.5 mm. long: seed less than 1.5 mm. long, ellipsoid, with a minute tip. [*Polygala lutea* L.]—(Bog Bachelor's-button. Candyweed. Wild Bachelor's-button.)—Low pinelands and sandy bogs, often in acid soil, Coastal Plain, Fla. to La. and N. Y.—Spr.–sum.

4. P. Rugelii (Shuttlw.) Small. Plant 3–7 dm. tall: leaf-blades various, those of the lower leaves spatulate, those of the upper leaves oblanceolate to lanceolate: raceme lemon-yellow: upper sepal becoming 2.5 mm. long, broadly ovate: mature wings obovate to elliptic or elliptic-lanceolate, 8–9 mm. long, cuspidate: capsule over 1.5 mm. wide: seed fully 1.5 mm. long, ellipsoid, with a minute tip. [*Polygala Rugelii* Shuttlw. *P. Reynoldsiae* Chapm.]—(Yellow Bachelor's-button.)—Low pinelands, swamps, and ponds, pen. Fla.—Spr.–fall.—A hot infusion of this plant is drunk by the Seminoles, in cases of snake-bite.

5. P. ramosa (Ell.) Small. Plant 1–5 dm. tall: leaf-blades various; those of the lower leaves spatulate or obovate, those of the upper leaves oblanceolate to linear: raceme lemon-yellow: upper sepal ovate, becoming 1.5 mm. long: mature wings ovate, 2.5–3 mm. long, acuminate: capsule about 1 mm. wide: seed pubescent, oval, fully 0.5 mm. long, minutely tipped. [*Polygala ramosa* Ell.]—Moist pinelands, acid swamps, marshes, and ponds, Coastal Plain, Fla. to Tex. and N. J.—Sum.–fall.

6. P. cymosa (Walt.) Small. Plant 4–12 dm. tall: leaf-blades various, those of the lower leaves linear, those of the upper narrowly linear: raceme lemon-yellow: upper sepal orbicular-ovate, becoming 2 mm. long: mature wings oval or somewhat obovate, 3.5–4 mm. long, mucronate: capsule didymous, about 1 mm. long, fully 1.5 mm. wide: seed glabrous, globose-ovoid, nearly 1 mm. long. [*Polygala cymosa* Walt.]—Pineland pools, meadows, and acid cypress swamps, Coastal Plain, Fla. to La. and Del.—Spr.–fall.—The fragrant principle common to the other species seems to be absent from the roots of this one.

7. P. Baldwinii (Nutt.) Small. Plant 2–6 dm. tall: leaf-blades various, those of the lower leaves spatulate to obovate, those of the upper leaves narrowly spatulate to lanceolate: raceme blunt, white: upper sepal ovate-lanceolate, becoming 2.5 mm. long, acuminate: mature wings ovate-lanceolate to narrowly ovate, or slightly broadened upward, 3 mm. long, acuminate: capsule less than 1 mm. wide: seed ovoid, 0.5–0.7 mm. long. [*Polygala Baldwinii* Nutt.]—(White Bachelor's-button.)—Low pinelands and swamps, Coastal Plain, Fla. to Miss. and Ga.—Sum.

8. P. Carteri Small. Plant 1–5.5 dm. tall: leaf-blades various, those of the lower leaves spatulate, those of the upper linear-elliptic to almost linear: raceme acute, greenish: upper sepal ovate, becoming 2 mm. long, cuspidate: mature wings elliptic, sometimes broadly so, about 4 mm. long, abruptly pointed: capsule fully 1 mm. wide: seed oval, nearly 1 mm. long. [*Polygala Carteri* Small.]—Low pinelands and prairies, Everglade Keys, and Big Cypress Swamp, S pen. Fla. and lower Florida Keys.—(*W. I.*)—All year.

Order **EUPHORBIALES**—Euphorbial Order

Herbs, shrubs, or trees, sometimes aquatic or amphibious, but mainly terrestrial, commonly with milky juice. Leaves various, sometimes re-

duced to scales, or almost wanting. Flowers mainly monoecious or dioecious, regular. Calyx of several sepals. Corolla of several petals, or often wanting. Androecium of more than one stamen, except when the staminate flowers are scattered over the inside of an involucre. Filaments distinct or united into a column. Anthers opening by longitudinal or transverse valves. Gynoecium of 2, 3, or 4, or rarely more, united carpels, superior. Styles, or stigmas, usually distinct and cleft or foliaceous, united by pairs in *Callitrichaceae.* Ovules 1, 2, or 3 in each cavity. Fruit capsular, achene-like, drupaceous or baccate. Seeds often carunculate.

Styles or stigmas distinct or mainly so, cleft or foliaceous: ovary 3-celled or rarely 1- or 2-celled: stamens several, except when on the inside of an involucre. — Fam. 1. EUPHORBIACEAE.
Styles united by pairs: ovary 4-celled: stamen solitary. — Fam. 2. CALLITRICHACEAE.

FAMILY 1. EUPHORBIACEAE — SPURGE FAMILY

Herbs, shrubs, or trees, often with milky sap. Leaves opposite, whorled, or alternate: blades simple and entire, toothed or lobed, or compound. Flowers monoecious or dioecious, solitary or variously clustered, or much reduced and in an involucre (*Euphorbia* and related genera). Calyx of 2–several sepals or obsolete. Corolla of 2–several petals or wanting. Androecium of few–many stamens. Fruit depressed or slightly elongate.—About 250 genera and 4,000 species, widely distributed.

Flowers not in an involucre: calyx of several sepals.
- Ovules, and seeds, 2 in each gynoecium-cavity.
  - Corolla present: stamens 5. — I. ANDRACHNEAE.
  - Corolla wanting: stamens 2 or 3.
    - Plants monoecious or rarely dioecious: ovary 3-celled: fruit capsular or baccate. — II. PHYLLANTHEAE.
    - Plants dioecious: ovary 1- or 2-celled: fruit drupaceous. — III. DRYPETEAE.
- Ovules, and seeds, solitary in each gynoecium-cavity.
  - Flowers, either staminate or pistillate, or both, in more or less elongate spikes or racemes, the pistillate basal.
    - Corolla present in either staminate or pistillate flowers, or in both kinds (except in *Croton punctatus* and *C. texensis*).
      - Stamens 5 to many: filaments distinct. — IV. CROTONEAE.
      - Stamens 10 or fewer: filaments monadelphous. — V. DITAXEAE.
    - Corolla wanting.
      - Gynoecium 2-carpellary: styles 2: sepals distinct: herbs. — VI. MERCURIALEAE
      - Gynoecium 3–several-carpellary: styles 3–several, or gynoecium 2-carpellary and sepals united.
        - Stamens 8–16. — VII. ACALYPHEAE.
        - Stamens 1–5.
          - Sepals valvate in the bud. — VIII. TRAGIEAE.
          - Sepals imbricate in the bud. — IX. HIPPOMANEAE.
  - Flowers, either the staminate or the pistillate, or both, in cymes or corymbs, or in open racemes.
    - Leaf-blades not peltate: filaments not repeatedly branched.
      - Flowers borne in forking cymes. — X. ADENOROPIEAE.
      - Flowers borne in racemes or panicles. — XI. MANIHOTEAE.
    - Leaf-blades peltate: filaments repeatedly branched. — XII. RICINEAE.

Flowers in involucres: calyx represented by a minute scale at the base of a filament-like pedicel: involucre and contents simulating a flower.
- Involucre regular or nearly so, not oblique. — XIII. EUPHORBIEAE.
- Involucre oblique and very irregular. — XIV. PEDILANTHEAE.

I. ANDRACHNEAE

Evergreen dioecious shrubs or trees: flowers axillary, the staminate sessile, the pistillate pedicelled. — 1. SAVIA.

II. PHYLLANTHEAE

Androecium and gynoecium surrounded by a disk at the base.
  Anthers opening horizontally: fruit capsular.
    Flower-bearing branches dilated, leaf-like, leafless or nearly so. — 2. XYLOPHYLLA.
    Flower-bearing branches not dilated, leafy. — 3. PHYLLANTHUS.
  Anthers opening vertically: fruit baccate. — 4. CICCA.
Androecium and gynoecium not surrounded by a disk at the base. — 5. BREYNIA.

III. DRYPETEAE

Evergreen shrubs or trees. — 6. DRYPETES.

IV. CROTONEAE

Ovary 3-celled or rarely 2-celled: capsule 3-celled or rarely 2-celled, 3-lobed or rarely 2-lobed, dehiscent: flowers in clusters, spikes, or racemes. — 7. CROTON.
Ovary 1-celled: capsule 1-celled, achene-like, indehiscent: flowers scattered. — 8. CROTONOPSIS.

V. DITAXEAE

Style once branched: petals distinct. — 9. DITAXIS.
Style several times branched: petals united at the base. — 10. CAPERONIA.

VI. MERCURIALEAE

Annual (or perennial) herbs. — 11. MERCURIALIS.

VII. ACALYPHEAE

Annual or perennial monoecious or rarely dioecious herbs, or shrubs: flowers in axillary or terminal spikes or spike-like racemes, the pistillate flowers subtended by lobed bracts: stigmas much branched. — 12. ACALYPHA.

VIII. TRAGIEAE

Perennial monoecious herbs, with erect or climbing stems, pubescent with often stinging hairs. — 13. TRAGIA.

IX. HIPPOMANEAE

Gynoecium 3-carpellary, or rarely 2-carpellary (*Sapium*): styles 3, or rarely 2 (*Sapium*): fruit dehiscent.
  Receptacle with 3 horn-like projections under the capsule. — 14. STILLINGIA.
  Receptacle with a central column.
    Calyx of the staminate flower present.
      Gynoecium 3-carpellary: stigmas 3: stamens usually 3.
        Capsule dry: seed with a caruncle: leaf-blades not biglandular at the base. — 15. SEBASTIANA.
        Capsule fleshy: seed without a caruncle: leaf-blades biglandular at the base. — 16. TRIADICA.
      Gynoecium 2-carpellary: stigmas 2: stamens 2. — 17. SAPIUM.
    Calyx wanting or rudimentary. — 18. GYMNANTHES.
Gynoecium 6–8-carpellary: styles 6–8: fruit indehiscent. — 19. HIPPOMANE.

X. ADENOROPIEAE

Petals wanting: stamens 10 or more: calyx corolloid. — 20. BIVONEA.
Petals present: stamens 10 or fewer: calyx not corolloid. — 21. ADENOROPIUM.

XI. MANIHOTEAE

Large herbs, shrubs, or rarely trees, with usually large tuberous roots. — 22. JATROPHA.

XII. RICINEAE

Annual herbs, or shrubs or trees, with large palmately lobed leaf-blades: capsule echinate. — 23. RICINUS.

XIII. EUPHORBIEAE

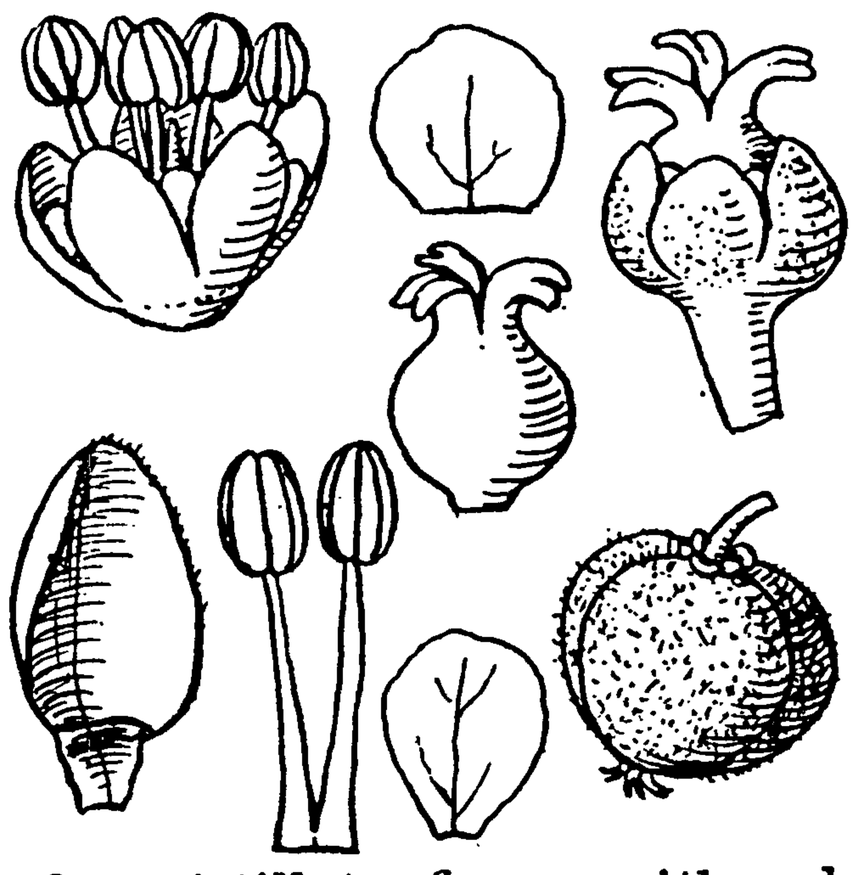
Herbs, annual or perennial, unarmed, or partly woody plants.
  Glands of the involucres with petal-like appendages, these sometimes much reduced.
    Leaves all opposite: leaf-blades inequilateral, oblique at the base. — 24. CHAMAESYCE.
    Leaves alternate or scattered at least below the inflorescence: stem topped by an umbel.

Annual or biennial: stipules narrow: bracts petal-like. 25. LEPADENA.
Perennial: stipules none: bracts not petal-like. 26. TITHYMALOPSIS.
Glands of the involucres without petal-like appendages, entirely naked, sometimes with crescent-like horns.
Stem topped by an umbel: stipules none: involucres in open cymes, each with 4 glands and entire or toothed lobes. 27. GALARHOEUS.
Stem not topped by an umbel: stipules gland-like: involucres in cluster-like cymes, each with a single gland or rarely 4 glands and fimbriate lobes. 28. POINSETTIA.
Shrubs with fleshy cactus-like branches, spine-armed. 29. EUPHORBIA.

XIV. PEDILANTHEAE

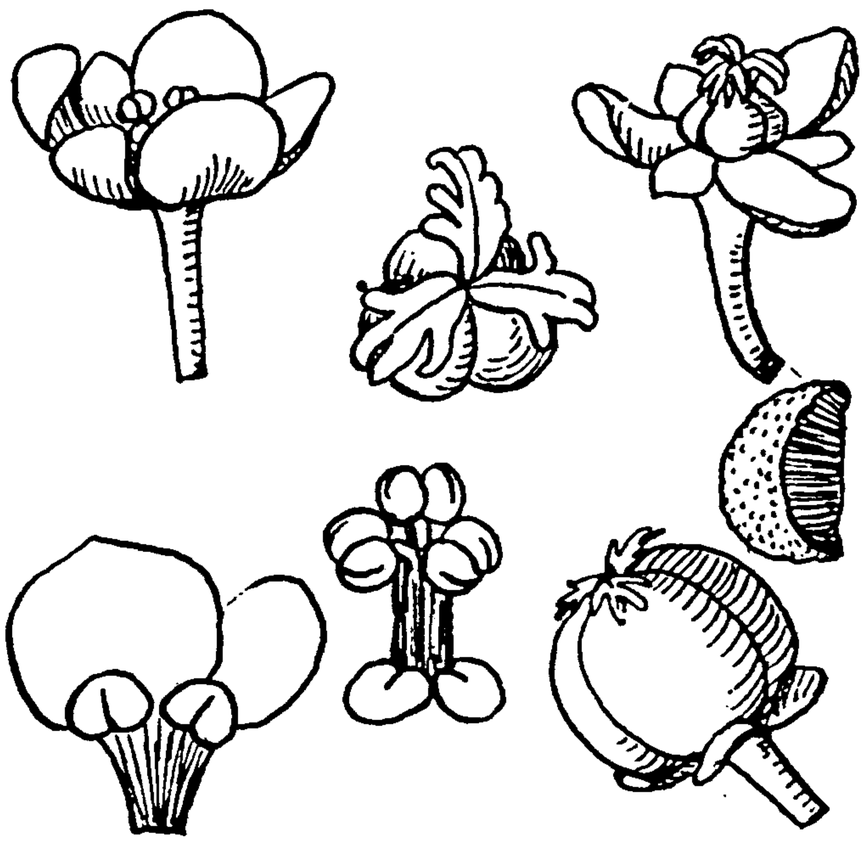
Fleshy plants with usually many stems, the involucres clustered at the ends of branches. 30. PEDILANTHUS.

1. **SAVIA** Willd. Shrubs or trees. Leaves alternate: blades thick, entire. Flowers green, dioecious; the staminate densely clustered, with 5 broad rounded sepals and 5 thin petals broadened upward: stamens 5, exserted. Pistillate flowers solitary or few together, with 5 broad sepals and 5 nearly similar petals: ovary 3-lobed; styles 2-parted. Capsule depressed.—About 6 species, West Indian.



1. **S. bahamensis** Britton. Shrub or small tree, the bark pale-gray or whitish: leaf-blades typically obovate, varying to narrowly obovate or oval-obovate, 2–5 cm. long, pale-green, shining above, glabrous, short-petioled: staminate flower with orbicular-ovate sepals about 2 mm. long and cuneate or flabellate thin petals shorter than the sepals: pistillate flower with sub-orbicular sepals and petals about 2 mm. long: capsule spheroidal, 5–6 mm. long: seed 4–5 mm. long.—(MAIDEN-BUSH.)—Hammocks, lower Florida Keys.—(*Bah.*)—Spr.

2. **XYLOPHYLLA** L. Shrubs or small trees, with flattened leaf-like, usually distichous, branchlets. Leaves minute or obsolete. Flowers green, borne in clusters along the margins of the leaf-like branchlets. Staminate flowers mostly with 6 sepals and 3 stamens. Pistillate flowers mostly with 6 sepals and a 3-celled ovary. Fruit capsular.—About 10 species, West Indian and South American.



1. **X. angustifolia** Sw. Shrub 1–2 m. tall: flattened branches almost linear, varying to somewhat spatulate or lanceolate, commonly 4–10 cm. long: larger sepals of the staminate flower 1–1.5 mm. long: capsule 4–5 mm. broad. [*X. Epiphyllanthus* (Fl. SE. U. S.)]—(SWORD-BUSH.)—Hammocks, Key West, Fla.—(*W. I.*)—This and other species are cultivated for ornament in warm countries.

3. **PHYLLANTHUS** L. Herbs or partly woody plants. Leaf-blades entire. Flowers apetalous, green or purple-tinged. Staminate flowers with 5

or 6 sepals and usually 3 stamens. Pistillate flowers with 5 or 6 sepals and a 3-celled ovary. Fruit capsular.—About 60 species, mostly in tropical regions.

Calyx of the pistillate flower about as large as that of the staminate, at anthesis, or only slightly larger; sepals scarcely accrescent in fruit.
  Stems solitary from a slender root, sometimes branched at the base. — I. CAROLINENSES.
  Stems several or many from a thick woody root. — II. PENTAPHYLLI.
Calyx of the pistillate flower much larger than that of the staminate, conspicuously accrescent. — III. PLATYLEPIDES.

I. CAROLINENSES

Stem herbaceous: annual herbs.
  Branches erect or ascending.
    Mature pistillate sepals broadly linear to broadly spatulate; calyx much wider than the capsule: seed about 1 mm. long. — 1. *P. carolinensis.*
    Mature pistillate sepals broadly ovate to broadly obovate: calyx as wide as the capsule or slightly wider: seed much less than 1 mm. long. — 2. *P. pruinosus.*
  Branches recurved-spreading.
    Staminate sepals longer than wide: calyx of the pistillate flower not reaching the middle of the capsule. — 3. *P. Niruri.*
    Staminate sepals wider than long: calyx of the pistillate flower reaching above the middle of the capsule. — 4. *P. lathyroides.*
Stem woody: short-lived shrub. — 5. *P. Garberi.*

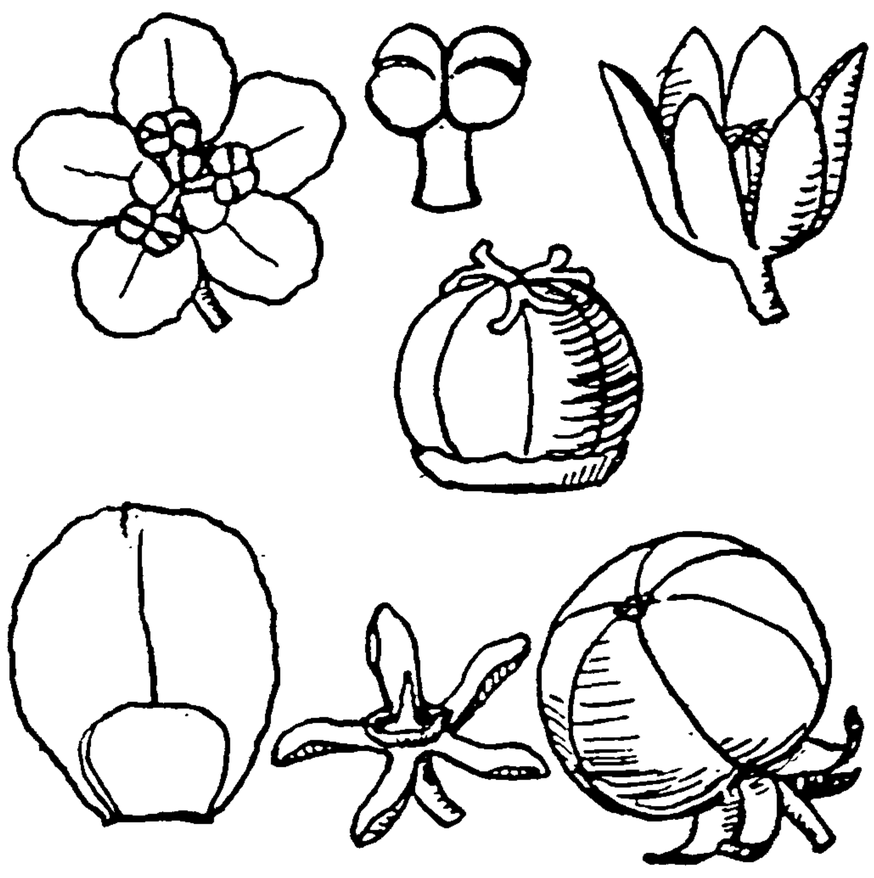
II. PENTAPHYLLI

Stems tufted on the root, slender-wiry: leaves numerous and approximate on the short branches: flowers usually approximate. — 6. *P. pentaphyllus.*

III. PLATYLEPIDES

Stems solitary or several from the thickened root: flowers few, borne in the upper leaf-axils, rather long-pedicelled. — 7. *P. platylepis.*

1. P. carolinensis Walt. Plant 1–5 dm. tall, the stem glabrous: leaf-blades obovate to elliptic-obovate, rather gradually narrowed to the base: staminate calyx 1.5–2 mm. wide; sepals suborbicular: mature pistillate calyx 2.5 mm. wide; sepals broadly linear to broadly spatulate: capsule about 2 mm. wide.—Woods, river-banks, and roadsides, various provinces, Fla. to Tex., Mo., and Pa.—(*W. I.*)—Spr.–fall.



2. P. pruinosus Poepp. Plant 0.5–3.5 dm. tall: leaf-blades cuneate to obovate, abruptly narrowed at the base: staminate calyx 1.5–2 mm. wide; sepals suborbicular: mature pistillate calyx 2–2.5 mm. wide; sepals broadly ovate to broadly obovate: capsule about 1.5 mm. wide. [*P. saxicola* Small]—Low pinelands and hammocks, Everglade Keys, Fla. and the Florida Keys.—(*W. I.*)—All year.

3. P. Niruri L. Plant 1–3 dm. tall: leaf-blades thickish, elliptic or nearly so, rounded at the base: staminate calyx 1–1.5 mm. wide; sepals orbicular-ovate: mature pistillate calyx about 2 mm. wide; sepals broadly linear to linear-ovate: capsule about 2 mm. wide.—Pinelands and waste-places, pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—All year.—Sometimes used medicinally.

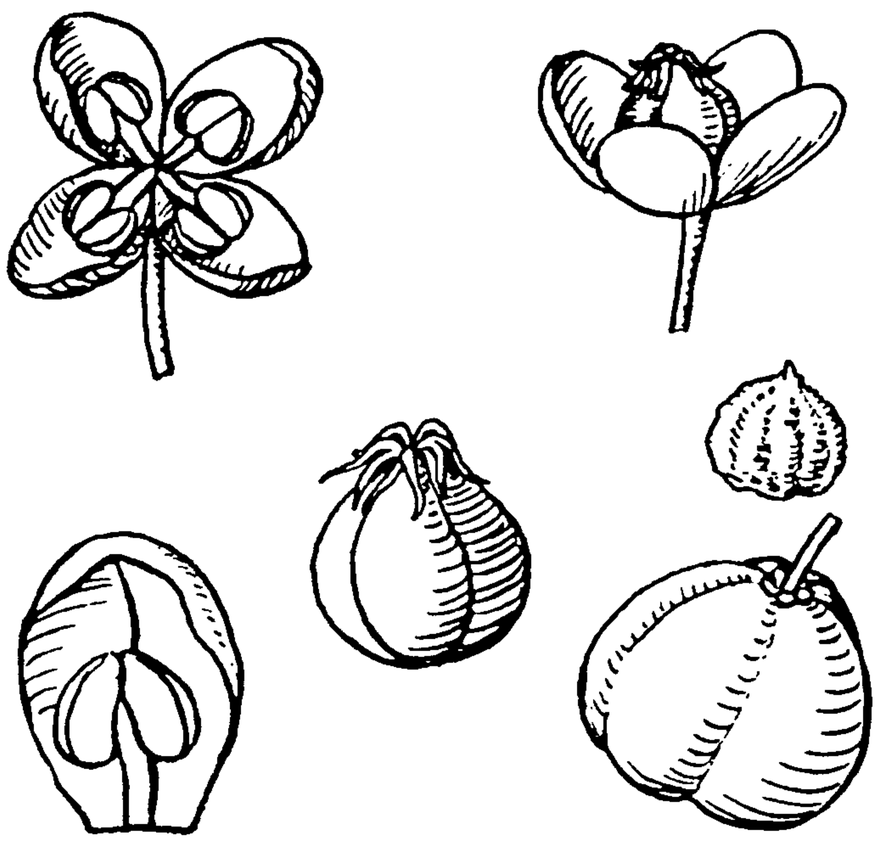
4. P. lathyroides H.B.K. Plant 2–6 dm. tall: leaf-blades thinnish, elliptic to obovate, acute or obtuse at the base: staminate calyx 1 mm. wide; sepals flabellate or reniform: mature pistillate calyx 2 mm. wide; sepals ovate to oval: capsule about 2.5 mm. wide.—Hammocks, S pen. Fla.—(*W. I., Mex., C. A., S. A.*)—All year.

5. **P. Garberi** Small. Plant 1–5 dm. tall: leaf-blades thickish, elliptic, sometimes narrowly so, or linear-elliptic: staminate calyx about 2 mm. wide; sepals ovate to orbicular-ovate: mature pistillate calyx 3 mm. wide; sepals elliptic to ovate: capsule 2.5–3 mm. wide. [*P. abnormis* (Fl. SE. U. S.)]—Coastal sand-dunes, pen. Fla. and the Keys.—All year.

6. **P. pentaphyllus** C. Wright. Plant 0.5–4 dm. tall: leaf-blades thinnish, mainly cuneate, often inequilateral: staminate calyx 1.5 mm. wide; sepals suborbicular: mature pistillate calyx about 3 mm. wide; sepals obovate to elliptic: capsule less than 1.5 mm. wide.—Pinelands, Everglade Keys, Fla. and lower Florida Keys.—(*W. I.*)—All year.

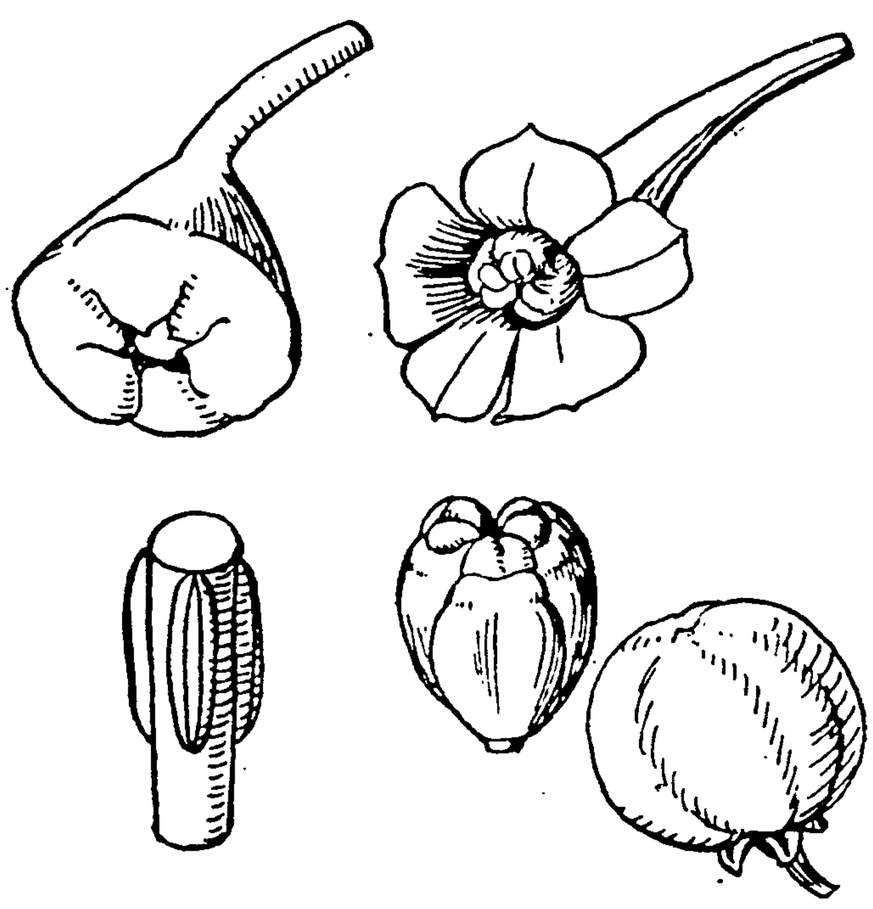
7. **P. platylepis** Small. Plant 1.5–4 dm. tall: leaf-blades obovate to elliptic-obovate: staminate calyx about 3 mm. wide; sepals elliptic to obovate: mature pistillate calyx about 6 mm. wide; sepals suborbicular to rhombic-orbicular, abruptly pointed: capsule 4–5 mm. wide.—Low hammocks, Gulf Hammock region, W pen. Fla.—All year.

4. **CICCA** L. Shrubs or trees. Leaf-blades entire. Flowers similar to those of *Phyllanthus*, but with vertically opening anther-sacs. Fruit baccate.—About 12 species, tropical.



1. **C. disticha** L. Shrub or small tree, the branchlets spreading or drooping, glabrous: leaves various, those near the base of the branchlets with suborbicular to orbicular-ovate blades 1.5–3 cm. long, those above them with larger ovate to elliptic-lanceolate blades: larger sepals suborbicular to orbicular-obovate, 1.5–2 mm. long: berry depressed, 1.5–2 cm. broad.—(OTAHEITE-GOOSEBERRY. GOOSEBERRY-TREE.)—Pinelands and waste-places, Everglade Keys, Fla. and Florida Keys. Nat. of E. I. and cult.—(*W. I.*)—All year.—Plants usually bear an abundance of fruits. These are light-green and very acid. They are used for making pies, preserves, and wine. The root and leaves are medicinal.

5. **BREYNIA** Forst. Shrubs or trees. Leaves alternate: blades broad, entire. Flowers solitary in the axils, or the staminate few together. Staminate flower with a turbinate calyx-tube and 6 minute broad lobes surrounding the minute orifice: stamens erect, united, the narrow anthers opening vertically. Pistillate flower with a short, broad calyx-tube and 6 very broad imbricate lobes: overy 3-celled: styles very short: stigmas 2-lobed. Berry depressed.—About 15 species, natives of Asia and Oceania.



1. **B. nivosa** (W. J. Smith) Small. Shrub with irregularly and loosely branched stems, the branches dark-red: leaves somewhat distichously spreading; blades oval, varying to ovate or obovate, green and white, varie-

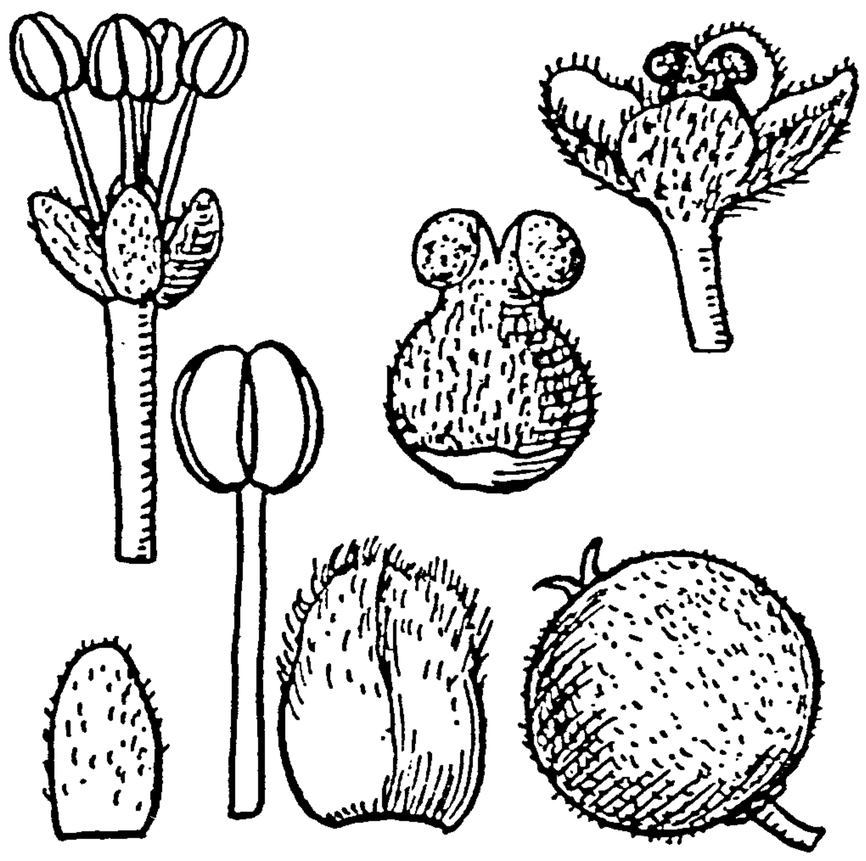
gated with red and pink; staminate calyx about 3 mm. wide, the lobes shallow: pistillate calyx 8–10 mm. wide, the lobes reniform: capsule 9–12 mm. broad.—(SNOWBUSH.)—Pinelands and waste-places. Everglade Keys, Fla.—Nat. of South Sea Islands, and cult.—(*W. I.*)—All year.—A very ornamental hedge-plant in pen. Florida. The leaves are well-colored and mottled with white. The flowers are mainly greenish and inconspicuous.

6. **DRYPETES** Vahl. Shrubs or trees. Leaf-blades entire or undulate-toothed. Flowers apetalous, green or brownish. Staminate flowers in rather dense clusters, with 4–8 sepals and 4–16 stamens. Pistillate flowers few in a cluster, with 4–8 sepals and a 1–2-celled ovary. Fruit a berry or a drupe.—About 10 species, West Indian and South American.

Sepals 4: gynoecium 2-carpellary: drupe subglobose, less than 15 mm. long. 1. *D. lateriflora.*

Sepals 5: gynoecium 1-carpellary: drupe elongate, over 15 mm. long. 2. *D. diversifolia.*

1. **D. lateriflora** (Sw.) Krug & Urban. Shrub, or tree becoming 10 m. tall, with brownish bark: leaf-blades elliptic or nearly so: stamens 4: drupe 9–11 mm. in diameter, red, ripe in spring or summer. — (GUIANA-PLUM.) — Hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—Fall–wint.—The sap-wood is yellow; the dark-brown heart-wood, close-grained, heavy, hard, but brittle, is used in cabinet-work.



2. **D. diversifolia** Krug & Urban. Shrub, or tree becoming 12 m. tall, with milk-white roughish bark: leaf-blades oblong, elliptic or oval: stamens 8: drupe 2–2.5 cm. long, ripe in fall. [*D. keyensis* Krug & Urban]—(WHITEWOOD.)—Hammocks, Cape Sable region, Fla. and Florida Keys.—(*W. I.*)—Spr.—The sap-wood is yellowish-brown; the brown and yellow streaked heart-wood, close-grained, heavy, hard, but brittle, is used in cabinet-work.

7. **CROTON** L. Shrubs or herbs. Leaf-blades entire, toothed, or lobed. Flowers mostly green, usually spicate or racemose. Staminate flower with 4–6, usually 5, sepals, small, often rudimentary, petals alternating with glands, and 6–many stamens, rarely less. Pistillate flower with 5–10 sepals, usually no petals and a 3-celled ovary. Fruit a capsule.—About 650 species, widely distributed in warm and tropical regions.

Staminate and pistillate flowers with petals. I. ALABAMENSES.

Staminate flowers with petals, or both staminate and pistillate flowers without petals.

Petals present in the staminate flowers, wanting or rudimentary in the pistillate.

Plant with scaly foliage. II. ARGYRANTHEMI.

Plant with stellate-pubescent foliage.

Pistillate calyx mostly not accrescent: leaf-blades entire.

Leaves with blades of an ovate or elliptic type. III. FRUTICULOSI.

Leaves with blades of a linear or narrowly elliptic type. IV. LINEARES.

Pistillate calyx mostly accrescent: leaf-blades toothed or entire. V. GLANDULOSI.

Petals wanting in both the staminate and the pistillate flowers. VI. PUNCTATI.

I. ALABAMENSES

Evergreen shrub, with leaf-blades silvery-scaly beneath. — 1. *C. alabamensis.*

II. ARGYRANTHEMI

Perennial herb, the stem often branched at the base: leaves, beneath, and inflorescence silvery-scaly. — 2. *C. argyranthemus.*

III. FRUTICULOSI

Shrub with slender branches: leaves with very slender petioles, the blades of an ovate or elliptic type. — 3. *C. Berlandieri.*

IV. LINEARES

Leaf-blades narrowly linear, glabrate above, yellow-pubescent beneath. — 4. *C. linearis.*

Leaf-blades narrowly elliptic to broadly linear, stellate above, white-pubescent beneath. — 5. *C. Fergusonii.*

V. GLANDULOSI

Leaves with prominently toothed blades.

Calyx, and capsule, glabrous or merely with few short appressed stellate hairs. — 6. *C. floridanus.*

Calyx, and capsule, pubescent with long hirsute or hispid branching hairs.

Leaf-blades shallowly crenate to shallowly serrate.

Seed elliptic, minutely punctate, dull: leaf-blades crenate. — 7. *C. arenicola.*

Seed oval or ovoid, smooth and shining: leaf-blades serrate or crenate-serrate. — 8. *C. glandulosus.*

Leaf-blades coarsely crenate or crenate-dentate. — 9. *C. miquelensis.*

Leaves with entire blades, except in *C. Engelmannii.*

Pistillate flowers not pendulous from the base of the raceme.

Lower leaves with lanceolate, oval, or ovate blades: sepals not hooded.

Petioles long: tomentum of inflorescence purplish. — 10. *C. capitatus.*

Petioles short: tomentum of inflorescence yellowish. — 11. *C. Engelmannii.*

Lower leaves with linear or linear-lanceolate blades: sepals hooded. — 12. *C. Elliottii.*

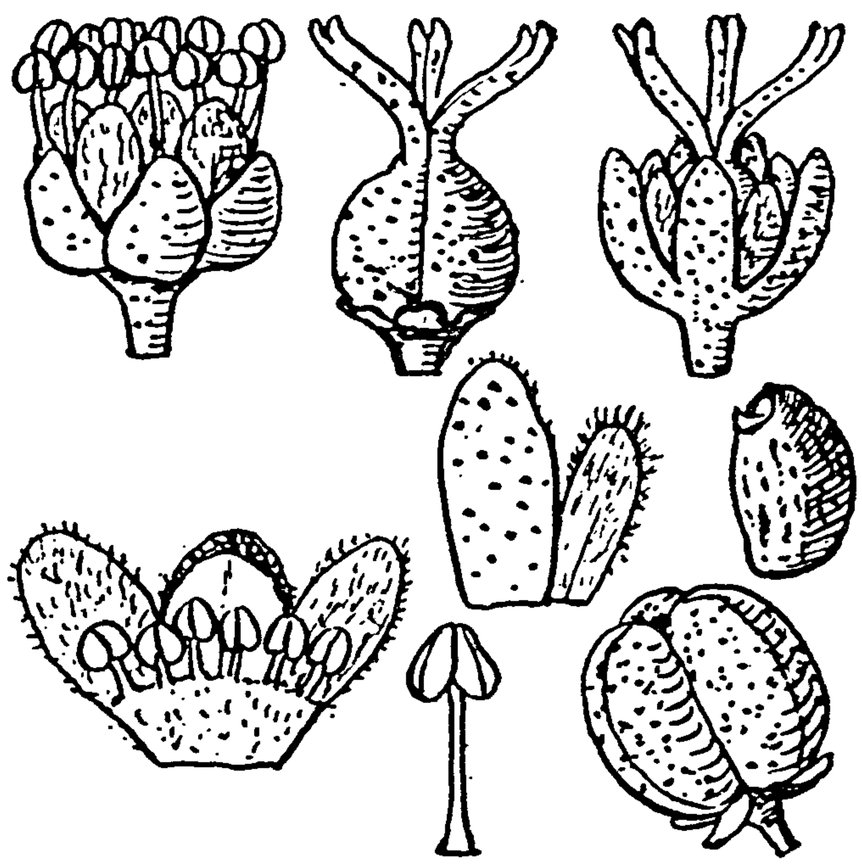
Pistillate flowers early drooping from the base of the raceme. — 13. *C. monanthogynus.*

VI. PUNCTATI

Plant perennial, more or less woody: leaves stout petioled. — 14. *C. punctatus.*

Plant annual, herbaceous: leaves with slender petioles. — 15. *C. texensis.*

1. C. alabamensis E. A. Smith. Shrub 2–3 m. tall: leaf-blades evergreen, elliptic to elliptic-lanceolate, 5–8 cm. long, green and glabrate above, clothed beneath with silvery overlapping scales: staminate flowers 10–20; sepals and petals ciliate; stamens 10–25; pistillate flowers 4–7; sepals 3–4 mm. long; petals scaly without; glands 5: capsule 6–8 mm. long: seed oval, 5–7 mm. long.—River-bluffs of shale and limestone, Tuscaloosa and Bibb Counties, Appalachian Plateau, Ala.—Spr.



2. C. argyranthemus Michx. Perennial herb, 3–6 dm. tall: leaf-blades obovate to oval, or elliptic to elliptic-lanceolate above, 1–5 cm. long, blunt, scaly or glabrate above, clothed with silvery scales beneath: staminate flowers often 10–15; sepals lanceolate, acute; petals elliptic, scaly without; stamens mostly 10; filaments swollen at the base: pistillate flowers few; sepals partly united, acute; capsule globular or oval-globose, about 5 mm. long: seed less than 5 mm. long.—Sandhills and pinelands, Coastal Plain and SW provinces, Fla. to Tex. (N. M.?) and Ga.—Sum.

3. **C. Berlandieri** Torr. Shrub 3–8 dm. tall: leaf-blades ovate to elliptic, 2.5–3.5 cm. long, usually abruptly acute, the edges slightly repand and glandular, rounded or subcordate at the base, tomentose above when young, paler below: staminate flowers on slender pedicels, with 15–20 stamens (30–35 in western forms): pistillate flowers 2–6 at base of raceme, usually short-pedicelled; sepals elliptic-spatulate with sessile or short-stipitate marginal glands; styles 3, palmately 4-parted or twice 2-parted: capsule globose, 4–5 mm. high.—Sandy soil, thickets, and waste-places, Key West, Fla. and coastal region, S. Tex.—(*Mex.*)—Spr.–fall.

4. **C. linearis** Jacq. Shrub 6–20 dm. tall: leaf-blades narrowly linear, 4–7 cm. long, obtuse, dark-green and smooth above, yellowish-pubescent beneath: racemes 4–8 cm. long or longer: sepals 5–6, triangular: petals spatulate, surpassing the sepals, obtuse, ciliate: stamens about 15: pistillate racemes 4–5 cm. long, frequently exceeded by the leaves: sepals narrow, acuminate: capsule subglobose, 5 mm. high, yellowish-floccose: seed broadly elliptic, about 3 mm. long.—Pinelands and coastal sand-dunes, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—All year.—The leaves of this species are used for tea.

5. **C. Fergusonii** Small. Shrub 4–12 dm. tall: leaf-blades narrowly elliptic to broadly linear, 3–6 cm. long, blunt, entire, white-pubescent beneath, the upper surface channeled and green but minutely stellate: staminate flowers 12–25 in stout interrupted racemes 3–5 cm. long: sepals deltoid, acute: petals spatulate, 2.5–3 mm. long, surpassing the sepals, ciliate: stamens about 15: pistillate flowers about 6, in racemes 2–3 cm. long: capsule subglobose, about 5 mm. long: seed 3.5–4 mm. long.—Pinelands, S pen. Fla.—All year.

6. **C. floridanus** Ferguson. Herb 2–5 dm. tall: leaf-blades various, those of the lower leaves elliptic to ovate, those above elliptic to lanceolate, 1–2 cm. long, serrate-crenate: racemes 2–4 cm. long: staminate flowers inconspicuous; sepals ovate or elliptic-ovate; petals elliptic or nearly so, narrower than the sepals, ciliate; stamens about 10: pistillate flowers solitary or several below the staminate, subtended by deltoid bracts; sepals linear to oblanceolate or spatulate, accrescent: capsule oblong-oval, about 4 mm. long: seed oval, about 3 mm. long.—Sand-dunes, pen. Fla.—Spr.–fall.

7. **C. arenicola** Small. Herb 1.5–4.5 dm. tall: leaf-blades ovate to elliptic-ovate, 1–3 cm. long, blunt, coarsely toothed: staminate sepals elliptic or oval, acute; petals elliptic to oblanceolate: stamens 9–12: pistillate flowers solitary or 2–3 below the staminate; sepals spatulate, accrescent: capsule globose-oval, 4.5–5 mm. long: seed 3–3.5 mm. long.—Pinelands and sand-dunes, Everglade Keys, Fla. and Florida Keys.—All year.

8. **C. glandulosus** L. A tropical American species represented in our area by the following: *C. glandulosus septentrionalis* with coarsely-stellate foliage and serrate mainly elliptic leaf-blades, ranges in various provinces, from Fla. to Tex., Ia., and Va.; *C. glandulosus Simpsonii* with densely stellate foliage and coarsely serrate-crenate ovate leaf-blades, occurs in S pen. Fla. and on the Keys; *C. glandulosus angustifolius* with thinly appressed stellate foliage and linear remotely serrate upper leaf-blades, occurs in Fla. and Tex.—Spr.–fall or all year S.

9. **C. miquelensis** Ferguson. Herb 3–5 dm. tall: leaf-blades ovate to lanceolate, 2–4 cm. long, acute or acutish, crenate or dentate-serrate, finely pubescent beneath, biglandular at the base, slender-petioled: racemes sessile or nearly sessile, short: staminate flowers inconspicuous; sepals ovate; petals narrowly oblong, ciliate; stamens 8–10: pistillate flowers 3 or 4, subtended by ovate bracts; sepals lanceolate; petals obsolete or rudimentary: capsule globose, 3.5–4 mm. long: seed oval, 3–3.5 mm. long, the caruncle minute.—Woods and waste-grounds, W Fla. Nat. of S. A.—Spr.–fall.

10. C. capitatus Michx. Herb 5–20 dm. tall: leaf-blades various, those of the lower leaves oval, those of the upper elliptic, 2–5 cm. long, mucronate, entire, rounded or rarely cordate at the base, velvety above, densely stellate-tomentose and paler beneath: racemes 1–3 cm. long, with loose purplish-tinged tomentum: staminate flowers short-pedicelled; sepals 5, oval, nearly equal; petals 5, spatulate, ciliate; stamens 7–12; filaments pubescent below: pistillate flowers usually clustered below the staminate; sepals 6–8, elliptic to oblanceolate; styles 3, 2–3 times 2-cleft, 5–6 mm. long: capsule globular, 7–9 mm. long: seed suborbicular, 5 mm. long.—(HOGWORT. WOOLLY-CROTON.)—Waste-places, various provinces, Ga. to Tex., Ia., and S N. Y.—Spr.–fall or all year S. Introduced, at least eastward.

11. C. Engelmannii Ferguson. Herb 5–20 dm. tall: leaf-blades lanceolate, those of the lower leaves 10–20 cm. long (white in *C. Engelmannii albinoides* and broadly ovate), those of the upper much shorter, acute or somewhat acuminate, often shallowly and unevenly toothed, rounded or usually cordate at the base: racemes 5–15 cm. long, with yellow-tinged tomentum: staminate flowers distinctly pedicelled; sepals ovate, acute; petals spatulate, ciliate; stamens 9–12; filaments stellate-pubescent below: pistillate flowers usually 3, short-pedicelled; sepals 7–8, acuminate, the inner ones smaller; styles 3, twice 2-cleft, 6–10 mm. long: capsule depressed, 6–8 mm. long: seed oval-orbicular, 4.5–5 mm. long.—Dry soil, Coastal Plain, Fla. to Tex., Ark., and Ga.—Sum.–fall.

12. C. Elliottii Chapm. Herb 5–9 dm. tall: leaf-blades linear or linear-lanceolate, 4–5 cm. long, or shorter above, entire, usually blunt, 3-nerved at the narrowed base, velvety-stellate, gray-tomentose beneath, slender-petioled: racemes 1–2 cm. long: staminate flowers short-pedicelled; sepals 5, narrowly elliptic; petals linear, ciliate; stamens 8–10: pistillate flowers clustered; sepals 6–7, unequal; styles 3, twice 2-cleft, 2–3 mm. long: capsule globose, 4–5 mm. long, sometimes surpassed by the accrescent hooded sepals: seed oval, 3–4 mm. long. —Pinelands, Fla. to S. C.—Sum.–fall.—Rare.

13. C. monanthogynus Michx. Herb 3–5 dm. tall: leaf-blades various, those of the lower leaves suborbicular, those of the upper ovate to elliptic-ovate, 1–4 cm. long, or slightly longer, usually mucronate, entire: racemes about 1 cm. long: staminate flowers short-pedicelled; sepals 3–5, ovate; petals spatulate, ciliate; stamens 3–10: pistillate flowers 1–4 below the staminate, nodding at maturity; sepals 5, elliptic; ovary 2-celled: capsule ovoid or oval, 3–4 mm. long: seed solitary by the abortion of one ovule, 2.5–3.5 mm. long.—(PRAIRIE-TEA.)—Limestone outcrops and waste-places, various provinces, rarely Coastal Plain, Ga. to Tex., Ia., and Ind.—(*Mex.*)—Sum.–fall.

14. C. punctatus Jacq. Plant partly woody, 5–12 dm. tall: leaf-blades elliptic or ovate, 1–5 cm. long, entire or merely undulate: pistillate sepals triangular, nearly equal; stamens normally 12, barely exserted; filaments pubescent: pistillate flowers solitary or 2 or 3 together; sepals elliptic or cuneate, not accrescent: capsule subglobose, 5–8 mm. long: seed about 6 mm. long. [*C. maritimus* Walt.]—(SILVER-LEAF CROTON. BEACH-TEA.)—Sand-dunes, Coastal Plain, Fla. to Tex. and N. C.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall or all year S.

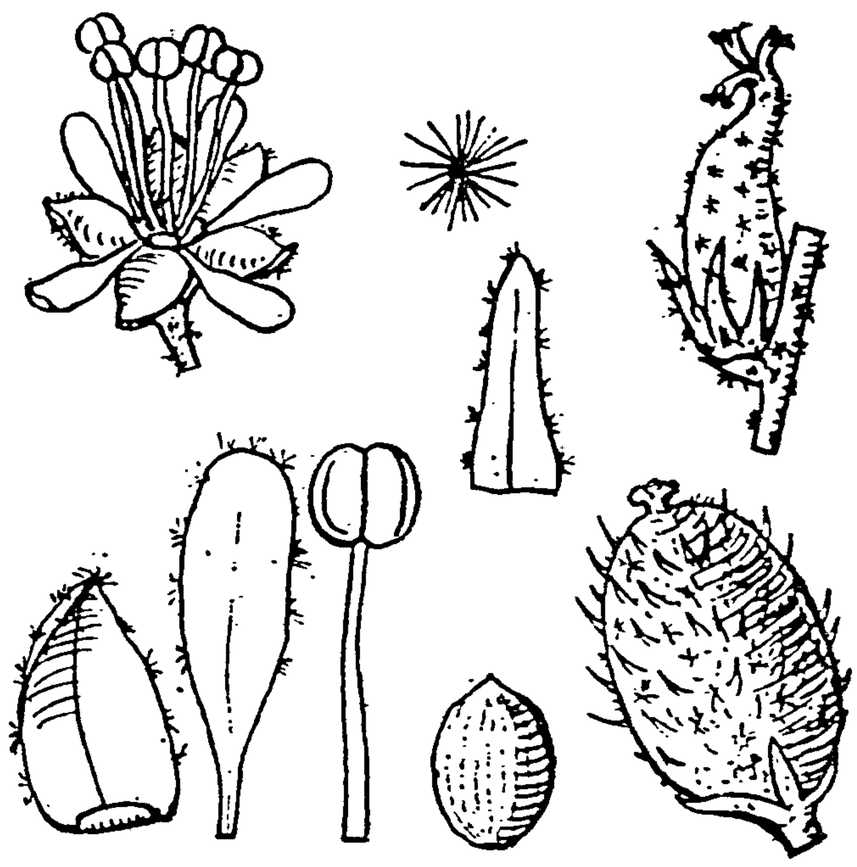
15. C. texensis (Kl.) Muell. Arg. Plant herbaceous, 4–16 dm. tall: leaf-blades linear-lanceolate or elliptic, those of the staminate plant the narrower, 4–12 cm. long, entire, rounded or blunt at the apex: racemes few-flowered: staminate flowers in racemes 1–3 cm. long; sepals elliptic to ovate-elliptic; stamens 8–12; filaments pubescent: pistillate flowers 2–4-together or solitary; sepals triangular: capsule oval or globular, 4–6 mm. long: seed orbicular, 3–5 mm. long.—(SKUNK-WEED.)—Dry soil, low hills and plains, various provinces, Ala., to Ariz., Wyo., S. D., and Ill.—(*Mex.*)—Sum.–fall or all year S.

8. CROTONOPSIS Michx. Annual herbs, covered, except the upper surface of the leaves, with silvery appressed peltate stellate scales. Leaf-blades entire, upper surface with slender-rayed stellate hairs. Flowers monoecious, green or greenish-white. Staminate flowers with 5 sepals, 5 petals, and 5 stamens. Pistillate flowers with 3–5 sepals, no petals, and a 1-celled ovary. Fruit an achene-like capsule, erect.—Two species.—RUSHFOILS.

Staminate flowers with petals longer than the sepals: filaments longer than the sepals: spikes long, with 3–6 fruits: fruit ellipsoid, without veins on the sides, the scales with minute disks fringed with irregular lax stellately spreading rays: stellate hairs on upper surface of leaf with short rays. 1. *C. linearis.*

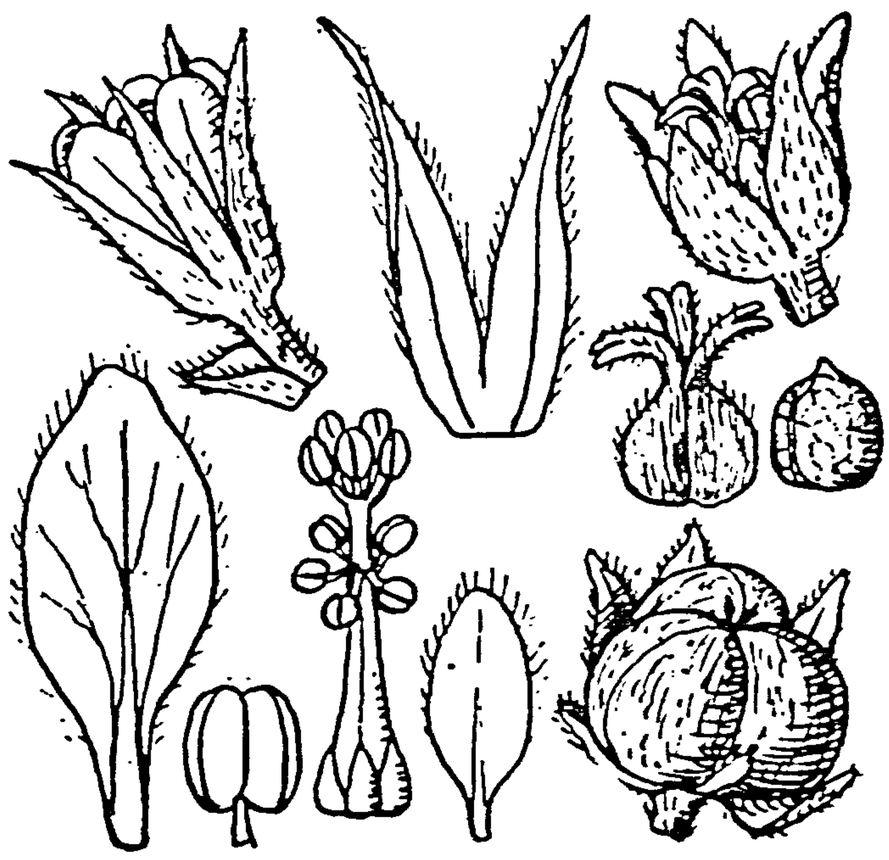
Staminate flowers with petals equalling the sepals: filaments shorter than the sepals: spikes short, with 1 or 2 fruits: fruit ovoid, with an evident vein on each side, the scales umbonate to tubercular-spiny, the margin with relatively uniform, appressed rays: stellate hairs on upper surface of leaf with long rays. 2. *C. elliptica.*

1. C. linearis Michx. Plant 3–8 dm. tall, the scales with small disks fringed with irregular lax stellately spreading rays: leaf-blades narrowly elliptic, linear-lanceolate, or linear: spikes elongate, with 3–6 fruits: staminate flower with ovate or oval sepals and spatulate petals: pistillate flower with linear or linear-lanceolate sepals; fruit ellipsoid, 2.5–3 mm. long, the stellate scales with blunt or spine-tipped disks; seeds 2–2.5 mm. long or more, slightly ridged, often bronze-colored. [*C. spinosa* Nash]—Dry acid sandy soil, flat rocks, and barren prairies, Coastal Plain and occasionally adj. provinces, Fla. to Tex., and S. C.—Spr.–fall.



2. C. elliptica Willd. Plant 1–4 dm. tall, the scales with large disks surrounded by finely radiating closely appressed rays: leaf-blades ovate-elliptic, ovate-lanceolate, lanceolate or linear-lanceolate: spikes short, appearing axillary, bearing 1 or 2 fruits: staminate flower with obovate sepals and spatulate petals: pistillate flower with ovate sepals: fruit ovoid, 2.5–3.2 mm. long, the radiate scales with umbonate to tuberculate-spiny disks: seed about 2–2.5 mm. long, brown, smooth.—Dry sandy soil, various provinces, rarely Coastal Plain, Fla. to Tex., Kans., and Conn.—Sum.–fall.

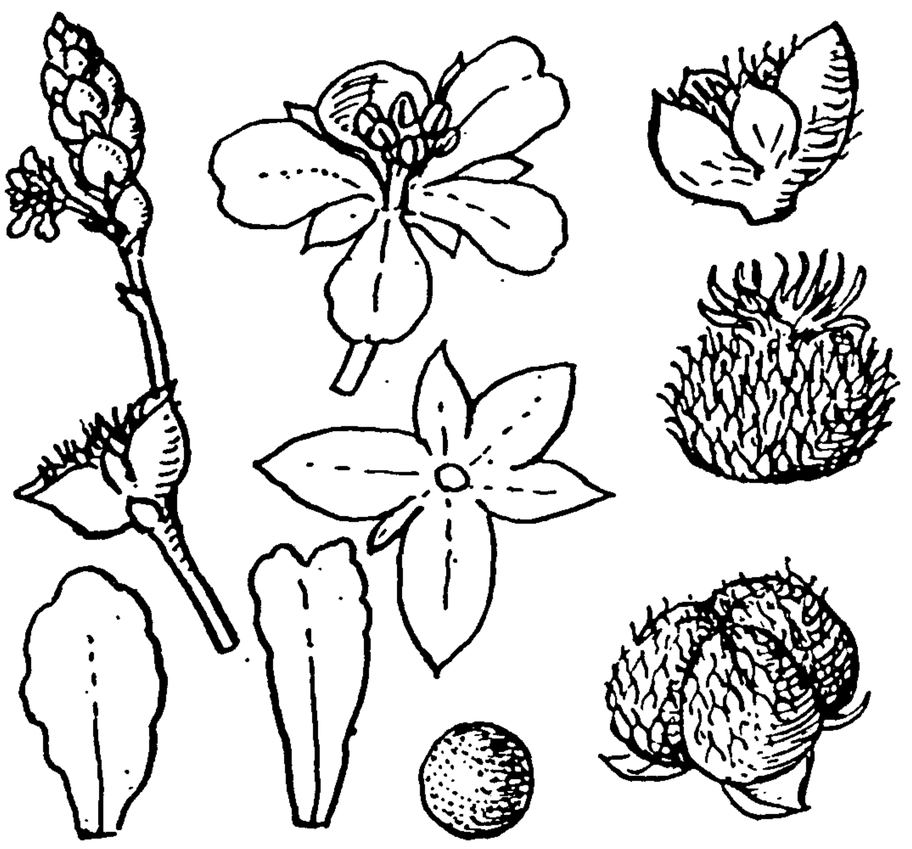
9. DITAXIS Vahl. Shrubs or perennial herbs. Leaves alternate: blades entire or rarely toothed. Flowers inconspicuously bracted, green. Staminate flower with 4 or 5 sepals, 4 or 5 petals, and 10 stamens or sometimes fewer. Pistillate flower with a perianth similar to that of the staminate, but with smaller or rudimentary petals, and a 3-celled ovary. Capsule depressed.—About 20 species.



1. D. Blodgettii (Torr.) Pax. Plants 1–6 dm. tall: leaf-blades oval or elliptic, or those of the lower leaves spatulate, 1.5–4 cm. long: staminate calyx 7–8 mm. wide; sepals lanceolate; petals broadly elliptic, shorter than the sepals: mature pistillate sepals lanceolate to linear-lanceolate, 5–6

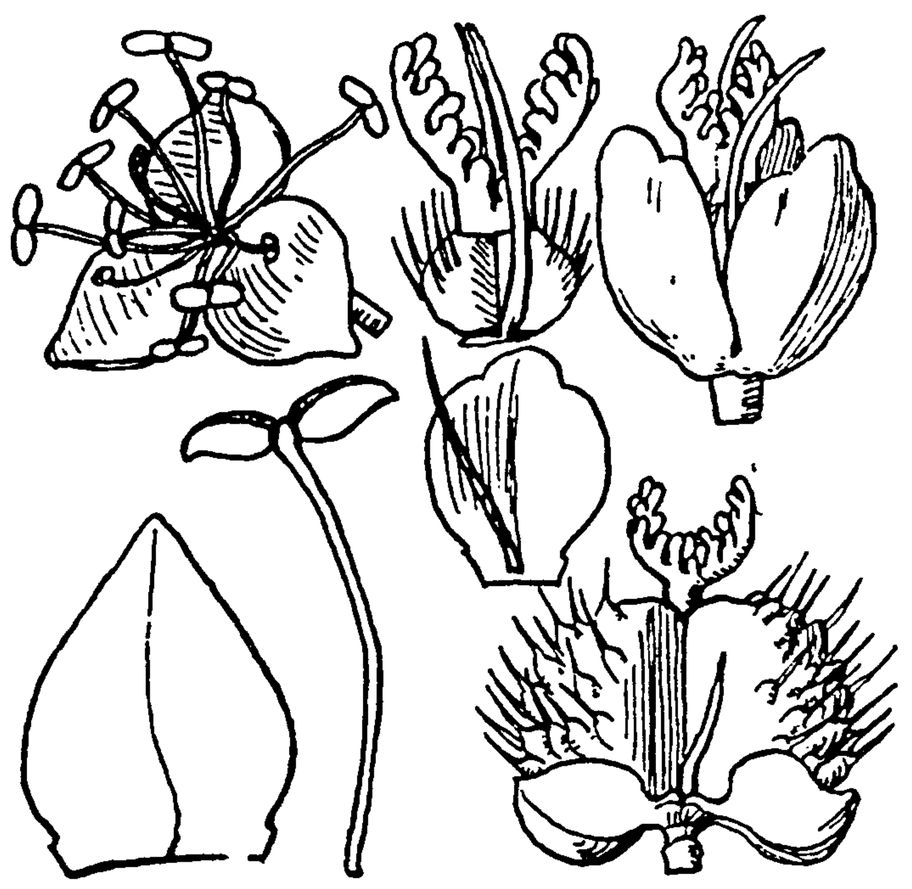
mm. long: capsule 4–5 mm. wide.—Pinelands and hammocks, Everglade Keys, Fla. Florida Keys.—All year.

10. CAPERONIA St. Hil. Herbs or partially woody plants, mostly monoecious. Leaves alternate: blades toothed. Flowers in elongate, interrupted spike-like racemes, green. Staminate flowers approximate, with 5, unequal sepals, 5 petals and 10 stamens or fewer, through abortion. Pistillate flowers separated, with 5 sepals, 5 petals, smaller than those of the staminate flower, and a 3-celled ovary. Capsule 3-lobed, depressed. Seed without a caruncle.—About 20 species, tropical American.



1. C. castaneàefolia (L.) St. Hil. Plant 1 m. tall or less, with spreading or decumbent branches: leaf-blades obovate, elliptic, oval, elliptic-lanceolate or ovate, mostly 2–6 cm. long, rather coarsely toothed, petioled: larger staminate sepals about 2.5 mm. long: petals obovate, 3–3.5 mm. long: sepals and petals of the pistillate flowers smaller than those of the staminate: capsule depressed, 6–7 mm. wide: seed globose, about 3 mm. in diameter.—Wet soil, Everglades, about the Everglade Keys, pen. Fla.—(*W. I.*)—All year.

11. MERCURIALIS L. Herbs or parly woody mostly dioecious plants. Leaves opposite: blades often toothed. Flowers green, apetalous. Staminate flower with 3 sepals and 8–20 stamens. Pistillate flower with 3 sepals and a 2-celled ovary. Stigmas pinnatifid. Capsule 2-lobed.—About 7 species, natives of the Old World.—DOG'S-MERCURIES.



1. M. annua L. Stem 2–6 dm. tall: leaf-blades ovate to lanceolate: staminate flowers in spikes which surpass the leaves: capsule 4–5 mm. broad, hispid.—(HERB-MERCURY.)—Waste-places, various provinces, Fla. to Tex., Ohio and Del., and locally further NE. Nat. of Eu. and Africa.—(*W. I.*)

12. ACALYPHA L. Herbs or shrubs, monoecious or sometimes dioecious. Leaf-blades entire or toothed. Flowers green (in our species). Staminate flower with 4 sepals and 8–16 stamens. Pistillate flower with 3–5 sepals and a 3-celled ovary, each flower subtended by a foliaceous bract. Capsule somewhat 3-lobed.—About 250 species most abundant in subtropical and tropical regions.—Spr.–fall, or all year S.—THREE-SEEDED MERCURIES. TAR-WEEDS. COUPLE-CAPS.

Staminate and pistillate flowers in the same spike: capsule glabrous or pubescent. I. CORCHORIFOLIAE.

Staminate and pistillate flowers in separate spikes: capsule tuberculate-echinate. II. OSTRYAEFOLIAE.

I. Corchorifoliae

Plant annual.
- Bracts subtending the pistillate flowers with 5–7, or rarely 9, long, elliptic to lanceolate, acute or obtusish lobes: leaves of the main stem with ovate or rhombic-ovate blades. — 1. *A. rhomboidea.*
- Bracts subtending the pistillate flowers with 9–15 short lobes or teeth: leaves of the main stem with mostly ovate-lanceolate to linear blades.
  - Bracts of the pistillate flowers with lanceolate acute lobes: blades of the cauline leaves broadly to narrowly lanceolate, tapering to a blunt tip. — 2. *A. virginica.*
  - Bracts of the pistillate flowers with ovate to deltoid lobes: blades of the cauline leaves elliptic-lanceolate to linear, obtusish; petioles a fourth to a tenth as long as the blades. — 3. *A. gracilens.*

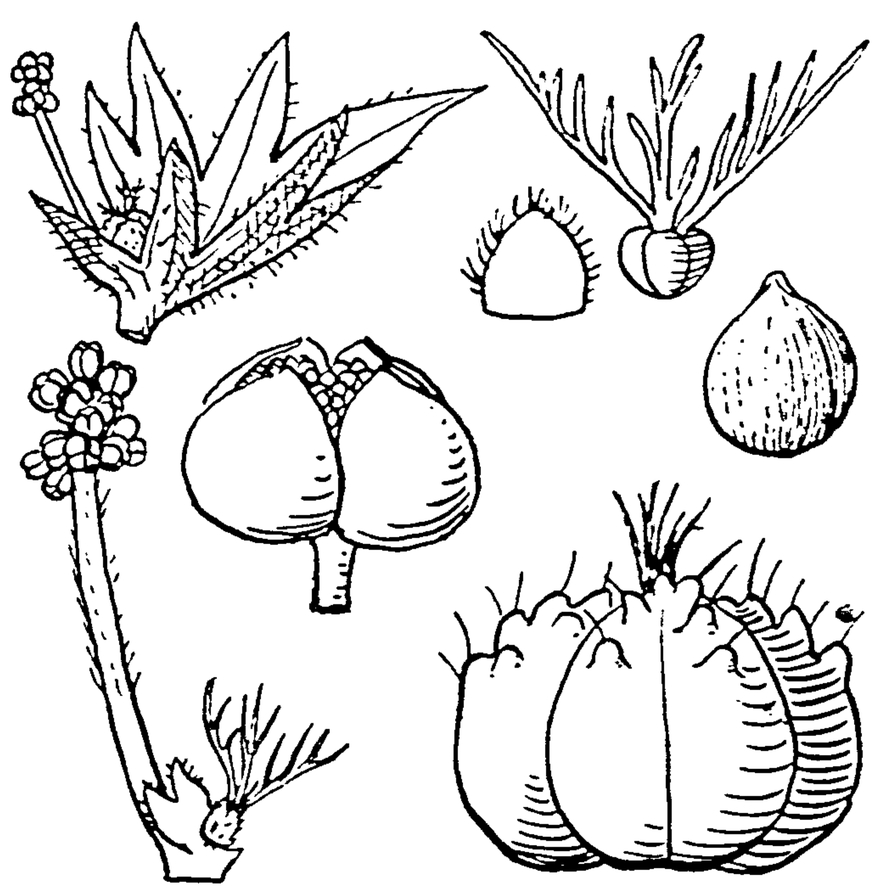
Plant perennial, prostrate: stems wire-like: seeds barely 1 mm. long. — 4. *A. chamaedrifolia.*

II. Ostryaefoliae

Mature pistillate spikes slender, interrupted, not plumose; bracts with lanceolate or subulate scabrous lobes: capsule depressed.
- Bracts with lanceolate lobes about as long as the body: capsule about 3.5 mm. wide, echinate-tuberculate: seed tubercled. — 5. *A. ostryaefolia.*
- Bracts with slender-subulate lobes much longer than the body: capsule about 2.5 mm. wide, sparingly pubescent: seed obscurely pitted. — 6. *A. setosa.*

Mature pistillate spikes stout, continuous, plumose; bracts with slender-caudate long-ciliate lobes: capsule globose-ovoid. — 7. *A. alopecuroidea.*

1. A. rhomboidea Raf. Stem 1–7 dm. tall: blades of the cauline leaves ovate to rhombic-ovate, 2–10 cm. long, glabrous except for a few long scattered hairs: bracts of the pistillate flowers, at least when young, with long stipitate whitish glands, ciliate, but not hispid: capsule 2.5–3 mm. in diameter: seeds 1.5–1.8 mm. long.—Woods and thickets, various provinces, Fla. to Nebr., Minn., Que., and Me.—Plant is reputed to have medicinal properties.



2. A. virginica L. Stem 2–5 dm. tall, with a few long spreading hairs, or often villous: blades of the cauline leaves broadly to narrowly lanceolate, 2–6 cm. long, finely toothed, finely pubescent: bracts of the pistillate flowers hispid on the veins and margins, usually not glandular: capsule 2.5–3 mm. in diameter: seed about 1.5 mm. long.—Woods and stream-banks, various provinces, Ga. to Tex., Mo., and Mass.

3. A. gracilens A. Gray. Stem 1–8 dm. tall, puberulent to pubescent with incurved or ascending hairs: blades of the cauline leaves elliptic-lanceolate to elliptic (or linear, often elongate-linear, in *A. gracilens Fraseri*), 1–6.5 cm. long, shallowly toothed, finely pubescent: bracts of the pistillate flowers sparsely beset with whitish or red sessile glands, ciliate to copiously pubescent: capsule about 2 mm. in diameter: seeds 1.5–2 mm. long.—Dry woods, hillsides, sandy banks, and old fields, various provinces, Fla. to Tex., Mo., Wisc., and Mass.

4. A. chamaedrifolia (Lam.) Muell Arg. Stem and branches mostly prostrate, 5–30 cm. long: blades of the upper leaves ovate to elliptic-lanceolate, 7–20 mm. long, crenate–serrate: larger bracts 4–6 mm. long, toothed: capsule

nearly 2 mm. in diameter.—Pinelands and sandy places, Everglade Keys, pen. Fla. and Florida Keys.—(*W. I.*).

5. A. ostryaefolia Ridd. Stem 3–8 dm. tall, closely fine-pubescent: leaf-blades ovate, 5–10 cm. long, serrate: larger bracts of the pistillate spike 4–5 mm. long, with lanceolate lobes: capsule about 3.5 mm. wide: seed broadly ovoid, 2 mm. long, finely tuberculate. [*A. caroliniana* Authors, not Ell.]—Thickets and waste-places, various provinces, Fla. to Tex., Kans., and N. J.—(*W. I., Mex.*)

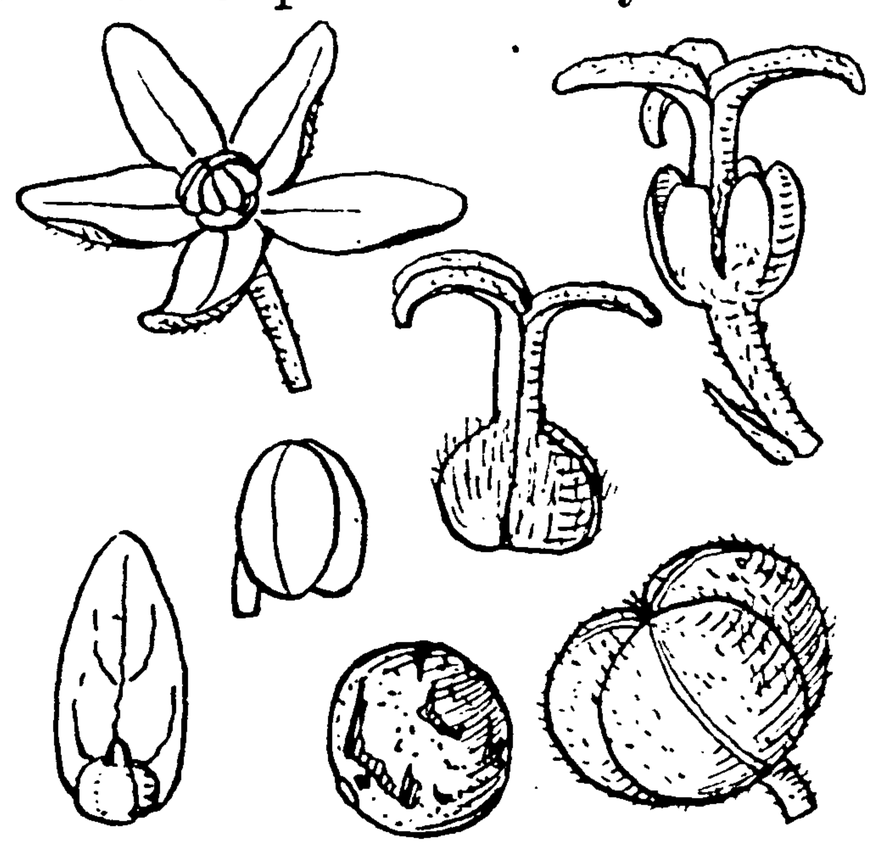
6. A. setosa A. Rich. Stem 1 m. tall or less, usually glabrous: leaf-blades ovate or orbicular-ovate, 3–9 cm. long, rather finely serrate: larger bracts of the pistillate spike 3–4 mm. long, with slender-subulate lobes: capsule about 2.5 mm. wide: seed oval-ovoid, about 1.5 mm. long, obscurely pitted.—Woods, waste-places, and roadsides, pen. Fla. Nat. of Cuba.—(*W. I., Mex., C. A., S. A.*)

7. A. alopecuroidea Jacq. Stem mostly less than 1 m. tall, often widely branched, glandular-pubescent: leaf-blades ovate, usually broadly so, 2–8 cm. long, finely serrate: larger bracts of the pistillate spike about 8 mm. long, with slender-caudate long-ciliate lobes: capsule globose-ovoid; seed fully 1 mm. long, minutely pitted.—Waste-places and roadsides, Coastal Plain, Ala. Nat. of S. A.—(*W. I., Mex., C. A.*)

13. TRAGIA [Plum.] L. Herbs or shrubs. Leaf-blades entire, toothed, or lobed. Flowers green or purple, on a slender rachis, racemose. Staminate flower with 3–5 sepals and 1–3, or rarely more, stamens. Pistillate flower with 3–8 entire or pinnatifid sepals and a 3-celled ovary. Capsule prominently 3-lobed.—About 50 species, most abundant in tropical regions.—Spr.–fall or all year S.

Stem not twining: leaf-blades not conspicuously long-petioled.
  Leaf-blades linear, entire. — 1. *T. linearifolia.*
  Leaf-blades broader and manifestly broadest above or below the middle.
    Leaves with more or less cuneately narrowed blades. — 2. *T. urens.*
    Leaves, at least the lower ones, truncate or cordate at the base.
      Leaf-blades of a triangular or lanceolate type. — 3. *T. urticaefolia.*
      Leaf-blades of a suborbicular, oval, or elliptic type.
        Leaf-blades slender-petioled, cordate or subcordate at the base, the teeth sharp. — 4. *T. saxicola.*
        Leaf-blades sessile or very short-petioled, obtuse or truncate at the base, the teeth rounded. — 5. *T. betonicaefolia.*
Stem twining: leaf-blades conspicuously long-petioled. — 6. *T. macrocarpa.*

1. T. linearifolia Ell. Plant 1–5 dm. tall: leaf-blades linear, 3–12 cm. long, undulate: staminate calyx 3–3.5 mm. wide: mature pistillate calyx 5 mm. wide; sepals ovate: capsule 7–8 mm. wide, strigillose.—Pinelands and sandhills, Coastal Plain, Fla. to Ala.



2. T. urens L. Plant 1–4 dm. tall, green: leaf-blades elliptic above the cuneate base to cuneate, 2–5 cm. long, irregularly few-toothed: staminate calyx about 3 mm. wide; sepals lanceolate to ovate: mature pistillate calyx 4–4.5 mm. wide; sepals linear: capsule 8-10 mm. wide, hirsutulous: seed 3.5–4 mm. long. [*T. innocua* Walt.]—Dry, often acid soil, Coastal Plain, Fla. to Tex. and S Va.

3. T. urticaefolia Michx. Plant 1–4 dm. tall: leaf-blades triangular or lanceolate, those of the lower leaves typically broadly lanceolate, 3–7 cm. long: staminate calyx 2.5–3 mm. wide; sepals ovate to suborbicular: mature pistillate calyx 11–12 mm. wide; sepals lanceolate: capsule 7–10 mm. wide, hirsutulous: seed 3.5–4 mm. long.—Dry sandy soil, Coastal Plain and occasionally adj. provinces, Fla. to Tex., Ark., Tenn. and S. C. (or Va. ?)

4. T. saxicola Small. Plant 0.5–2 dm. tall: leaf-blades suborbicular to broadly oval, 1–2.5 cm. long, crenate-dentate, finely and sharply many-toothed: staminate calyx 3–3.5 mm. wide; sepals linear to narrowly linear-lanceolate: capsule 7–8 mm. wide, hirsute.—Pinelands, Everglade Keys, pen. Fla. and Florida Keys.

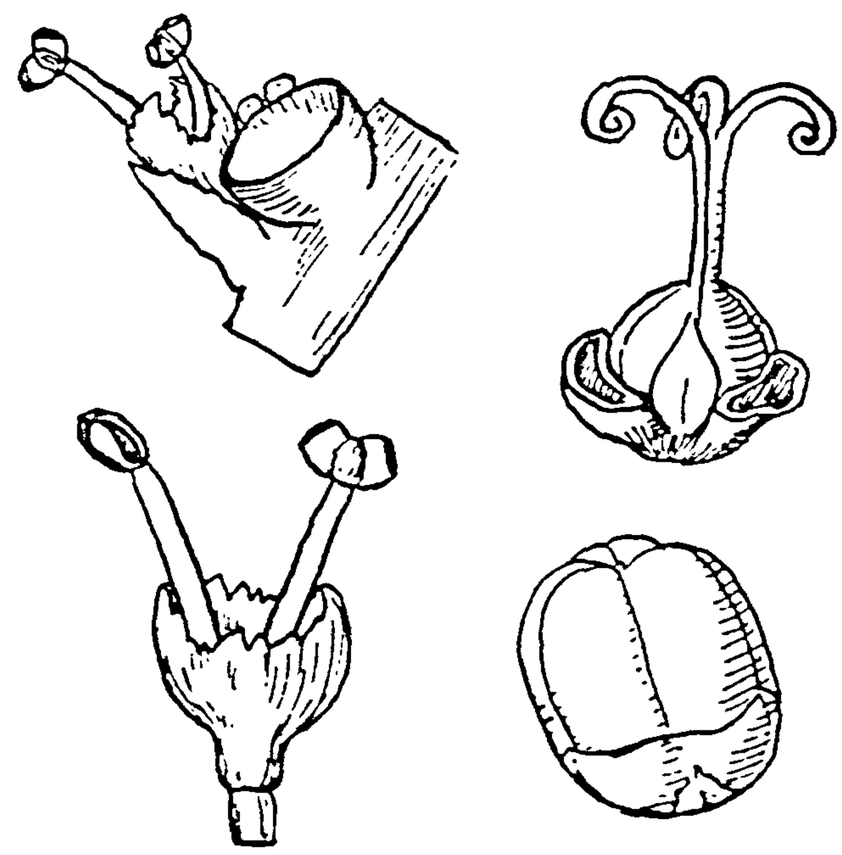
5. T. betonicaefolia Nutt. Plant 1–3 dm. tall: leaf-blades orbicular to broadly elliptic, 2–4 cm. long, coarsely crenate-serrate, or somewhat lobed: mature pistillate calyx 4.5–5.5 mm. wide; sepals linear to linear-oblong: capsule mostly 8–9 mm. wide: seed about 4 mm. long.—Sandy soil, Coastal Plain, Fla. to La.

6. T macrocarpa Willd. Plant with twining stems: leaf-blades ovate, 5–12 cm. long, coarsely dentate-serrate: staminate calyx about 2.5 mm. wide; sepals ovate to orbicular-ovate: mature pistillate calyx 8–9 mm. wide; sepals elliptic or ovate-elliptic: capsule 12–16 mm. wide, finely pubescent: seed about 5 mm. long.—Dry or rocky soil and wooded bluffs, various provinces, Fla. to Tex., Mo., and Ky.

14. STILLINGIA Garden. Shrubs or herbs. Leaf-blades entire or toothed. Flowers monoecious, apetalous, in a green, yellow, or red spike. Staminate flower with 2 or 3 sepals and 2 or 3 stamens. Pistillate flower with 3 sepals and a 2- or 3-celled ovary. Fruit a capsule.—About 15 species, mostly American.—QUEEN'S-DELIGHTS. QUEEN'S-ROOTS.

Plant herbaceous.	
Capsule less than 10 mm. wide: seed 4–6 mm. long.	
Stem leaves with linear or essentially linear blades.	1. *S. angustifolia.*
Stem leaves with spatulate or elliptic-spatulate blades.	2. *S. spathulata.*
Capsule over 10 mm. wide: seed 7–9 mm. long.	3. *S. sylvatica.*
Plant shrubby.	
Spikes yellow; glands smaller than the bracts: seed coarsely reticulate.	4. *S. aquatica.*
Spikes mainly red: glands as large as the bracts or larger: seed finely reticulate.	5. *S. tenuis.*

1. S. angustifolia (Torr.) S. Wats. Stem 2.5–6 dm. tall: leaf-blades linear or essentially so, 2–5 cm. long, crenulate-serrulate: spike 2–4.5 cm. long: capsule 5–6 mm. wide.—Sand-dunes and pinelands, pen. Fla. and Florida Keys.—All year.



2. S. spathulata (Muell. Arg.) Small. Stem 3–7 dm. tall: leaf-blades spatulate to elliptic-spatulate, or linear-spatulate on the branches 7–15 cm. long, crenulate: capsule 7–9 mm. wide.—Sand-dunes and pinelands, Coastal Plain, Fla., Ala., and Ga.—All year.

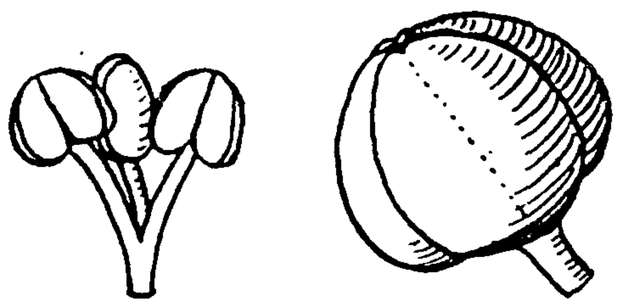
3. S. sylvatica L. Stem 4–12 dm. tall: leaf-blades obovate, oval or elliptic, 3–11 cm. long, obtuse: spike stout: capsule 12–15 mm. wide.—(QUEEN'S-ROOT.)—Dry, usually sandy, soil, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Va.—Sum.–fall.—The root is used medicinally.

4. S. aquatica Chapm. Short-lived shrub with wood lighter than cork, 6–20 dm. tall, stout-stemmed: blades of the upper leaves linear to linear-elliptic serrulate: spike stout, mainly yellow: capsule about 10 mm. wide.—(CORKWOOD.)—Ponds and wet pinelands, Coastal Plain, Fla. to Miss. and S. C.—Spr.–sum.

5. S. tenuis Small. Short-lived shrub with light brittle wood, 3–12 dm. tall, with slender stem not umbellately branched at the top: blades of the upper leaves narrowly linear, crenulate: spike slender, mainly red: capsule about 7 mm. wide.—Everglades, Fla.—All year.

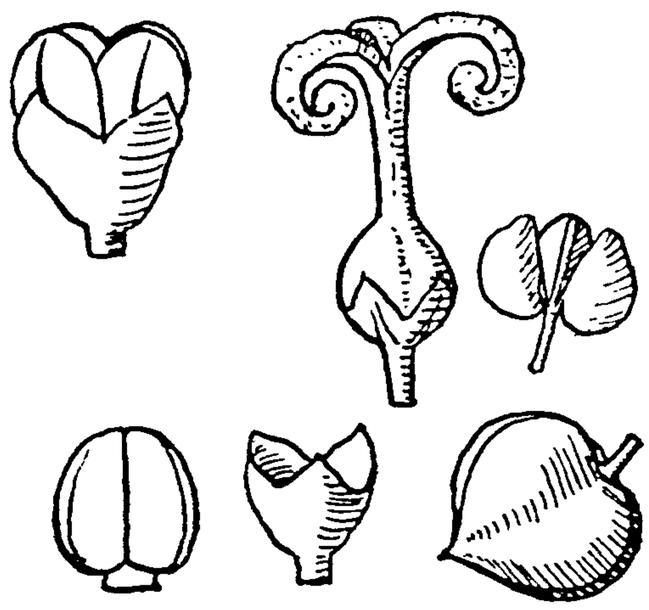
15. SEBASTIANA Muell. Arg. Shrubs or rarely herbs. Leaf-blades entire or barely toothed. Flowers monoecious, apetalous. Staminate flower with a calyx of 3–5 sepals and 3, or rarely 4, stamens. Pistillate flower with 3 sepals and a 3-celled ovary. Fruit a dry capsule.—About 40 species, mostly tropical.

1. S. ligustrina (Michx.) Muell. Arg. Shrub 1–4 m. tall: leaf-blades elliptic or oval, 3–8 cm. long: spikes shorter than the leaves, green or yellowish: capsule depressed, nearly 1 cm. broad: seed subglobose, about 4 mm. long.—(SEBASTIAN-BUSH.)—Swamps, stream-banks, and hammocks, Coastal Plain, Fla. to La., and N. C.—Spr.–sum.



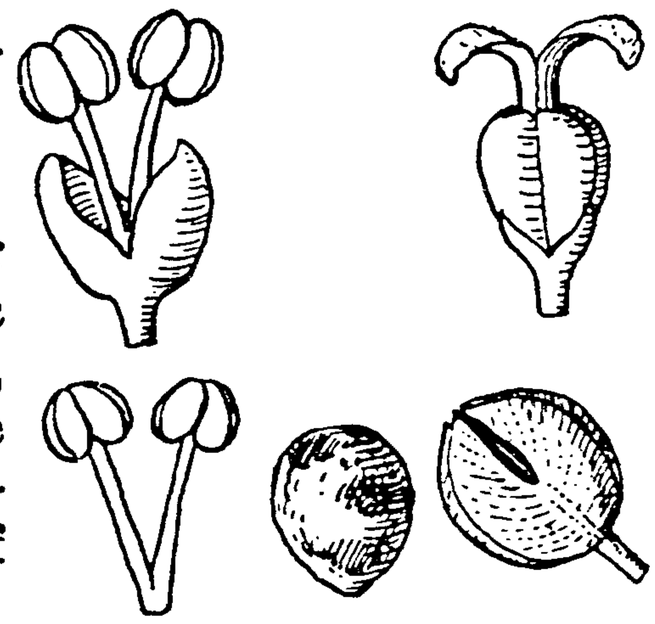
16. TRIADICA Lour. Shrubs or trees. Leaf-blades entire, usually broad. Flowers monoecious, in dense spike-like panicles, apetalous. Staminate flower with 2 or rarely 3 sepals and 3 stamens. Pistillate flower with 2 or 3 sepals and a 3-celled ovary. Fruit a fleshy capsule.—Few species, of tropical Asia.

1. T. sebifera (L.) Small. Tree resembling a poplar: leaf-blades broad, rhombic, acuminate, 4–8 cm. long, entire, long-petioled: spikes green: capsule about 1.5 cm. broad: seed 8–9 mm. long. [*Sapium sebiferum* (L.) Roxb.]—(CHINESE TALLOW-TREE.)—Hammocks and roadsides, Coastal Plain, Fla. to La. and S. C.—Nat. of E Asia and cult.—Spr.

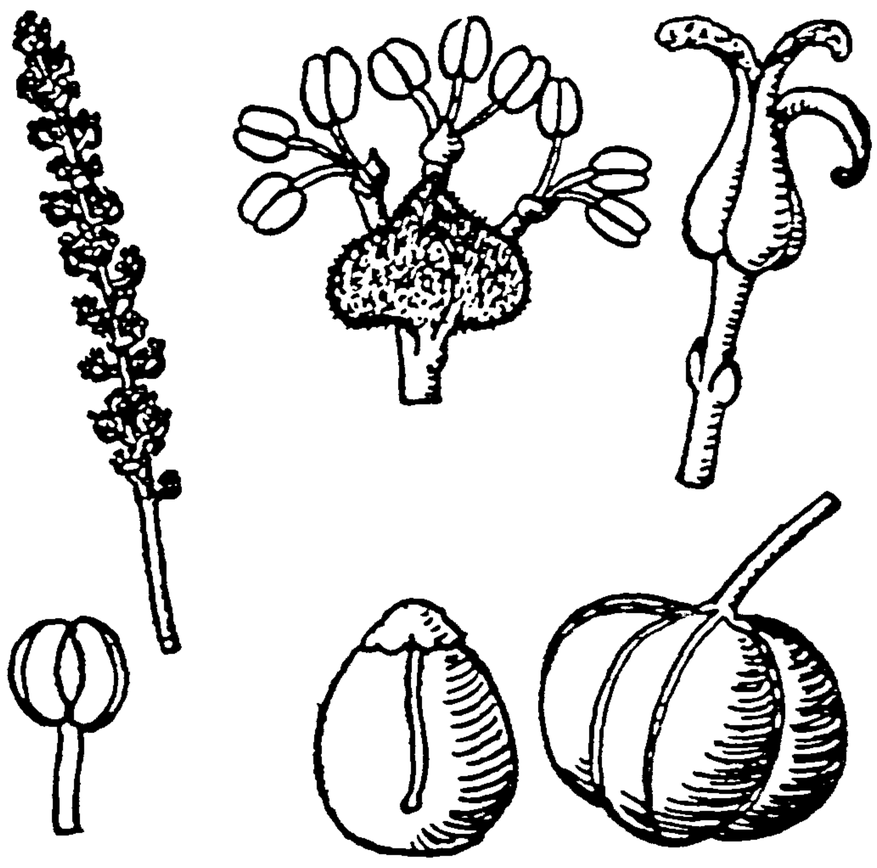


17. SAPIUM P. Br. Shrubs or trees. Leaf-blades entire or sparingly toothed. Flowers monoecious, in narrow spike-like panicles, apetalous. Staminate flower with 2 or 3 sepals and 2 stamens. Pistillate flower with 2 or 3 sepals and a 2-celled ovary. Fruit a dry capsule.—About 3 species, American.

1. S. glandulosum (L.) Morong. Small tree or shrub, resembling a willow: leaf-blades linear-elliptic to narrowly elliptic, acute, 8–16 cm. long, serrulate, short-petioled: spikes green or yellowish: capsule about 1 cm. broad: seed 6–7 mm. long.—(MILK-TREE.)—Roadsides and waste-places, W. Fla. Nat. of S. A.—Spr.

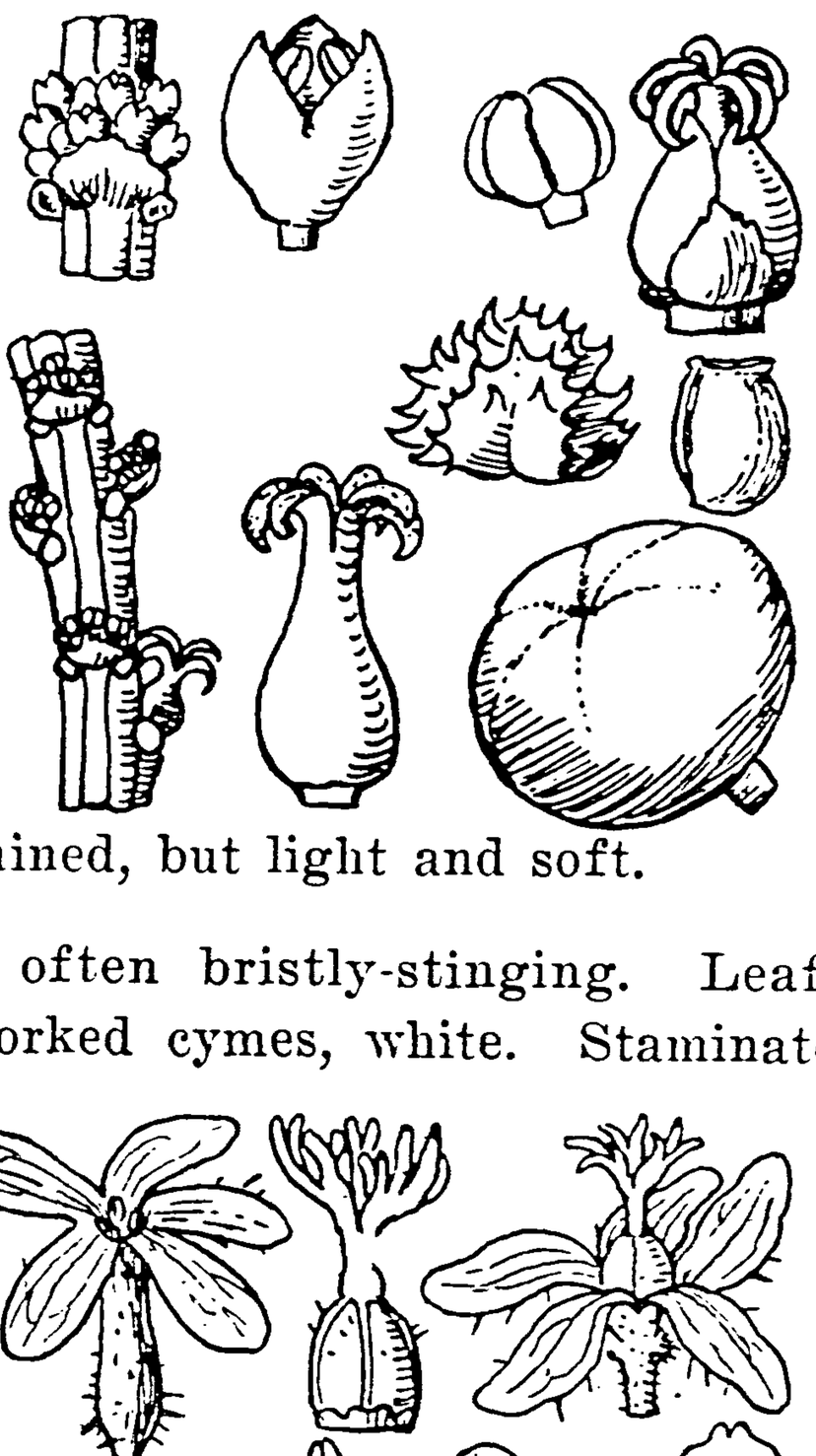


18. GYMNANTHES Sw. Shrubs or trees. Leaf-blades entire or toothed. Flowers monoecious or rarely dioecious, apetalous. Staminate flower with a rudimentary or obsolete calyx and 2 or 3 stamens. Pistillate flower with a rudimentary calyx and a 3-celled ovary. Fruit a capsule.—About 12 species, American.



1. G. lucida Sw. Shrub, or tree becoming 10 m. tall: leaf-blades cuneate to elliptic-spatulate, or nearly elliptic, 4–10 cm. long, undulate or obscurely toothed near the apex, spikes shorter than the leaves, green; capsule depressed, about 1 cm. wide: seed ovoid, 6–8 mm. long.—(CRABWOOD.)—Hammocks, Everglade Keys, pen. Fla. and Florida Keys.—(*W. I.*)—Spr.—The sap-wood is bright-yellow; the dark-brown and yellow streaked heart-wood, close-grained, heavy, and hard, is used in cabinet work.

19. HIPPOMANE L. Trees. Leaf-blades entire or toothed, pinnately veined. Flowers on a simple rachis, forming a green spike. Staminate flower with 2 or 3 sepals and 2 or 3 stamens. Pistillate flower with 3 sepals and a 6–8-celled ovary. Fruit a drupe, with a sharply tuberculate stone imbedded in the pulp.



1. H. Mancinella L. Tree becoming 18 m. tall: leaf-blades ovate, elliptic, or oval, 4–10 cm. long: spikes 4–8 cm. long: drupe spheroidal, 2.5–3.5 cm. broad.—(MANCHINEEL.)—Hammocks, Everglade Keys and Cape Sable region, pen. Fla. and Florida Keys.—(*W. I., Mex., C. A., S. A.*)—The milky sap is a powerful irritant, a skin poison. The sap-wood is yellow or light-brown, the dark-brown heart-wood is close-grained, but light and soft.

20. BIVONEA Raf. Herbs or shrubs, often bristly-stinging. Leaf-blades entire, lobed, or divided. Flowers in forked cymes, white. Staminate flower with a corolla-like 5-lobed calyx and 10–30 stamens. Pistillate flower with a usually 3-celled ovary. Fruit a somewhat 3-lobed capsule. [*Cnidoscolus* Pohl.]—About 20 species, mostly in tropical America.

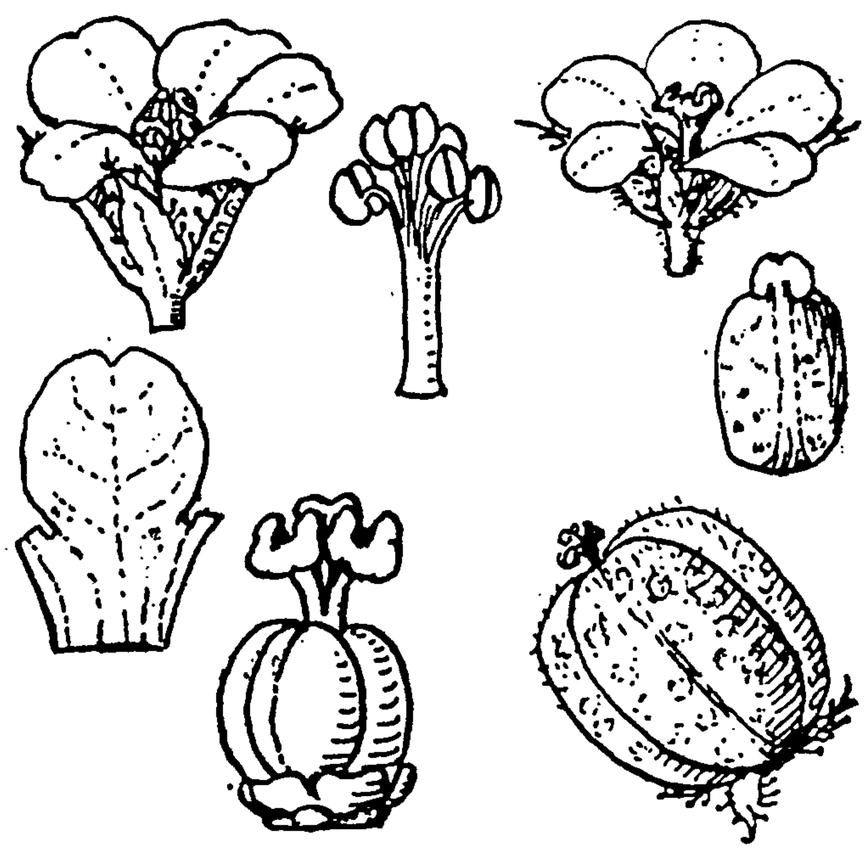
1. B. stimulosa (Michx.) Raf. Plant 1–12 dm. tall: leaf-blades 8–30 cm. broad, coarsely or finely lobed: staminate calyx with a cylindric tube, and lobes about equal in length: capsule 10–16 cm. long, bristly. [*Jatropha stimulosa* Michx.]—(SPURGE-NETTLE. FINGER-ROT. TREAD-SOFTLY.)—Dry woods, sandy hammocks, pinelands, and sand-dunes, Coastal Plain and adj. provinces, Fla. to Tex. and Va.—Spr.–fall or all year S.

21. ADENOROPIUM Pohl. Partly woody plants or herbs. Leaf-blades angled or lobed. Flowers monoecious, petaliferous, mostly red or purple. Staminate flower with 5 sepals, 5 small petals, and 8–10 stamens. Pistillate flower with a mainly 2–3-celled ovary. Fruit a capsule. [*Jatropha* L. in part.] —About 85 species, mainly tropical. All year.

Leaf-blades 3–5-lobed; lobes toothed, glandular-ciliate: inflorescence pubescent. 1. *A. gossypiifolium.*

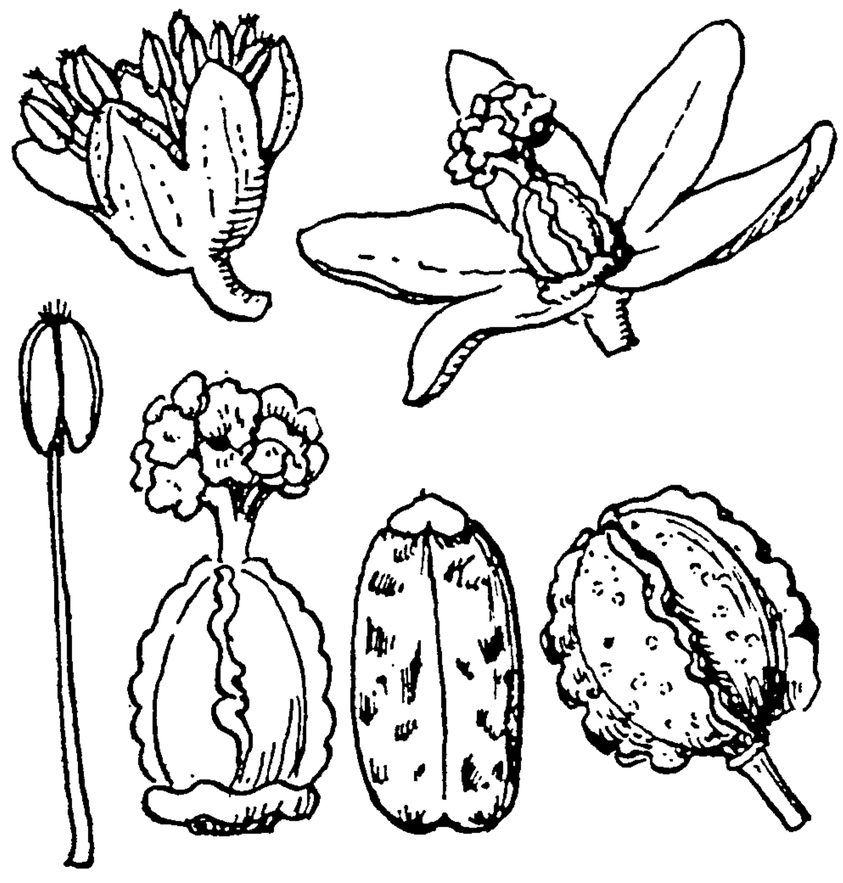
Leaf-blades 9–11-lobed; lobes entire or incised, eciliate: inflorescence glabrous. 2. *A. multifidum.*

1. A. gossypiifolium (L.) Pohl. Shrub 5–11 dm. tall: leaf-blades palmately 3–5-lobed, 8–15 cm. wide, the lobes broad, shallowly toothed and glandular-ciliate: cymules paniculate: petals scarcely twice as long as the sepals: capsule globular-ellipsoid, about 1 cm. long, slightly warty: seed 7–8 mm. long.—Roadsides and cult. grounds, Key West, Fla. Nat. of tropical regions and cult.—Like many of these plants this one is more or less poisonous when eaten, hence the popular name BELLY-ACHE BUSH.



2. A. multifidum (L.) Pohl. Shrub 9–20 dm. tall: leaf-blades palmately 9–11-lobed, mostly 10–20 cm. wide, the lobes narrow, entire or incised, not ciliate: cymules corymbose: petals thrice as long as the sepals: capsule globose-obovoid, 2.5–3 cm. long, smooth: seed 18–25 mm. long.—Pinelands, Everglade Keys, Fla. Nat. of tropical regions and cult.—This plant, like its relatives, has been used in popular medicine and also as a hedge-plant. It is known as PHYSIC-NUT or CORAL-PLANT.

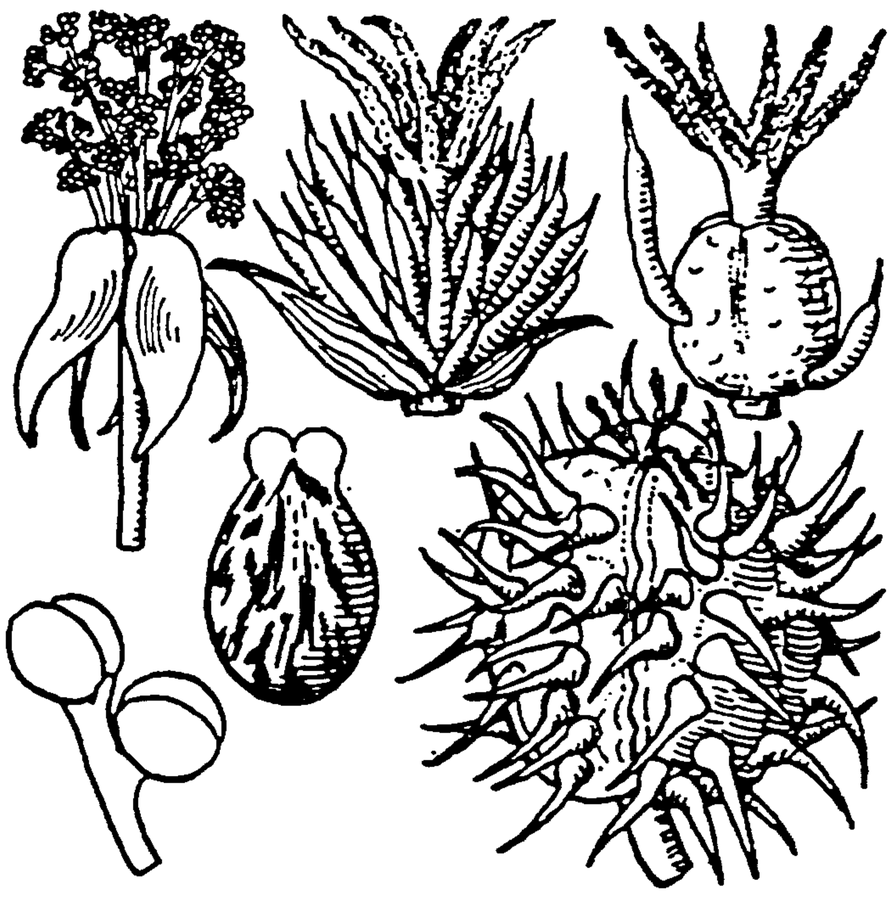
22. JATROPHA L. Shrubs or herbs. Leaf-blades entire, or palmately lobed or parted. Flowers monoecious, apetalous. Staminate flower with 5 sepals and 8 or 10 stamens. Pistillate flower often smaller than the staminate, with a 3-celled ovary, green or purple. Fruit a capsule. [*Manihot* Adans.]—About 80 species, South American.



1. J. Manihot L. Plants 9–16 dm. tall, with a very large root: leaf-blades 3–7 parted: flowers green or purple-tinged: capsules with crenate-undulate wings. [*M. Manihot* (L.) Karst.]—(CASSAVA.)—Roadsides, cult. grounds, and pinelands, Everglade Keys, Fla. and Florida Keys. Nat. of S. A., and cult.—(*W. I.*)—The large root yields starch in the form of cassava-meal and tapioca. It contains a poison, however, which must be dissolved out before these products are edible.

23. RICINUS [Tourn.] L. Herbs, shrubs, or trees. Leaf-blades peltate, palmately lobed. Flowers monoecious, apetalous. Staminate flower with 3–5

sepals and numerous stamens, mainly yellow, Pistillate flower with caducous sepals and a 3-celled ovary, green. Fruit a capsule.—One species.



1. **R. communis** L. Small tree or shrub, 1–5 m. tall, the stem widely branched, or an annual herb northward: leaf-blades nearly orbicular, 6–11-lobed: capsule 12–16 mm. in diameter.—(CASTOR-OIL PLANT. CASTOR-BEAN. PALMA-CHRISTI.)—Pinelands, hammocks, roadsides, and waste-places, locally escaped from gardens in various provinces, throughout SE U. S. Nat. of Africa, and cult.—(Widely distr.)—Sum.–fall or all year S.—The seeds yield the castor oil of commerce.

24. **CHAMAESYCE** S. F. Gray. Annual or perennial herbs or shrubs. Leaves opposite: blades oblique at the base. Involucres axillary or in axillary cymes, each with 4 naked or appendaged glands, one sinus being glandless. Capsule smooth, sometimes pubescent. Seed smooth or transverse-wrinkled.—About 225 species, widely distributed.—SPURGES. EUPHORBIAS.—The flower-like involucres have appendages to the marginal glands, either green tinged with red, red, greenish-white or white. Some of the species have reputed medicinal properties.

Leaf-blades entire.
  Plant with prostrate stems and branches.
    Leaves succulent: seed not angled, sometimes terete or nearly so. I. POLYGONIFOLIAE.
    Leaves herbaceous or chartaceous: seed sharply angled. II. CORDIFOLIAE.
  Plant with erect or ascending stems and branches. III. BUXIFOLIAE.
Leaf-blades toothed, sometimes only at the apex.
  Capsule glabrous.
    Plant with prostrate stems and branches. II. CORDIFOLIAE.
    Plant with erect or ascending stems and branches. IV. HYSSOPIFOLIAE.
  Capsule pubescent.
    Involucres axillary to the leaves or leaf-like bracts.
      Stem, or branches, erect. V. TRACYANAE.
      Stem, or branches, prostrate. VI. MACULATAE.
    Involucres in peduncled clusters. VII. HIRTAE.

I. POLYGONIFOLIAE

Seed 1.5 mm. long or more, somewhat 3-sided.
  Seed unequally 3-sided, covered with a silvery-gray bloom, usually 2 mm. long or more. 1. *C. polygonifolia.*
  Seed equally 3-sided, covered with a whitish or speckled bloom, usually about 1.5 mm. long. 2. *C. Ingallsii.*
Seed less than 1.5 mm. long, nearly terete. 3. *C. cumulicola.*

II. CORDIFOLIAE

Capsule, and ovary, glabrous.
  Leaf-blades, at least those of the stem or main branches, decidedly longer than wide, mainly elliptic to narrowly ovate.
    Involucre about 1.5 mm. long, broadly campanulate: leaf-blades thick and parchment-like. 4. *C. Chiogenes.*
    Involucre about 1 mm. long, narrowly campanulate: leaf-blades thin-herbaceous. 5. *C. Blodgettii.*
  Leaf-blades broadly ovate to orbicular.
    Appendages of the involucre-glands minute or obsolete. 6. *C. serpens.*
    Appendages of the involucre-glands petal-like.

Ultimate divisions of the inflorescence open, long-branched. — 7. *C. cordifolia.*
Ultimate divisions of the inflorescence comparatively dense, raceme-like clusters. — 7a. *C. Nashii.*

Capsule, and ovary, pubescent.
Stem, branches, and leaves permanently and usually copiously pubescent.
Plant with few stout or wiry branches, not forming dense mats.
Foliage finely hirsute.
Leaves of the branchlets much reduced in size, crowded: capsule with many long hairs. — 8. *C. brachypoda.*
Leaves of the branchlets not much reduced in size, not crowded: capsule with few short hairs. — 9. *C. Mosieri.*
Foliage canescent. — 10. *C. Garberi.*
Plant with many very slender, usually filiform branches, forming dense mats appressed to the ground.
Branches strigillose: leaf-blades much longer than wide. — 11. *C. Serpyllum.*
Branches villous-hirsutulous: leaf-blades nearly or quite as wide as long. — 12. *C. adhaerens.*
than 4 mm. long), as wide as long or nearly so. — 13. *C. deltoidea.*

III. Buxifoliae

Stem, branches, and leaves glabrous.
Twigs and leaves succulent: beach plant. — 14. *C. buxifolia.*
Twigs and leaves not succulent: pineland plants.
Leaf-blades very broad: stem sparingly branched. — 15. *C. Porteriana.*
Leaf-blades rather narrow: stem much-branched and broom-like. — 16. *C. scoparia.*
Stem, branches, and leaves pubescent.
Single-stemmed woody plants, sometimes branched near the base: stem and leaves finely, usually sparingly canescent.
Leaf-blades relatively small (on the main stem less than 4 mm. long), as wide as long or nearly so. — 17. *C. adicioides.*
Leaf-blades relatively large (on the main stem over 5 mm. long), twice as long as wide. — 18. *C. keyensis.*
Many-stemmed, wiry, cespitose plant: stem and leaves villous-hirsute. — 19. *C. pinetorum.*

IV. Hyssopifoliae

Involucres in dense axillary cymes, the cymes rarely branched. — 20. *C. hypericifolia.*
Involucres in loose cymes, rarely also with some axillary, the cymes much-branched. — 21. *C. hyssopifolia.*

V. Tracyana

Stem usually branched at the base and above, the branches and branchlets very leafy. — 22. *C. Tracyi.*

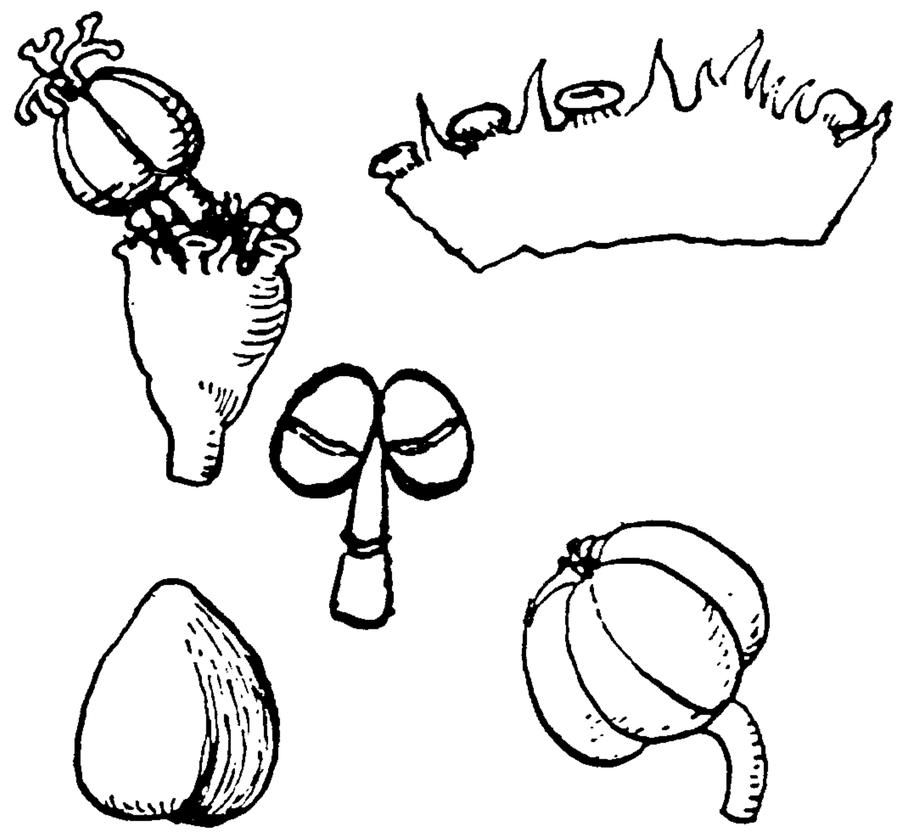
VI. Maculatae

Glands of the involucre with inconspicuous appendages. — 23. *C. prostrata.*
Capsule pubescent along the angles.
Capsule pubescent all over, but often mainly so, below the middle.
Leaf-blades twice as long as wide or less.
Involucre not cleft on one side: seed sharply 4-angled, the faces with 3 or 4 prominent transverse ridges. — 24. *C. maculata.*
Involucre deeply cleft on one side: seed bluntly angled, the faces minutely roughened or nearly smooth. — 25. *C. humistrata.*
Leaf-blades thrice as long as wide. — 26. *C. Mathewsii.*
Glands of the involucre, at least two of them, with petal-like appendages.
Branches densely and copiously floriferous, the involucres crowded: leaves of the flowering branches much reduced in size, of a different shape from those of the stem, and usually acuminate. — 27. *C. conferta.*
Branches not densely or copiously flowered, the involucres not approximate: leaves of the flowering branches much reduced in size, but not changed in shape, rounded at the apex. — 28. *C. adenoptera.*

VII. Hirtae

Plant erect: heads of involucres axillary, never terminal only, but rarely subtended by 2 or more leaf-like bracts. 29. *C. hirta.*
Plant prostrate: heads of involucres terminal, or terminating branches and subtended by 2 leaf-like bracts. 30. *C. gemella.*

1. C. polygonifolia (L.) Small. Leaf-blades narrowly elliptic to linear-lanceolate, fleshy: involucre between 1.5 and 2 mm. long: capsule globose-ovoid: seed ellipsoid-ovoid, usually over 2 mm. long. — (Seaside-spurge.) — Coastal sand-dunes, Coastal Plain, and New England Coast, Fla. to N. S.; also Great Lake Lowland, N. Y. to Wis.—Sum.–fall.



2. C. Ingallsii Small. Leaf-blades elliptic to ovate-elliptic, fleshy: involucre between 1 and 1.5 mm. long: capsule depressed: seed broadly ovoid or globose-ovoid, usually less than 2 mm. long.—Coastal sand-dunes, Fla. to Tex.

3. C. cumulicola Small. Branches prostrate, string-like, zigzag, glabrous; leaf-blades elliptic to elliptic-ovate, veinless: involucre campanulate, about 1 mm. long, glabrous; appendages whitish and narrower than the glands or obsolete: capsule about 2.5 mm. broad, glabrous: seed 1–1.3 mm. long, nearly terete, smooth.—(Sand-dune spurge.)—Sand-dunes and scrub, Cape Romano region and lower eastern coast, Fla.—All year.

4. C. Chiogenes Small. Leaf-blades narrowly ovate or elliptic, sometimes the lower ones suborbicular: involucres about 1.5 mm. long; appendages mostly smaller than the glands: capsule about 1.5 mm. broad: seed about 1 mm. long, angled, the faces uneven.—Pinelands, lower Florida Keys.—All year.

5. C. Blodgettii (Engelm.) Small. Branches glabrous or nearly so: leaf-blades narrowly ovate, elliptic, or spatulate: involucres about 1 mm. long, glabrous: gland-appendages white or pinkish, commonly slightly larger than the glands: capsule fully 1.5 mm. broad, glabrous: seed about 1 mm. long.—Coastal sand-dunes and low hammocks, S pen. Fla. and the Keys.—(*W. I.*)

6. C. serpens (H.B.K.) Small. Branches glabrous: leaf-blades orbicular, orbicular-ovate, or ovate: involucres barely 1 mm. long; appendages mostly smaller than the glands: capsule between 1 and 2 mm. broad: seed barely 1 mm. long, prominently angled.—Sandy woods, plains, and tablelands, various provinces, Fla. to Tex., N. M., Ia., and Ill.—(*W. I.*)—Spr.–fall.

7. C. cordifolia (Ell.) Small. Branches glabrous: leaf-blades broadly elliptic to ovate, or sometimes broadest below the middle: involucres fully 1 mm. long; appendages mostly much larger than the green glands: capsule between 2 and 3 mm. broad, glabrous: seed fully 1 mm. long, gray, obscurely angled.—Sandy hammocks and sandhills, Coastal Plain, Fla. to Tex. and S. C.—Spr.–fall.

7a. C. Nashii Small. Branches glabrous: leaf-blades broadly elliptic to ovate: involucres nearly 1.5 mm. long; appendages narrow, delicate, white or greenish: seed shallowly transverse-wrinkled.—Coastal sands and pinelands, pen. Fla. and Florida Keys.—All year.

8. C. brachypoda Small. Branches hirsute or villous-hirsute, with many short internodes: leaf-blades elliptic to ovate, hirsute: involucres fully 1 mm. long;

appendages much smaller than the red glands, or minute or obsolete: capsule about 2 mm. wide, pubescent: seed 1 mm. long, brown, obscurely angled.—Pinelands, Everglade Keys, Fla.—All year.

9. **C. Mosieri** Small. Branches prostrate, wiry, dark, villous-hirsutulous: leaf-blades orbicular-reniform to ovate, 4–8 mm. long, loosely-pubescent, acute or acutish: involucres campanulate, about 1 mm. long, pubescent; appendages red or deep-pink, some of them larger than the glands, others smaller, sometimes lobed: capsule globose-ovoid, about 1.5 mm. broad, sparingly pubescent: seed ovoid, about 1 mm. long, the faces nearly smooth.—Pinelands, Everglade Keys, S pen. Fla.—All year.

10. **C. Garberi** Small. Branches canescent: leaf-blades ovate or oval: involucres about 1.5 mm. long; appendages minute, or obsolete: capsule fully 1.5 mm. broad, pubescent: seed about 1 mm. long, reddish-brown.—Pinelands, hammocks, and sand-dunes, Everglade Keys and Cape Sable, pen. Fla. and Florida Keys. Adv. at Mobile, Ala.—All year.

11. **C. Serpyllum** Small. Branches puberulent-canescent, filiform, very numerous: leaf-blades deltoid or ovate-deltoid to triangular or triangular-ovate, 3–5 mm. long, obtuse: involucres about 1 mm. long; appendages very minute: capsule about 1.5 mm. broad, pubescent: seed less than 1 mm. long, yellowish or grayish.—Pinelands, lower Florida Keys.—All year.

12. **C. adhaerens** Small. Branches very numerous, forming closely prostrate mats, finely villous-hirsutulous, wiry-filiform: leaf-blades reniform to orbicular-ovate, or reniform-ovate, 2–3.5 mm. long, rounded at the apex, minutely pale-pubescent: involucres broadly campanulate or hemispheric, about 1 mm. long; appendages mere pale margins to the glands or obsolete: capsule fully 1.5 mm. broad, pubescent: seed ovoid, about 1 mm. long, the faces slightly wrinkled.—Pinelands, Everglade Keys, pen. Fla.—All year.

13. **C. deltoidea** (Engelm.) Small. Branches glabrous, closely appressed to the ground: leaf-blades deltoid-ovate or reniform, rarely minutely pubescent when young: involucres less than 1 mm. long, glabrous: glands yellow; appendages obsolete: capsule about 2 mm. broad, glabrous or sometimes sparingly pubescent: seed less than 1 mm. long, even, yellowish.—Pinelands, Everglade Keys, pen. Fla.—All year.

14. **C. buxifolia** (Lam.) Small. Branches, like the stem woody, 1 m. tall or less, glabrous, often purple, with long or short internodes: leaf-blades ovate to broadly elliptic or cuneate near the base of the stem, rather fleshy, 8–12 mm. long, obtuse or acutish, involute, rounded or subcordate, nearly sessile: involucres campanulate, about 1.5 mm. high, as long as the peduncles or shorter: glands transversely elliptic, 0.5 mm. broad: appendages whitish: capsule 2.5–3 mm. broad, glabrous.—Coastal sand-dunes and rocks along shores, S pen. Fla. and the Keys.—(*W. I.*)

15. **C. Porteriana** Small. Branches glabrous: leaf-blades ovate, or oval: involucres about 1 mm. long, glabrous: gland-appendages reddish, fully as long as the glands, or sometimes narrower: capsule about 2 mm. broad, glabrous: seed about 1 mm. long, markedly angled.—Pinelands, Everglade Keys, pen. Fla.—All year.

16. **C. scoparia** Small. Branches glabrous, pale: leaf-blades narrowly elliptic to narrowly ovate, 2–8 mm. long, obtuse or acutish, pale or glaucescent beneath: involucres about 1.5 mm. long, glabrous: gland-appendages white or pink, 2 of them prominent and 2 partly obsolete: capsule 1.5–2 mm. broad, glabrous: seed about 1 mm. long, grayish, scabrous.—Pinelands, lower Florida Keys.—All year.

17. C. adicioides Small. Shrub mostly less than 0.5 m. tall, finely pubescent with pale hairs, rather copiously branched above, zigzag: leaves numerous; blades ovate to oval, 2–3 mm. long, acute or acutish, entire, short-petioled: involucres campanulate, barely 1 mm. high, longer than the peduncles, minutely pubescent, deciduous: glands about 0.4 mm. broad: appendages obsolete: capsule pubescent, less than 1 mm. long.—Sandy shores and hammocks, Florida Keys.—All year.

18. C. keyensis Small. Branches erect or nearly so, finely pale-pubescent: leaf-blades elliptic-ovate, to elliptic, oval, or ovate, 3–9 mm. long: involucres turbinate, a little over 1 mm. long, finely pubescent; appendages white or pinkish, about as wide as the glands: capsule about 2 mm. broad, pubescent: seed nearly 1 mm. long.—Sand-dunes and pinelands, lower Florida Keys.—All year.

19. C. pinetorum Small. Branches villous-hirsute often ascending near the tips: leaf-blades reniform or deltoid to orbicular or ovate, conspicuously pubescent: involucres fully 1 mm. long, pubescent: glands green; appendages very narrow, even-edged: capsule fully 2 mm. broad, pubescent: seed 1 mm. long, transversely wrinkled, yellowish.—Pinelands, Everglade Keys, pen. Fla.—All year.

20. C. hypericifolia (L.) Small. Branches glabrous or nearly so, the ultimate ones slender: leaf-blades mainly elliptic, elliptic-lanceolate, or ovate, unequally serrate, usually nearly straight: involucres 1 mm. long or more: gland-appendages obovate to reniform, rather conspicuous: capsule fully 2 mm. wide, glabrous: seed brown or reddish-brown, about 1 mm. long.—Pinelands, waste-places, and roadsides, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)

21. C. hyssopifolia (L.) Small. Branches glabrous: leaf-blades elliptic, elliptic-ovate, elliptic-lanceolate, or sometimes linear-lanceolate, often slightly curved or even falcate, mostly 1–3 cm. long, usually toothed: involucres 1–1.5 mm. long, glabrous, few together in terminal cymes; appendages suborbicular or reniform, unequal: capsule 1.5–2 mm. wide, glabrous: seed gray, brown, or black, about 1 mm. long. [*Euphorbia brasiliensis* Lam. *E. nutans* Lag. *E. Preslii* Guss.]—(EYE-BANE.)—Hammocks, roadsides, fields, and waste-places, nearly throughout U. S. and S Can.—(*W. I., Mex., C. A., S. A.*)—Sum. or all year S.

22. C. Tracyi Small. Branches thinly canescent: leaf-blades elliptic to slightly broadest above the middle: involucres fully 1 mm. long, sparingly pubescent: gland-appendages minute, unequal and uneven: capsule nearly 2 mm. broad, slightly pubescent all over: seed less than 1 mm. long.—Sand-dunes and pinelands, Coastal Plain, Fla. to Miss.—Sum. or all year S.

23. C. prostrata (Ait.) Small. Branches pubescent: leaf-blades oval, obovate, or elliptic: involucres 1 mm. long or less, usually sparingly pubescent: appendages very narrow: capsule about 2 mm. broad, pubescent about the angles: seed 1 mm. long or less.—Sandy soil, Coastal Plain, Fla. to Tex.—All year.

24. C. humistrata (Engelm.) Small. Branches puberulent or finely pubescent: leaf-blades ovate-elliptic or sometimes narrower: involucres about 1 mm. long, pubescent: appendages white or red, commonly narrower than the glands: capsule about 1.5 mm. broad, pubescent: seed about 1 mm. long.—Dry or sandy soil, various provinces, W of Blue Ridge, Ala. to Tex., Nebr., Minn., Que., and N. Y.—Spr.–fall.

25. C. maculata (L.) Small. Branches like the stem puberulent or pilose: leaf-blades elliptic or ovate-elliptic, 8–12 mm. long: involucres mostly 1 mm.

long, pubescent; appendages white or red, narrow, nearly equal, entire: capsule less than 1.5 mm. wide, pubescent: seed nearly 1 mm. long, black beneath the pale coating.—(MILK-PURSLANE.)—Roadsides, cult. grounds, waste-places, and especially along railroads, various provinces, nearly throughout U. S. and S Can.—Spr.–fall or all year S.

26. **C. Mathewsii** Small. Branches prostrate, copiously loosely pubescent: leaf-blades broadly linear-elliptic to elliptic, 1–1.5 cm. long, with a black-purple blotch above, and scattered hairs beneath: involucres campanulate, slightly over 1 mm. long; appendages pale, very narrow, unequal, uneven: capsule about 1.5 mm. broad, pubescent: seed less than 1 mm. long.—Barren beaches, opposite Miami, Fla.—All year.

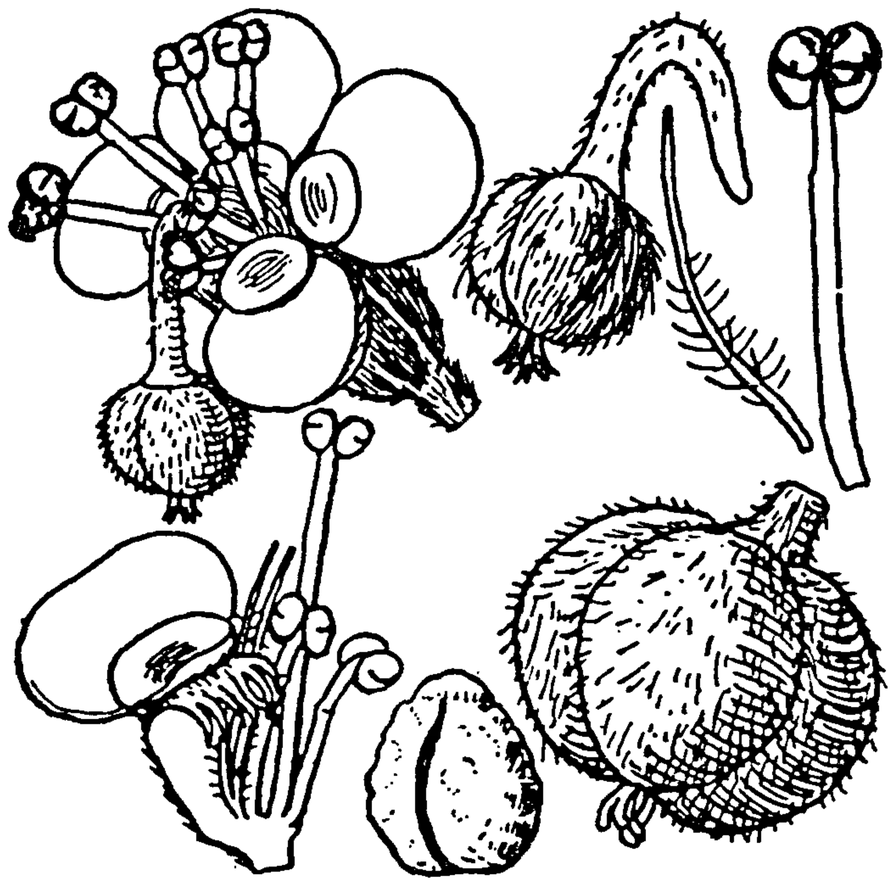
27. **C. conferta** Small. Branches villous: leaf-blades elliptic to ovate: involucres 1.5–2 mm. long, villous; gland-appendages red or magenta, 2 of them petal-like, much larger than the others, toothed: capsule less than 1.5 mm. broad, minutely pubescent: seed less than 1 mm. long, coarsely wrinkled.—Pinelands, Everglade Keys, pen. Fla.—All year.

28. **C. adenoptera** (Bertol.) Small. Branches closely villous: leaf-blades elliptic or ovate-elliptic: involucres 1–1.5 mm. long, finely pubescent; gland-appendages white or pink, petaloid, 2 of them much larger than the glands: capsule about 1.5 mm. broad, densely pubescent: seed about 1 mm. long, finely wrinkled.—Pinelands, S Fla.—Spr.–sum.

29. **C. hirta** (L.) Millsp. Branches closely pubescent: leaf-blades elliptic to elliptic-lanceolate, or somewhat triangular, often prominently blotched: involucres mostly in axillary clusters, 1 mm. long or less, minutely pubescent; gland-appendages imperfectly developed: capsule fully 1 mm. broad, finely pubescent: seed about 1 mm. long. [*C. pilulifera* (L.) Small]—Hammocks, roadsides, and cult. grounds, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)—All year.

30. **C. gemella** (Lag.) Small. Similar to *C. hirta* but smaller, and with more closely prostrate branches: leaf-blades elliptic to elliptic-lanceolate, mostly evenly green: involucres mostly in terminal clusters, about 1 mm. long, finely pubescent: gland-appendages white, narrower than the glands: capsule fully 1 mm. broad, often closely pubescent: seed less than 1 mm. long. [*C. pilulifera procumbens* (Boiss.) Small]—Hammocks, cult. grounds, roadsides, and waste-places, pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—All year.

25. **LEPADENA** Raf. Annual or biennial herbs, often topped by an umbel. Leaf-blades entire. Involucres in rather dense cymes, each with 5 conspicuously appendaged glands. Capsule pubescent. Seed wrinkled or tuberculate. [*Dichrophyllum* Kl. & Garcke.]—About 4 species, North American.—EUPHORBIAS.—SPURGES.

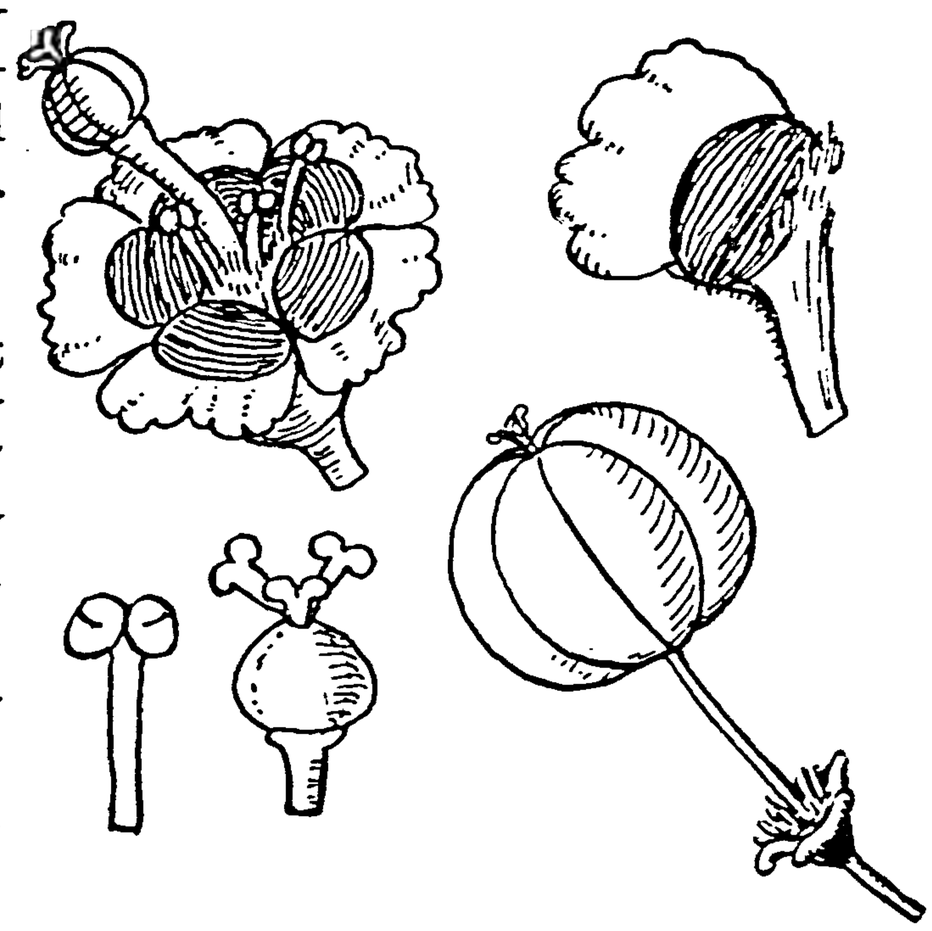


1. **L. marginata** (Pursh) Nieuwl. Plant 3–11 dm. tall: blades of the upper leaves obovate to ovate, like the bracts white-margined and conspicuous: involucre-glands with white appendages: capsule strigillose: seed 3–4 mm. long, coarsely wrinkled, obtuse.—(SNOW-ON-THE-MOUNTAIN.)—Dry soil and waste-places, various provinces, Ga. to N. C. and W; native from Tex. to N. M., Mont., and Minn.—Spr.–fall.—Extensively cultivated for the showy effect of the massed foliage which suggested the popular name.

26. TITHYMALOPSIS Kl. & Garcke. Perennial, mostly glabrous herbs often topped by an umbel. Leaf-blades entire. Involucres scattered or somewhat clustered in an umbel-like inflorescence, each with appendaged glands. Capsule smooth. Seed punctate.—About 18 species, North American.—EUPHORBIAS.—Some of the species, *T. corollata* and *T. Ipecacuanhae*, are used medicinally.

Leaves exceedingly numerous, approximate or imbricate. 1. *T. polyphylla.*
Leaves less numerous, never imbricate.
  Stem normally underground; branches of the inflorescence tufted; all leaves or bracts opposite.
    Glands of the involucre with inconspicuous margin-like appendages.
      Branches spreading or prostrate: leaf-blades fleshy. 2. *T. Ipecacuanhae.*
      Branches erect or ascending: leaf-blades thin. 3. *T. gracilis.*
    Glands of the involucre with conspicuous white appendages. 4. *T. eriogonoides.*
  Stems erect, topped by the umbel-like inflorescence: leaves alternate on the inflorescence branches.
    Stem-leaves reduced to scales: bracts foliaceous. 5. *T. mercurialina.*
    Stem-leaves with normally expanded blades.
      Inflorescence of scattered long-peduncled involucres.
        Involucres 2–4 mm. across the appendages.
          Stem-leaves with linear blades, fugacious. 6. *T. Curtisii.*
          Stem-leaves with elliptic or lanceolate blades, persistent. 7. *T. exserta.*
        Involucres 6–10 mm. across the appendages. 8. *T. zinniiflora.*
      Inflorescence aggregated into terminal cymes or cymose clusters.
        Leaf-blades manifestly petioled, the petioles over 2 mm. long. 9. *T. apocynifolia.*
        Leaf-blades sessile or nearly so, the petioles, if present, less than 1 mm. long.
          Involucres 3.5 mm. across the appendages or narrower. 10. *T. discoidalis.*
          Involucres 4–8 mm. across the appendages.
            Appendages about as long as the involucre. 11. *T. olivacea.*
            Appendages much longer than the involucre.
              Appendages longer than wide: leaf-blades relatively narrow. 12. *T. corollata.*
              Appendages as wide as long or wider: leaf-blades relatively broad. 13. *T. paniculata.*

1. T. polyphylla (Engelm.) Small. Plant 0.5–2.5 dm. tall, the stems stout, often tufted, copiously leafy: leaf-blades linear or linear-spatulate, 5–15 mm. long: involucres 1.5–2 mm. long; gland-appendages white or pinkish, mostly reniform, crenate: capsule 4–5 mm. broad: seed about 2.5 mm. long, white.—Pinelands, pen. Fla.—All year.



2. T. Ipecacuanhae (L.) Small. Plant 0.2–3 dm. tall, the stem slender, sparingly leafy: leaf-blades linear to orbicular, 1–7 cm. long: involucres 1.5 mm. long, or rarely longer: appendages of the glands very narrow or obsolete: capsule 4.5–5 mm. broad: seed 2.5 mm. long.—(IPECAC-SPURGE.)—Dry acid sand, often in pinelands, where vegetation is too sparse to carry fire, Coastal Plain and occasionally adj. provinces, Fla. to Tenn., Ind., and Conn.—Spr.–fall.

3. **T. gracilis** (Ell.) Small. Plant 1–3 dm. tall, the stems very slender, sparingly leafy: leaf-blades suborbicular to ovate or linear or rarely broader than long: involucres about 2 mm. long; appendages of the glands narrow: capsule 3–4 mm. broad: seed 2.5 mm. long.—Pinelands and sandhills, Coastal Plain, Fla. to S. C.—All year.

4. **T. eriogonoides** Small. Plant 1–3 dm. tall, the stem, diffusely branched: leaf-blades linear to linear-spatulate, 0.5–1.5 cm. long: involucres about 1 mm. long; appendages reniform to suborbicular, about 1 mm. broad: capsule about 4 mm. broad: seed about 2.5 mm. long.—Pinelands and roadsides, Coastal Plain, Fla. to N. C.—Spr.–fall.

5. **T. mercurialina** (Michx.) Small. Plant 1–4 dm. tall, often with several stems together: bracts oval, elliptic, or oblong-ovate, 2–9 cm. long: involucres 2 mm. long; appendages white, mostly narrower than the glands, undulate: capsule 5–6 mm. broad: seeds 2.5 mm. long, tuberculate.—Rocky woods, Coastal Plain and Appalachian provinces, Fla. to Ala., Tenn., and Ga.—Spr.–sum.

6. **T. Curtisii** (Engelm.) Small. Plant 1–5 dm. tall, the branches green: leaf-blades linear, 1.5–4 cm. long: involucres 1–1.5 mm. long: appendages white, reniform to orbicular-reniform, as wide as the glands or wider: capsule 4–5 mm. broad: seed about 2 mm. long.—Pinelands, Coastal Plain, Fla. to N. C.—Spr.–fall.

7. **T. exserta** Small. Plant 1–3 dm. tall, the branches reddish or purple: leaf-blades elliptic to lanceolate, 2–6 cm. long: involucres about 2 mm. long; appendages white, reniform, about as broad as the glands, or narrower: capsule long-exserted, 4–5 mm. broad: seed 3–3.5 mm. long.—Pinelands or coastal sands, Fla.—All year.

8. **T. zinniiflora** Small. Plant 3–5 dm. tall: leaf-blades linear-lanceolate to nearly linear, 2–5 cm. long, sessile or nearly so: involucres few, about 2 mm. long; appendages white or pink, suborbicular or 4-sided: capsule exserted, 4.5–5 mm. broad: seed about 2.5 mm. long.—Sandy soil, Coastal Plain, Fla. and Ala.—Spr.

9. **T. apocynifolia** Small. Plant 2–7 dm. tall: leaf-blades elliptic to oval, 2–7 cm. long, manifestly petioled: involucres numerous, about 1.5 mm. long; appendages white, orbicular to cuneate, or sometimes reniform: capsule about 5 mm. broad: seed 2.5 mm. long.—Sandy soil, Coastal Plain, Fla. to Miss. and N. C.—Sum.–fall.

10. **T. discoidalis** (Chapm.) Small. Plant 2–6 dm. tall: leaf-blades linear, 2–6 cm. long, sessile: involucres numerous, fully 1 mm. long; appendages white, reniform to ovate or 4-sided: capsule exserted, about 3 mm. broad: seed about 2 mm. long.—Pinelands, W Fla.—Sum.–fall.

11. **T. olivacea** Small. Plant olive-green, 2–7 dm. tall: leaf-blades elliptic, obovate-elliptic, or cuneate, 1–3 cm. long: involucres numerous, 1.5–2 mm. long; appendages white, reniform to ovate or cuneate: capsule slightly exserted, 3.5–4 mm. broad: seed 2.5 mm. long.—Sandy soil, Coastal Plain, Miss. to Tex.—Sum.–fall.

12. **T. corollata** (L.) Small. Plant bright-green, 2–9 dm. tall: leaf-blades linear, elliptic, or elliptic-spatulate, 2–4 cm. long: involucres numerous, conspicuous, 1–1.5 mm. long; appendages white, mostly cuneate or orbicular-cuneate: capsule exserted, 3.5–4.5 mm. broad: seed 2.5 mm. long.—(FLOWERING-SPURGE. TRAMP'S-SPURGE.)—Woods, fields, thickets, and roadsides, various provinces, Fla. to Tex., Minn., Ont., and Mass.—Sum.

13. **T. paniculata** (Ell.) Small. Plant deep-green, 3–9 dm. tall: leaf-blades elliptic to oval, 2–6 cm. long: involucres commonly few, about 1.5 mm. long: appendages white, suborbicular, somewhat reniform, or somewhat 4-sided: capsule 3–3.5 mm. broad: seed 2.5 mm. long.—Sandy or rocky woods, Coastal Plain and adj. provinces, Ga. and Ala. to N. C.—Spr.–fall.

27. **GALARHOEUS** Haw. Annual or perennial herbs or partially woody plants, the stem topped by an umbel. Leaf-blades entire or finely toothed. Stipules wanting. Involucres in open or compact cymes, each with 4 naked or appendaged glands. Capsule smooth or tuberculate. Seed pitted, grooved, reticulate, or smooth. [*Tithymalus* (Fl. SE. U. S.)]—About 250 species, widely distributed.—Sum.—SPURGES. EUPHORBIAS.

Leaf-blades entire.
  Leaves of the stem mainly opposite and decussate: capsule 1.5 mm. wide or more. I. LATHYRI.
  Leaves of the stem alternate or scattered: capsule 1 cm. wide or less.
    Bracts or leaves of the inflorescence-branches (rays) opposite: rays simple or dichotomous.
      Stem topped by a repeatedly forked inflorescence. II. PEPLI.
      Stem topped by an umbel-like simple or sparingly forked inflorescence. III. CYPARISSIAE.
    Bracts or leaves of the inflorescence-branches (rays) alternate: rays trichotomous. IV. TRICHOTOMI.
Leaf-blades serrulate. V. OBTUSATI.

I. LATHYRI

Annual or biennial coarse plant: leaf-blades entire: glands of the involucre crescent-shaped. 1. *G. Lathyrus.*

II. PEPLI

Glands of the involucre without horn-like processes.
  Glands with erose-crumpled edges. 2. *G. floridanus.*
  Glands entire or merely undulate.
    Bracts of the rays longer than broad.
      Stem-leaves with narrowly oblanceolate to linear blades. 3. *G. inundatus.*
      Stem-leaves with obovate, spatulate, or oblanceolate blades. 4. *G. telephioides.*
    Bracts of the rays fully as broad as long. 5. *G. Darlingtonii.*
Glands of the involucre lunate or crescent-shaped by horn-like processes.
  Surfaces of the seeds reticulate or rather finely and irregularly pitted.
    Stem-leaves with spatulate to ovate blades: bracts ovate-reniform or reniform: seeds pitted. 6. *G. commutatus.*
    Stem-leaves with linear blades: bracts deltoid: seeds reticulate. 7. *G. austrinus.*
  Surfaces of the seeds longitudinally grooved or with large pits in longitudinal rows: capsule with prominently keeled lobes. 8. *G. Peplus.*

III. CYPARISSIAE

Plants growing in dense colonies, the stems with numerous very narrow leaves, topped by a many-rayed umbel. 9. *G. Cyparissias.*

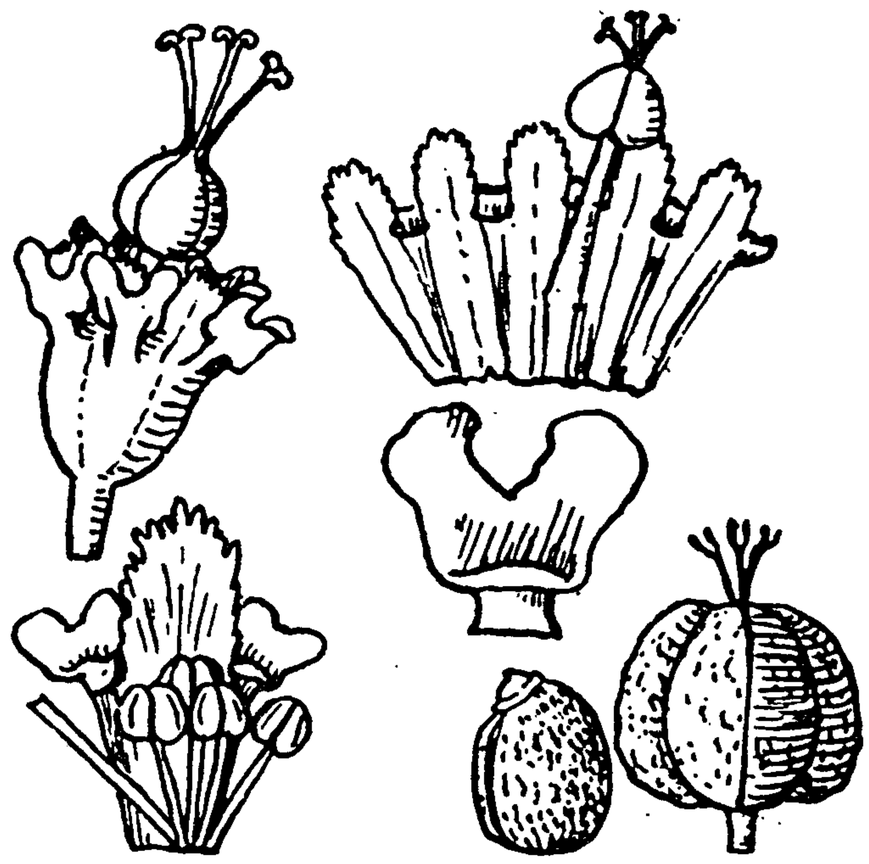
IV. TRICHOTOMI

Fleshy plant with few or many stems or branches. 10. *G. trichotomus.*

V. OBTUSATI

Capsule smooth. 11. *G. Helioscopia.*
Capsule warty.
  Leaves obtusely rounded at the tip, glabrous; seed reticulated.
    Blades of the cauline leaves with cordate or truncate blades, more or less auricled: glands of the involucre stalked. 12. *G. obtusatus.*
    Blades of the cauline leaves narrowed to the base, not auricled: glands of the involucre sessile. 13. *G. arkansanus.*
  Leaves acute, pubescent beneath; seed smooth. 14. *G. platyphylla.*

1. G. Lathyrus (L.) Haw. Stem 2–12 dm. tall: blades of the upper leaves lanceolate to linear-lanceolate, 3.5–12 cm. long: bracts ovate to ovate-lanceolate: involucres 4–5 mm. long; lobes triangular, toothed at the apex, surpassing the broad crescent-shaped glands: capsule 1.5–2 cm. broad: seed ellipsoid, ovoid, 5–6 mm. long, wrinkled. — (MOLE-PLANT. CAPER-SPURGE. MYRTLE-SPURGE.)—Roadsides, cult. grounds, and waste-places, various provinces, N. C. to Tex., W. Va., and Conn. Nat. of Eú.—Spr.–sum.—Used medicinally. The seeds yield an oil similar to castor oil.



2. G. floridanus (Chapm.) Small. Stem 2–6 dm. tall: leaf-blades linear to narrowly lanceolate, 3–6 cm. long: bracts ovate to lanceolate: involucre 3.5–4 mm. long; lobes ovate, erose, surpassed by the flabellate glands which have crumpled edges: capsule 8–10 mm. broad: seed subglobose or spheroidal, 4 mm. broad, smooth.—Pinelands, Coastal Plain, M Fla. to Ala. and Ga.—Spr.–sum.

3. G. inundatus (Torr.) Small. Stem 1–5 dm. tall: leaf-blades narrowly oblanceolate to linear, or slightly broadest above the middle, 3–10 cm. long: bracts ovate to elliptic-lanceolate: involucre campanulate, 2–3 mm. long; lobes ovate, several toothed, about as high as the glands: capsule 6–7 mm. broad, smooth: seed subglobose or ovoid-globose, 3–3.5 mm. long, smooth.—Low pinelands, Coastal Plain, W Fla. to Ala.—Spr.

4. G. telephioides (Chapm.) Small. Stem 0.5–2.5 dm. tall: leaf-blades obovate, broadly spatulate, or oblanceolate, 2–5 cm. long: bracts ovate to deltoid: involucre broadly campanulate, about 2 mm. long; lobes half-orbicular, about as high as the glands: capsule 7–8 mm. broad, granular: seed subglobose, about 3 mm. in diameter.—Pinelands, near the coast, M Fla.—Spr.

5. G. Darlingtonii (A. Gray) Small. Stem 3–15 dm. tall: leaves few; blades oblanceolate to elliptic-lanceolate, 3.5–10 cm. long: bracts reniform to orbicular-reniform: involucre 3–4 mm. long; lobes ovate or quadrate, toothed or often notched; glands elliptic: capsule 8–9 mm. broad, warty: seed ovoid-globose, 3–4 mm. long.—Woods and thickets, Piedmont and occasionally adj. provinces, N. C. to N. J. (or N. Y.?).—Spr.–fall.

6. G. commutatus (Engelm.) Small. Stem decumbent, 1–4 dm. long: leaf-blades spatulate to ovate (or those of the upper ones somewhat lanceolate in *G. commutatus erectus*), 1–4 cm. long, with slender petiole-like bases; bracts reniform or ovate-reniform: involucre 2.5 mm. long; horns 1 mm. long or nearly so: capsule 3.5–4 mm. broad, smooth: seed ovoid, fully 2 mm. long, irregularly pitted.—(WOOD-SPURGE.)—Woods and stream-banks, various provinces, Fla. to Mo., Minn., and Pa.—Spr.–sum.

7. G. austrinus Small. Stem erect, 3–4 dm. tall: leaf-blades linear, mostly 2–5 cm. long, acute or acuminate, very short-petioled: bracts deltoid: involucre 1–1.5 mm. long; horns about 0.5 mm. long: capsule 3–3.5 mm. broad; smooth: seed ovoid, nearly 2 mm. long, finely reticulate.—Pinelands, W Fla.—Sum.

8. G. Peplus (L.) Haw. Stem erect, 1–3 dm. tall: leaf-blades elliptic or obovate, 1–4 cm. long: bracts ovate or triangular-ovate: involucre 1–1.5 mm.

long; horns less than 1 mm. long: capsule 2.5–3 mm. broad, smooth: seed ellipsoid or ovoid-ellipsoid, 1.5 mm. long or less, with 1–4 series of pits.—(PETTY-SPURGE.)—Roadsides, waste-places, and cult. grounds, various provinces, Ala. to Ia. and N. B.; also Calif. Nat. of Eu.—Spr.–fall.

9. **G. Cyparissias** (L.) Small. Stem often tufted, 1–3 dm. tall: leaves very numerous; blades linear, 2–4 cm. long, acute or acutish, entire: bracts ovate, deltoid, or reniform: involucre campanulate, about 2 mm. long, sessile; glands lunate, nearly 1 mm. wide: capsule 3-lobed, about 3 mm. wide, granular, the lobes rounded: seed ovoid, nearly 2 mm. long, smooth.—(CYPRESS-SPURGE.)—Fence-rows, roadsides, and waste-places, various provinces, E. U. S. Nat. of Eu. —Sum.–fall.

10. **G. trichotomus** (H.B.K.) Small. Stem 1–4 dm. tall: leaf-blades cuneate to elliptic, 0.5–1.2 cm. long: bracts similar to the leaves: involucre 2 mm. long; glands obreniform: capsule about 4 mm. broad, minutely wrinkled: seed subglobose, fully 1.5 mm. in diameter.—Coastal sand-dunes, S pen. Fla. and the Keys.—(*W. I., Mex.*)—All year.

11. **G. Helioscopia** (L.) Haw. Stem 1–3.5 dm. tall: leaf-blades spatulate to cuneate, 1.5–4 cm. long, finely toothed near the rounded or emarginate apex: bracts of the rays cuneate to elliptic-cuneate: involucre turbinate-campanulate, about 1.5 mm. high, short-peduncled; glands transversely oval, about 0.5 mm. wide, unappendaged: capsule about 4 mm. broad, the lobes rounded: seed ovoid, nearly 2 mm. long, finely reticulate.—(WARTWEED.)—Fields, waste-places, and cult. grounds, various provinces, N. C. to Ill., Ore., Que., and N. Y. Nat. of Eu.—Sum.–fall.

12. **G. obtusatus** (Pursh) Small. Stem 3–6 dm. tall: leaf-blades spatulate-elliptic, 1–3 cm. long: bracts ovate: involucre 1–1.5 mm. long: capsule 3.5–4 mm. broad, warty: seed ellipsoid or orbicular-ellipsoid, 2 mm. long or less, faintly reticulate.—(WARTY-SPURGE.)—Dry soil, often in woods, various provinces, S. C. to Tex., Ia., and Pa.—Spr.–sum.

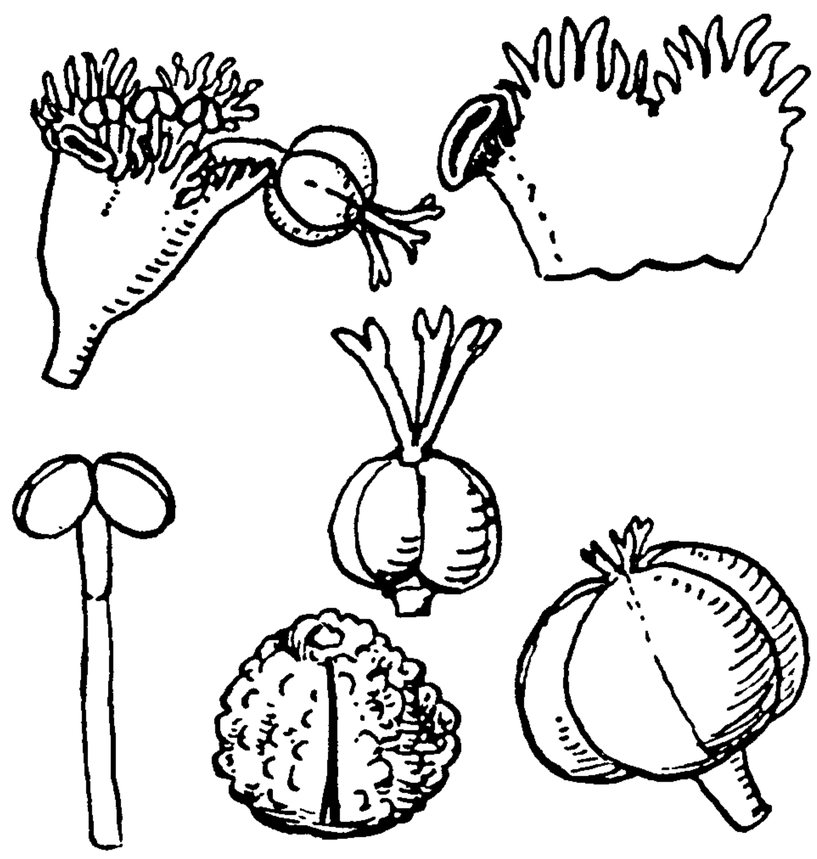
13. **G. arkansanus** (Engelm. & Gray) Small. Stem 2–5 dm. tall: leaf-blades spatulate or cuneate, 1–3 cm. long: bracts ovate to ovate-reniform: involucre about 1 mm. long: capsule 2.5–3 mm. broad, with elongate warts: seed ovoid-lenticular, 1.3–1.5 mm. long, finely reticulate.—Prairies and shaded banks, various provinces, Ala. to Tex., Colo., and Kans.—Spr.–sum.

14. **G. platyphylla** (L.) Small. Stem 2–10 dm. tall: leaf-blades oblanceolate, acute, cordate and auricled at the base, 2–5 cm. long, softly pubescent beneath especially at and near the margin, sometimes with scattered pubescence above: bracts obovate, triangular-ovate or reniform-ovate: involucre about 1.5 mm. long, cottony pubescent, the glands large, sessile: capsule 2.5–3 mm. broad with depressed worts: seed ovoid-lenticular with a slight dorsal keel, 2 mm. long, smooth.—Waste places and roadsides, various provinces, Lake Champlain and the Great Lake region, also central N. Y. and southern La. Nat. of Eu.—Spr.–early fall.

28. **POINSETTIA** Graham. Annual, biennial, or perennial herbs or woody plants. Leaf-blades entire, toothed, or lobed, those of the upper ones often like the bracts highly colored or discolored. Involucres solitary or cymose, each with 1, or rarely 3 or 4, unappendaged glands. Capsule smooth. Seeds tuberculate.—About 12 species, mostly tropical American.—Sum.–fall or all year S.—EUPHORBIAS. SPURGES.

Gland or glands of the involucre stalked: bracts and upper leaves barely if at all discolored. 1. *P. dentata.*
Gland of the involucre sessile or nearly so: bracts and upper leaves discolored at the base.
  Bracts white or pale-pink at the base. 2. *P. geniculata.*
  Bracts red, scarlet, or purple at the base.
    Leaves throughout the plant with very narrowly linear entire blades: plant glabrous: involucral glands mostly 3 or 4. 3. *P. pinetorum.*
    Leaves, at least those of the main stem, and the bracts, with broad, toothed, pandurate or pinnately lobed blades, those of the branches often narrow: plant pubescent: involucral glands mostly solitary.
      Broad leaves with toothed blades. 4. *P. heterophylla.*
      Broad leaves with pandurate or pinnately lobed blades. 5. *P. cyathophora.*

1. P. dentata (Michx.) Small. Stem 2–4 dm. tall, pubescent: leaf-blades 1–9 cm. long, ovate, lanceolate, or nearly linear: involucre 2.5–3 mm. long; glands usually solitary: capsule 4–4.5 mm. broad: seed prominently tuberculate.—Rich soil, dry hills, and plains, various provinces, rarely Coastal Plain, N. Fla. to N. M., Wyo., S. D., N. Y., and Va.



2. P. geniculata (Ortega) Small. Stem 3–9 dm. tall, glabrous or nearly so: leaf-blades elliptic or ovate, 4–9 cm. long, entire or obsoletely dentate: bracts often serrate or crenate: involucre 3–3.5 mm. long: capsule 4–5 mm. broad: seed ovoid, 3–3.5 mm. long.—Hillsides and roadsides, Rio Grande Region, Tex. and Fla. Keys.—(*W. I., Mex.*)

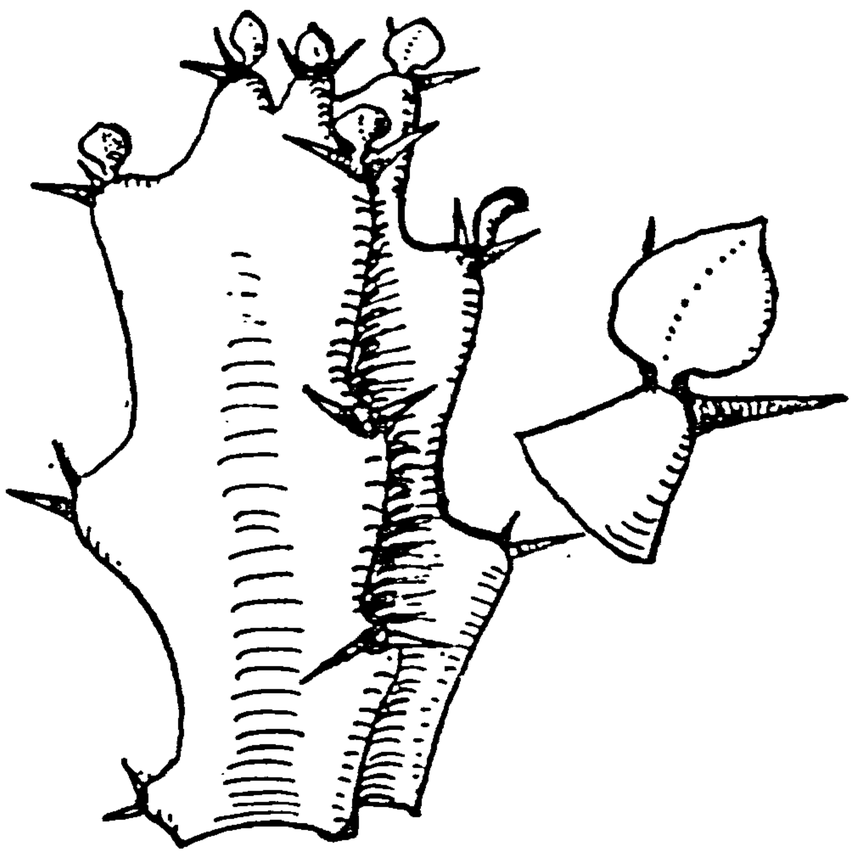
3. P. pinetorum Small. Stem 3–10 dm. tall, glabrous: leaf-blades narrowly elongate-linear, 4–15 cm. long: bracts entire: involucre turbinate, mostly less than 3 mm. long: capsule 2.5–3 mm. long: seed 2–2.5 mm. long, slightly tuberculate. [*P. havanensis* (Fl. SE. U. S.)]—Pinelands and sandy places, Everglade Keys, pen. Fla. and Florida Keys.—(*W. I.*)

4. P. heterophylla (L.) Small. Perennial, stem 3–12 dm. tall: leaf-blades obovate, elliptic, or ovate, or narrower, especially on the branches, 5–15 cm. long: involucre campanulate, mostly over 3 mm. long: capsule 3.5–4 mm. long: seed 3–3.5 mm. long, prominently tuberculate.—(PAINTED-LEAF. FIDDLER'S-SPURGE.)—Hammocks, wooded banks and rocky places, Coastal Plain, Fla. to Tex., Kans., Minn., and Ill.—(*W. I., Mex., C. A., S. A.*)

5. P. cyathophora (Murr.) Small. Annual, stem 1.5 m. tall or less, pubescent: leaf-blades elliptic or oval, varying to obovate or ovate, or narrower especially on the branches, 5–18 cm. long: involucre campanulate, 3.5–4 mm. long: capsule 4–4.5 mm. long: seed 3–3.5 mm. long, tuberculate.—(PAINTED-LEAF.)—Hammocks, cult. grounds, waste-places, and roadsides, Fla.—(*W. I., Mex., C. A., S. A.*)—A form, apparently of one or the other of the two preceding species occurs, perhaps as an immigrant in the Central States up into Kans., Minn., and Ill.

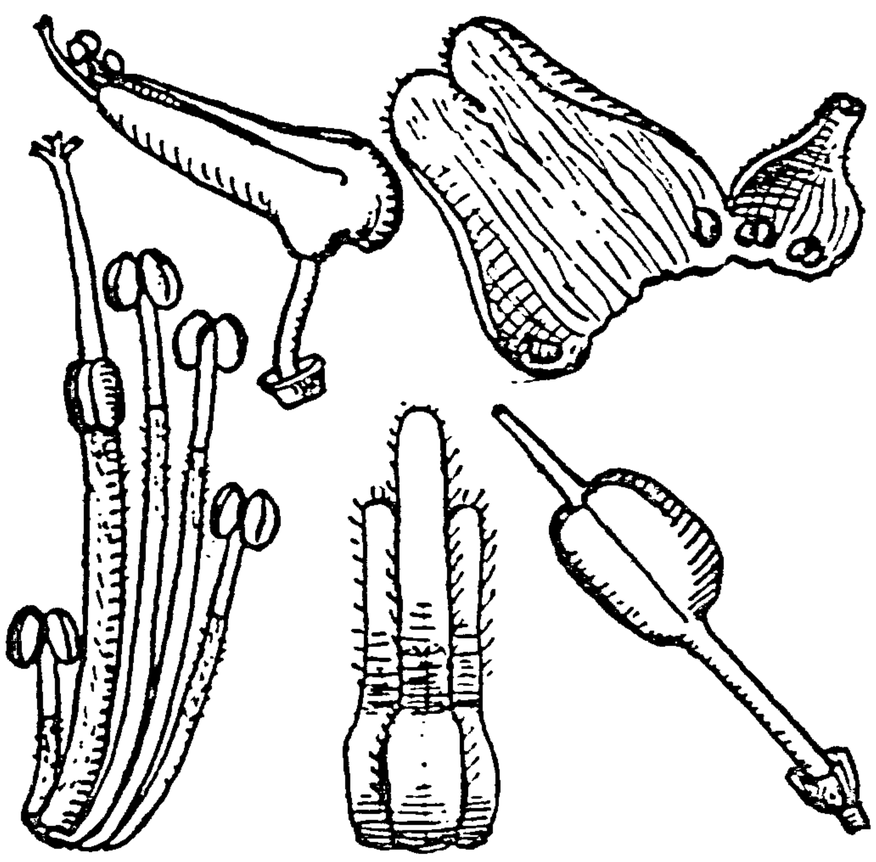
29. EUPHORBIA L. Very succulent cactus-like shrubs or trees, with angled or ribbed spine-armed jointed stems and branches. Leaves small or

minute, often scale-like, fleshy, early deciduous, or obsolete. Involucres solitary or clustered, each with five mostly unappendaged glands. Capsule usually smooth.—About 30 species, of the Old World.



1. **E. lactea** Haw. Plants 1–5 m. tall, copiously branched, the branches 3-angled, the angles repand, with the faces whitish-marbled: spines stout-subulate, 3–7 mm. long, divergent: leaves between the spines; blades suborbicular to orbicular-reniform, 2–4 mm. wide, glabrous, nearly sessile.—(MOTTLED-SPRUGE.)—Hammocks and waste-places, Florida Keys. Nat. of E. I.—(*W. I., Mex.*)—Frequently planted for ornament and for hedges in tropical regions.

30. **TITHYMALUS** Mill. Shrubs with fleshy branches. Leaves succulent: blades flat, entire or undulate-crisped. Involucres borne in dichotomous, often contracted cymes, oblique and strongly 2-lipped, the lower lip much larger than the upper. Capsule 3-lobed, the carpels often keeled or horned.—About 30 species, tropical American. [*Pedilanthus* Neck.]



1. **T. Smallii** (Millsp.) Small. Plant 3–16 dm. tall or more, the stem and branches sometimes zigzag: leaves spreading; blades ovate to ovate-lanceolate, 4–11 cm. long: involucres 12–14 mm. long, mainly red, the two terminal lobes broadly ovate, ciliolate: stamens and style exserted: capsule 6–7 mm. long; seed 3–3.5 mm. long. [*P. tithymaloides* (Fl. SE. U. S.) *P. Smallii* Millsp.]—(JEW-BUSH. RED-BIRD FLOWER.)—Hammocks and pinelands, Everglade Keys, pen. Fla. and Florida Keys. Nat. of trop. Am., and cult.—All year.—Used medicinally.

FAMILY 2. **CALLITRICHACEAE** — WATER-STARWORT FAMILY

Herbs, often aquatics, with tender tissues. Leaves opposite: blades entire, or 3-nerved. Flowers polygamous, minute, axillary, often minutely bracted. Calyx wanting. Corolla wanting. Androecium of a single stamen. Gynoecium of 4 united carpels. Ovary 4-celled. Fruit coriaceous, indehiscent, 4-lobed.—One genus.

1. **CALLITRICHE** L. Aquatic or more or less amphibious plants, the opposite leaves often approximate or congested at the ends of the stem and branches. Flowers inconspicuous, green.—About 20 species, of wide geographic distribution.—WATER-STARWORTS.

Carpels permanently united: leaf-blades in terrestrial plants, or of floating leaves in aquatics, obovate to spatulate and 3-veined. I. VERNAE.
Carpels, in fruit, separate nearly to the axis: leaf-blades uniformly linear and 1-veined. II. AUTUMNALES.

I. VERNAE

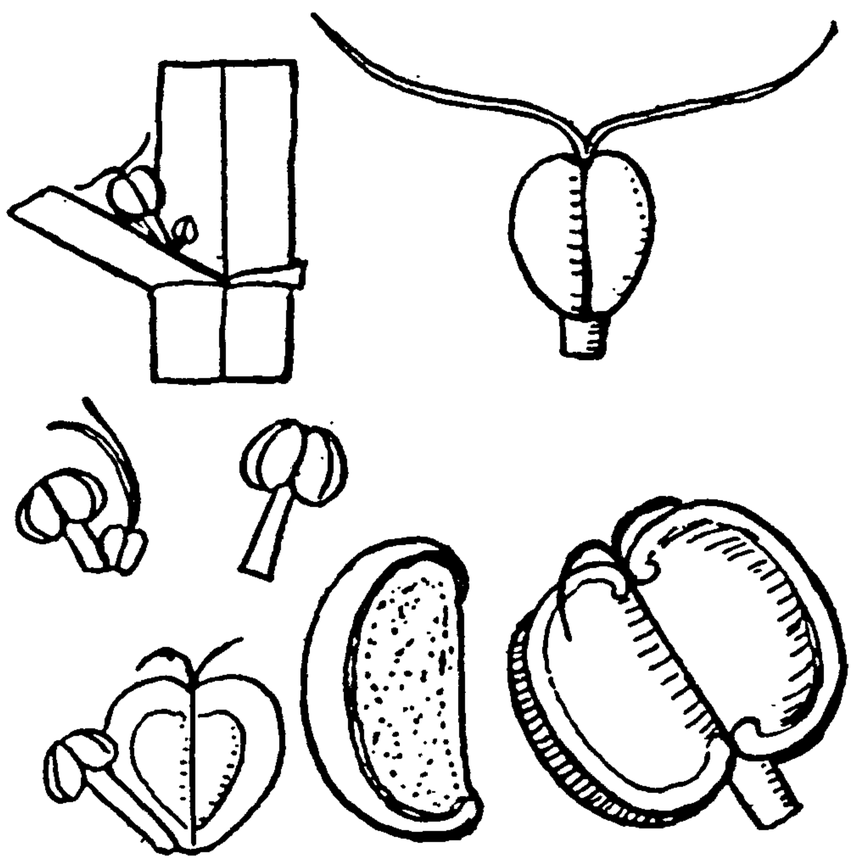
Fruit manifestly pedicelled: leaves uniform.
  Fruit about 0.8 mm. long: styles persistent. — 1. *C. terrestris.*
  Fruit about 0.7 mm. long: styles deciduous. — 2. *C. Nuttallii.*
Fruit essentially sessile.
  Styles much shorter than the fruit. — 3. *C. palustris.*
  Styles fully as long as the fruit.
    Aquatic: fruit 1 mm. broad. — 4. *C. heterophylla.*
    Terrestrial: fruit 0.5 mm. broad. — 5. *C. peploides.*

II. AUTUMNALES

Submerged perennial, with leaf-blades notched at the apex. — 6. *C. autumnalis.*

1. C. terrestris Raf. Terrestrial, fragrant in drying, the foliage scaleless: leaf-blades spatulate, 2–3 mm. long: fruit broader than long. [*C. Austinii* Engelm.]—Damp shaded soil, various provinces, rarely Coastal Plain, Ala. to Tex., Mo., Conn., and Va.—(*Mex.*)—Sum.–fall.

2. C. Nuttallii Torr. Terrestrial, the foliage scaleless: leaf-blades spatulate to elliptic, 2–4 mm. long: pedicels without scales: fruit broader than long.—Moist soil, Coastal Plain and occasionally adj. provinces, Ala. to La. and Ky.—Spr.–sum.



3. C. palustris L. Aquatic, the foliage scaly: blades of the submerged leaves linear, those of the emersed ones spatulate, shorter than the submersed ones: flower-stalks with 2 scales: fruit obovoid, about 1.5 mm. long. [*C. verna* L.] — (WATER-CHICKWEED.) — Ponds and streams, various provinces, U. S. and Can.—(*S. A., O. W.*)—Spr.–sum.

4. C. heterophylla Pursh. Aquatic or rarely uliginous; blades of the submersed leaves filiform or linear, those of the emersed ones spatulate: fruit decidedly pedicelled.—Slow-flowing streams, pools, and ditches, various provinces, Fla. to La., Colo., Man., and Newf.—Sum.

5. C. peploides Nutt. Terrestrial, the plant matted: leaf-blades uniform, obovate, oblanceolate, or elliptic: fruit sessile or nearly so.—Moist soil, various provinces, Fla. to Tex. and Ark.—Spr.–sum.

6. C. autumnalis L. Aquatic with stems 6–17 cm. long: leaf-blades narrowly linear, 5–12 mm. long: fruit orbicular-reniform, scarcely 2 mm. wide, 2-lobed, sessile.—Ponds, lakes, and streams, various provinces, La. to Colo., Ore., Man., and Que.—(*Eu.*)—Sum.–fall.

ORDER **SAPINDALES** — SAPINDAL ORDER

Shrubs or trees. Leaves various: blades simple and entire or toothed, or compound. Calyx of distinct sepals. Corolla of distinct petals, regular or rarely irregular, or wanting. Androecium of as many stamens as there are petals, or of twice as many, or rarely of more or fewer. Filaments distinct. Gynoecium of a single carpel, or of several united carpels. Ovary superior. Ovules 1 or 2, or several, in each cavity of the ovary, pendulous, with the raphe away from the axis of the ovary, or erect or ascending. Fruit various.—Exceptions to the woody plants are *Pachysandra* and *Cardiospermum.*

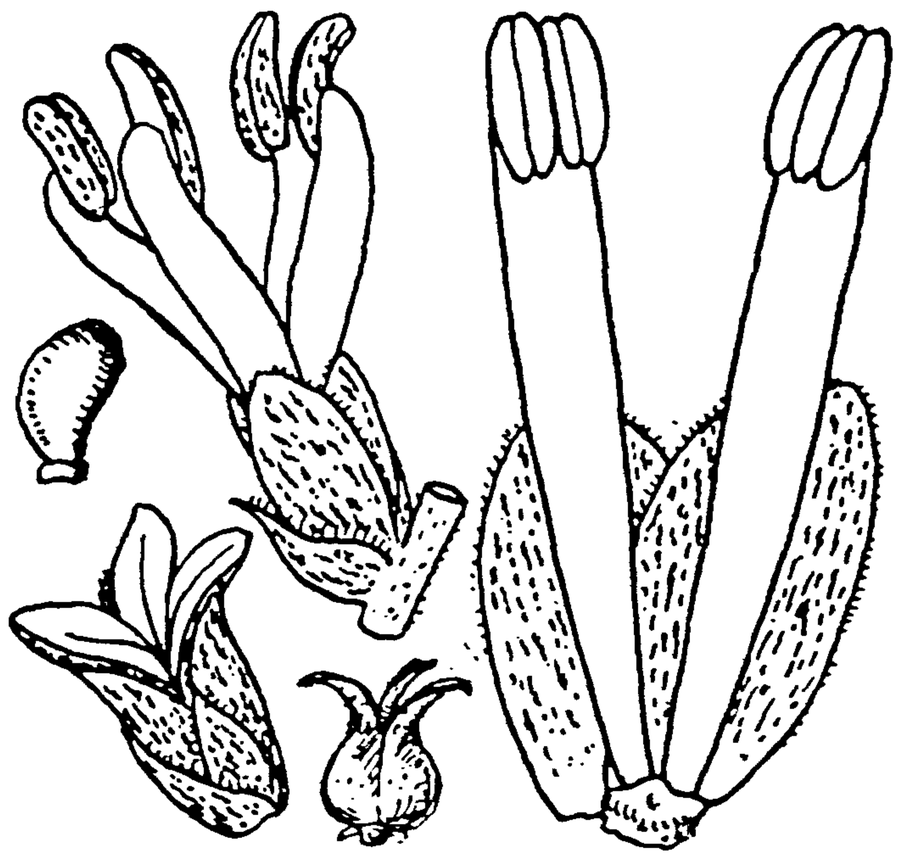
Corolla wanting: stamens 4 (in our genus): styles wanting.
Fam. 1. BUXACEAE.

Corolla present or if wanting (*Dodonaeaceae*) stamens 6: styles present, distinct or united, rarely single.
- Stigmas tufted or many-cleft. — Fam. 2. EMPETRACEAE.
- Stigmas entire.
  - Plant with resin-bearing tissues. — Fam. 3. SPONDIACEAE.
  - Plant not resin-bearing.
    - Leaf-blades simple, pinnately veined.
      - Each cavity of the ovary with a single ovule.
        - Flowers in racemes: fruit a dry terete or a winged, coriaceous drupe. — Fam. 4. CYRILLACEAE.
        - Flowers not racemose: fruit a fleshy drupe. — Fam. 5. AQUIFOLIACEAE.
      - Each cavity of the ovary with 2 or more ovules.
        - Disk present: corolla present.
          - Anthers introrse: seed often arilled. — Fam. 6. CELASTRACEAE.
          - Anthers extrorse: seed not arilled. — Fam. 7. HIPPOCRATEACEAE.
        - Disk obsolete: corolla wanting. — Fam. 8. DODONAEACEAE.
    - Leaf-blades simple and palmately veined or compound.
      - Leaves opposite.
        - Fruit capsular.
          - Flowers regular: fruit a membranous, bladdery 3-lobed capsule: leaf-blades pinnately compound. — Fam. 9. STAPHYLEACEAE.
          - Flowers irregular: fruit a leathery globular capsule: leaf-blades digitately compound. — Fam. 10. AESCULACEAE.
        - Fruit a samara. — Fam. 11. ACERACEAE.
      - Leaves alternate, in our species. — Fam. 12. SAPINDACEAE.

FAMILY 1. **BUXACEAE** — BOX FAMILY

Shrubs, trees, or perennial herbs. Leaves alternate or opposite, often persistent: blades simple. Flowers monoecious or dioecious. Calyx of several sepals or wanting. Corolla wanting. Androecium of 4–7 stamens. Gynoecium of 2–4 united carpels. Fruit a capsule or a drupe.—About 6 genera and 35 species, widely distributed.

1. **PACHYSANDRA** Michx. Herbs with leaves and flowers on separate branches. Leaves alternate, approximate. Flowers brownish, monoecious, spicate. Staminate flowers with 4 sepals and 4 stamens. Pistillate flowers with 4 or more sepals and a 3-celled ovary. Capsule 3-celled, 3-lobed. Seeds 2 in each cavity. Several species, mostly Asiatic.

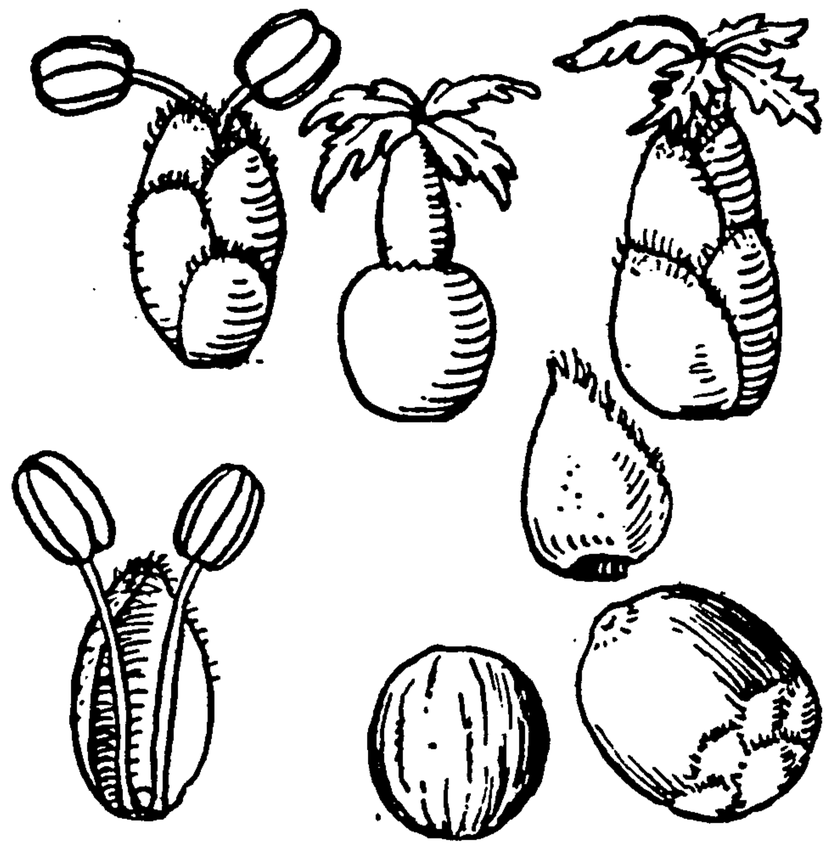


1. **P. procumbens** Michx. Stem 1–3 dm. long: leaves evergreen; blades thickish, 3–12 cm. long, obovate, oval, or ovate, sometimes coarsely toothed: spikes 3–10 cm. long: flowers musk-scented, the pistillate few at the base of the spike: outer sepals ovate or elliptic, the inner broader, 4–6 mm. long: capsule subglobose, about 1 cm. in diameter, each carpel with a long curved beak.—(ALLEGHENY-MOUNTAIN SPURGE.) — Rich woods, often in calcareous soils, various provinces, W. Fla. to La., Ky., and W. Va. —Spr.

Family 2. **EMPETRACEAE** — Crow-berry Family

Shrubs, mostly resembling heaths. Leaves alternate or whorled, sometimes numerous and crowded. Flowers dioecious or rarely polygamous. Calyx of 2 or 3 sepals. Corolla of 2 or 3 petals, or wanting. Androecium of 2–4, mostly 3 stamens. Gynoecium of 2–several united carpels.—Three genera and few species, but widely distributed.

1. CERATIOLA Michx. Evergreen shrubs. Leaf-blades narrow, revolute and thus almost tubular. Flowers 2 or 3 in an axil. Sepals 2. Petals 2. Stamens 2. Ovary 2-celled. Drupe with 2 nutlets.—One species.



1. C. ericoides Michx. Shrub 3–15 dm. tall: leaves crowded and spreading, 8–12 mm. long: flowers red or yellowish: sepals about 1 mm. long: stamens exserted: drupe subglobose, 2–3 mm. in diameter, yellow or red.—(Rosemary.)—Dry pinelands, sandhills, and scrub, often in very acid soil, Coastal Plain, Fla. to Miss., and S. C.—Spr.–sum. or all year.—A peculiar shrub of somewhat uncertain relationship, but associated with the crowberries of northern North America. It resembles the heaths in habit and in the peculiarly pleasant aroma it gives off. It has two deadly enemies. Throughout its range fire has destroyed vast areas of it, while in lower peninsular Florida the parasitic woevine (*Cassytha*) is equally as destructive.—Specimens of this species collected at Palma Sola, Florida, have been described as *C. falcatula* Gandoger.

Family 3. **SPONDIACEAE** — Sumac Family

Shrubs, trees, or vines, with a milky, resinous, often acid or caustic sap. Leaves alternate: blades simple or pinnately compound. Flowers monoecious, dioecious, or polygamous. Calyx of 3–6 sepals. Corolla of 3–5 petals, larger than the calyx. Androecium of 3–6, or rarely more, stamens. Gynoecium of 1, or 3–5 more or less united carpels. Fruit a drupe or a berry.—Sixty genera and 500 species, mostly tropical.

Gynoecium 1-carpellary: style single: ovary on a swollen receptacle: leaves with simple blades. — I. Mangifereae.
Gynoecium 3-carpellary: styles or stigmas 3: ovary not on a swollen receptacle: leaves with simple or compound blades. — II. Rhoedeae.

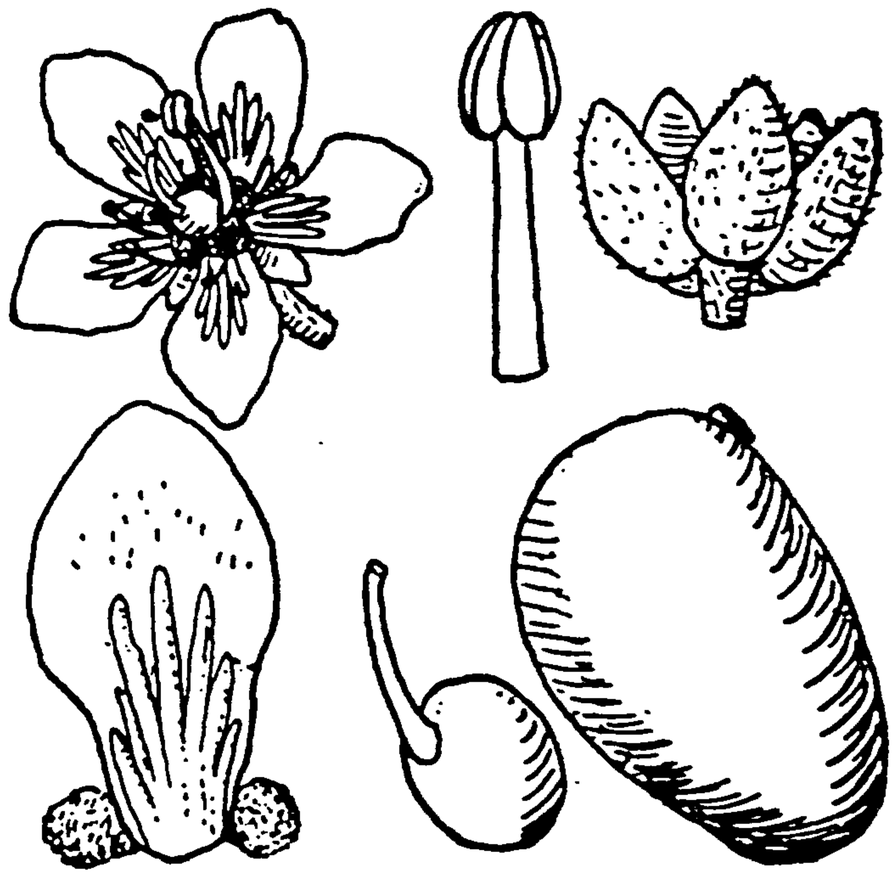
I. Mangifereae

Trees with narrow leaf-blades and panicled flowers. — 1. Mangifera.

II. Rhoedeae

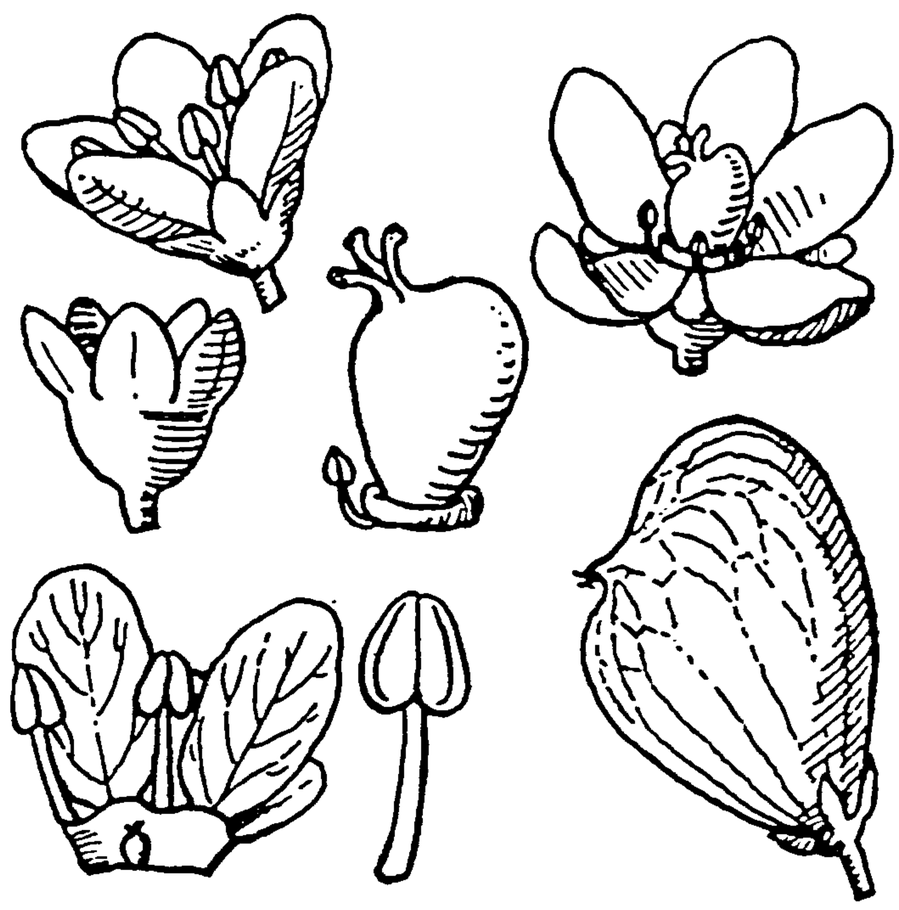
Ovary, and drupe, very oblique: style laterally oblique: leaves with broad simple blades. — 2. Cotinus.
Ovary, and drupe, not oblique: style terminal: leaves with compound blades.
  Drupe somewhat elongate, the coats permanently united. — 3. Metopium.
  Drupe depressed, the coats ultimately separating.
    Drupe with a glabrous or sparingly pubescent outer coat: stone ribbed. — 4. Toxicodendron.
    Drupe with a copiously pubescent outer coat: stone smooth.
      Flowers polygamous, in terminal thyrsoid panicles appearing after the leaves. — 5. Rhus.
      Flowers polygamo-dioecious, in solitary or clustered spikes in the axils, before the leaves. — 6. Schmaltzia.

1. MANGIFERA L. Trees. Leaf-blades simple, relatively narrow. Flowers polygamo-dioecious, in stiff panicles, the branches not plumose. Sepals 4 or 5. Petals 4 or 5. Ovary oblique: style 1, lateral. Drupe ovoid to somewhat reniform, smooth: stone tenaciously fibrous-coated.—About 14 species, Asiatic.



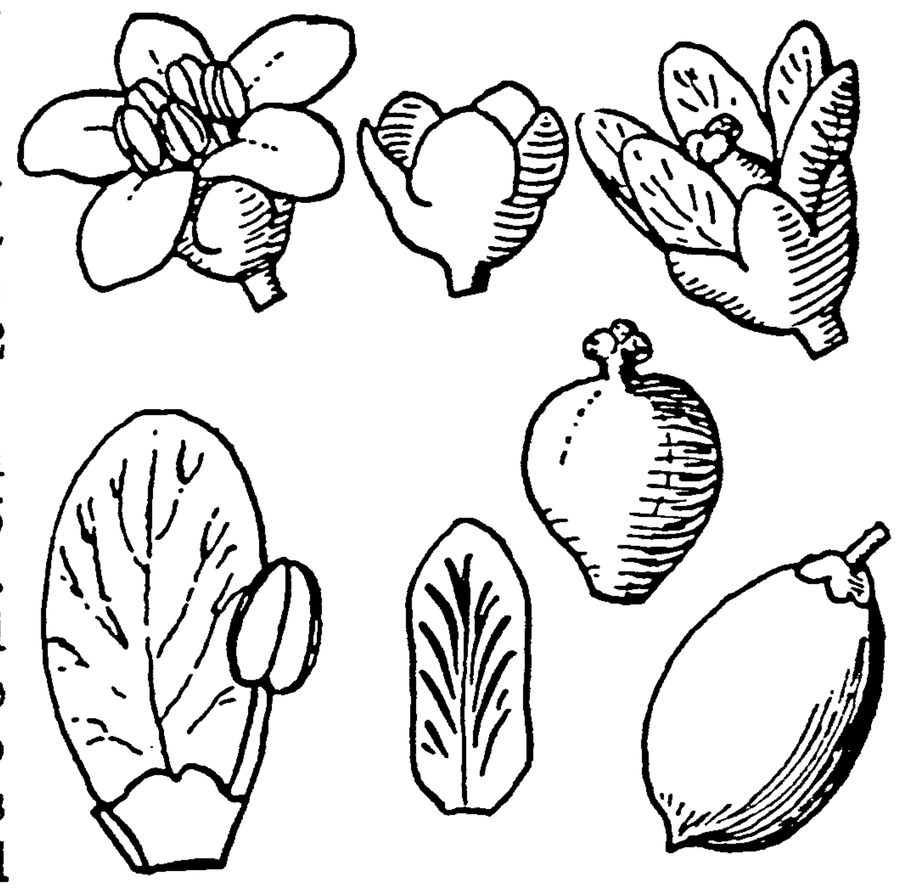
1. M. indica L. Leaf-blades leathery, elliptic to linear-elliptic or linear-lanceolate, mostly 1–3.5 dm. long, reticulate: panicles 1–4 dm. long: flowers greenish, yellowish, or red: sepals ovate: petals elliptic or obovate, 3.5–4 mm. long: drupe 5–10 cm. long, aromatic. — (MANGO.) — Hammocks and fields, S pen. Fla. and the Keys. Nat. of the E. I., and cult.—Spr.—Grown in many varieties for its esculent fruit.

2. COTINUS Adans. Shrubs or trees. Leaf-blades simple, relatively broad. Flowers mostly polygamous or dioecious, in loose panicles which often have plumose branches. Sepals 5. Petals 5. Ovary oblique: styles 3, eccentric. Drupe obliquely reniform, veiny: stone glabrous.—Two species, the following and one Eurasian.



1. C. americanus Nutt. Shrub, or tree becoming 12 m. tall: leaf-blades membranous, obovate or oval, 4–15 cm. long: panicles 1–3 dm. long, the branches glandular-villous: sepals ovate: petals elliptic-ovate, green: drupe 5 mm. long. [*C. cotinoides* (Nutt.) Britton.]—(SMOKE-TREE.)—Rocky limestone hills, Interior Plateau provinces, Ala. to Ark. (or Tex?), Mo., and Tenn.—Spr.—The sapwood is whitish; the orange heartwood is coarse-grained, light and soft, but durable in contact with the soil as fence-posts. It yields a yellow dye.

3. METOPIUM P. Br. Shrubs or trees. Leaf-blades pinnate. Flowers dioecious, in open panicles. Sepals 5. Petals 5. Ovary equilateral. Styles united: stigma 3-lobed. Drupe not oblique.—Three species, West Indian.



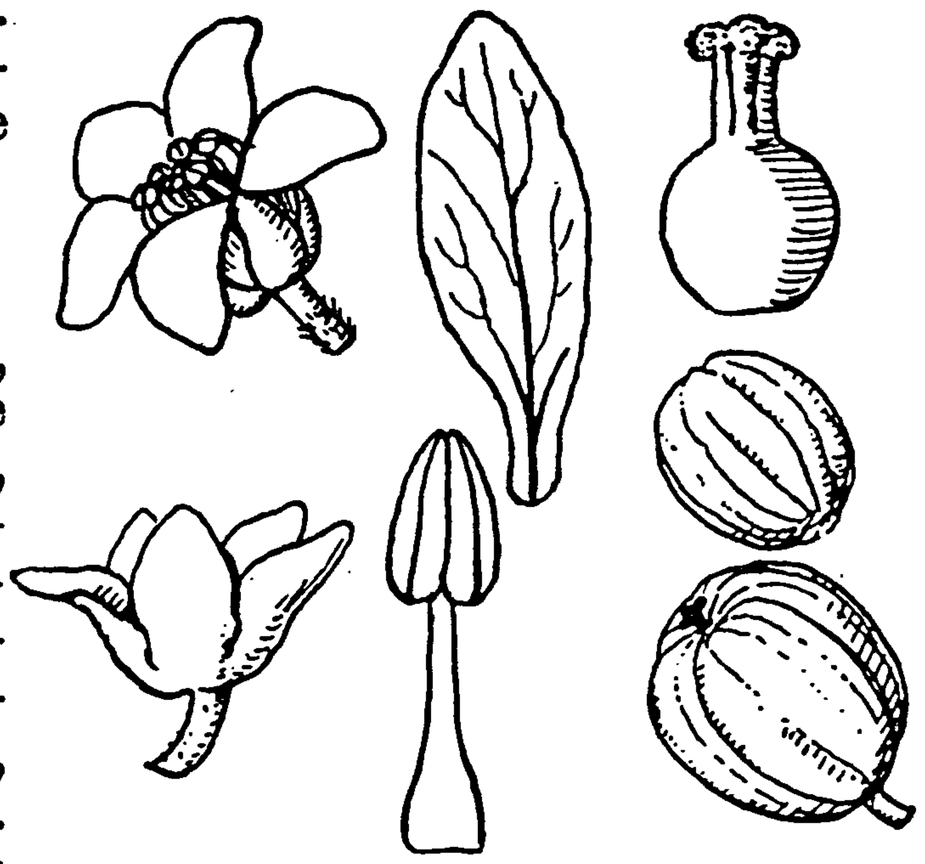
1. M. toxiferum (L.) Krug & Urban. Shrub, or tree becoming 14 m. tall, with a very poisonous sap: leaflets 3–7; blades leathery, ovate, 3–9 cm. long: panicles 1–2 dm. long: sepals reniform or suborbicular: petals elliptic to ovate or oval yellow-green and often dark-lined within: drupe 10–15 mm. long.—(POISONWOOD. DOCTOR-GUM. CORAL-SUMAC.)—Hammocks, pinelands, and coastal sand-dunes, S. pen. Fla. and the Keys.—(*W. I.*)—Spr. or all year.—The sap is a powerful skin-poison. The sap-wood is yellow or light-brown; the dark-brown and

red-streaked heart-wood is heavy and hard, but not strong. A large tree in hammocks, a shrub, often with diffuse or depressed stems in pinelands.

4. **TOXICODENDRON** [Tourn.] Mill. Shrubs, trees, or woody vines, with poisonous sap. Leaf-blades pinnately compound. Flowers polygamous or dioecious, in rather dense panicles, white or greenish. Sepals 4–6. Petals 4–6. Ovary glabrous. Styles short. Drupe mostly glabrous, the sarcocarp wax-secreting. Seed ribbed.—About 20 species, North American and Asiatic.—Spr.-sum.—The sap is a powerful skin poison. Some of the species are used medicinally.

Leaf-blades 3-foliolate: vines or low shrubs: panicles of fruits spreading.
  Stems climbing or erect especially when young: blades of the leaflets coarsely toothed or entire, thin. 1. *T. radicans.*
  Stems erect: blades of the leaflets lobed, thickish. 2. *T. Toxicodendron.*
Leaf-blades 7–11-foliolate: tall shrub or tree: panicles of fruits drooping. 3. *T. Vernix.*

1. T. radicans (L.) Kuntze. Stem climbing by aërial roots: blades of the leaflets membranous, ovate to ovate-lanceolate, 3–20 cm. long: sepals ovate, 1–2 mm. long: petals elliptic to elliptic-ovate, 3–4 mm. long: drupe 3–6 mm. in diameter. [*Rhus radicans* L.]—(POISON-IVY. POISON-OAK.)—Woods, hammocks, thickets, fence rows, and swamps, various provinces, Fla to Miss., Nebr., Minn., and N. S.—(*W. I.*)



2. T. Toxicodendron (L.) Britton. Shrub, with densely pubescent twigs: blades of the leaflets ovate in outline or rarely obovate, 4–12 cm. long, coarsely crenate-lobed: panicles densely flowered: petals elliptic-lanceolate, about 2.5 mm. long: drupe depressed-globose. [*Rhus Toxicodendron* L.]—(POISON-OAK.)—Dry woods and pinelands, Coastal Plain and rarely adj. provinces, Fla. to Tex., Tenn., and N. J. The stems are simple or little branched. The leaflet-blades are much firmer in texture than in *R. radicans*, and strongly pubescent beneath.

3. T. Vernix (L.) Kuntze. Shrub or small tree: blades of the lateral leaflets elliptic, or oval, 4–15 cm. long, undulate: petals linear-elliptic, about 2 mm. long: drupes subglobose, about 5 mm. broad, in drooping panicles. [*Rhus Vernix* L. *Rhus venenata* DC.]—(POISON-SUMAC. THUNDERWOOD. POISON-ELDER. POISON-DOGWOOD. SWAMP-SUMAC.)—Non-alluvial swamps and wet woods, various provinces, Fla. to La., Minn., and Me.—The heart-wood, coarse-grained, light and soft, is brown streaked with yellow.

5. **RHUS** L. Shrubs or trees, not poisonous. Leaf-blades pinnately compound, several-foliolate. Flowers polygamous or dioecious, borne in terminal usually compact panicles, white or greenish-white. Sepals commonly 5. Petals commonly 5. Ovary pubescent. Style short. Drupe pubescent. Seed smooth and even.—About 125 species, natives of temperate and warm regions.—Spr.—SUMACS. The bark and leaves are sometimes used for tanning.

Rachis of the leaf wingless, terete or nearly so: fruiting panicles erect. I. HIRTAE.
Rachis of the leaf winged: fruiting panicles nodding. II. LEUCANTHAE.

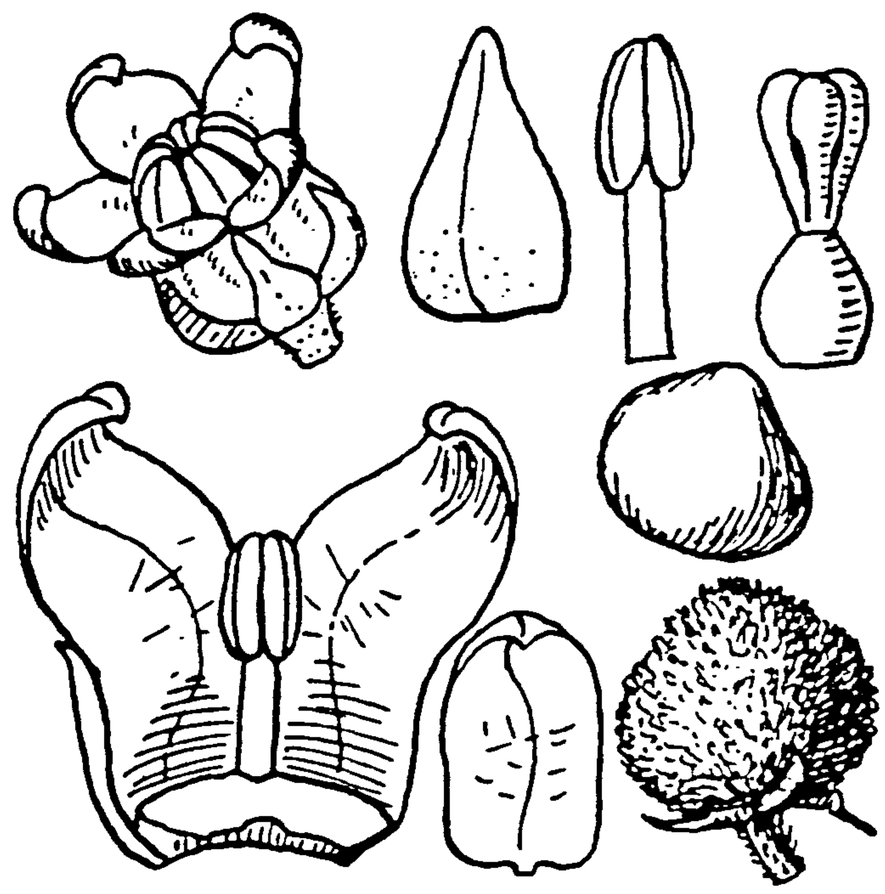
I. Hirtae

Foliage more or less glaucous or pale.
  Twigs, panicles, and drupes usually pubescent with soft very short hairs.
    Leaflets with acuminate, sharply serrate blades. 1. *R. glabra.*
    Leaflets with crenate-serrate blades, rounded at the apex. 2. *R. Ashei.*
  Twigs, panicles, and drupes bristly pubescent with long spreading hairs. 3. *R. hirta.*
Foliage densely pubescent with brownish hairs, not glaucous. 4. *R. Michauxii.*

II. Leucanthae

Bark of the trunk gray, dull: petals about 2.5 mm. long: anthers broadly ellipsoid, scarcely 1 mm. long.
  Blades of the leaflets acuminate, and usually acute: leaf-rachis broadly winged. 5. *R. Copallinum.*
  Blades of the leaflets obtuse: leaf-rachis narrowly winged. 6. *R. obtusifolia.*
Bark of the trunk red, shining: petals about 3 mm. long: anthers linear-ellipsoid, fully 1 mm. long. 7. *R. leucantha.*

1. R. glabra L. Shrub or tree becoming 6 m. tall, leaflets 11–31; blades elliptic or lanceolate (that of the terminal one often ovate), 3–8 cm. long: petals about 2 mm. long: drupe velvety, the stone 3–3.5 mm. long.—(Smooth-sumac. Scarlet-sumac. Red-sumac.)—Dry rich soil and thickets, various provinces, N Fla. to La., Minn., and N. S.—Spr.–sum.—The orange-colored and green-streaked heart-wood is coarse-grained, soft, and brittle. The fruiting panicles are erect.



2. R. Ashei Small. Shrub with glaucous stems: leaflets 13–17; blades elliptic to oval-elliptic, 3–9 cm. long: stone of the drupe about 3 mm. long. [*Rhus caroliniana* Ashe. Not Mill.]—Sandy soil, Piedmont, N. C.—Spr.

3. R. hirta (L.) Sudw. Shrub, or tree becoming 12 m. tall, with pubescent foliage: leaflets 11–31; blades elliptic to lanceolate, or that of the terminal one ovate-lanceolate, 4–15 cm. long: petals about 3 mm. long: drupe bristly, the stone 3–3.5 mm. long. [*Rhus typhina* L.]—(Staghorn-sumac. Hairy-sumac. Velvet-sumac.)—Roadsides and hillside-thickets, various provinces, Ga. to La., S. D., Minn., and N. B.—Spr.–sum.—The fruits of this and of related species are used to make an acid drink, similar to lemonade.

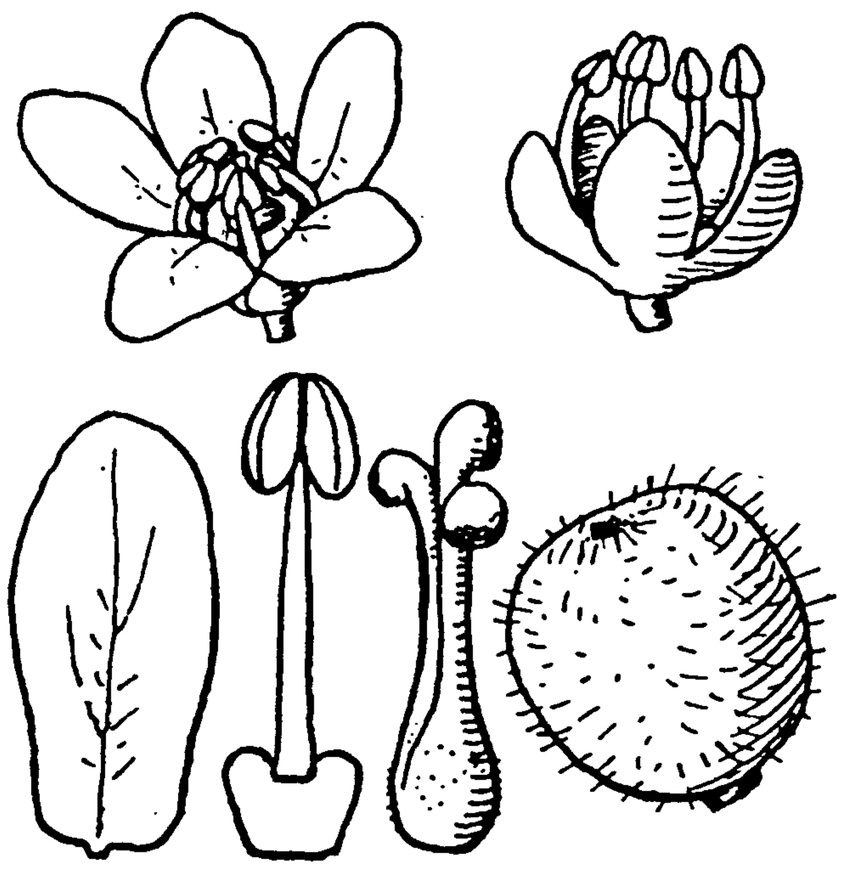
4. R. Michauxii Sarg. Shrub with densely pubescent stems: leaflets 9–15; blades elliptic, oval, or elliptic-ovate (that of the terminal one often ovate), 5–10 cm. long: stone of the drupe about 3.5 mm. long. [*Rhus pumila* Michx. Not Meerb.]—(False poison-sumac.)—Sandy soil, Piedmont, Ga. to N. C.—Spr.

5. R. Copallinum L. Shrub, or tree becoming 10 m. tall and 2.5 dm. in diameter, the bark thick, scaly: leaflets 9–21; blades elliptic to elliptic-lanceolate or sometimes oval, 3–10 cm. long: stone of the drupe 2.5–3 mm. long.—(Dwarf-sumac. Mountain-sumac. Black-sumac. Shining-sumac. Smooth-sumac.)—Dry, often stony soil, and hillsides, various provinces, Fla. to Tex., Minn., and Me.—Sum.—The heart-wood, light-brown streaked with green, is coarse-grained, light and soft. The fruiting panicles are drooping.

6. R. obtusifolia Small. Shrub: leaflets 17–21; blades ovate to elliptic, 2–5 cm. long: petals about 2.5 mm. long: stone of the drupe 3.5–4 mm. long.—Pinelands, Fla.—Spr.—sum. or all year S.

7. R. leucantha Jacq. Shrub, or tree becoming 9 m. tall, the bark thin, soft, smooth, peeling: leaflets 15–33; blades narrowly elliptic to linear-lanceolate, 3–9 cm. long: stone of the drupe about 3 mm. long.—(SOUTHERN-SUMAC.)—Hammocks, Everglade Keys, Fla.—(*W. I.*)—All year.

6. SCHMALTZIA Desv. Shrubs or trees, aromatic, not poisonous. Leaf-blades pinnately compound, usually 3-foliolate. Flowers polygamous or dioecious, in ament-like racemes or panicles before the leaves, yellowish-green. Sepals commonly 5. Petals commonly 5. Ovary pubescent: styles short. Drupe pubescent with crimson hairs, the sarcocarp not wax-secreting. Seed smooth and even.—About 8 species, North American.—SWEET-SUMACS.—The bark of some species is used medicinally.



1. S. crenata (Mill.) Greene. Shrub with diffuse stems, 1–2.5 m. tall: leaflets 3; blade of the terminal one mostly ovate or obovate: flowers yellow: drupe 7–8 mm. in diameter. [*S. aromatica* (Ait.) Desv.]—(FRAGRANT-SUMAC. SWEET-SCENTED SUMAC.)—Dry woods, often in calcareous soils, various provinces, Fla. to La., Minn., and Ind.—Spr.—The genus *Schmaltzia* has been interpreted as made up of many species. All, except the present species have geographic ranges northward and westward of our range.

FAMILY 4. CYRILLACEAE — TITI FAMILY

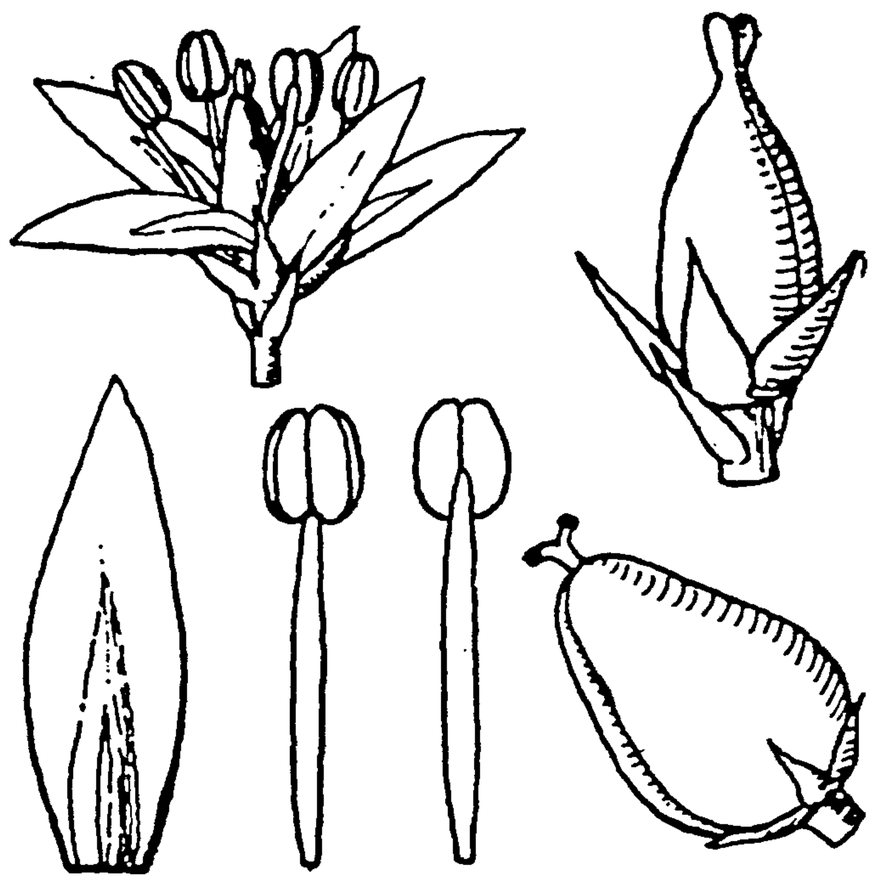
Shrubs or trees. Leaves alternate, mostly evergreen: blades entire. Flowers perfect, borne in lateral or terminal narrow racemes or raceme-like panicles. Calyx of 4 or 5 persistent sepals. Corolla of 5 or 8 petals, white. Androecium of 5 or 10 stamens. Gynoecium of 2–5 united carpels: styles united: stigmas 2–5. Fruit a dry terete or winged nut-like drupe.—Three genera and about 12 species, American.

Panicles lateral: sepals equal: petals acute, narrowed upward: stamens 5: ovary 2-celled: fruit terete, not winged. 1. CYRILLA.
Panicles terminal: sepals unequal: petals obtuse, broadened upward: stamens 10: ovary 3- or 4-celled: fruit winged. 2. CLIFTONIA.

1. CYRILLA Garden. Shrubs or small trees, with pale close bark. Leaves with veiny blades at maturity. Panicles raceme-like, narrow, clustered, spreading in anthesis. Sepals acute or acuminate. Petals narrowed upward, clawless, about twice as long as the sepals. Stamens equal: filaments flattened. Style short. Fruit an almost terete spongy drupe, spreading.—Four or five species, the following and the others tropical American.—IRONWOODS. TITIS. RED-TITIS. WHITE-TITIS.

Leaves mostly 5–10 cm. long; blades thick-membranous: petals 3 mm. long or more: drupe conic-ovoid or ovoid. 1. *C. racemiflora.*
Leaves mostly 1–4 cm. long; blades coriaceous: petals less than 3 mm. long: drupe globose-ovoid or subglobose.
  Sepals ovate: anthers apiculate. 2. *C. parvifolia.*
  Sepals lanceolate: anthers notched. 3. *C. arida.*

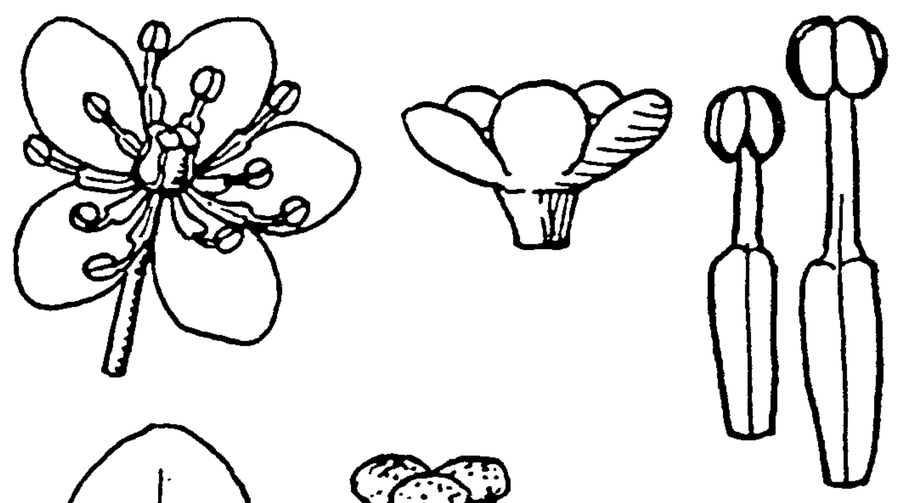
1. C. racemiflora L. Much branched glabrous shrub or small tree reaching a height of 10 m. and a maximum trunk diameter of 3 dm., semi-evergreen, the trunk clothed with a close pale or whitish bark: leaf-blades thick-membranous, oblanceolate, obovate, or nearly elliptic, 5–10 cm. long, obtuse, acute or acuminate, more or less strongly reticulate, lustrous above, dull and paler beneath: racemes slender, 8–15 cm. long: pedicels ascending or finally spreading: sepals ovate or ovate-lanceolate, 1 mm. long, acute: corolla white, 4–5 mm. broad: petals lanceolate or oblong-lanceolate, 3 mm. long or more, acute: drupe conic-ovoid or ovoid, 2.5–3 mm. long, obtuse, minutely granular: seeds narrowly ovoid.—(LEATHERWOOD. HE-HUCKLEBERRY. BLACK-TITI. MYRTLE.)—Swamps and stream-banks, Coastal Plain, and rarely adj. provinces, Fla. to Tex., Mo., and S. Va.—Spr.—The brown and red-tinged heart-wood is close-grained, heavy, and hard. The flowers are an important source of honey.



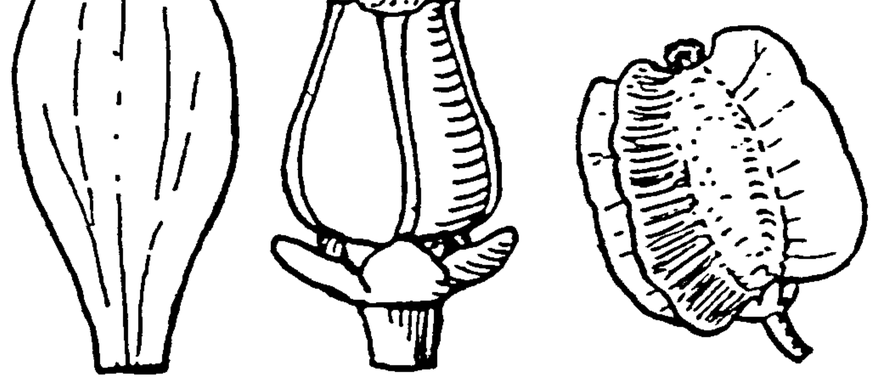
2. C. parvifolia Raf. Glabrous evergreen compact, rigid, and much branched shrub 1–5 m. tall, evergreen: leaf-blades thin-coriaceous, oblanceolate or linear-oblanceolate, 1–4 cm. long, acute or apiculate, lustrous above, paler beneath, more or less reticulate: racemes slender, 3–8 cm. long: pedicels 1–2 mm. long, commonly surpassing the subulate bracts: sepals ovate, 1 mm. long, acute: corolla white, 3–4 mm. broad: petals broadly elliptic-lanceolate, 1.5–2 mm. long, more than twice as long as the sepals, obtuse, thickened at the base and above the midrib: stamens included: drupe subglobose or globose-ovoid, 1.5–2 mm. long, slightly granular.—Swamps and bays, Coastal Plain, N Fla. to La.—Sum.

3. C. arida Small. Small tree, perhaps also a shrub, usually with vine-like branches: leaves evergreen, approximate near the ends of the branches; blades elliptic-spatulate, elliptic-oblanceolate, or narrowly elliptic, 1–3 cm. long, thick-coriaceous: panicles mostly 2–6 cm. long: sepals acuminate: petals elliptic-lanceolate about twice as long as the sepals, 2–2.5 mm. long: drupe globose-ovoid, often depressed, about 2 mm. long.—Scrub, inland sand-dunes, S lake region, Fla.—Sum.

2. CLIFTONIA Gaertn. Shrubs or small trees, with dark scaly bark. Leaves with smooth blades. Panicles raceme-like, stout, not clustered, erect in anthesis. Sepals very broad and rounded, often reniform. Petals broadened upwards, clawed, many times exceeding the sepals. Stamens unequal: filaments appendaged. Style wanting. Fruit a winged nut-like drupe, nodding.—One species.



1. C. monophylla (Lam.) Sarg. Shrub or tree becoming 8 m. tall: leaves evergreen; blades narrowly elliptic to elliptic-oblanceolate, oval, or obovate, 3–6 cm. long, pale or glaucous beneath: panicles 2–9 cm. long: flowers fragrant: sepals about 0.5 mm. long: petals spatulate, elliptic-obovate, or cuneate, 4–5 mm. long, or sometimes shorter: drupe ovoid to oval, 6–7 mm. long, the wings notched at both ends. [*C. ligustrina* Sims]—(TITI. BLACK-TITI. BUCK-



WHEAT-BRUSH. IRONWOOD.)—Non-alluvial swamps and bays, often in acid soil, Coastal Plain, N Fla. to La. and Ga.—Spr.—The brown and red-tinged heartwood is close-grained and heavy, but brittle. The flowers are an important source of honey.

FAMILY 5. AQUIFOLIACEAE — HOLLY FAMILY

Shrubs or trees. Leaves alternate: blades simple. Flowers perfect or polygamous. Calyx of 4–6 persistent sepals. Corolla of 4–6 petals, often united at the base. Androecium of 4–6 stamens. Gynoecium of 4–8 united carpels. Fruit drupaceous.—Three genera and 300 species, in temperate and tropical regions.

1. **ILEX** L. Shrubs or trees. Leaves mostly persistent: blades entire or toothed. Flowers sometimes nearly dioecious. Sepals persistent. Corolla deciduous, white or greenish-white. Drupe with 4–8 nutlets.—About 280 species, mostly American.—HOLLIES.—The flowers of some species are an important source of honey. Some of the red-fruited species are used for decorations for winter festivals.

Fruit with smooth nutlets. — Subgenus I. PRINOS.
Fruit with ribbed or striate nutlets.
  Nutlets many-striate on the back: leaves deciduous: blades thick-membranous or herbaceous. — Subgenus II. PRINOIDES.
  Nutlet few-ribbed or 1-grooved on the back: leaves persistent, evergreen: blades coriaceous. — Subgenus III. AQUIFOLIUM.

I. PRINOS

Drupes black, except in a red-fruited form of *I. glabra*: leaves persistent; blades leathery.
  Leaves with blades of an obovate or spatulate type prevailing; petioles relatively short and stout.
    Leaf-blades entire or distantly serrate above the middle, not spine-tipped: drupes mostly less than 6 mm. in diameter. — 1. *I. glabra.*
    Leaf-blades spinescent-toothed above the middle or spine-tipped: drupes mostly over 6 mm. in diameter. — 2. *I. coriacea.*
  Leaves with blades of an ovate type prevailing; petioles relatively long and slender. — 3. *I. Krugiana.*
Drupes red, orange-red, or scarlet: leaves deciduous; blades herbaceous.
  Staminate and pistillate flowers on pedicels of about equal length. — 4. *I. verticillata.*
  Staminate flowers on conspicuously slender and long pedicels: the pistillate shorter-pedicelled. — 5. *I. laevigata.*

II. PRINOIDES

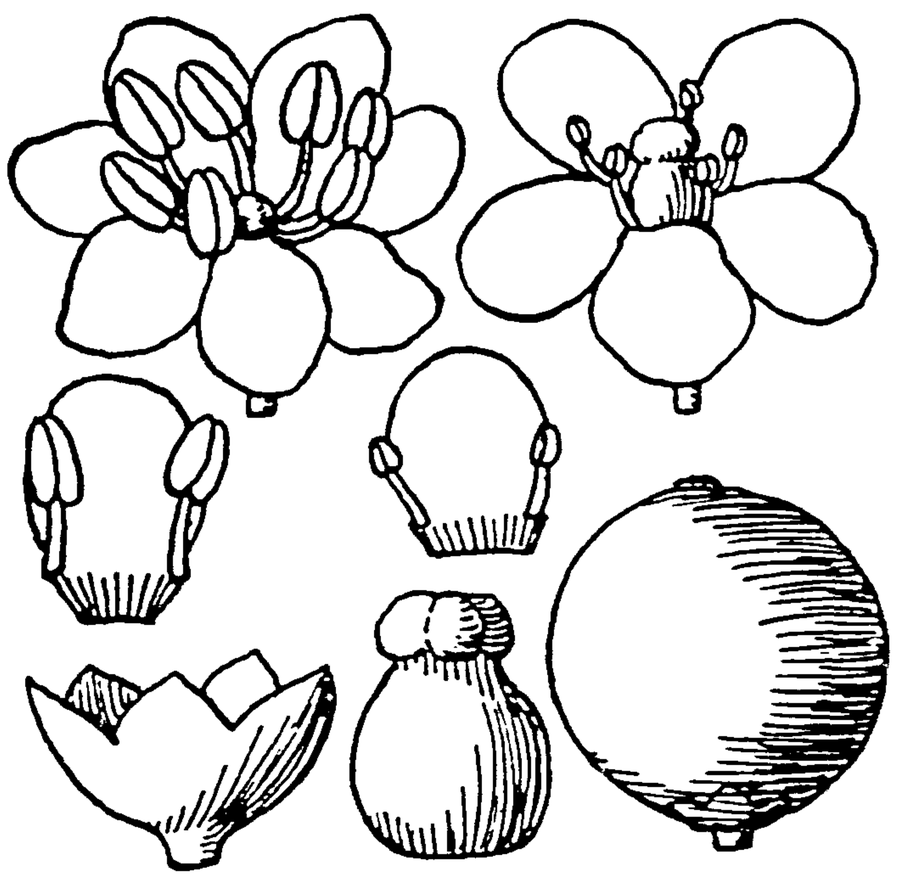
Staminate flowers solitary or clustered, without a common peduncle.
Leaf-blades typically broadest above the middle.
  Nutlets faintly ribbed and striate: leaf-blades glabrous or merely ciliate.
    Leaf-blades 3–9 cm. long: drupe shorter than the pedicel. — 6. *I. longipes.*
    Leaf-blade 1–2 cm. long: drupe longer than the pedicel. — 7. *I. Curtissii.*
  Nutlets prominently ribbed and striate: leaf-blades pubescent beneath or usually so.
    Pedicel much longer than the drupe: drupes solitary or 2 together. — 8. *I. Cuthbertii.*
    Pedicel much shorter than the drupe: drupes more or less clustered. — 9. *I. decidua.*
Leaf-blades broadest at the middle or below it.
  Leaf-blades glabrous or with few hairs about the nerves: calyx glabrous without.
    Leaf-blades 2–7 cm. long, inconspicuously toothed: Carolinian.

Leaf-blades subcoriaceous: drupe 9–11 mm. in diameter. 10. *I. Buswellii.*
Leaf-blades membranous: drupe 6–7 mm. in diameter. 11. *I. ambigua.*
Leaf-blades 6–20 cm. long, conspicuously toothed: Alleghenian. 12. *I. monticola.*
Leaf-blades densely pubescent beneath: calyx pubescent. 13. *I. Beadlei.*
Staminate flowers several on a common peduncle. 14. *I. Amelanchier.*

III. AQUIFOLIUM

Leaf-blades entire or with a few appressed teeth near the apex.
Leaf-blades linear or narrowly elliptic, or broader on shoots, 1–4 cm. long. 15. *I. myrtifolia.*
Leaf-blades elliptic, oblanceolate, or obovate, 4–10 cm. long. 16. *I. Cassine.*
Leaf-blades toothed or sinuate.
Teeth crenate. 17. *I. vomitoria.*
Teeth spine-like, rarely only the terminal one present.
Leaf-blades cuneate or cuneate-obovate, with the teeth directed forward: nutlets oval, shallowly grooved and blunt-ridged. 18. *I. cumulicola.*
Leaf-blades oval, elliptic, or elliptic-obovate, with the teeth spreading: nutlets deeply grooved and sharp-ridged. 19. *I. opaca.*

1. **I. glabra** (L.) A. Gray. Shrub 0.5–1.5 m. tall, with velvety-pubescent twigs: leaf-blades obovate, oblanceolate, elliptic, or oval, or rarely ovate, 1–5 cm. long, acute or obtuse, entire or distantly serrate above the middle, deep-green and lustrous above, short-petioled: staminate calyx fully 3 mm. wide: staminate corolla about 7 mm. wide: drupe 4–6 mm. in diameter, shorter than the stalks.—(INK-BERRY. EVERGREEN-WINTERBERRY. GALLBERRY.)—Low pinelands, swamps, and prairies, often in acid soil, Coastal Plain and rarely adj. provinces, Fla. to La. and N. S.—Spr.–early sum.—An interesting form, rather smaller throughout than typical *I. glabra* occurs in pen. Florida. The drupe is red and rather pointed.



2. **I. coriacea** (Pursh) Chapm. Shrub 1–3 m. tall, glabrous or nearly so: leaf-blades obovate, elliptic, elliptic-oblanceolate, or oval, 2–9 cm. long, acute or usually short-acuminate, entire or with appressed spinescent teeth above the middle, dark-green and lustrous above, short-petioled: staminate calyx 3.5–4 mm. wide: staminate corolla 5.5–7 mm. wide: drupe globose, 6–8 mm. in diameter, black, shining. [*I. lucida* (Ait.) T. & G.]—(LARGE-GALLBERRY.)—Non-alluvial swamps, Coastal Plain, Fla. to La. and S Va.—(*Mex.* (?))—Spr.

3. **I. Krugiana** Loesener. Shrub, or tree 11 m. tall, with glabrous twigs: leaf-blades elliptic or ovate, 4–7.5 cm. long, acuminate, mostly entire, deep-green and lustrous above, slender-petioled: staminate calyx about 3 mm. wide: staminate corolla 5–5.5 mm. wide: drupe 5.5–6.5 mm. in diameter, about as long as the stalk.—(KRUG'S-HOLLY.)—Hammocks, Everglade Keys, Fla.—(*W. I.*)—Wint.

4. **I. verticillata** (L.) Gray. Shrub, or small tree sometimes 7 m. tall, with glabrous or slightly pubescent twigs: leaf-blades thickish, elliptic or oval, varying to ovate or obovate, 2–8 cm. long, acute or acuminate at both ends, more or less pubescent beneath, often strongly reticulate, serrate: staminate calyx about 2.5 mm. wide: staminate corolla 6–7 mm. wide: drupe 6–8 mm. in diameter, red.—(BLACK-ALDER. WINTERBERRY. FEVER-BUSH.)—Swamps and low woods, various provinces, Fla. to La., Mo., Ont., and N. S.—Sum.

5. **I. laevigata** (Pursh) A. Gray. Shrub, or small tree rarely 6 m. tall, with glabrous twigs: leaf-blades thinnish, elliptic or oval, or sometimes lanceolate or oblanceolate, 3–9 cm. long, acute or mostly acuminate, appressed-serrate, glabrous on both surfaces or sometimes sparingly pubescent on the veins beneath: staminate calyx 3.5–4 mm. wide: staminate corolla 6–7.5 mm. wide: drupe 8–18 mm. in diameter, orange-red.—(SMOOTH-WINTERBERRY. HOOP-WOOD.)—Swamps and wet woods, often in acid soil, various provinces, in Coastal Plain only N, Ga. to Pa., N. H., and Me.—Spr.–early sum.

6. **I. longipes** Chapm. Shrub or tree 7 m. tall, with widely spreading branches and glabrous twigs: leaf-blades rather coriaceous, nearly elliptic or oval but broadest slightly above the middle, often abruptly short-acuminate, obtuse or acute, dark-green above, glabrous or nearly so beneath at maturity, crenate-serrate, the teeth often tipped with appressed spine-like bristles: staminate calyx about 2.5 mm. wide: staminate corolla 6–7 mm. wide: drupe globose, red, 7–10 mm. in diameter.—Rocky banks, various provinces, Fla. to La., Tenn., and N. C.—Spr.

7. **I. Curtissii** (Fernald) Small. Shrub or small tree with spreading branches and glabrous twigs: leaf-blades thin-coriaceous spatulate to elliptic-spatulate, acute or obtuse, glabrous, obscurely crenate, short-petioled: flowers not seen: drupe globose, red, 4–5 mm. in diameter. [*I. decidua Curtissii* Fernald]—Hammocks, along rivers, Fla.—Spr.

8. **I. Cuthbertii** Small. Shrub or small tree with sometimes densely pubescent twigs: leaf-blades thickish, mainly obovate to nearly elliptic, obtuse, shallowly and usually inconspicuously toothed, permanently more or less pubescent on both sides, but especially so beneath: flowers not seen: drupe subglobose, 8–10 mm. in diameter.—Woods, Coastal Plain, Fla., and Ga.—Spr.

9. **I. decidua** Walt. Shrub, or small tree 10 m. tall, the twigs glabrous or nearly so: leaf-blades thickish, spatulate, oblanceolate, or nearly elliptic, 2–6 cm. long, obtuse or retuse at the apex, crenate-serrate, dark-green and glabrous above, paler and usually pubescent beneath: staminate calyx 2.5–3 mm. wide: staminate corolla 4.5–6 mm. wide: drupe globose, 7–9 mm. in diameter, orange or nearly scarlet.—(DECIDUOUS-HOLLY. BEAR-BERRY. POSSUM-HAW. WELK-HOLLY.)—Alluvial swamps, various provinces, Fla. to Tex., Kans., and Md.—Spr.—The creamy-white heart-wood is close-grained, heavy, and hard.

10. **I. Buswellii** Small. Shrub up to 3 m. tall, with numerous branches, the dark-purple twigs glabrous: leaf-blades elliptic, oval, or ovate, 2–3 cm. long, serrulate above the middle: drupe globose, 9–11 mm. in diameter, red shining—Hammocks, along the Caloosahatchee, Fla.—Wint.–spr.

11. **I. ambigua** (Michx.) Chapm. Shrub or small tree rarely up to 6 m. tall, the purple twigs glabrous: leaf-blades elliptic, oval, or suborbicular, 4–7 cm. long, serrulate or crenate-serrulate, at least above the middle: drupe globose-oval, 6–7 mm. in diameter, red. [*I. caroliniana* (Walt.) Trelease, not Mill.]—Hammocks, scrub, and sandhills, Coastal Plain and rarely adj. provinces, Fla. to Tex., Ark., (Mo. ?) and N. C.—Spr.

12. **I. monticola** A. Gray. Shrub, or tree 12 m. tall, with glabrous twigs (or with pubescent twigs and leaves in *I. monticola mollis*): leaf-blades thinnish, elliptic to oval, varying to broadest above or below the middle, 6–20 cm. long, acuminate, serrate, deep-green above, paler beneath, glabrous except on the nerves: staminate calyx 3–4 mm. wide: staminate corolla 4–5 mm. wide: drupe globose, about 1 cm. in diameter, bright-scarlet.—(MOUNTAIN-HOLLY. MOUNTAIN-WINTERBERRY. HULVER.)—Woods, especially mountain slopes, Blue Ridge and more northern provinces, Ga. and Ala. to N. Y.—Spr.—The creamy-white heart-wood is close-grained, heavy, and hard.

13. I. Beadlei Ashe. Shrub or small tree, with pubescent twigs: leaf-blades elliptic, oval, or suborbicular, sometimes varying to slightly broader below the middle, 3–8 cm. long, acute or short acuminate, serrate, densely pubescent beneath and finely pubescent above: staminate calyx 2–2.5 mm. wide: staminate corolla 5–6 mm. wide: drupe oblong-globose, 8–10 mm. long.—Rocky woods, Blue Ridge to Appalachian Plateau, Ga. to Ala., Tenn., and N. C.—Spr.

14. I. Amelanchier M. A. Curtis. Shrubs with more or less persistently soft-pubescent foliage: leaf-blades leathery, elliptic, or elliptic-lanceolate, 4–8 cm. long, acute or short-acuminate, inconspicuously serrate, glabrous, dull and finely reticulate above, thinly tomentose beneath, acute or rounded at the base, 6–10 mm. long, pubescent: flowers not seen: drupe globose, 7–10 mm. in diameter, dull-red.—Sandy swamps, Coastal Plain, S. C.—Spr.

15. I. myrtifolia Walt. Shrub or small crooked tree, with smooth gray bark, and rigid branches: leaf-blades evergreen, leathery, narrowly elliptic or linear, or broader on shoots, 1–4 cm. long, apiculate, more or less revolute, dark-green and glabrous above, pale and usually glabrous beneath, short-petioled: calyx 1–1.5 mm. broad: corolla 4–5 mm. broad: drupe globose, about 6 mm. in diameter, red.—(YAUPON.)—Swamps and cypress ponds, Coastal Plain, Fla. to La. and N. C.—Spr.—A yellow fruited form is known.

16. I. Cassine L. Shrub, or small tree 12 m. tall, with smooth gray bark, usually pubescent twigs: leaf-blades leathery, oblanceolate or elliptic, or rarely obovate, 4–10 cm. long, obtuse, acute, or rarely retuse at the apex, more or less revolute, dark-green and glabrous above, pale and more or less pubescent beneath, or sometimes glabrous, rather slender-petioled: calyx 1.5–2 mm. broad: corolla 4–4.5 mm. broad: drupe globose, 6–8 mm. in diameter, red or sometimes nearly yellow. [*I. Dahoon* Walt.]—(DAHOON. YAUPON. CASSENA. HENDERSON-WOOD.)—Swamps, stream-banks, and hammocks, often in acid soils, Coastal Plain, Fla. to La. and S Va.—Spr. or all year S.—The pale-brown heart-wood is close-grained but light and soft.

17. I. vomitoria Ait. Shrub, or small tree 8 m. tall: leaf-blades leathery, oval or elliptic, sometimes elliptic-lanceolate on shoots, 1–2.5 cm. long, obtuse, crenate-serrate, deep-green and lustrous above, pale-green beneath: calyx 2 mm. broad: corolla 5–5.5 mm. broad: drupe globose, red, 5–6 mm. in diameter, longer than the pedicel. [*I. Cassine* Walt.]—(CASSENA. YAUPON.)—Sandy hammocks, sand-dunes, and sandhills, often in neutral soil, Coastal Plain and rarely adj. provinces, Fla. to Tex., Ark., and Va.—Spr.—The leaves contain caffeine. A decoction made from them was the ceremonial drink of the aborigines. The white heart-wood, turning yellow on exposure, is close-grained, heavy, and hard.

18. I. cumulicola Small. Shrub or small tree with fastigiate branches and pale-gray or whitish bark: leaf-blades 2.5–4.5 cm. long, more or less revolute, shallowly sinuate: sepals of the pistillate flowers acute or rather obtuse, eciliate, sometimes obscurely ciliolate: drupe globose, 7–8 mm. in diameter, deep-red: nutlets 5–6 mm. long. [*I. arenicola* Ashe]—Scrub, lake region, pen. Fla.—Spr.—Used locally for holiday decorations.—Additional species and varieties, apparently conspecific with this plant, have been described.

19. I. opaca Ait. Tree up to 15 m. tall, with spreading branches and pale-gray bark: leaf-blades 4–10 cm. long, flat or nearly so, rather deeply sinuate: sepals of the pistillate flowers acuminate, ciliate: drupe globose to ovoid-globose, 8–10 mm. in diameter, bright-red, or yellow, nutlets 6–7 mm. long.—(HOLLY. AMERICAN-HOLLY. WHITE-HOLLY.)—Woods, ravines, hammocks, bluffs, and river-banks, often in sub-acid soil, various provinces, Fla. to Tex., Mo., W. Va., and Mass., (Me.?).—Spr.—Collected in large quantities in winter.

Family 6. CELASTRACEAE — Stafftree Family

Shrubs or trees, or vines. Leaves alternate, opposite, or whorled: blades simple. Flowers perfect, polygamous, or dioecious, variously borne. Calyx of 3–5 sepals. Corolla of 3–5 petals. Androecium of 3–5 stamens borne on or under the disk. Gynoecium of 3–6 united carpels. Fruit a capsule, a drupe, or a berry. Seed often arillate.—About 45 genera and 375 species, widely distributed in temperate and warmer regions.

Fruits capsular, dehiscent. — I. Celastreae.
Fruits drupaceous, indehiscent. — II. Rhacomeae.

I. Celastreae

Leaves opposite.
  Ovary 3–5-celled: capsule 3–5-lobed: 3–5-valved: aril red: anther-sacs divergent. — 1. Euonymus.
  Ovary 2-celled: capsule not lobed, 2-valved: aril white: anther-sacs parallel. — 2. Pachystima.
Leaves alternate.
  Climbing woody vines: ovary free. — 3. Celastrus.
  Erect shrubs: ovary confluent with the disk. — 4. Maytenus.

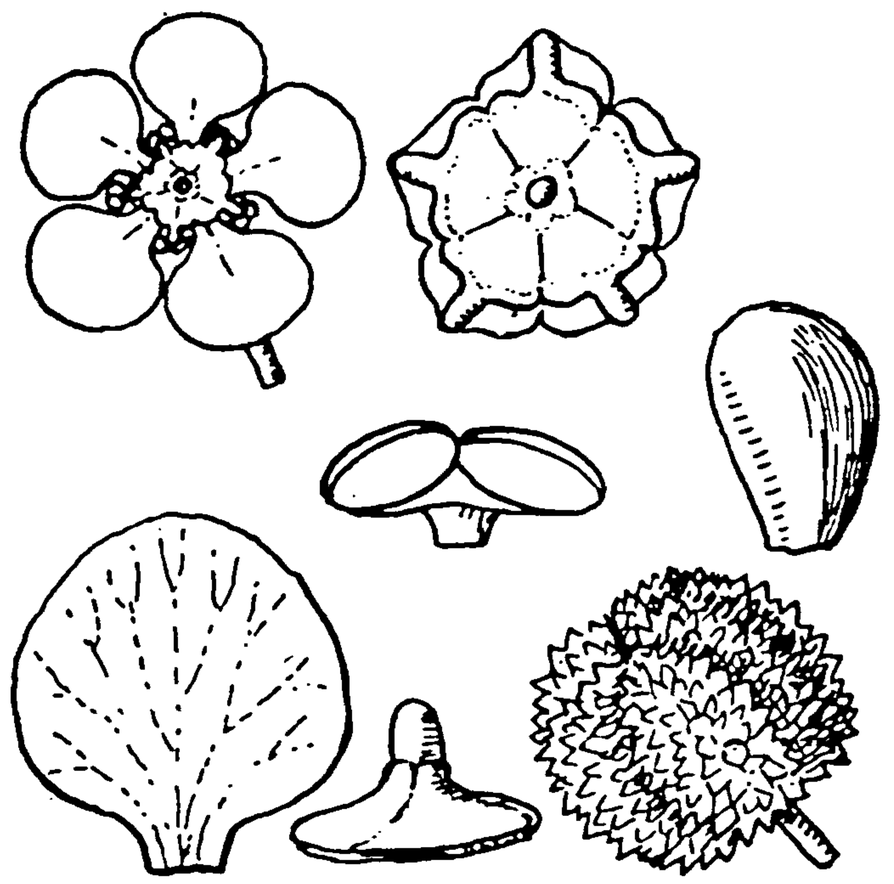
II. Rhacomeae

Flowers perfect: ovary 4-celled: fruit oblique. — 5. Rhacoma.
Flowers dioecious: ovary 2-celled: fruit not oblique.
  Leaves opposite: flower-clusters peduncled: calyx deciduous: drupe not lobed. — 6. Gyminda.
  Leaves alternate: flower-clusters sessile: calyx persistent: drupe lobed. — 7. Schaefferia.

1. **EUONYMUS** [Tourn.] L. Shrubs, often weak-stemmed, trees, or rarely vines. Leaves opposite: blades entire or toothed. Flowers perfect. Sepals 4 or 5. Petals 4 or 5. Stamens 4 or 5, borne on the lobes of the disk: filaments very short: anther-sacs diverging. Stigmas 3–5. Capsules drooping.—About 65 species, in the north temperate zone.

Cymes mostly 1–3-flowered: sepals, petals, and stamens, typically 5: leaf-blades sessile or nearly so: capsule slightly lobed, warty.
  Sepals eciliate: petals orbicular-ovate or suborbicular, manifestly broad-clawed: capsule copiously warty. — 1. *E. americanus.*
  Sepals erose-ciliate: petals orbicular-reniform, clawless: capsule sparingly warty. — 2. *E. obovatus.*
Cymes mostly 5–many-flowered: sepals, petals, and stamens, typically 4: leaf-blades petioled: capsule deeply lobed, smooth. — 3. *E. atropurpurea.*

1. **E. americanus** L. Erect or straggling shrub 2 m. tall or less: leaf-blades oval to lanceolate, 2–10 cm. long, acute or acuminate, crenate-serrate: calyx about 5 mm. wide: sepals usually 5, equal: corolla mostly over 1 cm. wide; petals greenish or greenish-purple: filaments arising from the edge of the disk; anthers fully 1 mm. wide: seed-body 4.5–5.5 mm. long.—(Strawberry-bush.)—Rich woods, bluffs, and hammocks, various provinces, N pen. Fla. to Tex., Nebr., and N. Y.—Spr.–sum.

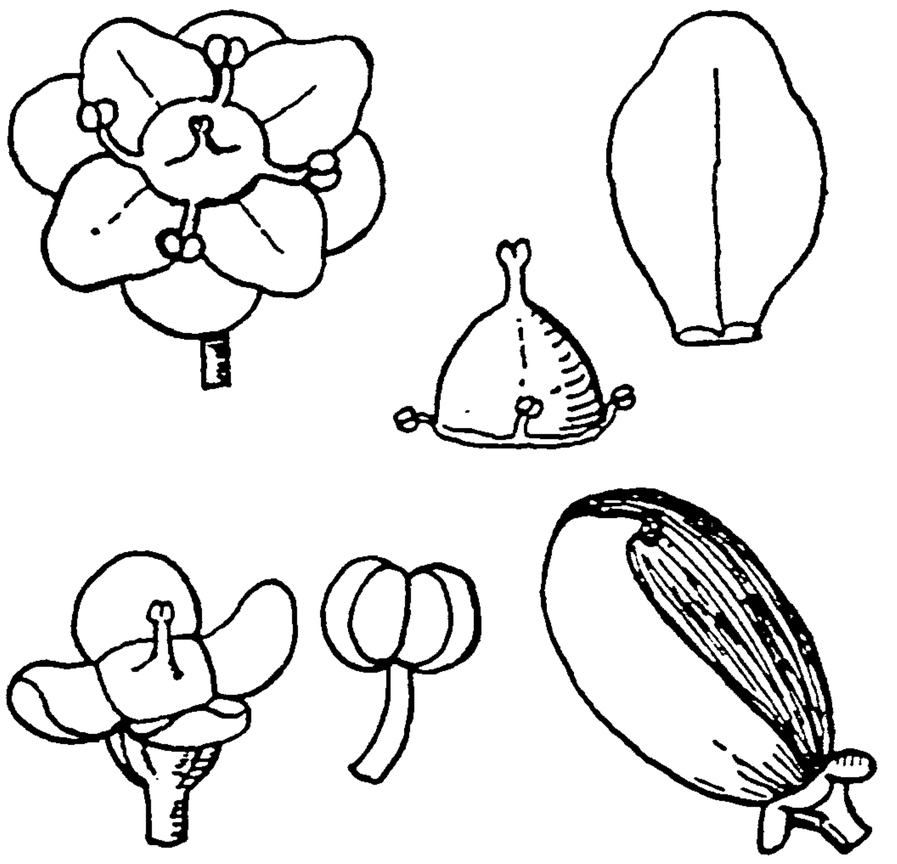


2. **E. obovatus** Nutt. Shrub with trailing, often rooting branches: leaf-blades thin, obovate, 2–6 cm. long, mostly obtuse, crenulate-serrulate: calyx about 4 mm. wide; sepals usually 5, erose-ciliate, equal: corolla mostly less than 8 mm. wide; petals greenish-purple, about 3 mm. wide: filaments arising from the top of the disk: anthers fully 1

mm. wide: seed-body 4–5 mm. long.—(RUNNING STRAWBERRY-BUSH. RUNNING-EUONYMUS.)—Shaded banks and low grounds, various provinces, Tenn. to Ill., Ont., and W N. Y.—Sum.—The rough red fruits of this and of the preceding species, suggested the name strawberry-bush.

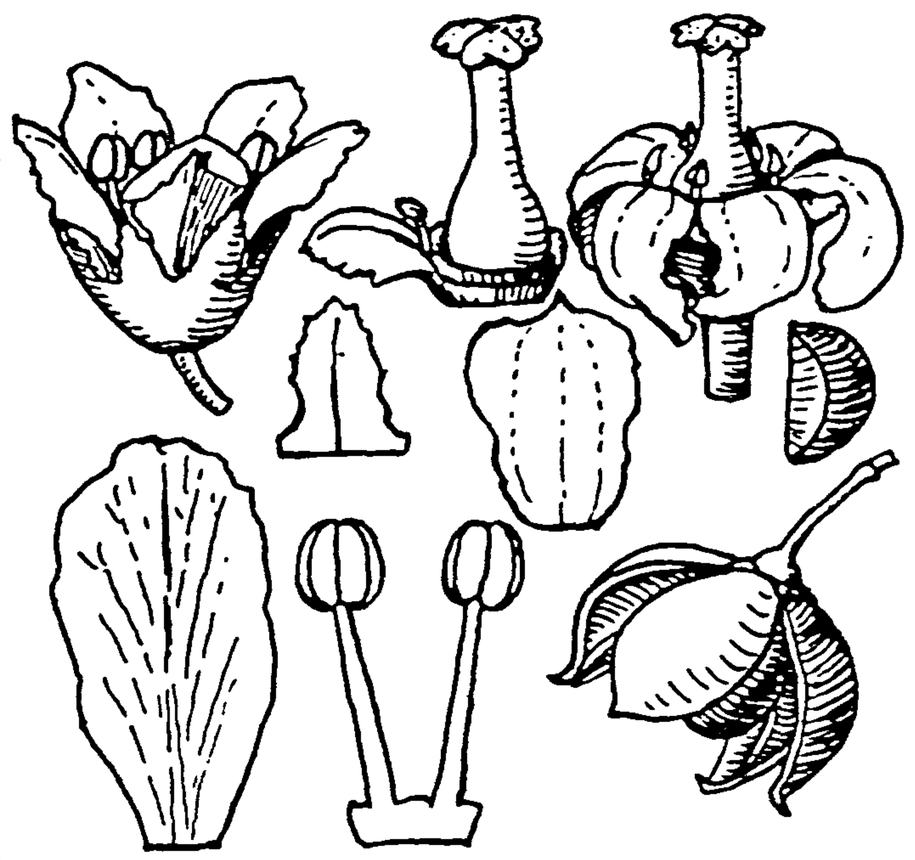
3. **E. atropurpureus** Jacq. Erect shrub, or tree becoming 8 m. tall: leaf-blades elliptic, oval, ovate, or obovate, 5–16 cm. long, short-acuminate, serrate: calyx about 4 mm. wide; sepals usually 4, in unequal pairs: corolla mostly less than 1 cm. wide; petals dark-purple: filaments arising from the top of the disk; anthers less than 1 mm. wide: seed-body 8–9 mm. long.—(BURNING-BUSH. WAAHOO. SPINDLE-TREE. STRAWBERRY-BUSH. ARROW-WOOD. BLEEDING-HEART.)—Woods and thickets, various provinces, Ala. (or Fla.?) to Okla., Mont., and N. S.—Spr.—The bark of the root is used medicinally. The white heart-wood, often tinged with yellow, is very close-grained, heavy, and hard. The dangling fruits are pinkish-purple.

2. **PACHYSTIMA** Raf. Shrubs. Leaves opposite, evergreen: blades toothed or entire. Flowers perfect. Sepals 4. Petals 4. Stamens 4, borne below the disk: filaments short: anther-sacs nearly globular. Stigmas 2.—Two species, North American.



1. **P. Canbyi** A. Gray. Diffuse and creeping, 1–4 dm. tall: leaf-blades linear, linear-elliptic or rarely oblanceolate, 0.5–2 cm. long, serrate: petals white, about 1.5 mm. long: capsule ellipsoid, about 4 mm. in diameter. — (MOUNTAIN-LOVER. RAT-STRIPPER. CLIFF-GREEN.)—Limestone cliffs and shaded banks, Blue Ridge and Appalachian Plateau, N N. C. to Ohio and Va.—Spr.—Its closest relative grows in the N Rocky Mountains.

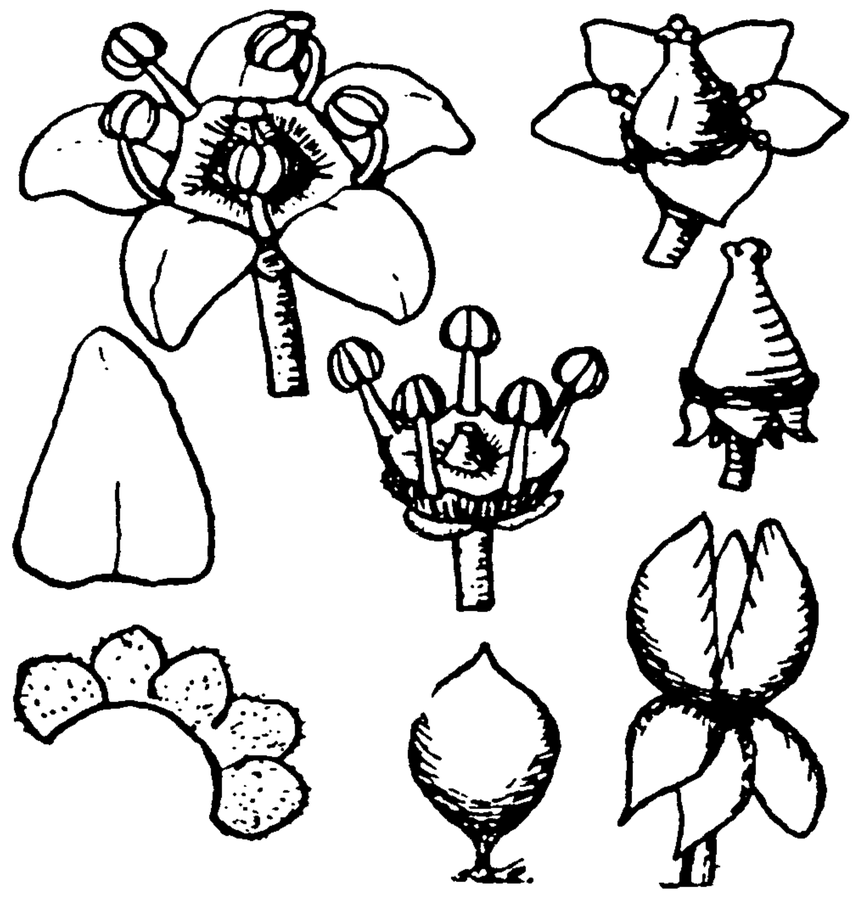
3. **CELASTRUS** L. Vines with woody stems. Leaves alternate, deciduous: blades membranous, broad, entire or toothed. Flowers inclined to be dioecious, racemose or paniculate. Sepals 5. Petals 5. Stamens 5, borne at the sinuses of the disk. Capsules in drooping clusters.—About 30 species, most numerous in Asia.



1. **C. scandens** L. Diffuse climber: leaf-blades elliptic or oval, varying to ovate or obovate, 6–10 cm. long, serrate: panicles drooping: corolla greenish, about 8 mm. broad: capsule subglobose, about 1 cm. in diameter, orange, 3-valved, the scarlet seeds persistent and conspicuous in early winter. — (STAFF-TREE. SHRUBBY-BITTERSWEET. CLIMBING-BITTERSWEET. WAXWORK. GNOME'S GOLD.)—Thickets, woods, and fence-rows, various provinces, Ga. to La., Okla., Man., and Me.—Spr.–sum.—The bark is used medicinally. The ripe fruits are used for interior decoration in winter.

4. **MAYTENUS** Molina. Shrubs or trees. Leaves alternate, persistent: blades leathery, entire or toothed. Flowers polygamous or dioecious, solitary

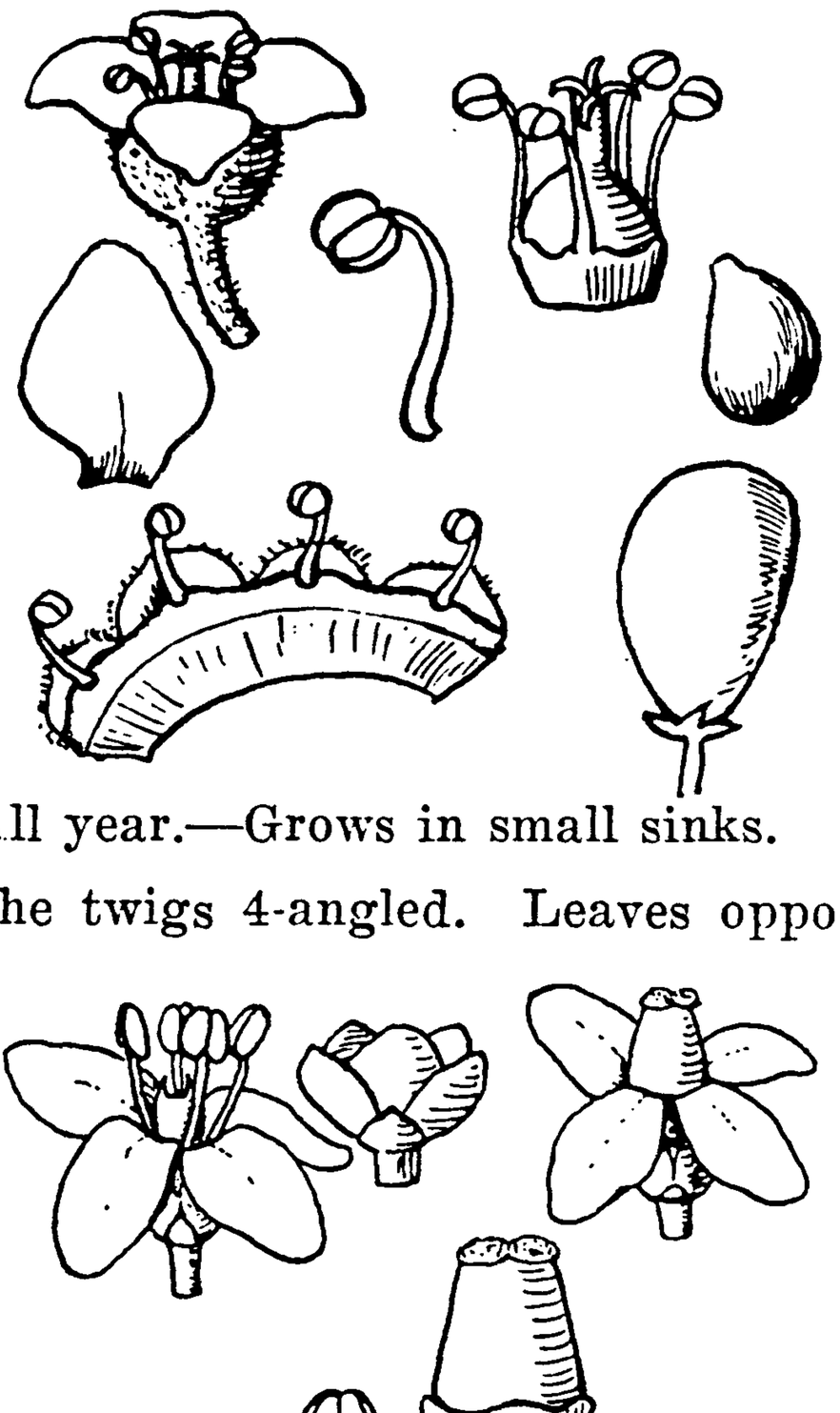
or clustered. Sepals 5. Petals 5. Stamens 5, borne beneath the disk. Capsule erect.—About 10 species, tropical American.



1. M. phyllanthoides Benth. Shrub or tree: leaf-blades obovate to elliptic-oblanceolate, 2–4 cm. long: hypanthium broadly turbinate: sepals reddish: corolla 2–3 mm. broad, white or greenish-white: capsule obovoid or ellipsoid, 8–12 mm. long: seeds exposed by the recurved capsule valves, red.—Hammocks and sand-dunes, coast of lower pen. Fla. and Florida Keys, and lower Rio Grande region, Tex.—(*W. I., Mex., C. A.*)—Spr.–sum.—The leaves yield gutta-percha.

5. RHACOMA L. Shrubs or small trees. Leaves alternate, opposite, or whorled, persistent: blades entire or toothed. Flowers perfect, few together or solitary in axillary peduncled cymes. Sepals 4 or 5. Petals 4 or 5. Stamens 4 or 5, borne between the lobes of the disk. Drupe smooth.—About 12 species, tropical American.

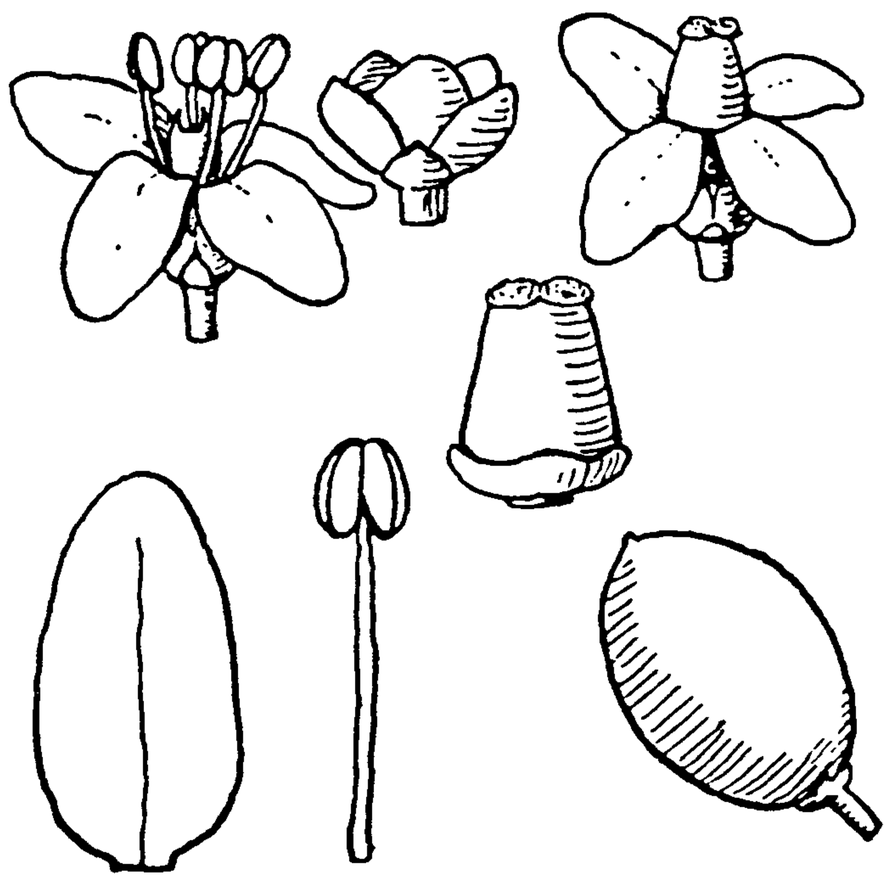
Leaf-blades crenate or entire: cymes long-stalked (10–15 mm.) 1. *R. Crossopetalum.*
Leaf-blades spiny toothed: cymes short-stalked (3–5 mm.) 2. *R. ilicifolia.*



1. R. Crossopetalum L. Erect shrub or tree, with glabrous twigs: leaf-blades obovate or rarely somewhat elliptic, 1–4 cm. long, shallowly crenate or entire: cymes long-peduncled: petals oval or obicular, 1 mm. long or less, red or purplish: drupe obovoid, 5–6 mm. long, red.—Hammocks and sand-dunes, coasts of S. pen. Fla. and the Keys.—(*W. I.*).—All year.

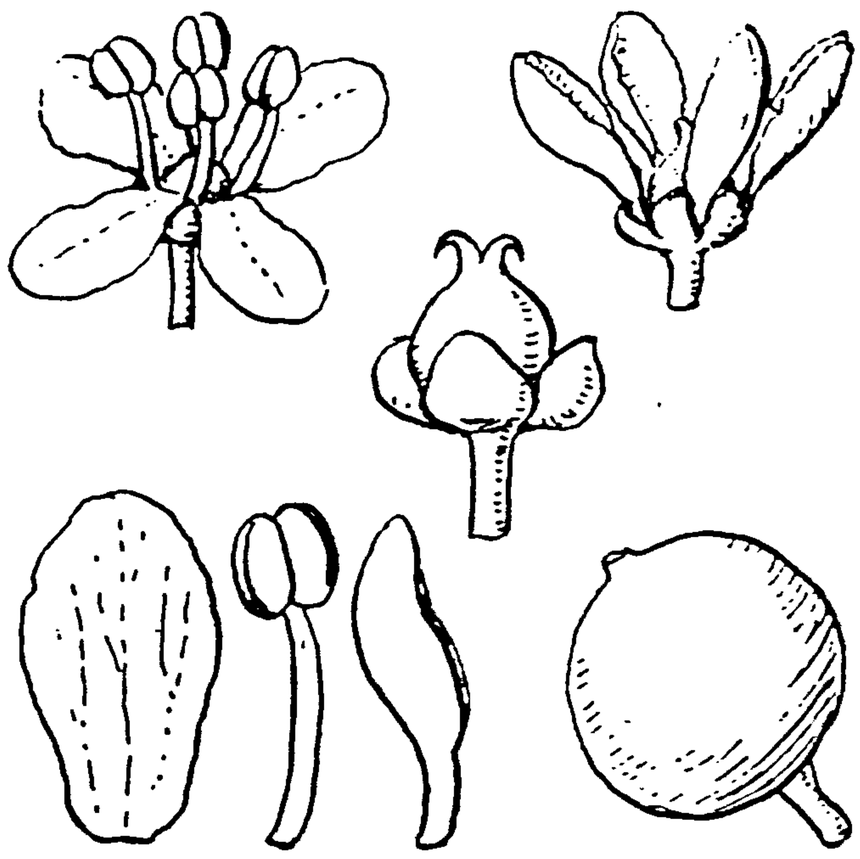
2. R. ilicifolia (Poir.) Trelease. Depressed shrub with pubescent twigs: leaf-blades oval or ovate, 10–15 mm. long, coarsely spiny toothed: cymes short-peduncled: petals suborbicular, less than 1 mm. long, red: drupe subglobose, 3–4 mm. long, red.—(CHRISTMAS-BERRY.)—Pinelands, Everglade Keys, Fla. and Florida Keys.—(*W. I.*).—All year.—Grows in small sinks.

6. GYMINDA Sarg. Shrubs or trees, the twigs 4-angled. Leaves opposite, persistent: blades mostly entire. Flowers dioecious, in axillary cymes. Sepals 4, or rarely 3. Petals 4, or rarely 3. Stamens 4, borne without a disk. Drupe smooth.—Two species, the following and 1 in C. A.



1. G. latifolia (Sw.) Urban. Shrub or small tree: leaf-blades obovate to elliptic-obovate, 2–4 cm. long, bright-green (or glaucous above in *G. latifolia glaucifolia*): petals elliptic to obovate-elliptic, 1.5–2 mm. long, white: drupe ellipsoid to ovoid, 7–8 mm. long, bluish-black. — (FALSE-BOXWOOD.) — Hammocks, Florida Keys.—(*W. I., Mex.*)—The dark heart-wood is heavy, and hard.

7. **SCHAEFFERIA** Jacq. Shrubs or trees, the twigs terete. Leaves alternate, persistent: blades entire. Flowers dioecious, in axillary clusters. Sepals 4. Petals 4. Stamens 4, borne without the disk. Stigmas recurved. Drupe tuberculate.—Five species, tropical American.

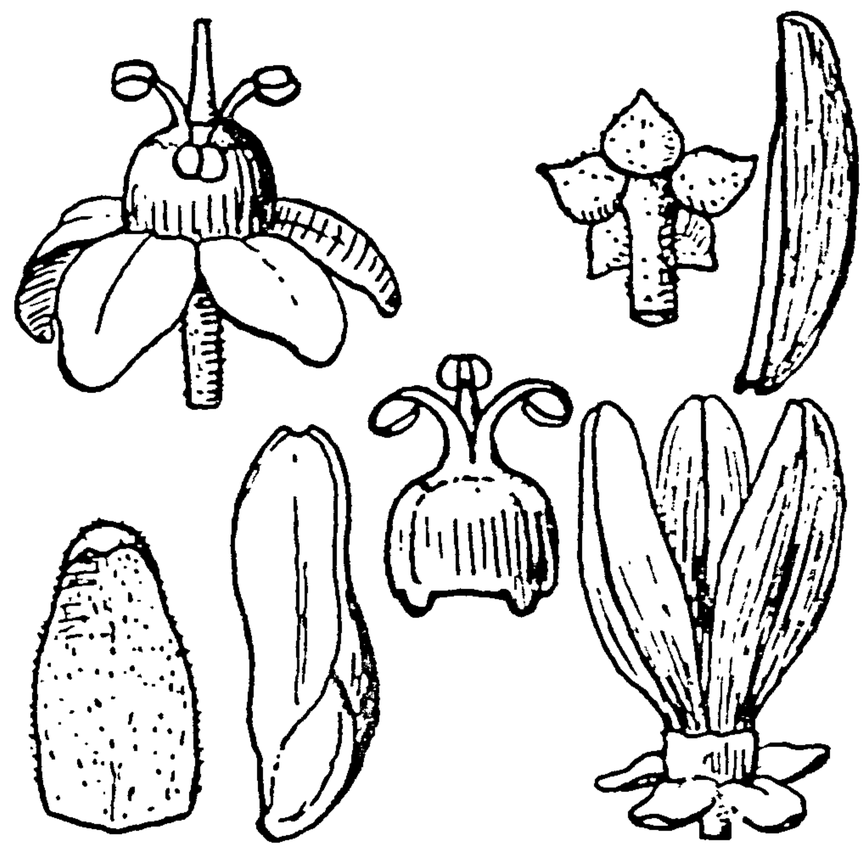


1. S. frutescens Jacq. Shrub or small tree: leaves not clustered; blades elliptic, oval, elliptic-obovate, or elliptic-oblanceolate, 4–6 cm. long, shining above: flowers manifestly pedicelled, greenish: drupe about 5 mm. in diameter.—(BOXWOOD. YELLOW-WOOD.)—Hammocks, lower eastern coast of Fla. Everglade Keys, and Florida Keys.—(*W. I.*)—Spr.—The bright-yellow heart-wood is close-grained and heavy. It is sometimes used as a substitute for boxwood in engraving.

FAMILY 7. HIPPOCRATEACEAE — HIPPOCRATEA FAMILY

Shrubs or trees, or vines. Leaves opposite: blades simple. Flowers perfect, in axillary racemes, panicles, or cymes. Calyx of 5 persistent sepals. Corolla of 5 petals. Androecium of mostly 3 stamens. Gynoecium of 3 united carpels. Fruit a berry, a drupe, or a capsule, of 3 or fewer carpels cohering at the base. Seeds flattened.—Three genera and 170 species, mostly tropical.

1. **HIPPOCRATEA** L. Trees or woody vines. Leaf-blades leathery. Sepals and petals 5. Stamens 3: filaments dilated at the base and partly united. Capsule lobed. Seeds winged. About 70 species, tropical America.—Spr.–sum.



1. H. volubilis L. Climber: leaf-blades elliptic, varying to ovate or obovate, 5–14 cm. long, crenate-serrate: corolla 5–6 mm. broad, white: mature carpels broadly obovate, 2.5–3 cm. long. [*H. ovata* Lam.]—Hammocks, stream-banks, and shores, S pen. Fla. and the Keys.—(*W. I.*)—Wint.–sum.—In both hammocks and mangrove swamps the stems of this liane clambering over shrubbery or climbing to the tops of trees are much-branched, often diffusely so. The branches and branchlets hook or coil and thus bind the mass of growth into an impenetrable network.

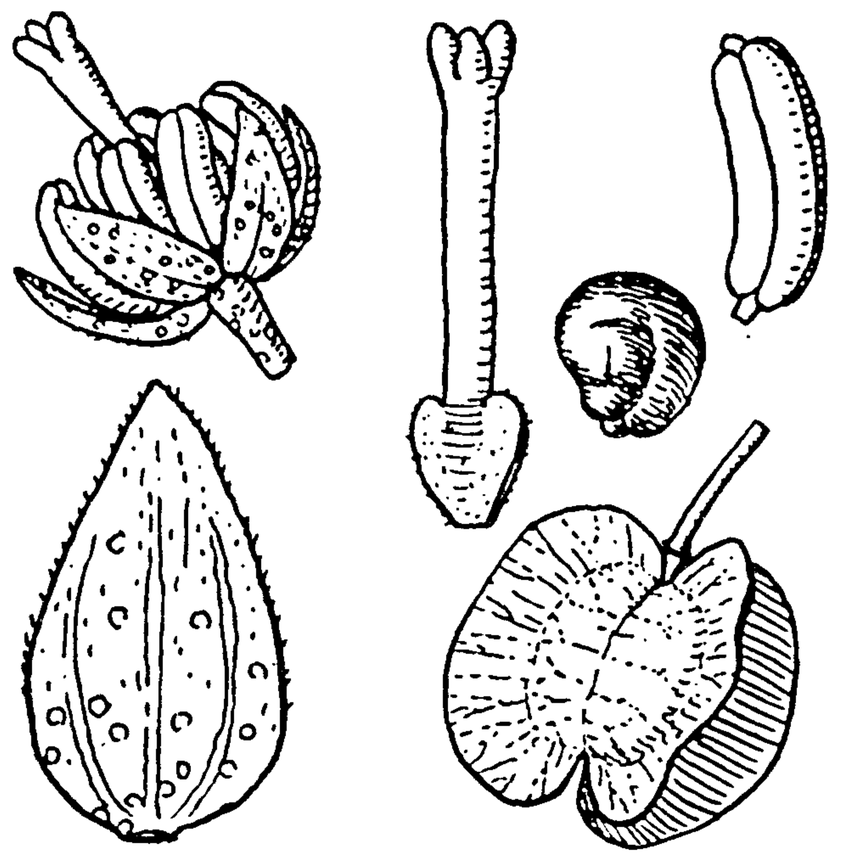
FAMILY 8. DODONAEACEAE — VARNISH-LEAF FAMILY

Shrubs or trees. Leaves alternate: blades simple. Flowers polygamous or polygamo-dioecious, variously borne. Calyx of 3–5 sepals. Corolla wanting. Androecium of 5–8 stamens. Disk obsolete. Gynoecium of 3 or 4 united carpels. Fruit a reticulated septicidal capsule. Seeds subglobose or somewhat flattened.—Only the following genus.

1. **DODONAEA** [Plum.] L. Erect shrubs or trees, with usually viscid foliage. Leaf-blades broadened upward. Flowers green, yellow, or purplish. Capsule winged.—About 50 species, tropical and subtropical.—Spr. or all year. —VARNISH-LEAVES.

Leaf-blades spatulate to elliptic: fruit 10–30 mm. wide.
  Leaf-blades narrowly spatulate: fruit less than 2 cm. wide: seed 2–2.5 mm. in diameter. 1. *D. jamaicensis.*
  Leaf-blades broadly spatulate to elliptic: fruit over 2 cm. wide: seed 3–3.5 mm. in diameter. 2. *D. viscosa.*
Leaf-blades cuneate to obovate-cuneate: fruit 5–7 mm. wide. 3. *D. microcarya.*

1. **D. jamaicensis** DC. Shrub 1–4 m. tall: leaves 3–11 cm. long; blades narrowly spatulate, gradually narrowed to the base: sepals elliptic or oval, 2.5–3 mm. long, ciliolate: anthers about as long as the sepals: fruits 10–16 mm. long, deeply notched at the apex: seed orbicular-lenticular, 2–2.5 mm. in diameter.—Pinelands, hammocks, and coastal sand-dunes, pen. Fla. and the Keys.—(*W. I.*)—All year.



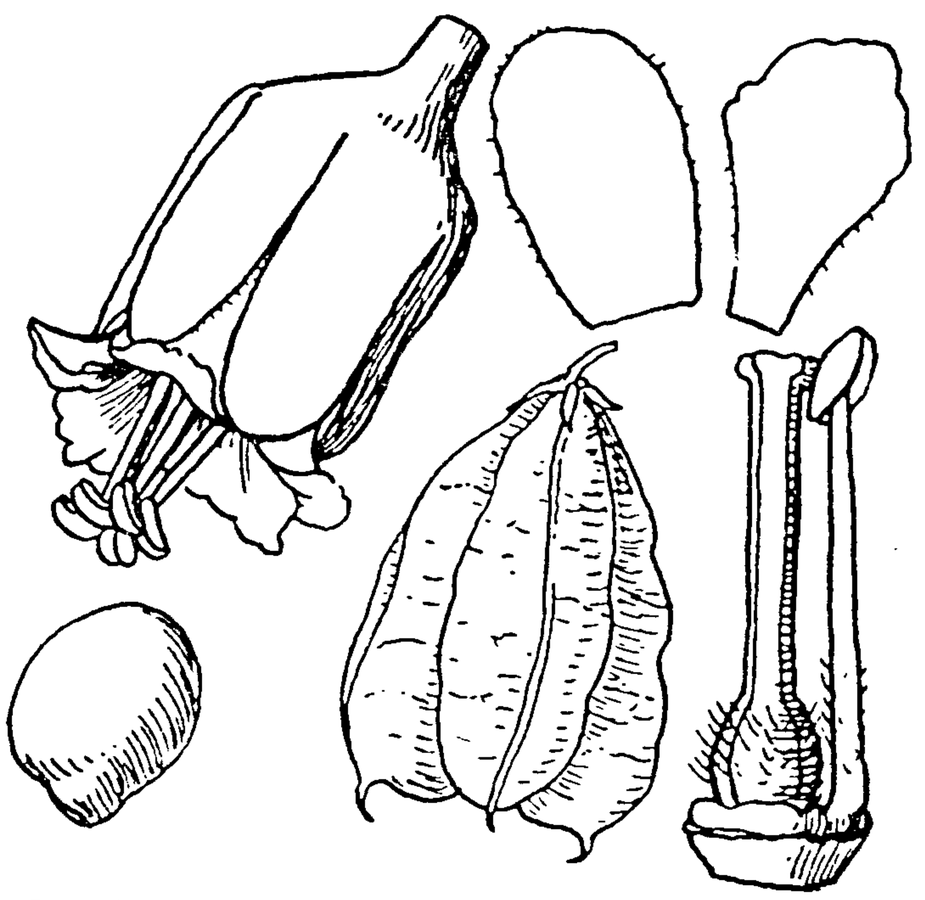
2. **D. viscosa** L. Shrub 2–5 m. tall: leaves 8–15 cm. long; blades broadly spatulate to elliptic, gradually or abruptly narrowed at the base: sepals ovate or oval, 2.5–3 mm. long: anthers rather shorter than the sepals: fruit 23–30 mm. long, deeply notched at the apex: seed orbicular-reniform, 3–3.5 mm. in diameter.—Woods and hammocks, pen. Fla.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.

3. **D. microcarya** Small. Shrub or small tree: leaves 2–5 cm. long; blades cuneate to obovate-cuneate: sepals smaller than in the two preceding species: fruit 5–7 mm. wide, emarginate at the apex: seed subglobose, nearly 2 mm. in diameter.—Hammocks, lower Florida Keys.—Fall.

FAMILY 9. STAPHYLEACEAE — BLADDERNUT FAMILY

Shrubs or trees. Leaves mostly opposite: blades pinnately compound. Flowers perfect or polygamous, racemose or paniculate, drooping. Calyx of 5 sepals. Corolla of 5 equal petals. Androecium of 5 stamens. Gynoecium of 2 or 3 partially or wholly united carpels. Fruit an inflated capsule.—Five genera and 22 species, widely distributed.

1. **STAPHYLEA** L. Shrubs or small trees. Leaf-blades pinnate, often 3-foliolate. Racemes cluster-like, drooping. Sepals and petals nearly erect. Capsule bladdery, 2- or 3-lobed.—About 6 species, of the north temperate zone.



1. **S. trifolia** L. Shrub or small tree: leaflets 3: blades oval or elliptic, varying to ovate or obovate, 5–10 cm. long, serrate: racemes 5–10 cm. long: sepals 7–10 mm. long: petals spatulate, surpassing the sepals, green and cream striped: capsule 4–6 cm. long, the lobes apiculate.—(BLADDERNUT)—Rich woods and stream-banks, various provinces, rarely Coastal Plain, Ga. to Okla., Kans., Minn., and Que.—Spr.—Near the southern end of its range it may attain a trunk-diameter of six inches.

Family 10. **AESCULACEAE** — Buckeye Family

Shrubs or trees. Leaves opposite: blades palmately compound. Flowers polygamous, in terminal racemes or panicles. Calyx of 5 partially united sepals. Corolla of 4 or 5 unequal clawed petals. Androecium of 5–8 stamens. Gynoecium of 3 united carpels. Fruit a leathery loculicidal capsule.—Two genera and about 15 species, North American and Asiatic.

1. **AESCULUS** L. Shrubs or trees. Leaf-blades palmately 5–11-foliolate. Petals with their claws mostly in the calyx-tube. Filaments slender. Capsule smooth or echinate.—About 24 species, North American and Asiatic.—Buckeyes. Horse-chestnuts.

Panicle much elongate and narrow: corolla of petals not very different in shape: stamens several times longer than the calyx. Subgenus I. Macrothyrsus.
Panicle short and thick: corolla of very differently shaped petals: stamens twice or thrice as long as the calyx.
  Upper petals with small rounded blades much shorter than the elongate claw: ovary and capsule smooth and glabrous. Subgenus II. Pavia.
  Upper petals with spatulate blades about as long as the claw: ovary and capsule soft-prickly. Subgenus III. Euaesculus.

I. Macrothyrsus

Shrub with erect, slender, elongate panicles of white flowers. 1. *Ae. parviflora.*

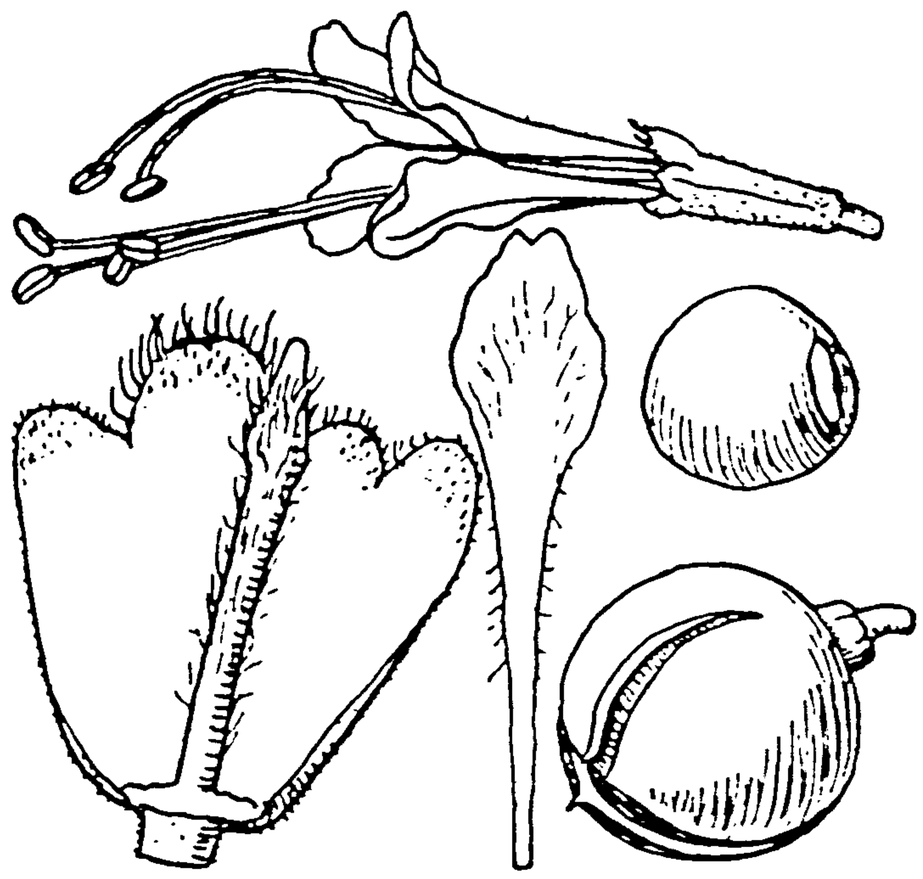
II. Pavia

Calyx tubular: broad petals not twice as long as the calyx. 2. *Ae. Pavia.*
Calyx campanulate: broad petals more than twice as long as the calyx. 3. *Ae. octandra.*

III. Euaesculus

Tree: blades of the leaflets serrate: flowers pale-yellow, in short panicles. 4. *Ae. glabra.*

1. Ae. parviflora Walt. Shrub: leaflets 5–7; blades elliptic-oblanceolate to obovate, 5–18 cm. long: calyx 5–7 mm. long: corolla white: petals 16–20 mm. long: capsules globular, 2.5–3 cm. in diameter. — (Bottlebrush-buckeye.) — Rich woods, Coastal Plain and adj. provinces, W Fla. to Ala. and S. C.—Spr.



2. Ae. Pavia L. Low shrub or small tree: leaflets 5–7 or rarely 3; blades oval, oval-ovate, oblanceolate, or elliptic-lanceolate: calyx 8–12 mm. long or rarely longer; tube about 5 times as long as the lobes: narrow petals 3.5–4 cm. long, the claws more than twice as long as the calyx: capsule 3–5 cm. in diameter.—(Firecracker-plant. Red-buckeye. Scarlet-buckeye.)—Rich or dry woods, Coastal Plain and adj. provinces, Fla. to Tex., SE Mo., and Va.—Spr.—Additional species, related to *Ae. Pavia* have been proposed.

3. Ae. octandra Marsh. Shrub or large tree: leaflets mostly 5; blades oblanceolate to elliptic: calyx 12–16 mm. long or rarely shorter; tube about 8 times as long as the lobes: narrow petals 2.5–3 cm. long, the claws less than twice as long as the calyx: capsule 3–6 cm. in diameter. [*Ae. flava* Ait.]—(Yellow-buckeye. Sweet-buckeye. Large-buckeye.)—Rich woods and river banks, various provinces, Ga. to Tex., Ia., and W. Pa.—Spr.—Additional species, related to *Ae. octandra*, have been proposed.—The creamy-white heart-wood is close-grained, soft, and light. It is used for artificial limbs and various utensils.

4. **Ae. glabra** Willd. Tree: leaflets 5, or rarely 7; blades elliptic to elliptic-oblanceolate: calyx 6–8 mm. long: corolla pale-yellow; lateral petals 11–12 mm. long: capsule 3–7 cm. in diameter.—(OHIO-BUCKEYE. FETID-BUCKEYE.)—Woods, various provinces, rarely Coastal Plain, Ala. to Okla., Kans., Mich., and W Pa.—Spr.—The wood is used for artificial limbs and various utensils.

FAMILY 11. ACERACEAE — MAPLE FAMILY

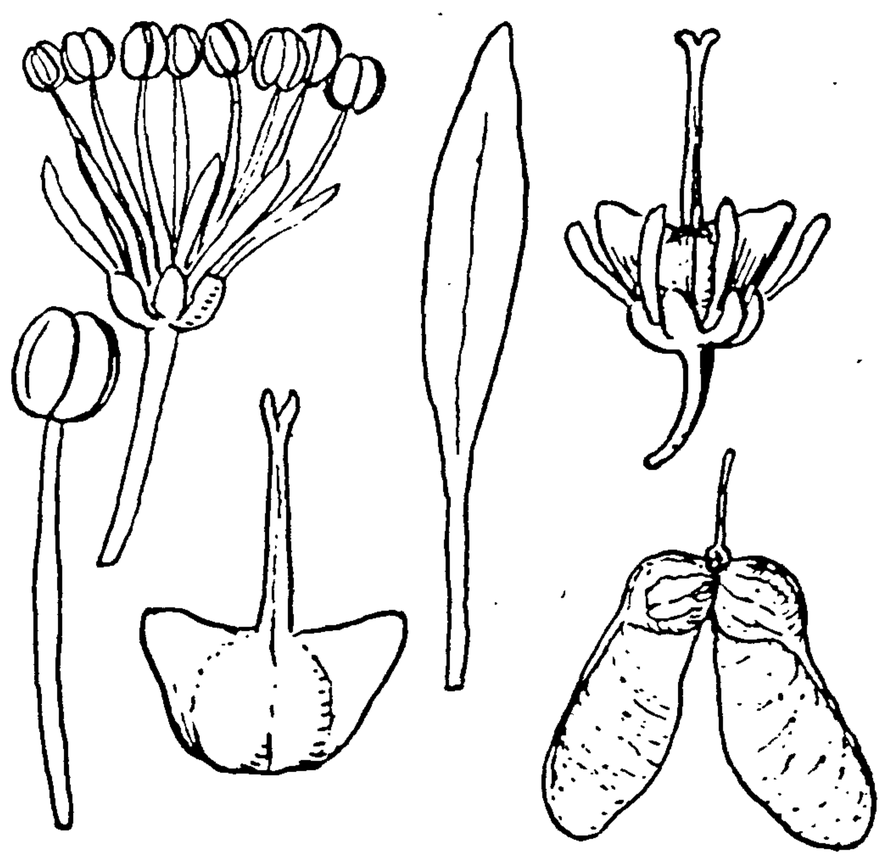
Shrubs or trees. Leaves opposite: blades simple or compound. Flowers perfect or polygamous, in cymes, racemes, or panicles, or often in congested clusters. Calyx of 4 or 5, or rarely more, deciduous sepals. Corolla of 4 or 5, or rarely more, petals, or wanting. Androecium of as many stamens as there are sepals or twice as many. Gynoecium of 2 more or less united carpels. Fruit 2 nutlets with wings (samaras).—Six genera and more than 100 species, in the north temperate zone.

Leaf-blades simple: flowers polygamous, monoecious, andromonoecious, or androdioecious; disk present: anthers ellipsoid or oval, not tipped.
  Flowers in terminal racemes or panicles: stigmas shorter than the style. — 1. ACER.
  Flowers in lateral or terminal clusters: stigmas as long as the style or longer.
    Flowers filiform-pedicelled, in drooping clusters appearing with the leaves: sepals united into a lobed cup-like calyx, the staminate and pistillate similar. — 2. SACCHARODENDRON.
    Flowers sessile or short-pedicelled, in dense lateral involucrate clusters, appearing before the leaves.
      Sepals united, the staminate and pistillate calyx very distinct: petals wanting. — 3. ARGENTACER.
      Sepals distinct, those of the staminate and pistillate flowers similar: petals present. — 4. RUFACER.
Leaf-blades pinnately compound: flowers dioecious: disk wanting: anthers linear, minutely tipped. — 5. NEGUNDO.

1. **ACER** L. Shrubs or trees. Leaf-blades broad, coarsely toothed or 3–5-lobed. Flowers borne in terminal racemes or panicles, appearing after the leaves, polygamous. Calyx of usually 5 distinct or slightly united sepals. Petals 5, narrower or broader than the sepals. Stamens exserted or included: stigmas shorter than the style.—About 30 species, North American and Eurasian.—Spr.—MAPLES. ACERS.

Flowers in erect panicles: petals linear or linear-spatulate, about twice as long as the sepals. — 1. *A. spicatum*.
Flowers in drooping racemes: petals obovate, about as long as the sepals or slightly longer. — 2. *A. pennsylvanicum*.

1. **A. spicatum** Lam. Shrub, or small tree 10 m. tall, the bark thin, relatively smooth: leaf-blades mostly longer than broad, mainly 3-lobed, sometimes with 2 additional lobes near the base, serrate, glabrate above, paler and more or less tomentulose beneath, cordate or subcordate: panicles many-flowered: pedicels spreading, 6–10 mm. long, or longer at maturity: petals yellow: stamens exserted: fruit green, about 2.5–3.5 cm. broad, the wings of the samaras spreading at about 90 degrees.—(MOUNTAIN-MAPLE. LOW-MAPLE.)—Damp rocky woods, Blue Ridge and more northern provinces, Ga. to Man. and Newf.—Spr.–early sum.—The heart-wood is soft, and light.



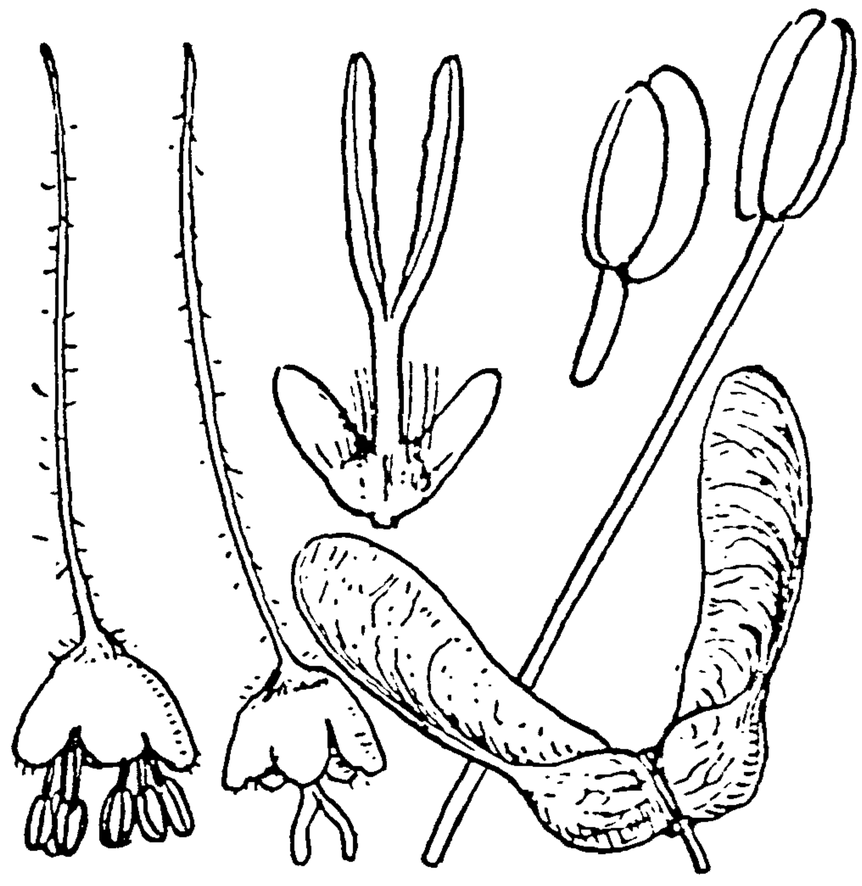
2. **A. pennsylvanicum** L. Shrub or tree, rarely over 11 m. tall, the bark relatively smooth, longitudinally striped: leaf-blades

sometimes broader than long, 1–3 dm. broad, deep-green, with 3 nearly erect acuminate lobes, sometimes with 2 additional lobes, finely or doubly serrate, glabrous above, finely pubescent beneath, rounded or subcordate at the base: racemes relatively few-flowered: pedicels not spreading, 5–10 mm. long: petals pale-green or yellowish-green, obovate, slightly surpassing the elliptic sepals: stamens included: fruit bright-green, 3.5–5.5 cm. broad, glabrous, the wings of the samaras spreading at an angle of about 120 degrees.—(MOOSEWOOD. MOUNTAIN-ALDER. STRIPED-DOGWOOD. STRIPED-MAPLE.)—Rocky woods, Blue Ridge and more northern provinces, Ga. to Ont. and N. S.—Spr.—The heart-wood resembles that of *A. spicatum*.

2. **SACCHARODENDRON** Nieuwl. Trees or shrubs. Leaf-blades 3–5-lobed. Flowers in terminal umbels, somewhat precocious, appearing with the leaves, andromonoecious, long-pedicelled. Calyx campanulate, the lobes mostly shorter than the tube. Petals none. Stamens exserted: anthers ellipsoid or oval. Stigmas mostly longer than the style.—About 6 species, North American.—MAPLES. ACERS.—The sap of some of the species, particularly of *S. nigrum* and *S. barbatum*, is rich in sugar—the source of maple sugar.

Leaf-blades glabrous or sparingly pubescent and glaucous beneath.
  Leaf-blades with 3–5 acute or acuminate, often toothed lobes. 1. *S. barbatum.*
  Leaf-blades with 3 blunt few-toothed lobes. 2. *S. floridaum.*
Leaf-blades downy pubescent beneath, not glaucous.
  Leaf-blades green beneath: calyx campanulate: samaras green. 3. *S. nigrum.*
  Leaf-blades greenish, tinged with red beneath: calyx hemispheric: samaras red. 4. *S. leucoderme.*

1. S. barbatum (Michx.) Nieuwl. Tree sometimes 40 m. tall, the bark usually separating in coarse scales at maturity, the twigs red-brown: leaf-blades firm, mostly with 5 sinuate-toothed lobes, 8–15 cm. in diameter, deep-green above, pale or glaucous beneath, with an open shallow sinus: flower-clusters yellowish-green: calyx campanulate, about 5 mm. long; sepals obtuse: samaras slightly spreading, 3.5–4 cm. long. [*Acer saccharum* Marsh. *A. barbatum* Michx.] — (SUGAR-MAPLE. HARD-MAPLE. ROCK-MAPLE. SUGAR-TREE.)—Rich woods, rocky slopes, and stream-banks, various provinces, rarely Coastal Plain, Ga. to Tex., Man., and Newf.—Spr.—The light-brown heart-wood is close-grained, tough, hard, and strong.—*Acer saccharum* Marsh. is merely a misspelling of *A. saccharinum* L.



2. S. floridanum (Chapm.) Nieuwl. Tree rarely over 18 m. tall, the bark rather close, but rough in age, chalky-white: leaf-blades rather broader than long, 5–6 cm. broad, with 3–5 blunt undulate lobes about as long as the body, deep-green above, glaucous and more or less pubescent beneath, truncate and shallowly cordate at the base: flower-clusters yellowish: pedicels sparingly pubescent at least until the fruit matures: calyx campanulate, 1–1.5 mm. long: samaras green, 1.5–2 cm. long, sparingly pubescent near the base; wings rather widely spreading. [*Acer saccharinum floridanum* Chapm. *A. floridanum* Pax]—(HAMMOCK-MAPLE.)—Rich woods, bluffs, and hammocks, Coastal Plain and rarely adj. provinces, Fla. to La. and S. C. Naturalized in N. C. Reported from Va.—Wint.–spr.

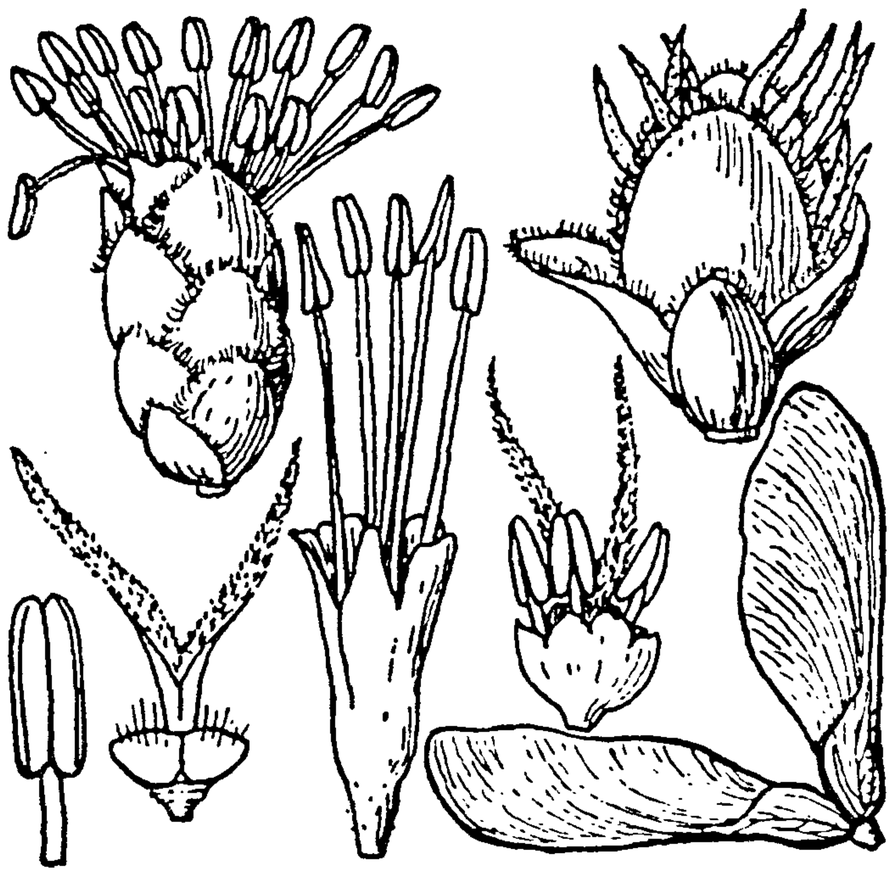
3. S. nigrum (Michx. f.) Small. Tree sometimes 30 m. tall, the bark dark, coarsely flaky, the twigs light orange-brown: leaf-blades mainly broader than

long, often 15–20 cm. broad, relatively thin, deep-green above, scarcely paler and more or less downy beneath, with 3–5 entire or merely undulate lobes; basal sinus closed by the overlapping lobes: calyx campanulate, about 5 mm. long; sepals rounded: samaras 3–4 cm. long, slightly spreading. [*Acer nigrum* Michx. f.]—(BLACK-MAPLE.)—Woods, open slopes, and fields, various provinces, Ga. to La., Minn., Ont., and N. H.—Spr.—The wood is nearly similar to that of *S. barbatum*.

4. S. leucoderme (Small) Nieuwl. Shrub, or tree reaching a height of 8 m., the bark smooth, white: leaf-blades broader than long, or rarely orbicular in outline, mostly 4-lobed, sometimes imperfectly 5-lobed, 4–9 cm. in diameter, cordate or truncate, with a rather open and shallow sinus, dark-green, glabrous and marked with light nerves above, greenish, tinged with red, prominently nerved and velvety (especially to the touch) beneath, the lobes acute or acuminate (the fourth or fifth when present, obtuse), each, or the terminal one only with 2 obtuse teeth: flower clusters yellow: calyx 2 mm. long: samaras red; wings elliptic-spatulate, 1–2 cm. long, red, conspicuous, parallel or nearly so. [*A. leucoderme* Small]—(CHALK-MAPLE.)—Rocky river-banks, woods, and cliffs, inner edge of Coastal Plain and Piedmont, Ga. to La., Ark. and N. C.—Spr.—The heart-wood is very close-grained and hard. The trunk is often crooked.

3. **ARGENTACER** Small. Trees. Leaf-blades mostly 3-lobed. Flowers in dense lateral clusters, subtended by an imbricate involucre, very precocious, appearing long before the leaves, androdioecious, sessile or nearly so. Calyx various, that of the staminate flowers narrow and elongate, that of the pistillate short and broad, the lobes shorter than the tube. Petals wanting or minute. Stamens long exserted: anthers ellipsoid. Stigmas longer than the style.—One species.

1. A. saccharinum (L.) Small. Tree rarely 36 m. tall, the bark flaky at maturity, gray, or that of the twigs reddish-brown: leaf-blades about as long as broad, 10–15 cm. long, with 3–5 prominent incised lobes longer than the body, silky when young, glabrate, bright-green above, glaucous or silvery-white beneath, truncate or cordate at the base: calyx greenish or yellowish: samaras 5–6 cm. long, tomentose, or glabrate at maturity, green, at length, widely spreading. [*Acer dasycarpum* Ehrh.]—(SILVER-MAPLE. WHITE-MAPLE. SOFT-MAPLE.)—Woods, river-banks, and alluvial soil, various provinces, N Fla. to La., Okla., N. D., Ont., and N. B.—Wint.–spr.—The pale-brown heart-wood is close-grained and hard, but brittle.

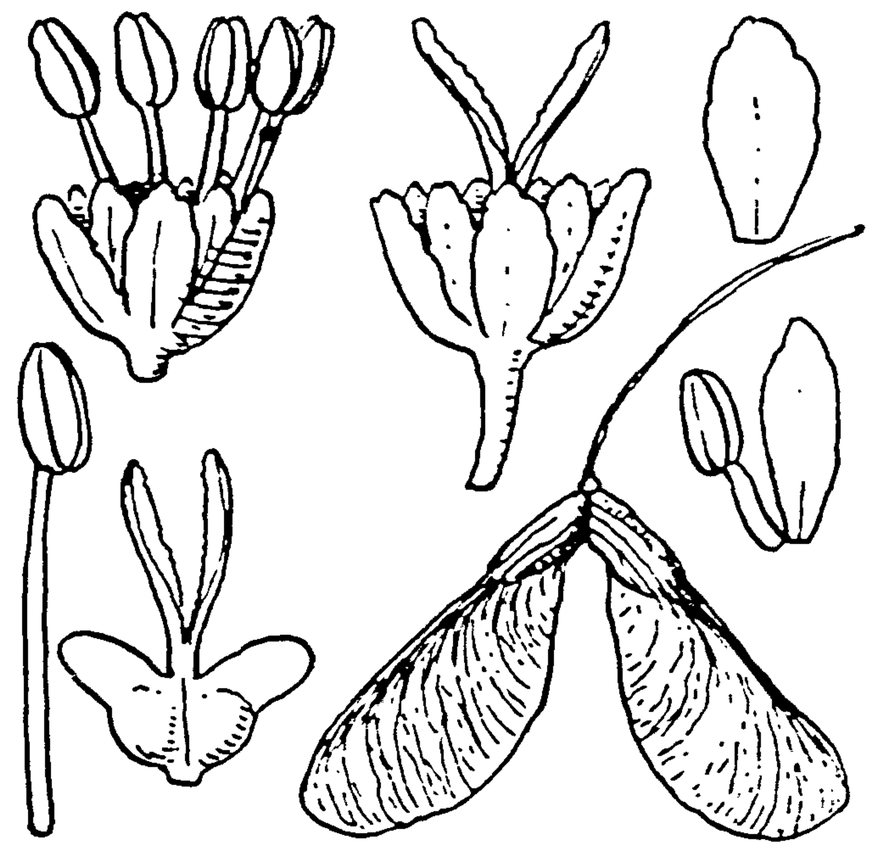


4. **RUFACER** Small. Trees. Leaf-blades coarsely toothed or 3–5-lobed. Flowers in dense lateral clusters subtended by an imbricate involucre, appearing long before the leaves; androdioecious, short-pedicelled. Calyx of usually 5 distinct or nearly distinct sepals. Petals somewhat smaller than the sepals. Stamens, in the staminate flowers, exserted: anthers oval. Stigmas longer than the style.—About 6 species, North American.—MAPLES. ACERS.

Leaf-blades glabrous or glabrate beneath: samaras less than 4 cm. long: wings rather spreading.
  Leaf-blades prominently and sharply lobed, the lobes prominently toothed: samaras mostly less than 3 cm. long. 1. *R. rubrum*.

Leaf-blades mostly shallowly 3-lobed, the lobes shallowly toothed: samaras mostly over 3 cm. long. 2. *R. carolinianum.*
Leaf-blades copiously woolly beneath: samaras over 4 cm. long: wings tending to converge. 3. *R. Drummondii.*

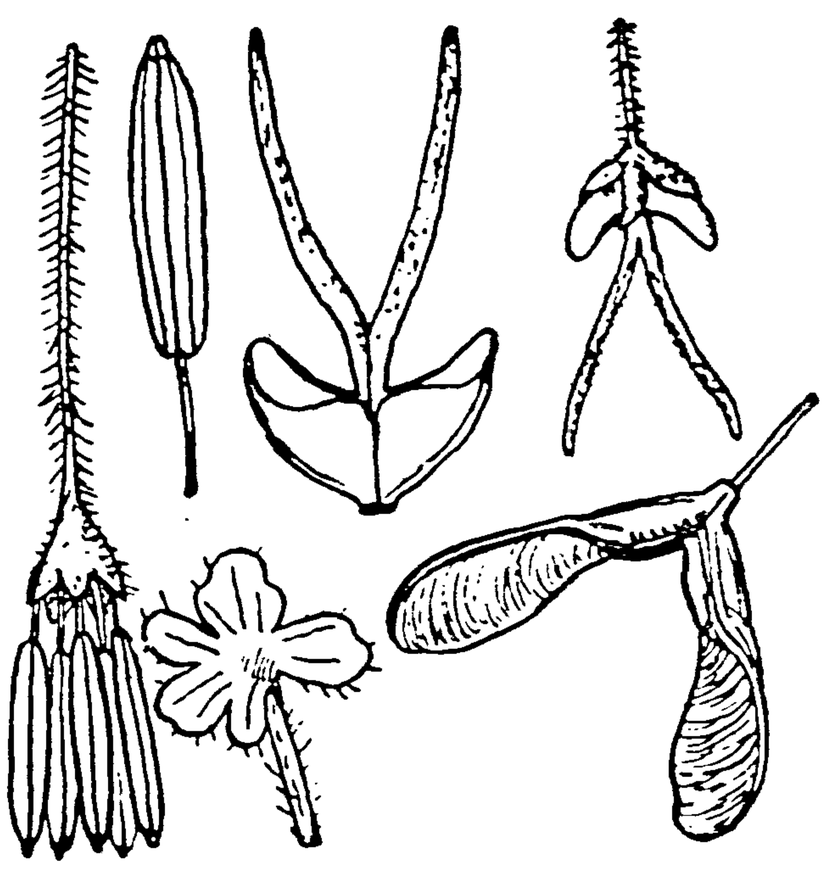
1. R. rubrum (L.) Small. Tree sometimes 35 m. tall, the bark dark-gray and fissured on the trunk, smooth and pale or white-gray on the branches: leaf-blades commonly broader than long, deep-green above, pale or glaucous beneath, mostly shallowly 5-lobed, rather evenly serrate, cordate at the base: flower-clusters red or yellowish: sepals nearly distinct: petals narrower than the sepals: samara-wings commonly red.—(RED-MAPLE. SWAMP-MAPLE. WATER-MAPLE. SCARLET-MAPLE.) — Woods and swamps, various provinces, Fla. to Tex., Man., and N. B.—Wint.-spr.—The heart-wood is close-grained and very heavy.



2. R. carolinianum (Walt.) Small. Tree resembling *R. rubrum,* but usually smaller, the bark of the trunk pale-gray: leaf-blades as long as broad, or longer, mostly shallowly 3-lobed, but sometimes merely toothed, dark-green above, pale beneath, unevenly serrate, rounded or subcordate at the base: flower-clusters red or yellowish: sepals nearly distinct: petals about as broad as the sepals: samara-wings usually diverging at less than 45 degrees.—(CAROLINA-MAPLE. RED-MAPLE. SOUTHERN RED-MAPLE).—Moist, often acid, soil, Coastal Plain and occasionally adj. provinces S Fla., to Tex., Mo., and N. J.—Wint.-spr.—The wood is nearly similar to that of *R. rubrum.*

3. R. Drummondii (Hook. & Arn.) Small. Tree reaching a height of 26 m., the bark pale or whitish, rough on the trunk: leaf-blades thick, mostly broader than long, 8–15 cm. broad or sometimes smaller, coarsely and irregularly toothed, deep-green above, white and woolly beneath, rounded or cordate at the base: flower-clusters red: sepals nearly distinct, elliptic or slightly narrowed upward: petals nearly like the sepals only narrower: samaras over 4 cm. long, the wings tending to converge.—(RED-MAPLE.)—River swamps, Coastal Plain and rarely adj. provinces, Fla. to Tex., Mo., and Ga.—Spr.—The wood is nearly similar to that of the two preceding species.

5. NEGUNDO [Ray] Ludwig-Boehmer. Trees. Leaf-blades pinnately compound. Flowers dioecious, the staminate in lateral clusters, long-pedicelled; the pistillate in lateral racemes. Sepals 5, partly united. Petals wanting. Stamens exserted: anthers linear, minutely appendaged at the tip. Stigmas much longer than the style.—Three or four species, North American.



1. N. Negundo (L.) Karst. Tree becoming 25 m. tall, with light-green twigs: leaflets 3–9; blades oval, ovate, or ovate-lanceolate, often 5–12 cm. long, coarsely toothed: flowers greenish, drooping: samaras 2.5–3.5 cm. long.—(BOX-ELDER. ASH-LEAVED MAPLE. WATER-ASH.)—Low woods and stream-banks, various provinces, Fla. to Tex., Man., Ont., and Me.—Spr.—The whitish heart-wood, close-grained, but soft, is made into wooden-ware and cheap furniture.

Family 12. **SAPINDACEAE** — Soapberry Family

Shrubs, trees, or vines. Leaves alternate in our species: blades simple or pinnate, sometimes 1-foliate. Flowers dioecious, polygamous, or polygamo-dioecious, or rarely perfect, borne in racemes, panicles, or corymbs. Calyx of 4 or 5 sepals. Corolla of 4 or 5 petals or wanting. Disk sometimes gland-bearing. Androecium mostly of 5 or more stamens. Gynoecium of 2–4 more or less united carpels. Fruit capsular or baccate. —About 125 genera and over 1,000 species.

Vines: fruit bladdery. — Tribe I. Cardiospermeae.
Shrubs or trees: fruit not inflated.
  Fruit baccate, not stipitate. — Tribe II. Sapindeae.
  Fruit capsular, loculicidal, stipitate. — Tribe III. Cupanieae.

I. Cardiospermeae

Climbers with tendrils and herbaceous or woody stems: capsule inflated, with 1 seed in each cavity. — 1. Cardiospermum.

II. Sapindeae

Petals appendaged, longer than the calyx.
  Fruit lobed, the carpels nearly distinct: petals with short claw-like bases. — 2. Sapindus.
  Fruit not lobed, the carpels united: petals with long claw-like bases. — 3. Talisia.
Petals unappendaged, about as long as the calyx.
  Ovary 2-celled: leaflets 2, 4 or 6: calyx persistent. — 4. Exothea.
  Ovary 3-celled: leaflets 3: calyx deciduous. — 5. Hypelate.

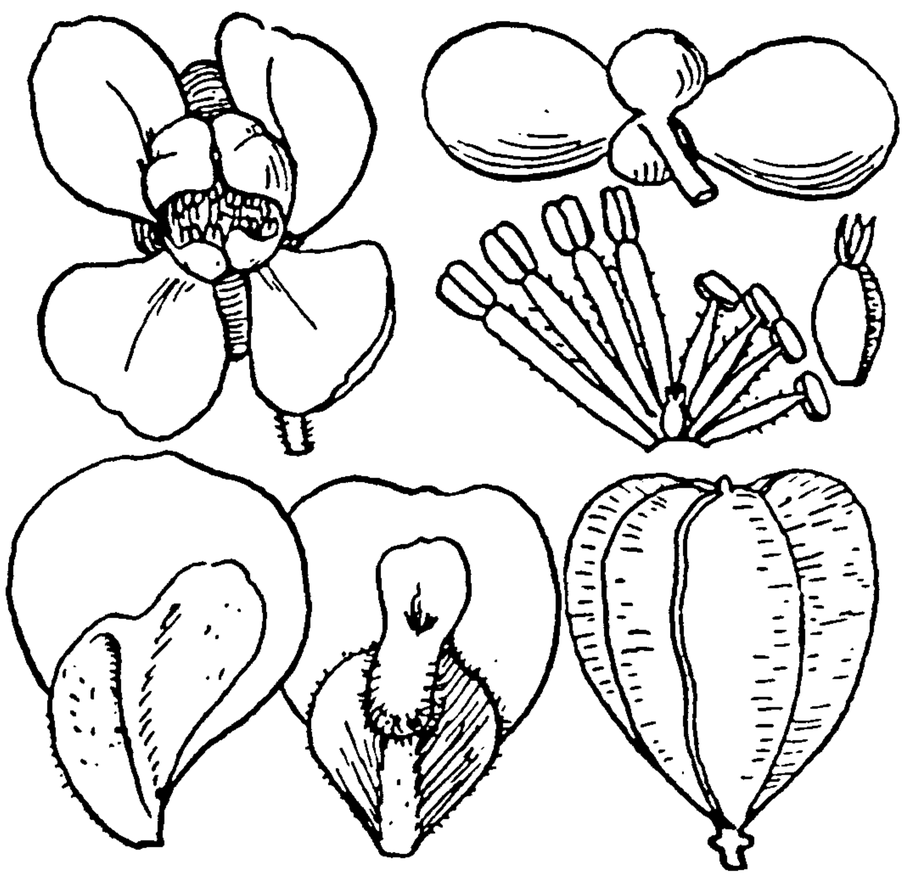
III. Cupanieae

Shrub or tree: leaflets with toothed blades. — 6. Cupania.

1. **CARDIOSPERMUM** L. Herbaceous or woody vines. Leaves alternate: blades biternate or decompound. Flowers polygamo-dioecious, irregular. Sepals 4. Petals 4, unequal, white. Disk one-sided, with 2 glands opposite the lower petals. Stamens 8. Capsules bladdery.—About 15 species, of the warmer parts of America.—Balloon-vines. Heart-seeds.

Capsule subglobose, obovoid, globose-obovoid, or oval, slightly longer than wide, not angled: blades of the leaflets rather large and acute or acuminate.
  Outer sepals glabrous: seed about 5 mm. in diameter, the aril reniform: leaflets glabrous or nearly so. — 1. *C. Halicacabum.*
  Outer sepals pubescent: seed about 3.5 mm. in diameter, the aril heart-shaped: leaflets finely pubescent. — 2. *C. keyense.*
Capsule obpyramidal and lobed, wider than long: blades of the leaflets small, usually decidedly acuminate. — 3. *C. microcarpum.*

1. C. Halicacabum L. Twigs glabrous or sparingly pubescent: blades of the leaflets lanceolate to ovate, acute to acuminate, coarsely serrate and incised, sparingly pubescent or glabrous: calyx glabrous; outer sepals about 2 mm. long, rounded: petals 3.5–4.5 mm. long: capsule subglobose to obovoid or globose-obovoid, about as wide as long, 3.5–4.5 cm. in diameter, short-stipitate.—(Heart-pea.)—Waste-places and cult. grounds, various provinces, Fla. to Tex., Kans., and Del. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A.*)—Sum. or all year S.—The root is medicinal.



2. C. keyense Small. Twigs closely and finely pale-pubescent: blades of the leaflets ovate, more or less lobed or incised, and crenate, or crenate-serrate, acute to somewhat acuminate, copiously fine-pubescent:

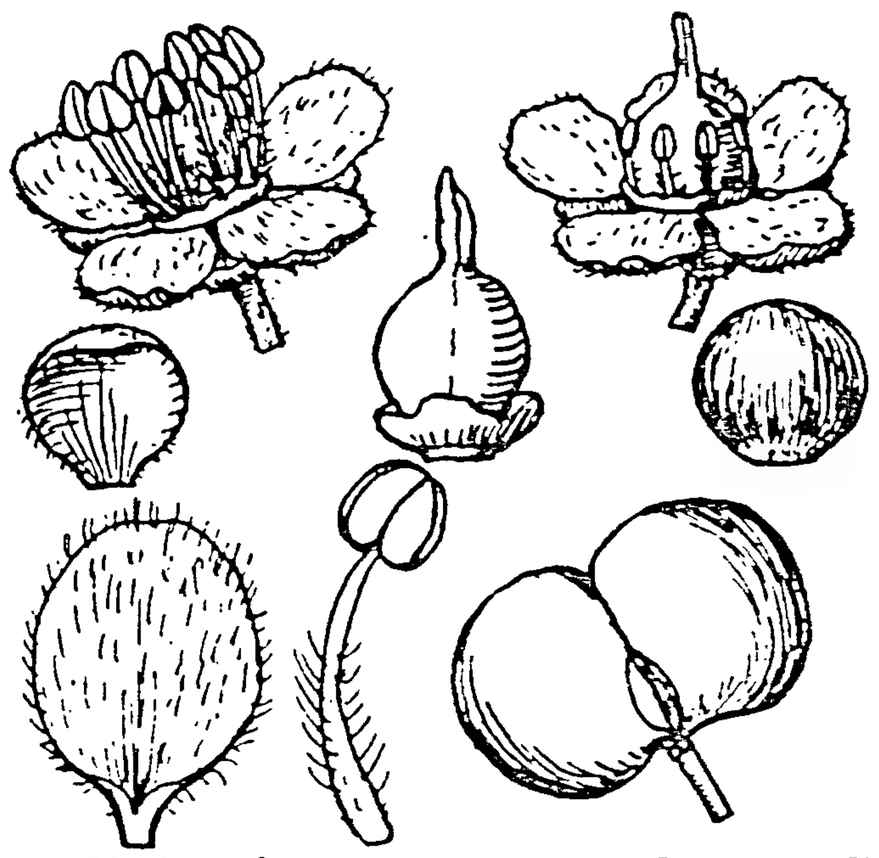
calyx similar to that of *C. Halicacabum*, but outer sepals pubescent: petals 3.5–4 mm. long: capsule subglobose to oval, 3–3.5 cm. in diameter, mostly longer than wide, rather long-stipitate.—Hammocks, Florida Keys.—All year.

3. **C. microcarpum** H.B.K. Twigs glabrous or obscurely fine-pubescent: blades of the leaflets lanceolate to ovate-lanceolate, decidedly acuminate, incised and coarsely toothed, glabrous or with scattered hairs: calyx glabrous or nearly so; outer sepals 1–1.5 mm. long: petals 2–3 mm. long: capsule broadly obpyramidal, 1.5–2 cm. wide, not stipitate.—Hammocks, pinelands, and swamps, S pen. Fla. and the Keys, and S Tex.—(*W. I., Mex., C. A., S. A.*)—All year.

2. **SAPINDUS** [Tourn.] L. Shrubs or trees. Leaves alternate: blades pinnate. Flowers polygamous, regular. Sepals 4 or 5. Petals 4 or 5, appendaged, white or greenish. Stamens 8–10. Baccate fruit not elongate, lobed.—About 10 species, American and Asiatic.—Wint.–spr.—The fruits contain saponin.

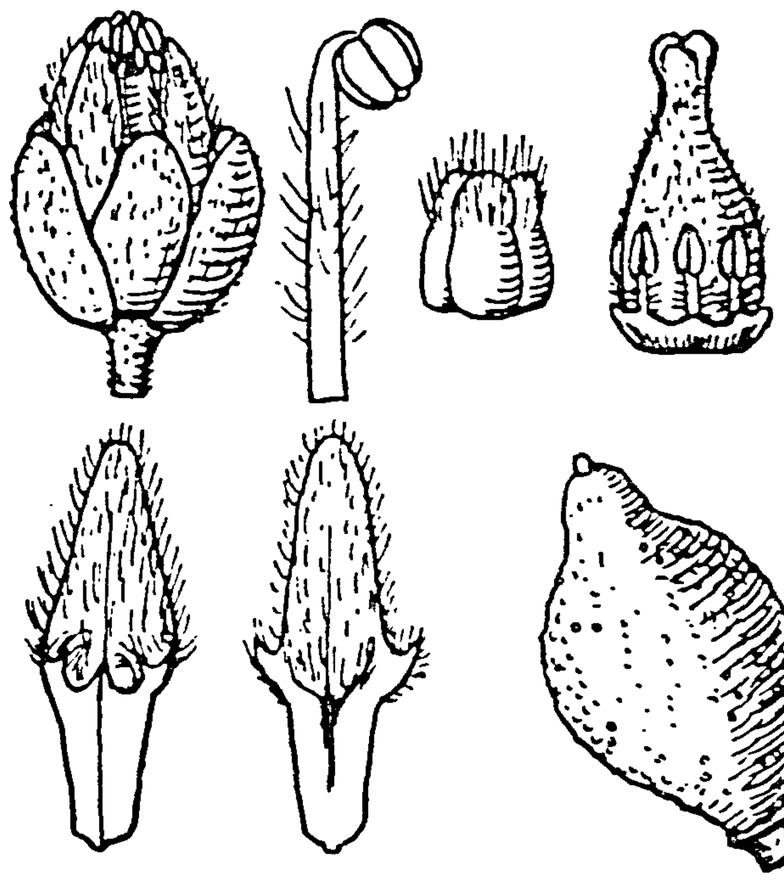
Leaf-rachis winged: blades of the leaflets obtuse, at least not acuminate: petals short-clawed. 1. *S. Saponaria.*
Leaf-rachis wingless: blades of the leaflets acuminate: petals long-clawed. 2. *S. marginatus.*

1. **S. Saponaria** L. Shrub, or tree becoming 10 m. tall: leaflets 4–7; blades elliptic, oval, or obovate, 3–12 cm. long; leaf-rachis winged: mature carpels globose, 14–18 mm. in diameter.—(SOAPBERRY. FALSE-DOGWOOD.)—Hammocks, pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—All year.—The light-brown heart-wood is close-grained, hard, and heavy.



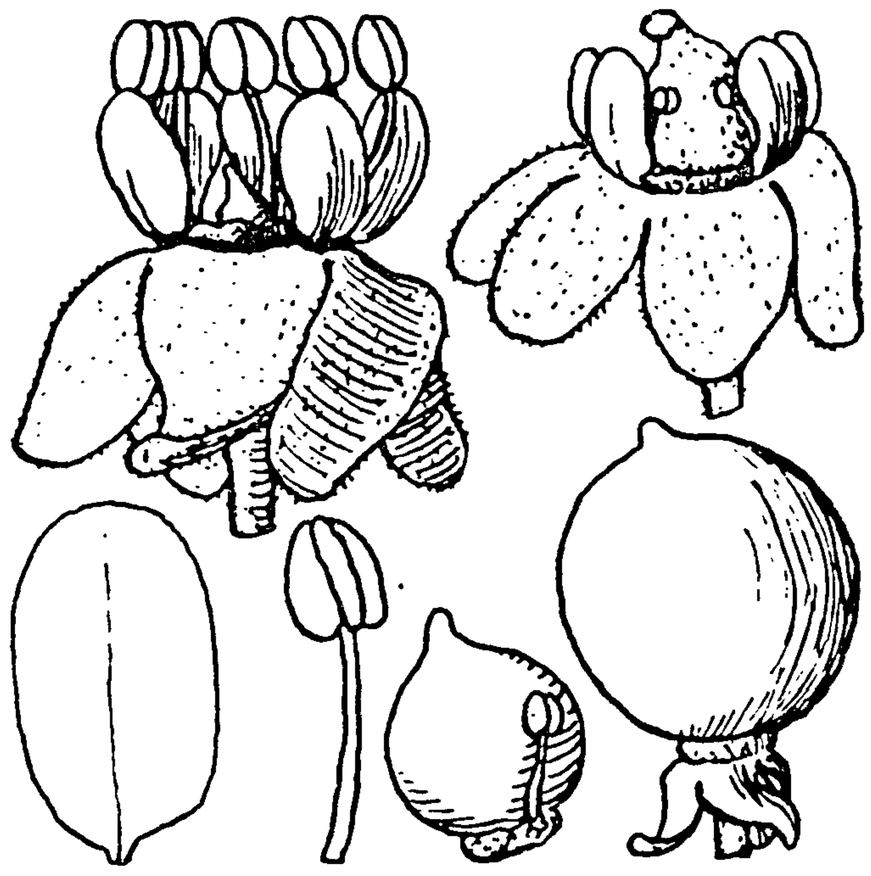
2. **S. marginatus** Willd. Tree 10–15 m. tall, the twigs and inflorescence pubescent: leaflets 7–13; blades lanceolate to elliptic-lanceolate, 5–15 cm. long: leaf-rachis margined above: mature carpel globose, 10–15 mm. in diameter.—(WILD-CHINA. SOAPBERRY.)—Hammocks, near the coast, Fla., Ga. and S. C. Adv. elsewhere.—Spr.—The light-brown heart-wood is close-grained, heavy, and strong, being easily split it is used for making light frames and baskets.—*S. manatensis* Radlk. seems to be a form of this species.

3. **TALISIA** Aubl. Shrubs or trees. Leaves alternate, the rachis wingless: blades pinnate, the leaflet-blades slightly inequilateral. Flowers polygamo-dioecious, regular. Sepals 5. Petals 5, appendaged. Stamens 5–7, or usually 8. Baccate fruit somewhat elongate, not lobed.—About 33 species, all but the following exclusively South American.



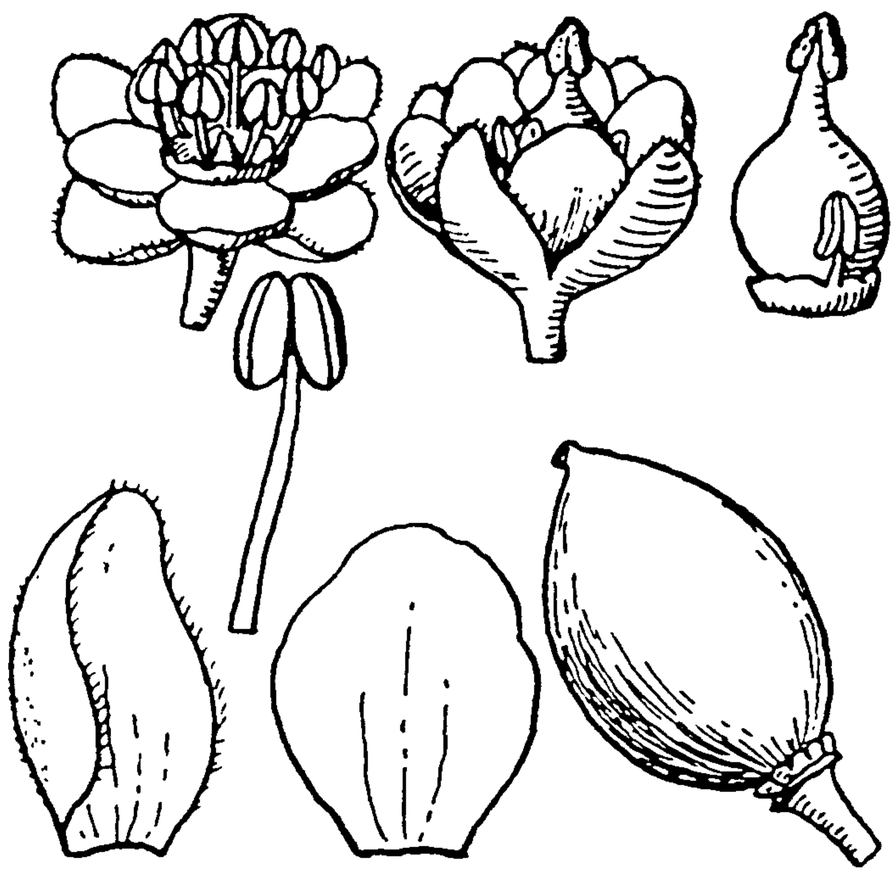
1. **T. pedicellaris** Radlk. Small tree with puberulent twigs: leaflets 4–6; blades elliptic to elliptic-ovate, 5–9 cm. long, acuminate, short-petioled: panicle small, the branches pubescent: petals ovate to ovate-lanceolate, 4–5 mm. long, green or yellowish: fruits ovoid or ellipsoid, 1.5–2 cm. long, papillose.—Brickell hammock, Miami, Fla.—(*S. A.*)—Spr.

4. **EXOTHEA** Macfadyen. Shrubs or trees. Leaves alternate; blades equally pinnate. Flowers mostly polygamous, irregular. Sepals 5. Petals 5, unappendaged, short-clawed. Stamens mostly 8. Baccate fruit not lobed.—One species.



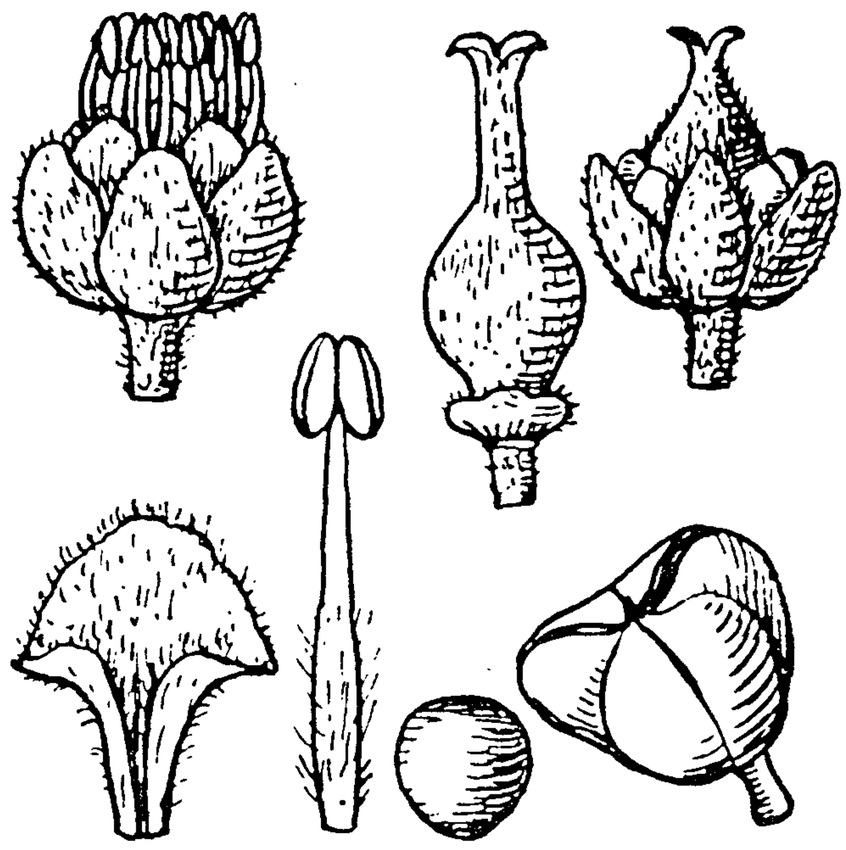
1. E. paniculata (Juss.) Radlk. Tree or shrub: leaflets 2–4, or rarely 6; blades elliptic, 5–13 cm. long, entire: buds clove-shaped: sepals 3–4 mm. long: petals white, smaller than the sepals: fruit subglobose, 10–13 mm. in diameter, orange turning purple. —(INKWOOD. IRONWOOD. BUTTER-BOUGH.) —Hammocks, pen. Fla. and the Keys.—(*W. I.*)—The light-brown heart-wood, close-grained, heavy and very hard, is used for cabinet work, boat-building, and small articles. The trees flower in wint. and spr. Has been carried far up the coast and planted on kitchenmiddens by birds.

5. **HYPELATE** P. Br. Shrubs or trees. Leaves alternate: blades 3-foliate. Flowers polygamo-dioecious. Sepals 5. Petals 5, unappendaged, clawless. Stamens 8–10. Baccate fruit not lobed.—One species.



1. H. trifoliata Sw. Tree: leaflets 3; blades spatulate to narrowly obovate, 2.5–4.5 cm. long: petals white, suborbicular, 1–1.5 mm. long: fruit ovoid, 5–7 mm. long, black. — (WHITE-IRONWOOD.) — Hammocks, Florida Keys.—(*W. I.*)—The dark-brown heart-wood, close-grained and very heavy, is used for cabinet-work, tool-handles, and in boat-building. The largest trees in our range occur on Umbrella Key. On Big Pine Key specimens of this typically hammock plant are scatted in the pinelands. The trees flower in spr. and sum.

6. **CUPANIA** [Plum.] L. Shrubs or trees. Leaves alternate: blades pinnate. Flowers polygamo-dioecious, regular. Sepals 4 or 5, rarely 3 or 6. Petals 4 or 5, sometimes appendaged, or wanting. Stamens 8, or 5, 6, 10, or 12. Capsule 2–4-lobed.—About 32 species, tropical American.



1. C. glabra Sw. Tree: leaflets 6–12; blades oblong with a cuneate base, 6–11 cm. long, crenate or crenate-serrate above the middle: sepals ovate, 2–2.5 mm. long: petals cuneate-flabellate, 2–2.5 mm. long, green, often tinged with yellow or red: capsule turbinate 11–14 mm. broad, stipitate.—Hammocks, Big Pine Key, Fla.—(*W. I.*)—Spr.—This is one of the trees discovered about a century ago on the Florida Keys, and up to several years ago thought to be exterminated in our range.

Order **RHAMNALES** — Rhamnal Order

Shrubs, trees, or vines. Leaves typically alternate. Flowers regular, sometimes imperfect or incomplete. Calyx present. Corolla present or wanting. Androecium of as many stamens as there are sepals. Gynoecium of 2 or more united carpels. Ovary superior or nearly so. Fruit a capsule or a berry, or drupaceous.

Sepals manifest: petals involute or wanting: fruit capsular, berry-like, or drupaceous. — Fam. 1. Frangulaceae.
Sepals minute or obsolete: petals valvate: fruit baccate. — Fam. 2. Vitaceae.

Family 1. **FRANGULACEAE** — Buckthorn Family

Shrubs, trees, or vines. Leaf-blades simple, pinnately veined. Flowers perfect or polygamous, or sometimes dioecious. Calyx of 4 or 5 sepals. Corolla of 4 or 5 petals, or wanting. Androecium of 4 or 5 stamens opposite the petals. Gynoecium of 2 or 3 united carpels. Fruit capsular, berry-like, or drupaceous, sometimes separating into nutlets.—About 50 genera and 600 species, of temperate and tropical regions.

Fruit wingless.
  Fruit drupaceous, pulpy, with a 1–4-celled stone. — Tribe I. Zizypheae.
  Fruit dry or berry-like, with 2–4 separate nutlets. — Tribe II. Rhamneae.
Fruit winged. — Tribe III. Gouanieae.

I. Zizypheae

Petals wanting.
  Sepals crested. — 1. Krugiodendron.
  Sepals not crested. — 2. Reynosia.
Petals present.
  Petals hooded and clawed, broadly rounded at the apex. — 3. Zizyphus.
  Petals involute, sessile, obtuse or acute. — 4. Berchemia.

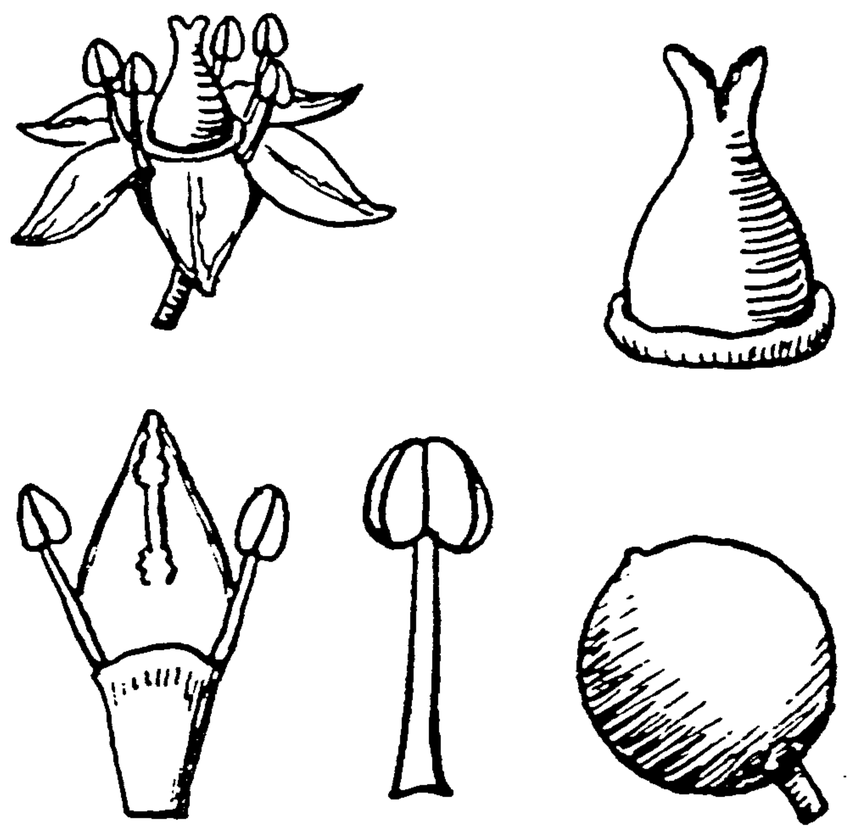
II. Rhamneae

Fruit pulpy.
  Hypanthium flattish: disk conspicuous. — 5. Sageretia.
  Hypanthium cup-like: disk inconspicuous, lining the hypanthium. — 6. Rhamnus.
Fruit dry.
  Sepals inflexed: petals on slender claws. — 7. Ceanothus.
  Sepals spreading: petals sessile, involutely folded over the filaments. — 8. Colubrina.

III. Gouanieae

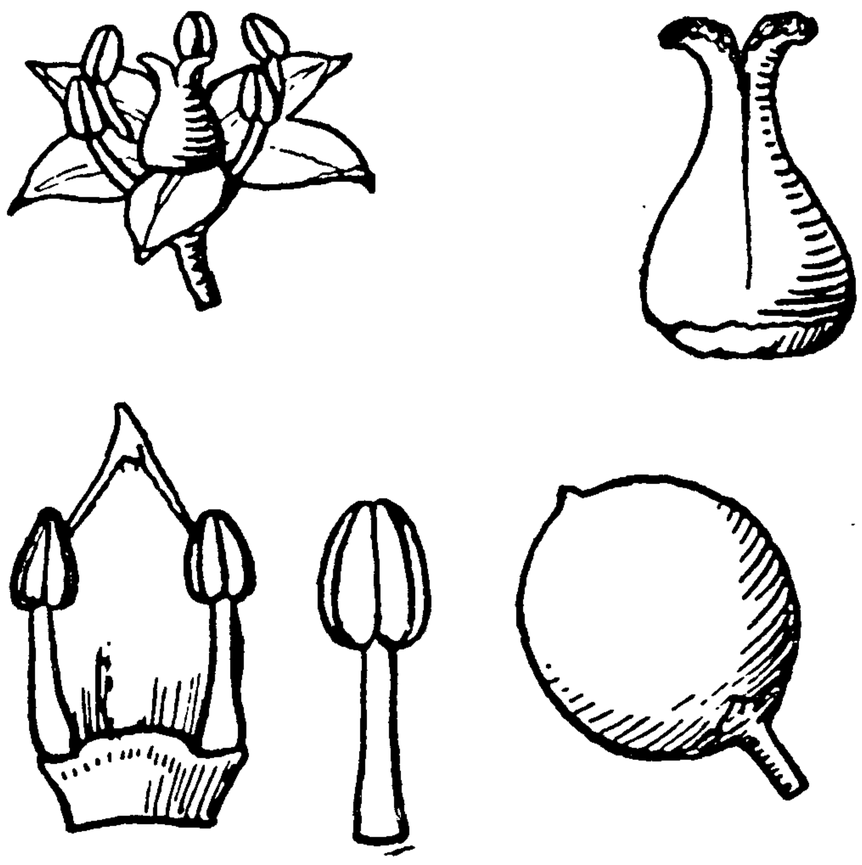
Vine with tendril-like twigs. — 9. Gouania.

1. KRUGIODENDRON Urban. Shrubs or trees. Leaves nearly opposite: blades entire. Flowers perfect, green. Sepals 5, crested within. Petals wanting. Stamens 5: filaments longer than the anthers. Drupe apiculate.—One species.



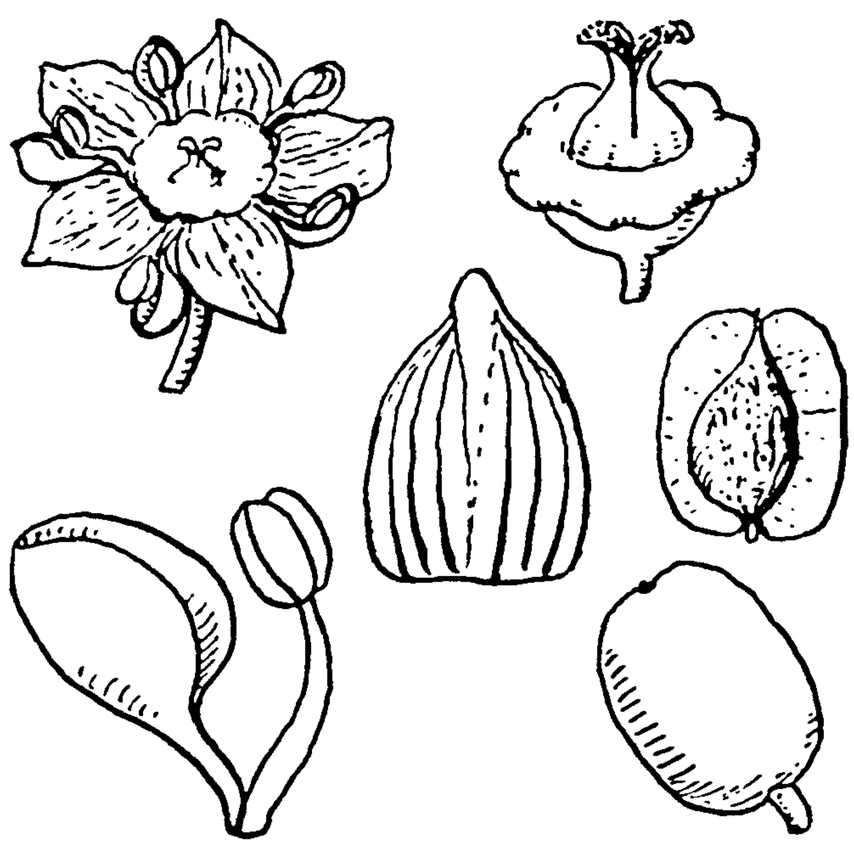
1. K. ferreum (Vahl) Urban. Shrub, or small tree 9 m. tall, the bark ridged: leaf-blades ovate or oval, 3–6 cm. long: sepals ovate: drupe subglobose or oval, 5–8 mm. long, black. [*Rhamnidium ferreum* (Vahl) Sarg.] — (Black-ironwood.) — Hammocks, lower E coast of Fla., Everglade Keys, and Florida Keys.—(*W. I.*)—Spr.—The orange-brown heart-wood, hard and very heavy, is used locally for cabinet-work. The geographic range of this species is not as wide as its relative the darling-plum, for it has not yet been found on the lower western coast of Fla.

2. **REYNOSIA** Griseb. Shrubs or trees. Leaves opposite: blades entire. Flowers perfect, green. Sepals 5, crestless. Petals wanting. Stamens 5: filaments longer than the anthers. Drupe apiculate.—About 9 species, West Indian.



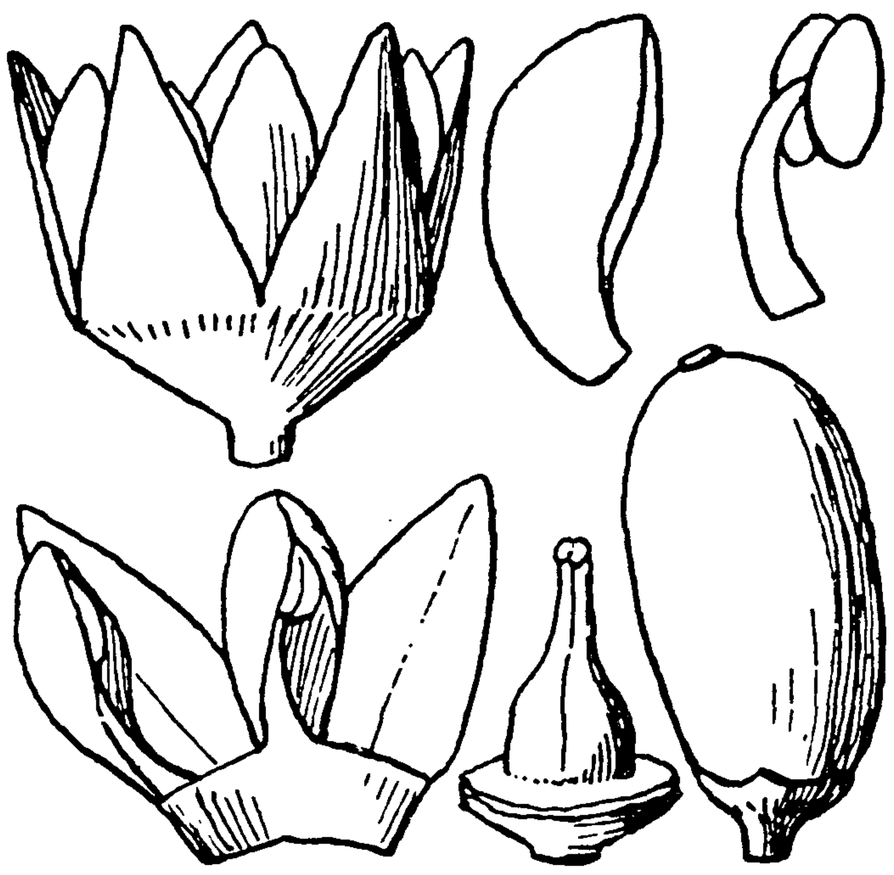
1. **R. septentrionalis** Urban. Shrub, or tree 9 m. tall, the bark scaly: leaf-blades elliptic, varying to ovate or obovate: sepals deltoid or ovate-deltoid: drupe subglobose, oval, or obovoid, 1.5–2 cm. long, purple or nearly black.—(RED-IRONWOOD. DARLING-PLUM.)—Hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—Spr.–sum.—The fruit is edible.—The dark-brown heartwood, close-grained and very hard, is used locally for cabinet-work.—The fruits are pleasantly flavored.

3. **ZIZYPHUS** Juss. Shrubs. Leaves alternate: blades three-ribbed, entire, or sometimes shallowly toothed. Flowers perfect. Sepals 5, keeled within. Petals 5, hood-like. Stamens 5, opposite the petals. Drupe fleshy, edible, with a 1–3 celled stone. About 40 species, most abundant in the Old World tropics.



1. **Z. Zizyphus** (L.) Karst. Shrub or small tree, with glabrous branchlets: leaf-blades ovate, oval, or elliptic-ovate, 3–6 cm. long, obtuse or retuse at the apex, shallowly toothed, inequilateral, oblique at the base, short-petioled: cymes contracted, axillary: sepals ovate, 2–2.5 mm. long: petals white or greenish, 2–2.5 mm. long; blades oval or suborbicular, short-clawed: drupe ovoid or ellipsoid, 15–25 mm. long, red or nearly black.—(JUJUBE-TREE.)—Thickets and roadsides, Coastal Plain, Ala. to La. Nat. of Eu. and cult.—Spr.—The fruit is edible.

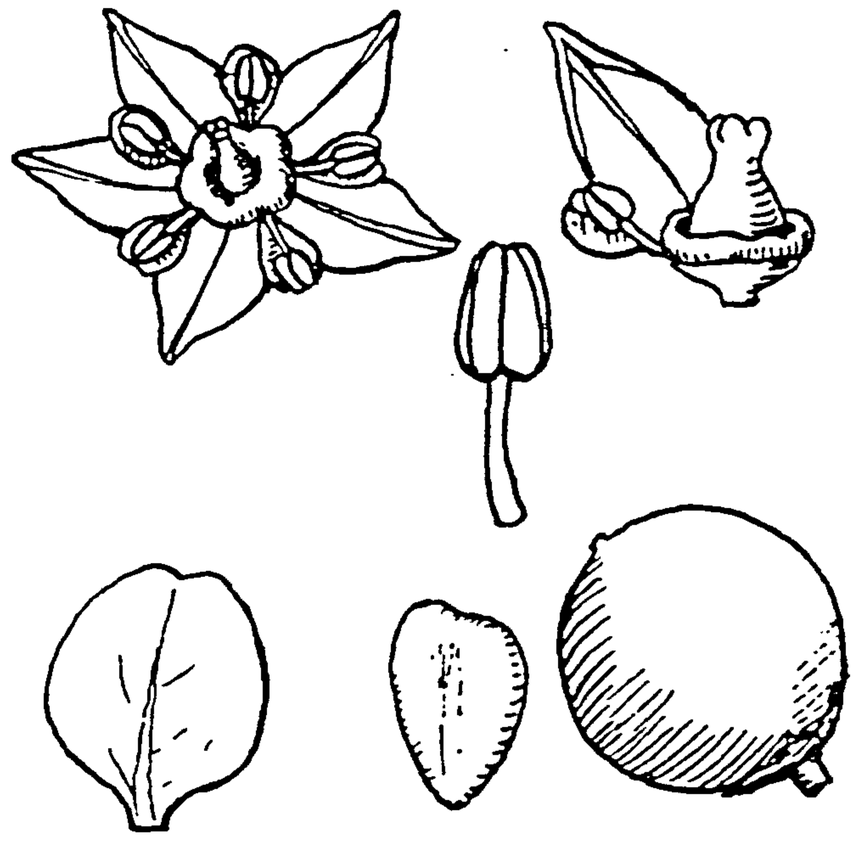
4. **BERCHEMIA** Neck. Shrubs or vines. Leaves alternate: blades many-ribbed. Flowers perfect or polygamous. Sepals 5, flat. Petals 5, involute, sessile. Stamens 5, often shorter than the petals. Drupe somewhat flattened, slightly longer than thick.—About 10 species, the following and the others in tropical Asia and Africa.



1. **B. scandens** (Hill) Trelease. Glabrous climber with wide-spreading branches: leaf-blades oval, elliptic, or sometimes varying to lanceolate, 4–8 cm. long, entire or undulate-crenate: sepals longer than the hypanthium: petals greenish-yellow, obovate, about as long as the sepals: drupe ellipsoid or ovoid-ellipsoid, 6–8 mm. long. [*B. volubilis* DC.]—(SUPPLE-JACK. RATTAN-VINE.)

—Swamps and low hammocks, Coastal Plain, and occasionally adj. provinces, Fla. to Tex., Mo., and Va.—Spr.

5. **SAGERETIA** Brongn. Shrubs with diffuse branches. Leaves opposite or nearly so: blades of firm-texture, finely toothed. Flowers perfect. Sepals 5, keeled within. Petals 5, concave, short-clawed. Stamens 5, about as long as the petals. Drupe separating into 3 leathery nutlets.—About 10 species, mostly Asiatic.

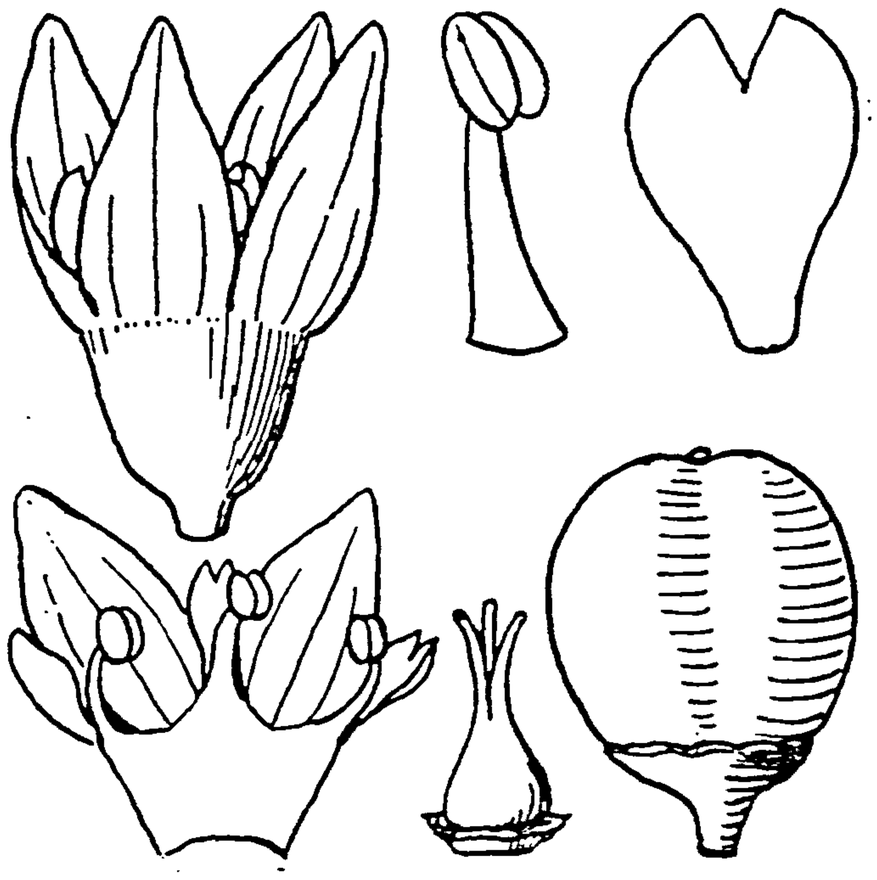


1. **S. minutiflora** (Michx.) Trelease. Pubescent, spinescent shrub: leaf-blades ovate or orbicular-ovate, 1–5 cm. long: spikes 1–4 cm. long: calyx 2–2.5 mm. broad: petals orbicular, ovate, about ½ as long as the sepals, white: drupe subglobose, 7–9 mm. in diameter.—(BUCKTHORN.)—Calcareous hammocks and bluffs, Coastal Plain, Fla. to Miss. and N. C.—Spr.—The flowers are very fragrant.

6. **RHAMNUS** [Tourn.] L. Shrubs or trees. Leaves alternate: blades entire or toothed, many-ribbed. Flowers perfect or polygamo-dioecious, green. Sepals 4 or 5, keeled within. Petals 4 or 5, commonly concave, clawless, shorter than the sepals, or wanting. Stamens 4 or 5, included: anthers acute. Drupe berry-like, not lobed, with 3 or 4 nutlets.—About 90 species, of warm and temperate regions.—Spr.—BUCKTHORNS.

Flowers usually dioecious: nutlet deeply grooved on the back; raphe dorsal: cotyledons leaf-like. 1. *R. lanceolata.*
Flowers perfect: nutlet not grooved; raphe lateral: cotyledons thick. 2. *R. caroliniana.*

1. **R. lanceolata** Pursh. Shrub 1–2 m. tall: leaf-blades elliptic, elliptic-lanceolate or sometimes oval, 2.5–9 cm. long: calyx about 3 mm. broad: petals about ½ as long as the sepals: drupe 5–7 mm. in diameter.—River-banks and moist hillsides, various provinces, rarely Coastal Plain, Ala. to Tex., Ia., and Pa.



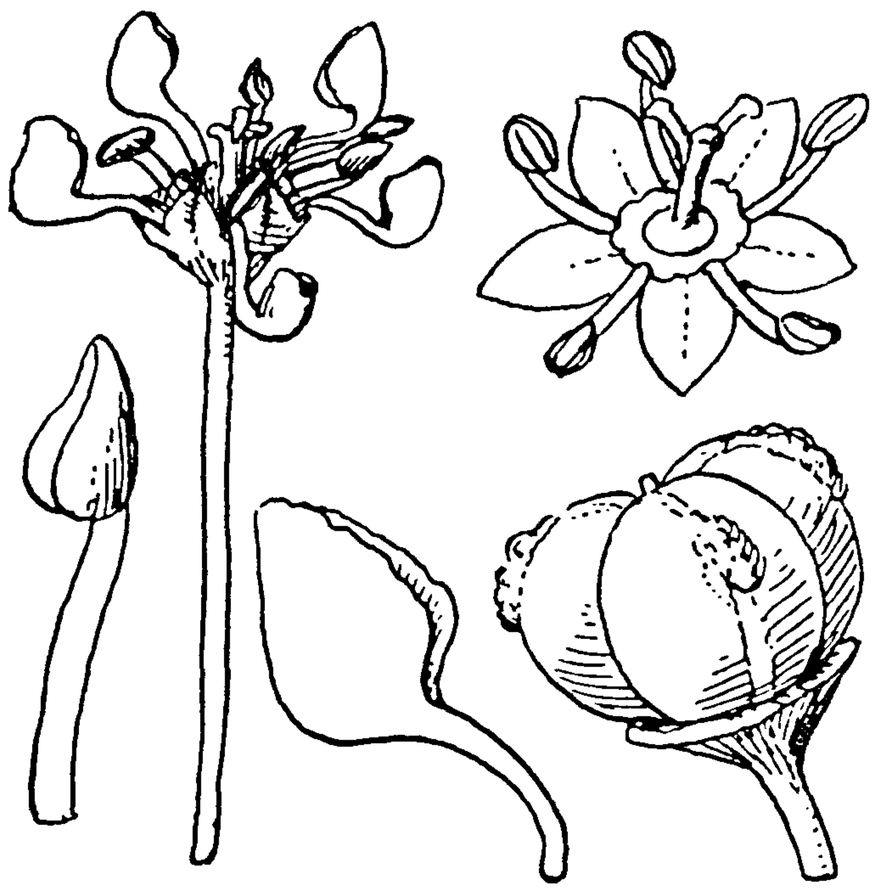
2. **R. caroliniana** Walt. Shrub, or tree becoming 11 m. tall: leaf-blades elliptic or slightly obovate, 5–12 cm. long: calyx about 4 mm. broad: petals about ½ as long as the sepals: drupe black, 10–11 mm. in diameter.—[INDIAN-CHERRY. YELLOW-WOOD. POLECAT-TREE.)—Shaded banks and hillsides, often in calcareous soils, various provinces, Fla. to Tex., Kans., and Va.—The bark is medicinal. The light-brown heart-wood is close-grained, light but rather hard.

7. **CEANOTHUS** L. Shrubs or trees. Leaves alternate: blades usually toothed, commonly 3-ribbed. Flowers perfect, white. Sepals 5, keelless. Petals 5, longer than the sepals, clawed, the blades hooded. Stamens 5, ex-

serted: anthers emarginate. Drupe lobed, separating into 3 carpels.—About 55 species, North American.—RED-ROOTS.

Leaf-blades toothed, membranous or nearly so.
  Erect shrubs: leaves deciduous.
    Common peduncle elongate.
      Leaves 3–10 cm. long: corolla about 5 mm. wide. 1. *C. americanus.*
      Leaves 1–3 cm. long: corolla about 4 mm. wide. 2. *C. intermedius.*
    Common peduncle abbreviated.
      Twigs and branches viscid-puberulent: lower surface of the leaf-blades glabrous or with few scattered hairs. 3. *C. ovatus.*
      Twigs and branches copiously pubescent: lower surface of the leaf-blades closely and permanently pubescent. 4. *C. pubescens.*
  Low decumbent shrub: leaves 5–10 mm. long, persistent. 5. *C. serpyllifolius.*
Leaf-blades entire, fleshy. 6. *C. microphyllus.*

1. C. americanus L. Shrub 2–9 dm. tall: leaf-blades ovate to ovate-lanceolate or rarely orbicular-ovate, prominently serrate: sepals about 1.5 mm. long: petals about 2 mm. long: fruit 5–6 mm. broad.—(NEW JERSEY TEA. RED-ROOT. RED-SHANK.)—Dry woods and hillsides, various provinces, Fla. to Tex., Man., and Me.—Spr.–sum.—The leaves were used as a tea substitute in colonial times. The root is used medicinally.



2. C. intermedius Pursh. Shrub 3–10 dm. tall: leaf-blades ovate to elliptic-ovate, or nearly elliptic, finely serrate: sepals about 1 mm. long: petals about 1.5 mm. long: fruit 4–5 mm. broad.—(RED-ROOT.)—Pinelands and woods, Coastal Plain and occasionally adj. provinces, Fla. to La., Tenn., and Ga.—Spr.

3. C. ovatus Desf. Shrub 2–6 dm. tall: leaf-blades thinnish, elliptic, oval, or ovate, 1.5–6 cm. long, somewhat veiny: sepals ovate, about 1.5 mm. long: petals about 2 mm. long.—Sandy woods, various provinces, Fla. to Tex., Minn., Vt., and Ga.—Spr.

4. C. pubescens (T. & G.) Rydb. Shrub similar to *C. ovatus* in habit: leaf-blades relatively thick, ovate-elliptic to narrowly elliptic, usually prominently veined: sepals deltoid, about 1 mm. long: petals about 2 mm. long.—Dry soil, various provinces, rarely Coastal Plain, Ga. to Tex., Mich., and Va.—Spr.

5. C. serpyllifolius Nutt. Shrub with diffuse or decumbent, very slender or filiform branches: leaf-blades elliptic to ovate-elliptic, serrulate, strigose beneath: sepals mostly 1 mm. long and obtuse: petals about 1.5 mm. long.—Pinelands, Coastal Plain, Fla. and Ga.—Spr.—Rare.

6. C. microphyllus Michx. Plant 3–6 dm. tall, diffuse: leaf-blades suborbicular, oval, or elliptic, 3–6 mm. long: sepals acute or abruptly pointed: petals about 1.5 mm. long: anthers brown: fruit depressed, 4–5 mm. wide.—Dry pinelands and sandhills, Coastal Plain, Fla., Ala., and Ga.—Spr.

8. **COLUBRINA** L. C. Rich. Shrubs or trees. Leaves alternate: blades entire or toothed, sometimes 3-nerved at the base. Flowers perfect. Sepals 5, spreading, often keeled. Petals 5, folded around the stamens, clawless. Sta-

mens 5: anthers notched. Drupe slightly 3-lobed, the carpels separating at least at the top.—About 15 species, with one exception tropical American.—Fall–spr. or all year.—The bark of some species is used as a substitute for hops.

Leaf-blades rather evenly pinnately veined: seeds shining, black. I. AMERICANAE.
Leaf-blades 3-ribbed from the base: seeds gray, dull. II. ASIATICAE.

I. AMERICANAE.

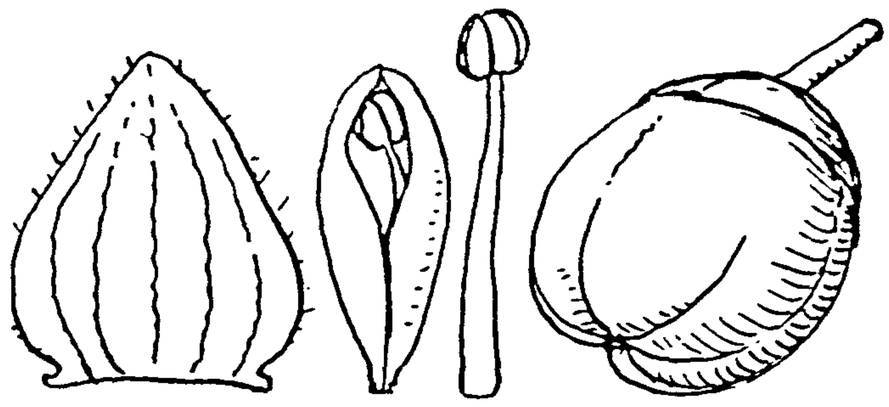
Leaf-blades mostly of an ovate type, neither prominently reticulate, nor copiously pubescent all over.
  Drupe 4–6 mm. in diameter: pedicel abruptly dilated into the hypanthium: leaf-blades glabrate, at most not rusty tomentose. 1. *C. reclinata.*
  Drupe 8–10 mm. in diameter: pedicel gradually dilated into the hypanthium: leaf-blades rusty-tomentose beneath. 2. *C. Colubrina.*
Leaf-blades mostly of an elliptic type, prominently fine reticulate, and copiously pubescent all over. 3. *C. cubensis.*

II. ASIATICAE.

A diffuse shrub, the dark-green leaf-blades shining. 4. *C. asiatica.*

1. C. reclinata (L'Her.) Brongn. Shrub or small tree becoming 20 m. tall, with puberulent twigs: leaf-blades ovate-elliptic or rarely oval or obovate, 3–8 cm. long: sepals about 2 mm. long: petals about 1.5 mm. long, yellow or greenish-yellow: drupe slender-pedicelled, seated on the hypanthium.— (NAKED-WOOD. SOLDIER-WOOD.)—Hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—The dark-brown heart-wood is close-grained, heavy, and hard.

2. C. Colubrina (Jacq.) Millsp. Shrub or tree, with rusty-tomentose twigs: leaf-blades ovate, elliptic, or rarely oblanceolate, 5–15 cm. long: sepals about 2.5 mm. long: petals somewhat longer than those of *C. reclinata,* yellow, sometimes red-tinged: drupe stout-pedicelled, partly immersed in the deep hypanthium.—(WILD-COFFEE.)—Hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)

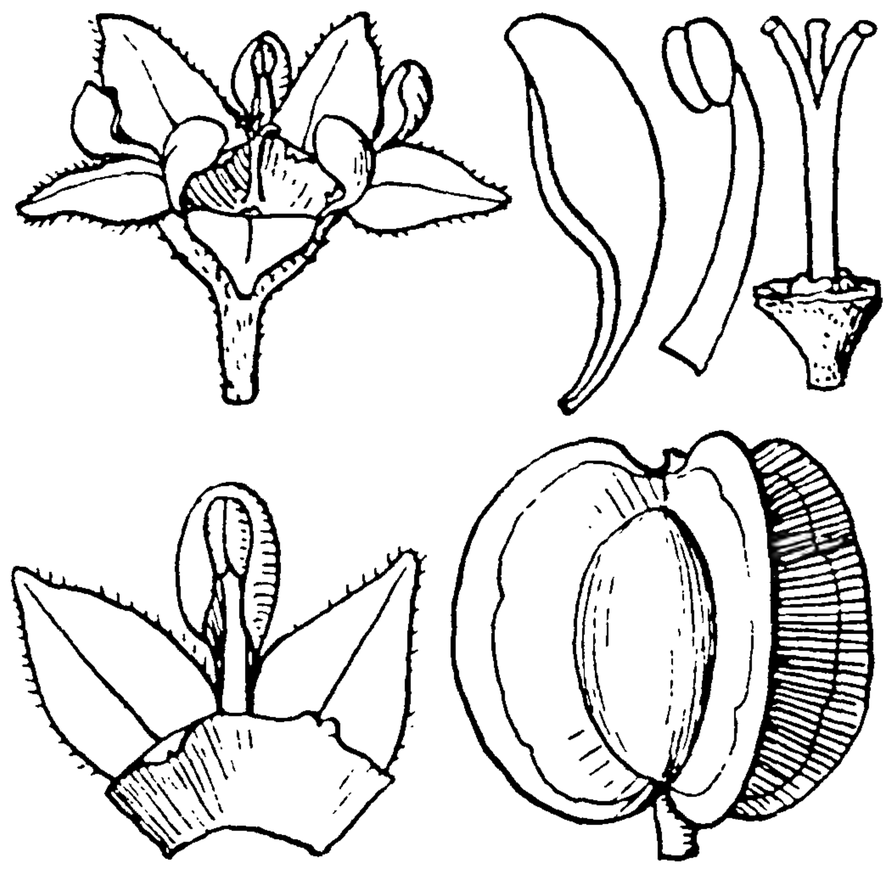


3. C. cubensis (Jacq.) Brongn. Shrub or small tree, with closely fine-pubescent twigs: leaf-blades elliptic, mostly 4–9 cm. long, prominently ribbed: sepals nearly 1.5 mm. long: petals about 1 mm. long: drupe slender-pedicelled, immersed in the hypanthium nearly or quite to the middle.—Hammocks, Everglade Keys, Fla.—(*W. I.*)—Rarely occurs as a woody vine climbing high into trees.

4. C. asiatica (L.) Brongn. Shrub with weak, diffuse or prostrate branches and glabrous twigs or sometimes erect and tree-like; leaf-blades ovate, 4–9 cm. long, acuminate or sometimes acute, crenate-serrate, glabrous, dark-green and shining above, truncate or cordate at the base, slender-petioled: sepals about 2 mm. long: petals nearly as long as the sepals, greenish: drupe subglobose, 7–10 mm. in diameter.—Hammocks and shores, S pen. Fla. and the Keys. Nat. of Asia.

9. GOUANIA Jacq. Shrubs or vines. Leaves alternate: blades broad. Flowers polygamous, the inflorescence-branches often tendril-bearing. Sepals

5, spreading. Petals 5, clawed, the blades scoop-like. Stamens 5, each surrounded by a petal. Drupe capsule-like, 3-winged, separating into 3 carpels.—About 40 species, widely distributed in the tropics.



1. G. lupuloides (L.) Urban. Climber: leaf-blades oval or elliptic, varying to ovate, 3–9 cm. long: spikes 6–15 cm. long: petals 1 mm. long, short-clawed, yellowish or greenish-yellow: drupe depressed, about 10 mm. broad. [*G. domingensis* L.]—(CHEW-STICK.)—Hammocks, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—The wood is used for cleaning the teeth.—Spr.–sum.

FAMILY 2. **VITACEAE** — GRAPE FAMILY

Vines, sometimes bushy or tree-like, usually with tendrils. Leaves alternate, or the lower ones opposite: blades simple or compound. Flowers perfect, polygamous, or dioecious, in flat-topped or elongate clusters. Calyx of 4 or 5 sepals, or obsolete. Corolla of 4 or 5, often caducous, petals, or wanting. Androecium of 4 or 5 stamens opposite the petals. Gynoecium of usually 2 united carpels. Fruit a berry.—About 10 genera and 500 species, widely distributed.

Hypogynous disk present, either annular, cup-shaped, or glandular: leaf-blades simple or ternately compound.
- Petals cohering into a cap, caducous, never separating.
  - Bark shreddy: pith interrupted by diaphragms at the nodes: tendrils forking. — 1. VITIS.
  - Bark not shreddy: pith continuous through the nodes: tendrils simple. — 2. MUSCADINIA.
- Petals distinct, spreading.
  - Floral envelopes mostly in 4's: disk 4-lobed: plant-tissues fleshy. — 3. CISSUS.
  - Floral envelopes mostly in 5's: disk entire or nearly so: tissues not fleshy. — 4. AMPELOPSIS.

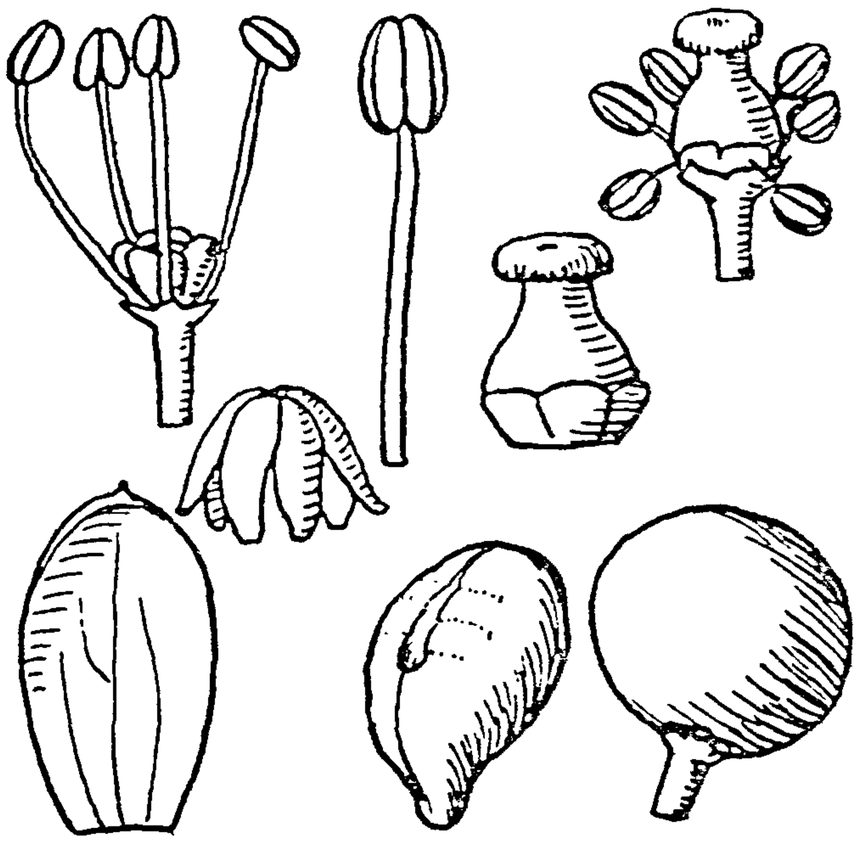
Hypogynous disk wanting or obsolete: leaf-blades digitately 5–7-foliolate. — 5. PARTHENOCISSUS.

1. VITIS [Tourn.] L. Woody vines. Leaf-blades palmately lobed, angled or coarsely toothed. Flowers in elongate racemes or panicles, green. Calyx minute. Petals cohering. Berry juicy, mostly edible. Seed pyriform.—About 40 species, widely distributed in warm and temperate regions.—Spr.—GRAPES.—Some species have been cultivated in many varieties from very ancient times, for the fruit. Some of our native species are represented in many hybrids which are grown commercially for their fruits.

Leaf-blades green and glabrous beneath at maturity, or merely cobwebby about the nerves or in their axils.
- Leaf-blades merely toothed, or sometimes angled or shallowly lobed.
  - Low shrub. — 1. *V. rupestris.*
  - Elongate, trailing or climbing vines.
    - Shoots terete, glabrous or early becoming so: leaf-blades usually lustrous above. — 2. *V. cordifolia.*
    - Shoots angled, pubescent throughout the year: leaf-blades not lustrous on either side. — 3. *V. Baileyana.*
- Leaf-blades prominently lobed.
  - Lobes and sinuses of the leaf-blades acute: berries with a bloom. — 4. *V. vulpina.*

Lobes of leaf-blades acuminate: sinuses obtuse: berries destitute of any bloom. — 5. *V. palmata.*
Leaf-blades at maturity densely woolly, or glaucous and sparingly cobwebby-flocculent beneath.
Lower surface of leaf-blades very glaucous, and pale, glabrate, the veins tawny pubescent. — 6. *V. bicolor.*
Lower surface of leaf-blades more or less woolly or cobwebby.
Leaf-blades cobwebby or flocculent beneath at maturity.
Young foliage gray-cobwebby or white-tomentose: leaf-blades gray-cobwebby beneath. — 7. *V. cinerea.*
Young foliage ferrugineous-pubescent, at least on the nerves of the leaf-blades.
Berry 12 mm. or more in diameter. — 8. *V. Linsecomii.*
Berry 5–6 mm. in diameter.
Twigs and petioles tomentose: panicle-branches felty-flocculent, at least during anthesis. — 9. *V. rufotomentosa.*
Twigs, and often petioles, glabrous or nearly so: panicle-branches not felty-flocculent. — 10. *V. aestivalis.*
Leaf-blades felt-like or densely tomentose beneath at maturity.
Tendrils, or flower-clusters, intermittent, usually every third node without tendril or inflorescence.
Leaf-blades densely tomentose with white hairs: berries less than 12 mm. in diameter. — 11. *V. coriacea.*
Leaf-blades densely tomentose with rusty or tawny hairs. — 12. *V. Simpsonii.*
Tendrils continuous, usually every node with a tendril, or inflorescence. — 13. *V. Labrusca.*

1. V. rupestris Scheele. Stems 1–2 m. tall: leaf-blades commonly broader than long, reniform to ovate-reniform, 4–10 cm. in diameter, coarsely toothed and rarely slightly, and sometimes somewhat irregularly, lobed, and with an abrupt tip at the apex, mostly lustrous above, glabrous or sparingly pubescent on the veins beneath, somewhat glaucescent on both sides: panicles 2–10 cm. long, slender, not dense: berry subglobose, 7–14 mm. in diameter, purple-black, somewhat glaucous, pleasant-tasted. — (SAND-GRAPE. SUGAR-GRAPE.) — River-banks and hillsides, various provinces, N of Coastal Plain, Tenn. to Tex., Mo., Pa., and Va.



2. V. cordifolia Lam. Leaf-blades thin, deep-green, longer than broad, commonly ovate in outline, rarely 3-lobed or 3-angled near the apex, rather coarsely and irregularly toothed, glabrous or sometimes sparingly pubescent beneath when young, more or less deeply cordate at the base (persistent and lustrous in *V. cordifolia sempervirens*): panicles 1–3 dm. long, commonly drooping: berry globose, 8–10 mm. in diameter, black under a slight bloom, pleasantly acid, persistent.—(FROST-GRAPE. CHICKEN-GRAPE.)—Woods, thickets, and stream-banks, various provinces, Fla. to Tex., Nebr., Wis., and N. Y.

3. V. Baileyana Munson. Leaf-blades thinnish but firm, ovate or orbicular-ovate, 5–10 cm. long, glabrous and somewhat rugose above in age or pubescent on the nerves beneath, toothed, otherwise entire or angularly 3-lobed near the apex, cordate at the base: panicles 8–13 cm. long, compact: berry globose, 7–10 mm. in diameter, black, destitute of bloom or nearly so.—Woods and mountain slopes, Blue Ridge and Appalachian Plateau, Ga. to Ala. and W. Va.

4. **V. vulpina** L. Leaf-blades thin, commonly longer than broad, 5–20 cm. broad, mostly sharply 3-lobed and coarsely and irregularly toothed, glabrate or pubescent on and about the nerves beneath, cordate or nearly truncate at the base, the teeth and lobes acuminate: panicles 6–20 cm. long, often much branched: berry globose, 8–10 mm. in diameter, very dark with a copious bloom, the pulp sour.—(RIVERSIDE-GRAPE. FROST-GRAPE.)—Rocky banks and along streams, various provinces, rarely Coastal Plain, Ala. to Miss., Colo., Man., N. B., and Md.

5. **V. palmata** Vahl. Leaf-blades thin, deeply 3–5-lobed and very coarsely toothed, green and glabrous on both sides or glaucescent beneath and sparingly pubescent on the nerves, cordate at the base: panicles 5–12 cm. long, slender: berry subglobose, 7–10 mm. in diameter, black, destitute of any bloom.—(RED-GRAPE. CAT-GRAPE.)—Sandy banks and rocky places, various provinces, Tenn. to La., Tex., and Ind.

6. **V. bicolor** Le Conte. Leaf-blades thinnish, mostly longer than broad, 1–3 dm. in diameter, 3–5-lobed, shallowly toothed, glabrous above, pale and very glaucous and glabrous beneath or the veins usually pubescent, glabrous or glabrate at maturity: panicles 5–10 cm. long, commonly long-peduncled: berry globose, 10–14 mm. in diameter, black beneath the bloom, rather sour but pleasant-tasted.—(SUMMER-GRAPE. BLUE-GRAPE. WINTER-GRAPE.)—Rocky woods and river-banks, various provinces, N of Coastal Plain, Ala. to Mo., N. H., and N. C.

7. **V. cinerea** Engelm. Leaf-blades thinnish, mostly longer than broad, 8–20 cm. in diameter, shallowly toothed, otherwise entire, or distinctly angularly 3-lobed near the apex, cowebby above or glabrous and rugose in age, more or less softly pubescent beneath with ashy or dark-brown webby hairs, cordate at the base: panicles 1.5–3 dm. long, irregular, drooping: berry subglobose, 10–14 mm. in diameter, black, barely glaucous, rather numerous.—(DOWNY-GRAPE. SWEET WINTER-GRAPE.)—Woods and stream-banks, various provinces, Fla. to Tex., Nebr., and Ill.

8. **V. Linsecomii** Buckl. Leaf-blades firm, as long as broad or a little longer than broad, 3-lobed and toothed, cordate, glabrate above, densely cobwebby or glabrate beneath (glaucous-blue beneath, except the rusty veins, in *V. Linsecomii lactea*): panicles 5–10 cm. long: berry subglobose, mostly 12–20 mm. in diameter, black beneath the bloom, pleasantly tasted.—Dry oaklands, various provinces, Tenn. to La., Tex., and Mo.

9. **V. rufotomentosa** Small. Leaf-blades suborbicular to ovate-orbicular, 10–20 cm. long, or sometimes shorter, dull-green above, finely and closely tomentose on the veins, otherwise cobwebby beneath, especially rusty on and about the nerves, rather coarsely and irregularly toothed, cordate at the base: panicles rather small, or ample, sometimes 2.5–3 dm. long: peduncles much shorter than the panicles: berry black, with little or no bloom, often 5–6 mm. in diameter.—(WILD-GRAPE.)—Hammocks, Coastal Plain, Fla. to La.

10. **V. aestivalis** Michx. Leaf-blades varying from broader than long to longer than broad, 1–3 dm. in diameter, angularly or deeply 3–5-lobed, shallowly toothed, dull-green and glabrate above, more or less densely, often unevenly, cobwebby or flocculent beneath, with rusty or brown hairs, cordate; petioles usually glabrous: panicles 1–2.5 dm. long, often conspicuously elongate and rather simple: berry globose, 8–10 mm. in diameter, black, under a bloom, with a tough skin, and pulp varying from sweet to very astringent.—(SUMMER-GRAPE. PIGEON-GRAPE.)—Thickets and rocky places, various provinces, Fla. to Tex., Kans., and N. H.

11. V. coriacea Shuttlw. Leaf-blades reniform to suborbicular in outline, 3–10 cm. broad, shallowly toothed, angularly lobed (those of shoots often deeply lobed), becoming glabrate above, felty beneath, cordate or truncate and subcordate: panicles 5–12 cm. long: berry subglobose, less than 12 mm. in diameter, pleasantly acid.—Hammocks, pen. Fla.—(*W. I.*)

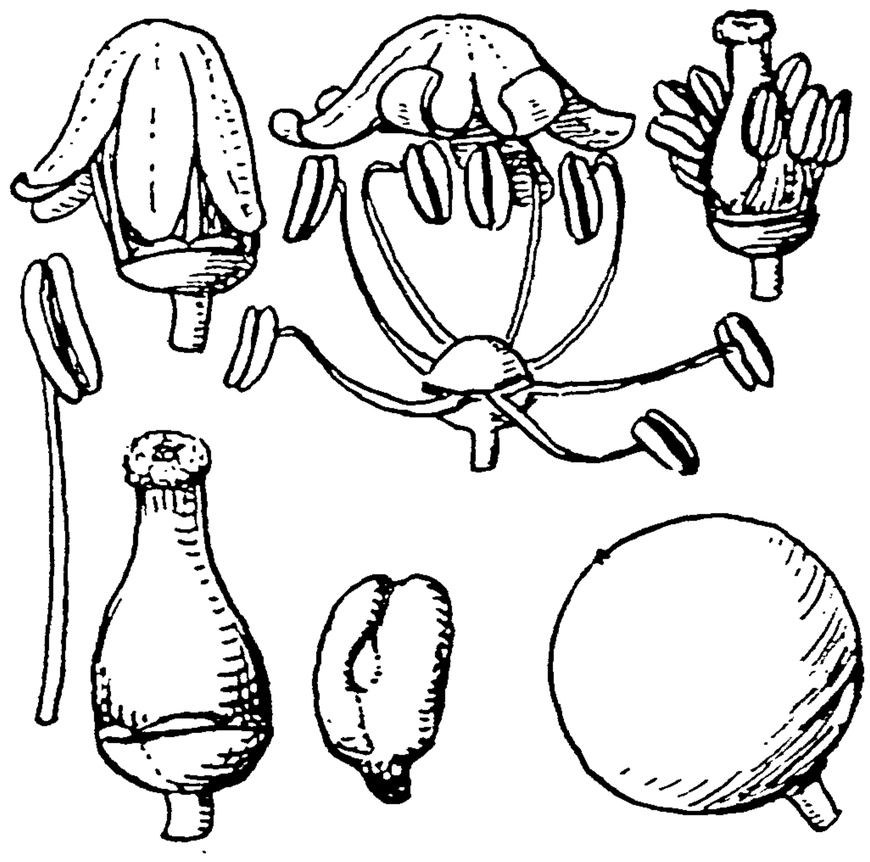
12. V. Simpsonii Munson. Leaf-blades suborbicular in outline, 5–18 cm. broad, prominently or mostly deeply 3–5-lobed, and shallowly toothed, glabrate above, more or less densely tawny- or rusty-tomentose beneath, cordate: panicles 5–10 cm. long, usually compact: berry commonly 15 mm. in diameter, black, mostly 4-seeded.—Sandy soil, especially in scrub and on shell mounds, pen. Fla.

13. V. Labrusca L. Leaf-blades thickish, suborbicular to broadly ovate, mostly longer than broad, shallowly toothed or scalloped, otherwise entire, or 3-lobed near the apex, glabrate above, densely tomentose or felty beneath: panicles 5–12 cm. long, usually simple: berry globose, 1.5–2 cm. in diameter, amber to purple, with a slight bloom, the skin and tough pulp sweet and musky, or astringent.—(FOX-GRAPE. PLUM-GRAPE.)—Thickets and woods, various provinces, Ga. to Miss., Ind., and Vt.

2. **MUSCADINIA** Small. Vines. Leaf-blades angled or coarsely toothed. Flowers in racemes or panicles, green. Calyx minute. Petals cohering. Berries rather juicy, ultimately edible.—Two species.—SCUPPERNONGS.

Berries 1.5–2.5 cm. in diameter; the skin and pulp tough, the latter musky: seed 6–9 mm. long. 1. *M. rotundifolia.*
Berries 1–1.5 cm. in diameter; the skin and pulp tender, the latter acid: seed 3–5 mm. long. 2. *M. Munsoniana.*

1. M. rotundifolia (Michx.) Small. Leaf-blades firm or leathery, suborbicular to ovate-orbicular, 4–9 cm. in diameter or larger, usually acuminate, coarsely toothed, glabrous, except the axils and sometimes the nerves beneath, cordate: berry subglobose, dull-purple, without bloom, with musky pulp, the bunches globular.—(MUSCADINE. SOUTHERN FOX-GRAPE. SCUPPERNONG.)—Thickets, swamps, river-banks, and hammocks, various provinces, Fla. to Tex., Kans., and Del.—(*Mex.*)—Spr.–sum.

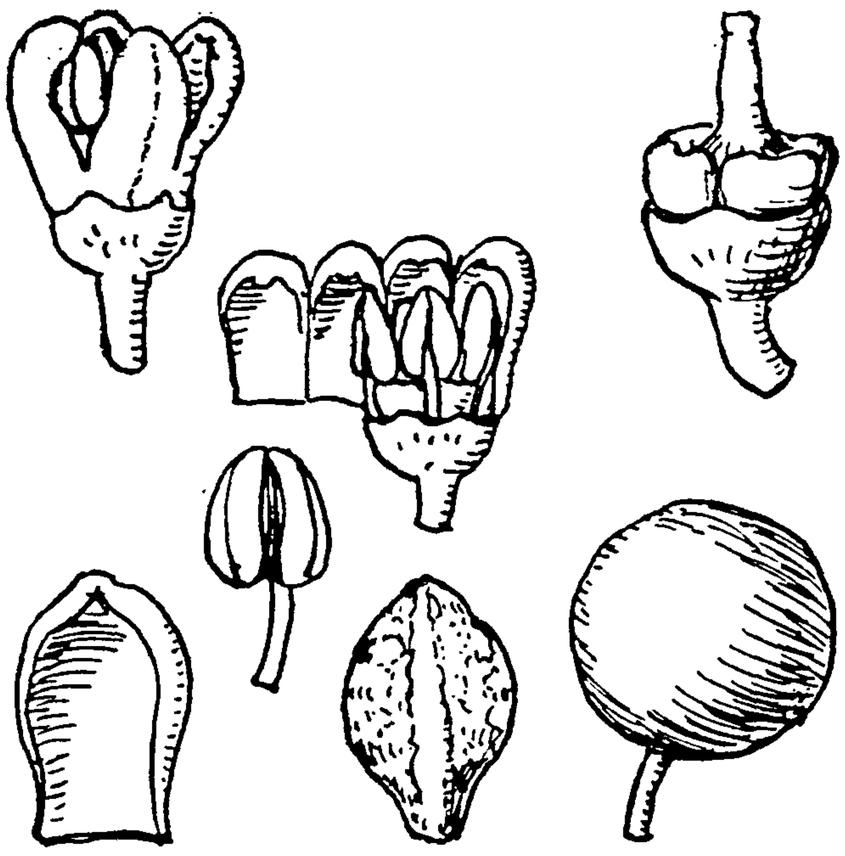


2. M. Munsoniana (Simpson) Small. Leaf-blades thinnish, but rather firm, suborbicular or reniform, 4–8 cm. broad, coarsely toothed, glabrous, except the axils of the vein beneath, persistent, cordate at the base: berry globose, 1–1.5 cm. in diameter, nearly black under a slight bloom or shining, the skin and pulp tender, acid: seed 3–5 mm. long.—[*?Vitis peltata* Raf.]—(BULLACE-GRAPE.)—Hammocks and scrub, Fla. and Ga.—(*W. I.*)—Spr.–fall, or all year S.

3. **CISSUS** L. Fleshy vines. Leaf-blades simple or 3-foliolate. Flowers in small cymes, green. Petals spreading. Berry inedible.—About 225 species, tropical.—Spr.–sum. or all year S.—POSSUM-GRAPE.

Leaf-blades 3-foliolate, the leaflets coarsely toothed.
  Flowers in trichotomous cymes: berry thickest above the middle. 1. *C. incisa.*
  Flowers in compound umbel-like cymes: berry thickest below the middle. 2. *C. trifoliata.*
Leaf-blades simple, distantly serrate. 3. *C. sicyoides.*

1. C. incisa Desmoul. Plant glabrous: leaf-blades 3-foliolate; leaflets pale-green, very fleshy, 3–10 cm. long, coarsely toothed and incised, the terminal one sometimes 3-lobed, the lateral ones 2-lobed, all more or less cuneately narrowed at the base, on stout petiolules: berry obovoid or obovoid-globose, 10–12 mm. long, apiculate.—(MARINE-IVY.)—Sand-dunes and hammocks, various provinces, Fla., except the Florida Keys, to Tex., Kans., and Mo.—Sum.



2. C. trifoliata L. Plant glabrous: leaf-blades 3-foliolate; leaflets 1–3 cm. long, suborbicular varying to ovate or obovate, often flabellate: berry globose-ovoid or ovoid, abruptly pointed, 5–7 mm. in diameter, dark-purple. [*C. acida* L.]—(SORREL-VINE.)—Hammocks, mostly near the coast, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—Sum.

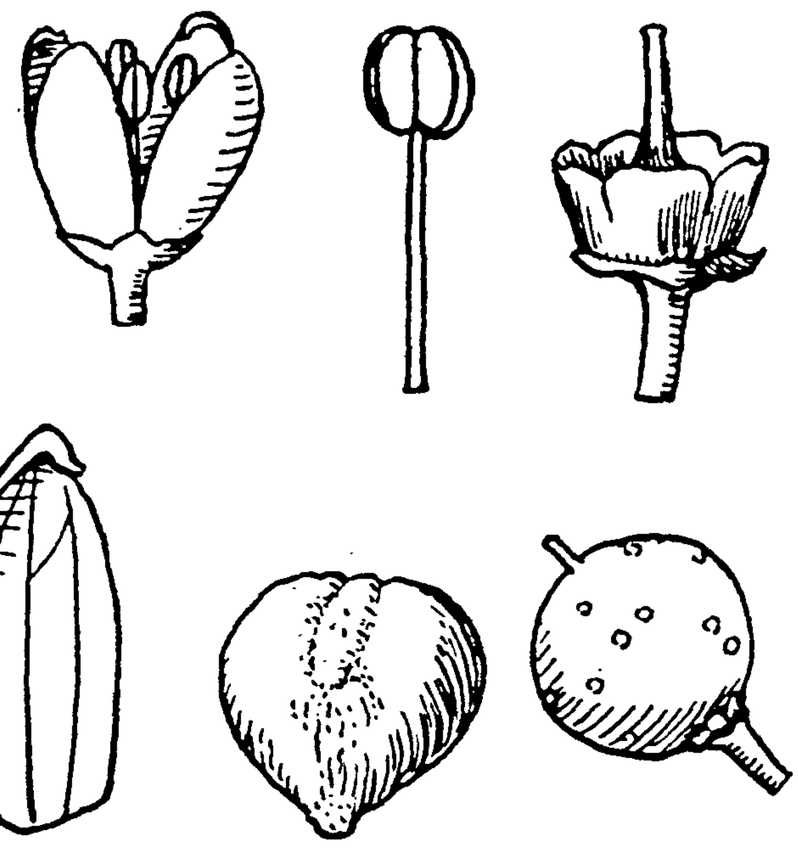
3. C. sicyoides L. Plant pubescent: leaf-blades ovate or elliptic-ovate, 2–8 cm. long, acute or often acuminate: berry subglobose, about 1 cm. in diameter, black. —The inflorescence is often infected by a fungus, *Ustilago Cissi,* which transforms the flowers into cigar-shaped bodies.—Hammocks, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall or all year S.

4. AMPELOPSIS Michx. Woody vines. Leaf-blades simple or bipinnate; flowers in flat cymes, green. Petals spreading. Berry inedible.—About 15 species, of temperate and tropical regious.

Leaf-blades simple: ovary not surpassing the disk but nearly free from it.
- Calyx scarcely lobed: petals elliptic, about 2.5 mm. long. 1. *A. cordata.*
- Calyx prominently lobed: petals broadly ovate or suborbicular, about 1.5 mm. long. 2. *A. heterophylla.*

Leaf-blades bipinnate: ovary surpassing the disk, the latter mostly adnate to it. 3. *A. arborea.*

1. A. cordata Michx. Leaf-blades ovate or triangular-ovate, 4–12 cm. long, shallowly serrate, long-petioled: style slender: berry 6–8 mm. in diameter, bluish or greenish-blue. [*Cissus Ampelopsis* Pers.] —River-banks and woods, various provinces, Fla. to Tex., Nebr., and Va.—Spr.



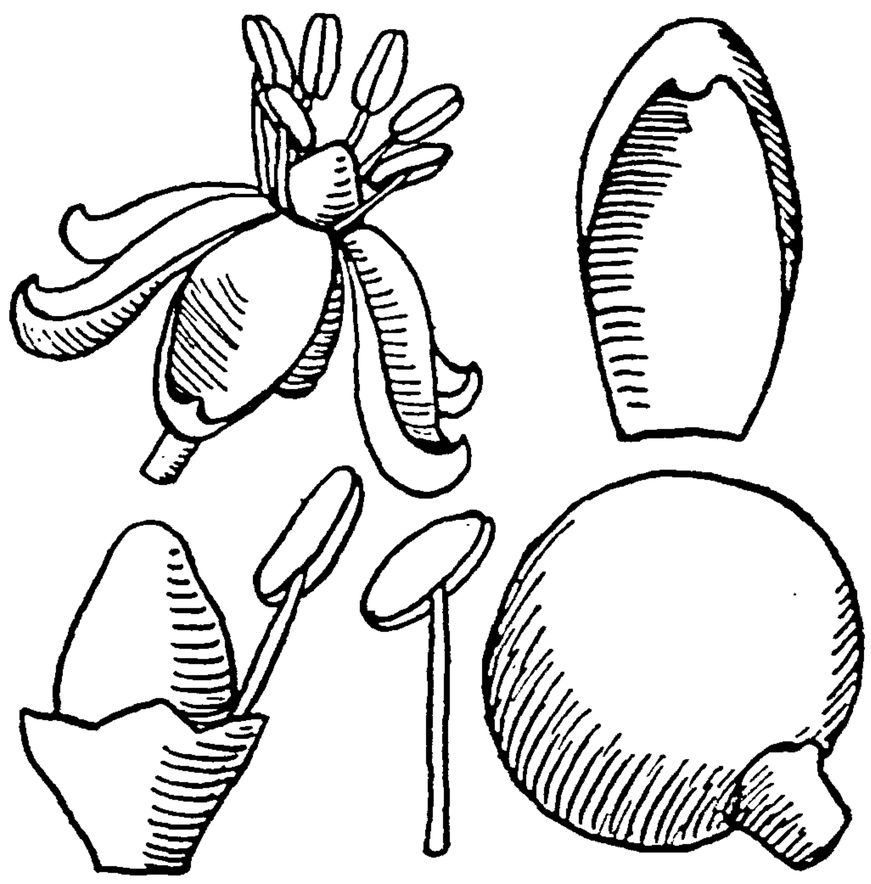
2. A. heterophylla Sieb. & Zucc. Leaf-blades broadly ovate, or deltoid in outline, 3–8 cm. long, crenate, short petioled: style stoutish: berry light-blue or white, dark-spotted.—Cult. grounds, various provinces, Ga. to N. C. and locally elsewhere. Nat. of E. Asia and cult.—Sum.–fall.

3. A. arborea (L.) Rusby. Leaf-blades bipinnate, 1–2 dm. long; leaflets several or many, the blades ovate, often broadly so or cuneate-obovate, 1–3 cm. long, coarsely toothed, incised, or lobed: berry 10–13 mm. in diameter, dark-purple. [*Cissus stans* Pers.]—(PEPPER-VINE.)—Hammocks, low thickets and swamps, Coastal Plain and occasionally adj. provinces, Fla. to Tex., Mo., and Va.—(*W. I., Mex.*)—Spr.–fall.

5. **PARTHENOCISSUS** Planch. Vines, the tendrils often disk bearing. Leaf-blades digitately compound. Flowers in compound cymes, green. Petals spreading. Berry inedible.—About 10 species, North American and Asiatic.—VIRGINIA-CREEPERS. WOODBINES. AMERICAN-IVIES.

Twigs, tendrils, and leaves pubescent. 1. *P. hirsuta.*
Twigs, tendrils, and leaves glabrous. 2. *P. quinquefolia.*

1. P. hirsuta (Donn.) Small. Leaflets 5; blades oval, elliptic, or ovate, acute or short-acuminate, coarsely toothed above the middle, all except the terminal one: berry 7–8 mm. in diameter, dark-blue, with a slight bloom, slightly pulpy: seed 5 mm. long, glossy, notched at the top, with a conspicuous spatulate raphe.—Rocky places, various provinces, Ga. to Tex.—(*Mex.*)—Spr.



2. P. quinquefolia (L.) Planch. Leaflets 5; blades usually thinnish, oval or elliptic, the lateral ones inequilateral, coarsely serrate above the middle with rather appressed teeth: tendrils with disks: berry 8–9 mm. in diameter, deep-blue with scant bloom, pulpy: seed 4–4.5 mm. long, prominently rugose, mostly rather dull, with an orbicular raphe.—(VIRGINIA-CREEPER. WOODBINE. AMERICAN-IVY.)—Woods, thickets, sand-dunes, and hammocks, various provinces, Fla. to Tex., Man., and Que.—(*W. I., Mex.*)—Spr. or all year S.—The bark is used medicinally.

ORDER **MALVALES** — MALVAL ORDER

Herbs, shrubs, or trees. Leaves alternate or opposite: blades simple, often lobed and toothed. Flowers mostly perfect, regular and involucrate. Calyx of distinct or partially united sepals. Corolla of distinct petals. Androecium of numerous monadelphous or grouped stamens. Gynoecium of several distinct or united carpels. Fruit capsular, follicular, berry-like, or nut-like.

Stamens numerous (in our genera).
  Stamens distinct or in several groups: anthers 2-celled. Fam. 1. TILIACEAE.
  Stamens monadelphous: anthers 1-celled. Fam. 2. MALVACEAE.
Stamens as many as the sepals. Fam. 3. BUETTNERIACEAE.

FAMILY 1. **TILIACEAE** — LINDEN FAMILY

Shrubs or trees, or rarely herbs. Leaves mostly alternate: blades simple. Flowers usually perfect. Calyx of 4 or 5 sepals. Corolla of 4 or 5 petals which sometimes bear a petaloid scale at the base. Androecium of usually numerous stamens, sometimes of as many or twice as many as the sepals. Gynoecium of 2–several united carpels. Fruit capsular, nut-like, or berry-like.—About 35 genera and 275 species, widely distributed.

Peduncles or pedicels without a conspicuous bract: filaments not forked: fruit capsular.
  Petals inserted with the stamens: capsule often silique-like. 1. CORCHORUS.
  Petals inserted below the stamens, at the base of an elevated receptacle: capsule subglobose. 2. TRIUMFETTA.

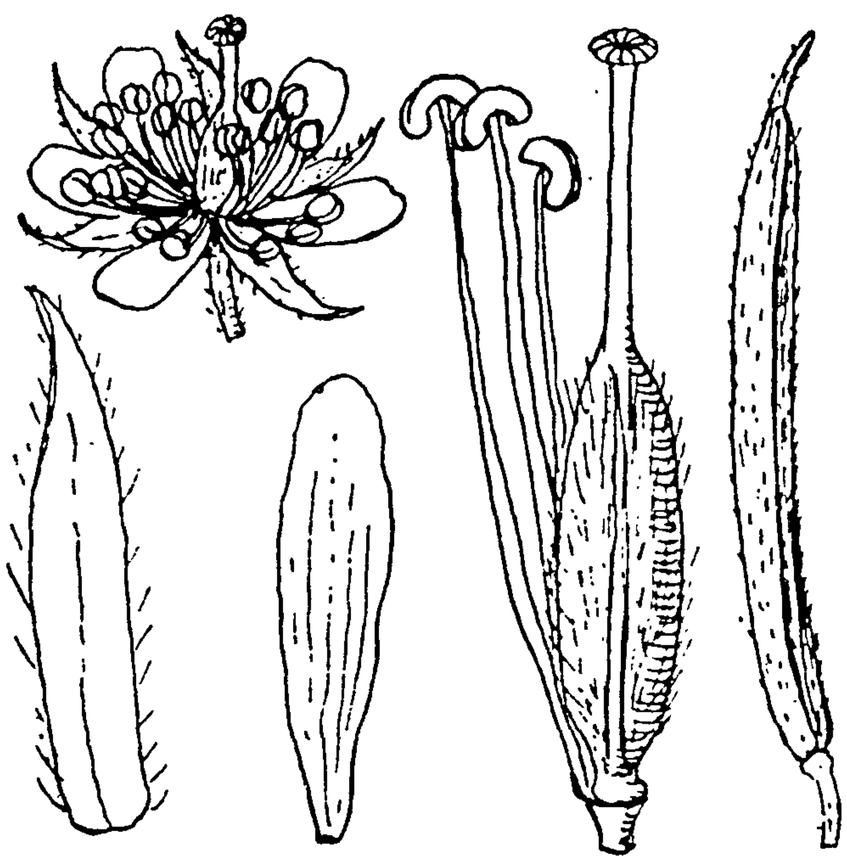
Peduncles each with a conspicuous adnate bract: filaments forked: fruit nut-like. 3. TILIA.

1. **CORCHORUS** [Tourn.] L. Herbs or small shrubs. Leaf-blades serrate. Sepals 5, or rarely 4, unappendaged at the tip. Petals 5 or rarely 4, naked at the base, larger than the sepals, yellow. Anther-sacs contiguous. Ovary elongate. Ovules numerous. Capsule many-seeded.—About 40 species, mostly tropical.—JUTES. JEW'S-MALLOWS.—The fibrous bark of some species form at least part of the jute of commerce.

Capsule long (4 cm. or more) and narrow, neither angled nor winged: leaf-blades without basal appendages, the teeth not bristle-tipped: seed about 1 mm. long.
- Petals of a spatulate type, often linear-spatulate: capsule with a single beak. 1. *C. orinocensis.*
- Petals of an obovate type, often rhombic-obovate: capsule with 4 tooth-like beaks. 2. *C. siliquosus.*

Capsule short (2 cm. or less) and stout, angled and winged: leaf-blades with a pair of basal bristle-tipped appendages, the teeth bristle-tipped: seed much less than 1 mm. long. 3. *C. acutangulus.*

1. **C. orinocensis** H. B. K. Stem usually sparingly branched: leaf-blades ovate, elliptic, or lanceolate, 2–6 cm. long, acute or acutish, crenate-serrate, short-petioled: flower-clusters sessile: sepals linear to narrowly linear-lanceolate, 5–6.5 mm. long or rarely longer: petals spatulate, mostly 4.5–6 mm. long: capsule slender, 4–7 cm. long, subulate-beaked, finely pubescent.—Hammocks, waste-places, and roadsides, Coastal Plain and southwestern provinces, Fla. to Tex. and Ariz.—(*W. I., Mex., C. A., S. A.*)—All year.



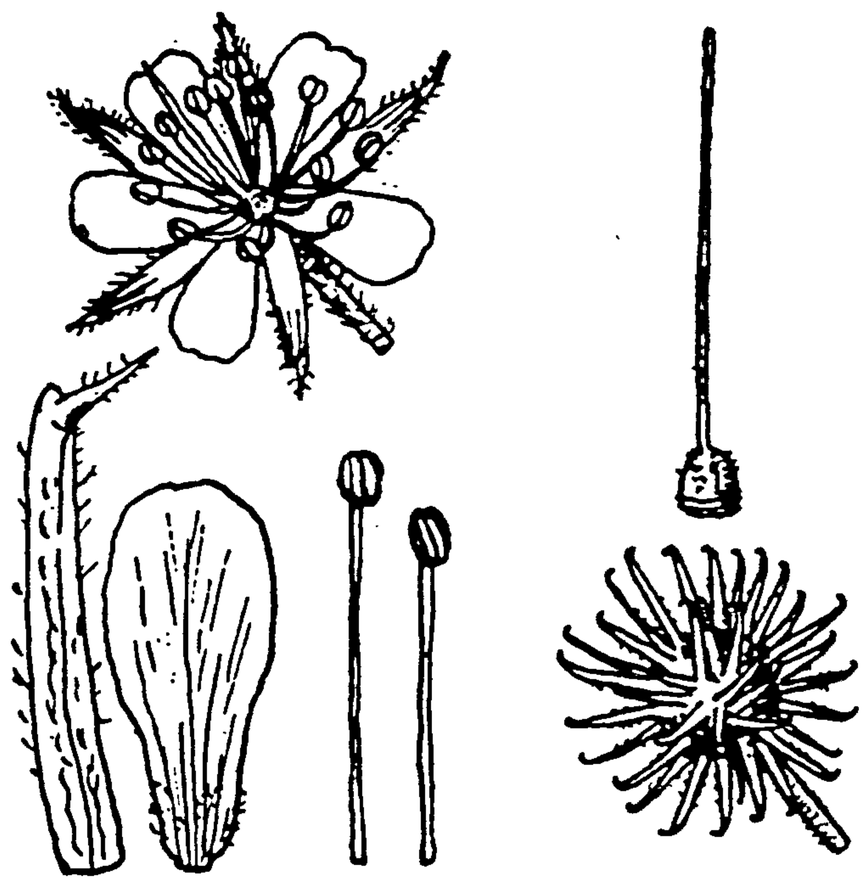
2. **C. siliquosus** L. Stem often widely much-branched: leaf-blades ovate, oval-ovate, or elliptic-lanceolate, mostly 1–3 cm. long, sometimes longer, mostly acute, serrate, short-petioled: flower-clusters sessile: sepals nearly linear, 6–8 mm. long, acuminate: petals rhombic-obovate, 4.5–5.5 mm. long: capsule slender, 5–8 cm. long, 4-beaked at the truncate apex, obscurely pubescent.—Hammocks, roadsides, and cult. grounds, S Fla.—(*W. I., Mex., C. A., S. A.*)—All year.

3. **C. acutangulus** Lam. Stem finely pubescent, 1 m. tall or less, widely branched: leaf-blades elliptic-ovate, ovate, or orbicular-ovate, 2.5–7.5 cm. long, acute or acutish, crenate-serrate, slender-petioled: flower-clusters nearly sessile: sepals linear to linear-lanceolate, 4–4.5 mm. long: petals spatulate, 4–5 mm. long: capsule stout, 1–2 cm. long, the angles winged, each with 5 spreading or recurved beaks.—Waste-places and roadsides, W Fla. Nat. of E. I.—(*W. I., S. A.*)—Spr.–fall.

2. **TRIUMFETTA** [Plum.] L. Herbs or shrubs. Leaf-blades mostly toothed and lobed. Sepals 5, often appendaged at the tip. Petals 5, each with a pit at the base, often shorter than the sepals, yellow, or rarely wanting. Anther-sacs contiguous. Ovary globular. Ovules few. Capsules few-seeded.—About 70 species, of warm and tropical regions.—BURWEED.

Twigs hirsute: capsule-body glabrous or with scattered hairs: the prickles as long as its diameter or longer. 1. *T. semitriloba.*
Twigs softly pubescent: capsule-body cinereous-tomentulose: the prickles shorter than its diameter. 2. *T. Bartramia.*

1. **T. semitriloba** Jacq. Plants stellate-tomentose, 1–2 m. tall: leaf-blades ovate, rhombic, or suborbicular, serrate, angulate or 3-lobed, 3–8 cm. long: sepals linear, 5–6 mm. long, or longer: petals cuneate-spatulate or linear-spatulate: capsule-body 4–5 mm. in diameter, rigidly prickle-armed.—Pinelands, hammocks, and cult. grounds, pen. Fla. and the Keys. Nat. of S. Am.—(*W. I., Mex., C. A., S. A.*)—The bark yields a fiber similar to jute.



2. **T. Bartramia** L. Plants pubescent, fully 2 m. tall or less, usually widely branched: leaf-blades reniform, suborbicular, ovate or elliptic, commonly 1 dm. long or less, 3–5-lobed and toothed, cuneate to nearly truncate at the base; petioles shorter than the blades: panicles elongated, much interrupted: sepals linear or nearly so, 5–6 mm. long: petals spatulate, commonly shorter than the sepals: capsule-body 2.5–3.5 mm. in diameter, weakly prickled-armed.—Cult. grounds, waste-places, and roadsides, W Fla. Nat. of trop. Am.—(*W. I.*)—Spr.–fall.

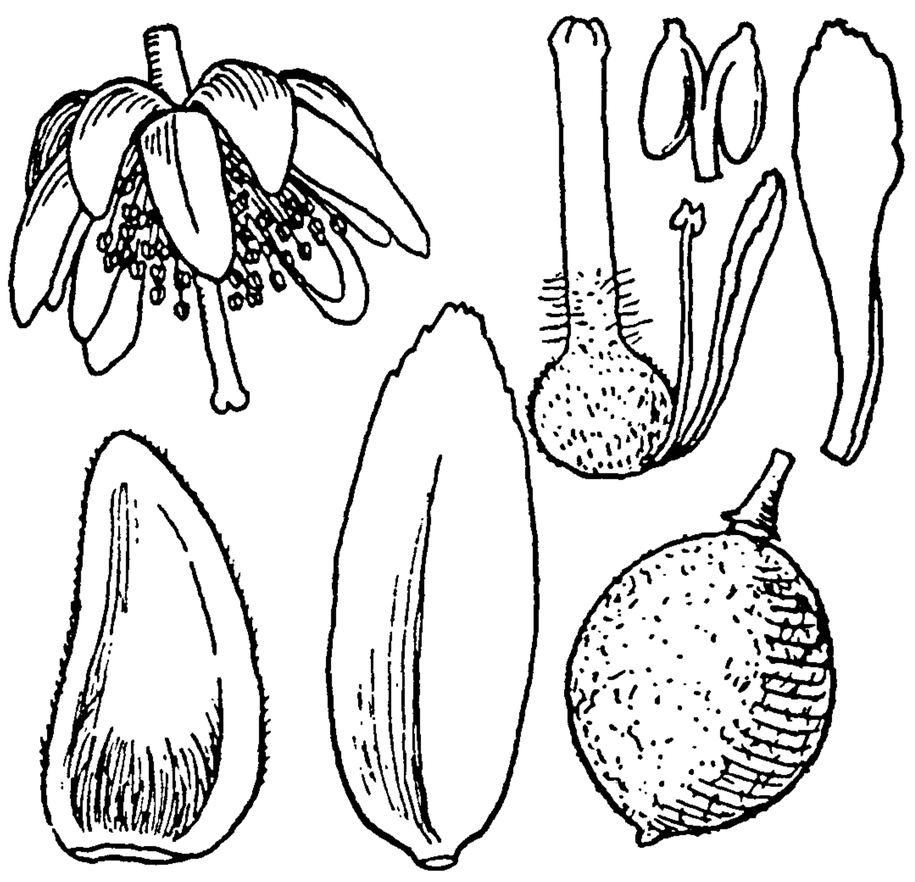
3. **TILIA** L.[1] Trees with roundish stoutish branchlets without terminal buds, the large acute axillary buds covered with numerous imbricate scales. Leaves deciduous: blades long-petioled, cordate, truncate, or cuneate at base, generally more or less oblique, mucronate-crenate: stipules caducous. Flowers in axillary or terminal cymes or corymbs, the peduncle more or less adnate to a reticulate bract. Sepals 5, distinct, alternate with the five white or yellow petals opposite each one of which in our species, stands a spatulate staminodium or petal-like scale. Stamens borne in clusters of five on the receptacle: filaments united at base and adnate to the staminodia, forked near apex, each branch bearing an extrorse anther-sac. Ovary sessile, 5-celled: stigmas 5. Fruit woody, nut-like, sometimes ribbed, 1-celled, 1- or 2-seeded, globose or subglobose.—About 65 species, in the Northern Hemisphere.—Spr.–early Sum.—BASSWOODS. LINDENS.—The wood is soft, light, pale, and straight-grained, and the inner bark is fibrous. The flowers are fragrant and yield fine honey, and are used medicinally. The European-lime, *Tilia europaea* L., without staminodia in the flowers, is often planted, and yields lime-flower oil used as a perfume. The leaves are variable in shape and pubescence, marked differences sometimes being found on the same tree. Leaves from suckers and new shoots are not so serviceable in identification as those on flowering branches.

Leaf-blades pubescent beneath at maturity.
- Hairs, when present, all stellate and closely appressed.
  - Leaf-blades with brown or rusty pubescence beneath.
    - Leaf-blades obliquely cordate at the base.
      - Bracts mostly gradually narrowed to a peduncle above the base. — 1. *T. neglecta.*
      - Bracts mostly abruptly narrowed to or nearly to the base of the peduncle. — 2. *T. caroliniana.*
    - Leaf-blades obliquely truncate at the base.
      - Bracts 1–1.5 cm. wide. — 3. *T. porracea.*
      - Bracts over 1.5 cm. wide. — 4. *T. georgiana.*
  - Leaf-blades with white, gray, or silvery-gray pubescence beneath. (Sometimes brown in No. 7).

[1] Contributed by Benjamin Franklin Bush.

Bracts mostly gradually narrowed to the peduncle above the base.
Sepals pubescent on the outside, with short, felt-like hairs. 5. *T. Michauxii.*
Sepals nearly glabrous outside, with few scale-like hairs. 6. *T. truncata.*
Bracts mostly abruptly narrowed to the base of the peduncle.
Leaf-blades gray or silvery-gray beneath. 7. *T. heterophylla.*
Leaf-blades white beneath. 8. *T. eburnea.*
Hairs on branchlets, peduncles, and pedicels long and spreading. 9. *T. lasioclada.*
Leaf-blades glabrous beneath at maturity.
Bracts more or less pubescent at anthesis.
Bract 0.5–2 cm. wide. 10. *T. littoralis.*
Bract 3–4 cm. wide. 11. *T. glabra.*
Bracts glabrous at anthesis.
Leaves not glaucous beneath: cymes loosely few-flowered. 12. *T. leucocarpa.*
Leaves glaucous beneath: cymes compactly many-flowered.
Bract 1.5–2 cm. wide: stmainodia erose. 13. *T. floridana.*
Bract 3–4 cm. wide: staminodia entire. 14. *T. australis.*

1. T. neglecta Spach. Tall tree, with deeply furrowed and scaly reddish-brown bark, often pendulous branches, and slender glabrous branchlets: leaf-blades thick, acute or abruptly acuminate, obliquely concave, or unsymmetrically cordate at base, coarsely mucronate-crenate, dark-green, smooth and lustrous above, covered below, except on the midrib and veins with a short persistent pubescence and with conspicuous axillary tufts, 10–15 cm. long, 8–12 cm. wide: flowers 5–15 together in long-branched glabrous cymes: peduncles slender, glabrous, the free portion 3–4 cm. long: bract narrow, long-attenuate to the base, rounded at the apex, glabrous, 7–11 cm. long, 2–4 cm. wide: sepals broadly ovate, ciliate, glabrous without, pilose with long white hairs within, half as long as the lanceolate petals. [*T. americana* Marsh. Not L.]—Rich moist ground, often in woods, various provinces, rarely Coastal Plain, N. C. to N Miss., N. Y., Que., and W Mass.



2. T. caroliniana Mill. Large tree, with slender reddish branches: leaf-blades ovate, 7–11 cm. long, abruptly long-pointed, oblique, truncate, or cordate at base, coarsely mucronate-crenate with broad gland-tipped teeth, coated below with a rusty or pale detaching stellate pubescence, at first hoary-tomentose, the upper surface glabrous, dark and lustrous at maturity: flowers 8–15 together in small, stout-branched, pubescent cymes: peduncle slender, pubescent, the free portion 2–3.3 cm. long: bract linear-elliptic, 10–12 cm. long, sessile or nearly so, becoming glabrous or glabrate: sepals ciliate, brown and pubescent without, bearing long white hairs within. [*T. pubescens* Ait. *T. apposita* Ashe *T. lata* Ashe]—Woods, Coastal Plain, Ga. to N. C.; also W La. to S W Ark., and rather generally in Tex. to the Edwards Plateau.

3. T. porracea Ashe. Tree: leaf-blades on flowering branches elliptic-ovate, 8–10 cm. long, taper-pointed, about twice as long as broad, cuneate at base or rounded on one side, mucronate-crenate with gland-tipped teeth, dull blue-green above, pale grayish-green below, the early appressed straight pubescence deciduous by flowering time, or a little easily detached fascicled pubescence remaining; corymbs 7–15 flowered, pubescent; peduncle slender, pubescent, the free portion 2–3.5 cm. long; bract linear-elliptic or lingulate, often falcate, finally glabrous, 4–8 cm. long, narrowed to the rounded sessile base: sepals

pubescent without, long silky within at the base, three-fourths as long as the elliptic, obtuse petals, not longer than the staminodia.—Hammocks, Okaloosa Co., Fla.

4. **T. georgiana** Sarg. Small tree, with the slender branchlets at first pale-pubescent and rusty, ultimately red-brown and glabrous: leaf-blades ovate, abruptly short-pointed, cordate, oblique, or truncate at base, coarsely mucronate-crenate, reddish and tomentose when unfolding, ultimately dark yellow-green and scabrate above and covered below with a thick pale or reddish tomentum, or glabrous in autumn, conspicuously reticulate-veined: flowers 10–15 together in pubescent compact corymbs: peduncle slender, densely pubescent, the free portion 2.5–4 cm. long: bract linear-elliptic to spatulate, pubescent or becoming nearly glabrous, 6.5–10 cm. long: sepals ovate, half as long as the lanceolate-acuminate petals.—Hammocks, Coastal Plain, C Fla. to S. C.

5. **T. Michauxii** Nutt. Tree similar to *T. heterophylla*, but the leaf-blades longer and narrower, generally abruptly acute and obliquely cordate, the vein-axils generally without axillary tufts: flowers in puberulent cymes; peduncle glabrescent, the free portion 3.5–5 cm. long: bract oblanceolate to spatulate, occasionally linear-elliptic, 9–12 cm. long: sepals pubescent and ciliate without, tomentose within: petals lanceolate.—Woods, various provinces, though rarely Coastal Plain or higher mountains, Ga. to Miss., Ark., Mo., S Ill., and S N. Y.

6. **T. truncata** Spach. Large tree, with stout glabrous branchlets, which are bright-red the first season and later brown, the bark of the trunk furrowed and scaly: leaf-blades ovate or ovate-elliptic, or triangular-ovate, abruptly acuminate, obliquely cordate at the base, deeply crenate-serrate, dark-green and lustrous above, hoary-tomentose below, 10–18 cm. long, 8–10 cm. wide: flowers 7–10, in glabrous cymes: peduncle glabrous, slender, the free portion 3.5–4 cm. long: bract elliptic, obtuse, glabrous, 5–7 cm. long: sepals ovate, pale-pubescent outside, silky inside, half as long as the lanceolate petals. [*T. cinerea* Raf. *T. monticola* Sarg.]—Wooded hills, Blue Ridge to Appalachian Plateau, N. C. to Tenn. and Va.

7. **T. heterophylla** Vent. Large tree, with slender, glabrous reddish or yellowish-brown branchlets: leaf-blades ovate, gradually narrowed to the acuminate apex, obliquely truncate or slightly cordate at base, pubescent above at unfolding but at maturity dark-green and glabrous above, with the lower surface covered with thick firmly attached pale (sometimes brown) tomentum, the vein-axils with rusty tufts, mucronate-crenate with gland-tipped teeth, 8–12 cm. long; flowers 10–12 together in pubescent more or less corymbs; peduncle glabrous, the free portion generally 3–4 cm. long, or sometimes less: bract linear-elliptic to oblanceolate or spatulate, unsymmetrically cuneate at base, finally glabrous, 10.5–15 cm. long: sepals pale-pubescent without, villous within: petals lanceolate. [*T. tenera* Ashe]—Wooded slopes, various provinces, though rarely Coastal Plain or higher Appalachians, N Fla. to S Ind. and W. Va.

8. **T. eburnea** Ashe. Tall tree, with dark gray-brown furrowed bark on the trunk and smooth silver-gray bark on the branches, the twigs stout, 5–6 mm. thick, soft, glabrous, occasionally sparingly glaucous, those of the first season bright-green, brown, or red-brown, becoming gray the second year, the buds large and glaucous: leaf-blades ovate or round-ovate, 8–14 cm. long, abruptly acuminate, obliquely cordate or truncate at the base, sharply mucronate-crenate, thick, dark-green and glabrous above, densely pubescent beneath with soft ivory-white hairs which are sometimes deciduous by autumn: bract linear-elliptic or spatulate, 10–20 cm. long, or occasionally shorter, glabrate above, often pubescent beneath, nearly sessile: ovary coarsely brown-pubescent.—Rich soil and cool glens, various provinces, N W Fla. to N. C., in Coastal Plain only in the former State.

9. T. lasioclada Sarg. Large tree, becoming 20 m. tall: leaf-blades thick, ovate, 10–15 cm. long, abruptly acuminate, finely mucronate-crenate with gland-tipped teeth, bright-green and lustrous above, covered below with a thick, pale-brown or rufous, easily detached stellate pubescence: petioles at first with long spreading hairs mixed with fascicled hairs: flowers mostly 10–15 together in small, branched cymes shorter than the bract, the branches with long spreading hairs, the free portion 2.5–3 cm. long; bract linear-elliptic to spatulate, abruptly tapering to a short peduncle: sepals acute, pubescent without, villose within, about one-third as long as the lanceolate acuminate petals, about the same length as the staminodia.—Rich soil, Coastal Plain and Piedmont, Fla. to S. C., so far as known only the Valleys of the Apalachicola and Savannah Rivers—Distinct from all other American species in its long and spreading hairs on the branchlets, veins of the leaves, and the peduncle and branches of the inflorescence.

10. T. littoralis Sarg. Tree, the branchlets slender, reddish or purplish and pale-pubescent the first season, becoming glabrous and light gray-grown: leaf-blades ovate, 8–12 cm. long, 8–10 cm. wide, abruptly short-pointed, unsymmetrically rounded on one side at base, and cuneate at the other, finely serrate, at first tomentose, soon glabrous and even glaucous beneath, pale yellow-green above, only the vein-axils bearing conspicuous rusty tufts: flowers 9–15 together in small compact pubescent cymes: peduncle somewhat pubescent, the free portion 2–2.5 cm. long: bract oblanceolate, 5–17.5 cm. long, glabrous but for the ciliate margins and pubescent midrib beneath: sepals pale-pubescent without, villose on the margins and with long white hairs within: petals acuminate.—Coast and Sea-Islands of Ga.

11. T. glabra Vent. Tall tree, with stout, red, ultimately glabrous branchlets: leaf-blades broadly ovate, 10–18 cm. long, 10–15 cm. wide, abruptly acuminate, cordate, obliquely-cordate, or truncate at base, coarsely serrate-crenate with gland-tipped teeth, at first coated with pale tomentum, soon glabrous, dark yellow-green above, pale beneath, the vein-axils without axillary tufts: flowers 10–15 together in broad, slender-branched, nearly glabrous cymes: peduncle stout, glabrous, red, the free portion 2.5–4 cm. long: bract elliptic to obovate, gradually narrowed to the base, 8–16 cm. long: sepals one-third shorter than the lanceolate petals. [*T. venulosa* Sarg. *T. fulva* Raf.]—Cool upland woods, Blue Ridge and Appalachian provinces, N. C. to Tenn., and E Ky.

12. T. leucocarpa Ashe. Small tree, with pale furrowed bark, narrow crown, and rather slender, glabrous, orange or red-brown branchlets: the winter-buds dull-red, ovoid: leaf-blades thin, variously ovate, 10–15 cm. long, 8–10 cm. wide, abruptly painted unsymmetrically cordate or truncate at base, coarsely mucronate-crenate with glandular teeth, on unfolding dark-red and sparsely pubescent, soon glabrous or with small axillary tufts in the vein-axils beneath, dark-green above, pale and lustrous beneath: flowers usually 10–12, or sometimes as many as 40 together in long-branched pubescent cymes: peduncle glabrous: bract linear-lingular, sometimes broadly-lingular, 8–10 cm. long, usually 1.5 cm. wide, or occasionally 2.5 cm. broad, nearly sessile: sepals acute, rusty-tomentose without, glabrous within. [*T. nuda* Sarg.]—Woods, Coastal Plain and adj. provinces, Ala. to E Tex., S E Okla., and S W Ark.—Closely similar to *T. americana* L., of the northern States, differing chiefly in its densely tomentose pedicels.

13. T. floridana Small. Small tree, with furrowed bark and slender red-brown or yellowish glabrous branchlets: leaf-blades broadly ovate, 6–12 cm. long, 5–10 cm. wide, acuminate at apex, truncate or cordate at the unsymmetrical base, or variously oblique, coarsely mucronate-crenate with rather large teeth, the mucro exceedingly long, reddish and tomentose in unfolding, but at maturity

dark and glabrous above, pale below, or sometimes with a silvery-white bloom, sometimes tufted in the vein-axils: cymes compact, few-flowered: peduncle pubescent, the free portion 2–4 cm. long, pedicels hoary-tomentose: bract linear-elliptic to nearly spatulate, often falcate, glabrous, 8–16 cm. long, mostly narrow: sepals hoary-tomentose without, two-thirds as long as the lanceolate petals. [*T. crenoserrata* Sarg. *T. alabamensis* Ashe]—Rich woods, various provinces, but not in the higher mountains, W Fla. to Tex., S E Okla., Ky., and W N. C. —(*Mex.*)

14. T. australis Small. Tree becoming 20 m. tall: leaf-blades relatively thin, ovate to oval-ovate, 7–17 cm. long, abruptly acuminate, crenate-mucronate with prominently gland-tipped teeth, deep-green above, glaucous beneath and essentially glabrous, cordate or nearly truncate at base: peduncle glabrous, the free portion 2–4 cm. long; bract lingulate, relatively large, often 4 cm. broad, peduncled, glaucous and glabrous beneath: sepals about three-fifths as long as the petals: staminodia linear-spatulate.—Wooded hillsides, Blue Ridge to Appalachian provinces, Ala. to N. C.

Family 2. **MALVACEAE** — Mallow Family

Herbs, shrubs, or trees. Leaves alternate: blades simple, palmately veined. Flowers perfect. Calyx of 5 more or less united valvate sepals. Corolla of 5 convolute petals. Androecium of numerous monadelphous stamens. Gynoecium of several united, often whorled, carpels. Fruit capsular or sometimes baccate.—About 45 genera and 900 species, widely distributed.

Fruit of several radially disposed carpels which separate from each other at maturity.
  Carpels as many as there are stigmas: staminal-column anther-bearing at the summit.
    Stigmas short, capitate or truncate. — Tribe I. Sideae.
    Stigmas elongate, usually filiform, introrse. — Tribe II. Malveae.
  Carpels one half as many as there are stigmas: staminal-column anther-bearing on the upper part, but not at the lobed or truncate summit. — Tribe III. Ureneae.
Fruit a loculicidal capsule or rarely indehiscent. — Tribe IV. Hibisceae.

I. Sideae

Seeds 2–several in each carpel.
  Involucel wanting.
    Carpels leathery or parchment-like, not bladdery. — 1. Abutilon.
    Carpels membranous, bladdery. — 2. Gayoides.
  Involucel of 3 bractlets. — 3. Modiola.
Seeds solitary in each carpel.
  Involucel of 2 or 3 bractlets. — 4. Malvastrum.
  Involucel wanting. — 5. Sida.

II. Malveae

Petals notched at the apex: carpels beakless, without internal processes. — 6. Malva.
Petals erose at the apex: carpels beaked, with an internal process above the seed. — 7. Callirrhoe.

III. Ureneae

Carpels dry, achene-like.
  Involucel wanting: inflorescence capitate. — 8. Malachra.
  Involucel of several bractlets: inflorescence axillary or racemose.
    Involucel of 5 partially united bractlets: carpels spiny all over. — 9. Urena.
    Involucel of 5–15 distinct bractlets: carpels unarmed or with 1–3 spines on the back.
      Mature carpels spine-armed. — 10. Pavonia.
      Mature carpels spineless, sometimes cuspidate. — 11. Malache.
Carpels forming a drupe-like berry, but separating at maturity. — 12. Malvaviscus.

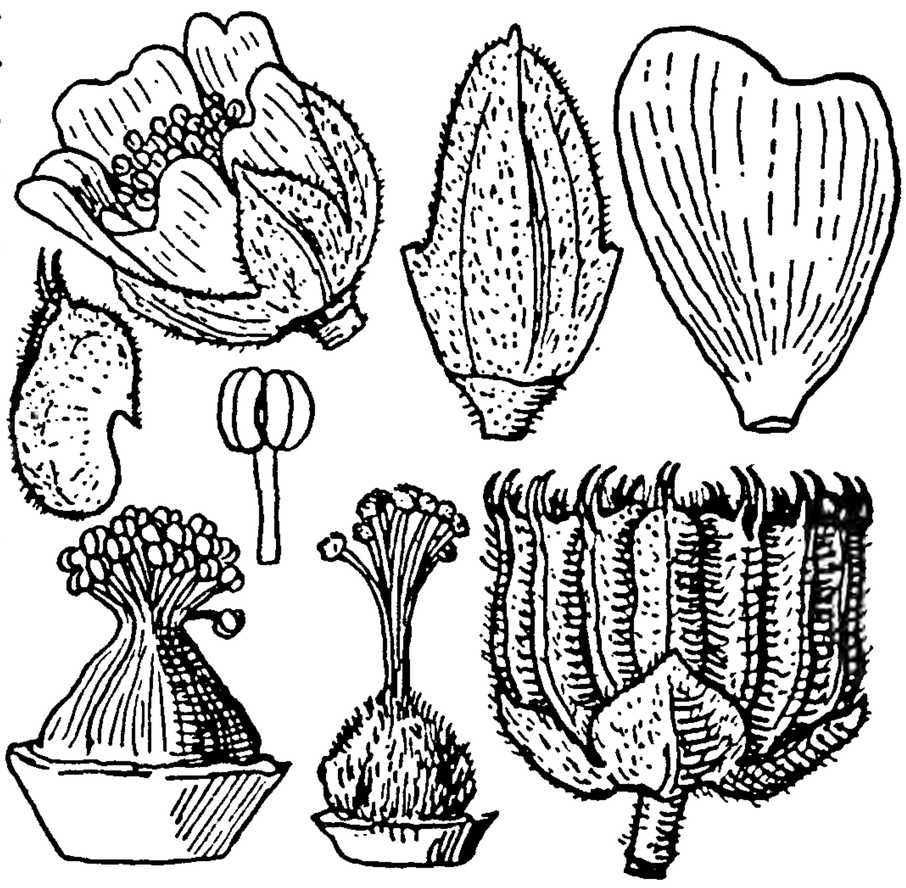
IV. HIBISCEAE

Styles distinct, spreading: seeds usually reniform.
  Capsule as long as broad or much longer, the cavities 2–many-seeded.
    Bractlets of the involucel distinct.
      Calyx not bladdery, surrounding the base of the capsule, persistent or deciduous.
        Calyx cup-like, persistent, nearly equally 5-lobed. — 13. HIBISCUS.
        Calyx spathe-like, split on one side and deciduous about the base. — 14. ABELMOSCHUS.
      Calyx bladdery-inflated, scarious and conspicuously veined. — 15. TRIONUM.
    Bractlets of the involucel united into a lobed cup. — 16. PARITI.
  Capsule much depressed, the cavities 1-seeded. — 17. KOSTELETZKYA.
Styles united: seed not reniform.
  Bractlets of the involucels entire, rather inconspicuous.
    Sepals wholly united or nearly so: capsule indehiscent. — 18. THESPESIA.
    Sepals merely united at the base: capsule loculicidal. — 19. CIENFUEGOSIA.
  Bractlets of the involucels laciniate, conspicuous. — 20. GOSSYPIUM.

1. ABUTILON [Tourn.] Mill. Herbs, shrubs, or rarely trees. Leaf-blades entire, toothed, or lobed. Involucel wanting. Sepals 5, united below. Petals 5, often yellow. Carpels 5–30, beaked at maturity.—About 100 species, mostly in tropical regions.—INDIAN-MALLOWS.—The bark yields a fiber. The plants, especially the flowers, are mucilaginous.

Carpels 11 or more: fruit hirsute at the top: mature carpels short-beaked or merely mucronate.
  Plant annual: petals yellow. — 1. *A. Abutilon.*
  Plant perennial: petals pink, salmon-pink, or red, or yellow above a purple base.
    Petals yellow above a purple base: mature carpels less than 15 mm. long: seed merely minutely stellate. — 2. *A. hirtum.*
    Petals pink, salmon-pink or red: carpels mostly over 15 mm. long; seed hirsute. — 3. *A. pauciflorum.*
Carpels 10 or fewer: fruit finely pubescent or puberulent at the top: mature carpels slender-beaked. — 4. *A. permolle.*

1. A. Abutilon (L.) Rusby. Stem 3–18 dm. tall, velvety-pubescent: leaf-blades suborbicular to ovate or reniform-orbicular, 9–30 cm. long: calyx-lobes abruptly pointed: petals yellow, 10–15 mm. long: carpels 15–20 mm. long. [*A. Avicennae* Gaertn.] — (INDIAN-HEMP. VELVET-LEAF.)—Roadsides, cult. grounds, and waste-places, various provinces, Fla. to Tex., S. D., and Me. Nat. of Asia.—(*W. I.*)



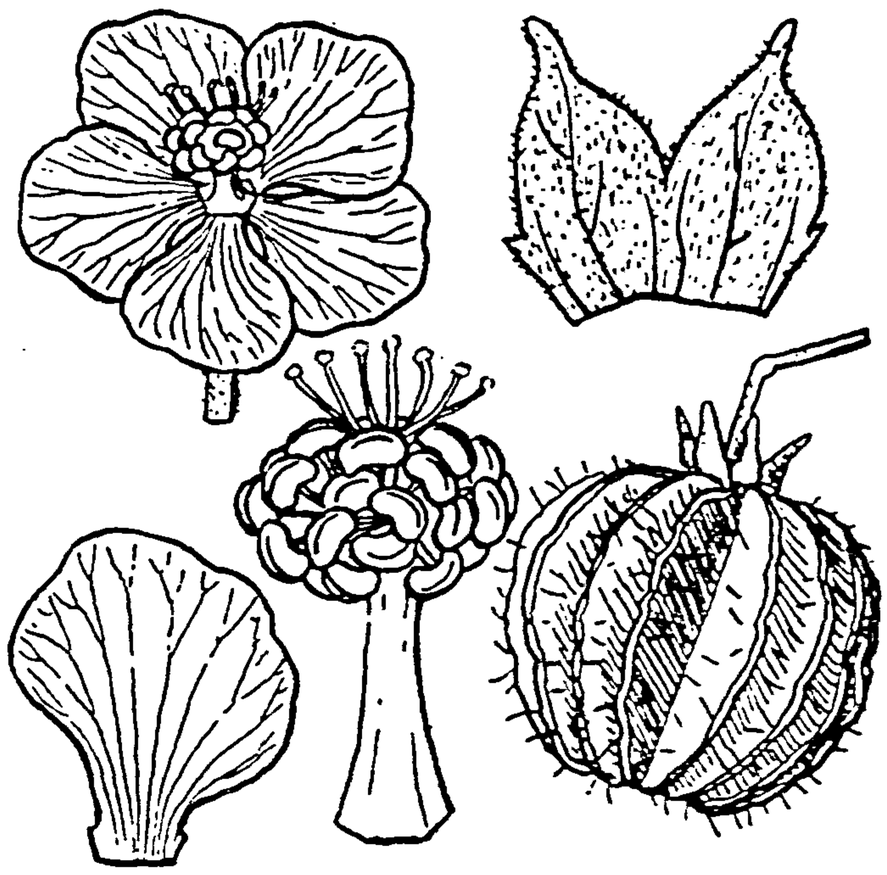
2. A. hirtum Sweet. Stem 1–3.5 dm. tall, velvety-canescent, and somewhat villous-hirsute: leaf-blades ovate to suborbicular, 2–15 cm. long: calyx-lobes acute or acuminate: petals 15–20 mm. long: carpels 8–10 mm. long. Coastal sands, pen. Fla. and the Keys.—(*W. I., E. I.*)—All year.

3. A. pauciflorum St. Hil. Stem 9–40 dm. tall, hirsute: leaf-blades ovate to suborbicular, 5–8 cm. long: calyx-lobes acuminate: petals 20–25 mm. long: carpels 15–17 mm. long. [*A. pedunculare* H.B.K.]—Roadsides, pinelands, and waste-places, pen. Fla. and the Keys.—(*W. I., S. A.*)—All year.

4. A. permolle (Willd.) Sweet. Stem 5–16 dm. tall, velvety-tomentose: leaf-blades ovate, 2.5–10 cm. long: petals yellow, 10–15 mm. long: carpels

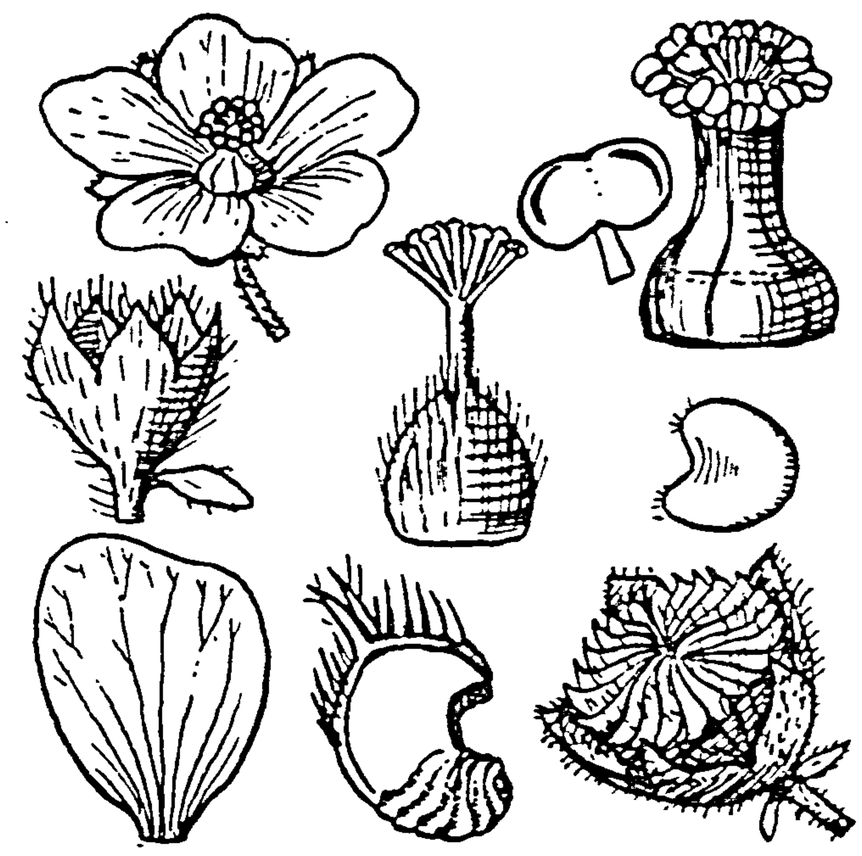
11–12 mm. long.—(INDIAN-MALLOW.)—Coastal hammocks, cult. grounds, and roadsides, pen. Fla. and the Keys.—(*W. I.*)—All year.

2. **GAYOIDES** Small. Herbs, sometimes vine-like. Leaf-blades commonly toothed. Involucel wanting. Sepals 5, united below. Petals 5, usually yellow. Carpels numerous, beakless at maturity.—One species.



1. **G. crispum** (L.) Small. Stem and branches 3–9 dm. long: leaf-blades ovate, 1–5 cm. long, mostly acute or rather obtuse: calyx-lobes rather abruptly pointed: mature carpels angled at the summit.—Pinelands, hammocks, waste-places, and cult. grounds, Coastal Plain, Fla. and southwestern provinces, Tex. to Ariz.—(*W. I., Mex., C. A., S. A.*)—All year.—*G. imberbe* (Fl. SE. U. S.) has merely velvety pubescent foliage. It seems otherwise to be the same as *G. crispum* and occupies the same geographic range.

3. **MODIOLA** Moench. Herbs. Leaf-blades palmately lobed or divided. Involucel present. Sepals 5, united below. Petals 5, entire. Carpels many, transversely 2-celled, beaked at maturity, the faces smooth or merely wrinkled.—One species.

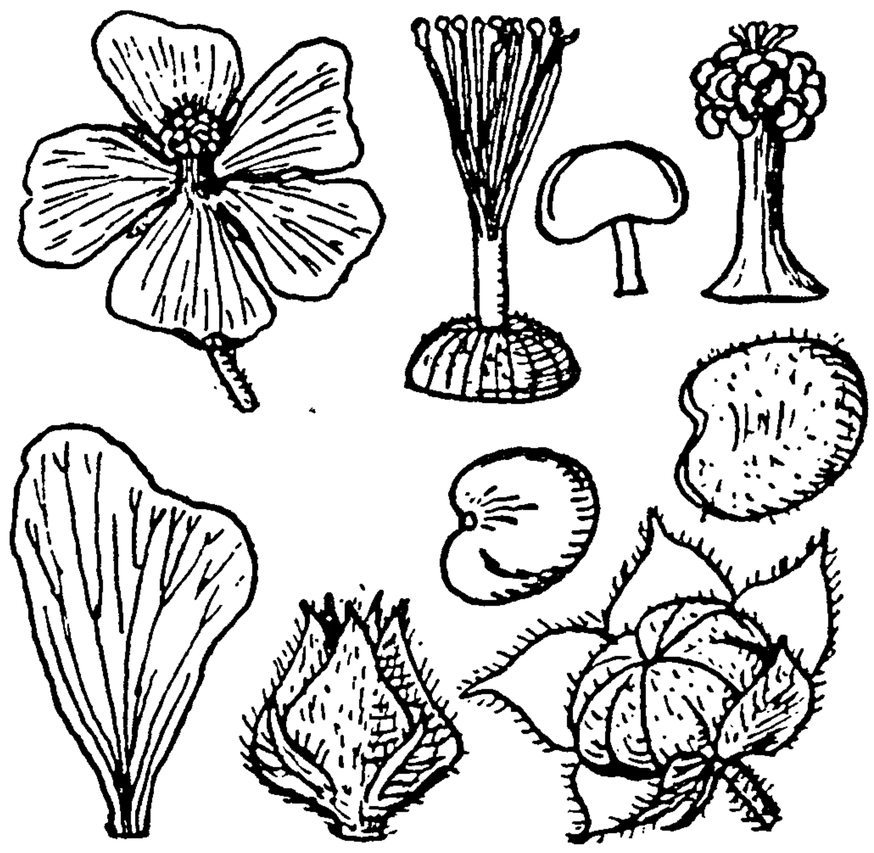


1. **M. caroliniana** (L.) G. Don. Branches spreading or prostrate, 1–7 dm. long: leaf-blades 2–6 cm. long, with coarsely serrate or incised lobes: calyx-lobes ovate or ovate-lanceolate: petals scarlet, obovate or oval-obovate, 6–10 mm. long: head of fruit depressed. [*M. multifida* Moench.]—Low grounds, waste-places, and roadsides, Coastal Plain and occasionally adj. provinces, Fla. to Tex. and Va.—(*W. I., Mex., C. A., S. A.*)—Sum.—The petals are sometimes orange.

4. **MALVASTRUM** A. Gray. Herbs or partly woody plants. Leaf-blades entire, lobed, or parted. Involucel of distinct bractlets, or wanting. Sepals 5, partially united. Petals 5, variously colored. Carpels 5 or more, 1-celled, beaked or beakless.—About 75 sepecies, American and African.—FALSE-MALLOWS.

Plant annual:	1. *M. angustum.*
Plant perennial:	
Flowers solitary in the axils or in terminal interrupted spikes or spike-like racemes: stem strigose.	
Mature carpels beakless, sometimes with a mere protuberance behind the apex.	2. *M. corchorifolium.*
Mature carpels with a subulate beak behind the apex.	3. *M. coromandelianum.*
Flowers in congested terminal and axillary spikes: stem hirsute.	4. *M. spicatum.*

1. **M. angustum** A. Gray. Stem 1–3 dm. tall; leaf-blades elliptic-lanceolate to linear-elliptic, 2–4 cm. long, remotely serrate: calyx-lobes broadly triangular: petals yellow, about equalling the calyx-lobes: carpels 5 or 6, pubescent.—(YELLOW FALSE-MALLOW.)—Dry soil and rocky hills, various provinces, rarely Coastal Plain, Ala. to Kans., Ia., and Tenn.—Sum.



2. **M. corchorifolium** (Desr.) Britton. Stem 3–9 dm. tall; leaf-blades ovate to elliptic-lanceolate, 2–6 cm. long, coarsely serrate: calyx-lobes triangular-ovate, acuminate: petals orange-yellow: carpels hispidulous. [*M. Rugelii* S. Wats.]—Hammocks, waste-places, and cult. grounds, pen. Fla. and the Keys.—(*W. I.*)

3. **M. coromandelianum** (L.) Garcke. Stem 3–9 dm. tall: leaf-blades orbicular-ovate to elliptic-ovate, 2–8 cm. long, sharply serrate: calyx-lobes triangular-ovate: petals light-yellow: carpels hirsute on top. [*M. americanum* (L.) Torr.]—Hammocks, roadsides, cult. grounds and waste-places, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A., O. W.*)

4. **M. spicatum** (L.) A. Gray. Stem 3–9 dm. tall: leaf-blades ovate to deltoid-ovate, 3–8 cm. long, crenate-serrate, or sometimes slightly lobed: calyx densely pubescent; lobes triangular-lanceolate, 3–4 mm. long: petals orange, 8–11 mm. long: carpels 3 mm. long, the tip inflexed.—Sandy soil, Coastal Plain, Fla. and Tex.

5. **SIDA L.** Herbs or partially woody plants. Leaf-blades usually toothed. Involucel usually wanting. Sepals 5, partially united. Petals 5, pale, often yellow. Carpels 5 to many, 1-celled, commonly singly or doubly beaked.—About 100 species, widely distributed.—The bark of some species yields a strong fiber.

Leaf-blades palmately lobed: corolla white: calyx terete at the base.—Subgenus PSEUDO-NAPAEA. — I. HERMAPHRODITAE.
Leaf-blades merely toothed: corolla colored: calyx angled.—Subgenus MALVINDA.
  Flowers or flower-clusters in leafy involucres at the ends of the branches. — II. CILIARES.
  Flowers or flower-clusters axillary or sometimes in terminal panicles. — III. SPINOSAE.

I. HERMAPHRODITAE

Tall perennial: lobes of the leaf-blades toothed. — 1. *S. hermaphrodita.*

II. CILIARES

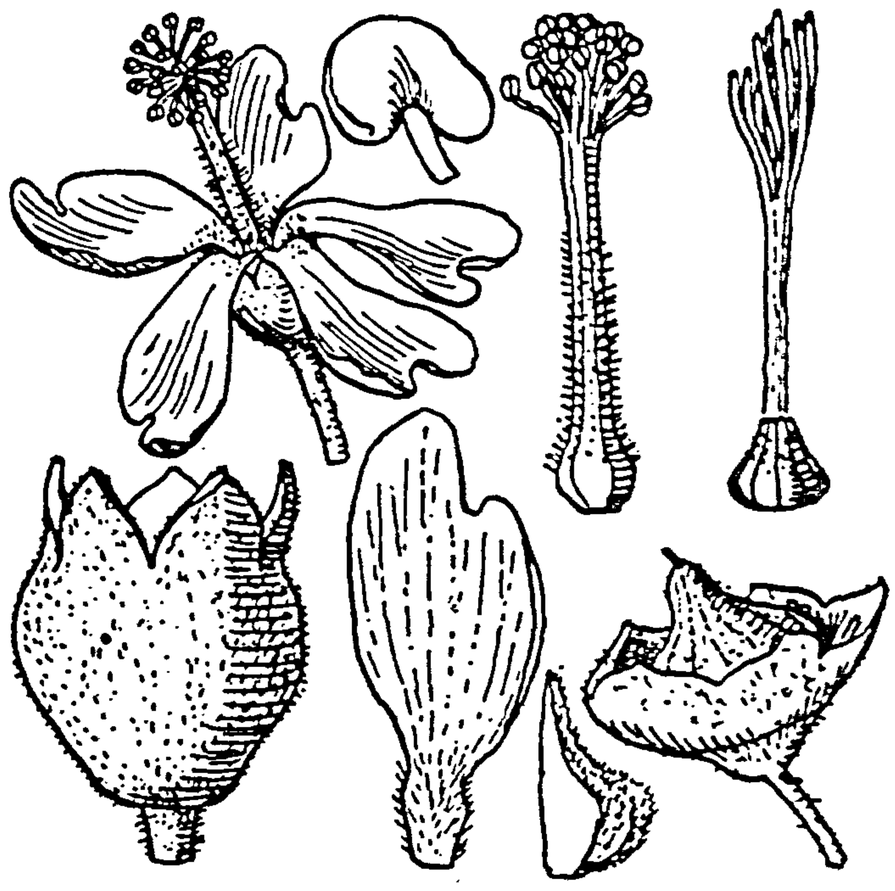
Diffuse perennial, somewhat resembling a *Stylosanthes* in habit: flower-clusters leafy-involucrate. — 2. *S. ciliaris.*

III. SPINOSAE

Stems or branches decumbent or prostrate. — 3. *S. procumbens.*
Stems erect or ascending.
  Leaf-blades cordate. — 4. *S. cordifolia.*
  Leaf-blades acute, rounded, or truncate at the base.
    Leaf-blades ovate to cuneate or lanceolate.
      Mature carpels with 1 tooth each: peduncles, at least those arising from the stem, much longer than the pedicels. — 5. *S. rhombifolia.*
      Mature carpels with 2 teeth each: peduncles shorter than the pedicels or only slightly longer.

Stem-leaves with petioles less than 1 cm. long. 6. *S. carpinifolia.*
Stem-leaves with petioles over 1 cm. long. 7. *S. spinosa.*
Leaf-blades linear or linear-elliptic.
Leaf-blades and calyx with red margins.
Leaf-blades of a narrowly linear type: mature carpels 4–5 mm. high. 8. *S. Elliottii.*
Leaf-blades broader: mature carpels 3–4 mm. high. 9. *S. rubromarginata.*
Leaf-blades and calyx with green margins, not discolored. 10. *S. leptophylla.*

1. **S. hermaphrodita** (L.) Rusby. Plant erect, 9–40 dm. tall: leaf-blades palmately 3–7-lobed: calyx-lobes triangular: petals white: mature carpels 6–7 mm. long. [*S. Napaea* Cav.]—(VIRGINIA-MALLOW.)—River-banks and rocky slopes, various provinces N of Coastal Plain, Tenn. to Ohio, Pa., and Va.—Sum.



2. **S. ciliaris** L. Plant with diffuse branches 1–3 dm. long; leaf-blades elliptic to cuneate, 1–4 cm. long, serrate: calyx-lobes triangular: petals reddish-purple: mature carpels 5–8, 2–2.5 mm. long.—Hammocks and open places, Florida Keys and S Tex.—(*W. I., Mex., C. A., S. A.*)—All year.

3. **S. procumbens** Sw. Plant with tomentose branches, 1–6 dm. long: leaf-blades suborbicular to ovate, 1–2.5 cm. long, crenate: calyx-lobes deltoid-acuminate: petals yellow, 4–6 mm. long: mature carpels often 5, about 2 mm. long, puberulent. [*S. supina* L'Her.]—Hammocks and waste-places, Florida Keys.—(*W. I., Mex., C. A., S. A.*)—All year.

4. **S. cordifolia** L. Plant 6–15 dm. tall, the stem and branches velvety-tomentose: leaf-blades ovate or suborbicular, 4–10 cm. long, irregularly crenate: calyx-lobes triangular: petals tawny-yellow, 5–7 mm. long: mature carpels often 10–12, about 3 mm. long, retrorse-pubescent.—Pinelands, hammocks, waste-places, and roadsides, pen. Fla. and the Keys; also Gulf seaports.—Nat. of trop. Am. (*W. I., Mex., C. A., S. A.*)—All year.

5. **S. rhombifolia** L. Plant 5–12 dm. tall, the branches puberulent or glabrate: leaf-blades rhombic, elliptic-obovate, or oblanceolate, 1.5–8 cm. long, serrate: calyx-lobes triangular: petals pale-yellow or sometimes red-blotched at the base: mature carpels 10–12, about 5 mm. long.—Roadsides and waste-places, Coastal Plain, Fla. to Tex. and N. C.—Spr.–fall or all year S.

6. **S. carpinifolia** L. f. Plant 3–9 dm. tall, the branches puberulent or glabrate: leaf-blades lanceolate, oblong-ovate, or ovate, 2–10 cm. long, irregularly serrate: calyx-lobes triangular: petals yellow to white: mature carpels 8–10, about 4 mm. long.—Pinelands, hammocks, and cult. grounds, Coastal Plain, Fla.—Spr.–fall or all year S.

7. **S. spinosa** L. Plant 1–6 dm. tall, pubescent: leaf-blades elliptic to ovate or ovate-lanceolate to linear-lanceolate, 1–5 cm. long, serrate: calyx-lobes triangular: corolla pale-yellow or orange: mature carpels about 5, 4 mm. long.—(INDIAN-MALLOW. FALSE-MALLOW. PRICKLY-SIDA.)—Roadsides, cult. grounds,

and waste-places, various provinces, Fla. to Tex., Ia., and Me.—Nat. of trop. Am.—(*W. I., Mex., C. A., S. A.*)—Sum.

8. S. Elliottii T. & G. Plant 3–5 dm. tall or sometimes depressed: leaf-blades linear or nearly so, 2–7 cm. long, serrate: calyx-lobes triangular: petals deep-yellow: mature carpels 8–12, 4–5 mm. long, rugose-reticulated on the back.—Pinelands and edges of hammocks, Coastal Plain, Fla. to Miss., Mo., and Va.—Sum.

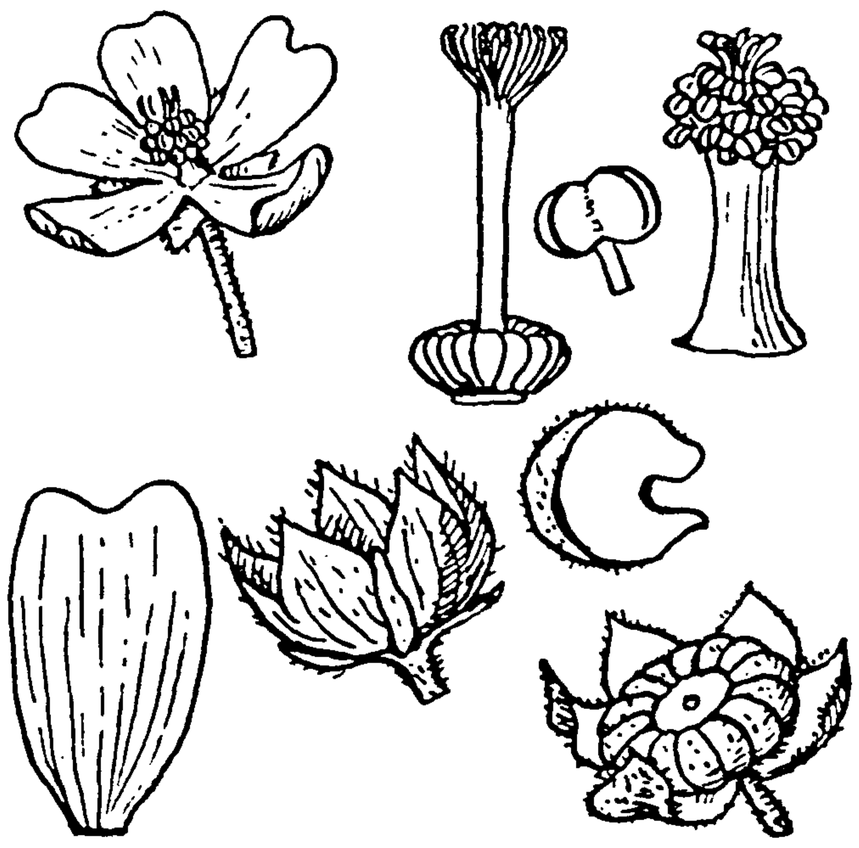
9. S. rubromarginata Nash. Plant 5–10 dm. tall: leaf-blades varying from narrowly obovate to elliptic or oblong-lanceolate, 1.5–5.5 cm. long, serrate: calyx-lobes triangular: petals light-orange: mature carpels 8–10, 3–4 mm. long, rugose-pitted on the back.—Sandy pinelands, Fla.—Spr.–fall.

10. S. leptophylla Small. Plant 9–13 dm. tall, thinly pubescent: leaf-blades linear to linear-elliptic, 2–10 cm. long, sharply serrate: calyx-lobes triangular: petals light orange: mature carpels about 4 mm. long.—Sandy soil, Coastal Plain, Ga. to La.—Spr.–fall.

6. **MALVA** [Tourn.] L. Herbs. Leaf-blades lobed or dissected. Involucel of usually 3 bractlets. Sepals 5, partially united. Petals 5, sometimes eroded. Carpels many, 1-celled, beakless, the faces radially striate or ribbed at maturity.—About 30 species, natives of the Old World.—MALLOWS.—The leaves and flowers of some species are mucilaginous and are used medicinally.

Corolla less than 2 cm. broad: bractlets linear to lanceolate.
  Branches procumbent: carpels finely pubescent and smooth on the back. 1. *M. rotundifolia.*
  Branches erect or ascending: carpels glabrous and reticulated on the back. 2. *M. parviflora.*
Corolla over 2 cm. broad: bractlets elliptic to ovate-lanceolate. 3. *M. sylvestris.*

1. M. rotundifolia L. Plant depressed: leaf-blades obscurely lobed, crenate-dentate; calyx-lobes ovate to triangular-ovate: petals light-blue, pink, or white, 9–14 mm. long: carpels 1.5–2 mm. long.—(CHEESES. LOW-MALLOW.)—Cult. grounds, waste-places, and roadsides, various provinces, throughout U. S. and S Can. Nat. of Eu.—Spr.–sum.



2. M. parviflora L. Plant erect or ascending: leaf-blades angularly or obtusely lobed and crenate: calyx-lobes triangular: petals white or purple-tinged, 3.5–7 mm. long: carpels 2–2.5 mm. long.—Waste-places, various provinces, Fla. to Tex., Calif., and B. C. Nat. of Eu.—(*Mex.*)—Sum.

3. M. sylvestris L. Plant 3–4 dm. tall: leaf-blades prominently lobed and crenate-dentate: calyx-lobes triangular or nearly so: petals light-purple to reddish-purple, 2–2.5 cm. long: carpels obovate, 3 mm. long.—(HIGH-MALLOW.)—Fields, waste-places, and about gardens, local in various provinces, U. S. and S Can. Nat. of Eu.—(*Mex.*)—Sum.

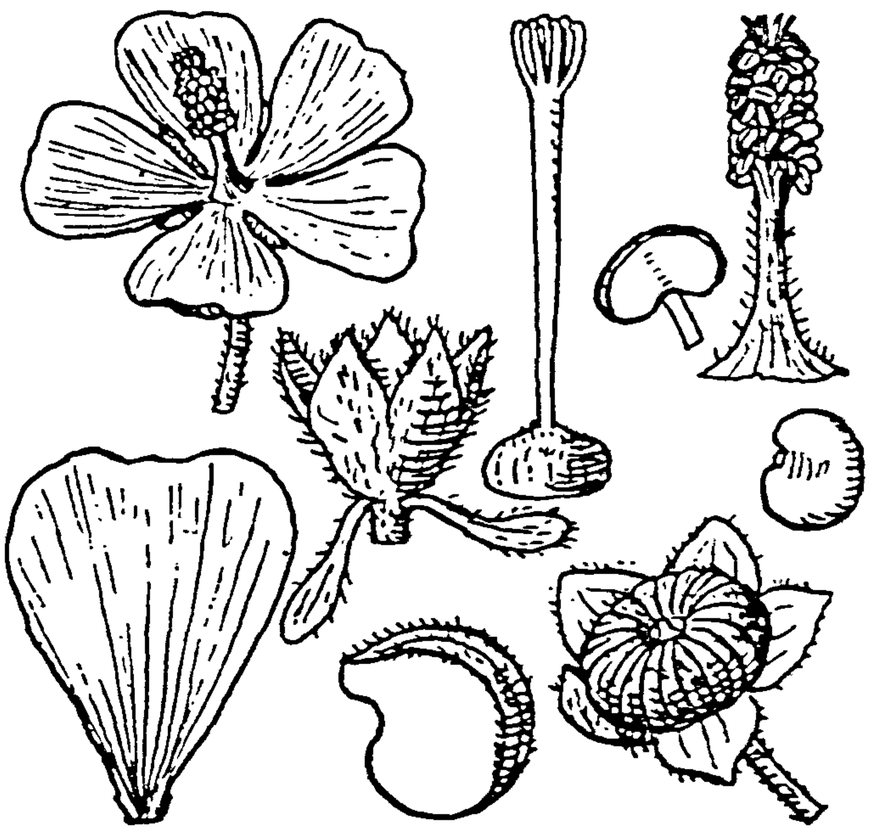
7. **CALLIRRHOË** Nutt. Herbs, resembling species of *Malva*. Leaf-blades lobed, cleft, or dissected. Involucel of distinct bractlets, or wanting.

Sepals 5, united below. Petals 5, sometimes erose-fimbriate. Carpels 10–20, 1-celled, more or less beaked, the faces smooth or reticulate at maturity.—About 8 species, North American.—POPPY-MALLOWS.

Peduncles several-flowered.	1. *C. triangularis.*
Peduncles 1-flowered.	
Involucels present.	2. *C. Papaver.*
Involucels wanting.	3. *C. alceoides.*

1. C. triangulata (Leavenw.) A. Gray. Stem 3–9 dm. tall, rough-pubescent: leaf-blades triangular-ovate to triangular-hastate, 3–1.5 cm. long, those of the lower ones crenate or lobed: calyx-lobes deltoid-ovate: petals deep-purple, 2–2.5 cm. long: carpels 3.5–4 mm. long.—(CLUSTERED POPPY-MALLOW.)—Dry woods, various provinces, rarely Coastal Plain, Ala. to Tex., Minn., Ill., and N. C.—Spr.–sum.

2. C. Papaver (Cass.) A. Gray. Stem with decumbent branches 2–7 dm. long, strigillose or glabrate: leaf-blades 3–5-lobed or 3–5-parted: calyx-lobes lanceolate to elliptic-lanceolate, 1–1.5 cm. long: petals red-purple, 2–4.5 cm. long: carpels 3 mm. long.—Sandy woods, Coastal Plain, Fla. to Tex. and Ga.—Spr.–sum.

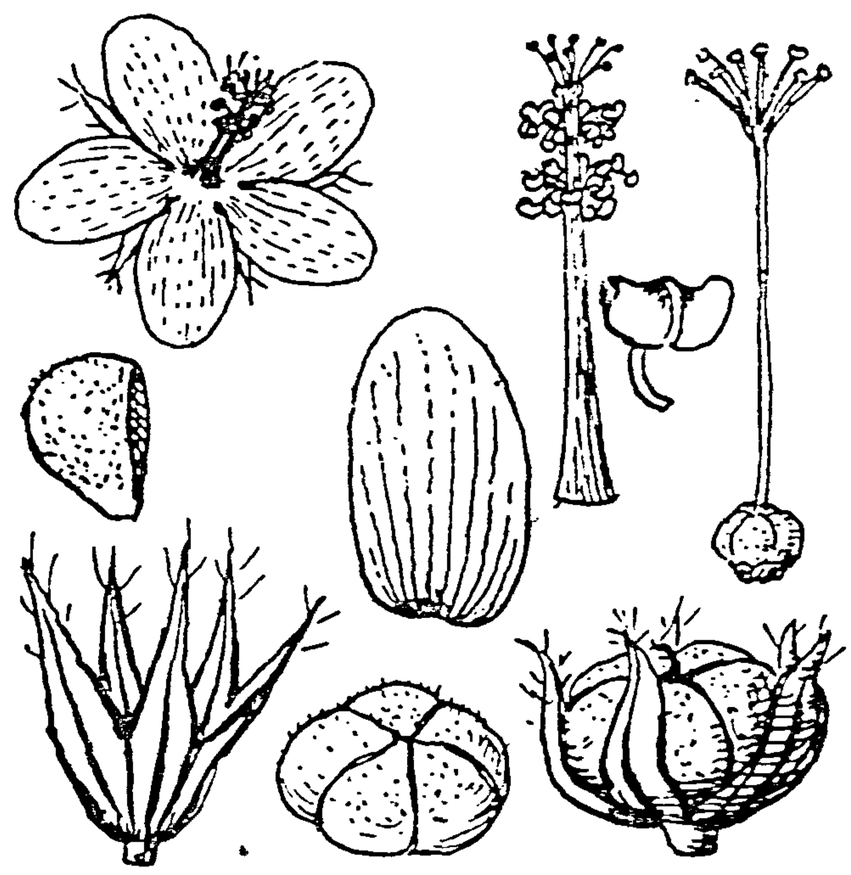


3. C. alceoides (Michx.) A. Gray. Stem with strigillose branches 2–5 dm tall: leaf-blades palmately lobed or incised: calyx-lobes triangular or triangular-lanceolate, less than 1 cm. long: petals pink or rose, 1–1.5 cm. long: carpels 4 mm. long.—Dry soil, various provinces, Ala. to Tex., Nebr., and Ky.—Spr.–sum.

8. MALACHRA L. Herbs or woody plants, sometimes with stinging hairs. Leaf-blades lobed. Involucel wanting. Sepals 5, partially united. Petals 5, broad. Carpels 5, 1-celled, beakless, the faces reticulate-veiny.—About 6 species, tropical American.

Bracts acuminate: calyx-lobes acuminate, with rather weak hairs.	1. *M. urens.*
Bract acute: calyx-lobes setaceous-tipped, with stout hairs.	2. *M. alceifolia.*

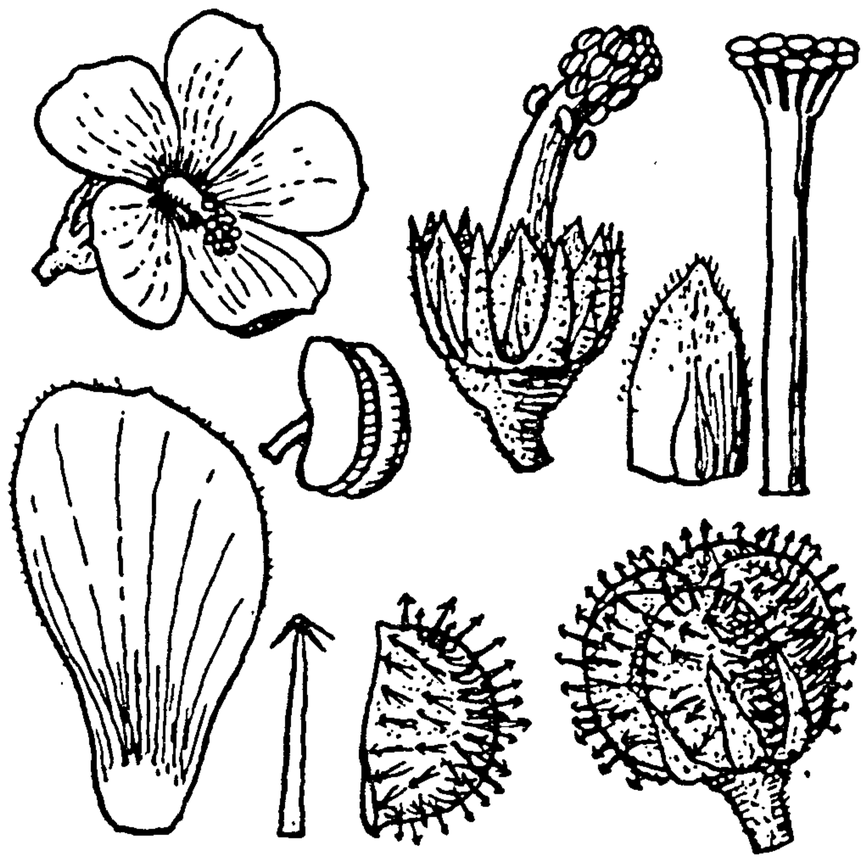
1. M. urens Poit. Stem 2–6 dm. tall, more or less branched and spreading, finely pubescent in lines and with coarse simple or branched hairs: leaf-blades ovate to lanceolate, sometimes slightly 3-lobed, 3–10 cm. long, rather coarsely dentate or dentate-crenate: flower-clusters sessile or nearly so: calyx-lobes with acuminate tips: petals 6–12 mm. long, light-yellow, orange, or red, usually sparingly pubescent: carpels about 3 mm. long: seed nearly as wide as long.—Roadsides, cult. grounds, and waste-places, S pen. Fla. and the Keys.—(*W. I.*)—All year.



2. M. alceifolia Jacq. Stem mostly 3–10 dm. tall or diffusely branched and spreading. finely soft-pubescent all over and with stiff forking hairs: leaf-blades suborbicular to ovate, sometimes 3-lobed, 3–15 cm. long,

rather finely dentate or crenate; flower-clusters manifestly short-peduncled: calyx-lobes with setaceous tips as long as the body or longer: petals 11–16 mm. long, bright-yellow, pubescent without and ciliate: carpels about 4 mm. long: seed much longer than wide.—Waste-places, roadsides, and pinelands, S pen. Fla.—(*W. I., Mex., C. A., S. A.*)—All year.

9. **URENA** [Dill.] L. Shrubs or partly woody herbs. Leaf-blades angled or lobed. Involucel present. Sepals 5, united below, and often partially adnate to the bractlets. Petals 5, yellow, pink, or purplish. Carpels 5, or rarely more, 1-celled, indehiscent, usually bristly with barbed spines.—Three species, tropical.

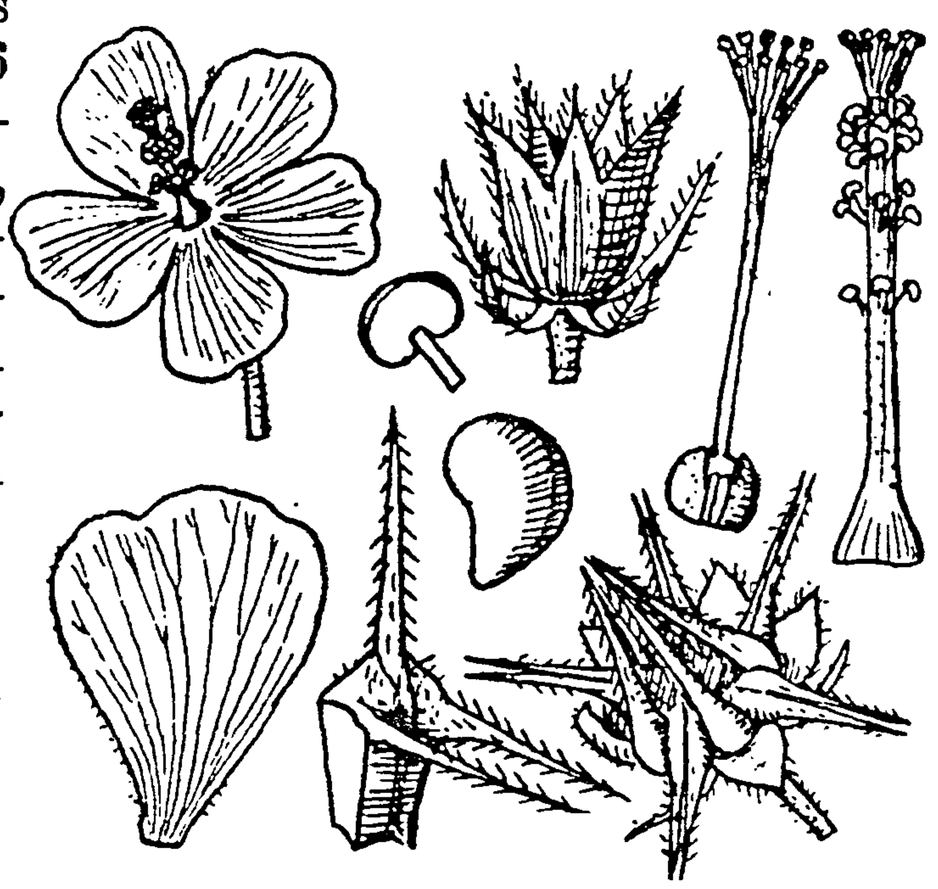


1. **U. lobata** L. Stem mostly 1–2 m. tall, tomentose: leaf-blades suborbicular to oval, shallowly lobed and serrulate: bractlets linear-lanceolate, 3–5 mm. long: calyx about as long as the involucel: petals pink or rose, about 2 cm. long: carpels 4–5 mm. in diameter.—Hammocks, waste-places, and roadsides, Fla. Nat. of E. I.—(*W. I., Mex., C. A., S. A.*)—The bark yields a fiber; the flowers are used medicinally.

10. **PAVONIA** Cav. Shrubs or woody herbs. Leaf-blades angled or lobed. Involucel present. Sepals 5, partially united. Petals 5, often showy. Carpels 5, 1-celled, spine-armed.—About 60 species, mostly tropical.

Carpels 3-awned, the awns barbed: leaf-blades of an ovate type: calyx-lobes lanceolate to ovate-lanceolate. 1. *P. spinifex.*
Carpels awnless and pointless: leaf-blades of a hastate type: calyx-lobes broadly ovate. 2. *P. hastata.*

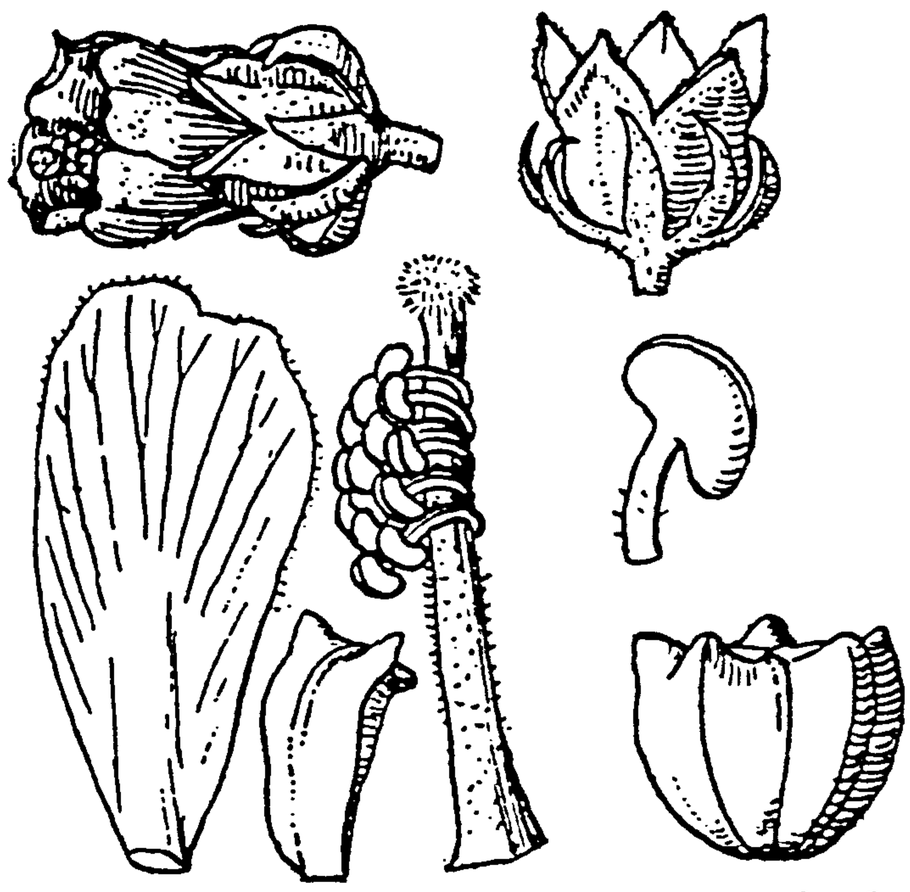
1. **P. spinifex** (L.) Cav. Shrub 1–3 m. tall, hirsute and strigillose: leaf-blades ovate to elliptic-ovate, 5–10 cm. long: bractlets linear to lanceolate: calyx-lobes lanceolate to ovate-lanceolate: petals yellow, 2.5 cm. long: mature carpels 5–6 mm. long, the spines slender-subulate.—Sandy woods, hammocks, and shell-mounds, Coastal Plain, Fla. to S. C.—Spr.–sum.—Formerly this mallow was thought to be confined to the coastal regions in Florida, and suspected as being an introduction. However, in recent years it has been found in the wildest hammocks of the interior.



2. **P. hastata** Cav. Plant 9–20 dm. tall, roughish-canescent: leaf-blades of a hastate type, 2–5 cm. long: bractlets ovate to obovate, 4–5 mm. long: petals 15–25 mm. long, mainly pale red: carpels 4 mm. long. [*P. LeContei* T. & G.]—Sandy soil, Coastal Plain, Ga. Nat. of S. A.—(*W. I.*)—Spr.–fall.

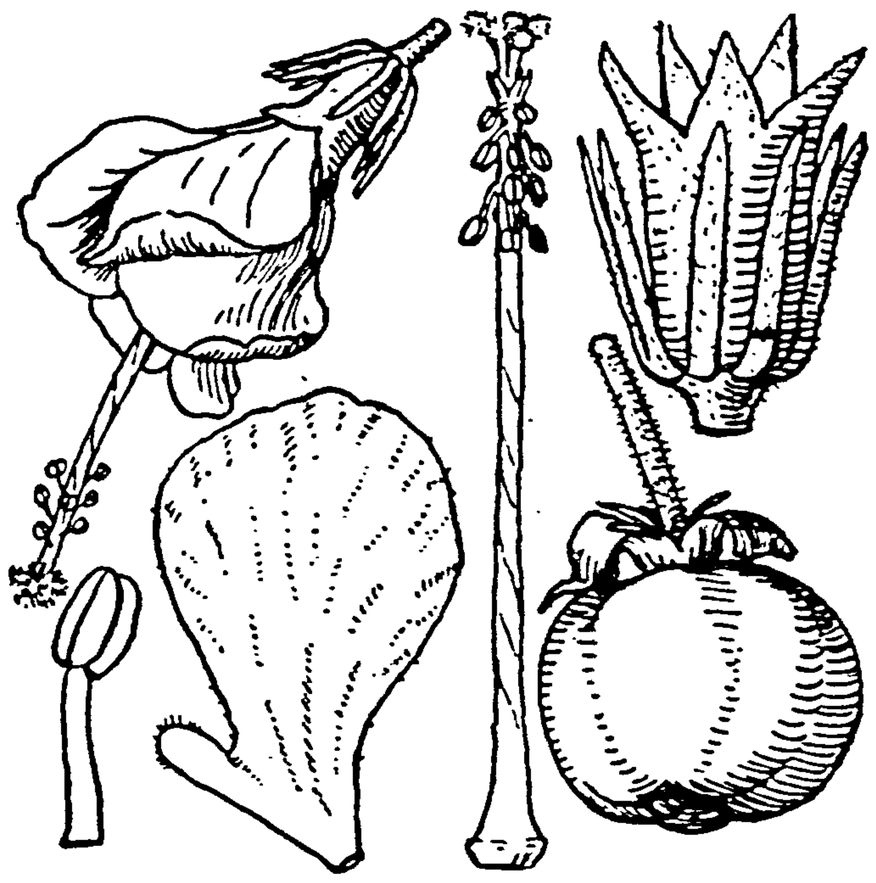
11. **MALACHE** B. Vogel. Shrubs or partly woody plants. Leaf-blades broad, remotely serrate or repand, 3-ribbed. Involucel of 6–8 bractlets or more.

Sepals 5, partially united. Petals 5, pale. Carpels with a median crest at the apex and 2 lateral cusps.—Three species, tropical American.



1. M. scabra B. Vogel. Plant 1–3 m. tall, puberulent: leaf-blades ovate to elliptic-ovate, 6–15 cm. long: bractlets elliptic-lanceolate: calyx-lobes ovate: petals greenish-yellow or whitish, 2–2.5 cm. long: mature carpels about 10 mm. long, reticulate on the back. [*Pavonia racemosa* Sw.]—Coastal hammocks, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—All year.—Previous to the beginning of this century this mallow was thought to be rare in Florida. However, when the southern part of the state became accessible it was found to be very abundant on the shores of bays. It is often copiously and intricately branched.

12. **MALVAVISCUS** Dill. Shrubs, trees, or partially woody plants. Leaf-blades entire, toothed, or angulately lobed. Flowers horizontal or nodding, peduncled. Involucel of 7–12 narrow bractlets. Sepals 5, partly united. Petals 5, each with a lateral auricle. Carpels 5, ultimately forming a baccate fruit.—About 10 species, tropical American.



1. M. Drummondii T. & G. Stem 8–19 dm. tall, tomentose: leaf-blades suborbicular, angulately 3–5-lobed, softly pubescent: bractlets of the involucel about 9, linear or linear-spatulate, 5–6 mm. long: calyx tubular-campanulate, about 1 cm. long; lobes triangular, often deltoid, or sometimes ovate, shorter than the tube, acute: petals vermilion, 3 cm. long or less: berry drooping, much depressed, 1.5–2 cm. in diameter, scarlet.—(WAX-MALLOW.)—Hammocks, Coastal Plain, S Fla. to Tex.—(*W. I., Mex.*)—Spr.–fall

13. **HIBISCUS** L. Herbs, shrubs, or trees. Leaf-blades entire, lobed, or parted. Involucel of several, rarely 3, distinct bractlets. Sepals 5, more or less united. Petals 5, white, colored or variegated. Carpels forming a 5-valved capsule.—About 180 species, widely distributed.—ROSE-MALLOWS.—The bark of some species yields a fiber, and the leaves are used as pot-herbs.

Corolla cylindric or the petals merely spreading at the tip: seed woolly. I. TUBIFLORI.

Corolla funnelform to rotate: seeds glabrous or hirsute.
- Bractlets of the involucel dilated or forked at the apex. II. FURCELLATI.
- Bractlets of the involucel entire, not dilated at the apex.
  - Herbs, often tall perennials.
    - Involucel and calyx herbaceous, not succulent.
      - Corolla broadly funnelform or campanulate; petals mainly pink or white.
        - Calyx and involucel finely spinescent. III. CANNABINI.

Calyx and involucel glabrous or softly pubescent. IV. GRANDIFLORI.
Corolla rotate; petals red. V. COCCINEI.
Involucel and calyx succulent. VI. SABDARIFFAE.
Shrubs or trees.
Corolla open-funnelform: leaf-blades lobed. VII. SYRIACI.
Corolla with a short funnelform tube and a large rotate limb: leaf-blades merely toothed. VIII. ROSAE-SINENSES.

I. TUBIFLORI

Shrub with slender branches and nodding flowers. 1. *H. pilosus.*

II. FURCELLATI

Leaves softly pubescent; blades shallowly lobed; petals 8 cm. long or more. 2. *H. furcellatus.*
Leaves harshly pubescent; blades deeply lobed: petals 7 cm. long or less. 3. *H. aculeatus.*

III. CANNABINI

Erect bright-green plant, the leaf-blades with narrow coarsely toothed lobes: bractlets very slender: calyx-lobes slenderly attenuate from a broad base. 4. *H. cannabinus.*

IV. GRANDIFLORI

Leaf-blades glabrous. 5. *H. militaris.*
Leaf-blades pubescent at least beneath.
Capsule glabrous.
Corolla pink: capsule blunt. 6. *H. Moscheutos.*
Corolla white, with a crimson eye: capsule beaked. 7. *H. oculiroseus.*
Capsule pubescent.
Leaf-blades closely whitish-pubescent beneath.
Leaf-blades closely and minutely stellate-canescent beneath: capsule beaked.
Leaf-blades lanceolate to ovate, toothed. 8. *H. incanus.*
Leaf-blades as wide as long, 3–5-lobed, the lobes toothed: 9. *H. grandiflorus.*
Leaf-blades loosely stellate-tomentose beneath: capsule rounded or truncate at the tip. 10. *H. lasiocarpus.*
Leaf-blades brownish-pubescent beneath. 11. *H. mutabilis.*

V. COCCINEI

Leaf-blades with 5–7 narrow elongate more or less incised lobes. 12. *H. coccineus.*
Leaf-blades merely toothed or with 3–5 prominent, but short and broad lobes. 13. *H. semilobatus.*

VI. SABDARIFFAE

Plant more or less suffused with red, the 3–5 leaf-lobes shallowy toothed: succulent calyx-lobes elongate. 14. *H. Sabdariffa.*

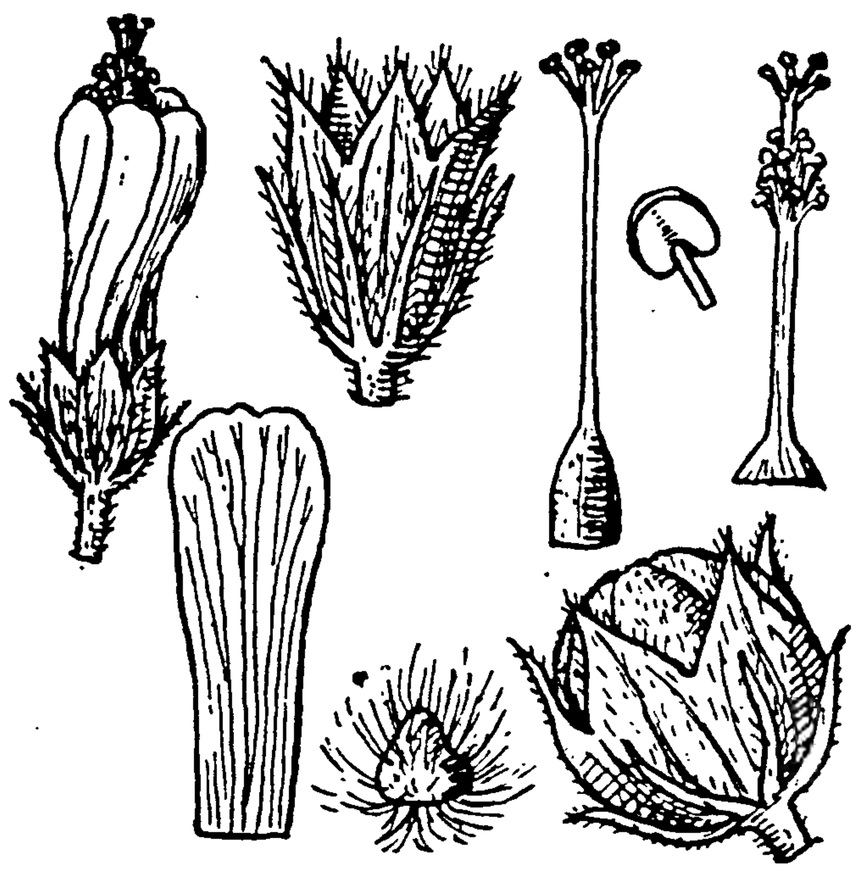
VII. SYRIACI

Leaf-blades typically cuneate at the base: short-pedicelled. 15. *H. syriacus.*

VIII. ROSAE-SINENSES

Leaf-blades rounded to cordate at the base: flowers long-peduncled. 16. *H. Rosa-sinensis.*

1. H. pilosus (Sw.) Fauc. & Rendle. Plant 3–18 dm. tall, stellate-hirsute: leaf-blades triangular-ovate or angulately 3-lobed, crenate, 1–4 cm. long: bractlets linear or nearly so, 7–9 mm. long: calyx-lobes acuminate: petals crimson, 2–2.5 cm. long: capsule fully 1 cm. long. [*H. spiralis* Cav. *H. tubiflorus* DC.]—Hammocks, Florida Keys.—(*W. I., Mex.*)—All year.



2. H. furcellatus Lam. Plant 9–25 dm. tall, finely gray-tomentose: leaf-blades orbicular-ovate to ovate or lanceolate, 5–15 cm. long, angulate or 3–5-lobed, crenate: bractlets narrow, 1–2 cm. long, not bristly: calyx-lobes lanceolate to triangular-lanceolate: petals pink or rose-purple, 8–10 cm. long: capsule ovoid, about 2.5 cm. long, copiously strigose.—Sandy shores, Indian River, Fla. —(*W. I., S. A.*)—All year.

3. H. aculeatus Walt. Plant 9–20 dm. tall, very rough-pubescent: leaf-blades angulate, 3–5-lobed or 3–5-parted, 4–12 cm. in diameter, the lobes rhombic to spatulate, coarsely toothed: bractlets linear, about 15 mm. long, bristly: calyx-lobes lanceolate, bristly ciliate: petals yellow or cream-colored, except the purple base, 7–8 cm. long: capsule conic-ovoid, about 1.5 cm. long or rarely longer, stellate-pubescent and hispid.—Pinelands, Coastal Plain, N Fla. to La. and S. C.—Sum.

4. H. cannabinus L. Plant 3–22 dm. tall, sparingly pubescent: leaf-blades palmately 3–7-parted, the divisions linear to elliptic, unevenly toothed: bractlets narrowly linear, flat, bristle-margined or spiny: calyx-lobes lanceolate, long-acuminate, rather thin, bristle-margined or spiny: petals white or pink, sometimes darker-colored, and purple at the base: capsule conic, 1.5–2 cm. long, strigose.—(AMBAREE. BASTARD-JUTE. BROWN INDIAN-HEMP.)—Hammocks and cultivated grounds, pen. Fla. and the Keys. Nat. of the O. W. tropics.—(*W. I.*)—All year.

5. H. militaris Cav. Plant 9–20 dm. tall, glabrous or nearly so: leaf-blades ovate to broadly lanceolate in outline, 6–16 cm. long, serrate-dentate and hastately 3–5-lobed: bractlets 1.5–2 cm. long: calyx-lobes ovate: petals pink with a purple blotch: capsule ovoid, 2–3 cm. long, glabrous: seeds velvety.—(HALBERD-LEAVED ROSE-MALLOW. SWEATING-WEED.)—Alluvial swamps and river-banks, various provinces, Fla. to La., Minn., and Pa.—Sum.–fall.

6. H. Moscheutos L. Plant 8–20 dm. tall, velvety-tomentose: leaf-blades lanceolate to broadly ovate, dentate-serrate and often angulately 3–5-lobed: petals mainly pink, 10–12 cm. long: capsule ovoid, 2.5–3 cm. long.—(SWAMP ROSE-MALLOW. SEA-HOLLYHOCK. MARSH-MALLOW.)—Brackish and fresh marshes, Coastal Plain, and occasionally adj. provinces, Fla. to Tex. and Conn., also Central Lowland, Mo. to S Ont.—Sum.–fall.

7. H. oculiroseus Britton. Plant similar to *H. Moscheutos* in habit: leaf-blades lanceolate to ovate, unequally toothed: petals white, except the purple spot at the base: capsule conic-ovoid, 2.5–3 cm. long.—Marshes, various provinces, N Ala. to N. J. and N. Y.—Sum.–fall.

8. H. incanus Wendl. Plant 9–20 dm. tall, pale or gray velvety-tomentose: leaf-blades ovate to lanceolate, dentate-serrate: petals white, sulphur-yellow, or pinkish, with a crimson base, 8–10 cm. long: capsule ellipsoid-ovoid, 2.5–3 cm. long, finely hirsute.—Swamps, Coastal Plain, Fla. to Ala. and Md.; perhaps in the interior.—Spr.–sum.

9. H. grandiflorus Michx. Plant 8–21 dm. tall, velvety-tomentose: leaf-blades hastately 3-lobed, the lobes irregularly toothed: bractlets linear, 1.5–2 cm. long, not bristly: calyx about twice as long as the bractlets: petals 12–15 cm. long, pink, purple, or red at the base: capsule ovoid, 2–5.3 cm. long, coarsely hirsute.—Marshes and wet hammocks, Coastal Plain, Fla. to Miss. and Ga.—Spr.

10. H. lasiocarpus Cav. Plant 9–20 dm. tall, densely stellate-tomentose: leaf-blades ovate, 5–14 cm. long, serrate-dentate: bractlets linear, 2.5–3 cm. long, bristly: calyx lobes triangular lanceolate, little longer than the bractlets: petals white or pink with a dark base, 6–10 cm. long: capsule about 2.5 cm. long.—Swamps, various provinces, Ga. to Tex., Mo., and Ill.—Spr.–sum.

11. H. mutabilis L. Shrub, sometimes tree-like, scurfy-pubescent with brownish hairs: leaf-blades suborbicular in outline, cordate at the base, angu-

lately 3–5-lobed, the broad lobes unevenly toothed: bractlets narrowly linear, 2–2.5 cm. long: calyx-lobes ovate: petals white or pink, becoming deep-red: capsule 2.5 cm. long.—(COTTON-ROSE.)—Waste-places and pinelands, S Fla. and S La. Nat. of China.—(*W. I., Mex., C. A., S. A.*)—Spr.–sum.

12. H. coccineus Walt. Plant 9–30 dm. tall, glabrous: leaf-blades with linear or lanceolate lobes 4–25 cm. long: bractlets 2.5–3 cm. long: calyx 4–5 cm. long; lobes acuminate: petals crimson or deep-red: capsule globose-ovoid, 2–2.5 cm. long, reticulate.—Swamps, near the coast, Fla. to Ala. and Ga.—Sum.

13. H. semilobatus Chapm. Plant similar to that of *H. coccineus* in habit: leaf-blades orbicular or ovate, coarsely toothed and 3–5-lobed, 8–15 cm. in diameter: bractlets 2–2.5 cm. long: calyx 4–5 cm. long; lobes acute: petals crimson: capsule about 2.5 cm. long.—Swamps, near the coast, E Fla.—Spr.–fall.

14. H. Sabdariffa L. Plant 6–26 dm. tall, the foliage red throughout: leaf-blades digitately 3–5-lobed, the lobes crenate-serrate, the teeth shallow: bractlets linear to linear-lanceolate, very thick, sparingly pubescent, juicy: calyx-lobes lanceolate, like the bractlets dark-red, very thick, copiously fine-pubescent within: petals pink with a dark base: capsule ovoid, 1.5–2 cm. long, pubescent.—(JAMAICA-SORREL. ROSELLE.)—Pinelands, hammocks, and waste-places, Everglade Keys, Fla. and Florida Keys. Nat of the O. W. trop. and cult.—(*W. I., Mex., C. A., S. A.*)—All year.—The succulent tissues contain much mucilage, coloring matter, and an acid, all of which combines to make an excellent jelly. The succulent calyces are cooked and served as "cranberries."

15. H. syriacus L. Shrub or small tree, minutely pubescent when young: leaf-blades 3-lobed, coarsely crenate, 3–12 cm. long: bractlets linear or linear-spatulate, 10–20 mm. long: calyx-lobes triangular-ovate: petals rose-purple, or white, usually with crimson blotches at the base: capsule ellipsoid-ovoid, 2–2.5 cm. long.—(SHRUBBY-ALTHAEA. ROSE-OF-SHARON.)—Roadsides, fields, and thickets, various provinces, Fla. to Tex. and Conn. Nat. of western Asia and cult.—Sum.–fall.

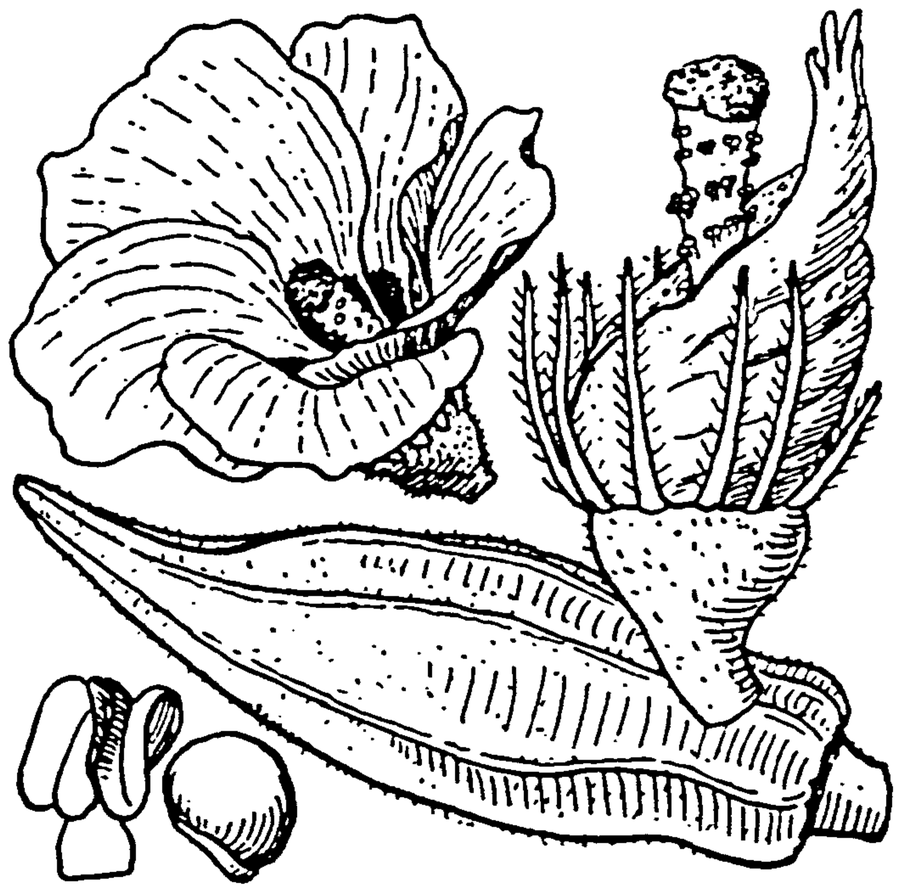
16. H. Rosa-Sinensis L. Shrub or small tree, usually sparingly pubescent: leaf-blades ovate to ovate-lanceolate, rounded or abruptly narrowed at the base, coarsely and unequally toothed: bractlets narrowly linear: calyx-lobes lanceolate, more pubescent within than without: petals rose-red or of other colors: capsule 2–2.5 cm. long.—(SHOE-BLACK PLANT. CHINESE-ROSE.)—Fields, waste-places, and roadsides, pen. Fla. Nat. of China and cult.—(*W. I.*)—All year.—Extensively grown as an ornamental in warm and tropical countries. It is represented by many color forms. The flowers yield a black dye.

14. ABELMOSCHUS Medic. Herbs, usually large and coarse, mostly annual. Leaf-blades entire or lobed. Flowers solitary and terminal. Involucel of 4–many narrow bractlets. Sepals united into a long spathe-like calyx which splits and falls away from the fruits. Petals 5, broad. Carpels elongate, forming a long and narrow pointed capsule. Seed glabrous.—About 12 species, tropical.

Leaf-blades with short broad lobes: bractlets of the involucel linear, caducous:
1. *A. esculentus.*

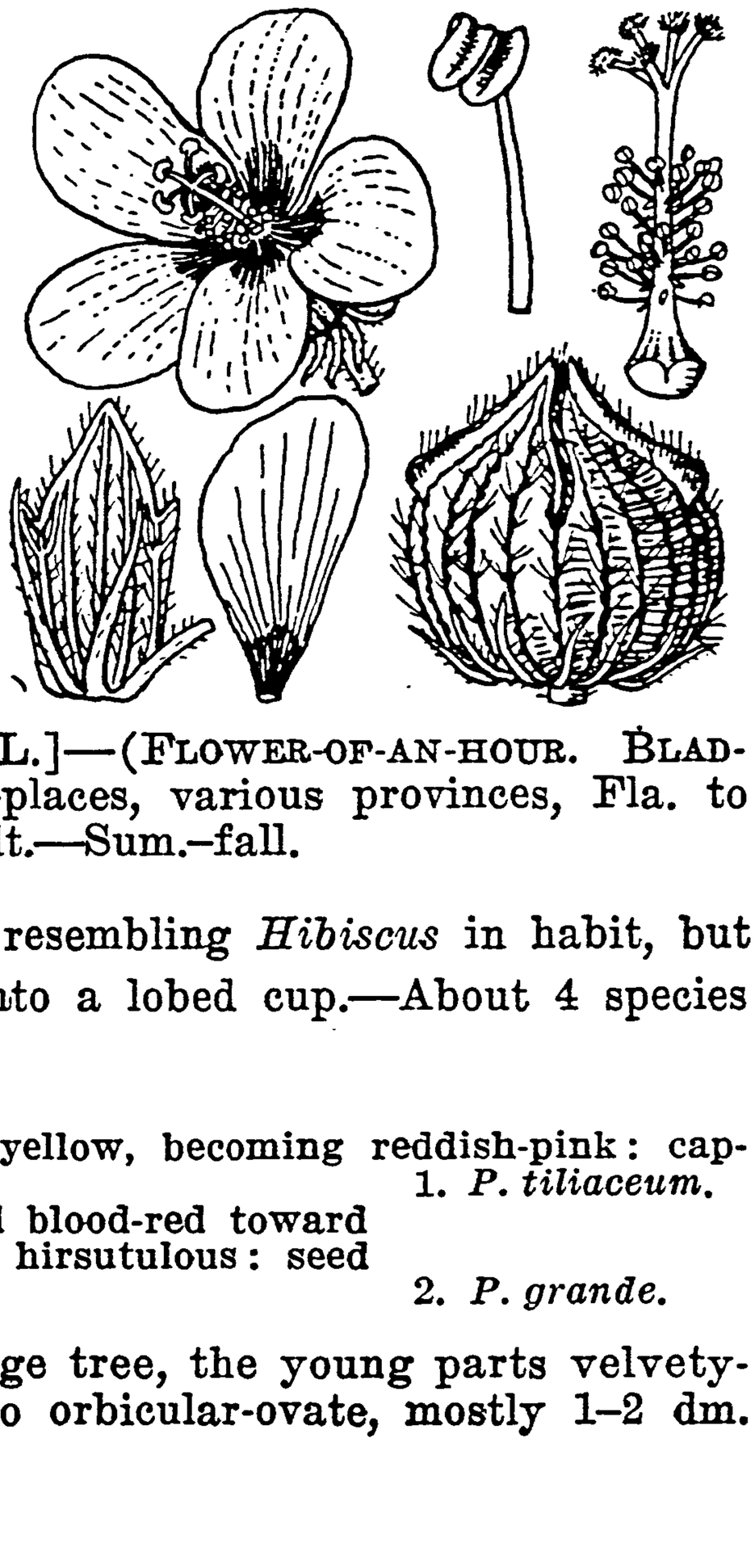
Leaf-blades with long narrow lobes: bractlets of the involucel elliptic or elliptic-lanceolate, persistent: 2. *A. Manihot.*

1. A. esculentus (L.) Moench. Plant 9–20 dm. tall, hirsute: leaf-blades 1–3 dm. broad, with 5–7 ovate, lanceolate, or oblanceolate, coarsely toothed or incised segments: corolla greenish-yellow: capsule columnar, 9–21 cm. long.—(OKRA. GUMBO.)—Waste-places, gardens, and cult. grounds, Coastal Plain, Fla. to Tex. Nat. of Africa and cult.—(*W. I.*)—Spr.–fall.—The unripe capsules are a very mucilaginous esculent.



2. A. Manihot (L.) Medic. Plant usually 20–25 dm. tall, ultimately glabrous: leaf-blades 1–4 dm. in diameter, with 5–9 coarsely toothed or again lobed segments: corolla pale yellow with a dark eye: capsule ellipsoid, 4–8 cm. long.—Waste-places, cult. grounds, and river-banks, Coastal Plain, Fla. to Tex. Nat. of Asia and cult.—Sum.–fall.

15 TRIONUM Medic. Annual pubescent herbs. Leaf-blades palmately 3–5-lobed. Flowers solitary at the ends of the branches. Involucels of several–many narrow bractlets: sepals 5, united into a ribbed and shallowly lobed calyx, which is persistent and inflated at maturity. Petals 5, broad. Carpels forming a short capsule which is included in the persistent calyx. Seed glabrous.—One species.

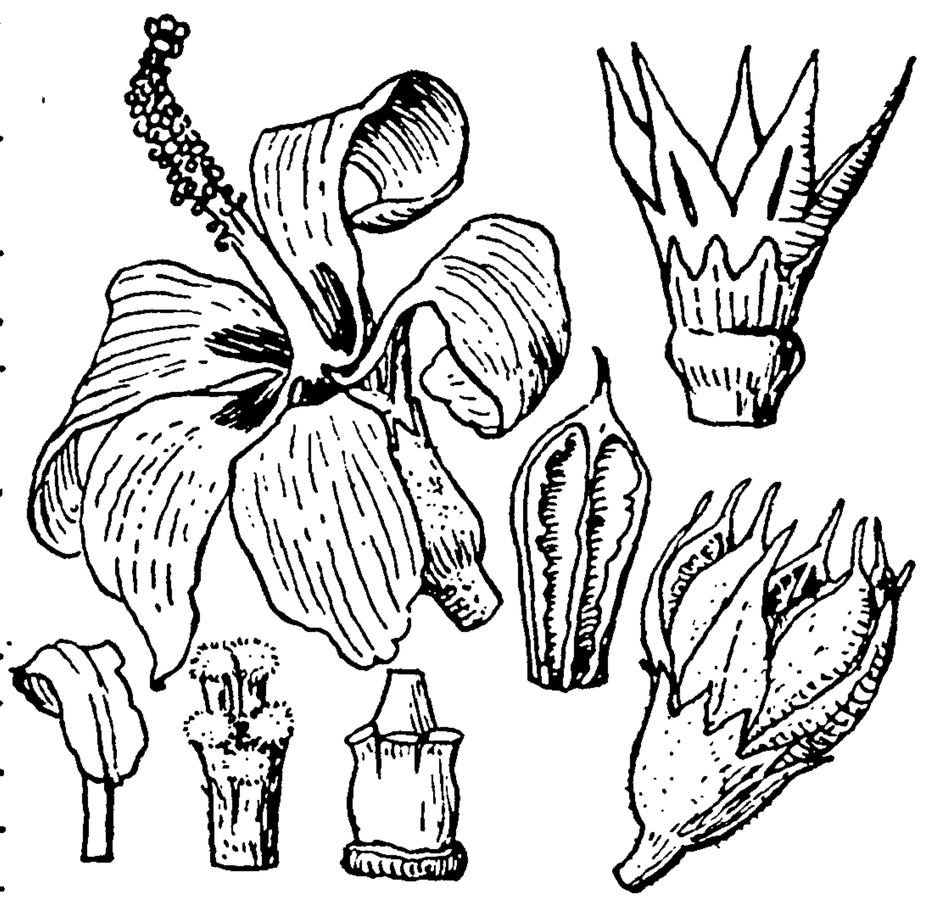


1. T. Trionum (L.) Wooton & Standley. Plant 1–4 dm. tall, hispid: leaf-blades ovate to suborbicular in outline, pedately 3–5-lobed or 3–5-parted, the lobes coarsely toothed or incised: bractlets about 1 cm. long: calyx-lobes triangular: petals yellow or whitish with a purple or brown-purple blotch: capsule about 1.5 cm. long. [*Hibiscus Trionum* L.]—(FLOWER-OF-AN-HOUR. BLADDER-KETMIA.)—Roadsides, fields, and waste-places, various provinces, Fla. to N. M., S. D. and N. S. Nat. of Eu. and cult.—Sum.–fall.

16. PARITI Adans. Shrubs or trees, resembling *Hibiscus* in habit, but with the bractlets of the involucel united into a lobed cup.—About 4 species tropical.—Spr. or all year.

Petals straight or spreading at the tip, pure-yellow, becoming reddish-pink: capsule velvety: seeds papillose. 1. *P. tiliaceum.*
Petals strongly recurved, bronze or orange and blood-red toward the center, becoming very dark-red: capsule hirsutulous: seed hirsutulous. 2. *P. grande.*

1. P. tiliaceum (L.) St. Hil. Shrub or large tree, the young parts velvety-tomentose: leaf-blades thick, suborbicular to orbicular-ovate, mostly 1–2 dm.



long, blunt entire, grayish-tomentose beneath: calyx-lobes lanceolate to triangular-lanceolate: corolla campanulate or tubular-campanulate; petals broadly obovate or orbicular-obovate, pure-yellow, becoming reddish-pink: capsule velvety, beaked, 1–2 cm. long, nearly or quite as long as the sepals.—(MAHOE)—Shore hammocks and sand-dunes coasts of southern pen. Fla. and the Florida Keys.—(*W. I., Mex., C. A., S. A.*)

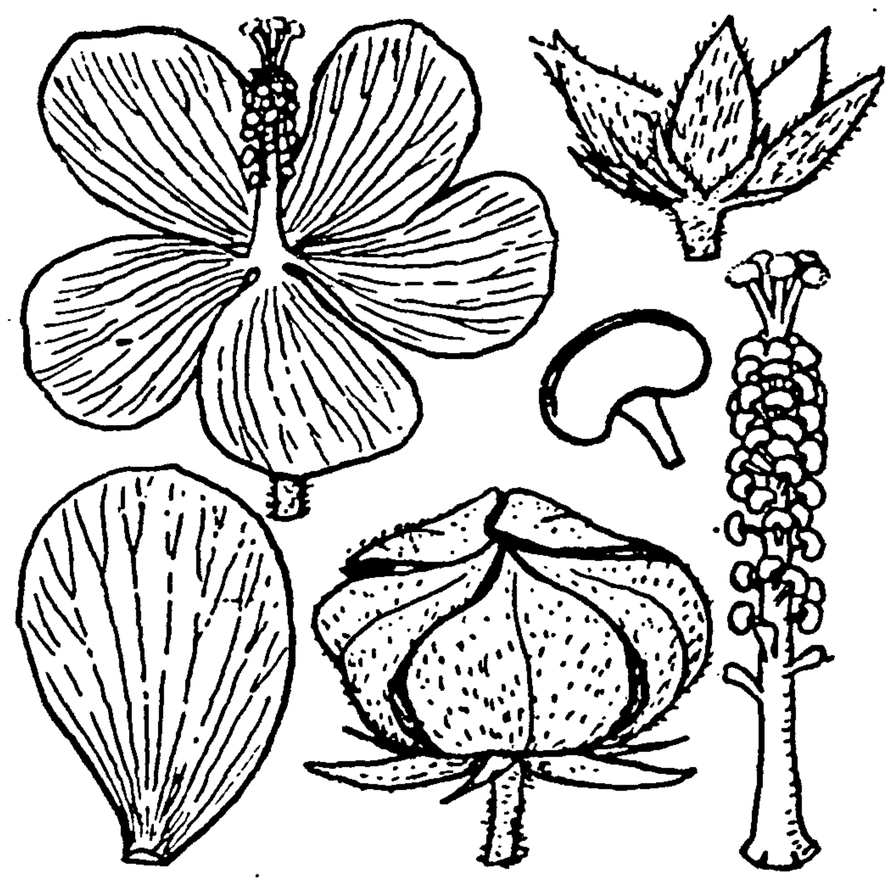
2. P. grande Britton. Tree with wide-spreading branches; the young parts thinly pubescent: leaf-blades thin or thinnish, suborbicular, mostly 1.5–3 dm. long, sharp-pointed, more or less crenate, thinly pubescent beneath or glabrous: calyx-lobes lanceolate: corolla rotate-campanulate: petals spatulate to narrowly obovate, bronze or orange along the edges and blood-red toward the center, becoming very dark-red: capsule hirsutulous, beakless, larger than in *P. tiliaceum,* much shorter than the sepals.—(MAHOE)—Sandy shores, S pen. Fla.—(*W. I.*)

17. KOSTELETZKYA Presl. Herbs or partly woody plants. Leaf-blades angulate-lobed, hastate, or sagittate. Involucel of 7–10 bractlets, or obsolete. Sepals 5, partly united. Petals 5. Carpels forming a depressed capsule.—About 8 species, of temperate and tropical America.—Spr.–fall or all year S.—FEN-ROSES.

Corolla pink; petals 3–4 cm. long: calyx over 1 cm. wide, surpassing the capsule.
- Stem and leaves copiously pubescent.
  - Calyx merely stellate-canescent: upper part of the stem sparingly scabro-pubescent. — 1. *K virginica.*
  - Calyx densely stellate-hirsute as well as canescent: upper part of stem densely pubescent, usually velvety. — 2. *K. althaeifolia.*
- Stem and leaves glabrous or sparingly pubescent. — 3. *K. smilacifolia.*

Corolla white; petals about 1 cm. long: calyx less than 1 cm. wide, surpassed by the capsule. — 4. *K. pentasperma.*

1. K. virginica (L.) A. Gray. Foliage pubescent with stellate hairs but not velvety, often scabrous: leaf-blades 3–15 cm. long, ovate to ovate-hastate, serrate-dentate, the lateral lobes triangular, acute: calyx-lobes lanceolate or elliptic-lanceolate, acute or acuminate: petals pink, 2–4 cm. long: capsule about 10 mm. broad: seed 3.5–4 mm. long.—(SALT-MARSH MALLOW.)—Marshes and wet hammocks, Coastal Plain and rarely adj. provinces, Fla. to La. and N. Y.



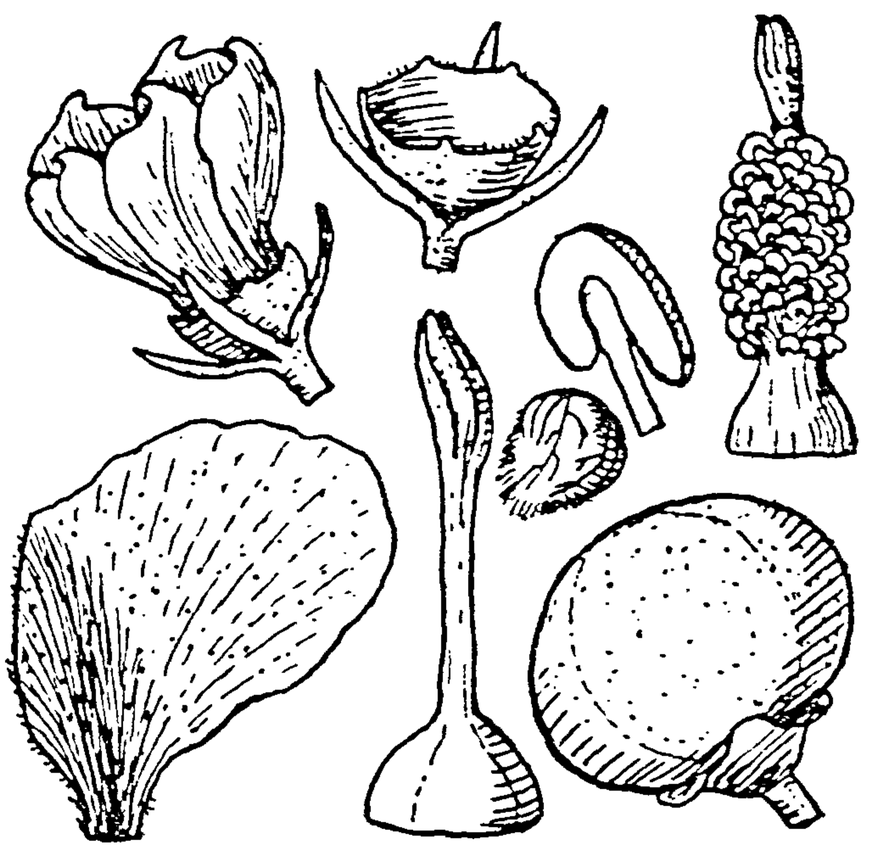
2. K. althaeifolia (Chapm.) A. Gray. Foliage mainly velvety-pubescent; leaf-blades ovate to ovate-lanceolate or nearly lanceolate, 5–15 cm. long, acuminate, irregularly dentate, the lower ones angularly 3-lobed, cordate, the upper ones truncate or subcordate at the base: calyx-lobes lanceolate, acuminate: petals pink, about 4 cm. long: capsule 12–15 mm. broad: seed about 3 mm. long.—Swamps, hammocks, Coastal Plain, Fla. to Tex. and N. C.—(*W. I.*)

3. K. smilacifolia A. Gray. Foliage nearly glabrous: leaf-blades 5–10 cm. long, those above the base of the stem hastate, with a linear-lanceolate or linear

entire or denticulate middle lobe and linear or nearly linear reflexed entire or toothed basal lobes; calyx-lobes lanceolate or ovate-lanceolate, acute or slightly acuminate, about as long as the bractlets: petals 2.5–3.5 cm. long, bright-pink: capsule hispid, fully 1 cm. broad, surpassed by the sepals: seed nearly 3.5 mm. long.—Low pinelands, W pen. Fla.

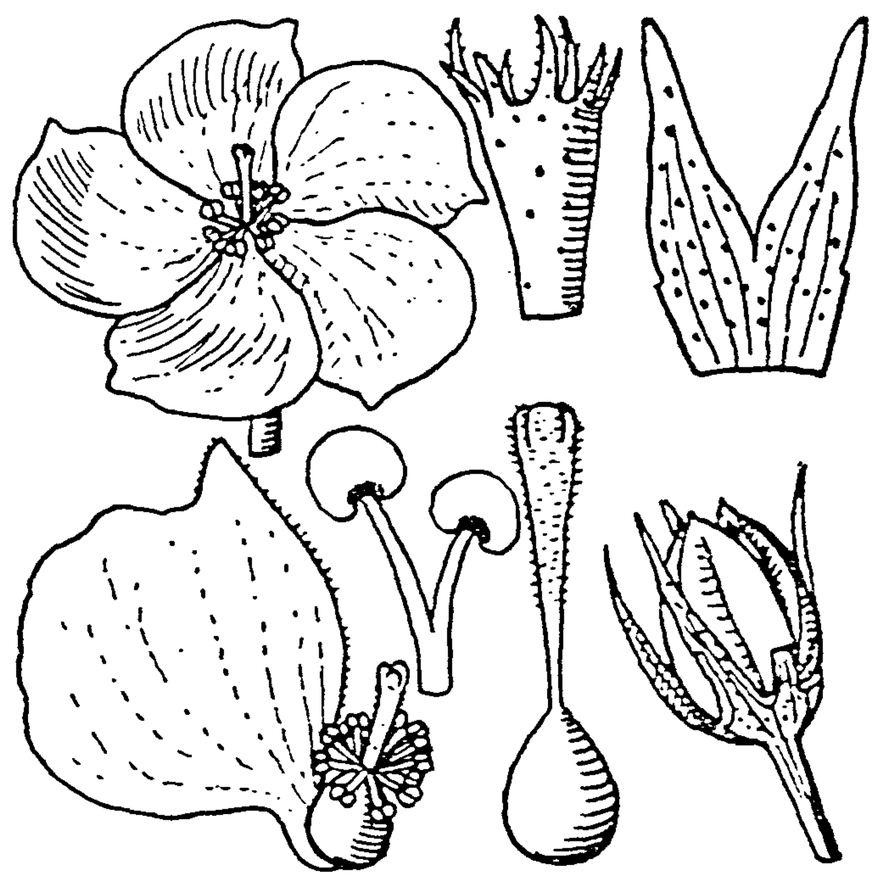
4. **K. pentasperma** (Bert.) Griseb. Foliage pubescent with stinging-hairs: stem up to 2 m. tall, widely branched: leaf-blades lanceolate to ovate-lanceolate or ovate, with the larger ones sometimes slightly lobed, 2.5–9 cm. long, serrate, slender-petioled: calyx bristly-pubescent; lobes ovate, acute, exceeding the bractlets: petals about 1 cm. long, white: capsule nearly 1 cm. broad, surpassing the sepals: seed about 2.5 mm. long.—Hammocks, Cape Sable region, Fla.—(*W. I.*)—All year.

18. THESPESIA Soland. Shrubs or trees, resembling species of *Hibiscus*. Leaf-blades entire or angulate-lobed. Involucel of 3–5 narrow deciduous bractlets. Sepals 5, partially or wholly united. Petals 5, showy. Carpels united into a mostly indehiscent capsule.—About 8 species, tropical.



1. **T. populnea** (L.) Soland. Low tree or shrub: leaf-blades ovate, 5–12 cm. long: calyx cup-like: petals 5–7 cm. long, yellow and purple: capsule depressed, 3–4.5 cm. broad.—(SEASIDE-MAHOE. PORTIA-TREE.)—Shore hammocks and sand dunes, Everglade Keys, Fla. and Florida Keys. Nat. prob. of the O. W. tropics, and cult.—(*W. I.*)—All year.—A sacred tree in some countries. This tree grows luxuriantly on shores of bays and inlets. By its elongate, spreading lower branches it makes almost impenetrable thickets. Large crops of fruits continuously increase its dense growth.

19. CIENFUEGOSIA Cav. Shrubs or woody herbs, resembling species of *Hibiscus*. Leaf-blades entire or lobed. Involucels of 3–many bractlets. Sepals 5, united below. Petals 5. Capsule 3–5-valved.—About 20 species, half of them American.



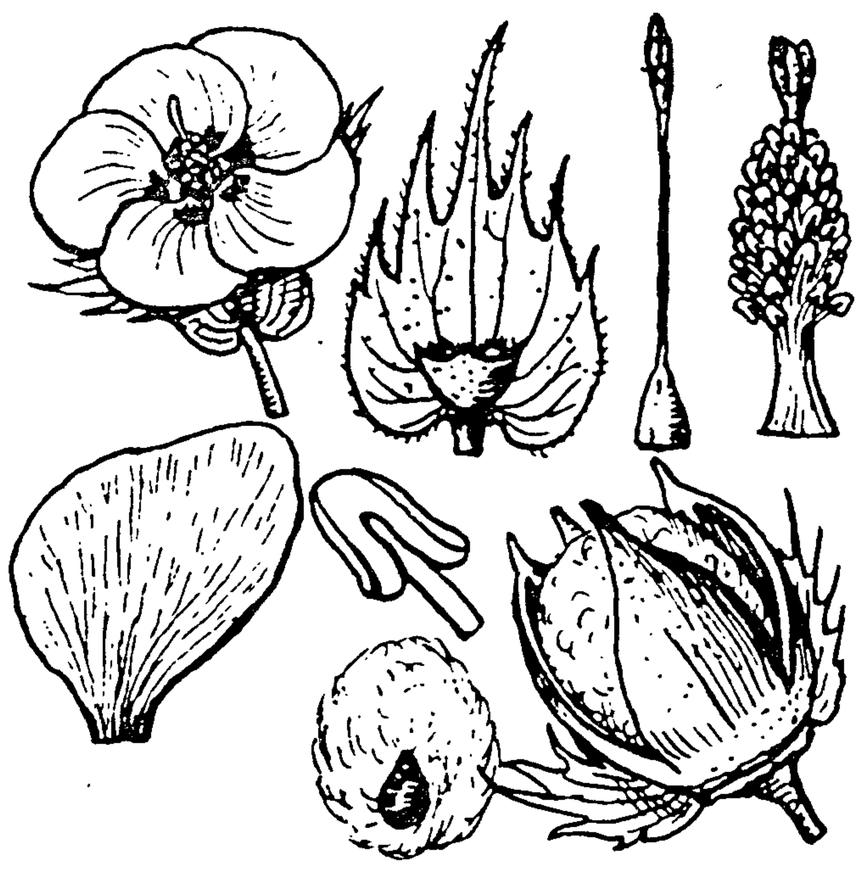
1. **C. heterophylla** (Vent.) Garcke. Leaf-blades 1.5–5 cm. long, those of the upper leaves narrow: peduncles clavate: bractlets minute: petals yellow, capsule rarely equaling the calyx.—Hammocks and open places, Florida Keys.—(*W. I., S. A.*)—All year.—This species ranges from Florida to northern South America. Forms from South America often appear quite distinct from those from the more northern West Indies. Another species, *C. Drummondii* occurs in the Coastal Plain of Texas. Like other Texan relatives, *Gayoides* and *Malvaviscus* it may occur on Key West.

20. GOSSYPIUM L. Herbs, shrubs, or trees. Leaf-blades palmately lobed or rarely entire. Involucel of 3 large bracts. Sepals 5, united into a cup-like calyx. Petals 5, usually dark-colored at the base. Capsule 5-valved.—

About 40 species, tropical.—COTTONS.—The bark of the root of some species is medicinal; the hairs of the seeds constitute cotton; the seeds yield oil.

Seed 4–5 mm. broad, glabrous, that is, completely separable from the wool: lobes of the leaf-blades mostly longer than the body. 1. *G. barbadense.*
Seed 6–7 mm. broad, woolly: lobes of the leaf-blades mostly shorter than the body.
  Wool tawny: plant woody: foliage closely pubescent with very short hairs. 2. *G. hirsutum.*
  Wool white: plant herbaceous: foliage if pubescent, hirsute. 3. *G. herbaceum.*

1. G. barbadense L. Shrub with glabrous twigs, often 2 m. tall or more: leaf-blades with 3–5 lanceolate or ovate-lanceolate lobes: corolla pale-yellow: capsule ovoid, acute, 3.5–5 cm. long.—(SEA-ISLAND COTTON.)—Thickets, old fields, and hammocks, Coastal Plain, Fla. to La. Nat. of trop. Am. and cult.—Seeds black, smooth when the long fibers are removed.



2. G. hirsutum L. Shrub or small tree, with usually hirsute twigs: leaf-blades 4–11 cm. wide, sometimes pubescent, 3-lobed, the lobes ovate to deltoid, as long as the body of the leaf or very short: calyx becoming 1–1.5 cm. wide: corolla creamy-white except the purplish base, but becoming pink; petals 3–5 cm. long: capsule ovoid, 2.5–3 cm. long: seed with tawny cotton.—(WILD-COTTON.)—Hammocks, sand-dunes, and kitchen-middens, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—All year.

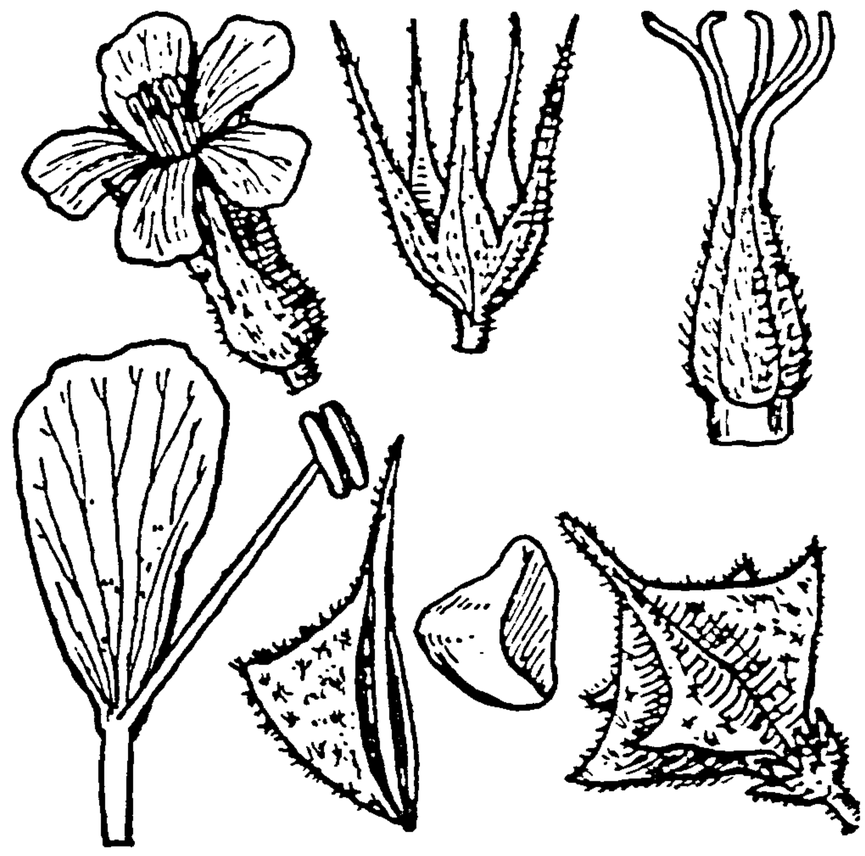
3. G. herbaceum L. Plant glabrous, or with long scattered hairs: leaf-blades with 3–5 triangular or ovate lobes: corolla creamy white, becoming pink; petals 5–7 cm. long: capsule subglobose: seed with white cotton.—(COMMON COTTON. UPLAND-COTTON.)—Fields, thickets, and waste places, vaious provinces, Fla. to Tex., Ark., and S Va Nat. of Asia, and cult.—(*W. I., Mex., C. A., S. A.*)—Sum.

FAMILY 3. BUETTNERIACEAE — CHOCOLATE FAMILY

Shrubs or trees, or herbs, often resembling *Malvaceae.* Leaves alternate: blades simple. Flowers mostly perfect. Calyx of 5, or rarely fewer, sepals. Corolla of 5, or rarely fewer, petals, or wanting. Androecium of as many stamens as there are sepals, or more. Staminodia sometimes present. Gynoecium of 5, more or less united carpels, or fewer. Fruit capsular or follicular.—About 45 genera and over 600 species, mostly tropical.

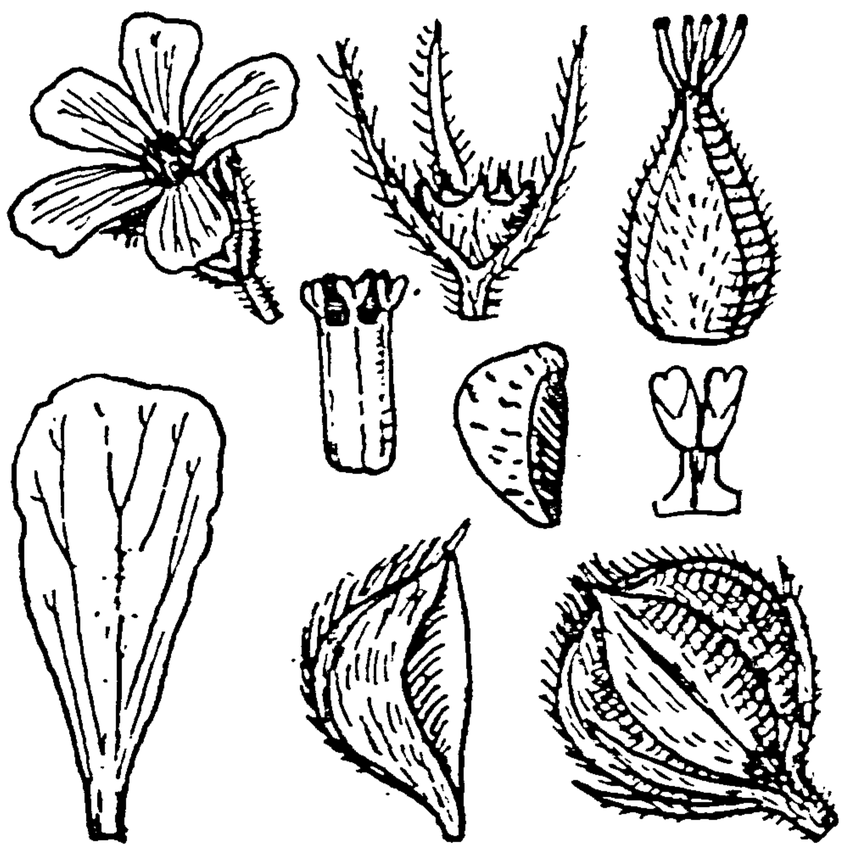
Corolla present.
  Petals with flat blades.
    Gynoecium of 5 united carpels: styles 5, not eccentric: stigmas capitate.
      Involucel wanting: capsule angular or pyramidal, loculicidal. 1. MOLUCHIA.
      Involucel of 3 or more bractlets: capsule globose, loculicidal and septicidal.
        Styles distinct: flowers and fruits mostly in interrupted spike-like panicles. 2. MELOCHIA.
        Styles partly united: flowers and fruits mostly in a terminal cluster. 3. RIEDLEA.
    Gynoecium of a single carpel: style 1, eccentric: stigma brush-like. 4. WALTHERIA.
  Petals with hooded blades. 5. AYENIA.
Corolla wanting. 6. FIRMIANA.

1. MOLUCHIA Medic. Herbs, shrubs, or small trees. Leaf-blades toothed. Involucel wanting. Sepals 5, united at the base. Petals 5, marcescent. Filaments united at the base. Styles 5, distinct. Capsules 5-valved, angled.—About 6 species, tropical.



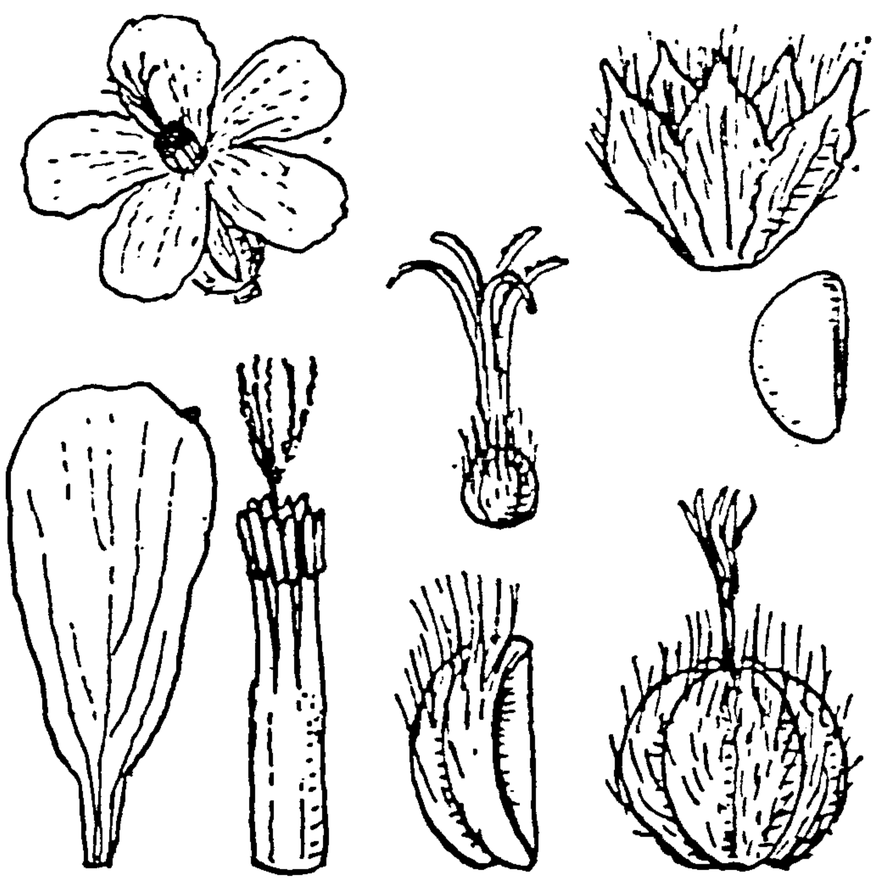
1. M. tomentosa (L.) Britton. Much-branched shrub up to 2 m. tall, the foliage densely pale stellate-tomentose: leaf-blades ovate, lanceolate, or linear-lanceolate, 1.5–6 cm. long, crenate or serrate-crenate, prominently veined beneath: calyx-lobes acuminate: petals mostly rose-purple, about 1 cm. long: capsule 6–8 mm. long, beaked, with 5 shoulder-like blades: seed 1.5 mm. long. [*Melochia tomentosa* L.]—(BROOM-WOOD.)—Pinelands, S pen. Fla. and S Tex.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall.

2. MELOCHIA [Dill.] L. Herbs or shrubby plants Leaf-blades toothed and sometimes also slightly-lobed. Involucel present. Sepals 5, partly united. Petals 5, marcescent. Filaments well united. Styles 5, distinct. Capsule primarily loculicidally 5-valved.—About 25 species, tropical and subtropical.



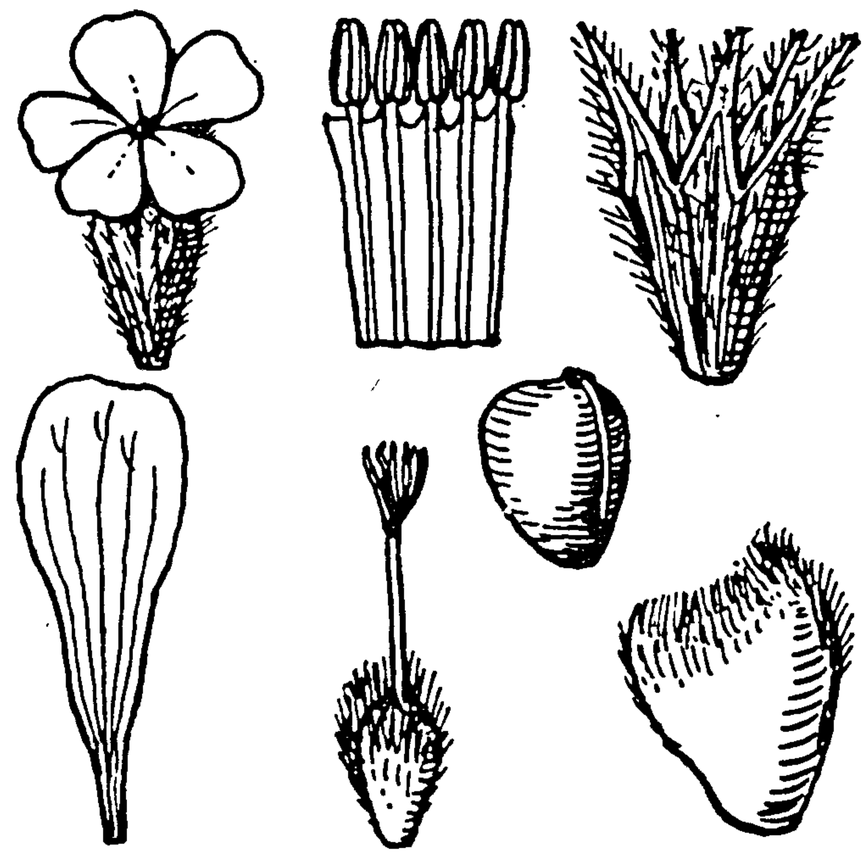
1. M. corchorifolia L. Stem up to 1.5 mm. glabrous or sparingly pubescent, virgately branched: leaf-blades ovate to ovate-lanceolate, irregularly serrate and often slightly 3-lobed, long-petioled: flower-clusters dense: calyx-lobes acute: petals purple, or with the claw yellowish, 4–7 mm. long: capsule subglobose, 4–4.5 mm. in diameter. [*M. hirsuta* (Chapm. Fl.) not Cav.]—Old fields, cult. grounds and waste-places, various provinces, Fla. to Tex., and S. C.—Spr.–fall.

3. RIEDLEA Vent. Herbs or low woody shrubs. Leaf-blades toothed. Involucel of 3 bractlets. Flowers in terminal and axillary clusters. Sepals 5, partly united. Petals 5, marcescent. Filaments partly united. Styles 5, partly united. Capsule 5-valved.—About 20 species, mostly tropical American.



1. R. hirsuta (Cav.) DC. Stem diffusely branched, the branches decumbent or ascending, up to 1.5 m. long, hirsute and often with some appressed hairs: leaf-blades ovate to lanceolate, serrate, short-petioled: calyx-lobes ovate to deltoid, 9–13 mm. long: petals violet: capsule subglobose, about 3 mm. in diameter. [*Melochia hirsuta* Cav.]—Pinelands, S pen. Fla.—(*W. I., Mex., C. A., S. A.*)—All year.

4. **WALTHERIA** L. Herbs, shrubs, or trees. Leaf-blades toothed. Involucel of 3-bractlets. Sepals 5, united to the middle or above it. Petals 5, loosely spreading, narrow, slender-clawed, yellow. Stamens 5: anthers with 2 sacs: staminodia wanting. Ovary 1-celled. Capsule smooth, often pubescent, longer than thick.—About 35 species, tropical American.

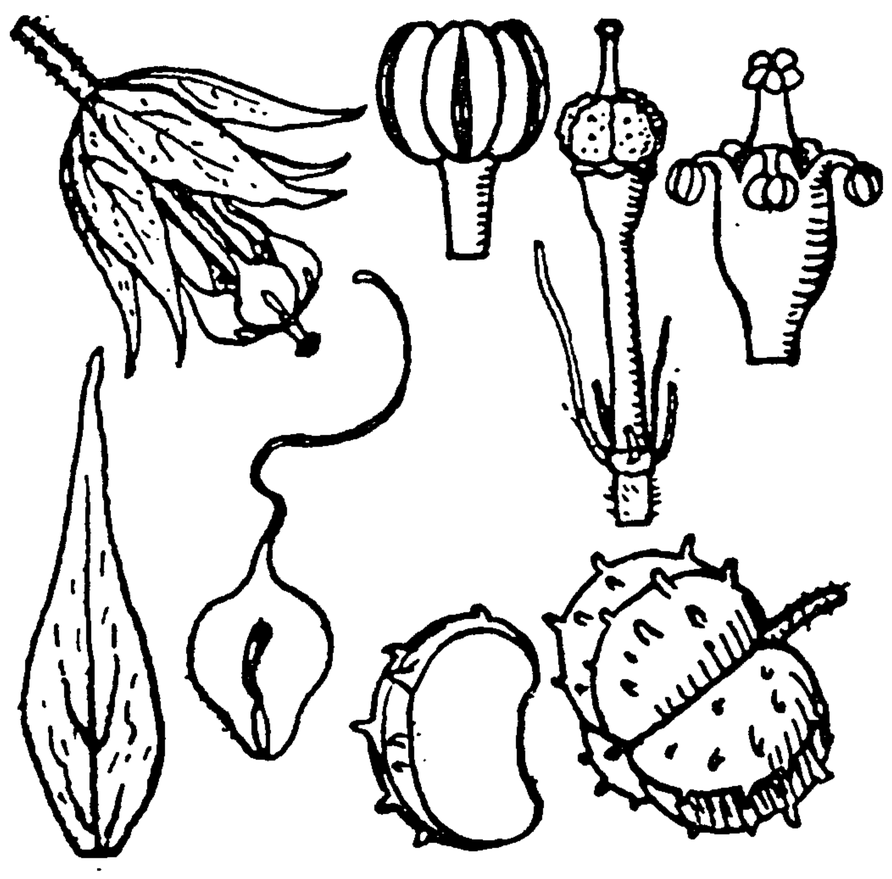


1. **W. americana** L. Stem erect or rarely diffuse and prostrate, 6–16 dm. long, often much-branched: leaf-blades ovate or orbicular-ovate, 1–8 cm. long, serrate or dentate-serrate, stout-petioled: flowers in dense axillary clusters: calyx 4–5 mm. long at maturity; lobes triangular to lanceolate or subulate-lanceolate, mostly nearly as long as the tube or shorter: petals 3–4 mm. long: capsule about 2 mm. long, obliquely rounded or truncate at the top and long-hairy.—Hammocks, pinelands and sand-dunes, S pen. Fla. and the Keys. Adv. on coast of Ala.—(*W. I., Mex., C. A., S. A.*)—All year.—Reputed to have medicinal properties.

5. **AYENIA** L. Herbs often partially woody. Leaf-blades toothed. Involucel wanting. Sepals 5, slightly united. Petals 5, converging, the claws involute. Stamens 5; anthers with three parallel sacs. Staminodia present. Ovary 5-celled. Capsule muricate, depressed.—About 10 species, tropical American.

Petals 6–6.5 mm. long; blades about 1.5 mm. wide; appendages stout, over 0.5 mm. long. 1. *A. euphrasiaefolia.*
Petals 4–4.5 mm. long: blades about 1 mm. wide; appendages slender, less than 0.5 mm. long. 2. *A. pusilla.*

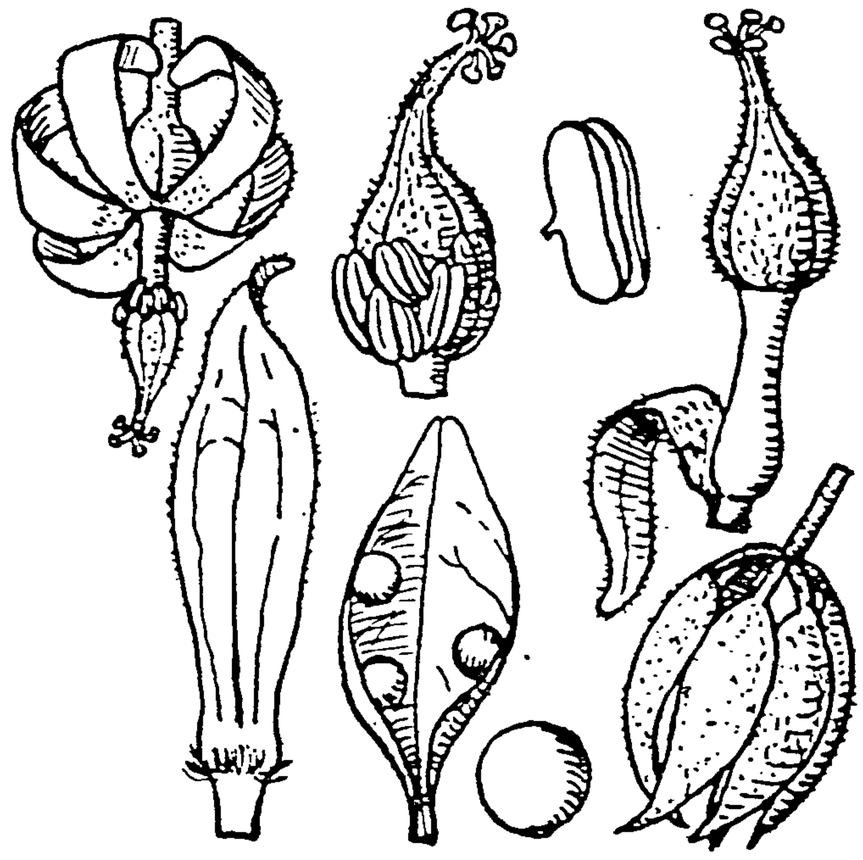
1. **A. euphrasiaefolia** Griseb. Tap-root stout: stem prostrate: leaf-blades predominately suborbicular to reniform, 0.5–1 cm. long, sharply few-toothed: calyx about 3 mm. long: petals reddish: capsule 4–5 mm. in diameter: seed bluntly tuberculate.—Pinelands, Everglade Keys, Fla. and lower Florida Keys.—(*W. I.*)—All year.



2. **A. pusilla** L. Tap-root slender: stem erect or ascending: leaf-blades predominantly elliptic to elliptic-ovate, 1–2.5 cm. long, rather bluntly many-toothed: calyx about 2 mm. long; lobes ciliate: petals red: seed sharply tuberculate.—Waste-places, Everglade Keys, Fla. and Key West. Perhaps introduced from the W. I.; also in rocky places, W Tex.—(*W. I., Mex., C.A., S. A.*)—Spr.–fall.

6. **FIRMIANA** Marsigli. Shrubs or trees. Leaf-blades entire or lobed. Flowers unisexual or polygamous. Sepals 5, or rarely 4, often petaloid.

Petals wanting. Staminal-column broad. Carpels nearly distinct. Stigmas peltate. Capsule opening before maturity, the carpels stellately spreading.—About 10 species, Asiatic.



1. F. platanifolia (L.) R. Br. Tree becoming 12 m. tall, or a shrub: leaf-blades 1–3 dm. broad, palmately 3–5-lobed: panicle commonly 2–3 dm. long: sepals linear: carpels 6–9 cm. long. [*Sterculia platanifolia* L.]—(CHINA PARASOL-TREE. JAPANESE VARNISH-TREE. BOTTLE-TREE.) — Roadsides, woods, thickets, and fields, Coastal Plain, Fla. to Tex. and S. C. Nat. of eastern Asia and cult.—Spr.—Like the tallow-tree (*Triadica*) this Asiatic tree is extensively naturalized in the Coastal Plain of South Carolina and less abundantly within the range given above. In open places the trunk may be widely branched, in the dense growth of large colonies the trunks are usually pole-like.

ORDER **HYPERICALES** — HYPERICAL ORDER

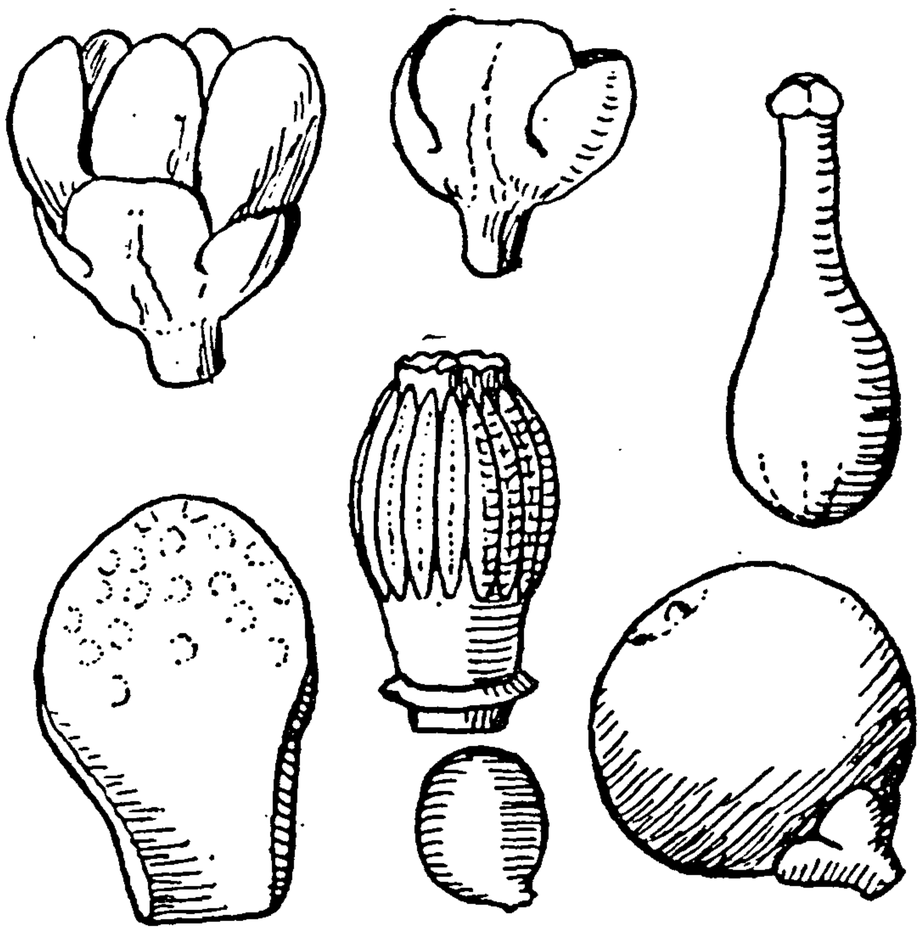
Herbs, shrubs, or trees. Leaves various. Flowers mostly perfect, complete and regular (irregular in Violaceae), sometimes involucrate. Calyx of distinct or essentially distinct sepals. Corolla of distinct petals (partially united in Fouquieriaceae), rarely wanting. Androecium of several united carpels. Ovary superior, mostly with parietal placentae. Fruit capsular, baccate, or drupaceous.

Stamens united into a tube which surrounds or encloses the gynoecium.
  Placentae parietal. — Fam. 1. CANELLACEAE.
  Placentae axial. — Fam. 2. CLUSIACEAE.
Stamens distinct.
  Styles wanting: stigmas introrse.
    Placentae axial: herbs or shrubby plants. — Fam. 3. ELATINACEAE.
    Placentae basal: shrubs or trees. — Fam. 4. TAMARICACEAE.
  Styles present, distinct or united: stigmas terminal.
    Styles distinct or partially united or coherent until maturity, if united to the stigmas, then grooved.
      Stigmas not brush-like: endosperm little or none.
        Herbs or shrubby plants, with opposite or whorled leaves. — Fam. 5. HYPERICACEAE.
        Shrubs or trees, with alternate leaves. — Fam. 6. THEACEAE.
      Stigmas brush-like: endosperm copious. — Fam. 7. TURNERACEAE.
    Styles wholly and permanently united.
      Corolla regular. — Fam. 8. CISTACEAE.
      Corolla irregular, the petals markedly unequal and one of them spurred; stamens 5. — Fam. 9. VIOLACEAE.

FAMILY 1. **CANELLACEAE** — WILD CINNAMON FAMILY

Trees. Leaves alternate: blades entire, pellucid-punctate. Flowers perfect. Calyx of 3 thick imbricate sepals. Corolla of 4–12 narrow petals, or wanting. Androecium of numerous stamens, the filaments united into a tube around the pistil. Gynoecium of 2–5 united carpels. Fruit a berry.—Five genera and 7 species, in tropical America and Africa.

1. CANELLA P. Br. Trees with gray bark. Leaf-blades leathery. Flowers in cymes. Petals 5. Stamens mostly 15–20, the tube projecting beyond the anthers. Ovary 1-celled. Berry subglobose.—One species.



1. C. Winteriana (L.) Gaertn. Trees 5–15 m. tall: leaf-blades oblanceolate, spatulate, or elliptic-spatulate, 3–10 cm. long: sepals 2.5–3 mm. broad: petals 5, elliptic, 4.5–5 mm. long, purple: berry about 10 mm. in diameter, crimson or nearly black.—(WILD-CINNAMON. CINNAMON-BARK.)—Hammocks, Cape Sable region, pen. Fla. and Florida Keys.—(*W. I.*)—Sum.–fall.—The leaves and bark are spicy-aromatic, and are used in medicine and as a condiment. The red-brown heart-wood is close-grained, very hard, and very heavy. The contrast of the cymes of purple flowers and the deep-green foliage is striking. The clusters of almost black berries also render the tree conspicuous.

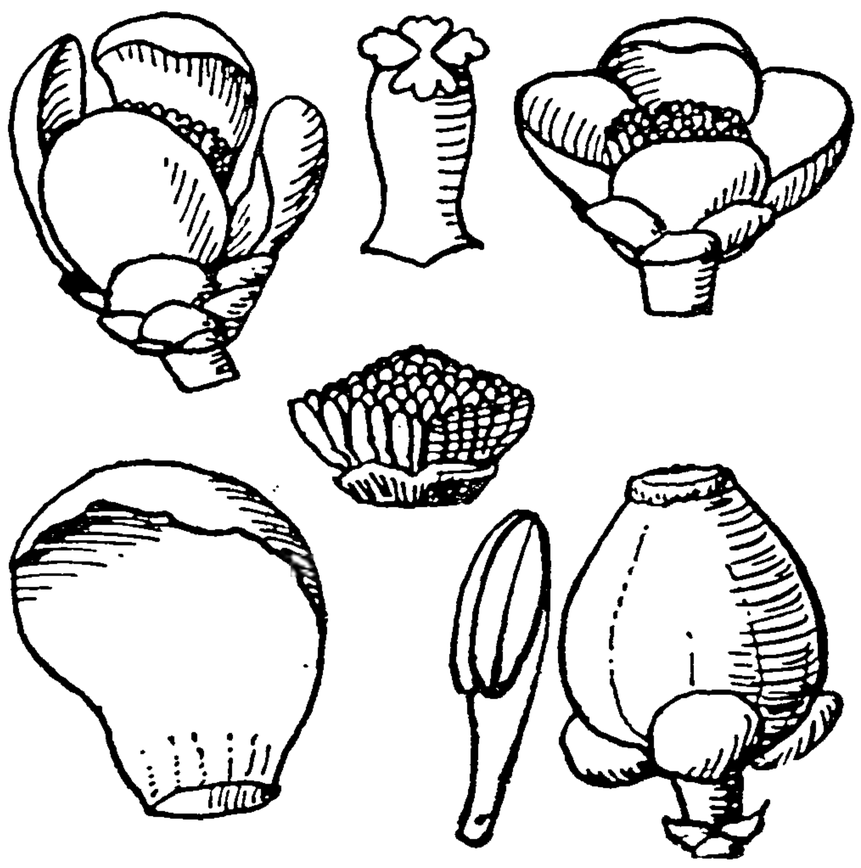
FAMILY 2. CLUSIACEAE — BALSAM-TREE FAMILY

Shrubs or trees. Leaves opposite: blades entire. Flowers mostly dioecious or polygamous. Calyx of 2–6 imbricate sepals. Corolla of 4–9 petals. Androecium of numerous stamens, the filaments wholly or partly united. Gynoecium of 2 or more united carpels. Fruit baccate, drupaceous, or capsular.—About 25 genera and over 250 species, mostly tropical.

1. CLUSIA L. Shrubs or trees, often epiphytic, at least when young. Leaf-blades leathery. Flowers solitary or few together. Petals 4–9. Ovary 8–10-celled. Capsule leathery or fleshy.—About 80 species, tropical American. —BALSAM-APPLES. FAT-PORKS. MONKEY-APPLES.—Incomplete specimens of both the following species were collected on Big Pine Key and Key West many years ago.

Flowers yellow: fruits slightly elongate or globular: stigmas 12–14. 1. *C. flava.*
Flowers white or pink: fruits depressed: stigmas 6–8. 2. *C. rosea.*

1. C. flava Jacq. Tree, sometimes 20 m. tall: leaf-blades cuneate-obovate, 1–1.5 dm. long, many-ribbed: sepals suborbicular: petals yellow, obovate, 2.5–3 mm. long: capsule slightly elongate or globular.—Hammocks, Key West, Fla.; not collected in recent years.—(*W. I.*)

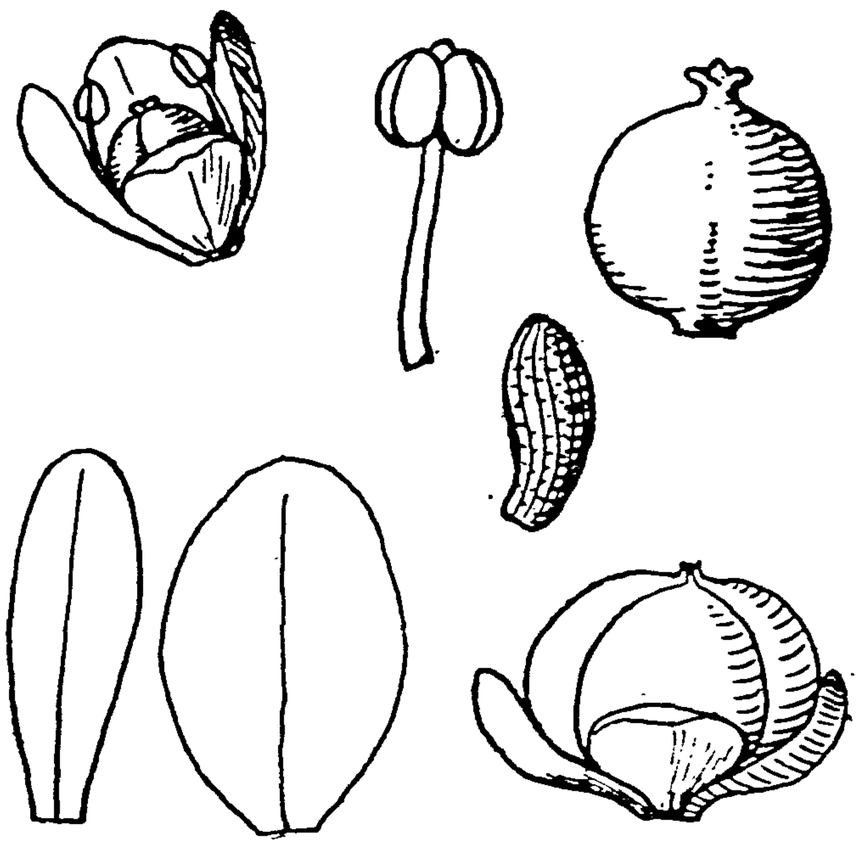


2. C. rosea L. Tree similar to *C. flava* in habit, but leaves rather larger: petals white or pink: capsule depressed.—Hammocks, Big Pine Key, Fla.; not recently collected.—(*W. I.*)—Among the several shrubs and trees discovered on the lower Florida Keys in the earlier part of the past century and then "lost," the two balsam-apples appear to be the only ones not yet rediscovered. They may yet be found in the hammocks not visited in recent years. Their discovery was due to the activities of a resident botanist, Dr. Blodget, of Key West.

Family 3. **ELATINACEAE** — Water-wort Family

Herbs or partly woody plants. Leaves opposite. Flowers perfect. Calyx of 2–5 imbricate sepals. Corolla of 2–5 petals. Androecium of 2–5, or sometimes 10, stamens. Gynoecium of 2–5 carpels. Fruit a capsule.—Two genera and 30 species, widely distributed.

1. **ELATINE** L. Wholly succulent plants. Leaf-blades commonly entire. Sepals ribless. Ovary 2–4-celled: styles 2–4. Capsule membranous, 2–4-celled.—About 10 species, natives of warm regions.

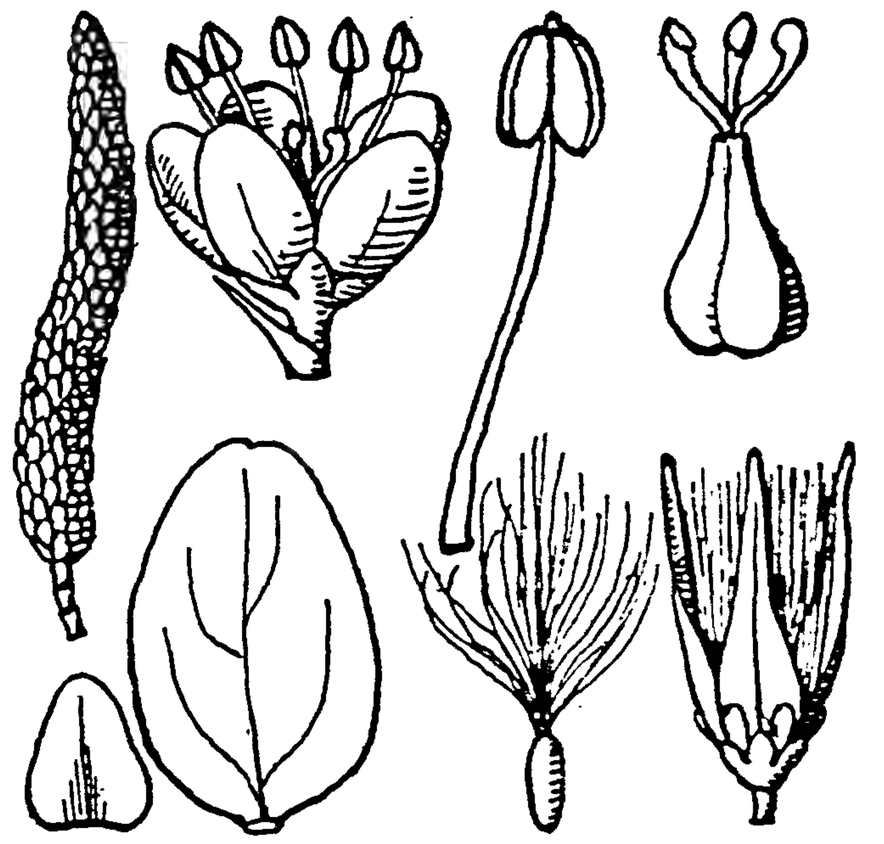


1. **E. americana** (Pursh) Arn. Stem 1–5 cm. long: leaf-blades cuneate-obovate to elliptic, 1–5 mm. long: flowers greenish: sepals 2, obtuse: petals 2: stamens 2; capsule subglobose, about 1 mm. in diameter.—(Water-wort. Mud-purslane.) — Ponds and slow streams, various provinces, Tenn. to Tex., Minn., Ont., and N. C.—Sum.—The petals may sometimes be pink-tinged. The plants, creeping on mud, resemble diminutive chickweeds and pimpernels.

Family 4. **TAMARICACEAE** — Tamarisk Family

Shrubs or trees, or partially herbaceous plants. Leaves alternate: blades entire, often scale-like. Flowers mainly perfect, sometimes in profuse panicles. Calyx of 5, or 4 or 6, sepals. Corolla of 5, or 4 or 6, petals. Androecium of 5 or many stamens. Gynoecium of 2–5 united carpels. Ovary 1-celled. Fruit a capsule—Four genera and 90 species, of Africa and Eurasia.

1. **TAMARIX** L. Irregularly branching evergreen shrubs or trees. Leaves scale-like, clasping or sheathing. Flowers borne in plume-like panicles. Capsule many-seeded.



1. **T. gallica** L. Small tree or shrub, with weak branches, the branchlets clothed with the imbricate leaves: panicles with numerous spikes: sepals about 0.5 mm. long: petals white or pinkish: capsule about 1 mm. long.—(Tamarisk.) — Roadsides, waste-places, and stream-banks, various provinces, Fla. to Tex., Ark., and S. C.—Nat. of Eu.—(*W. I.*)—Spr.–sum.—This species is widely cultivated and is naturalized in the Coastal Plain and adjacent provinces. It appears in several forms, varying with green or glaucous foliage, slender or stout branchlets and long or short racemes.

Family 5. **HYPERICACEAE** — St. John's-wort Family

Shrubs or herbs. Leaves opposite: blades mostly punctate, entire or nearly so, sometimes scale-like. Flowers perfect. Calyx of 4 or 5, sometimes unequal sepals. Corolla of 4 or 5, yellow, pink, or purple-tinged

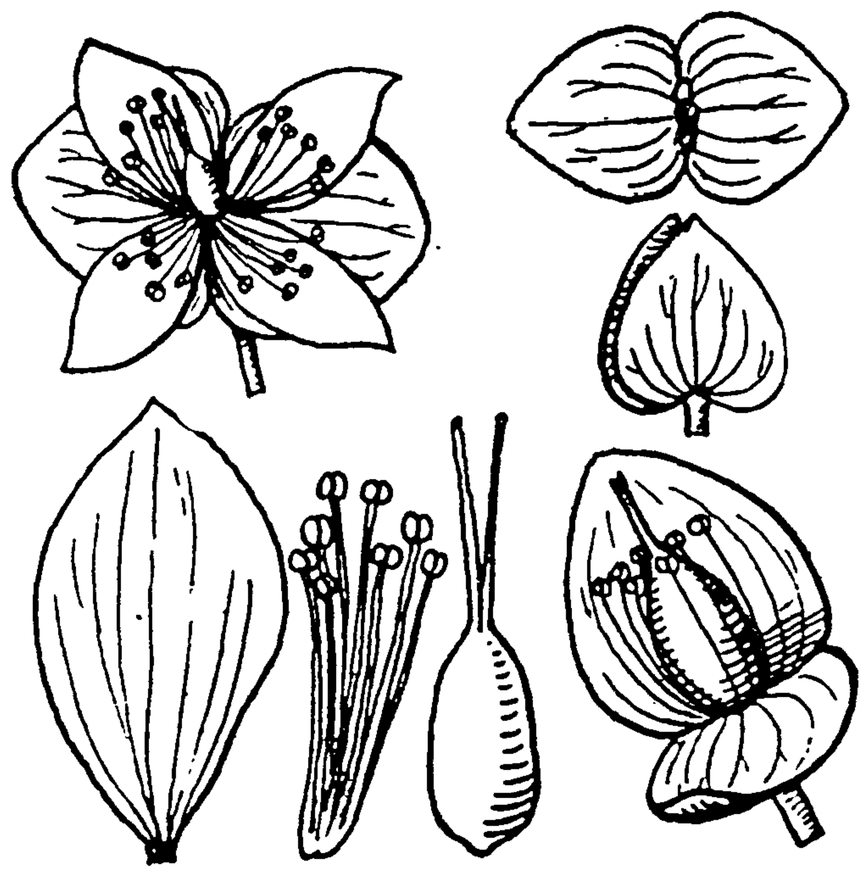
petals. Androecium of few or many stamens, sometimes grouped, the groups sometimes alternating with the glands. Gynoecium of 3–7 united carpels. Fruit a capsule.—Ten genera and more than 300 species, mostly in temperate and tropical regions.

Sepals 4, in more or less unequal pairs: petals mostly 4.
  Pairs of sepals very unequal in size or shape or both, the outer pair enclosing the capsule. 1. ASCYRUM.
  Pairs of sepals nearly equal in size and shape, much surpassed by the capsule. 2. CROOKEA.
Sepals and petals mostly 5.
  Petals yellow.
    Plants without basal branches, or with elongate ones with opposite leaves: petals deciduous: capsule not dehiscent to the base.
      Leaves with flat, more or less spreading blades. 3. HYPERICUM.
      Leaves reduced to erect or appressed, minute or slightly elongate scales, without blades. 4. SAROTHRA.
    Plants with clusters of short branches with crowded, decussate, bladeless leaves at the base, and wiry, remotely scaly flowering stems which terminate in slender-branched cymes: petals marcescent: capsule dehiscent to the base. 5. SANIDOPHYLLUM.
  Petals pink, sometimes tinged with green or purple. 6. TRIADENUM.

1. ASCYRUM L. Shrubs. Sepals 4, very unequal. Corolla yellow, Stamens not in groups. Styles relatively short. Capsule included in the calyx.—Seven species, American.—ST. PETER'S-WORTS. ST. ANDREW'S-CROSSES.

Styles 2: inner sepals very small, petal-like or obsolete.
  Peduncles reflexed at maturity: calyx without bractlets, conspicuously surpassing the leaves. 1. *A. pumilum.*
  Peduncles not recurved: calyx subtended by a pair of bractlets, not conspicuously surpassing the leaves.
    Outer sepals ovate at maturity: capsule included. 2. *A. hypericoides.*
    Outer sepals elliptic at maturity: capsule exserted at the tip. 3. *A. linifolium.*
Styles 3–4: inner sepals slightly smaller than the outer.
  Outer sepals obtuse or rounded at the apex.
    Leaf-blades predominately cuneate or obovate-cuneate, sessile: outer sepals suborbicular. 4. *A. cuneifolium.*
    Leaf-blades predominantly of an elliptic or oval type, somewhat clasping: outer sepals broadly ovate-orbicular. 5. *A. stans.*
  Outer sepals acute or acuminate at the apex.
    Leaf-blades predominately of an ovate type: outer sepals quite different from the leaves. 6. *A. Edisonianum.*
    Leaf-blades predominately of an elliptic or linear-elliptic type: outer sepals resembling the leaves. 7. *A. tetrapetalum.*

1. A. pumilum Michx. Shrub, depressed, the short stems often matted: leaf-blades oval, obovate, or linear-elliptic, 3–9 mm. long: outer sepals ovate to suborbicular, 6–10 mm. long, the inner obsolete or nearly so: petals yellow, obovate: capsule about 5 mm. long.—Pinelands, Coastal Plain, Fla. and Ga. to Miss.—Spr.–sum.



2. A. hypericoides L. Shrub, diffuse: leaf-blades linear, often narrowly so, 5–15 mm. long: outer sepals cuneate-obovate to elliptic or elliptic-lanceolate, 7–9 mm. long, the inner petaloid: petals pale-yellow: capsule 7–8 mm. long.—(ST. ANDREW'S-CROSS.)—Dry woods, thickets, and hammocks, various provinces, Fla. to Tex., Nebr., and Mass.—(*W. I.*)—Spr.–fall or all year.

3. **A. linifolium** Spach. Shrub, mostly erect: leaf-blades linear-spatulate to oblanceolate, elliptic, or obovate-elliptic, 1–3.5 cm. long: outer sepals ovate to elliptic-ovate, 6–9 mm. long, the inner petaloid: petals bright-yellow: capsule 5–8 mm. long.—Pinelands, Coastal Plain, Fla. to Tex., Ark., and S. C.—(*W. I.*)—Spr.–fall or all year.

4. **A. cuneifolium** Chapm. Shrub 1–2 dm. tall: leaf-blades cuneate or obovate, 5–20 mm. long: inner sepals elliptic or nearly so: petals yellow: capsule broadly ovoid.—Low pinelands, Coastal Plain, Fla. to Miss.—Sum.–fall.

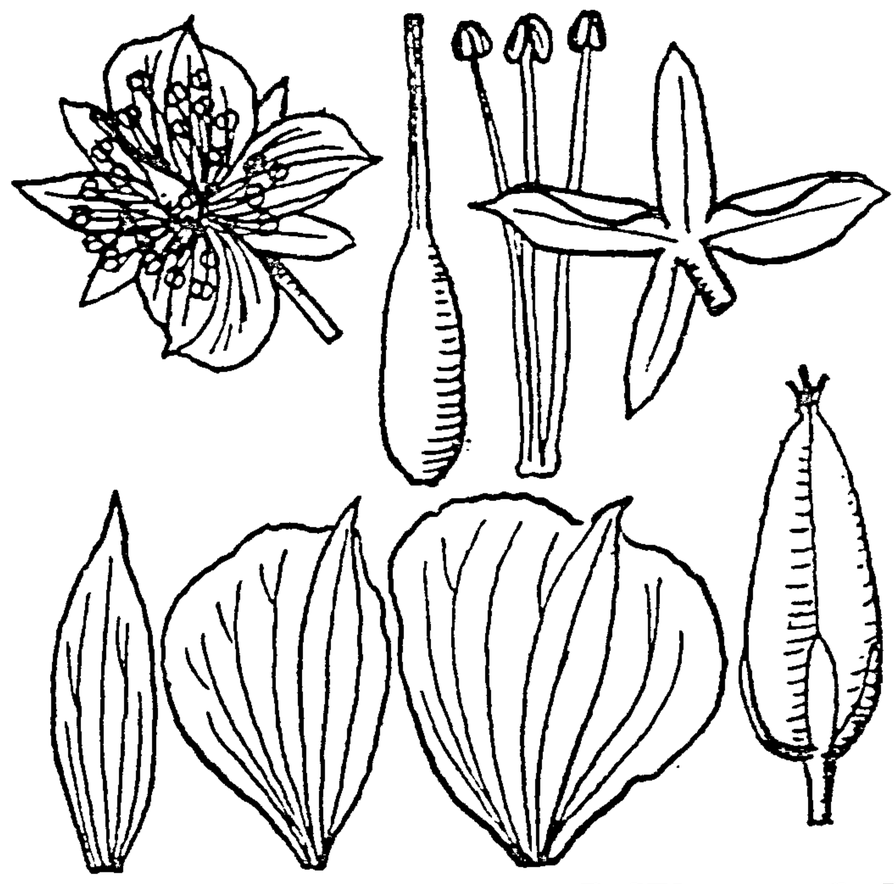
5. **A. stans** Michx. Shrub 3–9 dm. tall, the stem simple above the base or sparingly branched: leaf-blades broadly elliptic, varying to obovate obtuse: petals bright-yellow: inner sepals lanceolate, short-acuminate: capsule ovoid, 8–10 mm. long.—Acid swamps and moist sandy soil, Coastal Plain and adj. provinces, rarely Blue Ridge, Fla. to Tex., Tenn., and N. Y.—Sum.–fall.

6. **A. Edisonianum** Small. Shrub 3–6 dm. tall, the stem often much-branched: leaf-blades narrowly elliptic to linear-elliptic, acute: petals yellow: inner sepals linear-lanceolate, long-acuminate: capsule narrowly ovoid, 4–6 mm. long.—Pinelands S pen. Fla.—Spr.–sum.

7. **A. tetrapetalum** (Lam.) Vail. Shrub 2–9 dm. tall: leaf-blades ovate to oval: outer sepals resembling the leaf-blades, the inner elliptic to lanceolate: petals bright-yellow; capsule about one-half as long as the sepals.—Low pinelands and swamps, Coastal Plain, Fla. and S Ga.—Spr.–fall or all year.

2. **CROOKEA** Small. Shrubs resembling species of *Ascyrum,* evergreen. Sepals 4, nearly equal. Stamens numerous: filaments distinct. Styles relatively long. Capsule not included. One species.

1. **C. microsepala** (T. & G.) Small. Branching shrub, with erect, ascending, or decumbent stems less than 1 m. tall: leaves numerous; blades cuneate to linear-cuneate or narrowly elliptic, 6–14 mm. long, rounded at the apex, often slightly revolute, sessile: flowers showy, 2–2.5 cm. broad: sepals linear to elliptic, obtuse: petals 4, yellow, unequal, the smaller elliptic, the larger obovate, obtuse: capsules conic-elliptic, 7–8 mm. long, much surpassing the sepals: seeds less than 1 mm. long, striate and pitted. [*Ascyrum microsepalum* T. & G. *Hypericum microsepalum* (T. & G.) A. Gray]—Low pinelands, edges of woods, and fence-rows, Coastal Plain, N Fla. and S Ga.—Spr.



3. **HYPERICUM** [Tourn.] L. Herbs or shrubs. Leaves more or less black-dotted. Sepals 5, essentially equal. Corolla yellow: petals inequilateral or nearly equilateral. Stamens mostly in groups. Style relatively long. Capsule not included.—About 210 species, widely distributed.—ST. JOHN'S-WORTS.—Some species are used medicinally.

Stamens few or several, 5–12, usually in 3 clusters: petals copper-yellow.
I. CANADENSIA.

Stamens numerous, 15–40, distinct or in clusters.
Styles 3, or rarely 4: capsule 3-celled or 1-celled and with 3 more or less intruding placentae.

Capsule 1-celled or incompletely 3-celled.
Capsule with parietal placentae, 1-celled. II. VIRGATA.
Capsule incompletely 3-celled by the intrusion of the placentae. III. AMBIGUA.
Capsule completely 3-celled.
Herbs, perennial, often stoloniferous: stem simple or sparingly branched. IV. MACULATA.
Shrubs with tap roots: stem much-branched. V. PROLIFICA.
Styles 5: capsule 5-celled. VI. LOBOCARPA.

I. CANADENSIA

Leaf-blades linear. 1. *H. canadense.*
Leaf-blades ovate, oval, or oblong.
Sepals obtuse or somewhat acute: leaf-blades obtuse. 2. *H. mutilum.*
Sepals acuminate: leaf-blades acute. 3. *H. gymnanthum.*

II. VIRGATA

Styles distinct: stigmas capitate.
Foliage glabrous: sepals not ciliate.
Sepals conspicuously imbricate, at least the outer broadest at the base: leaf-blades broadest about the middle. 4. *H. denticulatum.*
Sepals not conspicuously imbricated, at least the outer broadest about the middle: leaf-blades broadest about the base. 5. *H. acutifolium.*
Foliage tomentose: sepals ciliate. 6. *H. setosum.*
Styles coherent, at least below: stigmas minute.
Corolla 18 mm. broad or more: capsules over 6 mm. high. 7. *H. dolabriforme.*
Corolla less than 18 mm. broad; capsules less than 6 mm. high.
Capsules broadest at the top, about as long as the sepals. 8. *H. turgidum.*
Capsules broadest at the base.
Sepals obtuse: seeds striate and pitted. 9. *H. opacum.*
Sepals acute or acutish: seeds transversely wrinkled. 10. *H. cistifolium.*

III. AMBIGUA

Sepals very small or at least not foliaceous.
Leaves never in conspicuous axillary clusters; blades relatively broad.
Sepals obtuse or merely acutish.
Sepals less than ½ as long as the petals: capsules 6–7 mm. long. 11. *H. nudiflorum.*
Sepals over ½ as long as the petals: capsules 12–13 mm. long. 12. *H. apocynifolium.*
Sepals manifestly acute or acuminate. 13. *H. adpressum.*
Leaves in conspicuous axillary clusters; blades narrow.
Leaves of the axillary clusters mostly much smaller than the main pair; blades neither subulate, nor fleshy.
Cymes in terminal congested corymbs: buds broadly ovoid: mountain species. 14. *H. glomeratum.*
Cymes in elongated narrow panicles: buds conic: lowland species.
Leaves linear-oblong, spatulate or oblanceolate. 15. *H. ambiguum.*
Leaves narrowly linear or narrowly linear-spatulate. 16. *H. galioides.*
Leaves of the axillary clusters about as large as the main pair or slightly shorter; blades subulate or linear-subulate, fleshy, about as thick as wide.
Sepals as long as the petals or fully ½ as long: leaves mostly over 10 mm. long. 17. *H. fasciculatum.*
Sepals less than ½ as long as the petals: leaves mostly less than 10 mm. long. 18. *H. aspalathoides.*
Sepals foliaceous.
Leaf-blades cordate-clasping. 19. *H. myrtifolium.*
Leaf-blades more or less narrowed to the sessile or short petioled base.
Flowers sessile: buds ovoid-globose. 20. *H. aureum.*
Flowers pedicelled: buds conic. 21. *H. splendens.*

IV. MACULATA

Corolla less than 15 mm. broad.
  Leaf-blades short-petioled or merely sessile, with a rounded base. — 22. *H. subpetiolatum.*
  Leaf-blades sessile and more or less clasping. — 23. *H. punctatum.*
Corolla over 15 mm. broad.
  Upper leaves and bracts with ovate or ovate-lanceolate blades: petals spotted all over. — 24. *H. pseudomaculatum.*
  Upper leaves and bracts with oblong blades: petals spotted around the edges.
    Sepals and petals merely dotted: capsules usually less than 6 mm. high. — 25. *H. perforatum.*
    Sepals and petals striped with black: capsules usually over 6 mm. high.
      Corolla about 3 cm. broad: styles filiform. — 26. *H. graveolens.*
      Corolla 1.5–2 cm. broad: styles subulate. — 27. *H. Mitchellianum.*

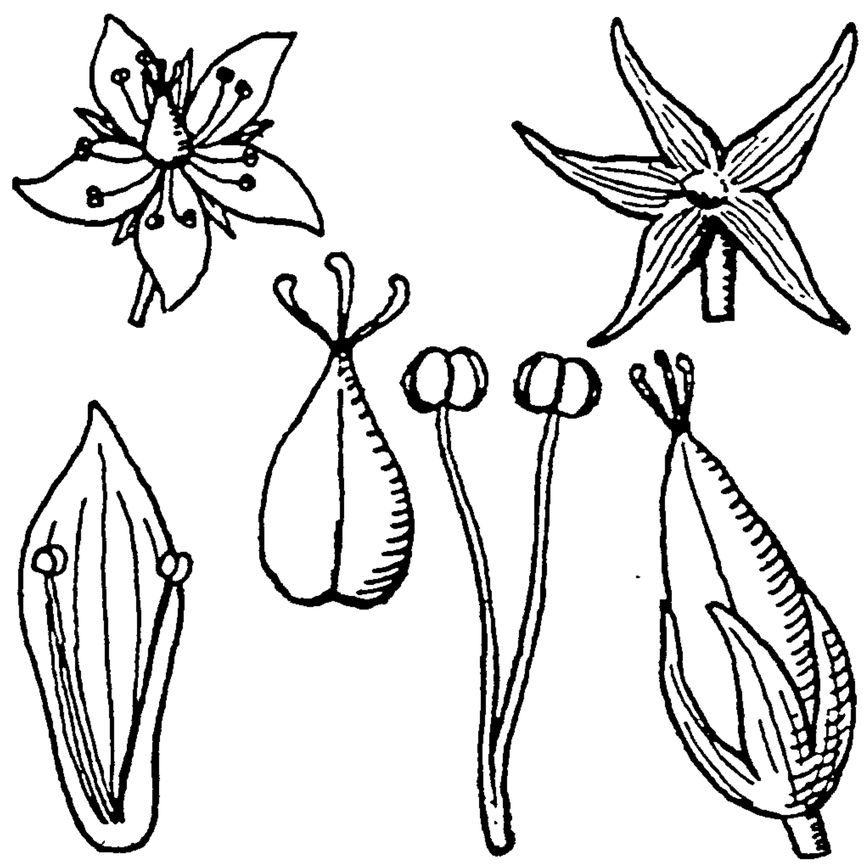
V. PROLIFICA

Stems diffusely spreading or decumbent. — 28. *H. Buckleyi.*
Stems erect, relatively tall.
  Flowers few in narrow panicles: corolla over 1.5 cm. broad. — 29. *H. prolificum.*
  Flowers numerous in rather corymb-like panicles: corolla less than 1.5 cm. broad. — 30. *H. densiflorum.*

VI. LOBOCARPA

Much-branched shrub, with numerous small flowers and a 5-lobed capsule. — 31. *H. lobocarpum.*

1. **H. canadense** L. Plant 1–6 dm. tall: leaf-blades 3-nerved: sepals lanceolate or linear-lanceolate, 3–5 mm. long: petals 3–6 mm. long: capsule 4–8 mm. long, acute.—Moist, often acid, soil, various provinces, rarely Coastal Plain, Ga. to Ala., Wis., Man., and Newf.—Sum.



2. **H. mutilum** L. Plant 1–8 dm. tall: leaf-blades oblong-ovate to ovate, or sometimes oblong, 5-nerved: sepals elliptic to elliptic-lanceolate: petals about 3.5 mm. long: capsule 2–3 mm. long, obtuse.—(DWARF ST. JOHN'S-WORT.)—Wet sand and miry places, various provinces, Fla. to Tex., Man., and N. S.—Sum.–fall.

3. **H. gymnanthum** Engelm. & Gray. Plant 2–9 dm. tall: leaf-blades ovate, 5–7 nerved: sepals lanceolate: petals 3–6 mm. long: capsule about 4 mm. long.—Moist places and wet sandy soil, various provinces, Fla. to Tex., Mo., Mich., and N. C.—Sum.

4. **H. denticulatum** Walt. Plant perennial, 2–9 dm. tall: leaf-blades elliptic or nearly so, 1–3 cm. long, acute, (oval and relatively shorter, with the sepals oval to ovate, in *H. denticulatum ovalifolium*): sepals more or less foliaceous, lanceolate, elliptic-lanceolate or slightly broadened upward, 4–10 mm. long: petals copper-yellow, 5–10 mm. long: capsule ovoid, about 4 mm. long. [*H. virgatum* Lam.]—(COPPERY ST. JOHN'S-WORT.)—Acid sandy soil and pinelands, various provinces, Fla. to Ill. and N. J.—Sum.

5. **H. acutifolium** Ell. Plant perennial, 2–6 dm. tall: leaf-blades narrowly lanceolate to linear-lanceolate, 1–2.5 cm. long, acuminate: sepals linear to linear-lanceolate, 3.5–5 mm. long: petals copper-yellow, 5–6 mm. long: capsule ovoid, about 4 mm. long.—Low pinelands, Coastal Plain and occasionally adj. provinces, Fla. to Miss., Tenn., and N. C.—Sum.

6. **H. setosum** L. Plant annual or biennial, 3–6 dm. tall: leaf-blades elliptic, oval or ovate-lanceolate, 3–15 mm. long: sepals oval, ovate, or ovate-lanceo-

late, 2.5–3.5 mm. long: petals yellow, 5–6 mm. long: capsule oval or ovoid-oval, 4–5 mm. long. [*H. pilosum* Walt.]—Moist pinelands, Coastal Plain, Fla. to La. and N. C.—Sum.

7. **H. dolabriforme** Vent. Plant perennial, woody, 2–5 dm. tall: leaf-blades linear or nearly so, 2–5 cm. long: sepals foliaceous, lanceolate to ovate-lanceolate, 6–10 mm. long: petals yellow, 8–11 mm. long: capsule conic-ovoid, 7–9 mm. long.—Dry hillsides, various provinces N of Coastal Plain, Ala. to Mo., Ky., and Ga.—Spr.–sum.

8. **H. turgidum** Small. Plant perennial, woody, 3–6 dm. tall: leaf-blades almost linear to linear-lanceolate, 1–2.5 cm. long: sepals ovate to elliptic, 3–4 mm. long: petals yellow, 6–8 mm. long: capsule subglobose, about 3.5 mm. long, turgid.—Wooded slopes, Appalachian provinces, Ala.—Sum.

9. **H. opacum** T. & G. Plant perennial, woody, 3–16 dm. tall: leaf-blades elliptic to elliptic-lanceolate, or sometimes linear-elliptic, 1–3 cm. long: sepals orbicular or obovate to elliptic-ovate, 2.5–4 mm. long: petals bright-yellow, about 5 mm. long: capsule ovoid, 5–6 mm. long.—Low pinelands, Coastal Plain, Fla. to La., and S. C.—Sum.

10. **H. cistifolium** Lam. Plant woody, 3–9 dm. tall: leaf-blades linear-elliptic to linear-lanceolate, or sometimes narrowly elliptic, 1.5–8 cm. long: sepals ovate to lanceolate, 3–4 mm. long: petals cuneate to obovate-cuneate, 5–8 mm. long, bright-yellow: capsule globose or globose-ovoid, 4–6 mm. long. [*H. sphaerocarpum* Michx.]—River-banks, and rocky-slopes, various provinces, Ala. to Miss., Kans., Ia., and Ohio.—Sum.

11. **H. nudiflorum** Michx. Plant woody, 3–10 dm. tall: leaf-blades elliptic to elliptic-lanceolate, 1.5–6 cm. long: sepals elliptic to elliptic-oblanceolate, 3–3.5 mm. long: petals bright-yellow, 7–8 mm. long: capsule conic-ovoid.—Sandy soil, Coastal Plain and rarely adj. provinces, Fla. to Ala. and N. C.—Sum.

12. **H. apocynifolium** Small. Plant 4–7 dm. tall: leaf-blades elliptic or nearly so, 2–4 cm. long: sepals spatulate, elliptic or oval, 4–5 mm. long: petals elliptic, 7–8 mm. long, yellow; capsule ellipsoid-conic.—Swamps, Coastal Plain, Fla. to Tex., Ark., and Ga.—Sum.

13. **H. adpressum** Bart. Plant 2–6 dm. tall: leaf-blades narrowly elliptic to lanceolate, 2–6 cm. long, conspicuously veined: sepals lanceolate to ovate-lanceolate, 4–6 mm. long: petals cuneate, 6–8 mm. long, bright-yellow: capsule ovoid, the body 5–6 mm. long.—(CREEPING ST. JOHN'S-WORT.)—Swamps and pond-margins, various provinces, Ga. to La., Tenn., and Mass.—Sum.

14. **H. glomeratum** Small. Shrub 3–10 dm. tall: leaf-blades narrowly elliptic to linear-elliptic or nearly linear, 2–4 cm. long, sessile: sepals rather foliaceous, narrowly elliptic to linear-elliptic, 5–6 mm. long: petals bright-yellow, cuneate-spatulate, fully 1 cm. long: capsules densely clustered, ellipsoid-ovoid, 5–6 mm. high.—Rocky woods, Grandfather Mtn. and Table Rock, in the Blue Ridge of N. C.—Sum.

15. **H. ambiguum** Ell. Shrub 0.5–1.5 m. tall, evergreen: leaf-blades linear-elliptic to spatulate, 1–2.5 cm. long: sepals linear or slightly broadened upward, 3–5 mm. long: petals obliquely obovate or cuneate, almost laterally apiculate, 5–7 mm. long, bright-yellow: capsule almost conic, 5–6 mm. high. [*H. galioides pallidum* C. Mohr.]—River swamps and stream-banks, Coastal Plain, Fla. to Miss. and S.C.—Spr.–sum.

16. H. galioides Lam. Shrub 3–18 dm. high or taller, evergreen: leaf-blades narrowly linear or slightly broadened upward, 0.5–1.5 cm. long: sepals linear or linear-spatulate, 3–4 mm. long: petals cuneately narrowed, obliquely or almost laterally pointed, 4–7 mm. long, bright-yellow: capsule conic, 5–6 mm. long, acute.—Low pinelands and swamps, Coastal Plain and rarely adj. provinces, Fla. to Miss., Tenn., and N. C. (or Del.?).—Sum.–fall.

17. H. fasciculatum Lam. Shrub 9–45 dm. tall, evergreen: leaves numerous, a bunch usually clustered in the axils of the larger ones; blades leathery, linear-filiform, 1–2 cm. long, or shorter in the clusters: sepals linear, 3–4 mm. long, about 1 mm. wide: petals bright-yellow, obliquely apiculate, 7–8 mm. long: capsule ovoid or conic-ovoid, 4–5 mm. long. —(SAND-WEED.)—Ponds and low pinelands, Coastal Plain, Fla. to Tex. and N. C.—Spr.–fall.—A growth of this shrub in a pond indicates a hard sand bottom, hence the common name. It often reaches tree-like form in swamps near the gulf coast.

18. H. aspalathoides Willd. Shrub 2–8 dm tall, evergreen: leaves very numerous, with clusters of small ones borne in the axils of the large ones; blades linear-subulate to subulate, 5–8 mm. long, or shorter in the clusters: sepals linear or nearly so, 2–3 mm. long: petals 6–7 mm. long, intense orange-yellow: capsule 4 mm. long.—Pinelands and prairies, Coastal Plain, Fla. to La. and N. C.—Spr.–sum.—The flowers of some of the St. John's-worts are of such a bright yellow that they seem to irritate the eye. Those of this species come in that class, particularly when the plants are in open sunny places.

19. H. myrtifolium Lam. Shrub 3–10 dm. tall, evergreen: leaf-blades ovate to elliptic-ovate, or ovate-lanceolate or rarely nearly elliptic, 1–3 cm. long: sepals foliaceous, ovate, 5–8 mm. long: petals obovate, 12–15 mm. long, bright-yellow: capsule pyramidal-ovoid, incompletely 3-celled or rarely 4-celled, 5–6 mm. high.—Low pinelands and ponds, Coastal Plain, Fla. to Miss. and S. C. —Spr.–sum.

20. H. aureum Bartr. Shrub 6–12 dm. tall: leaf-blades elliptic to ovate-elliptic, 2.5–7 cm. long, glaucous beneath: flowers very showy, usually solitary, sometimes 3 in terminal or axillary cymes: sepals very unequal, broadened upward: petals quite oblique, 15–23 mm. long, golden-yellow: capsule conic, 1.3–2 cm. high, acuminate at the apex. (GOLDEN ST. JOHN'S-WORT.)—Bluffs and stream-banks, often in calcareous soil, various provinces, rarely Coastal Plain, Ga. to Tex., Tenn., and S. C.—Sum.

21. H. splendens Small. Shrub 0.5–1.5 m. tall: leaf-blades elliptic, 1.5–2.5 cm. long, glaucous, especially beneath: flowers very showy, several or many in terminal or axillary cymes: sepals unequal, elliptic, firm, apiculate, the outer about 8 mm. long, the inner 5 mm. long: petals golden-yellow, cuneate, oblique, 1.5–2 cm. long: capsules often crowded, conic, 1.5 cm. high, acuminate at the apex.—Granite rocks, Stone Mt. on the Piedmont of Ga.—Sum.

22. H. subpetiolatum Bicknell. Plant bright-green, heavy-scented, 2–8 dm. tall: leaf-blades thin or thinnish, elliptic, varying to elliptic-obovate or elliptic-ovate, 3–6 cm. long, narrowed, often gradually so, at the base, short-petioled: sepals becoming 3–4 mm. long, the narrower ones linear, the broader elliptic-lanceolate, all mostly acute: petals dull-yellow, 5–7 mm. long, sparingly black-streaked: capsule ovoid or globose-ovoid, 4–6 mm. long.—Woods and thickets, various provinces, Ga. to Miss. and Me.—Sum.

23. H. punctatum Lam. Plant dark-green, not heavy-scented, 2–9 dm. tall: leaf-blades thick, elliptic, varying to elliptic-obovate to elliptic ovate, 1–7 cm. long, obtuse or retuse at the apex, abruptly narrowed or subcordate, and often partly clasping at the base: sepals becoming 3.5–4.5 mm. long, narrower ones elliptic, the broader elliptic-lanceolate or elliptic-ovate, all acute,

sometimes abruptly pointed: petals deep-yellow, 5–7 mm. long, copiously black-streaked: capsule ovoid, 3–5 mm. long. [*H. maculatum* Walt.]—(SPOTTED ST. JOHN'S-WORT.)—Dry soils or hillsides, various provinces, Fla. to Tex., Kans., Ont., and Que.—Sum.

24. **H. pseudomaculatum** Bush. Plant bright-green, not heavy-scented 4–9 dm. tall: leaf-blades ovate to lanceolate or nearly elliptic, 1.5–4.5 cm. long, acutish or obtuse, often revolute, sessile and clasping by the broad cordate base: sepals becoming 5–6 mm. long, the narrower ones lanceolate, the broader ovate-lanceolate or ovate, all acuminate, glandular-margined: petals copper-yellow, 11–15 mm. long, black-streaked: capsule ovoid, 4–5 mm. long.—Woods and dry soil, various provinces, Fla. to Tex., Mo., Ill., and S. C.—Spr.–sum.

25. **H. perforatum** L. Plant 4–7 dm. tall: leaf-blades linear-elliptic, 0.5–2 cm. long, glandular-punctate, those of the main stem usually subtending leafy branches: sepals linear-lanceolate, 3–4 mm. long, acute, glandular-punctate: corolla deep-yellow, 19–24 mm. wide; petals toothed on one side from the middle to the apex, bearing black glands near the teeth: capsule ovoid, oblique, 6–8 mm. high.—(ST. JOHN'S-WEED.)—Dry fields and waste-places, various provinces, nearly throughout U. S. and S Can. Nat. of Eu.—Sum.

26. **H. graveolens** Buckl. Plant erect or decumbent, 2–9 dm. tall: leaf-blades ovate to elliptic, often broader or subcordate at the base: sepals lanceolate to linear-lanceolate, 6–8 mm. long, acuminate: corolla copper-yellow, about 3 cm. broad; petals decidedly obliquely narrowed below the middle, faintly streaked with brown on one side: capsule conic-ovoid, 10–12 mm. long.—Moist woods and open slopes, Blue Ridge, N. C. and Tenn.—Sum.—Most abundant at about 6,000 feet alt.

27. **H. Mitchellianum** Rydb. Plant similar to *H. graveolens*: leaf-blades thickish, elliptic or ovate-elliptic, 2–6 cm. long, obtuse, mostly rounded at the base: sepals ovate to lanceolate, 5–6 mm. long, acute: corolla copper-yellow, 1.5–2 cm. broad; petals delicate, decidedly spotted with brown on one side: capsule ovoid, 8–10 mm. long.—(BLUE RIDGE ST. JOHN'S-WORT.)—Moist mtn. slopes, Blue Ridge, N. C. and Tenn. to Va.—Sum.—Most abundant at 4,000–5,000 feet alt.

28. **H. Buckleyi** M. A. Curtis. Plant 1–3 dm. tall, decumbent or ascending, often diffusely matted: leaf-blades obovate, elliptic-obovate, or elliptic, 0.5–2 cm. long, rounded at the apex or retuse: sepals obovate or spatulate, 4–5 mm. long, obtuse: corolla yellow, 2–2.5 cm. broad: petals rather delicate, about twice as long as the sepals: capsule conic, 6–10 mm. long, 3-celled.—(MOUNTAIN ST. JOHN'S-WORT.)—Cliffs and rocky mtn. summits, Blue Ridge and adj provinces, Ga. to N. C.—Sum.

29. **H. prolificum** L. Shrub 3–12 dm. tall, the branches narrowly 2-winged leaf-blades narrowly elliptic or rarely lanceolate, 2–8 cm. long, short-petioled: cymes few-flowered, short-peduncled, in cylindric panicles: sepals mostly obovate, 4–6 mm. long: corolla deep-yellow, 2–2.5 cm. broad: capsule conic or narrowly ovoid, 8–10 mm. long, acute.—(BROOM-BRUSH. SHRUBBY ST. JOHN'S-WORT.)—Rocky and sandy woods and stream-banks, often in calcareous soil, various provinces, rarely Coastal Plain, Ga. to Miss., Ark., Minn., and N. Y.—Sum.

30. **H. densiflorum** Pursh. Shrub 6–24 dm. tall: leaf-blades linear, linear-oblanceolate, or linear-elliptic, 1–5 cm. long, acute: sepals unequal, elliptic to elliptic-lanceolate, 2–2.5 mm. long: corolla bright-yellow, 1–1.5 cm. broad; petals obliquely pointed: capsule ovoid, 4–6 mm. long, slightly 3-lobed, completely 3-celled.—(BUSHY ST. JOHN'S-WORT.)—Acid swamps and marshes, various provinces, Fla. to Tex., Mo., and N. J.—Sum.

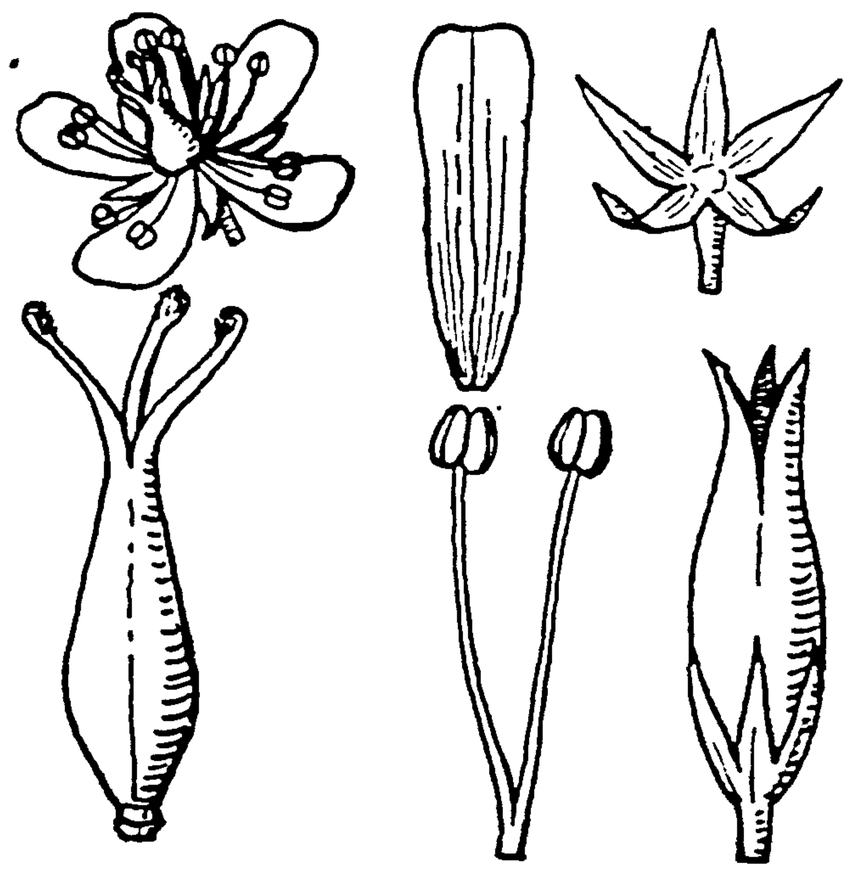
31. **H. lobocarpum** Gattinger. Shrub 1–2 m. tall: leaf-blades narrowly elliptic or oblanceolate, 2–7 cm. long: flowers numerous: sepals elliptic to obovate-elliptic, 2.5–3.5 mm. long, rather obtuse: corolla yellow, 1–1.5 cm. broad: petals rather cuneate: capsule 5-celled, 5-lobed, 5–7 cm. long, separating into 5 carpels at maturity.—Swamps and low grounds, Coastal Plain, Tenn. and Blue Ridge, N. C.—Spr.–sum.

4. **SAROTHRA** L. Wiry scaly-leaved annual herbs. Sepals 5, equal or nearly so. Stamens grouped. Styles relatively long. Capsule exserted.—Two species, of eastern North America.

Flowers sessile or nearly so: sepals much shorter than the conic capsules. 1. *S. gentianoides.*

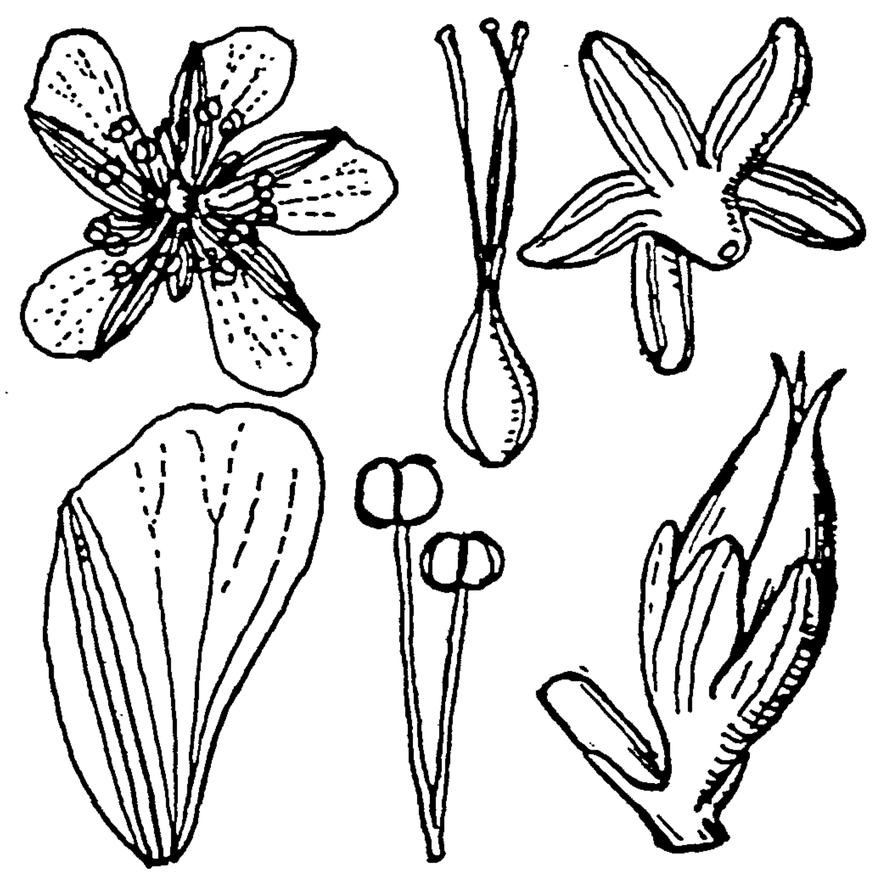
Flowers pedicelled: sepals and ovoid or oval-ovoid capsule about equal in length, or sepals slightly shorter. 2. *S. Drummondii.*

1. **S. gentianoides** L. Stem 1–5 dm. tall: leaves scale-like, appressed, much shorter than the internodes, often subulate or those on the lower part of the stem sometimes linear or narrowly elliptic: sepals linear or linear-lanceolate, 2–3 mm. long: corolla yellow or orange, 4–8 mm. broad: stamens 5–10: capsule conic, 4–5 mm. long.—(PINEWEED. ORANGE-GRASS.)—Sandy and rocky soil in fields, pastures, and on roadsides, various provinces, Fla. to Tex., Ont., and Me.—Sum.–fall.—Sometimes used medicinally.



2. **S. Drummondii** Grev. & Hook. Stem 1–6 dm. tall: leaves scale-like, but longer than the internodes, narrowly linear or linear-subulate, erect or strongly ascending: sepals linear-lanceolate, 3–4 mm. long: corolla deep-yellow, 10–12 mm. broad: stamens 10–20: capsule ovoid or oval-ovoid.—Dry soil, pastures, and hillsides, various provinces, Fla. to Tex., Kans., and Va.—Sum.—Rare E.

5. **SANIDOPHYLLUM** Small. Biennial or perennial herbs. Leaves minutely pustulate, rather succulent: blades very narrow, those of the flowering stem erect or appressed. Sepals unequal, 2–4-ribbed. Corolla yellow: petals with the midnerve nearly lateral and an oblique blade on one side. Stamens grouped in 4's. Styles filiform. Capsule invested by the persistent perianth at the base, the 3 valves distinct.—One species.

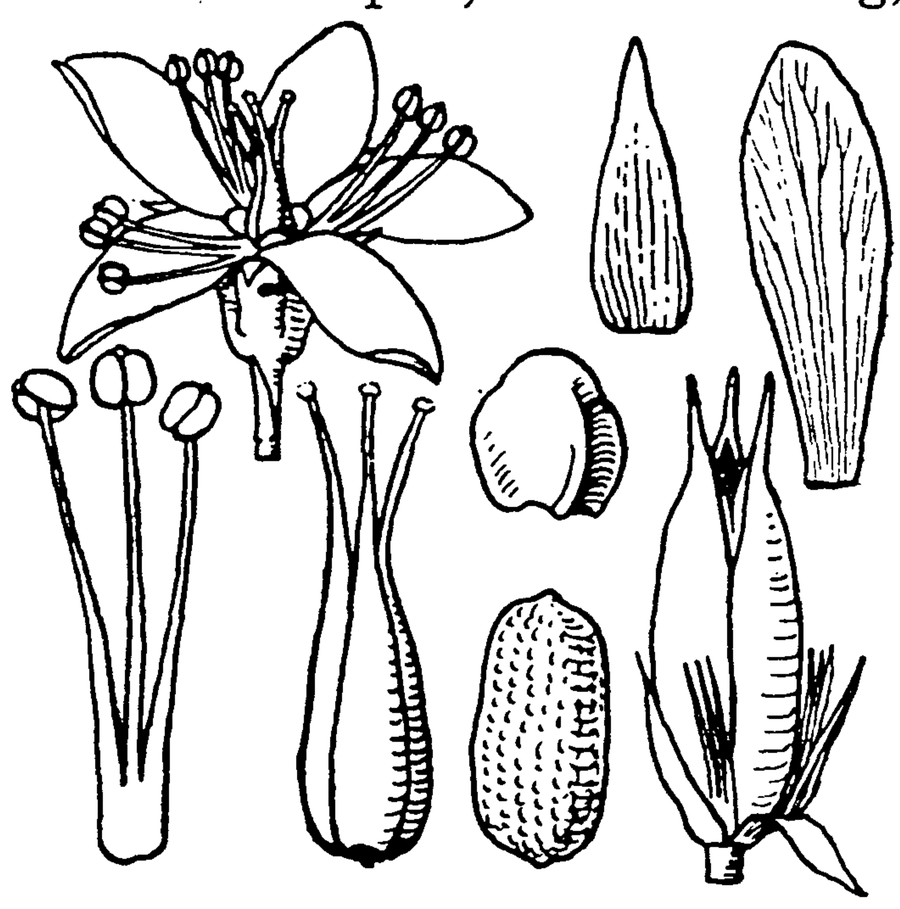


1. **S. cumulicola** Small. Flowering stems few or many together, wiry, 2–7 cm. tall, with the leafy shoots on the caudex-like base: leaves linear-subulate, 1–6 mm. long: sepals broadly linear to ovate, 1–1.5 mm. long: petals yellow, 3–4 mm. long: capsule 5–6 mm. long, subulate-tipped, brown.—Scrub S pen. Fla.—All year.—The plants grow only in the white sand of the scrub and resembles some species of yellow-flax (*Cathartolinum*) in habit as well as the color and size of the flowers.

5. **TRIADENUM** Raf. Leafy perennial herbs, resembling species of *Hypericum*. Corolla pink, sometimes tinged with green or purple. Sepals 5, equal. Stamens mostly 9, grouped in 3's, the filaments of each group well united. Styles relatively long. Capsule exserted. Three species, of eastern North America.—Sum.—MARSH ST. JOHN'S-WORTS.

Filaments united near the base. 1. *T. virginicum.*
Filaments united to above the middle.
  Leaf-blades sessile, truncate or subcordate at the base. 2. *T. longifolium.*
  Leaf-blades petioled, narrowed at the base. 3. *T. petiolatum.*

1. **T. virginicum** (L.) Raf. Stem 2–6 dm. tall: leaf-blades elliptic or ovate, 2–10 cm. long, obtuse, clasping: sepals lanceolate to elliptic, 5–6 mm. long, acute: petals obovate to oblanceolate or nearly elliptic, 8–10 mm. long, acute, delicately nerved: capsule ellipsoid, 8–10 mm. long.—Acid bogs and sandy swamps, various provinces, Fla. to La., Man., and Lab.



2. **T. longifolium** Small. Stem 3–6 dm. tall: leaf-blades oblanceolate to elliptic: sepals lanceolate or linear-lanceolate, 3–4 mm. long, acuminate: petals broadened upward, 4–5 mm. long: capsule ellipsoid, about 1 cm. long.—Swamps and low grounds, Coastal Plain, Ga. to Ala. and Ky.

3. **T. petiolatum** (Walt.) Britton. Stem 3–10 dm. tall: leaf-blades elliptic or narrowly elliptic, 2–15 cm. long: sepals elliptic or nearly so 2.5–3.5 mm. long, obtuse: petals elliptic-obovate, 4–6.5 mm. long: capsule ellipsoid, prismatic 8–10 mm. long.—Swamps and borders of ponds, Coastal Plain, Fla. to La., Mo., and N. J.

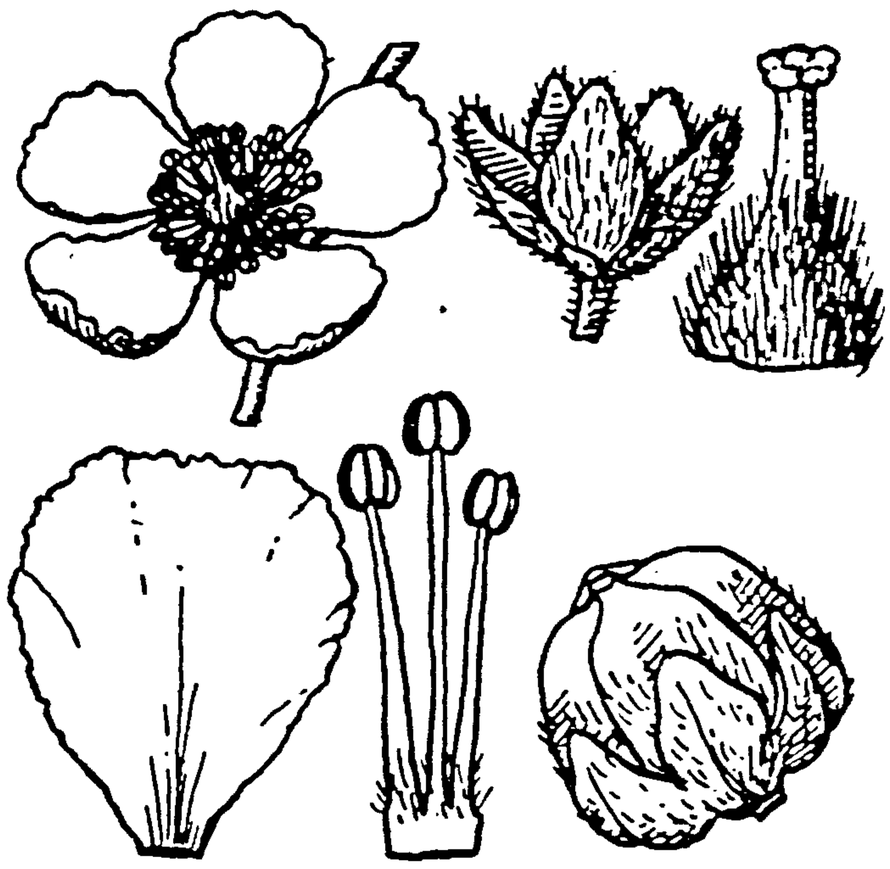
FAMILY 6. **THEACEAE** — CAMELLIA FAMILY

Shrubs, trees, or vines. Leaves alternate. Flowers perfect and showy. Calyx of 5, or rarely 4–7, imbricate sepals. Corolla of 5, or rarely of 4–7, petals. Androecium of numerous, or rarely few, stamens. Gynoecium of 3–5 partly or wholly united carpels. Fruit mostly capsular, sometimes indehiscent.—Sixteen genera and about 160 species, natives of tropical and temperate regions.

Sepals slightly unequal: ovules 2, ascending: seeds lenticular, sometimes margined.
  Sepals ovate, united at the base: filaments united at the base: styles united: capsule not beaked: seeds marginless. 1. STUARTIA.
  Sepals narrowly oblong, distinct: filaments distinct: styles distinct: capsule long-beaked: seeds margined. 2. MALACHODENDRON.
Sepals very unequal: ovules 4–8, pendulous: seeds strongly angled or winged.
  Leaf-blades membranous, deciduous: flowers nearly sessile: filaments distinct: capsule globose: seeds angled. 3. FRANKLINIA.
  Leaf-blades leathery, persistent: flowers long-pedicelled: filaments united into a thick tube: capsule ovoid: seeds winged. 4. GORDONIA.

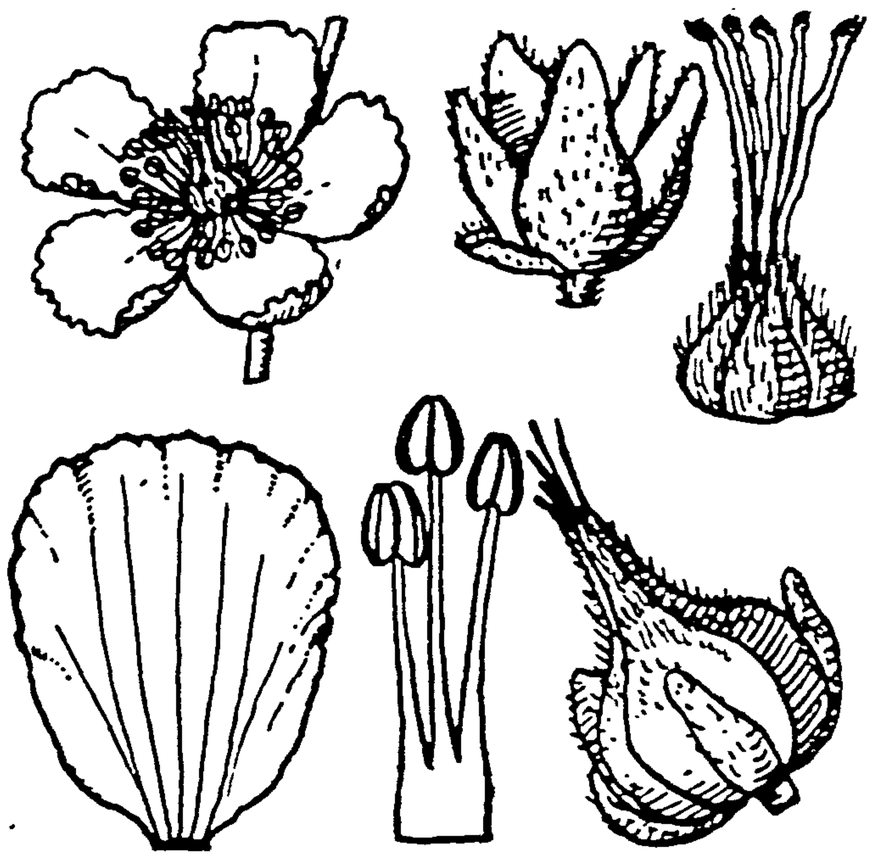
1. **STUARTIA** L. Shrubs. Leaf-blades usually toothed. Sepals mostly 5, relatively broad. Petals mostly 5, white. Style columnar. Stigma radiate.

Capsule globular or depressed.—Four species, American and Japanese.



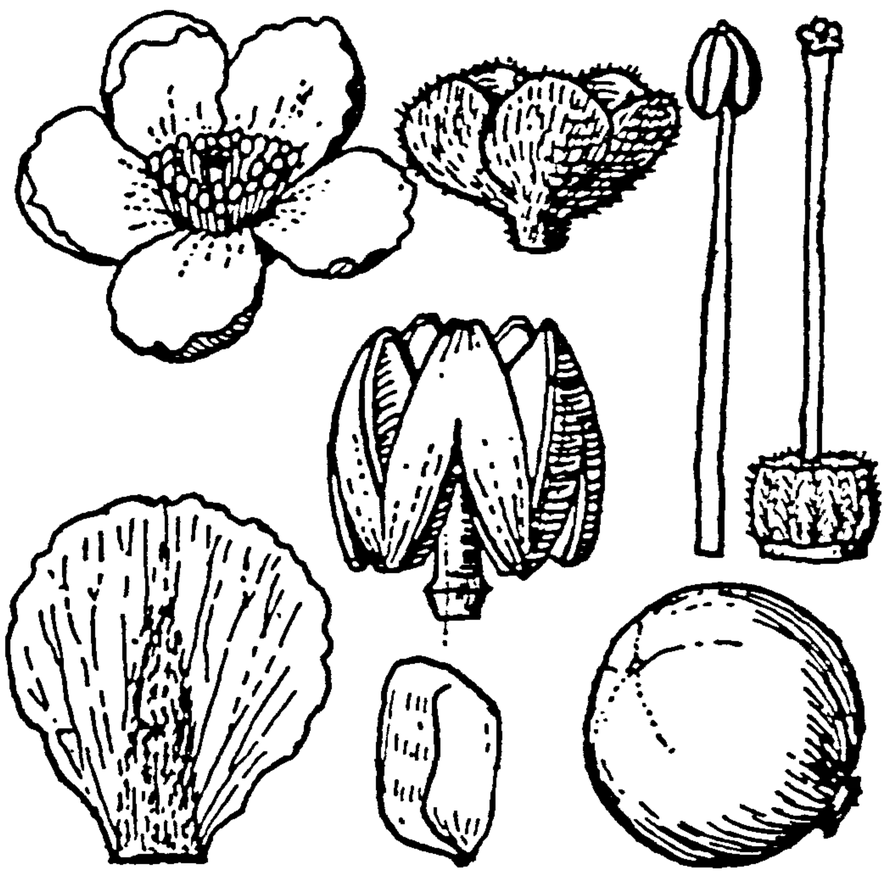
1. S. Malachodendron L. Shrub 1–5 m. tall: leaf-blades oval, elliptic, or sometimes ovate or obovate, 5–11 cm. long: sepals about 1 cm. long: petals obovate, 3–5 cm. long: capsule depressed-globular, 12–17 mm. in diameter.—(SILKY CAMELLIA. VIRGINIAN-STUARTIA.)—Wooded banks and hillsides, Coastal Plain and adj. provinces, W Fla. to La., Tenn., and Va.—Spr.—In Florida only in the Knox Hill country, where it grows in company with *Illicium floridanum* and *Magnolia Ashei*.—The stamens are usually purple.

2. MALACHODENDRON Cav. Shrubs resembling *Stuartia*. Sepals mostly 6, relatively narrow. Petals mostly 5, white. Styles 5, subulate. Stigmas introrse. Capsule slightly elongate.—One species.



1. M. pentagynum (L'Her.) Small. Shrub 1–5 m. tall: leaf-blades ovate, oval, or elliptic, 6–12 cm. long: sepals 1–1.5 cm. long: petals obovate, 3–3.5 cm. long: capsule ovoid, 1.5–2 cm. long. [*Stuartia pentagyna* L'Her.]—(MOUNTAIN CAMELLIA. MOUNTAIN-STUARTIA.)—Along streams and rich woods, Blue Ridge to Appalachian Plateau and adj. Piedmont, Ga. to Ala., Ky., and Va.—Spr.–early sum.—Contrary to *Stuartia* which seeks the lower provinces, this genus inhabits the higher ones, apparently entering the Coastal Plain only in SE Va.

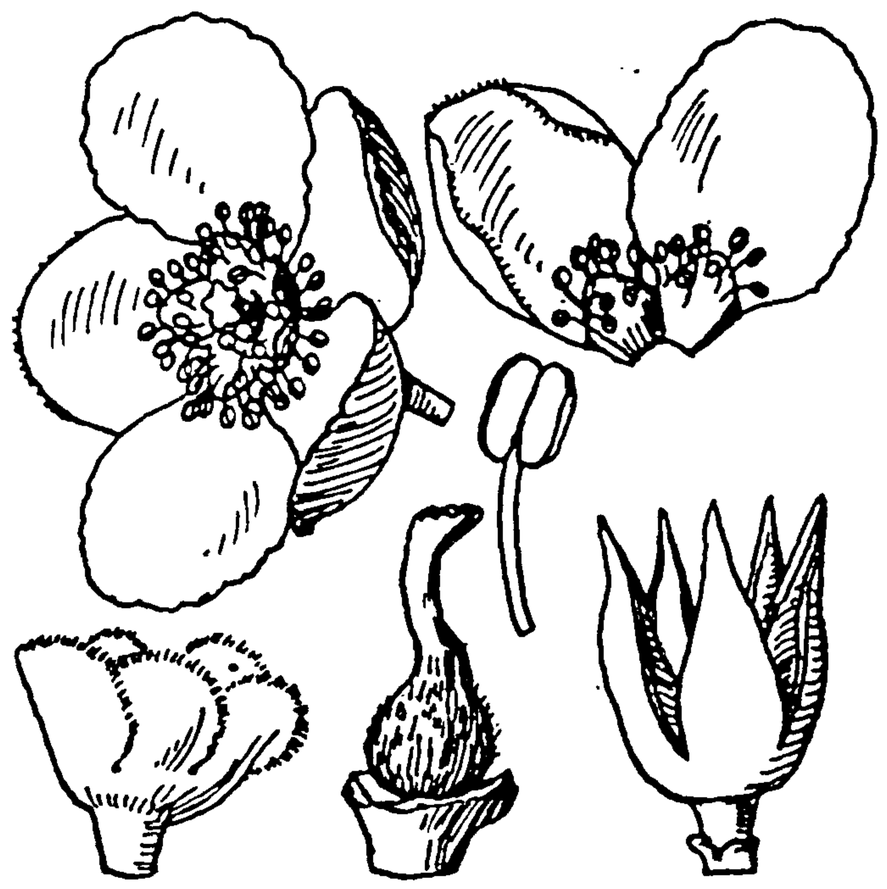
3. FRANKLINIA Marsh. Trees. Leaves deciduous. Flowers nearly sessile. Sepals 5. Petals 5, unequal, white. Stamens distinct, adnate to the bases of the petals. Style ridged. Capsule loculidical from the top and septicidal from the bottom.—One species.



1. F. Alatamaha Marsh. Shrub or small tree with smooth black bark: leaf-blades oblanceolate to oblong-obovate, 6–15 cm. long, serrate: sepals 12–14 mm. long: corolla 7–9 cm. broad: capsule subglobose, 1.5–2 cm. in diameter: seeds 12–14 mm. long. [*Gordonia pubescens* L'Her.]—(LOST CAMELLIA. FRANKLIN-TREE.)—Moist acid sandy soil in swamps N or E of Ft. Barrington, on the Altamaha River, S W of Townsend, in the Coastal Plain of Ga.—Sum.—Associated with *Pinckneya pubens*. Discovered by John and William Bartram in 1765. Not seen in its native place since 1790, but preserved in cultivation.

4. GORDONIA Ellis. Trees. Leaves persistent. Flowers long-pedicelled. Sepals and petals, 5, concave. Stamens borne on a 5-lobed disk.

Style terete. Capsule loculicidal.—About 16 species, American and Asiatic.



1. G. Lasianthus (L.) Ellis. Large trees with firm furrowed gray bark: leaf-blades narrowly elliptic or oblanceolate, 5–15 cm. long, appressed-serrate: sepals 8–10 mm. in diameter: corolla 5–7 cm. broad, white: capsule ovoid, 15–18 mm. long.—(LOBLOLLY-BAY. TAN-BAY. RED-BAY. BLACK-LAUREL.) —Non-alluvial swamps and bays, often in acid soil, Coastal Plain, Fla. to La. and N. C. (or S Va.?).—Sum.—The southern extremity of the range is about the latitude of Lake Okeechobee in Florida. The bark is some times used for tanning. The red heartwood, close-grained but light and soft, is locally used for cabinet-work.

FAMILY 7. **TURNERACEAE** — TURNERA FAMILY

Herbs or shrubs. Leaves alternate: blades entire, toothed, or pinnatifid, pinnately veined. Flowers mostly perfect. Calyx of 5 imbricate sepals. Corolla of 5 convolute delicate petals. Androecium of 5 distinct stamens. Gynoecium of 3 united carpels. Ovary 1-celled, with 3 parietal placentae opposite the styles. Fruit a 3-valved capsule.—Six genera and about 180 species, tropical and subtropical.

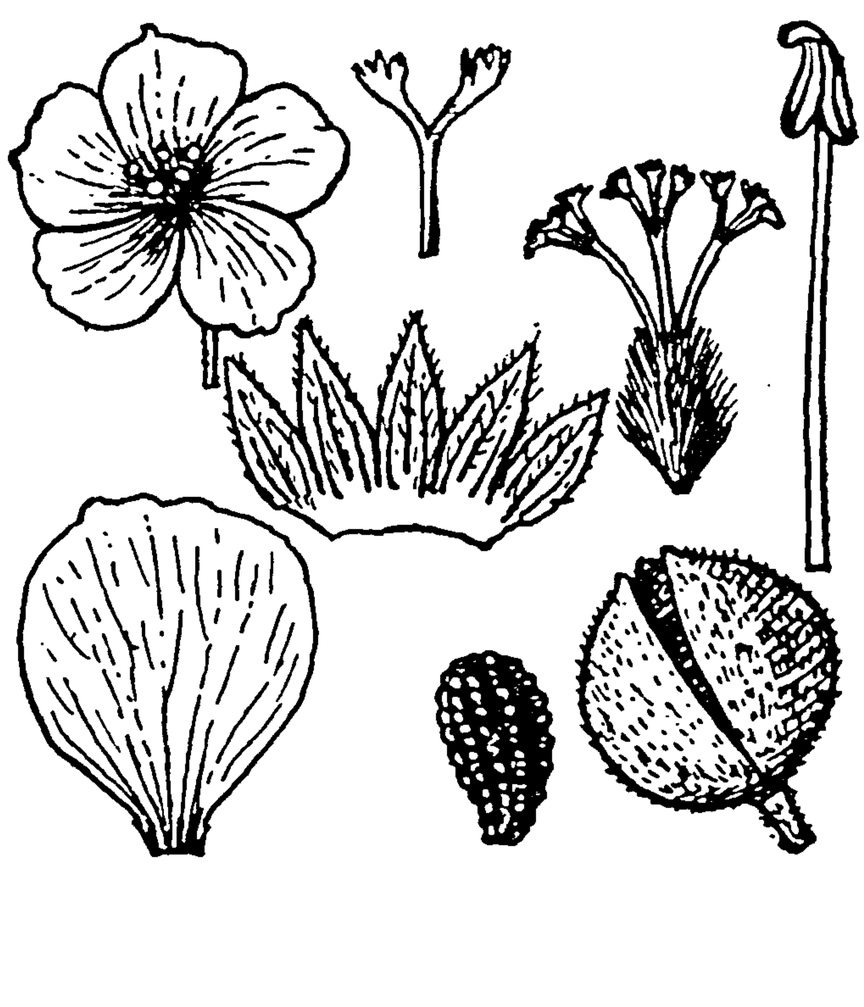
Ovary seated in a receptacle with a crown-like edge: plant herbaceous. 1. PIRIQUETA.
Ovary seated in a receptacle without a crown: plant partially woody. 2. TURNERA.

1. PIRIQUETA Aubl. Herbs. Sepals slightly united. Stigmas lobed. —About 20 species, mostly in tropical and subtropical America.—Spr.–fall or all year southward.

Foliage glabrous, at least to the inflorescence.
  Pedicel and calyx glabrous: bracts leaf-like. 1. *P. viridis.*
  Pedicel and calyx pubescent: bracts scale-like. 2. *P. glabrescens.*
Foliage tomentose or hirsute throughout.
  Stem tomentose. 3. *P. tomentosa.*
  Stem hirsute as well as tomentose. 4. *P. caroliniana.*

1. P. glabrescens Small. Plants glabrous up to the inflorescence, 4–6 dm. tall: leaf-blades narrowly linear, 1–5 cm. long, entire: corolla light-yellow: capsule about 5 mm. long.—Everglades and swamps, Fla.

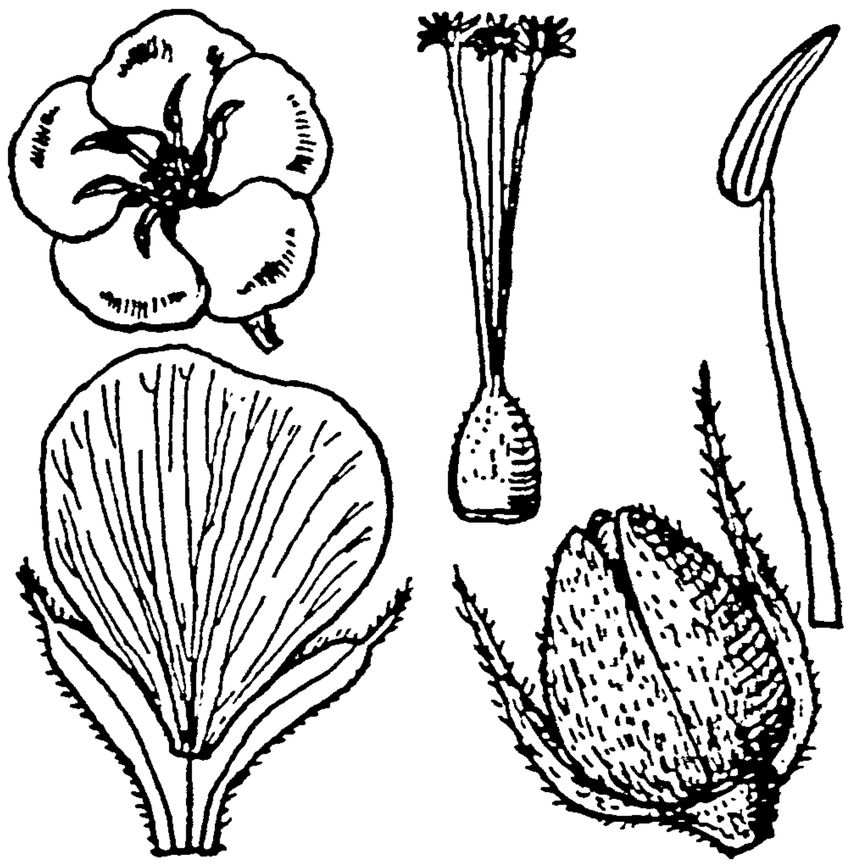
2. P. viridis Small. Plants glabrous, 1–5 dm. tall: leaf-blades linear-spatulate to linear, 3–8 cm. long, repand: calyx-lobes lanceolate: corolla yellow: capsule 7–8 mm. in diameter.—Pinelands, Fla.



3. P. tomentosa H.B.K. Plants stellate-tomentose, 2–4 dm. tall: leaf-blades oval, elliptic, or rarely narrowly elliptic-lanceolate, 1–4 cm. long, crenate-serrate: corolla bright-yellow: capsule 5–6 mm. in diameter. —Pinelands, S pen. Fla. and the Keys.—The stems are sometimes hirsute near the base.

4. **P. caroliniana** (Walt.) Urban. Plants fulvous-hirsute, 1–4 dm. tall: leaf-blades obovate, elliptic, cuneate, lanceolate, or rarely oval, 1–7 cm. long, repand or crenate-serrate: corolla deep-yellow: capsule 5–7 mm. long.—Pinelands and sand-dunes, Coastal Plain, Fla. to N. C.

2. **TURNERA** L. Shrubs or partly woody plants. Flowers usually solitary and axillary. Corolla yellow. Stigmas 3, brush-like.—About 75 species, mostly American.



1. **T. ulmifolia** L. Shrub 2 m. tall or less, with appressed-pubescent branchlets: leaf-blades ovate, varying to elliptic or spatulate, mostly 3–9 cm. long, serrate or crenate-serrate, 2-glandular at the base, short-petioled: calyx 14–17 mm. long; lobes lanceolate to ovate-lanceolate, acuminate: petals yellow, 2.5–3 cm. long: capsule globular to ovoid, 8–10 mm. long.—Hammocks and waste-places, Coastal Plain, Fla. to La. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A.*)—All year.—Used medicinally. This plant naturalized on Key West many years ago. The washing and scouring of storms and the clearing and building operations covering most of the island have not eliminated it from the flora.

Family 8. **CISTACEAE** — Rock-rose Family

Shrubs or partially woody plants. Leaves alternate or opposite: blades simple. Flowers generally perfect. Calyx of 3–5 persistent sepals. Corolla of 5 or 3 often fugacious petals, or wanting. Androecium of 6 or more stamens. Gynoecium of usually 3 united carpels. Fruit a capsule.—Nine genera and about 160 species, natives of the Northern Hemisphere.

Petals 5, yellow, fugacious or wanting.
  Leaves with flat blades; style short. 1. Crocanthemum.
  Leaves scale-like or subulate; style elongate. 2. Hudsonia.
Petals 3, greenish or purplish, withering-persistent. 3. Lechea.

1. **CROCANTHEMUM** Spach.[1] Erect plants. Leaf-blades flat, but often narrowly revolute-margined. Flowers of two kinds, the earliest complete, showy with yellow petals and many stamens, some or all of the later ones apetalous, inconspicuous, and with few stamens. Ovules pendulous. Capsules of the petaliferous flowers larger than those of the apetalous ones. [*Helianthemum* (Fl. SE. U. S.)]—About 25 species, American.—Rock-roses. Sun-roses. Frost-weeds.

Flowers few, in a simple raceme-like leafy-bracted inflorescence. I. Caroliniana.
Flowers, at least the apetalous ones, clustered.
  Petaliferous and apetalous flowers in the same clusters. II. Corymbosa.
  Petaliferous flowers solitary or few; apetalous flowers numerous, clustered, later in the season. III. Canadensia.

I. Caroliniana

Leaves mostly in a basal rosette. 1. *C. carolinianum.*

II. Corymbosa

Flowers in a dense terminal cyme. 2. *C. corymbosum.*
Flowers in scattered or panicled clusters.
  Flower-clusters scattered or solitary.

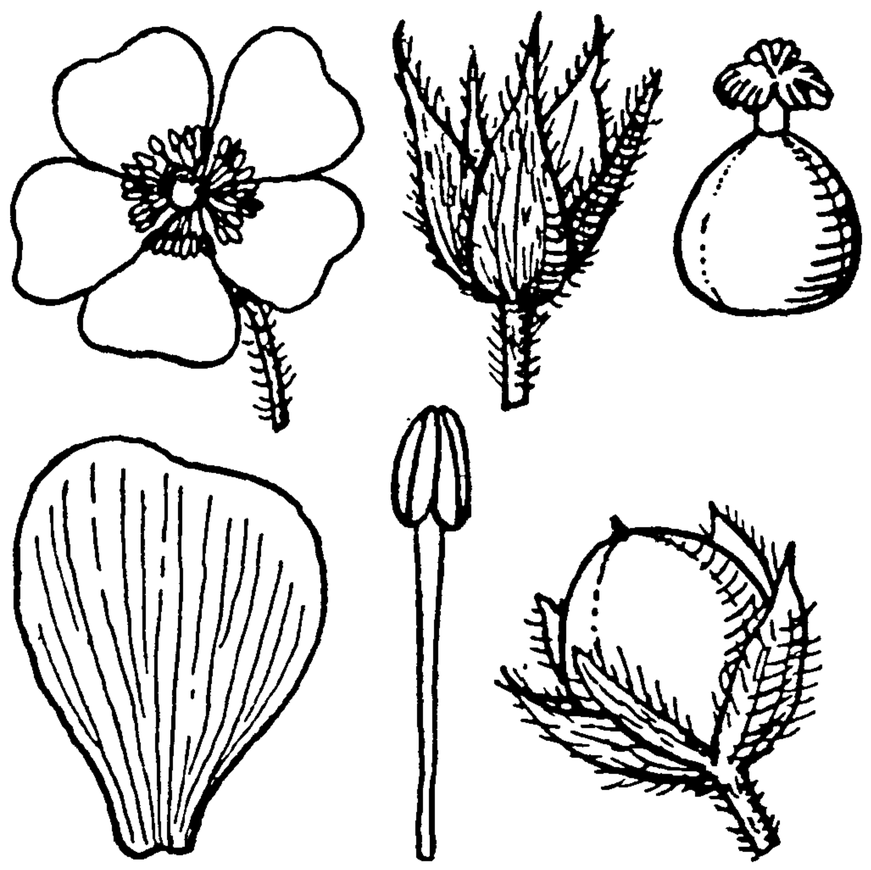
[1] Contributed by John Hendley Barnhart.

Sepals becoming 6–8 mm. long; lateral nerves of leaves not prominent beneath. 3. *C. arenicola.*
Sepals becoming 4–6 mm. long: lateral nerves of leaves prominent beneath. 4. *C. georgianum.*
Flower-clusters in more or less elongate thyrsoid panicles.
Sepals of the apetalous flowers fully 2 mm. long at maturity.
Sepals canescent-puberulent. 5. *C. Nashii.*
Sepals hirsute. 6. *C. thyrsoideum.*
Sepals of the apetalous flowers less than 2 mm. long. 7. *C. rosmarinifolium.*

III. Canadensia

Petaliferous flowers 1 or 2, their capsules far overtopped by the apetalous inflorescence. 8. *C. canadense.*
Petaliferous flowers 5–12, the apetalous inflorescence on short lateral branches. 9. *C. Bicknellii.*

1. C. carolinianum (Walt.) Spach. Stem hirsute, 0.5–2.5 dm. tall: leaves mostly in a basal rosette; blades oblanceolate to elliptic, 2–4 cm. long: flowers few, in a raceme-like, leafy-bracted inflorescence: petaliferous flowers with 25–35 stamens and 80 ovules, the apetalous with 5 stamens and 50–60 ovules: inner sepals becoming 10–15 mm. long, acuminate: corolla yellow, 2.5–3 cm. broad: capsule subspheric, 8–10 mm. in diameter. [*H. carolinianum* (Walt.) Michx.]—Dry pinelands, Coastal Plain, N Fla. to E Tex. and N. C.—Spr.



2. C. corymbosum (Michx.) Britton. Stem finely and densely canescent, 1.5–2 dm. high: leaf-blades elliptic, or the lowest obovate, 1.5–3 cm. long, pale beneath, dark-green above: corolla bright-yellow, 16–20 mm. broad: capsule of the larger flowers 4–6 mm. broad, many-seeded, that of the apetalous ones smaller and few-seeded. [*H. corymbosum* Michx.]—Pinelands, dunes, and open hammocks, Coastal Plain, Fla. to S. C.—Spr.–sum. or all year S.

3. C. arenicola (Chapm.) Barnhart. Stem canescent-tomentulose, 1–2 dm. long: leaf-blades linear-elliptic, 1–2.5 cm. long, obtuse, only the midrib prominent beneath: petaliferous flowers with 25 stamens and 20 ovules, the apetalous with 5 stamens and 10 ovules: sepals various, the larger ovate or oval-ovate, becoming 6–8 mm. long: corolla yellow, 16–20 mm. broad: capsule oval, about 4 mm. long. [*H. arenicola* Chapm.]—Coastal sand-dunes, Fla. to Miss.—Spr.

4. C. georgianum (Chapm.) Barnhart. Stem 1.5–3 dm. long: leaf-blades elliptic or slightly narrower below the middle, 1–2.5 cm. long, the lateral nerves as well as the midrib prominent beneath: petaliferous flowers with 15–30 stamens and 35 ovules, the apetalous with 8 stamens and about 17 ovules: sepals various, the larger ovate or oval, becoming 4–6 mm. long, acute or slightly acuminate: corolla yellow, 15–18 mm. broad: capsule ovoid-globose, about 4 mm. long, apiculate. [*H. georgianum* Chapm.]—Sandy woods, pinelands, dunes, and fields, Coastal Plain, N Fla. to E Tex. and Va.—Spr.

5. C. Nashii (Britton) Barnhart. Stem 1.5–4 dm. long: leaf-blades elliptic or linear-elliptic, 1–3 cm. long, the midrib very prominent beneath: petaliferous flowers with 15 stamens and 8–10 ovules, the apetalous with 5 stamens and 3–6 ovules: sepals various, the inner oval or oval-elliptic, becoming 4–5 mm. long: corolla yellow, 16–20 mm. broad: petals broadly cuneate, slightly eroded: capsule broadly ovoid, 3–3.5 mm. long, blunt. [*H. Nashii* Britton]—Scrub, pen. Fla.—Spr.

6. C. thyrsoideum Barnhart. Plant similar to *C. Nashii* in habit, but the inflorescence less widely branched, and the sepals densely hirsute. [*H. thyrsoideum* Barnh.]—Dry sandy soil, Pinellas Co., Fla.—Spr.

7. C. rosmarinifolium (Pursh) Barnhart. Stem 1.5–4 dm. tall: leaf-blades linear or narrowly linear-oblanceolate, or those on basal shoots broader, 1–3 cm. long: petaliferous flowers few, with 12–30 stamens and 8 ovules, their sepals ovate, 2–3 mm. long, the corollas 12–15 mm. broad, their capsules 2–3 cm. long: apetalous flowers in dense clusters, with 3 stamens and 3 ovules, the capsule short-pedicelled, about 1 mm. broad. [*H. rosmarinifolium* Pursh]—Pinelands, sandy fields, and roadsides, Coastal Plain, N Fla. to E Tex. and S. C.—Sum.

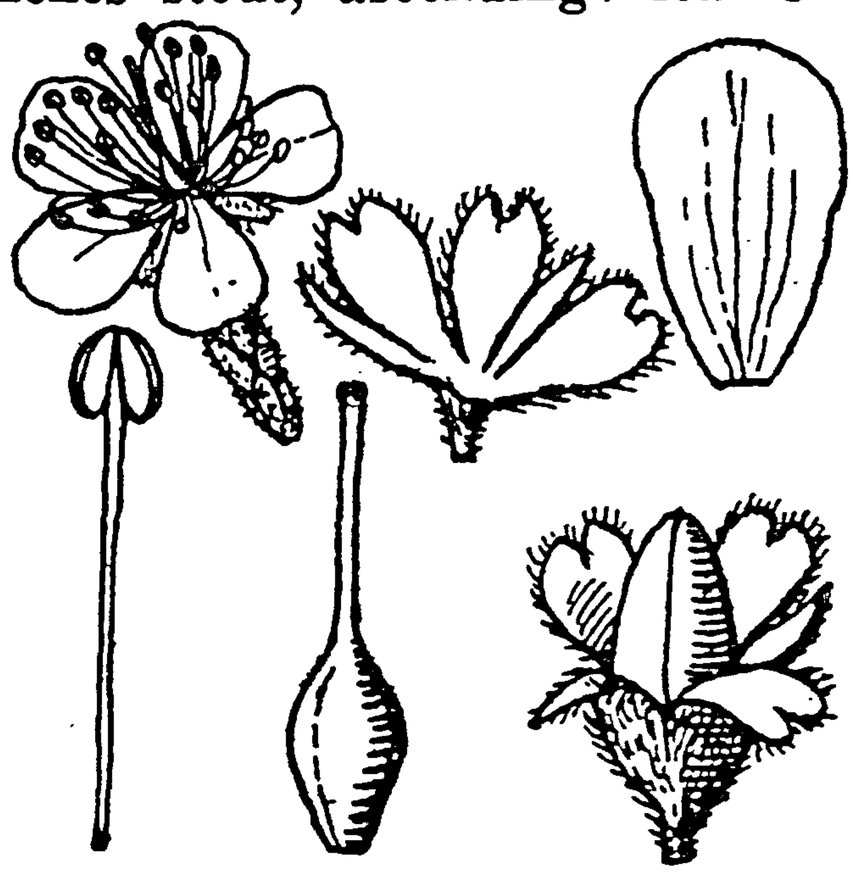
8. C. canadense (L.) Britton. Stem 1–6 dm. tall: leaf-blades elliptic, linear-elliptic, or oblanceolate, nearly sessile, 1.2–3 cm. long, rough and dark-green above, paler and canescent beneath: petaliferous flowers with 30 stamens and 30–60 ovules, their corollas 1.8–3 cm. wide, the capsule ovoid or obovoid and 6–8 mm. long: apetalous flowers appearing later, axillary, nearly sessile, with 4 stamens and 6–20 ovules, the capsule about 4 mm. in diameter: seed papillose. [*H. canadense* (L.) Michx.]—(FROST-WEED.)—Acid sandy or rocky soil, often in woods, various provinces, N. C. to Miss., Wis., and Me.—Spr.–fall.

9. C. Bicknellii (Fernald) Barnhart. Stem 3–6 dm. tall: leaf-blades elliptic-lanceolate or oblanceolate, acute or obtuse, 1.5–3.5 cm. long, stellate-canescent beneath, darker above, short-petioled: petaliferous flowers with 30 stamens and 30–60 ovules, their sepals densely canescent, the outer nearly as long as the inner, their corollas 1.5–2.5 cm. broad, light-yellow, the capsule ovoid, 3–4 mm. long: apetalous flowers appearing later, with 4 stamens and 6–20 ovules: seed evenly reticulate. [*H. majus* (Fl. SE. U. S.) *H. Bicknellii* Fernald]—(HOARY FROST-WEED.)—Dry soil, often in open woods or old fields, various provinces, S. C. to Tex., Colo., and N. S.—Spr.–fall.

2. HUDSONIA L. Diffuse-spreading tufted or matted shrubs. Leaf-blades subulate or scale-like. Flowers complete. Corolla bright-yellow. Ovules erect. Capsules all alike.—Three species, of eastern North America.—BEACH-HEATHERS. FALSE-HEATHERS.

Flowers sessile or nearly so: leaves scale-like: ovary glabrous.	1. *H. tomentosa.*
Flowers slender-pedicelled: leaves subulate: ovary pubescent.	
Ovary pubescent all over: one sepal, at least, with a linear-subulate lobe.	2. *H. montana.*
Ovary pubescent at the top: one sepal, at least, with a tooth near the apex.	3. *H. ericoides.*

1. H. tomentosa Nutt. Densely tufted and intricately branched, matted hoary-pubescent, pale, 1–2 dm. high, the branches stout, ascending: leaves 2 mm. long, oval or elliptic, densely imbricate and appressed: sepals obtuse: capsule ovoid, glabrous.—(BEACH-HEATHER.)—Sands of the seashore and in pinelands, Coastal Plain and New England Coast, N. C. to N. B.; and on lake and river shores, Great Lakes Lowland, Ind. to Man.—Spr.–early sum.



2. H. montana Nutt. Bushy, somewhat villous throughout, the branches tufted, 1–1.5 dm. long: leaves commonly erect, sometimes spreading in age, 3–6 mm. long, approximate: pedicels 8–10 mm. long: flowers several: sepals 5–6 mm. long, acuminate, densely pubescent: corolla yellow, 9–11 mm.

broad: capsule oval-ellipsoid or broadly ellipsoid, 3–4 mm. long, sparingly pubescent.—Dry, stony summit of Table Rock and adj. peaks, in the Blue Ridge of N. C.—Sum.—Now localized on a few mountain peaks, but doubtless once of wider distribution, and perhaps the ancestor of the following species.

3. **H. ericoides** L. Bushy, softly-pubescent, 1–2 dm. high, the principal branches slender, ascending: leaves 6–8 mm. long, somewhat spreading, densely imbricate on the younger branches, more scattered on the older ones: pedicels 10–15 mm. long: flowers numerous: corolla about 8 mm. broad: sepals 4–6 mm. long, obtuse or acutish: capsule ellipsoid, slightly pubescent.—(GOLD-HEATHER.)—Dry sandy or rocky soil, especially in pinelands near the coast, Coastal Plain and New England Coast, N. C. to N. S.—Spr.

3. **LECHEA** Kalm. Erect plants with many very leafy shoots at the base of the stem in the fall. Leaf-blades narrow, or those of the leaves on the shoots often broad and short. Flowers complete, minute. Corolla purplish or greenish. Ovules erect. Capsules all alike.—Sum.—PINWEEDS.—Some species are used medicinally.

Plants with annual flowering stems from the base of which rosettes of leafy shoots spring.
  Flowers, and fruits, relatively long-pedicelled, in long-peduncled lax clusters.
    Flowers and fruits not drooping.
      Calyx with the outer (narrow) sepals longer than the inner. — I. LONGISEPALAE.
      Calyx with the outer (narrow) sepals shorter than the inner. — II. BREVISEPALAE.
    Flowers and fruits drooping. — III. CERNUAE.
  Flowers, and fruits, very short-pedicelled, in short-peduncled close or dense clusters. — IV. DIVARICATAE.
Plants largely woody, much branched, with copiously leafy branches which later develop panicles at the tip. — V. MYRIOPHYLLAE.

I. LONGISEPALAE

Blades of the cauline leaves of an oval or elliptic type.
  Capsule oval or obovoid-oval: outer sepals much longer than the inner: basal shoots, stem, and branches appressed-pubescent. — 1. *L. minor.*
  Capsule subglobose: outer sepals slightly longer than the inner: basal shoots, stem, and branches with lax or spreading hairs. — 2. *L. villosa.*
Blades of the cauline leaves of a linear or subulate type.
  Capsule subglobose ellipsoid, or oval, not angled.
    Outer sepals slightly longer than the inner: capsule slightly exserted from the calyx, longer than wide. — 3. *L. patula.*
    Outer sepals much longer than the inner: capsule included, about as wide as long. — 4. *L. tenuifolia.*
  Capsule ellipsoid-prismatic, decidedly 3-angled, fully 1.5 mm. long. — 5. *L. prismatica.*

II. BREVISEPALAE

Capsule ellipsoid: — 6. *L. racemulosa.*
Capsule oval or subglobose:
  Capsule oval:
    Capsule narrowly oval, much exserted: sepals sparingly pubescent. — 7. *L. exserta.*
    Capsule broadly oval, scarcely exserted: sepals copiously pubescent. — 8. *L. Leggettii.*
  Capsule subglobose.
    Blades of the cauline leaves linear-subulate: inner sepals about 1.5 mm. long. — 9. *L. Torreyi.*
    Blades of the cauline leaves linear to narrowly elliptic: inner sepals about 2 mm. long. — 10. *L. maritima.*

III. CERNUAE

Plant with several inconspicuously-pubescent flowering stems and several very stout copiously silvery pubescent branched and copiously leafy basal shoots. — 11. *L. cernua.*

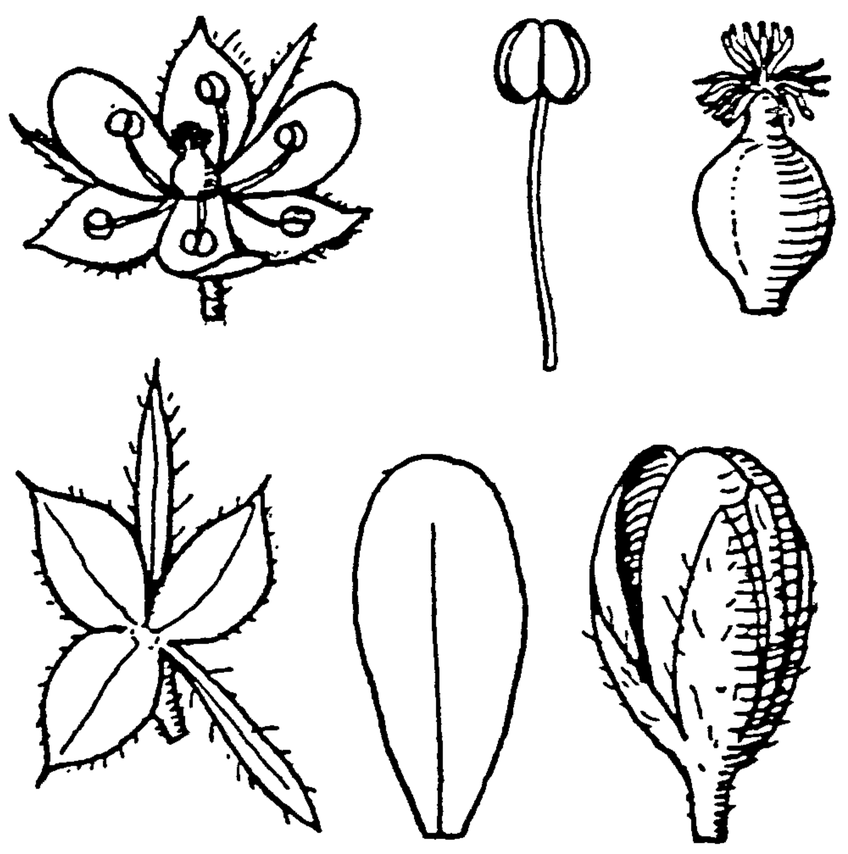
IV. DIVARICATAE

Plant more or less diffuse, the branches with numerous relatively short branches: the whole plant loosely gray-pubescent. 12. *L. divaricata.*

V. MYRIOPHYLLAE

Leaf-blades subulate to elliptic-subulate: capsule depressed-globose. 13. *L. Deckertii.*
Leaf-blades elliptic, sometimes narrowly so: capsule globose. 14. *L. myriophylla.*

1. L. minor L. Stem 1.5–6 dm. tall, the often numerous branches rather short, erect or strongly ascending, which terminate in open clusters: blades of the cauline leaves oval or elliptic, 0.8–1.5 cm. long: basal shoots with strigose branches and suborbicular or oval leaf-blades: calyx in fruit obovoid; inner sepals 1.5 mm. long at maturity; outer sepals decidedly longer than the inner: capsule oval or obovoid-oval, about 1.5 mm. long, included.—Dry woods and banks, various provinces, Fla. to La., Mich., and Mass.—Sum.



2. L. villosa Ell. Stem 3–8 dm. tall, with short or long ascending branches above, which terminate in dense flower, or fruit, clusters: foliage loosely, sometimes copiously pubescent with gray hairs: blades of the cauline leaves elliptic, 1.5–2.5 cm. long: basal shoots slender with numerous leaves with elliptic, oval, or ovate blades much smaller than those of the cauline-leaves: calyx in fruit globose-turbinate and angular: inner sepals about 1.5 mm. long at maturity, outer sepals slightly longer than the inner: capsule subglobose, bluntly 3-angled, fully 1.5 mm. long, slightly exserted.—Dry woods, pinelands, sandhills, and prairies, various provinces, Fla. to Tex., Nebr., S Ont., and Mass.—Sum.

3. L. patula Leggett. Stem 1.5–4.5 dm. tall, with loosely spreading or divergent branches: blades of the cauline leaves linear or nearly so, 4–9 mm. long: basal shoots with linear-elliptic or somewhat spatulate leaf-blades: calyx in fruit obovoid; inner sepals 1–1.5 mm. long at maturity; outer sepals slightly longer than the inner: capsule oval, often broadly so, 1.5 mm. long or more, exserted at the tip.—Dry pinelands, sand-dunes, and hammocks, Coastal Plain, Fla. to S. C.—Sum.–fall or all year S.

4. L. tenuifolia Michx. Stem 1–3 dm. tall, laxly much-branched: foliage finely strigose: blades of the cauline leaves narrowly linear or linear-subulate, 0.4–1.5 cm. long: basal shoots with leaves nearly or quite similar to those of the stem: calyx in fruit subglobose or oval; inner sepals about 2 mm. long at maturity; outer sepals much exceeding the inner: capsule subglobose or globose-obovoid, 1.5 mm. long or less, included.—Dry, often rocky or sandy woods, plains, and prairies, various provinces, Fla. to Tex., Kans., Wis., and Mass.—Spr.–fall.

5. L. prismatica Small. Stem 1–3 dm. tall, loosely-branched, the branches loosely ascending or spreading: foliage rather coarsely strigose: blades of the cauline leaves narrowly linear or linear-subulate, about 1 cm. long: basal shoots with narrowly linear-elliptic to linear-spatulate leaf-blades: calyx in fruit narrowly turbinate; inner sepals about 1.5 mm. long at maturity; outer sepals much longer than the inner: capsule ellipsoid-prismatic, about 2 mm. long, 3-angled, exserted at the tip.—Scrub, S end of Lake Region, Fla.—Sum.–fall.

6. **L. racemulosa** Michx. Stem simple or branched at the base, the branches erect or ascending, 1–5 dm. tall, copiously branched above, the branchlets slender, mostly ascending, rather inconspicuously strigillose: blades of the cauline leaves elliptic-spatulate to elliptic, or linear-elliptic, mostly 1–2 cm. long, strigillose or glabrate: basal shoots with narrowly elliptic leaf-blades: calyx in fruit narrowly pyriform; inner sepals about 1.5 mm. long at maturity; outer sepals much shorter than the inner: capsule ellipsoid, fully 1.5 mm. long, slightly exserted.—Dry woods, often in sandy or rocky soil, various provinces, Fla. to Ala., Ind., and E Mass.—Sum.

7. **L. exserta** Small. Stem usually branched at the base, the branches erect, 3–6 dm. tall, fastigiately much-branched above, inconspicuously pubescent: blades of the cauline leaves linear-elliptic to almost linear, glabrous or nearly so: basal shoots not seen: panicles many-flowered: bracts linear-elliptic to subulate: calyx in fruit campanulate; inner sepals 1–1.2 mm. long, at maturity; outer sepals slightly shorter than the inner: capsule narrowly oval, about 1.5 mm. long, much-exserted.—Dry pinelands, S pen. Fla.—Spr.–fall or all year S.

8. **L. Leggettii** Britt. and Hollick. Stem branched at the base, the branches erect or nearly so, loosely branched above, the branches long and slender, inconspicuously strigillose: blades of the cauline leaves linear-spatulate to linear, 1–2.5 cm. long, sparingly strigillose or glabrous: basal shoots with linear-elliptic leaf-blades: calyx in fruit broadly pyriform; inner sepals about 1.5 mm. long, at maturity; outer sepals much shorter than the inner: capsule oval, about 1.5 mm. long, scarcely exserted.—Dry woods, pinelands, old fields, and sand-dunes, various provinces, Fla. to La., Ind., and E. Mass.—Sum.–fall.

9. **L. Torreyi** Leggett. Stem usually branched at the base, the branches 1.5–5 dm. tall, the branchlets rather long and slender, pale-strigose: blades of the cauline leaves linear-subulate, mostly 1–1.5 cm. long, acute, strigillose: basal shoots with leaves nearly similar to those of the stem or slightly wider: calyx in fruit globose-obovoid; inner sepals about 1.5 mm. long at maturity; outer sepals much shorter than the inner: capsule subglobose, about 1.5 mm. long, not exserted.—Pinelands, Coastal Plain, Fla. to S. C.—Spr.–fall or all year S.

10. **L. maritima** Leggett. Stem often branched at the base, the branches 1.5–3.5 m. tall, much-branched above, the branchlets rather short, gray-strigillose: blades of the cauline leaves linear to narrowly-elliptic, mostly 1–2 cm. long, whitish-strigose: basal shoots with narrowly elliptic leaf-blades: bracts similar to the cauline leaves, but much smaller: calyx in fruit globose-obovoid: inner sepals about 2 mm. long at maturity; outer sepals much shorter than the inner: capsule subglobose, about 1.5 mm. long, not exserted.—Sandy seashores and pinelands, Coastal Plain and New England Coast, Ga. to Me.—Sum.–fall.

11. **L. cernua** Small. Stem usually branched at the base, the branches 3–6 dm. tall, often numerous, widely often much-branched above, the branchlets rather finely strigose: blades of the cauline leaves elliptic or ovate-elliptic, about 1 cm. long or less, strigose, several-ribbed: basal shoots with ovate to suborbicular densely pale-hairy leaf-blades: calyx in fruit turbinate; inner sepals about 2 mm. long at maturity; outer sepals minute: capsule obovoid, about 2 mm. long, slightly exserted.—Scrub, on sand-dunes, Lake Region and eastern coast, Fla.—Sum.–fall.

12. **L. divaricata** Shuttlw. Stem often branched at the base, the branches erect, ascending, or spreading, copiously pubescent with lax or spreading hairs;

the branchlets usually divaricate, relatively short, ending in compact flower- or fruit-clusters: blades of the numerous cauline and branch-leaves, elliptic, often narrowly so, or oval, 4–8 mm. long, acute: calyx in fruit obovoid; inner sepals about 1.5 mm. long, loosely pubescent; outer sepals slightly shorter than the inner: capsule subglobose or globose-obovoid, 2 mm. long, exserted.—Dry sandy soil, pen Fla., also reported from Tex.—Sum.–fall.

13. L. Deckertii Small. Stem branched at the woody base, the branches forming tufts, very leafy, usually minutely and sparingly pubescent, sooner or later developing terminal panicles: leaves numerous; blades elliptic-subulate to subulate, 1.5–2.5 mm. long, acutish, glabrous or nearly so: panicles few–several-flowered, with minute bracts: calyx in fruit lax, not enveloping the capsule; inner sepals about 1.5 mm. long at maturity; outer sepals fully one-half as long as the inner: capsule depressed-globose, 1.2–1.4 mm. long, much exserted.—Scrub, Coastal Plain, pen. Fla. to S Ga.—Sum.–fall.

14. L. myriophylla Small. Stem branched at the woody base, the branches forming tufts, very leafy, more or less pubescent, sooner or later developing panicles at their tips: leaves numerous; blades elliptic, sometimes narrowly so, 3–5 mm. long, acute, somewhat loosely strigose or glabrous: panicles many-flowered, with the bracts much smaller than the leaves: calyx in fruit, lax, not enveloping the capsule; inner sepals nearly 1.5 mm. long at maturity; outer sepals about half as long as the inner: capsule globose, about 1.5 mm. long, much-exserted.—Scrub, S part of Lake Region, pen. Fla.—Sum.–fall.

Family 9. **VIOLACEAE** — Violet Family

Herbs, or in tropical regions occasionally shrubs or trees, with simple alternate or opposite stipulate leaves, and perfect irregular solitary or clustered flowers. Sepals and petals 5, the latter hypogynous, imbricate in the bud, the lowermost often spurred. Stamens 5, the anthers erect, syngenesious or connivent. Gynoecium 3-carpellary. Ovary 1-celled, enclosing numerous ovules on the 3 parietal placentae and becoming in fruit a loculicidal capsule. Seeds anatropous.—Fifteen genera and about 300 species, widely distributed.

Sepals auriculate at base. 1. Viola.
Sepals not auriculate at base. 2. Cubelium.

1. VIOLA L.[1] Herbs, either leafy stemmed and rather low or stemless; petaliferous flowers mostly in early spring on one-flowered peduncles: succeeded throughout the season by cleistogamous flowers that bear abundant seed; stamens 5 in the petaliferous flower, the two lowest with appendages that project into the sac or spur of the odd petal; these two stamens alone developed in the cleistogamous flower.—Allied species freely hybridize when growing together; the hybrids commonly display characters more or less intermediate to those of the parent species, and show marked vegetative vigor but impaired fertility; their offspring are often much unlike the mother plant and unlike each other, reverting variously to the characters of the two original species.—About 200 species, of wide geographic distribution.—Violets.—Some species are used medicinally; others for ornamental gardening.

Plant stemless: leaves and scapes from a rootstock or a runner.
  Flowers scentless or with a faint pungent fragrance: plants indigenous.
    Corolla violet or purple (white in albino forms): plant without stolons.
      All petals beardless: apetalous flowers wanting. I. Pedatae.

[1] Contributed by the late Ezra Brainerd for Flora of the Southeastern United States (Ed. 2), and adapted with slight changes, for the present work, by Edward Johnston Alexander.

Lateral petals bearded: apetalous flowers present. II. PALMATAE.
Corolla white or yellow, the petals often with dark lines: plant stoloniferous. III. BLANDAE.
Flowers very fragrant: corolla violet or white: plant introduced. IV. ODORATAE.
Plant with leafy stems: flowers axillary.
Style scarcely enlarged at the tip or merely capitate.
Style capitate, beakless: spur of the corolla short: stipules nearly entire, soon scarious. V. HASTATAE.
Style not capitate, slender and bent at the tip: spur of the corolla at least twice its width: stipules bristly toothed, somewhat herbaceous. VI. ROSTRATAE.
Style stout, much enlarged upward into globular hollow summit: stipules large, leaf-like, lactinate at the base. VII. ARVENSES.

I. PEDATAE

Leaf-blades pedately finely divided: petals lilac, or the two upper ones dark-violet. 1. *V. pedata.*

II. PALMATAE

Cleistogamous flowers ovoid, on short prostrate peduncles, their capsules usually brown.
Leaf-blades all palmately 5–11-lobed or -parted, or rarely the first leaf of spring uncut: seed brown.
Plant villous-pubescent. 2. *V. palmata.*
Plant nearly or quite glabrous. 3. *V. Egglestonii.*
Earliest and later leaf-blades usually uncut, others pedately 3–7-lobed, -parted, or -divided: seed generally buff.
Plants villous-pubescent.
Cut leaf-blades mostly 3-lobed, with broadly open sinus. 4. *V. triloba.*
Cut leaf-blades mostly 5–7-parted, with narrow sinus. 4a. *V. triloba dilatata.*
Plants obscurely pubescent and glabrate: corolla deep-violet: inhabitant of shady uplands. 5. *V. Lovelliana.*
Plants glabrous: corolla pale-violet: inhabitant of wet woods. 6. *V. esculenta.*
Leaf-blades all uncut.
Plant nearly or quite glabrous.
Flowers violet or purple (except in albinos).
Flowers violet-purple: seed brown. 7. *V. papilionacea.*
Flowers rose-purple: seed buff. 8. *V. rosacea.*
Flowers pale-violet or whitish.
Petals uniformly pale violet, with only a few darker veins at the base: seeds buff: leaf-blades reniform-hastate. 9. *V. floridana.*
Petals grayish, the basal veins so numerous as to make large blotches of brilliant violet-blue: seeds brown: leaf-blades cordate. 10. *V. Priceana.*
Plant villous-pubescent, especially on petiole and lower leaf-surface: seed dark-brown. 11. *V. sororia.*
Plant hirsutulous on upper leaf-surface, elsewhere glabrous: seed buff. 12. *V. hirsutula.*
Cleistogamous flowers on long ascending peduncles, their capsules more or less brown.
Leaf-blades at vernal flowering narrowly cordate-acuminate: seed buff.
Auricles of sepals short appressed. 13. *V. affinis.*
Auricles of sepals 2 mm. long, spreading. 14. *V. Langloisii.*
Leaf-blades at vernal flowering subcordate, 3-lobed: seed bronze. 15. *V. chalcosperma.*
Cleistogamous flowers subulate or sagittate, on erect peduncles, their capsules green.
Spurred petal glabrous, the lateral ones with clavate beard: leaves glabrous; blades uncut, cordate-ovate. 16. *V. cucullata.*
Spurred petal villous at base, the lateral ones with capillary beard.
Foliage finely pubescent.
Leaf-blades ovate-elliptic, acute. 17. *V. fimbriatula.*
Leaf-blades ovate to orbicular, obtuse. 18. *V. villosa.*
Foliage nearly or quite glabrous.
Leaf-blades elliptic-lanceolate, incised at base. 19. *V. sagittata.*
Leaf-blades deltoid to broadly ovate, coarsely toothed at base. 20. *V. emarginata.*
Leaf-blades uncut or pedately 3–9-lobed. 21. *V. septemloba.*

III. Blandae

Corolla white.
- Cleistogamous flowers on prostrate peduncles, their capsules ovoid, commonly reddish-brown: plants of cold ravines and low rich woods.
  - Lateral petals bearded: seed obtuse at base. — 22. *V. incognita.*
  - Lateral petals beardless: seed acute at base. — 23. *V. blanda.*
- Cleistogamous flowers on erect peduncles, their capsules ellipsoid, green: plants of open bogs.
  - Leaf-blades broadly elliptic to cordate-ovate.
    - Leaf-blades broadly cordate-ovate. — 24. *V. pallens.*
    - Leaf-blades ovate or elliptic.
      - Leaf-blades rugose, cordate-tapering at the base. — 25. *V. rugosa.*
      - Leaf-blades smooth, not rugose, sub-cordate or tapering at the base. — 26. *V. primulifolia.*
  - Leaf-blades narrowly elliptic to linear.
    - Leaf-blades lanceolate or elliptic, 10–15 mm. wide: petals usually rounded at the tip. — 27. *V. lanceolata.*
    - Leaf-blades narrowly lanceolate or linear, 4–10 mm. wide: petals usually acute or acutish. — 28. *V. vittata.*

Corolla yellow. — 29. *V. rotundifolia.*

IV. Odoratae

Plants producing leafy stolons and fragrant flowers: style terminating in a sharp hook. — 30. *V. odorata.*

V. Hastatae

Petals yellow.
- Rootstock long, thick, whitish, bearing crisp, capillary roots. — 31. *V. hastata.*
- Rootstock short, woody, brown, bearing coarse, fibrous roots.
  - Petals tinged outside with violet.
    - Leaf-blades 3-lobed to 3-divided. — 32. *V. tripartita.*
    - Leaf-blades uncut, ovate or rhombic-ovate. — 32a. *V. tripartita glaberrima.*
  - Petals yellow outside.
    - Sparingly pubescent, root-leaves usually 1–3. — 33. *V. eriocarpa.*
    - Markedly pubescent, root-leaves usually wanting. — 34. *V. pubescens.*

Petals white inside, usually violet outside. — 35. *V. canadensis.*

VI. Rostratae

Corolla-spur less than 8 mm. long: lateral petals bearded.
- Petals white or cream-colored. — 36. *V. striata.*
- Petals violet-blue.
  - Stem ascending: later leaf-blades subacuminate. — 37. *V. conspersa.*
  - Stem soon prostrate: leaf-blades obtuse, usually mottled. — 38. *V. Walteri.*

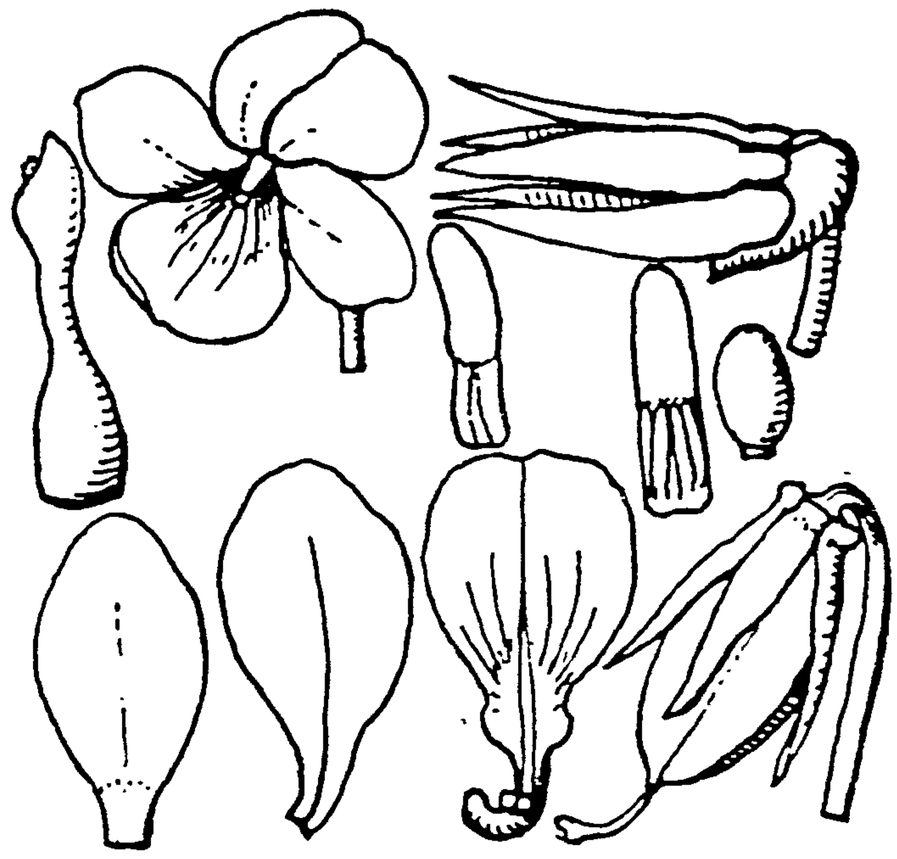
Corolla-spur 10–12 mm. long, slender: lateral petals beardless. — 39. *V. rostrata.*

VII. Arvenses

Upper leaf-blades entire, or obscurely crenulate: petals twice the length of sepals. — 40. *V. Rafinesquii.*

Upper leaf-blades plainly crenate: petals usually shorter than the sepals. — 41. *V. arvensis.*

1. V. pedata L. Plant nearly glabrous: rootstock short, erect: leaf-blades 3-divided, the lateral divisions pedately 3–5-parted or -cleft, the segments linear to spatulate, often 2–4-toothed or -cleft near the apex; the leaf-blades of early spring and of late autumn often smaller and less deeply dissected: corolla 2–3 cm. broad, the upper petals dark violet, the three lower lilac-purple, all beardless (all petals lilac-purple in *V. pedata linearíloba*): the orange tips of the stamens large and conspicuous at the center of the flower: capsule green, glabrous: seed copper-colored: apetalous flowers wanting, but petaliferous frequent in late summer and autumn.—(Bird's-foot violet. Crowfoot-violet. Pansy-violet. Johnny-jump-up.)—Open woods and dry fields, often in acid soil, various provinces,



Fla. to La., Minn., and Mass.—Shows marked variations in leaf-form and coloration of petals; the color-form with the upper two petals dark-violet is more common in the east-central part of its range.

2. **V. palmata** L. Plant villous: leaf-blades palmately 5–11-lobed or -parted, the segments variously toothed or cleft, the middle segment usually widest; petioles, and veins of the lower leaf-surface, villous, the upper surface often glabrous: sepals ovate-lanceolate, rather blunt: corolla violet-purple, 2–3 cm. broad: cleistogamous flowers on prostrate peduncles, their capsules ovoid, mottled with brown, 8–12 mm. long: seeds brown.—Wooded hillsides in dry rich soil, various provinces, Fla. to Miss., Minn., and Mass.

3. **V. Egglestonii** Brainerd. Plant glabrous, of spreading habit especially in spring: leaf-blades truncate at base, often flabellately decurrent, rarely subcordate; early leaf-blades simply 3–5 lobed, the later ones 3-parted, with the middle or all three primary segments 2–3-cleft, the subdivisions oblanceolate or linear, crenately serrate towards the summit and bearing a few long narrow acute teeth below: corolla violet-purple, the lateral petals bearded at the throat; spurred petal somewhat villous: cleistogamous flowers and fruits on short underground peduncles till seeds ripen: capsule green turning pale-yellow, broadly ellipsoid, 13 mm. long, with lanceolate sepals one third as long, their auricles short, appressed: seed brown, 2.5 mm. long.—Barrens, Interior Low Plateaus, Tenn. and Ky.

4. **V. triloba** Schwein. Plant villous: earliest leaf-blades, and those put forth in late summer, broadly cordate-ovate, usually uncut, sparsely pubescent or glabrate; those unfolding at petaliferous flowering, densely villous beneath like the petioles, 3-lobed or rarely 3-parted, the middle segment broad, the lateral lunate, divaricate, often coarsely toothed or pedately cleft, the upper subdivision narrow, with more and deeper incisions, and the middle primary segment ovate, elliptic or rhombic-lanceolate in *V. triloba dilatata;* blades 10–15 cm. wide when mature: peduncles mostly glabrous, shorter than the leaves: petals deep-violet: outer sepals ovate-lanceolate, somewhat obtuse, slightly ciliate: cleistogamous capsules ovoid, purplish: seeds buff or brown.—Dry woodlands, various provinces, Ga. to Tex., Mo., and Mass.

5. **V. Lovelliana** Brainerd. Plant often minutely hoary-pubescent on the upper part of the petiole and the adjacent lower surface of the blade, elsewhere obscurely pubescent: leaf-blades cordate at base, earliest often uncut, later ones hastately 3-lobed, the middle lobe much the longest, lanceolate, sometimes contracted at the base and undulately serrate, the lateral lobes divaricate, either lunate or variously 2–3-cleft; leaf-blades at petaliferous flowering 2–5 cm. long, those of later summer twice as long, glabrate, often less deeply cut, or uncut: flowers on stalks often exceeding the leaves: sepals broadly lanceolate, acute, one third the length of capsule; the auricles short, appressed, rounded, sparsely ciliate: corolla violet-purple, the three lower petals villous at the throat and marked with dark-purple lines: cleistogamous flowers and immature fruit on prostrate peduncles: capsule purple-dotted, 14 mm. long: seed buff, 2 mm. long.—Sparsely wooded hillsides and knolls, Coastal Plain and adj. provinces, Miss. to La., Okla., and Ark.

6. **V. esculenta** Ell. Rootstock stout, ascending, sometimes with purple horizontal branches 5–7 cm. long; the foliage spreading, usually glabrous, becoming stiff and succulent: first leaf-blades usually uncut, broadly cordate-ovate, 2–3 cm. long, followed at flowering time by leaf-blades 3–5-lobed, successively larger and longer-petioled till blade may be 8 cm. in length and in breadth, the late summer ones with obscure lobes or none: flowers long-peduncled: sepals ovate-lanceolate with emarginate auricles: corolla pale-

violet or white, the spurred petal slightly villous: cleistogamous flowers ovoid-acuminate: mature capsule trigonous-cylindric, closely purple-dotted, 12–16 mm. long; their sepals one third as long: seed dark-brown or sometimes buff, 2 mm. long.—River swamps and borders of slow streams, Coastal Plain, Fla. to S. C.

7. **V. papilionacea** Pursh. Plant glabrous, commonly robust, from a stout horizontal branching rootstock: leaf-blades often 12 cm. broad, sometimes deltoid in outline above the cordate base, sometimes rounded and abruptly pointed; petioles often sparingly pubescent: outer sepals ovate-lanceolate: corolla deep-violet, white or greenish-yellow at the base, sometimes wholly white, the odd petal often narrow and boat-shaped, usually glabrous: cleistogamous flowers ovoid, on horizontal peduncles usually underground but lengthened and erect when the capsules ripen: capsule ellipsoid or cylindric, green or reddish-brown, 10–15 mm. long: seed 2 mm. long, dark-brown.—(WOOD-VIOLET.)—Moist meadows and woods, and frequently about dwellings, various provinces, Fla. to Tex., Minn., and Mass.

8. **V. rosacea** Brainerd. Plant nearly or quite glabrous: leaf-blades at vernal flowering narrowly cordate-ovate, acute or acuminate, crenate-serrate, 2–4 cm. long, sparsely hirtellous above; later leaf-blades much wider, subcordate, acuminate, glabrous, 5–7 cm. long: corolla rose-purple, about 2 cm. broad, the spurred petal glabrous or slightly villous: cleistogamous flowers ovoid on prostrate peduncles, their mature capsules ellipsoid, about 12 mm. long, purple-dotted, enclosed for over half their length in lanceolate sepals: seeds buff, 2 mm. long, about 50 in a capsule.—Dry open woods and well-drained bayou margins, Coastal Plain, Miss. and La.

9. **V. floridana** Brainerd. Leaf-blades at time of petaliferous flowering on spreading petioles, cordate, acute, finely crenate-serrate, often somewhat puberulent above, 2–3 cm. wide, 3–4 cm. long; leaves with blades twice as long and wide appearing soon after, on long erect petioles, glabrate, sometimes persisting through the winter: flowers on peduncles much surpassing the leaves: corolla whitish or pale-violet, the odd petal glabrous; apetalous flowers concealed under soil or dead leaves, narrowly ovoid-acuminate; their ripe capsules reddish-brown, about 16 mm. long, on decumbent peduncles: sepals broadly lanceolate, about one third the length of the capsule: seed 2 mm. long, salmon-colored or dark-brown, about 60 in a capsule.—Moist rich woodlands, C and N Fla.

10. **V. Priceana** Pollard. Plant glabrous, robust, from a stout, branching rootstock: leaf-blades glabrous, rather dark green, cordate-ovate in outline, the tip obtuse or abruptly acute: scapes equalling or exceeding the leaves: sepals lanceolate-acuminate: corolla 3 cm. broad, grayish, the petals heavily veined at the base with brilliant violet-blue, the veins extending well into the blades; the spurred petal somewhat smaller than the others, keel-shaped, glabrous: cleistogamous flowers ovoid on horizontal peduncles: capsule broadly ellipsoid, purplish-green; seeds brown.—(CONFEDERATE VIOLET.)—Rich soil, in partially shaded situations, various provinces, Ga., Ark., Ken., N. C., and S. C. Brainerd regards this plant as an albino of *V. papilionacea,* but that species has flowers violet with white center, while this is reversed. This species also is very constant in its form and continually comes true from seed, never reverting to *V. papilionacea.*

11. **V. sororia** Willd. Leaf-blades broadly cordate-ovate, villous-pubescent especially on the under surface when young, and on the petioles, often 10 cm. wide when mature: vernal flowers on peduncles about the length of the leaves: outer sepals ovate-elliptic, commonly obtuse, all finely ciliate below the middle

and on the short rounded auricles: corolla violet to lavender and occasionally white: cleistogamous capsule usually mottled with brown: seed dark-brown, 2 mm. long.—Moist meadows, shady ledges, and dooryards, various provinces, N. C. to Okla., Minn., and Que.

12. V. hirsutula Brainerd. Plant of small size: leaf-blades frequently appressed to the ground, 2–5 cm. wide, cordate-ovate to reniform, obtuse, purplish and glabrous beneath, silvery-pubescent above, often purple-veined and mottled with different shades of green: flowers on peduncles exceeding the leaves: corolla reddish-purple: apetalous flowers small, ovoid, on short prostrate peduncles, developing ovoid purplish capsules, 6–8 mm. long, bearing each 20–30 light-brown seeds.—Dry rich woods, various provinces, Ga. to Ala. and N. Y.

13. V. affinis LeConte. Plant nearly glabrous: leaf-blades that unfold at vernal flowering narrowly cordate-ovate and commonly attenuate toward the apex, becoming 4–6 cm. wide in summer, the margin noticeably crenate-serrate; petioles slender: corolla violet with the white base conspicuous, the spurred petal more or less villous: cleistogamous flowers small, ovoid, on rather long ascending peduncles: capsule ellipsoid, 5–8 mm. long, usually reddish-brown, sometimes green, either glabrous or clothed with minute dense pubescence: sepals half the length of the capsule, with small appressed auricles: seed normally buff.—Moist meadows, low woods, and shaded stream-banks, various provinces, Ga. to Ala., Wis., and Vt.

14. V. Langloisii Greene. Leaf-blades glabrous, cordate-ovate, attenuate, crenate-serrate (3–5-lobed in *V. Langloisii pedatiloba*); those that mature after flowering relatively wider, cordate-deltoid, about 6 cm. long: flowers on peduncles taller than the leaves: sepals lanceolate: corolla violet, 2–3 cm. broad, the lateral petals bearded, the spurred petal mostly glabrous: cleistogamous flowers on ascending peduncles, sagittate, their mature capsule narrowly ellipsoid, pale-yellow faintly dotted with purple, 10–12 mm. long, with lanceolate acuminate sepals one half as long, the auricles glabrous, dentate, 2 mm. long: seed buff, 1.5 mm. long.—Wet and shady borders of slow streams, Coastal Plain, Miss. to Tex.

15. V. chalcosperma Brainerd. Plant glabrous, heterophyllous: leaf-blades at the beginning and at the close of the season's growth uncut, the former cordate 2–3 cm. long, the latter truncate at base, broadly deltoid 4–5 cm. long; vernal leaf-blades cordate, 3-lobed, the middle lobe ovate, acute, the lateral ones more or less incised: flowers small, raised above the leaves on slender peduncles; corolla lilac-purple, the lateral petals bearded, the odd petal sparsely villous, all finely purple-veined: cleistogamous flowers sagittate, on ascending peduncles: ripe capsule pale-yellow tinged with purple at base, ellipsoid, about 11 mm. long, with sepals dark purple, lanceolate, 5 mm. long, the auricles 3–4 mm. long, the three outer sepals with one or more sharp teeth: seeds bronze-colored, 1.5 mm. long, about 50 in a capsule.—Wet soil in shaded ravines, near Jacksonville, Fla.

16. V. cucullata Ait. Plant glabrous: leaf-blades, except the earliest, cordate-ovate, acute or subacuminate, often 9 cm. wide when mature: peduncles commonly much exceeding the leaves: sepals narrowly lanceolate: corolla violet-blue, darker-colored at the throat, the lateral petals with strongly clavate beard, the spurred petal glabrous, generally somewhat shorter than the lateral ones: cleistogamous flowers long and slender, on erect often elongate peduncles: capsule ovoid-cylindric, green, 10–15 mm. long, but little exceeding the long-auricled sepals: seed nearly black, 1.5 mm. long.—(BLUE MARSH-VIOLET. MEADOW-VIOLET.)—Wet soil, various provinces, Coastal Plain only N, Ga. to Ont., Que., and Me.

17. **V. fimbriatula** J. E. Smith. Rootstock becoming long and stout, usually erect: earliest leaf-blades ovate, obtuse, the later ones ovate-elliptic, acute, finely pubescent, obscurely crenulate toward the apex, the basal lobes often sharply toothed, incised, or auriculate: scapes commonly exceeding the leaves: auricles of the sepals somewhat spreading and ciliate: corolla violet-purple: capsule green, ovoid, 6–10 mm. long; seed brown: cleistogamous flowers on erect peduncles.—Hillsides and dry fields, various provinces, Fla. to La., Wis., and N. S.

18. **V. villosa** Walt. Rootstock simple, often long and jagged; foliage spreading, minutely villous throughout: leaf-blades ovate, varying to elliptic-ovate and orbicular, obtuse, obscurely crenate, cordate with small narrow sinus, when mature sometimes 6 cm. long and on petioles 12 cm. long: flowers early: sepals ciliolate, elliptic-ovate with rather short auricles: corolla violet, the three lower petals bearded, the spur large globose: capsule green, ovoid-cylindric, 10 mm. long: seed dark brown, 1.8 mm. long. [*V. carolina* Greene]—Dry soil, open woods and roadsides, various provinces, Fla. to Miss., Tenn., and S W Va.; also W Ark., Tex., and E Okla.

19. **V. sagittata** Ait. Plant usually glabrous, except the often ciliate leaves, or finely pubescent throughout: leaf-blades lanceolate or elliptic-lanceolate, becoming 4–8 cm. long, hastately or sagittately toothed or cleft at the base; the earliest and those produced in late summer often deltoid-ovate, obtuse, merely crenate at the base: sepals narrowly lanceolate, acute, glabrous: corolla violet-purple: capsule 8–14 mm. long, containing 50–70 brown seeds.—(ARROW-LEAVED VIOLET.)—Moist banks and wet meadows, various provinces, Ga. to La., Minn., and Mass.

20. **V. emarginata** (Nutt.) LeConte. Plant glabrous: mature leaf-blades deltoid or broadly ovate, the base truncate or subcordate often decurrent, obscurely crenate-serrate above the middle, coarsely toothed or incised below: corolla violet-blue, the petals sometimes emarginate: cleistogamous capsule ellipsoid, 8–14 mm. long: peduncles erect, somewhat shorter than the leaves: seed brown.—Dry woods and hillsides, various provinces, N Ga. to Okla. and S E N. Y.

21. **V. septemloba** LeConte. Plant glabrous with a vertical rootstock: leaf-blades cordate-ovate; the first ones often, and sometimes all the leaves, uncut, the others primarily 3-lobed, 3-cleft or 3-parted with widely open sinuses, the middle segment uncut, relatively long and broad, usually narrowed at the base; the lateral segments sometimes uncut, but generally pedately cleft into 2–4 narrow divergent parts that become smaller towards the base of the leaf: flowers usually raised above the foliage: sepals narrowly lanceolate, with entire rounded auricles: corolla violet, the three lower petals villous at the base: cleistogamous flowers erect: capsule green, ovoid-cylindric, about 14 mm. long: seed dark-brown, 2 mm. long. [*V. vincialis* Greene]—Pinelands, Coastal Plain, Fla. to Miss. and Va.

22. **V. incognita** Brainerd. Peduncles, petioles and lower surface of leaf-blades pubescent with soft white hairs especially when young (nearly or quite glabrous in *V. incognita Forbesii*), the upper leaf-surface glabrous; aestival leaves large, the blades rugose, broadly cordate-ovate with open sinus, acute: petals white, the lateral bearded, the upper pair obovate: seed narrowly obovoid, obtuse at base, smooth, brown, 2 mm. long: plants flowering early, in summer producing numerous filiform runners.—Moist woods, Blue Ridge and more northern provinces, Tenn. to N. Dak. and Que.

23. **V. blanda** Willd. Leaf-blades cordate-ovate with narrow sinus, commonly acute, often acuminate, glabrous except for minute scattered hairs on the

upper surface; petioles, and scapes, usually tinged with red: lateral petals beardless, the upper pair often long, narrow, and strongly reflexed, sometimes twisted: cleistogamous capsules ovoid, dark-purple: seed dark-brown, minutely rugose, acute at base, 1.5 mm. long: plants freely producing in summer, slender leafy runners. [*V. LeConteana* G. Don]—(SWEET WHITE-VIOLET.)—Cool ravines and moist shaded slopes, often in humus, various provinces, on Coastal Plain only N, Ga. to Minn. and Que.

24. V. pallens (Banks) Brainerd. Leaf-blades broadly cordate-ovate, obtuse or rarely acute, glabrous on both sides; petioles and scapes often dotted with red in summer and more or less hirsutulous: lateral petals usually bearing a small tuft of hairs, the upper petals broadly obovate: seed 1 mm. long, almost black. [*V. blanda* of recent authors, not Willd.]—(WILD WHITE-VIOLET.)—Springy soil and banks of cool streams, various provinces, on Coastal Plain only N, S. C. to Ala., Tenn., Mich., and Lab.—Plants often grow in slow-flowing streams after the manner of water-lilies, the leaves and flowers only raised above the surface of the water. In most cases the plant sinks to the bottom in winter, retaining two or three leaves, and rises again in the spring to bloom.

25. V. rugosa Small. Leaf-blades ovate-elliptic, cordate at the base and in the larger leaves decurrent as wings down the petioles, 4–6 cm. long, rugose, sparsely pubescent on the veins, bright green, paler beneath; petioles about as long as the blades, copiously hirsutulous: scapes about as long as the leaves, hirsutulous, usually red: petals all about the same size; the lateral was a small tuft of hairs; the spurred petals veined at the base with brownish-purple: sepals lanceolate: cleistogamous capsule green, about 1 cm. long, on short erect peduncles, ellipsoid, seeds red-brown.—Edges of white-cedar swamps, Liberty Co., Fla.

26. V. primulifolia L. Plant often quite glabrous, but usually more or less pubescent especially toward the base of the petioles (with densely villous petioles and lower leaf-surfaces in *V. primulifolia villosa*): leaf-blades elliptic or ovate, the base slightly cordate, rounded or tapering, obscurely crenate-serrate; petioles often broadly winged above: flowers white: capsule green, the peduncle erect as in *V. lanceolata:* seed reddish-brown, 1.5 mm. long.—Marshes and swamps, various provinces, Fla. to Tex., W. Va., and N. B.

27. V. lanceolata L. Stolons leafy, often bearing apetalous flowers: leaves and scapes glabrous, 5–8 cm. high at time of vernal flowering; later leaves with lanceolate or elliptic blades, 10–15 mm. wide, 7–15 cm. long, obscurely crenulate, gradually tapering into margined, often reddish, petioles: sepals broadly lanceolate, acute: lateral petals usually beardless: cleistogamous capsules 6–12 mm. long, on erect peduncles but usually shorter than the leaves; seed dark-brown.—(BOG WHITE-VIOLET. LANCELEAF-VIOLET.)—Moist meadows, bogs, and marshes, various provinces, Fla. to Tex., Minn., and N. S.

28. V. vittata Greene. First leaf-blades narrowly lanceolate, obtuse, succeeded after flowering by linear leaves 4–10 mm. wide, 15–30 cm. long, the blades acute at the apex and gradually tapering at the base, mucronulately serrulate; petioles, peduncles, and lower leaf-surface usually more or less villous: flowers and capsules as in the preceding species: seed obovoid, brown, 1.3 mm. long. [*V. denticulosa* Pollard]—Marshes, bogs, and borders of hammocks, Coastal Plain, Fla. to Tex. and N. C.

29. V. rotundifolia Michx. Rootstock long and stout, jagged with the persistent bases of former leaves: runners short, usually without roots or leaves, bearing 1–4 cleistogamous flowers: leaf-blades oval or orbicular, cordate with

short and narrow sinus, repand-crenate, at vernal flowering sparsely hirtellous, 2–3 cm. wide, in midsummer mostly glabrate, 6–10 cm. wide, prostrate: corolla bright-yellow, the three lower petals with brown veins, the lateral ones bearded: style clavate, abruptly capitate, beakless: capsule ovoid, 6–8 mm. long, closely dotted with purple: seed nearly white.—(EARLY YELLOW-VIOLET.) —Cool woods, various provinces, coastal Plain only N, N Ga. to Ont. and Me.

30. **V. odorata** L. Plant producing above ground leafy stolons rooting freely at the nodes: leaf-blades broadly cordate-ovate, finely pubescent: flowers violet or white, very fragrant: style hook-shaped: capsules from apetalous flowers broadly ovoid, angled, pubescent, purple: seed large, cream-colored. [*V. Thompsonae* Chapm.] — (SWEET-VIOLET. ENGLISH-VIOLET.) — Roadsides, fence-rows, and waste-places, locally established throughout U. S., as are some of its hybrids with other European species.

31. **V. hastata** Michx. Plant slightly puberulent: stem slender, 1–2.5 dm. high, from a long white brittle horizontal rootstock: stem-leaves 2–4 near the summit; blades halberd-shaped with rounded basal lobes: radical leaves occasional; blades elliptic-lanceolate, more deeply cordate; all distantly serrulate: sepals linear-lanceolate, acute: corolla yellow, the upper petals often tinged outside with violet: capsule ovoid, glabrous, 8–10 mm. long: stipules ovate, small, often with a few bristly teeth.—Rich woods, various provinces, Fla. to Ala., Ohio, and Pa.

32. **V. tripartita** Ell. Rootstock short and woody, with long coarse fibrous roots: stem erect, usually solitary, beginning to bear flowers when 1–2 dm. high, bearing foliage above the middle; the first two or three leaves with petioles 2–8 cm. long; blades commonly 3-lobed to 3-divided, ovate or rhombic-ovate merely toothed in *V. tripartita glaberrima* [*V. tenuipes*], the middle segment narrowly lanceolate to ovate, usually constricted at the base, remotely serrate toward the apex, the lateral segments falcate or lunate, coarsely toothed on the outer margin; upper leaves smaller, ovate-lancolate, mostly uncut; petioles and lower leaf-surface more or less pubescent when young, at length nearly glabrate: peduncles slender, 2–9 cm. long, axillary: sepals linear-lanceolate, ciliate: petals yellow, the upper usually tinged outside with violet, the three lower ones somewhat bearded: capsule trigonous-ovoid, glabrous: seed large, brown.—Rich woods, various provinces, N Fla. to Ala., Tenn., and N. C.

33. **V. eriocarpa** Schwein. Plant glabrous except for minute pubescence along veins on lower leaf-surfaces and on upper parts of petioles and stem: stems ascending, commonly 2–4 from one rootstock: basal leaves 1–5; blades cordate-reniform, on long petioles; cauline leaves only on upper half of stem; blades broadly ovate, subcordate, acuminate, the uppermost smaller, truncate, nearly sessile; stipules ovate to lanceolate, nearly entire, glabrous, tardily scarious: sepals narrowly lanceolate: lateral petals bearded: capsule ovoid, woolly or sometimes glabrous: cleistogamous flowers on short peduncles from axils of upper leaves: seed brown, 2.5 mm. long. [*V. scabriuscula* Schwein.] —(YELLOW-VIOLET.)—Low open woods, various provinces, Coastal Plain only N, Ala. to Okla., Man., and N. S.—This and the following yellow-flowered violets are frequently called WILD-PANSY.

34. **V. pubescens** Ait. Plant softly pubescent: stems 2–3 dm. high, often solitary: leaves, either cauline, 2–4, near the summit, or occasionally a long-petioled basal-leaf is present; blades broadly ovate, cordate or truncate-decurrent at the base, crenate-dentate, somewhat pointed; stipules large, ovate-elliptic: sepals narrowly lanceolate: lateral petals bearded: capsule ovoid, 10–12 mm. long, glabrous or sometimes woolly: seed brown, 2.5 mm. long.—(DOWNY VIOLET.)—Dry rich woods, various provinces, rarely Coastal Plain, Ala. to Miss., Mo., N. D., N. S., and N. C.

35. **V. canadensis** L. Stems usually 3–4 dm. high, minutely pubescent: leaf-blades cordate-ovate, pointed, serrate; stipules sharply lanceolate: sepals slender, acuminate, spreading: lateral petals bearded, the spurred petal yellow at the base and striped with fine dark lines: capsule subglobose, 6–10 mm. long, often downy or puberulent: seed brown.—(TALL WHITE-VIOLET. SUMMER-VIOLET.)—Rich woods, various provinces, N of Coastal Plain, S. C. to Ala., Sask., Ont., and N. B.

36. **V. striata** Ait. Stems several, ascending, 15–30 cm. long when in flower, in late summer often 6 dm. long, decumbent: leaves glabrous or nearly so; blades cordate-ovate, 2–4 cm. broad, usually acuminate, finely crenate-serrate: stipules large, elliptic-lanceolate: sepals ciliolate, narrow, attenuate: corolla white or cream-colored: style beaked: capsule ovoid, glabrous, 4–6 mm. long: seed light-brown.—(CREAM-VIOLET.)—Low woods and thickets, various provinces, rarely Coastal Plain, Ga. to Mo., Minn., and Conn.

37. **V. conspersa** Reichenb. Rootstock oblique, often much branched: stem, at time of vernal flowering, 8–16 cm. high: lower leaf-blades cordate-orbicular, obtuse, the upper ones cordate-ovate, crenate, subacuminate, becoming 2–4 cm. wide: flowers numerous, usually pale-violet, sometimes white, raised above the leaves on axillary peduncles 5–8 cm. long: cleistogamous flowers in summer on short peduncles from the same axils that bore vernal flowers, or from axils of later leaves of the lengthened stem: style bent downward at the tip and slightly hairy: seed light-brown.—(AMERICAN DOG-VIOLET.)—Low grounds and shaded banks, various provinces, Coastal Plain only N, Ga. to Minn., Que., and Me.

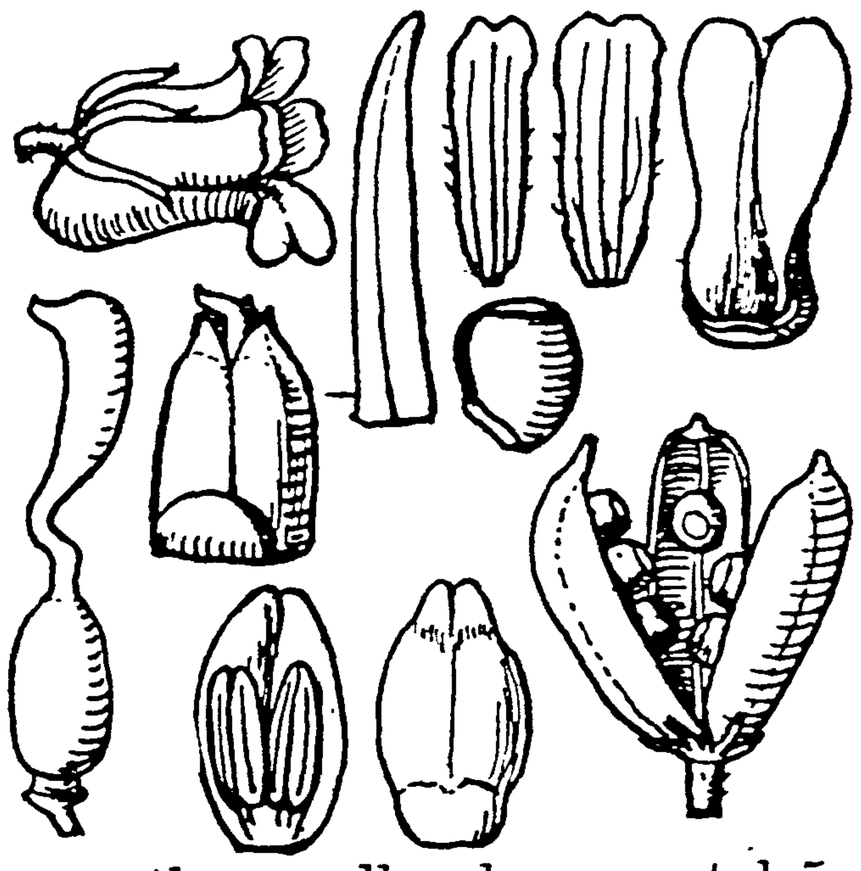
38. **V. Walteri** House. Plant finely puberulent: stems several, at first ascending, leafy, bearing in early spring small violet-blue flowers in the axils of basal leaves, later elongating, becoming prostrate, and bearing through the season apetalous flowers on long slender axillary peduncles: stems often surviving the winter and sending up in spring from their tips rosettes of leaves and petaliferous flowers, afterwards rooting and forming new plants: leaf-blades glabrous, cordate, orbicular to ovate, mostly obtuse, mottled with darker-green bordering the veins, 2–4 cm. wide: stipules bristly fimbriate, 6–10 mm. long: capsule purplish, ovoid-globose, 6 mm. long: seed brown. [*V. multicaulis* (T. & G.) Britton]—Dry woodlands and moist rocky ledges, various provinces, Fla. to Tex., Ky., and S. C.

39. **V. rostrata** Pursh. Stems often numerous, commonly 1–2 dm. high: leaf-blades orbicular to broadly ovate, cordate, nearly or quite glabrous, serrate, the upper acute or pointed: petaliferous flowers borne on long peduncles above the leaves: petals spotted with darker violet, all beardless, the spur slender, 10–12 mm. long: later cleistogamous flowers with minute or aborted petals and on short peduncles from the axils of the upper leaves: style straight, beakless, glabrous: capsule ovoid, 3–5 mm. long, glabrous: seed light-brown.—(BEAKED-VIOLET. LONG-SPURRED VIOLET.)—Shady hillsides and rich woods, various provinces, N of Coastal Plain, Ga. to Ala., Mich., Que., and Pa.

40. **V. Rafinesquii** Greene. Plant glabrous, annual, with the slender stem often branched from the base: leaf-blades small, the lowest 6–10 mm. wide, orbicular, on slender petioles, the upper obovate to linear-oblanceolate, sparsely crenulate, attenuate at the base; stipules pectinately cut, the upper segment elongate, narrowly spatulate, mostly entire; internodes usually exceeding the leaves: flowers small, but the obovate bluish-white to cream-colored petals nearly twice the length of the lanceolate sepals: seed light-brown, 1.2 mm. long.—(FIELD-PANSY.)—Open woods, exposed hillsides, and fields, various provinces, Ga. to Tex., Mich., and N. Y.—The roots have a wintergreen scent.

41. **V. arvensis** Murr. Similar to the next preceding, but stouter, often 3–4 dm. high, erect or branching and decumbent: leaf-blades ovate to lanceolate, noticeably crenate; stipules more coarsely pectinate, the upper lobe usually much enlarged, oblanceolate and sparsely crenate: petals usually shorter than the lanceolate acute sepals, pale-yellow, or sometimes the upper with violet tips, and the spurred petal deep-yellow at base: capsule globose: seed brown, narrowly obovoid, 1.7 mm. long.—(WILD-PANSY.)—Fields and roadsides, various provinces N of Coastal Plain, N. C. to Ont., and Newf.—Nat. of Eu.

2. **CUBELIUM** Raf. Perennial caulescent, rather tall herbs. Leaves alternate: blades entire or slightly toothed. Flowers borne in axillary clusters, inconspicuous. Sepals 5, nearly equal, not auricled. Petals 5, green, nearly equal in length, the lower one largest and gibbous near the base. Stamens 5, filaments united into a sheath around the pistil and bearing a gland on the lower side. Style hooked at the apex. Capsule longer than thick, slightly 3-lobed, 3-valved.—One species.



1. **C. concolor** (Forst.) Raf. Stem up to 1 m. tall, pubescent: leaf-blades elliptic or elliptic-obovate, 7–16 cm. long, acuminate or acute at the apex, tapering to a rather slender petiole-like base: sepals linear-subulate or linear-lanceolate, more than half as long as the corolla: lower petal 5–6 mm. long, notched at the apex: connective-tips ovate: capsule ellipsoid or nearly so: 1.5–2 cm. long: seed about 5 mm. in diameter.—(GREEN-VIOLET.)—Rich woods, ravines, and stream-banks, various provinces, rarely Coastal Plain, Ga. to Miss., Kans., Ont., and N. Y.—Spr.

ORDER **PASSIFLORALES** — PASSIFLORAL ORDER

Herbs, vines, or shrubby plants, or succulent tree-like plants with milky sap. Leaves alternate: blades entire, toothed, or lobed. Flowers perfect or dioecious. Calyx of 4 or 5 more or less united sepals. Corolla of 4 or 5 distinct or united petals, sometimes accompanied by a fringed crown, or rarely wanting. Androecium of 5 stamens, or of 10 stamens in 2 unequal rows. Gynoecium of 3–5 united carpels. Ovary superior. Fruit a berry or a capsule.

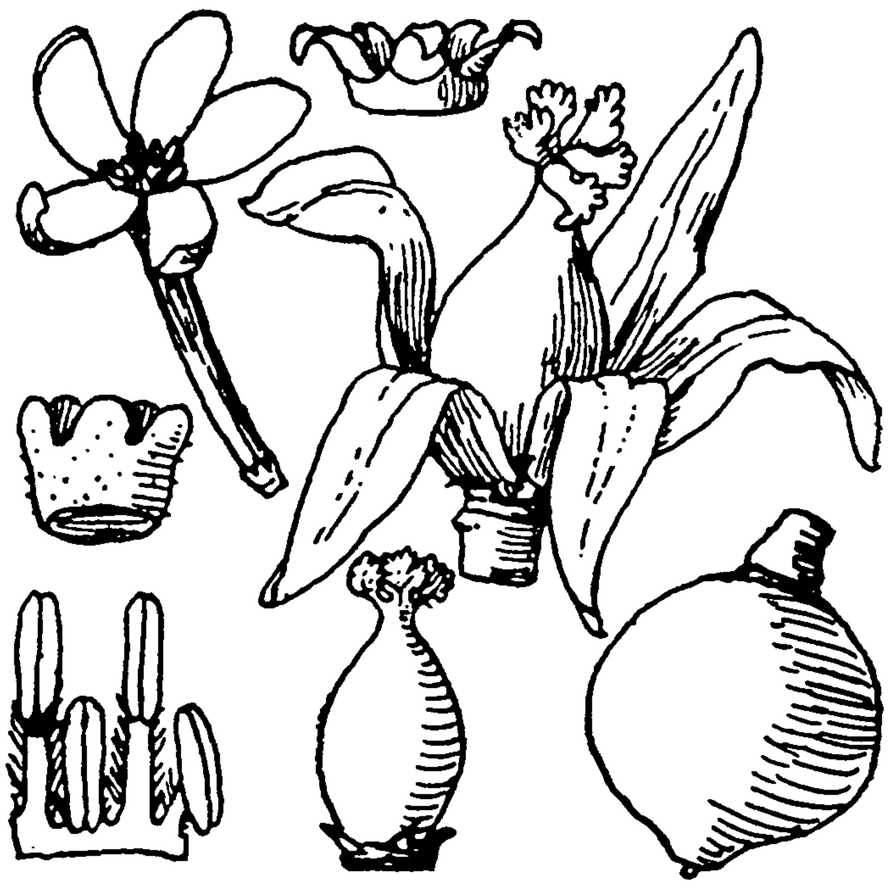
Corolla not accompanied by a crown: flowers mainly dioecious, the staminate and pistillate different. Fam. 1. PAPAYACEAE.
Corolla accompanied by a crown: flowers perfect, all alike. Fam. 2. PASSIFLORACEAE.

FAMILY 1. **PAPAYACEAE** — PAPAYA FAMILY

Shrubs or trees. Leaves with ample 7–9-lobed blades. Corolla salverform. Stamens 10: filaments adnate to the corolla-tube. Anthers erect. Fruit baccate, borne near the top of the stem.—Two genera and over 30 species tropical and subtropical.

1. **CARICA** L. Plants with milky juice, the stem rather tender, simple or branched, much-scarred above. Leaf-blades palmately or pinnately lobed.

Staminate flowers in long-peduncled cymes: pistillate flowers in short-peduncled cymes. Berries nearly sessile, many-seeded.—About 25 species, tropical American.—(PAPAYA. PAPAW. CUSTARD-APPLE. MELON-TREE.)—The flowers are sometimes polygamous.



1. **C. Papaya** L. Stem 3–6 m. tall, simple, leafy at the top: leaf-blades 3–6 dm. broad, on stout spreading petioles: corolla yellow or reddish, that of the pistillate flower the larger: berry ellipsoid to subglobose, 2–18 cm. long.—Hammocks, pinelands, and waste-places, pen. Fla. and the Keys. Nat. of Trop. Am.—(*W. I., Mex., C. A., S. A.*)—All year.—Frequently found in wild localities remote from human habitations, but doubtless sown there by birds who greatly relish the seeds. In cultivated forms the fruit is very large. The milky juice of unripe fruit has properties similar to those of pepsin.

FAMILY 2. **PASSIFLORACEAE** — PASSION-FLOWER FAMILY

Herbs, tendril-bearing vines, or shrubby plants. Leaves with entire or lobed, simple, or rarely compound blades. Corolla mostly rotate. Stamens 5: filaments usually monadelphous around the gynoecium. Fruit baccate. —Eighteen genera and about 350 species, most abundant in South America.

1. **PASSIFLORA** L. Perennial vines. Leaf-blades entire, lobed, or parted. Crown filamentous, single, double, or triple. Anthers versatile.—About 300 species, mostly of tropical America.—PASSION-FLOWERS. PASSION-VINES.—Some species are used medicinally; others in ornamental gardening.

Peduncle bearing an involucre of 3 bracts near the calyx.	I. INCARNATAE.
Peduncle without an involucre, or this obscure.	
Petioles without glands.	II. LUTEAE.
Petioles with glands at the middle or near the base of the leaf-blade.	
Peduncles single.	III. SUBEROSAE.
Peduncles clustered.	IV. MULTIFLORAE.

I. INCARNATAE

Leaf-lobes toothed: stipules minute: petiolar glands sessile.	1. *P. incarnata.*
Leaf-lobes entire: stipules foliaceous: petiolar glands stalked.	2. *P. pallens.*

II. LUTEAE

Cymes several-flowered: berry pubescent.	3. *P. sexflora.*
Cymes 1-flowered: berry glabrous.	4. *P. lutea.*

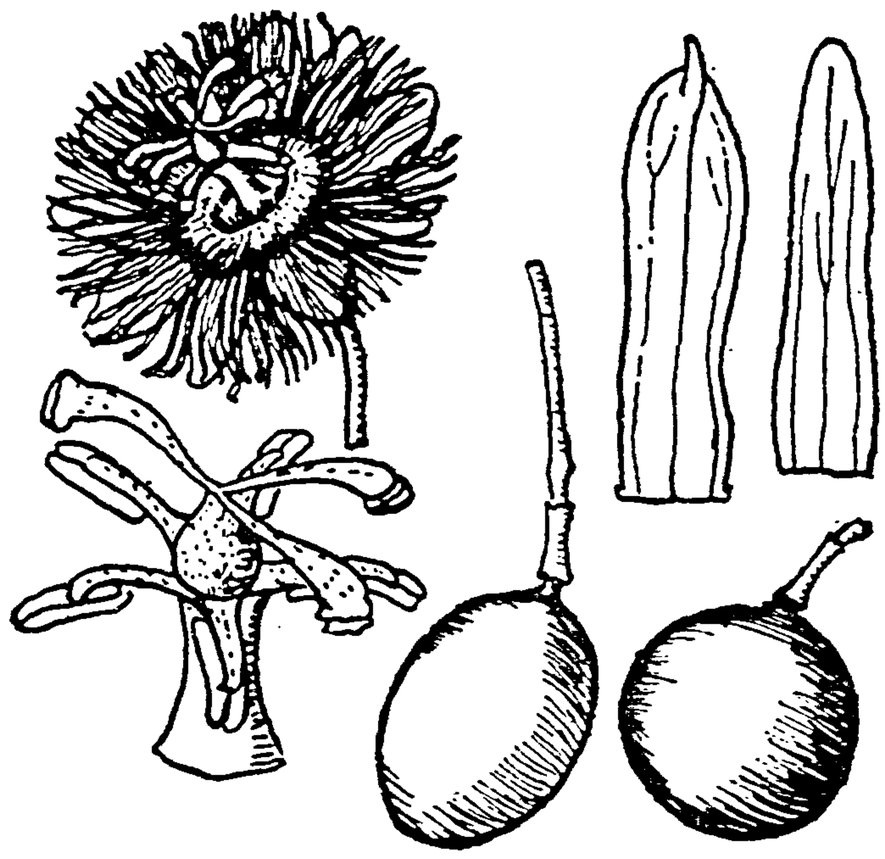
III. SUBEROSAE

Calyx or corolla 2.5–3 cm. wide: leaf-blades, or lobes, toothed.	5. *P. Warmingii.*
Calyx less than 2 cm. wide: leaf-blades, or lobes, not toothed.	6. *P. pallida.*

IV. MULTIFLORAE

Woody tomentose vine, with thick leaf-blades.	7. *P. multiflora.*

1. **P. incarnata** L. Twigs finely pubescent or glabrate: leaf-blades 8–12 cm. long, glabrous or sparingly pubescent, the lobes finely serrate: sepals 25–30



mm. long: petals pale-lavender: crown lavender and purple: berry ellipsoid or oval, 4–10 cm. long, yellowish: seed 5–6 mm. long.—(MAY-POP. APRICOT-VINE.)—Dry roadsides, rocky slopes, and old fields, various provinces, Fla. to Tex., Mo., and Va.—Spr.-sum.—The fruit is edible.

2. **P. pallens** Poepp. Twigs glabrous, glaucous: leaf-blades nearly equally 3-lobed, 4–8 cm. long, the lobes ovate, the terminal one usually slightly larger than the others: stipules foliaceous, ovate to reniform: sepals lanceolate to linear-lanceolate, 20–30 cm. long, white or greenish-white: corolla wanting: berry 4–5 cm. long, yellow.—Hammocks, Everglade Keys and Cape Sable region, Fla.—(*W. I.*)—All year.

3. **P. sexflora** Juss. Twigs tomentulose: leaf-blades 6–14 cm. broad, pubescent: cymes several-flowered: sepals 9–11 mm. long: corolla greenish-white: berry globular, 9–11 mm. in diameter, greenish-purple, pubescent: seed about 2.5 mm. long.—Hammocks, Everglade Keys, Fla.—(*W. I.*)—All year.

4. **P. lutea** L. Twigs finely pubescent or glabrous: leaf-blades 3–15 cm. broad, mostly obtuse, glabrous: cymes 1-flowered: sepals 8–12 mm. long: corolla greenish-yellow, about 2 cm. broad: berry 10–15 mm. in diameter, purple-black.—(YELLOW PASSION-FLOWER.)—Rich woods and thickets, various provinces, Fla. to Tex., Kans., and Pa.—Spr.-sum.

5. **P. Warmingii** Mast. Twigs sparingly fine-hirsute: leaf-blades 5–14 cm. in diameter; lobes triangular or ovate, remotely toothed: sepals lanceolate, 18–21 mm. long: corolla pale-yellow, 2.5–3 cm. broad: berry globular, 25–30 mm. long, white-hairy: seed 4.5–5 mm. long, wrinkled.—Thickets and woods, near Clemson College, in the Piedmont of S. C. Nat. of Brazil.—Spr.-sum.

6. **P. pallida** L. Twigs glabrous or minutely pubescent: leaf-blades entire to 3-lobed, mostly 2–10 cm. long: calyx greenish; sepals linear to lanceolate or elliptic, 7–9 mm. long: corolla wanting: berry 6–10 mm. in diameter, purple-black: seeds 2.5–3 mm. long. [*Passiflora suberosa* L. *P. minima* L. *P. angustifolia* Sw.]—(CORKY-STEMMED PASSION-FLOWER.)—Hammocks and pinelands, pen. Fla. and the Keys.—(*W. I., C. A., S. A.*)—The older stems frequently develop broad corky wings.

7. **P. multiflora** L. Twigs velvety: leaf-blades elliptic or nearly so, 5–12 cm. long, entire, rugose beneath: sepals 5–6 mm. long, yellow-green: petals linear or nearly so, white: berry subglobose, 6–8 mm. in diameter, purplish-black.—Hammocks, S pen. Fla. and the Keys.—(*W. I.*)—The old stems are frequently covered with a thick corky bark.

ORDER **OPUNTIALES** — OPUNTIAL ORDER

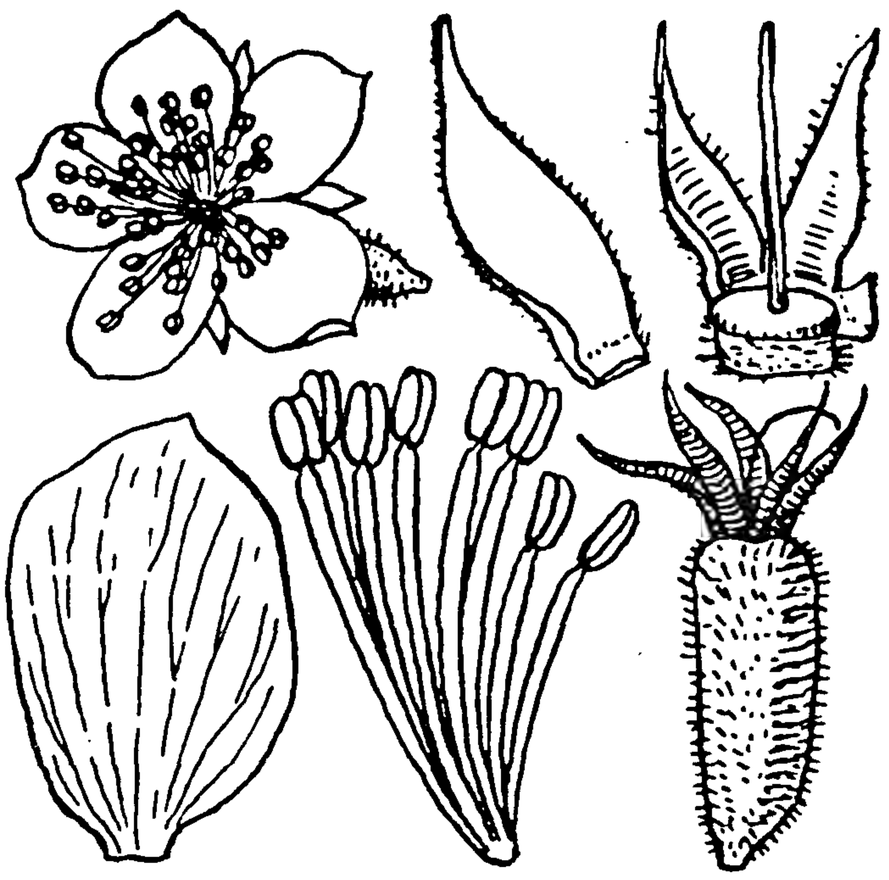
Succulent, typically spine-armed, herbs, shrubs, or trees, mainly leafless or essentially so, or leafy rigid herbs, with more or less specialized hairs. Flowers perfect. Hypanthium present. Calyx of 4 or 5, or many, sepals. Corolla of 4 or 5, or many, stamens, in several series or groups, sometimes partially reduced to staminodia. Gynoecium of 4, or 2–several, united carpels. Ovary inferior. Fruit baccate or capsular.

Sepals and petals 4 or 5 each, very different: leaves with entire or dissected blades: erect or climbing plants, with rigid hairs. Fam. 1. LOASACEAE.
Sepals and petals nearly alike, at least the latter numerous: leaves typically mere scales or wanting: succulent plants, usually armed with spines. Fam. 2. OPUNTIACEAE.

FAMILY 1. LOASACEAE — LOASA FAMILY

Rigid herbs with barbed or stinging hairs. Leaves with entire lobed, pinnatifid, or dissected blades.—About 20 genera and 250 species, mostly American.

1. **MENTZELIA** [Plum.] L. Brittle-stemmed, mostly diffuse or reclining herbs. Leaf-blades relatively broad, sinuate or lobed. Androecium without staminodia. Seeds angled.—About 35 species, American.



1. **M. floridana** Nutt. Leaf-blades 2–9 cm. long, ovate to deltoid-ovate toothed and 3-lobed: sepals lanceolate, often very broad at the base: petals golden-yellow, 15–18 mm. long: capsule 1–1.5 cm. long.—(POOR-MAN'S PATCHES. STICK-LEAF. BLAZING-STAR.)—Hammocks, sand-dunes, and shell-mounds, pen. Fla. and the Keys.—(*W. I.*)—Spr.–fall or all year S.—The barbed hairs on the leaves cause them to adhere very closely to clothing. They are also very effective in cutting off the feet and legs of small insects that alight on them.

FAMILY 2. OPUNTIACEAE — CACTUS FAMILY

Shrubs or trees with more or less succulent tissues over a woody framework, the stem depressed or elongate, simple or branched, continuous or jointed, terete, fluted, or flattened, usually armed with spines which arise from cushions (areolae) of hairs or minute stiff bristles. Leaves rudimentary, obsolete, or wanting, or rarely well-developed. Flower solitary, often showy, diurnal or nocturnal. Calyx of several or numerous sepals. Corolla of few or many white or colored (except blue) petals. Androecium of numerous stamens in several series. Gynoecium of several united carpels. Ovary inferior, with the hypanthium often much produced beyond it, 1-celled, with several parietal placenate. Styles united. Stigmas clustered. Fruit a fleshy berry, either spiny or scaly, hairy or naked.—About 100 genera and over 1,200 species, American.—Many of the plants are used for foods and for ornamental gardening.

Plant copiously leafy, the leaves with broad blades, persistent. I. PERESKIEAE.
Plants leafless, or leaves obsolete or rudimentary, mere succulent scale-like deciduous structures.
  Plants conspicuously jointed, sometimes loosely so, the internodes (joints) relatively short, more or less flattened: leaves mere thick deciduous scale-like structures: areolae with barbed bristles and often with single or clustered spines: hypanthium not prolonged beyond the ovary, deciduous from the ovary with a clean scar leaving a flat or more or less depressed umbilicus. II. OPUNTIEAE.
  Plants inconspicuously jointed, the internodes (joints) terete, grooved, or angled: leaves none or obsolete: areolae without bristles, but spine-bearing: hypanthium much prolonged beyond the ovary, persistent on the fruit or rotting off irregularly, or very short.

Flower rotate: hypanthium not prolonged: perianth of few sepals and petals. — III. RHIPSALIDEAE.
Flower funnelform, trumpet-shaped, or narrowly campanulate: hypanthium much prolonged: perianth of numerous sepals and petals. — IV. CEREEAE.

I. PERESKIEAE

Climbing or reclining plants with broad leaves and a pair of reflexed spines at each areola which is devoid of bristles: flowers stalked. — 1. PERESKIA.

II. OPUNTIEAE

Plant prostrate or with erect diffusely branched stems, without a continuous terete trunk: seed glabrous. — 2. OPUNTIA.
Plant with erect terete unjointed trunks: seed pubescent.
Trunk supporting dimorphous branches, the lateral ones terete, the succeeding ones flat: hypanthium short and terete: corolla with narrow, loosely spreading petals: berry subglobose. — 3. BRASILIOPUNTIA.
Trunk supporting all flat irregularly placed branches: hypanthium elongate, flattened, resembling a small joint: corolla with broad, short, closely imbricate petals: berry elongate. — 4. CONSOLEA.

III. RHIPSALIDEAE

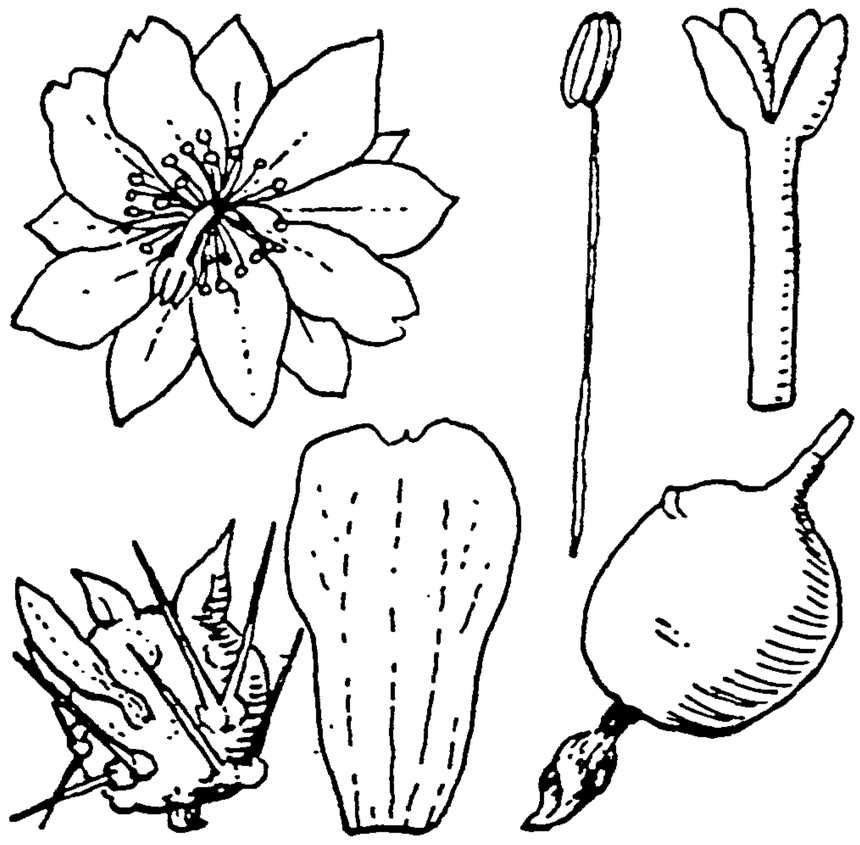
Pendent much-branched epiphyte with small white flowers. — 5. RHIPSALIS.

IV. CEREEAE

Stem and branches unequally 3–5-angled, not terete: berry persistently scaly or spiny.
Hypanthium scaly and hairy, the scales subtending tufts of hairs. — 6. SELENICEREUS.
Hypanthium scaly or spiny, but not hairy.
Hypanthium scaly: berry more or less clothed with broad scales: plant climbing with aerial roots. — 7. HYLOCEREUS.
Hypanthium spiny: berry armed with clusters of spines: plant erect, diffuse, or reclining. — 8. ACANTHOCEREUS.
Stem and branches terete in outline, more or less fluted: berry neither persistently scaly or spiny.
Flower trumpet-shaped: hypanthium elongate, copiously scaly at the base: sepals and petals long and narrow: berry with stout scale-bases and often tufts of hair. — 9. HARRISIA.
Flower narrowly campanulate: hypanthium short, naked at the base: sepals and petals broad and short: berry naked and glabrous. — 10. CEPHALOCEREUS.

1. PERESKIA Plum. Woody and partly succulent vines with reclining or clambering stems and branches with spines at the leaf-axils. Leaves alternate: blades broad, flat, entire, short-petioled. Flowers often panicled. Hypanthium depressed, smooth or scaly. Sepals narrow. Corolla rotate: petals relatively few and broad, white or colored, broader than the sepals. Stamens numerous. Berry pyriform to subglobose, translucent, sometimes scaly.—About 20 species, tropical American.

1. P. Pereskia (L.) Karst. Stems and branches reclining or clambering, elongate, glabrous: leaf-blades ovate to lanceolate-elliptic, 4–9 cm. long, often acute or abruptly pointed, coriaceous, short-petioled: flowers very fragrant: sepals lanceolate, 1–1.5 cm. long, recurved: corolla 3.5–4 cm. wide: petals ovate-lanceolate, elliptic, or elliptic-obovate, the outer green, the inner white or nearly so, or sometimes yellowish or pinkish: berry subglobose, yellowish, 1–1.5 cm. in diameter, smooth in age: seeds 3–4 mm. in diameter. [*P. aculeata* Mill.] —(WEST-INDIAN GOOSEBERRY. LEMON-VINE. BARBADOS-GOOSEBERRY.)—Hammocks, thickets, and woods, S pen. Fla. Nat. of trop. Am.—Although frequently grown as an ornamental, the fruits are eaten raw or as a preserve and the leaves as a pot-herb.



2. OPUNTIA [Tourn.] Mill. Shrubs or trees, the trunk of fused joints, more or less irregular, usually widely or diffusely branched, the branches (joints) flat, armed at the areolae with solitary or clustered spines which arise from among clusters of bristles, or spineless. Leaves small, fleshy, thick scales, deciduous. Flowers large, at least relatively so, solitary or several on a joint. Hypanthium broadened upward, with areolae like the joints. Sepals fleshy, mostly green. Petals broad, usually broadened upward. Berries longer than thick, enlarged upward, mostly fleshy. Seeds flattened, cochleate, with even edges and glabrous sides.—About 260 species, American.—PRICKLY-PEARS. DEVIL'S PINCUSHIONS. TUNAS. DEVIL'S-TONGUES.—The fruits of prickly-pears are edible. They formed an important food-supply for the aborigines, who also used the stems as food by roasting them. The fruits are much used for food in some countries to-day. In the following descriptions the color of the spine is first stated for the immature stage, followed by the mature stage when dry and the mature stage when wet.

Joints of the stem and of the branches loosely attached, readily separating when shocked or touched, or even when blown by the wind, at least in the case of the smaller plants: fruits early deciduous: plants of some species often propagating only by the easily separating joints.
- Spines acicular, gray or salmon-colored the first year, when dry.
  - Longer spines of each areola solitary or paired, gray the first year, when dry. — I. CURASSAVICAE.
  - Longer spines of each areola several, salmon-colored the first year, gray the second year, when dry. — II. PISCIFORMES.
- Spines subulate, ivory-white the first year, gray the second year, when dry. — III. TUNAE.

Joints of the stem and of the branches firmly attached: fruits persistent.
- Joints glabrous; spines acicular to elongate-subulate: very rigid, or wanting; hypanthium with few areolae.
  - Plants with spine-armed joints.
    - Mature spines gray when dry, at least in the second year.
      - Mature plants prostrate or erect and diffuse, often bushy; spines gray, or white, or yellow the first year, becoming gray at maturity, when dry.
        - Spines bright-yellow the first year, gray the second year. — IV. OCHROCENTRAE.
        - Spines gray the first year or white the first year and gray the second. — V. TORTISPINAE.
      - Mature plants erect, with the joints of the main stem fused into a subterete trunk which divides above into a few or many branches: spines red the first year, becoming gray at maturity, when dry. — VI. AMMOPHILAE.
    - Mature spines yellow, red, or red-brown when dry, unchanged from year to year, uniform, discolored or banded.
      - Mature spines yellow or slightly discolored, often stout and clustered, sometimes curved, rarely very short and then mostly hidden in the areolae, not closely spirally twisted. — VII. DILLENIANAE.
      - Mature spines red or red-brown, banded in our species, closely spirally twisted. — VIII. ELATIORES.
  - Plants with unarmed joints.
    - Joints thin oh thinnish, with persistent bristles in the areolae: berries small, less than 5 cm. long. — V. TORTISPINAE.
    - Joints thick and turgid, with deciduous or obsolete bristles in the areolae: berries large, over 5 cm. long. — IX. FICUS-INDICAE.
- Joints pubescent: spines setaceous, pliable: hypanthium with numerous areolae. — X. LEUCOTRICHAE.

I. CURASSAVICAE

Larger joints broad, obovate, oval, suborbicular, or subglobose: spines setaceous-acicular, exceptionally long and slender: berry urceolate, tuberculate. — 1. *O. abjecta.*

Larger joints elliptic, linear-elliptic, spatulate, or subcylindric: spines acicular-subulate: berry of a turbinate, obovoid or clavate type.

Joints mostly subcylindric, only slightly flattened, repand-tuberculate: berry narrowly turbinate or clavate-turbinate. — 2. *O. Tracyi.*

Joints decidedly flattened, although often quite turgid, not repand: berry obovoid to obconic-turbinate or clavate.

Corolla lemon-yellow: joints deep-green: spines dark-gray: berry narrowly obovoid to obconic-turbinate, less than twice as long as thick. — 3. *O. Drummondii.*

Corolla bright-yellow: joints pale-green: spines light-gray: berry clavate, over twice as long as thick. — 4. *O. impedita.*

II. PISCIFORMES

Plants in dense colonies with turgid very spiny narrow, deep-green joints, the spines conspicuously long and slender,. salmon-colored in the first year, gray in the second: flowers numerous, bright-yellow: berry turbinate-obovoid, 4 cm. long or less. — 5. *O. pisciformis.*

III. TUNAE

Plants in depressed colonies with conspicuously spiny broad pale-green joints, the spines conspicuously short and stout, white in the first year, gray in the second: flowers few, clear-yellow: berry obovoid, 2 cm. long or less. — 6. *O. eburnispina.*

IV. OCHROCENTRAE

Plants erect and diffusely branched, with rather narrow light-green joints: spines stout, bright-yellow in the first year, gray in the second. — 7. *O. ochrocentra.*

V. TORTISPINAE

Plants prostrate, the stem and branches often forming depressed mats or colonies of joints.

Plants not armed with spines.

Joints narrow, much longer than wide, thick or turgid: berry 4–6 cm. long. — 8. *O. macrarthra.*

Joints broad, little longer than wide, usually thinnish:

Joints deep-green: berry clavate-obovoid or narrowly obconic. — 9. *O. Opuntia.*

Joints bluish-green: berry obovoid: — 10. *O. Pollardi.*

Plants spine-armed, the spines mostly solitary in an areola.

Mature joints broad, not much longer than wide.

Joints dull, deep-green or bluish-green: inner sepals not reniform: corolla 6 cm. wide or more: mature spines gray in the first and second years: inner petals longer than wide.

Joints deep-green: berry clavate-obovoid or narrowly obconic: spines dark-gray, slender. — 9. *O. Opuntia.*

Joints bluish-green: berry obovoid: spines pale-gray, stout. — 10. *O. Pollardi.*

Joints shining: inner sepals reniform: corolla 5 cm. wide or less: mature spines ivory-white in the first year, gray in the second: inner petals nearly or quite as wide as long. — 11. *O. atrocapensis.*

Mature joints narrow, often elongate.

Intermediate sepals ovate; inner sepals merely acute: berry obconic-obovoid: seed usually less than 5 mm. in diameter. — 8. *O. macrarthra.*

Intermediate sepals lanceolate; inner sepals abruptly acuminate: berry clavate, constricted at the base: seed usually over 5 mm. in diameter. — 12. *O. lata.*

Plants erect, often diffusely branched, sometimes forming thickets.

Plants not armed with spines.

Hypanthium elongate: leaves spreading and recurved: berry broadly obovoid, nearly or quite as wide as long: seeds about 4 mm. in diameter. 13. *O. turgida.*
Hypanthium about as wide as long: leaves ascending: berry ellipsoid-obovoid, much longer than wide: seeds about 6 mm. in diameter. 14. *O. polycarpa.*
Plants armed with single or clustered spines at the areolae.
Mature spines (first year) gray, darker gray the second year.
Young spines mainly pale-yellow: berry rounded at the base: seeds 6 mm. in diameter. 14. *O. polycarpa.*
Young spines brown: berry narrowed, often constricted at the base: seeds 4 mm. in diameter. 15. *O. nitens.*
Mature spines (first year) white, becoming gray the second year.
Corolla 6–7 cm. wide: spines 2–4 cm. long: berry narrowly obovoid, 2.5–3.5 cm. long. 16. *O. austrina.*
Corolla 8–10 cm. wide: spines 5–7 cm. long: berry broadly obovoid, 4–5 cm. long. 17. *O. cumulicola.*

VI. Ammophilae

Plants tree-like, the stout or stocky trunk divided above into few or many divergent branching joints, sometimes semaphore-like: joints gray-green, usually copiously armed. 18. *O. ammophila.*

VII. Dillenianae

Spines subulate to acicular, rigid, spreading.
Areolae bearing 4–13 short-subulate spines which seldom exceed the bristles, the joints thus apparently unarmed: corolla campanulate or cupulate. 19. *O. keyensis.*
Areolae bearing 2–6 long spines which much exceed the bristles, the joints thus conspicuously armed (individually sometimes unarmed): corolla rotate, except in *O. tenuiflora.*
Corolla campanulate: hypanthium and berry contracted into a long slender base, thus decidedly clavate. 20. *O. tenuiflora.*
Corolla rotate: hypanthium and berry not contracted into a long slender base.
Berry decidedly longer than thick, the umbilicus depressed.
Hypanthium long-turbinate or obconic-turbinate, much longer than its greatest diameter.
All the areolae armed with a cluster of spines.
Intermediate and inner sepals acute: berry more or less constricted at the base: seeds large, 5–6 mm. in diameter. 21. *O. Dillenii.*
Intermediate and inner sepals truncate or emarginate: berry not constricted at the base: seeds small, 3–4 mm. in diameter. 22. *O. Lindheimeri.*
Some of the areolae armed with 1, 2, or 3 spines. 23. *O. stricta.*
Hypanthium short-turbinate or obovoid-turbinate, slightly longer than the greatest diameter.
Outer sepals of a deltoid type; intermediate sepals reniform or rhombic-reniform, rounded and minutely pointed. 24. *O. Bentonii.*
Outer sepals of a reniform type: intermediate sepals papilionaceous, emarginate. 25. *O. tunoidea.*
Berry globose-turbinate, nearly or quite as thick as long, the umbilicus convex. 26. *O. turbinata.*
Spines acicular-setaceous, weak and pliable, sparse, reflexed or recurved.
Joints short, orbicular to orbicular-obovate, the larger ones 1–1.5 cm. long: leaves subulate, recurved-spreading. 27. *O. cantabrigiensis.*
Joints elongate, elliptic, oval or narrowly obovate, the larger ones 3–5 dm. long: leaves loosely ascending. 28. *O. magnifica.*

VIII. ELATIORES

Plants erect, but diffusely branched: spines banded: hypanthium broadly turbinate: berry broadly obovoid, not constricted at the base. 29. *O. zebrina.*

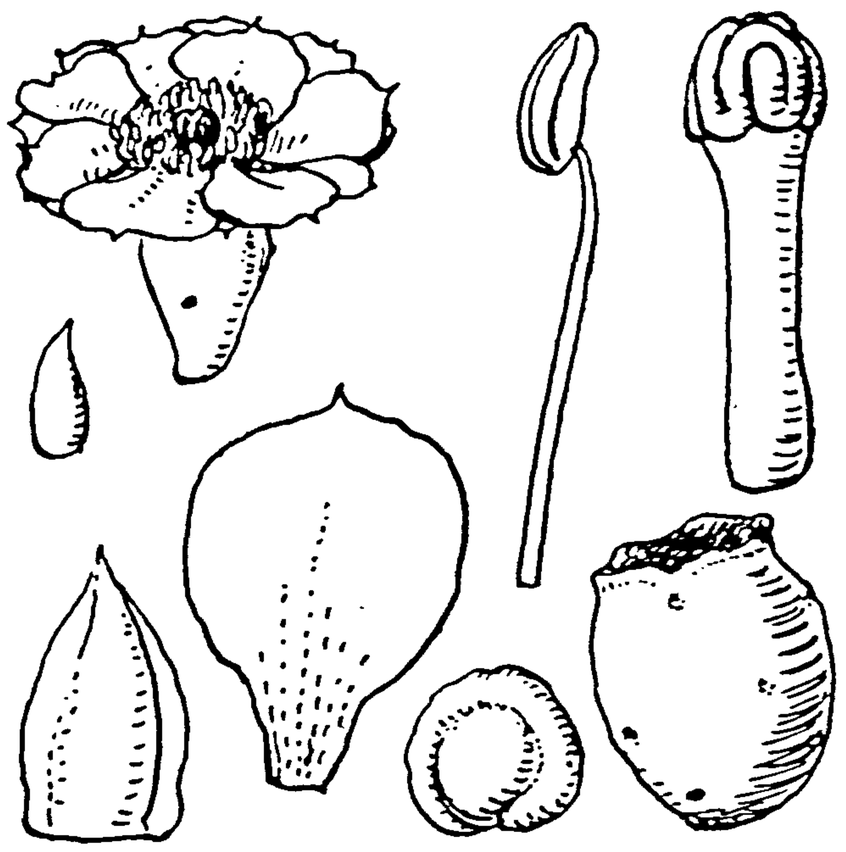
IX. FICUS-INDICAE

Plants very robust, more or less tree-like, the thick joints supported on the subterete trunk, mostly about 3 dm. long: corolla large, mostly 8–10 cm. wide: berry red or orange, said to be sometimes yellow. 30. *O. Ficus-Indica.*

X. LEUCOTRICHAE

Plants erect, often with the joints of the main stem fused into a trunk, the older parts especially, clothed with white hair-like bristles: joints with numerous, rather close-set areolae: hypanthium with numerous areolae: berry aromatic. 31. *O. leucotricha.*

1. O. abjecta Small. Plant prostrate, often growing in large irregular patches on almost bare limestone or where some sand and humus has collected, very irregularly branched, often with small tuberous roots: joints suborbicular, sometimes nearly subglobose, oval or broadly obovate, mostly 4–8 cm. long, very thick, frequently very turgid, light-green, often much-branched, loosely attached to each other: leaves ovoid to conic-ovoid, 2–3 mm. long, ascending and slightly curved upward, green or purplish, accompanied by fine bristles, but without spines: areolae not very conspicuous: spines acicular, mostly solitary, brown, mottled light and dark, becoming chalky-gray when dry, reddish-purple, except the paler and more or less mottled distal part when wet, the larger ones 2–6 cm. long: flowers usually solitary on a joint: hypanthium turbinate: sepals green, the outer subulate-lanceolate, 5–8 mm. long, acute: corolla light-yellow, 2.5–3.5 cm. wide; petals few, obovate, usually minutely pointed: berry urceolate, 2–2.5 cm. long, somewhat tuberculate, red or purple-red, rounded at the base, the umbilicus relatively very broad, concave: seeds few, flattish, about 4 mm. wide.—Hammock, S end of Big Pine Key, Fla.—Although the plants of this species flower and fruit in their native haunts, they have thus far failed to flower in cultivation.



2. O. Tracyi Britton. Plant similar to that of *O. Drummondii,* but usually more diminutive; joints narrowly ellipsoid to narrowly cylindric, more or less flattened, 2.5–8 cm. long or longer and worm-like, bright-green, very loosely attached to each other: leaves green, ovoid, sometimes narrowly so, sometimes accompanied by the young spines: areolae small but conspicuous, usually all of them armed: spines solitary or 2–4 together, pink, at maturity light-gray when dry, brown or purple-brown when wet, slightly flattened: flowers 1 or 2 on a joint: hypanthium turbinate-obconic: sepals sometimes purple-tinged, the outer subulate, the intermediate triangular, the inner rhombic-ovate: corolla bright-yellow, nearly similar to that of *O. Drummondii:* berry narrowly turbinate to clavate-turbinate, 3–4 cm. long, purple, the umbilicus depressed: seeds few, 5–5.5 mm. in diameter, flattish.—Sand-dunes and sandy woods near the coast, N E Fla. and S E Ga. to Miss.

3. O. Drummondii Graham. Plant prostrate, diminutive and scattered in the sand, or diffusely sprawling, sometimes forming depressed mats by the copious branching and hanging together by the armament, tuberous: joints ellipsoid,

usually narrowly so, or slightly broadest above the middle or below it, thick or turgid and sometimes globular, 2–12 cm. long, light-green or pale-green, loosely attached to each other: leaves stout-subulate or ovoid-subulate, 3–6 mm. long, ascending and slightly recurved, green, unaccompanied by prominent bristles or spines: areolae inconspicuous, the upper ones, at least, armed: spines slender-subulate, solitary or 2, 3, or 4 together, pink, reddish, or red, at maturity gray, often dark-gray, except the sometimes darker tip, when dry, purple-black when wet, nearly terete: flowers usually solitary on a joint: hypanthium obconic: sepals green, the outer linear-subulate to lanceolate, 5–9 mm. long, acute or acuminate, the intermediate triangular-ovate to rhombic-ovate, acuminate, the inner orbicular-ovate above the broad claw-like base, about 2 cm. long, abruptly pointed: corolla lemon-yellow, 5–6 cm. wide: petals few, broadly obovate, truncate and emarginate at the apex and mucronate: anthers fully 2 mm. long: berry narrowly obovoid to obconic-turbinate, 2.5–3.5 cm. long, reddish purple, the umbilicus concave: seeds few, turgid, about 5 mm. in diameter. [*O. frustulenta* Gibbes. *O. Pes-Corvi* LeConte]—Sand-dunes and pinelands, outer part of Coastal Plain, Fla. to Miss. and N. C.—This and the next preceding species are so thoroughly disguised in connection with their habitats that the loosely articulated joints are frequently to be found adhering to one's clothing before they are noticed on the ground.

4. **O. impedita** Small. Plants closely prostrate, ultimately copiously branched, the joints often piled several layers deep and forming viciously armed mats, elliptic or nearly so, mostly 7–15 cm. long, rather thick, light-green: leaves stout-subulate, 4–6 mm. long, erect or ascending, slightly curved upward, dark-green, unaccompanied by exserted bristles or spines: spines stoutish, usually numerous, solitary or 2 together, pale-gray, except the brown at the tip when dry, salmon-colored and faintly banded when wet: flowers often several on a joint, numerous: hypanthium obconic, nearly terete and even: sepals green, the outer lanceolate to ovate, 4–8 mm. long, acuminate, the inner much larger, with the shoulders of the very broad body narrowed into the stoutish tip: corolla bright-yellow, 4.5–5.5 cm. wide; petals several, about 12, about 2.5–3 cm. long, broadly obovate to cuneate-obovate, broadly rounded at the apex, mostly mucronate; anthers nearly 2 mm. long: berry clavate, about 3 cm. long, rounded at the base, the umbilicus rather small, somewhat concave: seeds rather few, 4–4.5 mm. in diameter. [By error first published as *O. impedata.*]—Sand-dunes, Coastal Plain, N E Fla. to N. C.

5. **O. pisciformis** Small. Plant prostrate, copiously branched forming dense mats often 1–3 m. in diameter, with the joints piled several layers deep, with sparingly tuberous-thickened roots: joints narrowly elliptic, linear-elliptic, or spatulate, mostly 1–3 dm. long, very thick, deep-green: leaves stout-subulate, 2–4 mm. long, incurved, acute: areolae rather prominent, mostly armed: spines solitary or 2 or 3 together, cream-colored, becoming salmon-colored and gray with a dark tip when dry, salmon when wet, the longer ones 5–6 cm. long: flowers numerous: hypanthium turbinate, angular and tuberculate: sepals green, the outer lanceolate to triangular-lanceolate, 9–12 mm. long, acuminate, the inner much larger, the broad ovate or suborbicular base broadly tapering into the very stout tip: corolla bright-yellow, 6–7.5 cm. wide: petals several, about 12, 3–4 cm. long, broadly cuneate, mostly truncate or emarginate at the apex, mucronate: anthers nearly 2 mm. long: berry broadly turbinate-obovoid, 3.5–4 cm. long, purple, narrowed at the base, the umbilicus deeply concave: seeds rather numerous, 5–5.5 mm. in diameter.—Sand-dunes, estuary of the Saint Johns River, Fla.—This and the next preceding species are vigorous growers and loose-jointed. This combination causes plants to form disorderly masses of joints often a foot high.

6. **O. eburnispina** Small. Plant prostrate, widely branched and forming mats on the dune sands, with tuberous roots: joints oval or suborbicular, varying

to broadest above the middle, thickish, 6–13 cm. long, light-green, somewhat shining, especially when young: leaves ovoid-subulate, 4–5 mm. long, pale green, recurved-spreading: spines relatively stout, 2–4 together or sometimes solitary, 1–2 cm. long, ivory-white with yellowish tips when young, becoming dark-gray, not spirally twisted, greenish when wet: flowers few: hypanthium obconic: sepals triangular, green, 5–7 mm. long: corolla yellow, 4–5 cm. wide; petals few, narrowly cuneate, often minutely pointed: anthers nearly 1.5 mm. long: berry obovoid, about 2 cm. long, red, the umbilicus depressed: seed few, 3–3.5 mm. in diameter, flattish.—Coastal sands, Romano Island, Fla.—The numerous ivory-white spines contrasted against the green joints render patches of the plants very conspicuous.

7. O. ochrocentra Small. Plant erect, 1 m. tall or less, much-branched, sometimes more or less diffuse, with coarse fibrous or somewhat swollen roots: joints elliptic to oval, varying to broadest above the middle, 1–3 dm. long, thickish, bright-green: leaves ovoid or subulate-ovoid, 2–4 mm. long, often pink or purplish, acute, erect or slightly spreading: areolae rather prominent, armed: spines 5–6 together or sometimes fewer on new joints, yellow, becoming gray when dry, yellowish-green when wet, straight, the longer ones 4.5–5 cm. long: flowers rather few: hypanthium turbinate or obovoid-turbinate: sepals often purple tinged, deltoid to rhombic-orbicular or rhombic-reniform, acute: corolla bright lemon-yellow, 7–8.5 cm. wide, usually rotate: petals few, cuneate to obovate, notched at the apex or with a minute tip: anthers about 2 mm. long: berry obovoid-pyriform, 2–3.5 cm. long, red to red-purple, sometimes slightly constricted at the base: seeds numerous, 2.5–3 mm. long.—On edge of hammock, S E end of Big Pine Key and Cape Romano, Fla.

8. O. macrarthra Gibbes. Plant prostrate, the young growth sometimes ascending, rather sparingly branched, but seldom forming mats, conspicuous on account of its long, thick, smooth joints, with fibrous roots: joints elliptic to broadly linear, sometimes broadened upward, mostly 15–35 cm. long, very thick, shining, light-green: leaves ovoid-subulate, green, 5–8 mm. long, nearly straight: areolae few and distant, mostly unarmed: spines, when present, solitary, slender-subulate, brown, except the pale tip, becoming gray when dry, straw-colored when wet, 1.5–3.5 cm. long: flowers few, rarely several on a joint: hypanthium obconic, 4–4.5 cm. long: sepals mostly green, the outer subulate to lanceolate, 7–14 cm. long, acute, the intermediate triangular-lanceolate to deltoid, the inner ovate to rhombic-ovate, acute: corolla rotate, bright-yellow, 6–7 cm. wide; petals broadly cuneate-obovate to obovate, 3–3.5 cm. long, rounded at the apex, mucronate, broad at the base: anthers about 3 mm. long: berry narrowly obovoid or clavate-obovoid, 4–6 cm. long, red or red-purple, the umbilicus concave: seeds relatively few, 4–4.5 mm. in diameter, flattish.—Sand-dunes, coast of S. C. and N. C.

9. O. Opuntia (L.) Karst. Plant prostrate, the new growth sometimes ascending, with fibrous roots, often forming extensive bright-green mats: joints obovate, varying to suborbicular or elliptic, 5–18 cm. long, deep-green, often somewhat shining: leaves stout-subulate, 5–7 mm. long, often purple-tinged, ascending, nearly straight, usually unaccompanied by spines: areolae inconspicuous: spines when present pinkish, becoming dark-gray when dry, dark brown when wet: hypanthium obconic, somewhat angled: sepals mostly green, the outer subulate to lanceolate, 4–9 mm. long, acute, or abruptly sharp-tipped, the intermediate ovate-lanceolate, acuminate, the inner rhombic-obovate, abruptly pointed: corolla rotate, bright-yellow or sometimes reddish at the center, 5–8 cm. wide: petals few, 8–10, broadly obovate to broadly cuneate-obovate, about 3–4 cm. long, rounded or emarginate and erose at the apex, mucronate; anthers 2.5–3 mm. long: berry narrowly obovoid to clavate-obovoid, 2.5–5 cm. long, red or purple-red, the umbilicus concave: seeds 4–5

mm. in diameter.—(ATLANTIC PRICKLY-PEAR.)—Sandy or rocky places, various provinces, Coastal Plain only N, Ga. to Ala., N. Y. and Mass. Has been confused with *O. vulgaris* Mill., a South American plant.

10. O. Pollardi Britton & Rose. Plant prostrate, forming irregular mats, somewhat tuberous: joints suborbicular or oval, varying to broadly obovate, usually quite thick, 10–15 cm. long, or sometimes smaller, deep-green beneath the more or less glaucous surface, dull: leaves ovoid, 3–4 mm. long, erect or appressed, slightly incurved, deep-green, unaccompanied by bristles or spines: areolae rather conspicuous, much scattered, some of the upper ones, at least, usually armed: spines stout, usually solitary, yellowish or pinkish, becoming pale-gray at maturity when dry, cinnamon-brown when wet: hypanthium obovoid or obconic-obovoid, uneven: sepals green, the outer ovate to deltoid, 2–12 mm. long, acute, the inner cuneate-obovate, abruptly pointed or mucronate: corolla 5–7 cm. wide, bright-yellow: petals few, 7–10, cuneate, sometimes broadly so, 2.5–3 cm. long, notched and often mucronulate at the apex: anthers about 1.5–2 mm. long: berry obovoid, 2.5–3 cm. long, purple, the umbilicus concave: seeds sometimes rather numerous, 5–6 mm. in diameter, turgid.—Pinelands, sand-dunes, and rarely oak woods, Coastal Plain, Fla. to Miss. and Del.

11. O. atrocapensis Small. Plant diffusely prostrate, sometimes assurgent at the tip, much-branched, the decumbent branches with fibrous (?) roots: joints obovate, elliptic, or broadly oval, 0.5–1 dm. long, deep-green, sometimes shining, not glaucous: leaves stout-subulate, 2–4 mm. long: areolae small, often armed: spines usually solitary, light-yellow, becoming white or finally gray when dry, straw-colored and often brown-mottled when wet, the longer ones 2–3.5 cm. long: hypanthium obconic, 2–2.5 cm. long, nearly even, blunt at the base: sepals green, the outer ovoid to triangular-lanceolate, 3–7 mm. long, acute, the inner deltoid, about 1 cm. long, acute: corolla pale-yellow, 4.5–5 cm. wide: petals few, 8–10, oval to suborbicular, 2–3 cm. long, rounded or notched at the apex, crisped, somewhat mucronate, rounded or truncate at the base: anthers nearly 2 mm. long: berry narrowly obovoid, 3–3.5 cm. long, reddish-purple, many-seeded, the umbilicus depressed: seeds 3–3.5 mm. in diameter, flat.—Sand-dunes, Cape Sable, Fla.

12. O. lata Small. Plant prostrate, often radially branched, sometimes forming mats nearly a meter across, the tips of the branches sometimes assurgent, with elongate cord-like roots: joints elliptic to narrowly obovate, often narrowly so, thick, 0.4–1.5 dm. long, deep-green, sometimes glaucous, especially when young: leaves subulate, 6–11 mm. long, green or purple-tinged: areolae scattered, often conspicuous, sometimes very prominent and densely bristly, the marginal ones, at least, armed: spines slender, solitary or 2 together, pink, turning red or red-banded, at maturity gray or nearly white when dry, pale stramineous when wet: hypanthium obconic to clavate: sepals green, the outer subulate to lanceolate, acute, the intermediate lanceolate to triangular-lanceolate, acuminate, the inner rhombic, abruptly acuminate: corolla yellow, 7–9 cm. wide; petals rather numerous, the outer broadly cuneate-flabellate, the inner ones broadly obovate to flabellate or suborbicular, erose at the broad minutely mucronate apex: anthers about 3 mm. long: berry clavate, 5–6.5 cm. long, red or red-purple, many-seeded, the umbilicus concave: seeds about 5–6 mm. in diameter.—Pinelands, lime-sink region, Fla.

13. O. turgida Small. Plant erect, more or less diffusely branched, 0.5 m. tall or less, with fibrous roots: joints elliptic to elliptic-obovate, 5–12 cm. long, thickish, deep-green, sometimes slightly glaucous when young: leaves subulate, 6–10 mm. long, spreading and more or less recurved, green, sometimes accompanied by fine bristles, but without spines: areolae scattered, often

prominent and densely bristly on the older joints: spines (as far as known) wanting: flowers often several on a joint: hypanthium obovoid or obconic-obovoid, 2–2.5 cm. long, slightly tubercled: sepals green or purple-tinged, the outer subulate to lanceolate, 4–10 mm. long, acute, the inner rhombic-ovate, fully 1.5 cm. long, stout-pointed: corolla bright-yellow, 5.5–6.5 cm. wide: petals 10–12, about 3 cm. long, broadly cuneate, abruptly narrowed, rounded or subtruncate at the apex, mucronate: anthers 2 mm. long: berry obovoid, 2–2.5 cm. long, greenish-purple, even, broadly rounded at the base, the umbilicus flat or a little depressed at the middle: seeds rather numerous, about 4 mm. in diameter, somewhat turgid.—Hammocks on the mainland along the Halifax River to the St. Mary's River, Fla.

14. O. polycarpa Small. Plant erect, 1 m. tall or less, copiously and diffusely branched, often in large colonies or patches: joints elliptic, narrowly rhombic-elliptic or sometimes broadly so, more or less twisted, mostly 1–4 dm. long, bright-green: leaves subulate, 3–7 mm. long, or sometimes longer, ascending and more or less curved upward, often purple-tinged, accompanied by very fine bristles, with or without spines: areolae scattered, often prominently bristly: spines, when present, solitary or 2 or 3 together, rather slender, pale-yellow or marked with darker-yellow or salmon below, gray except the brown tip when dry, brown or reddish when wet, the longer ones 2–3 cm. long: hypanthium narrowly obconic, 3–3.5 cm. long with very few areolae, the scales erect or ascending: sepals mostly green, the outer subulate to narrowly lanceolate, 6–15 mm. long, acute, the intermediate lanceolate, the inner nearly or quite as wide as long, more or less rhombic, sometimes broadly shouldered and narrowed into a short tip: corolla bright-yellow, 6.5–7.5 cm. wide; petals about 12, 2.5–3 cm. long, flabellate or cuneate-flabellate, broadly rounded or truncate at the apex, mucronate: anthers 2.5–3 mm. long: berry ellipsoid-obovoid, 4–5 cm. long, purple or reddish-purple, even, rounded or slightly narrowed at the base, the umbilicus flattish and shallowly pitted at the center: seeds, numerous, about 6 mm. in diameter, rather wide-margined, somewhat turgid.—Coastal sand-dunes from the mouth of the Saint John's River to the Halifax River and on dunes, islands of the Cape Romano region, also locally in the interior, Fla.

15. O. nitens Small. Plant 1 m. tall or less, more or less diffusely spreading, with long fibrous roots: joints mostly obovate, 6–15 cm. long, thickish, green, not glaucous, shining, sometimes slightly twisted: leaves short-subulate, 3–5 mm. long, ascending: areolae often prominent on account of the exserted coarse bristles, mostly armed: spines solitary or 2–4 together, brown with a light tip, becoming dark-gray with a brown tip when dry, most of the longer ones 2–3 cm. long: flowers usually several to a joint: hypanthium obconic, about 3 cm. long: sepals green, the outer subulate or lanceolate to triangular-lanceolate, 6–16 mm. long, the inner rhombic-ovate to broadly rhombic-cuneate, 1.5–2 cm. long, all acute: corolla light-yellow, rotate, 5.5–6.5 cm. wide; petals broadly cuneate-obovate, 2.5–3 cm. long, rounded or truncate at the apex, mucronate, rather broad at the base: anthers about 2.5 mm. long: berry clavate-obovoid, about 4 cm. long, purple, the stipe-like base much shorter than the body, the umbilicus concave: seeds numerous, about 4 mm. in diameter, very turgid.—Hammocks, on shell-mounds along the western side of the Halifax River, Fla.

16. O. austrina Small. Plant erect, 1 m. tall or less, irregularly branched, tuberous: joints broad, oval or suborbicular, varying to obovate, or nearly elliptic, thinnish, 5–10 cm. long or rarely longer, deep-green or bright-green: leaves stout-subulate, 4–7 mm. long, ascending, usually accompanied by spines; green or purple-tinged: areolae rather prominent, the marginal and upper ones usually armed: spines slender-acicular, yellowish or reddish, at maturity white or light-gray when dry, pale-brown when wet, solitary or 2 together: hypan-

thium obovoid-turbinate, 2.5–3 cm. long: sepals green, the outer subulate to lanceolate, 7–14 mm. long, acute, the intermediate lanceolate to ovate, somewhat acuminate, the inner rhombic-ovate, broadly acuminate: corolla 6–7 cm. broad, light-yellow, or sometimes very pale; petals few, the outer cuneate, emarginate and abruptly-pointed, the inner obovate, rounded and minutely pointed at the apex: anthers about 2 mm. long: berry narrowly obovoid, 2.5–3.5 cm. long, purple: seeds numerous, 2.5–4.5 mm. in diameter, very turgid.—Pinelands, S pen. Fla.

17. O. cumulicola Small. Plant similar to that of *O. austrina*, but more robust and larger throughout: joints elliptic, obovate, or suborbicular, 9–30 cm. long, thick, bright-green: leaves subulate, 5–11 mm. long, more or less spreading: areolae prominent, mostly marginal, nearly all often armed: spines stout-acicular, usually solitary, if 2, the additional one very small, light-yellow, becoming light-gray or whitish when dry, light-brown when wet: corolla mostly 8–11 cm. broad, deep-yellow; petals rather many, the outer cuneate-flabellate, truncate or slightly emarginate and pointed, the inner flabellate and broadly rounded at the apex: anthers about 2.5 mm. long: berry obovoid, 4–5 cm. long, purple, the umbilicus concave: seeds numerous, 4.5–5 mm. in diameter, very turgid.—Coastal sand-dunes, S pen. Fla.

18. O. ammophila Small. Plant erect, more or less branched throughout, or ultimately with a stem 1–2 m. tall or more, becoming 1–2.5 dm. in diameter, bearing several spreading branches at the top, thus tree-like, the roots tuberous: joints various, those of the main stem elongate, ultimately fused at the nodes and subcylindric, those of the branches typically obovate or cuneate, varying to elliptic or oval, thickish, 0.5–1.7 dm. long, becoming gray-green: leaves stout-subulate, 6–10 mm. long, spreading or ascending, sometimes purple-tinged: areolae relatively numerous, conspicuous on account of the densely crowded long bristles, especially on the older joints, the marginal ones, at least, armed: spines very slender, solitary or two together, reddish or red, at maturity gray, mostly 2–6 cm. long, nearly terete, scarcely spirally twisted: flowers usually several on a joint, the buds sharp-pointed: hypanthium turbinate, 3–3.5 cm. long, more or less tuberculate-ridged, with several areolae, the scales lax or spreading: sepals green or purple-tinged, the outer lanceolate, 8–16 mm. long, acute, the intermediate ovate-lanceolate to ovate, short-acuminate, the inner rhombic to broadly rhombic-cuneate, abruptly pointed: corolla bright-yellow, 5–8 cm. wide; petals broadly cuneate, cuneate-obovate or obovate, truncate or notched at the apex, prominently mucronate, even or obscurely erose: anthers 3–3.5 mm. long: berry obovoid, 2–3 cm. long or rarely somewhat larger, flushed with red-purple, tuberculate, somewhat juicy, the umbilicus concave: seeds numerous, about 4 mm. in diameter, narrowly margined, very turgid.—(SCRUB PRICKLY-PEAR.)—Scrub, pen. Fla.—This plant reaches its maximum development in the Lake George region of Florida. Bartram observed it there in his travels. However, in recording it in his narrative he confused the vegetative parts of this plant and the large fruits of the prickly-pear of the coastwise kitchenmiddens.

19. O. keyensis Britton. Plant erect, much-branched, sometimes forming clumps 3 m. tall, with long fibrous roots: joints elliptic, oval, obovate, or spatulate, thick, 1–3 dm. long, bright-green: leaves conic-subulate or narrowly ovoid, 2–4 mm. long, ascending, straight or nearly so, green, accompanied by inconspicuous bristles, but without spines: areolae rather conspicuous, often relatively large and prominent, apparently unarmed: spines stout, 4–13 together, very short, mostly hidden in the bristles, pink, at maturity salmon-colored, sometimes protruding from the areolae as tufts of very coarse bristles, slightly flattened: buds short-pointed: flowers solitary or 2 or 3 on a joint: sepals green, the outer deltoid to subreniform, acute or acutish, or abruptly pointed, inter-

mediate ones somewhat reniform, the inner rhombic-reniform, abruptly pointed: corolla salmon-colored, cup-like or short-campanulate, 3–3.5 cm. wide; petals rather few, the outer broadly cuneate, the inner broadly obovate or orbicular-obovate, undulate, scarcely, if at all, mucronate: anthers about 2 mm. long: berry obovoid, 4–6 cm. long, purple, slightly constricted at the base, the umbilicus flattish around the edge, depressed in the middle: seeds numerous, about 5 mm. in diameter.—Hammocks and coastal sand-dunes, Florida Keys and Cape Sable region to Cape Romano region, Fla.

20. **O. tenuiflora** Small. Plant partly erect, 1 m. tall or less, usually much-branched and decumbent and diffuse, with coarse fibrous roots: joints spatulate to elliptic-spatulate, or narrowly elliptic, mostly 1.5–4 dm. long, thickish, deep-green and often sparingly glaucous: leaves ovoid or ovoid-subulate, 3–3.5 mm. long, spreading or ascending, accompanied by short spines: areolae not very conspicuous, mostly armed: spines mostly 3–6 together, pale-yellow, becoming sordid-yellow when dry, pale-brown or yellow tinged with brown when wet, curved, the longer ones 2–5 cm. long: flowers few: hypanthium clavate, 4–4.5 cm. long, prominently ridged and tuberculate, with a slender stipe-like base: sepals green, the outer deltoid, to broadly reniform and with lateral wings or shoulders, 5–8 mm. long, acute, the inner rhombic-reniform to rhombic-obovate, 1–1.5 cm. long, abruptly pointed, winged: corolla deep-salmon colored, campanulate, about 3 cm. wide; petals few, narrowly obovate to cuneate-obovate, 2–2.5 cm. long, rounded or truncate at the apex, mucronate, slightly narrowed at the base: anthers about 2.5 mm. long: berry stout-clavate, 6–7 cm. long, purple, the stipe-like base nearly or quite as long as the body, the umbilicus concave: seeds numerous, 3–3.5 mm. long.—Hammocks, upper Florida Keys.

21. **O. Dillenii** (Ker) Haw. Plant erect, rather strict and sparingly branched or much-branched and sometimes diffuse, or sometimes 2 m. tall and often somewhat tree-like, with stout fibrous roots: joints elliptic to obovate or oval, thickish, 1–3 dm. long, light-green, often glaucous: leaves conic-subulate, 2–5 mm. long, ascending, straight or nearly so, usually green, accompanied by bristles but without spines: areolae remote but conspicuous, mostly armed: spines stoutish, clustered, usually 3–6 together, flattened, often curved, pale-yellow, at maturity deeper yellow and often sordid when dry, paler yellow when wet: flowers several on a joint: hypanthium narrowly obconic, 4.5–5.5 cm. long, slightly ridged, not stipitate at the base: sepals green, the outer ovate to triangular or deltoid, 3–9 mm. long, wingless or obscurely winged, acute; the inner orbicular-reniform to rhombic-reniform, 1.5–2 cm. long, abruptly pointed: corolla yellow, salmon, or reddish, rotate, 6–8 cm. wide; petals rather few, broadly obovate to cuneate-flabellate, 3.5–4.5 cm. long, erose and usually notched at the apex, decidedly narrowed at the base: anthers about 2 mm. long: berry pyriform, 5–8 cm. long, or sometimes smaller, purple, narrowed to the base, the umbilicus flattish with a depressed center: seeds numerous, 5–6 mm. in diameter, turgid.—Hammocks, along or near the coast, tidal hammocks, and coastal sand-dunes, pen. Fla., adj. islands and Florida Keys.—(*W. I., Mex.*)

22. **O. Lindheimeri** Engelm. Plant robust, 3 m. tall or less, often widely branched throughout, thus forming a large shrub with coarse fibrous roots: joints obovate or elliptic-obovate to oval, more or less twisted, 2–3.5 dm. long, thickish, light-green or somewhat glaucous: areolae often prominent, conspicuous on account of the numerous long bristles, armed: spines stout, 5–13 together or fewer, flattened, light-yellow, becoming dingy-yellow or salmon when dry, stramineous when wet, curved, the larger ones 2–4 cm. long: flowers numerous: hypanthium obconic-turbinate, about 6 cm. long: outer sepals broadly reniform, 5–6 cm. long, mucronulate, dark-green near the center; inner sepals cuneate-flabellate, mucronate, thin-edged: corolla rotate, clear-yellow; petals about 10, the outer broadly obovate, 4–5 cm. long, the inner scarcely as broad as the outer,

all notched and mucronulate, rather thin-edged and crisped, contracted at the base: anthers 2.5–3 mm. long: berry pyriform, varying to obovoid or nearly ellipsoid, 4–5.5 cm. long, purple, the umbilicus somewhat depressed: seeds numerous, 3–4 mm. in diameter, very turgid.—Pinelands, especially about old settlements and homesteads, pen. Fla. Nat. of Tex. and Mex.

23. **O. stricta** Haw. Plant erect, but ultimately diffusely much-branched, 1–2 m. tall: joints spatulate, elliptic, oval, or obovate, rather thick, mostly 1–3.5 dm. long, somewhat glaucous: leaves subulate, mostly 5–7 mm. long, ascending or spreading, sometimes accompanied by young spines: areolae widely separated, but evenly scattered, some of them usually armed: spines solitary or 2 or 3 together, pink or salmon, at maturity yellowish when dry, red-brown or orange-brown when wet; flowers showy, often several on a joint: hypanthium elongate-turbinate, 5–6.5 cm. long: sepals green, the outer with a very broad abruptly pointed body, the intermediate somewhat reniform, abruptly pointed, the inner cuneate-flabellate, truncate and mucronate: corolla light-yellow, up to 1 dm. wide; petals mostly 8–10, the outer cuneate-obovate, the inner obovate, obscurely pointed: anthers about 2.5 mm. long: berry pyriform or obovoid-clavate, 5–7.5 cm. long, purple, the umbilicus depressed: seeds rather numerous, 4.5–5 cm. in diameter, flattish.—Shell mounds, kitchenmiddens, and aboriginal village sites, Fla. and S E Ga.—(*W. I.*)—This and the next following species are two of the prickly-pears the early Spanish records tell us the aborigines feasted on for three months of each year and also cured, like figs, for food when out of season.

24. **O. Bentonii** Griffiths. Plants erect, but ultimately diffusely or widely branched, mostly less than 1 m. tall, not tuberous: joints broadly spatulate, obovate, elliptic, or oval, thinnish, or quite thick at the base of the plant, mostly 1–3 dm. long, bright-green: leaves stout-subulate, 4–6 mm. long, or rarely longer, spreading, straight or slightly recurved, not accompanied by spines and only obscurely bristly at the base: areolae rather evenly scattered or more numerous along the edges than on the faces of the joints, few of the upper marginal ones armed: or joints individually unarmed: spines slender, solitary, or 2 or 3 together and sometimes with several shorter ones, pale-yellow, at maturity deeper-yellow when dry, pale yellow when wet, nearly terete, obscurely spirally twisted: flowers showy, mostly few on a joint: hypanthium obovoid to short turbinate, 4–4.5 cm. long, glaucous: sepals green, darker near the center and the tips, the outer broadly ovate to deltoid, 5–10 mm. long, acute, the intermediate reniform or rhombic-reniform, the inner flabellate-reniform, rounded and minutely pointed: corolla yellow, 8–9 cm. wide; petals 12–15, the outer cuneate, often broadly so, the inner obovate to orbicular-obovate, deep-yellow within, often finely crisped and mucronulate: anthers about 3 mm. long: berry obovoid, sometimes slightly pyriform, 3.5–5 cm. long, purple, the umbilicus depressed in the middle: seeds numerous, 4–5 mm. in diameter, slightly turgid, unevenly thick-margined.—Pinelands and sand-dunes, mostly near the coast, N Fla. to Tex.

25. **O. tunoidea** Gibbes. Plant erect, but ultimately diffusely and widely branched, 2 m. tall or less, the roots not tuberous: joints broadly spatulate, obovate, elliptic or oval, mostly 1–3 dm. long, thick or sometimes thinnish, bright-green and more or less glaucous: leaves stout-subulate, 4–6 mm. long or rarely longer, spreading, straight or slightly recurved, not accompanied by spines, and only obscurely bristly at the base, green or purplish-green: areolae rather evenly placed, more numerous along the edges than on the faces of the joints, few of the upper marginal ones armed or all armed, or joints individually unarmed: spines solitary or clustered, 2–4 together or more, pale-yellow, becoming dingy-yellow at maturity when dry, pale yellow when wet, the longer ones 1–3 cm. long, straight or slightly curved: flowers solitary or few on a joint, showy: hypanthium short-turbinate or obovoid-turbinate: sepals green, the outer

reniform, 4–8 mm. long, abruptly pointed, the intermediate papilionaceous, the inner flabellate-cuneate, emarginate and mucronate: corolla bright-yellow, 6.5–8 cm. wide, rotate; petals few, the outer flabellate-cuneate, the inner broadly cuneate-obovate, all toothed, emarginate, mucronate: anthers 2.5–3 mm. long: berry globose-obovoid, 4.5–6 cm. long, purple, the umbilicus shallowly concave: seeds numerous, 5–6 mm. in diameter, turgid, thick-margined.—Coastwise sand-dunes, Ga. (N E Fla.?) to N. C.

26. O. turbinata Small. Plant erect, but diffuse, less than 1 mm. tall, much-branched, with stout fibrous roots: joints oval, suborbicular or obovate, 1–1.5 dm. long, light-green and glaucous, very thick: leaves ovoid, about 3 mm. long, areolae rather prominent, mostly armed: spines solitary or 2–5 together, pale-yellow to bright-yellow, becoming sordid-brown when dry, dark-brown when wet, the longer ones 2–3 cm. long: hypanthium turbinate: sepals green, the outer deltoid-ovate, acute, the intermediate orbicular-ovate, the inner somewhat reniform and broadly pointed: corolla light-yellow, 4.5–5.5 cm. wide; petals cuneate to obovate, minutely pointed: berry globose-turbinate, 3.5–4.5 cm. long, purple, the umbilicus convex: seeds numerous, about 4.5–5 mm. in diameter, very inequilateral.—Coastal sand-dunes, N E Fla. to Ga.

27. O. cantabrigiensis Lynch. Plant erect, 1 m. tall or less, diffusely branched, but with no definite main stem, with fibrous, sometimes stout roots: joints orbicular to orbicular-obovate, mostly 1–1.5 dm. long, thickish, bright-green, somewhat glaucous when young: leaves subulate, 5–11 mm. long: areolae small, nearly all armed and with long white hairs: spines solitary or 2–4 together, acicular, cream-colored when young, at maturity pale-yellow, except the dark tip when dry, light yellow-brown when wet, the longer ones 2–3 cm. long: hypanthium obovoid, green: corolla yellow, or sometimes red in the center, rotate, mostly 5–6 cm. wide: berry globose-obovoid or globular, 3.5–4.5 cm. long, purple: seeds numerous, 3–4 mm. long, somewhat turgid.—Coastal sand-dunes about Beaufort, N. C. Nat. of Mex.

28. O. magnifica Small. Plant 2 m. tall or less, more or less widely branched and diffuse, with thick fibrous roots: joints elliptic, oval, or narrowly obovate, 2–5 dm. long or more, relatively thin, more or less twisted, bright-green and glaucous: leaves subulate, 6–8 mm. long, usually loosely ascending: areolae rather inconspicuous, feebly armed: spines very slender, even weak, solitary or 2 or 3 together, pale-yellow, becoming sordid and minutely banded when dry, pale yellow when wet, the longer ones 1.5 cm. long: flowers not very numerous, usually several to a joint: hypanthium obconic, 5.5–7 cm. long, green or sometimes purple-tinged: sepals mostly green, the outer subulate to triangular-lanceolate, 8–20 mm. long, the inner rhombic-ovate or rhombic-obovate, 2.5–3 cm. long, all acute or somewhat acuminate: corolla deep-yellow, rotate, 9–12 cm. wide; petals 12 or fewer, broadly-obovate to orbicular-obovate, 4–6 cm. long, rounded at the apex, mucronate, slightly narrowed at the broad base: anthers linear, 4–5 mm. long: berry obconic-turbinate, 8.5–9.5 cm. long, purple, the umbilicus flat or nearly so: seeds about 3 mm. in diameter, very numerous. —Pinewoods and bluffs, Amelia Island, Fla.

29. O. zebrina Small. Plant erect, more or less branched throughout, fully 1 m. tall, or less, the roots fibrous: joints oval or obovate, thickish, mostly 1–2 dm. long, deep-green, sometimes obscurely glaucous, not twisted: leaves conic-ovoid, 4–6 mm. long, or rarely smaller, erect or appressed, often slightly curved upward, bright-green, unaccompanied by bristles or spines: areolae scattered, some of them, usually the lower ones, unarmed, the upper ones irregularly armed: spines slender, solitary or 2, 3, or 4 together, red-brown and finely banded when dry, paler or salmon-pink and less conspicuously banded when wet, nearly terete, closely spirally twisted: flowers few, sometimes several on a

joint: hypanthium obovoid or turbinate-obovoid, about 4 cm. long: sepals green, the outer lanceolate to deltoid, acute, the intermediate rhombic-obovate, acuminate, the inner rhombic-cuneate or broadly cuneate, abruptly pointed: corolla rich-yellow, rotate, 6–8 cm. wide; petals about 8, the outer obovate-cuneate, the inner broadly obovate, all undulate, emarginate or notched at the apex and mucronate: anthers 2–2.5 mm. long: berry broadly obovoid, not constricted at the base, mostly 5–6 cm. long, red-purple, the umbilicus very broad, raised about the edges and somewhat depressed in the middle: seeds numerous, 5–6 mm. in diameter or rarely larger.—Coastal sand-dunes and hammocks, lower Florida Keys, Cape Sable, and Ten Thousand Islands, Fla.

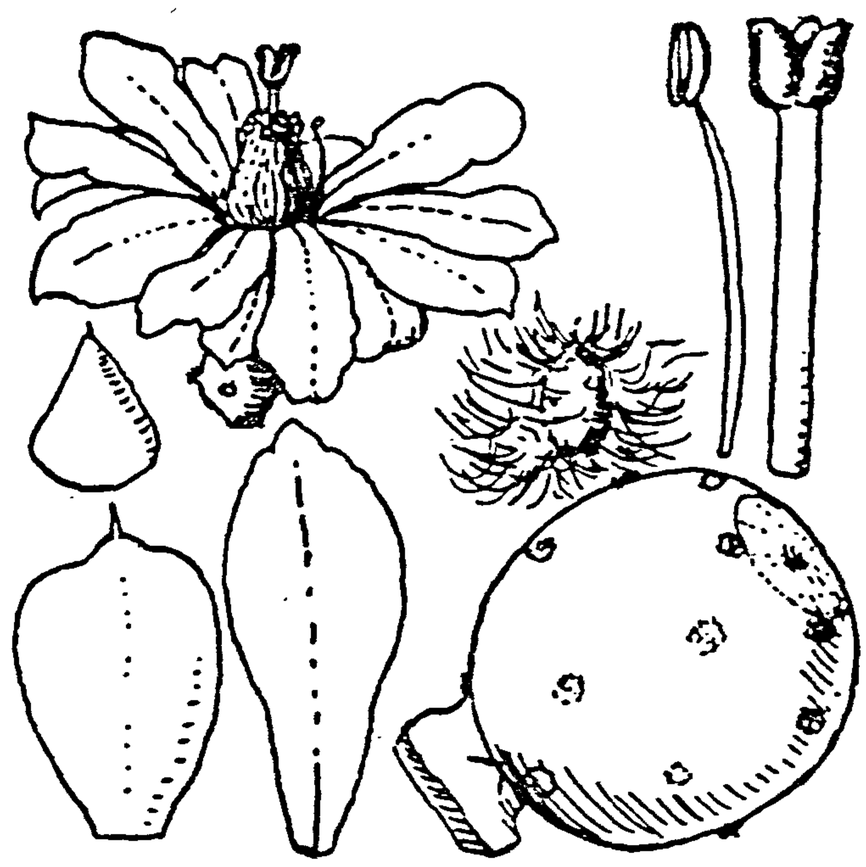
30. **O. Ficus-Indica** (L.) Mill. Plant erect, often tree-like, 4 m. tall or less, the early joints somewhat fusing to form a thick trunk which supports irregularly spreading heavy branches: joints elliptic, varying to slightly broadest above the middle or below it, thick, mostly 3–4 dm. long, often slightly glaucous: areolae small, with yellowish bristles and white wool: spines wanting, or occasionally and irregularly developed, and mostly solitary, pale, at maturity turning white, nearly terete: flowers usually several on a joint: corolla yellow, 8–10 cm. wide: berries obovoid, red or orange (said to be sometimes yellow), 5–9 cm. long: seeds 3.5–4.5 mm. in diameter.—Old fields, roadsides, and waste-places, Fla. Naturalized from cultivated plants. The original home is not known.

31. **O. leucotricha** DC. Plant stout, 5 m. tall or less, widely branched above, with stout fibrous roots: joints elliptic, oval, or suborbicular, mostly 1–2 dm. long, often thickened and narrowed in the main stems, thinnish, minutely pubescent, gray-green: areolae numerous, closely set, armed: spines 3–5 together when young, later developing as many as 19, very unequal, becoming white or gray when dry, nearly white when wet, straight or nearly so, partly deflexed, the longer ones 2.5–3 cm. long: flowers few: hypanthium turbinate or obovoid-turbinate, 2.5–3.5 cm. long, with many close-set areolae bearing clusters of small spines: sepals green, the outer lanceolate, 8–14 mm. long, with curved acuminate tips, the intermediate rhombic-obovate, slender-acuminate, the inner with obovate, oval, or orbicular-obovate bodies which are abruptly narrowed into curved tips: corolla yellow, 7.5–9 cm. wide; petals broadly cuneate or cuneate-obovate, 3–4 cm. long, rounded at the apex and mucronate: anthers fully 2 mm. long: berry short-obovoid or globose-obovoid, 4–6 cm. long, yellow, or sometimes paler or red, finely pubescent, the hair-like spines fugaceous.—(DURASNILLA. AARON'S-BEARD CACTUS.)—Hammocks, W side of Saint Lucie Sound, Fla. Nat. of Mex.—Naturalized in the hammock south of Ft. Pierce from plants taken there by the pioneers during Seminole War times.

3. **BRASILIOPUNTIA** Small. Trees, more or less shrub-like in the early stages, with terete trunks and dimorphic branches, the lateral often horizontal ones terete like the trunk, spiny, supporting flat, dilated, leaf-like, relatively thin branchlets. Leaves small, stout, early deciduous. Spines various, clustered on the trunk and branches, often solitary on the branchlets. Flowers relatively small, sometimes numerous. Hypanthium stout, with bristly areolae. Sepals broad. Petals relatively narrow, often spatulate. Berry globose to clavate, juicy. Seeds few or solitary, relatively large, woolly.—Three species, South American.—Interpreted under this generic name as a subgenus, by Schumann.

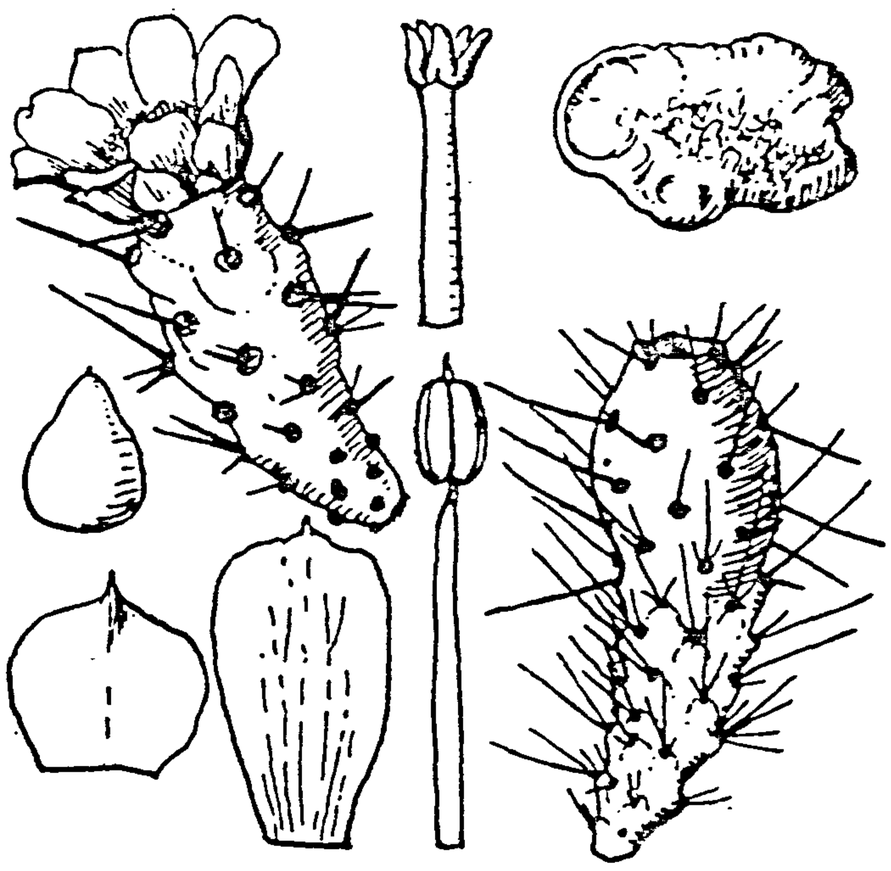
1. **B. brasiliensis** (Willd.) Haw. Plant erect, tree-like, 5 m. tall or more, or often much smaller, with a terete upwardly tapering trunk which in mature

plants supports terete spreading branches, these in turn divide into joints: leaves flat, oblong, elliptic, or obovate, mostly 1–3 mm. long, clear-green or light-green, nearly straight, unaccompanied by bristles or spines, deciduous; areolae small, minutely white-woolly, those of the stem, branches, and edges of the joints armed: spines slender, usually solitary on the flat branchlets, terete, mostly 1–3 cm. long, pale with reddish or brown tips, ultimately gray: flowers usually several on the terminal joints: sepals ovate, the inner ones broadly so: corolla lemon-yellow, mostly 3–4 cm. wide: berry subglobose to oval, 2.5–4 cm. long, light-yellow, the areolae conspicuous on account of the tufted brown bristles, the umbilicus slightly concave in the middle: seeds 7–9 mm. in diameter. [*Opuntia brasiliensis* Haw.]—Hammocks, mostly on shell-mounds, or occasionally in waste-places, pen. Fla. and the Keys. Nat. of E S. A.

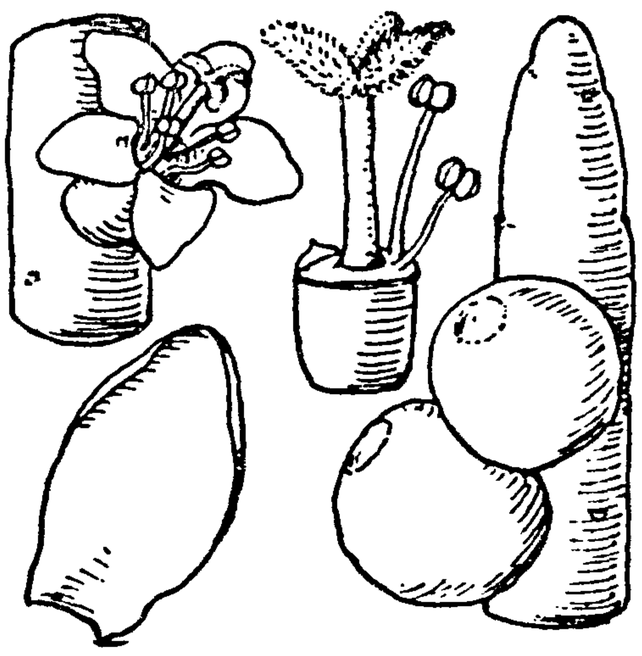


4. **CONSOLEA** Lemaire. Shrubs or small trees, the main stems or trunk ultimately a continuous terete or flattened shaft more or less copiously armed with acicular, clustered, often greatly elongate reflexed spines, the branches flat, inequilateral, thin, mostly spiny joints more or less irregularly spreading. Leaves usually very small deciduous scales. Flowers relatively small, commonly several on a joint. Hypanthium somewhat elongate, more or less flattened, usually with spiny, often numerous areolae. Sepals broad. Petals broad, often of an obovate type. Berry more or less elongate, enlarged upward, fleshy. Seeds flattened with cristate edges and hairy sides.—Eight species, West Indian and the following.

1. **C. corallicola** Small. Plants tree-like, 2 m. tall or less, or ultimately larger, light-green: stem (trunk) erect, arising from coarse fibrous roots, strict, copiously and bristly armed, elliptic or oval in cross-section: aerolae numerous, each with a cluster of 5–9 spines: spines salmon-colored when young, light-gray when mature and dry, darker when wet, acicular, one of each areola much longer than the others, often 7–12 cm. long: joints arising from the top or near the top of the stem or trunk, elliptic or broader above the middle or below it, inequilateral, more or less curved, relatively thin, the larger ones 2–3 cm. long, all copiously armed, the spines similar to those of the trunk, but smaller: flowers rather numerous: sepals green, the outer ones deltoid, 3–4 mm. long, very thick, the inner more or less reniform, thinner, abruptly pointed: petals bright-red, obovate to orbicular-obovate, 1 cm. long or less: style with an obovoid base: berry obovoid or clavate-obovoid, 2.5–5 cm. long, yellow, with spreading spines, the umbilicus deeply concave: seeds few, irregular, 7–9 mm. in diameter.—Hammocks, Key Largo and Big Pine Key, Fla. All year.—This plant has several unusual characteristics. The flat branches are inclined to grow in one plane from the trunk, hence the name semaphore-cactus; the unfertilized flower reverts to a vegetative branch; the berries are frequently proliferous.



5. **RHIPSALIS** Gaertn. Succulent pendent shrubs, sometimes with aerial fibrous roots. Main stem woody, the branchlets terete, but heteromorphic, very succulent. Leaves obsolete or minute scales. Areolae scattered. Flowers small for the family, diurnal and nocturnal. Hypanthium short-campanulate or hemispheric, naked, not produced beyond the ovary. Sepals very broad. Petals few, broad, white in our species. Stamens few. Style erect: stigmas 3, stout. Berry white, as thick as long or nearly so, smooth.—About 50 species, mostly tropical American.

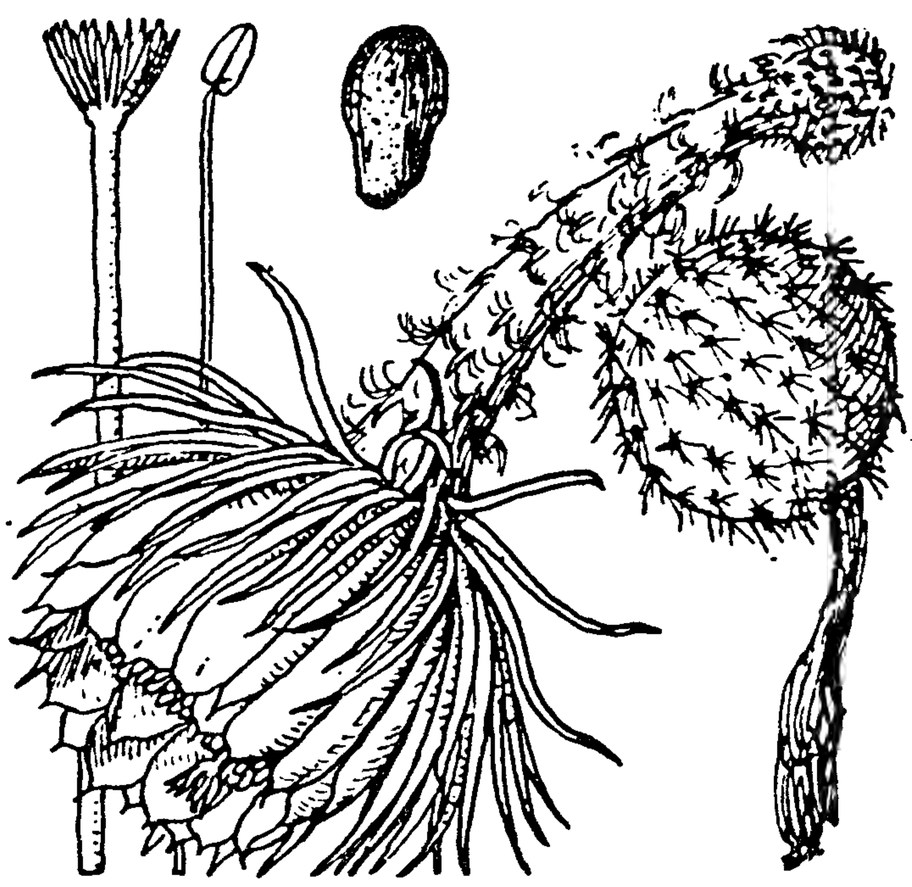


1. **R. Cassutha** Gaertn. Plants in much-branched clusters a meter or more in length, the branches often very slender (1 mm. in diameter), becoming stouter (4–8 mm.), two together or 4–8 in a cluster, the areolae with 5–9 deciduous bristles: flowers sessile: sepals reniform to ovate-reniform, about 1 mm. long or less: petals white, oval or elliptic, varying to ovate or obovate, about 3 mm. long: stamens 1–2 mm. long: berry globose or oval varying to ovoid or obovoid, 4–5 mm. in diameter. — (PENCIL-CACTUS. MISTLETOE-CACTUS.) — Hammocks, Everglade Keys, pen. Fla.—(*W. I., Mex., C. A., S. A.*)—Nat. in the O. W.—All year.

6. **SELENICEREUS** Britton & Rose. Succulent shrubs with angled or ridged, trailing, sometimes creeping, clambering, or climbing stems and branches, the angles or ridges supporting separated areolae, each of which has a tuft of wool and single or clustered spines. Leaves obsolete. Flowers nocturnal, showy, arising from an areola. Hypanthium clavate, scaly and hairy. Sepals colored, often green or yellow, very narrow. Petals white, broader than the sepals. Berry oval, varying to ovoid or obovoid, or subglobose, armed with clusters of deciduous spines.—About 18 species, tropical American.—Spr.—SNAKE-CACTI.

Branches armed with short conic inconspicuous spines: hypanthium about 15 cm. long, funnelform at the top. 1. *S. pteranthus.*
Branches armed with long slender-subulate spines: hypanthium about 10 cm. long, scarcely dilated at the top. 2. *S. coniflorus.*

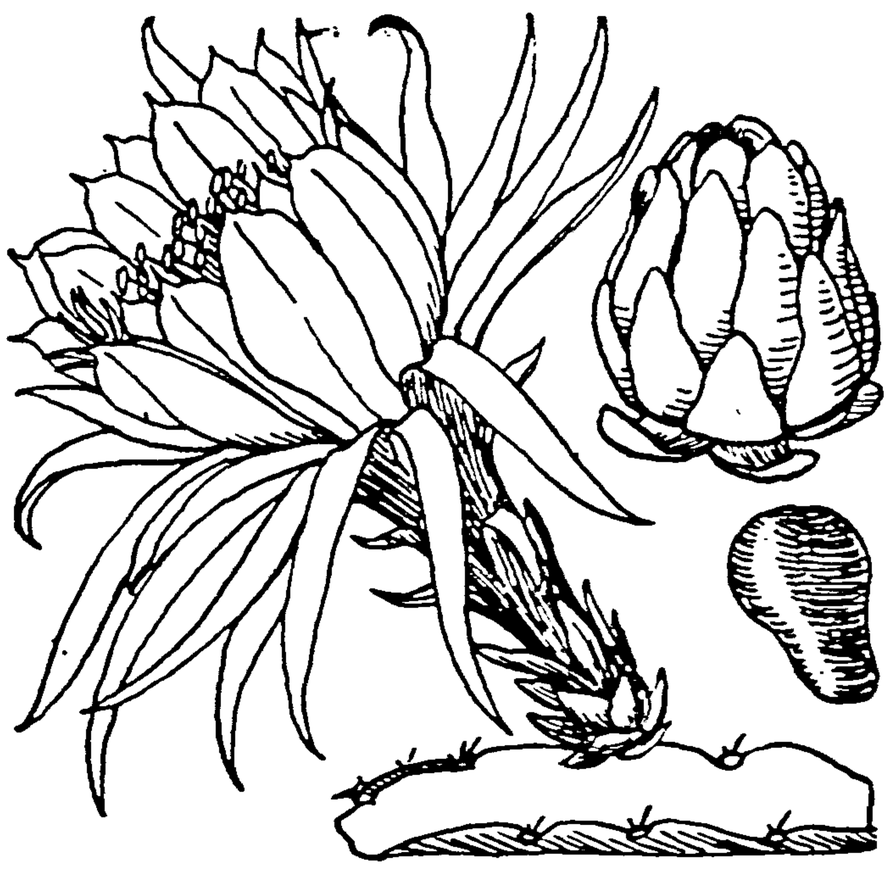
1. **S. pteranthus** (Link & Otto) Britton & Rose. Vine, the stem and branches clambering, extensively rooting, dull green: old stems subterete, the branches obtusely usually 4-angled, the branchlets sharply 4–5-angled or ridged, altogether forming serpent-like masses over objects: areolae small, the hairs white, very short, the spines conic, usually 2–4 together: flowers lateral, starting as short conic buds which soon greatly elongate; basal part of the hypanthium subglobose, covered with close-set subulate scales which subtend tufts of long stiff white hairs and clusters of long slender spines; tubular part of the hypanthium about 15 cm. long, dilated into a funnelform throat, bearing widely scattered scales with tufts of long hairs and usually a long and a short spine in their axils: sepals narrowly elongate-linear, 9–12 cm. long, except the very outer ones, light-green,



acuminate: petals white, linear-spatulate to spatulate, the narrow ones acuminate, the broader somewhat erose and mucronate: anthers 4.5–5 mm. long; berry globose, 6–8 cm. in diameter, red.—Hammocks on high sand-dunes, S pen. Fla.—Nat. of Mex.—Introduced into the hammock south of Ft. Pierce by the pioneers during Seminole War times.

2. **S. coniflorus** (Weingart.) Britton & Rose. Vine, the stem and branches diffusely clambering and climbing by copious roots, deep-green, the older portions stout and turgid, the younger parts more slender, mostly rather sharply 5-angled: areolae small, the hairs pale or nearly white, often about 1 cm. apart, the spines acicular, 5–7 together, gray, the larger ones 1–1.5 cm. long: flowers lateral, starting as conic buds which soon elongate: basal part of the hypanthium ovoid, covered with close-set stiff subulate scales which subtend tufts of short white hairs and clusters of short spines; tubular part of the hypanthium about 10 cm. long, scarcely dilated at the top, bearing rather closely scattered scales with tufts of relatively short hairs and clusters of spines in their axils: sepals very narrowly elongate-linear, 3–9 cm. long, except the outermost ones, bright-green, attenuate: petals white: berry subglobose, 5–7 cm. in diameter.—Pinelands near the Everglades, west of Halendale, and fence-rows in pen. Fla.—Nat. of Mex.

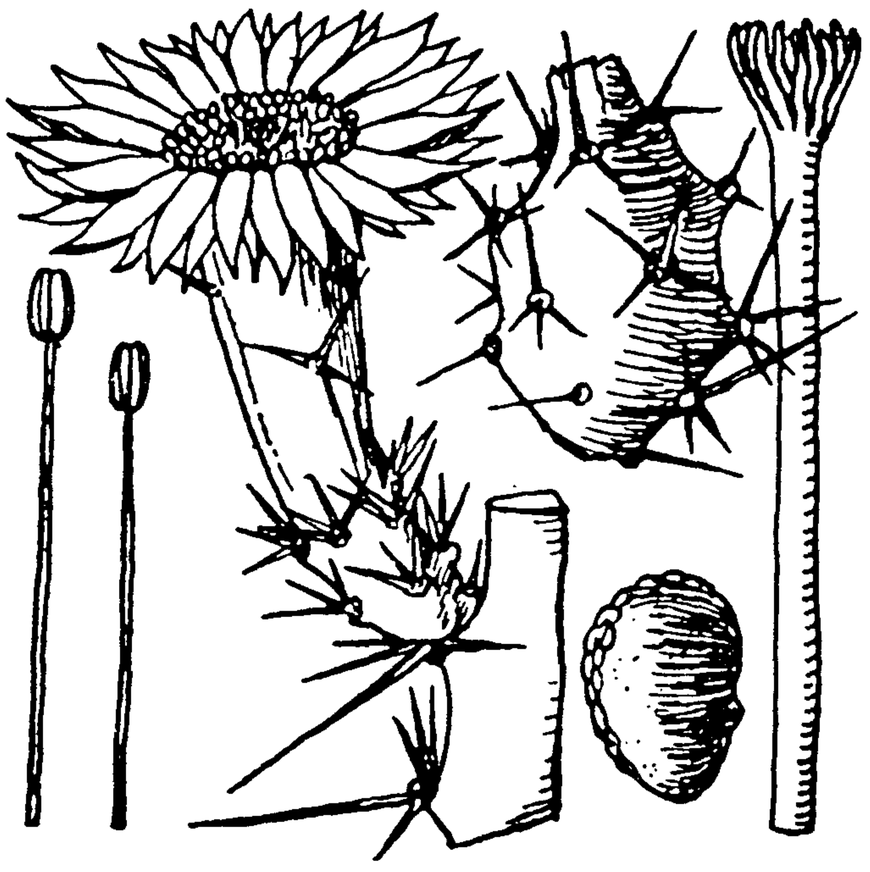
7. **HYLOCEREUS** Britton & Rose. Coarse vines with 3-angled or 3-winged stems and branches, climbing by aerial roots, the areolae remote on the ridges, each with a tuft of short hairs and a cluster of spines. Leaves obsolete. Flowers nocturnal, very large and showy. Hypanthium trumpet-shaped, with foliaceous scales. Sepals various, the outer ones resembling the hypanthium scales, the inner resembling the petals. Petals white, narrow. Berry ovoid to globose, with broad scales.—About 18 species, tropical American.



1. **H. undatus** (Haw.) Britton & Rose. Stem and branches stout, 8–12 cm. thick, light-green, commonly high-climbing, often formed in dense or compact masses: areolae usually with 3–5, relatively stout, dark spines 2–4 mm. long in the stem-sinuses: hypanthium relatively very stout, copiously scaly, shorter than the diameter of the calyx: sepals linear-lanceolate to linear, loosely spreading: petals spatulate to obovate, shorter than the sepals: berry ovoid, 8–10 cm. long, scarlet, the scales flat.—(NIGHT-BLOOMING CEREUS. QUEEN-OF-THE-NIGHT.)—Hammocks, S pen. Fla. and the Keys. Nativity not known.—Spr.–sum.—Originally described from specimens grown in China, perhaps, from tropical America. Apparently first introduced into Florida by the pioneers of the lower Indian River region during Seminole War times.

8. **ACANTHOCEREUS** Britton & Rose. Coarse shrubs with 3–6-angled, erect, diffuse, or reclining, often greatly elongate, stems and branches, the areolae remote on the ridges, each with a tuft of short hairs and a cluster of spines. Leaves obsolete. Flowers nocturnal, relatively large. Hypanthium trumpet-shaped, armed with spines. Sepals various, the outer short, the inner long and narrow. Petals white, linear to spatulate. Berry ovoid or oval, spine-armed.—About 8 species, of continental tropical America.

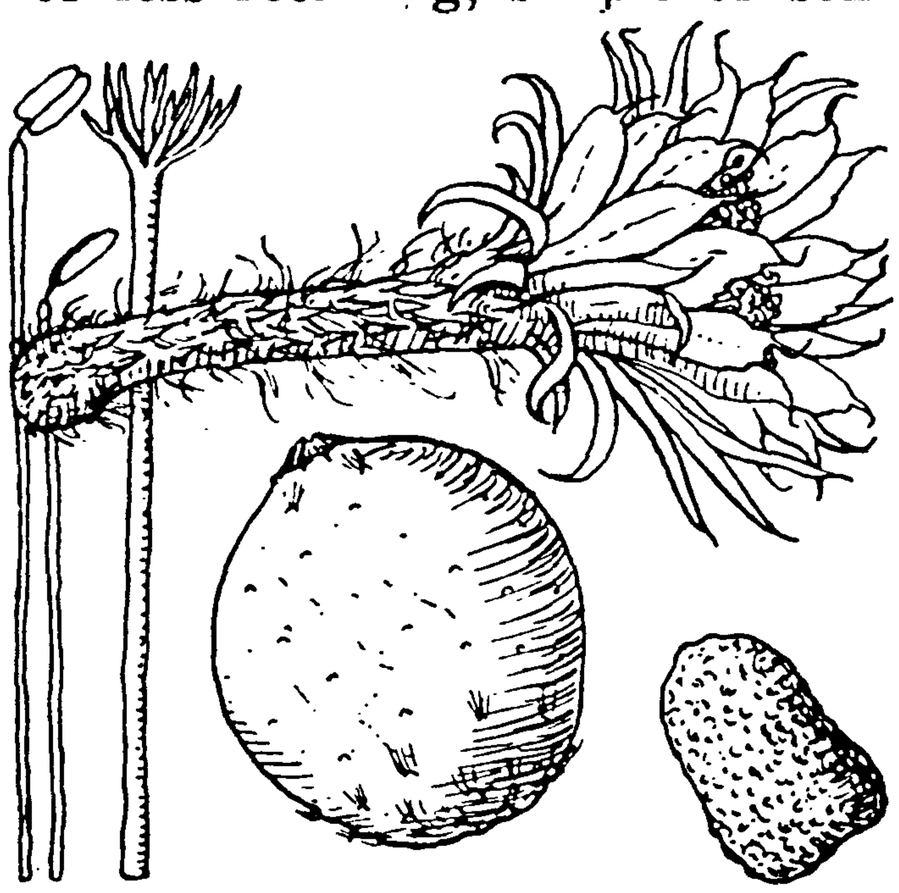
1. A. floridanus Small. Stems and branches diffusely spreading or reclining, 3–10 m. long, stout, starting as a several-ribbed plant about as thick as a lead-pencil, the successive joints thicker and prominently 3–5-angled, the mature branches mostly 3–angled, dark-green, often forming impenetrable thickets: areolae remote, with mostly 4–7 slender or subulate spines, the central one often 1–2 cm. long, or more: hypanthium stout-trumpet-shaped, 8–10 cm. long, with few large separated tubercled areolae at the base, the areolae at the base of the hypanthium bearing mostly 3–5 diverging spines, those on the tubular part usually with one spine each: calyx green or purple-tinged; sepals deltoid to triangular-lanceolate, lanceolate-subulate and almost linear, the longer ones 3.5–4 cm. long, acuminate: corolla 8–11 cm. wide, white; petals broadly linear, 3.5–4.5 cm. long, about six times as long as wide, broadly acuminate: filaments adnate more than half way up from the base of the hypanthium: anthers less than 2.5 mm. long: berry ovoid, 4–6.5 cm. long, scarlet, shining. [*A. pentagonus* (Fl. SE. U. S.)]—(DILDOE. BARBED-WIRE CACTUS.)—Hammocks, along or near the coast, S pen. Fla., and the Keys.—Sum.



9. HARRISIA Britton. Succulent shrubs, with fluted stems and branches, the ridges supporting areolae, each of which supports a tuft of spines, the spines of each areola arising below the tuft of wool and varying greatly in length. Leaves obsolete. Flowers nocturnal, showy, arising from the upper side of an areola. Hypanthium narrowly funnelform or clavate, scaly. Sepals colored. Petals white, narrow. Berry globose or ovoid-globose, with few scale-bases, often with tufts of hairs. Seeds very numerous.—About 18 species, distributed from Florida to Argentina.—Spr.—PRICKLY-APPLES.

Flower-buds brown-hairy: scales of the hypanthium with tufts of brown hairs in their axils: berry yellow. 1. *H. Aboriginum.*
Flower-buds white-hairy: scales of the hypanthium with tufts of white hairs in their axils: berry red.
  Hypanthium prominently ridged, the scales turgid at the base: berry depressed-globose. 2. *H. Simpsonii.*
  Hypanthium even or scarcely ridged, the scales flat or nearly so: berry obovoid. 3. *H. fragrans.*

1. H. Aboriginum Small. Plants 6 m. tall or less, usually forming dense thickets, terrestrial, the stems erect or more or less reclining, simple or some of them usually branched, 9–11-ridged: spines 7–9 in each areola, very slender, the longer ones mostly 1 cm. long or less, or sometimes longer near the ends of the branches, all pink when young, becoming gray with brown near the tips: young buds clothed with brown hairs: hypanthium longer than the flower-limb, long-funnelform, the swollen base partly covered with lanceolate scales which are very small below, but larger above, all of them more or less separated, with stiff long brown hairs protruding from beneath them: scales on the tubular part of the hypanthium, distant, lanceolate, turgid, each with short brown



hairs protruding from beneath: flowers faintly scented: longer inner sepals narrowly linear, acuminate: petals white, most of them exceeded by the longer sepals, oblanceolate, erose near the apex, broadly acuminate and minutely slender-tipped: stamens erect: berry globular, 6.5–7.5 cm. in diameter, dull yellow, the scar at the apex about 1 cm. in diameter: seeds 3 mm. long.—Shore hammocks and shell-mounds, Tampa Bay region, Fla., to the Ten Thousand Islands.

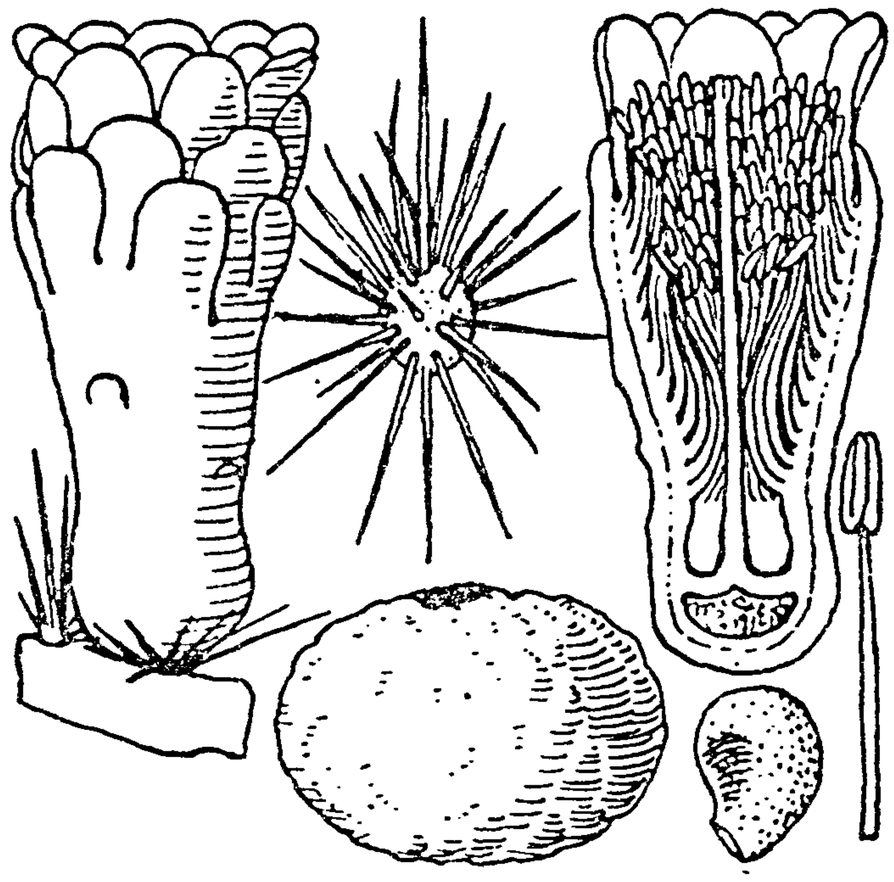
2. **H. Simpsonii** Small. Plants 4 m. tall or less, scattered or in colonies, terrestrial or often epiphytic, the stems sometimes vine-like, simple or individually branched, 9- or 10-ridged: spines mostly 7–9 in each areola, slender, the longer ones of each cluster 1–2.5 cm. long: young buds clothed with white hairs: hypanthium longer than the flower-limb, long-funnelform, prominently and coarsely ridged, the swollen base clothed with broadly lanceolate, closely set or imbricate scales, with white hairs protruding from beneath them: scales of the tubular part of the hypanthium rather numerous and close-set, very turgid, lanceolate, each with white hairs protruding from beneath: flowers inodorous: longer inner sepals linear, 4.5–5.5 cm. long, acuminate: petals white, narrowly spatulate or narrowly cuneate-spatulate, erose near the apex, each abruptly narrowed into a short tip: stamens nearly erect: berry depressed-globose, about 6 cm. in diameter, dull-red, usually with partly persistent scales, the scar at the apex less than 1 cm. in diameter: seeds fully 3 mm. long. [*H. Brookii* (Fl. SE. U. S.)]—Hammocks and mangrove swamps, terrestrial or epiphytic, Cape Sable to Ten Thousand Islands and Madeira Bay region, Fla. and Florida Keys.

3. **H. fragrans** Small. Plants 5 m. tall or less, growing singly, sometimes approximate, but not in colonies, the stems erect, reclining, or clambering, prominently 10–12-ridged, the ridges more or less depressed between the areolae, the grooves rather deep and sharp: areolae about 2 cm. apart, each with a dense tuft of very short hairs on the upper side: spines acicular, 9–13 in each areola, mostly grayish and yellowish at the tip, one of each areola longer than the others, mostly 2–4 cm. long: young buds copiously white-hairy: buds about to expand fully 15 cm. long (18–20 cm. long): hypanthium light-green, longer than the flower-limb, slender-funnelform, scarcely ridged, the swollen base bearing subulate or lanceolate-subulate separated scales, with long white hairs protruding from beneath them and very lax: scales of the tubular part of the hypanthium few and remote, subulate, slenderly acuminate, not turgid, with a tuft of long white hairs in each axil: sepals very narrowly linear, slenderly acuminate: petals white or pinkish, spatulate, caudate-tipped: ovary-cavity ovoid: berry obovoid, about 6 cm. in diameter, dull-red, with tufts of long hairs persistent with the scale-bases: seeds nearly 3.5 mm. long.—Hammocks on high sand-dunes, kitchenmiddens, and coquina ledges, from Mosquito Inlet to Saint Lucie Sound, Fla.

10. **CEPHALOCEREUS** Pfeiff. Succulent shrubs or trees with fluted stems and branches, the ridges supporting areolae, each of which supports a tuft of spines, the spines of each areola arising from all parts of the tuft of wool and varying greatly in length. The bark at length scaly. Leaves obsolete. Flowers diurnal, inconspicuous, arising from the center of an areola. Hypanthium campanulate, naked or scaly above. Sepals colored. Petals white or pale, broad. Berry more or less depressed, naked. Seeds numerous.—About 40 species, tropical American.—Wint.-spr.—TREE-CACTI.—The two following species have a definite geologic distribution. *C. Deeringii* inhabits the Key Largo limestone, *C. keyensis* the Key West oölite. Where these two limestones meet on Big Pine Key the ranges of the two species come together.

Sepals and petals obtuse, rounded or emarginate: spines of the areolae mostly more than 25 (25–31). 1. *C. Deeringii.*
Sepals and petals acute, abruptly pointed or acuminate: spines of the areolae mostly fewer than 15 (9–15). 2. *C. keyensis.*

1. C. Deeringii Small. Shrub or small tree becoming 10 m. tall, the stem erect, simple or with few erect elongate fastigiate branches forming a very narrow head, the branches deep-green, usually 10-ribbed: areolae copiously hairy, the hairs rather persistent; spines 25–31, the longer ones 1 cm. long or more: flowers about 6 cm. long, narrowly campanulate: sepals obovate, obtuse or emarginate: petals 9–11 mm. long, clawless, oval, obtuse, scarcely narrowed at the base: anthers less than 2 mm. long: berry much depressed, 3–5 cm. in diameter, dark-red.—Rocky hammocks, upper Florida Keys, from the S front of Big Pine Key to Upper Matecumbe Key.



2. C. keyensis Britton & Rose. Shrub or small tree, becoming 5 or 6 m. tall, the stem erect, ultimately much-branched, often forming a compact narrow head, the branches light-green or somewhat glaucous, 9- or 10-ribbed: areolae copiously short-hairy, the hairs mostly deciduous; spines 9–15, the longer ones mostly less than 1 cm. long: flowers about 5 cm. long, campanulate: sepals ovate, acute: petals 14–16 mm. long, the outer ones clawed, with ovate or elliptic blades, the inner clawless, oblanceolate to almost broadly linear, all acute, erose: anthers over 2 mm. long: berry depressed, about 3.5 cm. in diameter, reddish.—Rocky hammocks, lower Florida Keys, from Key West to Big Pine Key.

Order **BEGONIALES** — Begonial Order

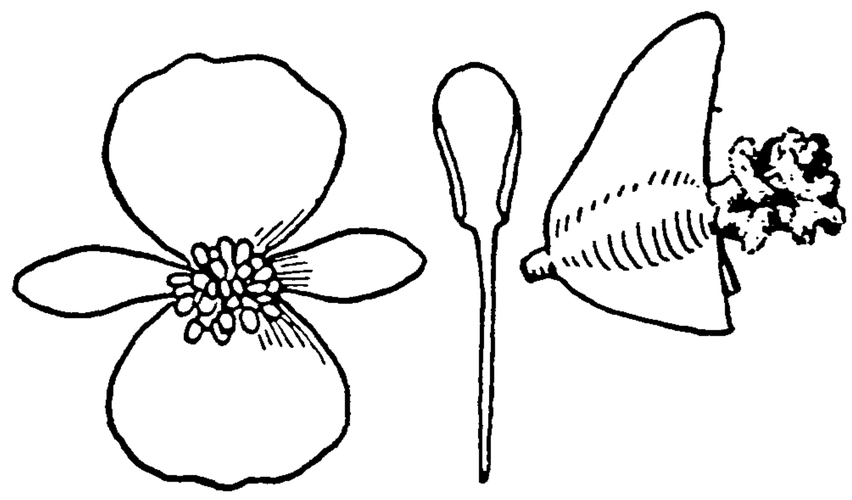
Succulent herbs, shrubby plants or vines. Leaves alternate: blades commonly inequilateral, toothed or lobed. Flowers monoecious, usually somewhat irregular, cymose: staminate flowers with 2 or more sepals, 5 minute petals and many stamens, whose anthers open by pores or valves. Pistillate flowers with a calyx, a corolla and a gynoecium of 2–5 united carpels. Ovary inferior, 2–several-celled, the placentae entire or lobed. Stigmas curved, twisted or coiled. Ovules numerous. Fruit capsular, winged.

Family 1. **BEGONIACEAE** — Begonia Family

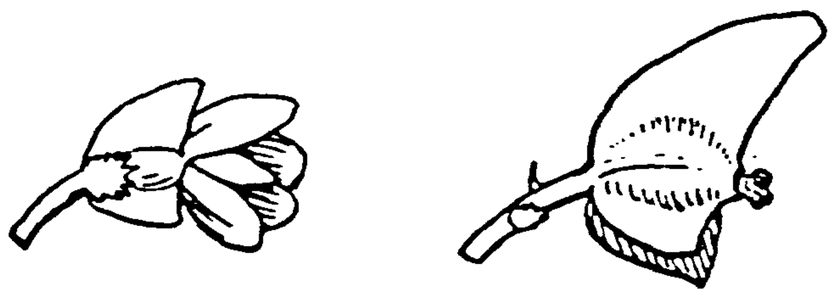
Unusual looking plants with odd-shaped leaves and conspicuous inflorescence, the staminate and pistillate flowers usually borne in the same clusters. Capsule many-seeded.—About 4 genera and over 400 species, widely distributed in tropical regions.

1. BEGONIA L. Succulent plants sometimes woody below. Leaf-blades oblique. Staminate flowers with 2 unequal pairs of petals. Pistillate flowers

with 5 somewhat unequal petals. Gynoecium with a short style, spiral stigmas and 2-lobed placentae. Capsule unequally 3-winged.—About 400 species, widely distributed.—ELEPHANT'S-EARS. BEGONIAS.—Many species with showy leaves and highly colored wax-like flowers are widely cultivated.



1. B. semperflorens Link & Otto. Plants 3–10 dm. tall: leaf-blades 4–7 cm. broad, the teeth apiculate: bracts ciliate-fimbriate: corolla white; larger petals of the staminate flowers 6–14 mm. long, the smaller ones spatulate: capsules drooping.—(PERPETUAL-BEGONIA)—Swamps and low grounds, pen. Fla. Nat. of S. A.



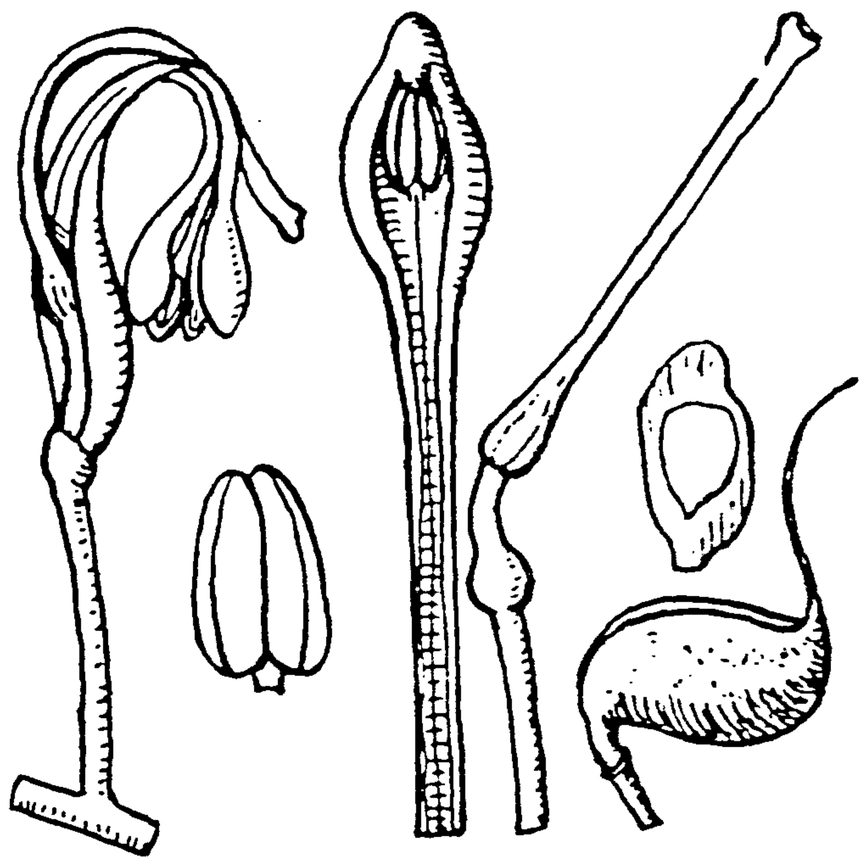
ORDER **PROTEALES** — PROTEAL ORDER

Perennial herbs, or shrubs or trees. Leaves alternate or rarely opposite: blades simple or compound. Flowers perfect, or occasionally polygamous or dioecious. Perianth of 4 valvate distinct or partially united sepals. Androecium of 4 stamens, one borne on each sepal. Gynoecium a single carpel. Ovary superior, often oblique. Fruit indehiscent, or often follicular or capsular.

FAMILY 1. **PROTEACEAE** — PROTEA FAMILY

Leaf-blades simple, entire, toothed, or divided. Flowers borne in spikes, racemes, or panicles, which are commonly congested. Calyx, androecium, and gynoecium, various, often very irregular.—Fifty genera and about 1,000 species, mostly of Asia, Africa, and Australia.

1. GREVILLEA R. Br. Shrubs or trees. Leaf-blades often pinnately parted. Flowers borne in racemes or panicles, sometimes irregular. Ovary stipitate. Style often protruding from the cleft of the calyx. Fruit follicular or 1- or 2-valved. Seeds flat, often winged.—About 175 species, most abundant in Australia.



1. G. robusta A. Cunn. Tree becoming 20 m. tall: leaf-blades 2–4 dm. long: panicle showy, orange or red: the racemes 1–2 dm. long, many-flowered: sepals 9–11 mm. long: follicles recurved, the bodies 1.5–2 cm. long, slender-beaked.—(SILK-OAK.)—Roadsides, waste-places, and cult. grounds, Fla. Nat. of Australia.—(*W. I.*)—Spr.—This tree, wholly different from our native trees in both foliage and inflorescence, was introduced into Florida many years ago as an ornamental and a shade tree. It is unusual among our trees in that it bears the flower clusters along the trunk and the main branches.

Order **THYMELEALES** — Thymeleal Order

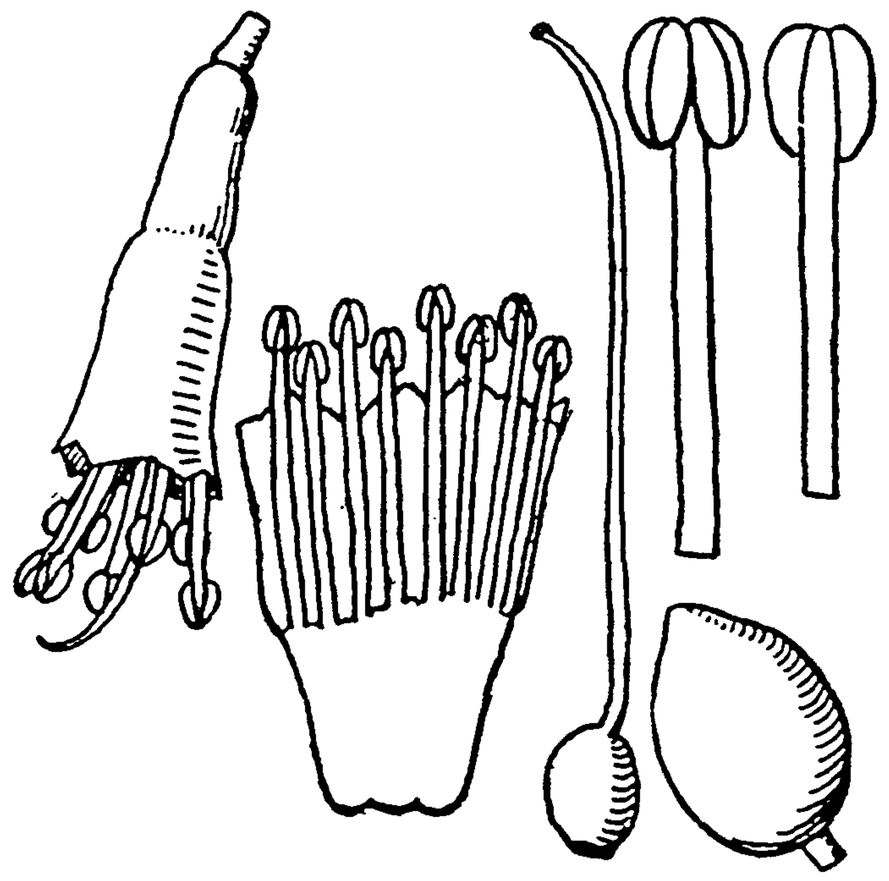
Shrubs or trees, or partially herbaceous plants. Leaves opposite or alternate, the blades simple, rarely mere scales, or obsolete. Flowers perfect, polygamous, or dioecious, regular or nearly so. Calyx of 6 or fewer sepals. Corolla wanting (in our species). Androecium of as many stamens as there are sepals or of twice as many. Anthers opening by slits or hinged valves. Gynoecium a single carpel. Ovary inferior. Ovules mostly solitary. Fruit usually baccate or drupaceous.

Anthers opening by slits.
  Ovule and seed pendulous: leaves green, sometimes merely pubescent. Fam. 1. Daphnaceae.
  Ovule and seed erect: leaves silvery-scurfy. Fam. 2. Elaeagnaceae.
Anthers opening by hinged valves.
  Leafy shrubs or trees: fruit seated on the hypanthium. Fam. 3. Lauraceae.
  Leafless, twining, parasitic vines: fruit enclosed in the accrescent hypanthium. Fam. 4. Cassythaceae.

Family 1. **DAPHNACEAE** — Mezereon Family

Shrubs or trees, or rarely herbs, often pubescent. Leaves opposite or alternate: blades entire. Calyx of 4 or 5 sepals, sometimes with 4 or 5 scales within. Androecium of as many stamens as there are sepals or twice as many. Gynoecium seated in the bottom of the hypanthium. Style usually eccentric.—Forty genera and about 425 species, most abundant in Australia and southern Africa.

1. DIRCA L. Shrubs. Leaves alternate. Flowers appearing before the leaves. Sepals usually shorter than the hypanthium. Filaments slender. Ovary 1-celled: style filiform. Drupe slightly elongate.—Two species, North American.



1. D. palustris L. Shrub 0.5–2 m. tall: leaf-blades oval or obovate, 4–8 cm. long: flowers lemon-yellow: hypanthium 7–8 mm. long: sepals very short: drupe oval, 7–9 mm. long, red.—(Leatherwood. Swamp-wood. Moose-wood. Leather-bark.)—Rich woods, bluffs, and stream-banks, various provinces, rarely Coastal Plain, Fla. to La., Ont., and N. B.—Spr.—The bark has been used medicinally. The wood is soft and brittle but the bark is unusually tough, and was used by the aborigines for thongs.

Family 2. **ELAEAGNACEAE** — Oleaster Family

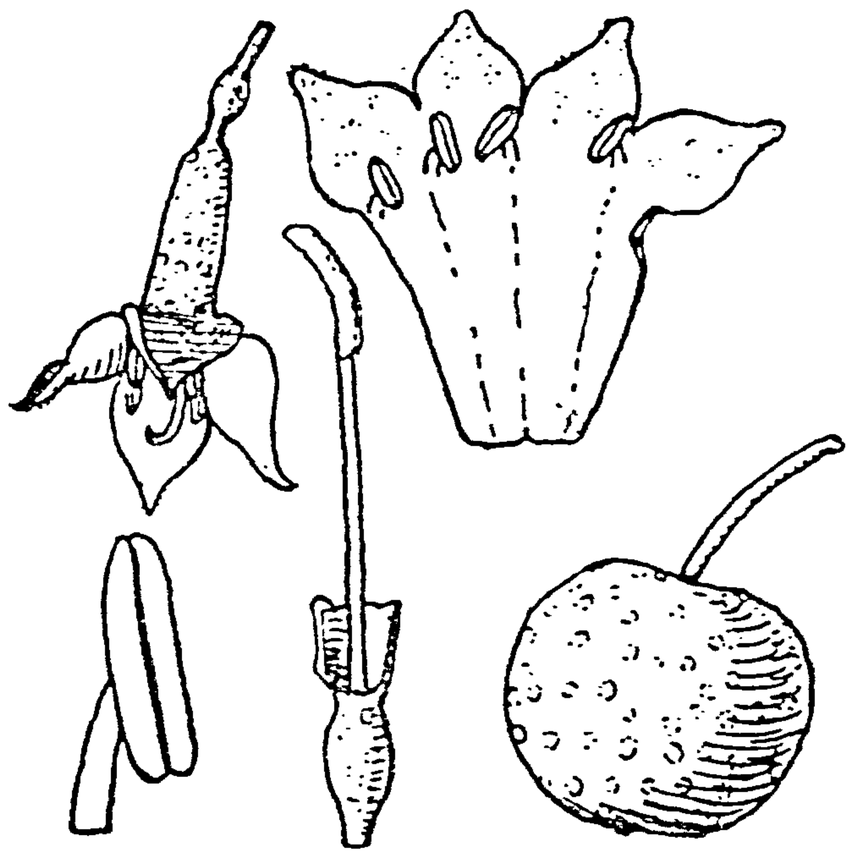
Shrubs or trees, scaly or stellate-pubescent. Leaf-blades entire. Calyx of 4, or rarely of 2, sepals. Androecium of 4 or 8 stamens. Gynoecium closely invested by the hypanthium which is thickened and often ridged within. Style usually axial.—Three genera and about 25 species, widely distributed.

1. ELAEAGNUS L. Shrubs or rarely trees, pubescent with silvery scales. Leaves alternate. Flowers white or yellow within, silvery without. Sepals

shorter than the hypanthium. Stamens 4: filaments very short or wanting. Ovary 1-celled: style elongate. Drupe somewhat elongated.—SILVER-BERRIES.—About 20 species, Eurasian, Australian, and North American.—Some species are used in horticulture. The fruits of some species are edible.

Leaf-blades beneath, and hypanthium, not brown-scaly: sepals less than ½ as long as the prolonged portion of the hypanthium. 1. *E. umbellatus.*
Leaf-blades beneath, and hypanthium, brown-scaly: sepals over ½ as long as the prolonged portion of the hypanthium. 2. *E. multiflorus.*

1. E. umbellatus Thunb. Shrub, 1–3 m. tall. Leaves numerous; blades elliptic, 2–4 cm. long, mainly obtuse, green above, silvery beneath, short-petioled: flowers few, in umbel-like clusters, short-pedicelled: hypanthium narrowly funnelform, 4–6 mm. long during anthesis: sepals ovate, 2.5–3 mm. long, silvery scaly without like the hypanthium: anthers less than 1.5 mm. long: fruit globose to oval, 6–8 mm. long. — (AUTUMN-ELAEAGNUS.) — Thickets, banks, and cult. grounds, near Augusta, in the Piedmont of Ga. Nat. of Japan.—Sum.–fall.



2. E. multiflorus Thunb. Shrub, mostly 1–2.5 m. tall. Leaves rather numerous; blades elliptic or somewhat obovate to oval, 3–6.5 cm. long, rounded or abruptly blunt-tipped at the apex, bright green above, silvery beneath, short-petioled: flowers few or several together in umbel-like clusters, rather long-pedicelled: hypanthium stout, slightly dilated upward, 5.5–7 mm. long during anthesis: sepals orbicular-ovate to reniform, 3–4 mm. long, copiously scaly without, like the hypanthium: anthers over 1.5 mm. long: fruit oval, 7–10 mm. long.—(JAPANESE CHERRY.)—Roadsides and fields, Coastal Plain, Miss. and La. Nat. of Japan.—Sum.

FAMILY 3. LAURACEAE — LAUREL FAMILY.

Aromatic shrubs or trees. Leaves alternate or opposite: blades entire or lobed. Flowers in open or congested cymes. Calyx of 5 (or rarely 4–10) sepals in 2 series. Corolla wanting. Androecium of usually more stamens than there are sepals, in 2–4 series, those of the third series usually glandular-appendaged, those of the fourth series mostly mere staminodia. Gynoecium a single carpel. Ovary 1-celled. Fruit drupaceous.—Forty genera and about 1,000 species, most abundant in tropical regions.—Some of the species are of great economic value.

Anthers 4-celled, 4-valved.
  Anther-sacs of outer stamen-series extrorse. Tribe I. CINNAMOMEAE.
  Anther sacs introrse. Tribe II. LITSEAE.
Anthers 2-celled, 2-valved.
  Mature hypanthium large, succulent: inflorescence of erect panicles: anther-sacs extrorse. Tribe III. ACRODICLIDIEAE.
  Mature hypanthium minute, dry: inflorescence of umbel-like clusters: anther-sacs introrse. Tribe IV. LAUREAE.

I. CINNAMOMEAE

Staminodia present, large, often sagittate.
  Sepals deciduous.
    Calyx falling away as separate sepals: leaf blades ribbed. 1. CAMPHORA.
    Calyx falling away with the sepals united: leaf-blades pinnate-veined. 2. PERSEA.

Sepals persistent under the fruit. 3. TAMALA.
Staminodia small, subulate, or wanting. 4. NECTANDRA.

II. LITSEAE

Sepals persistent on the cup-like hypanthium. 5. SASSAFRAS.
Sepals deciduous from the cylindric hypanthium. 6. GLABRARIA.

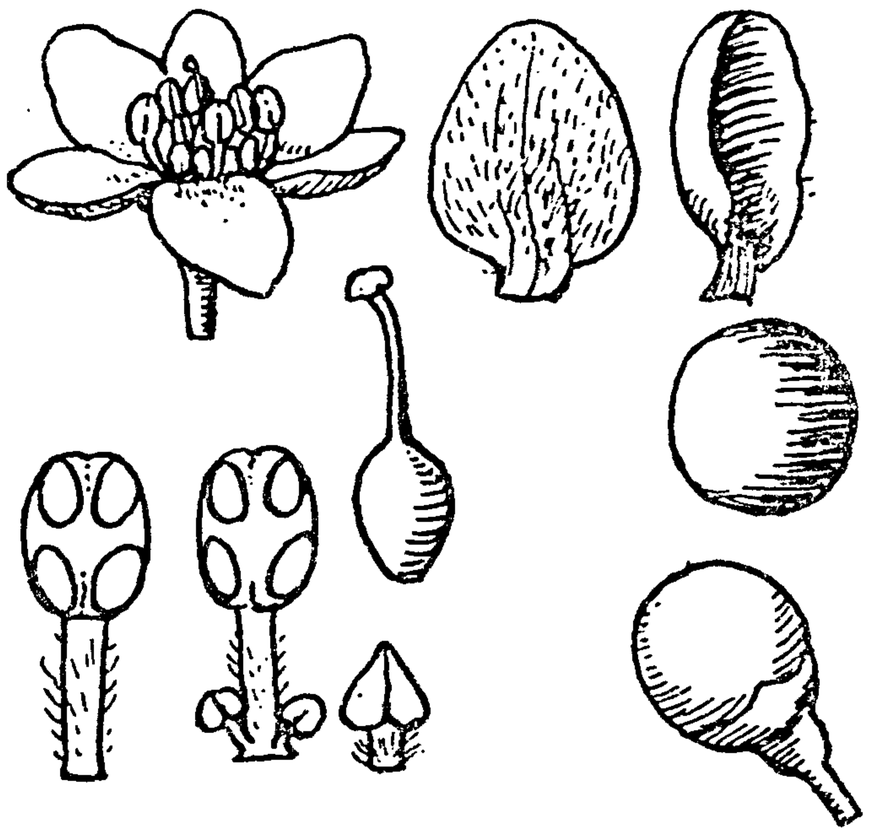
III. ACRODICLIDIEAE

Large trees with whitish flowers: leaf-blades coriaceous. 7. MISANTECA.

IV. LAUREAE

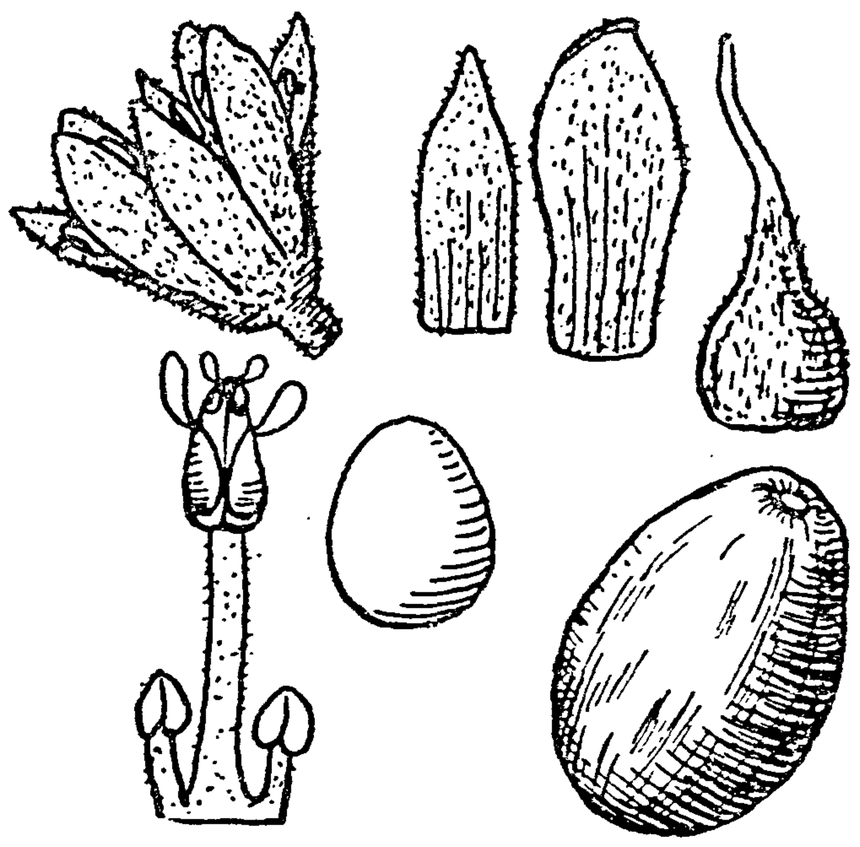
Shrubs with yellow flowers: leaf-blades membranous. 8. BENZOIN.

1. **CAMPHORA** [Gronov.] L. Trees or shrubs. Leaves alternate or opposite, persistent: blades entire. Flowers in panicled axillary cymes, mainly white or greenish. Style slender. Stigma minute. Drupe equilateral, as broad as long, or nearly so.—Few species, natives of eastern Asia.



1. C. Camphora (L.) Karst. Small tree or shrub: leaf-blades elliptic to ovate, 4–12 cm. long, short-acuminate, pale beneath, long-petioled: panicles slender-peduncled: sepals 1–1.5 mm. long: drupes globose to oval-globose, 6–9 mm. in diameter.—(CAMPHOR-TREE.) — Pinelands and hammocks, pen. Fla. to Tex. Nat. of E Asia and cult.—Spr.—The wood yields the camphor of commerce.

2. **PERSEA** [Plum.] Gaertn. Trees. Leaves alternate, persistent: blades entire. Flowers in terminal panicled cymes, greenish. Sepals 6, nearly equal, united at the base. Style subulate: stigma minute. Drupe inequilateral.—One species, in many cult. forms.



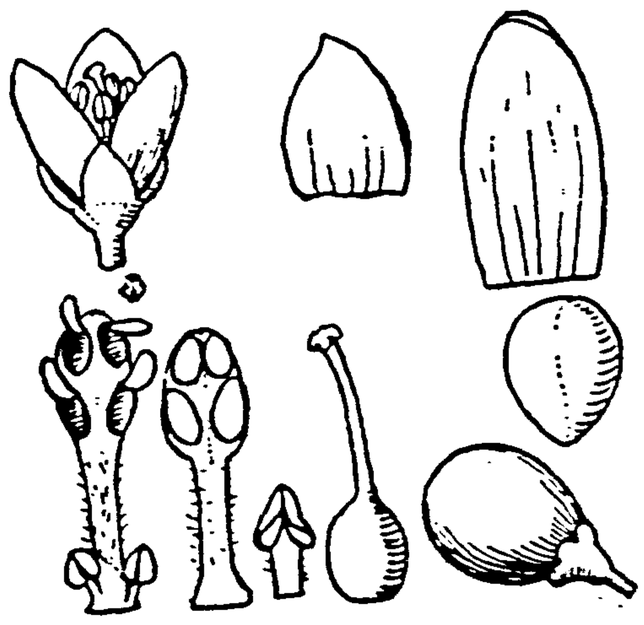
1. P. Persea (L.) Cockerell. Large tree: leaf-blades elliptic or oval or nearly so, 8–15 cm. long, short-petioled (relatively small and with long and slender petioles in *P. Persea mexicana*): inner sepal 4–5 mm. long, somewhat surpassing the outer: fruits slightly elongate, often pyriform, 8–18 cm. long, the flesh butter-like.—(AVOCADO. ALLIGATOR-PEAR.)—Hammocks and pinelands, S pen. Fla. and the Keys.—Grown in many varieties for its edible fruit. Nat. of trop. Am. and cult.—(*W. I., Mex., C. A., S. A.*)—Spr.

3. **TAMALA** Raf. Shrubs or trees. Leaves alternate, persistent: blades entire. Flowers in axillary peduncled cymes, greenish. Sepals 6, dissimilar. Style long-columnar: stigma capitate. Drupe equilateral. Few species, American.—Spr. or all year S.

Peduncles, pedicels and petioles glabrous or appressed-pubescent: fruit over 1 cm. thick.
Leaf-blades glabrous or nearly so, except sometimes the nerves beneath.

Leaf-blades finely reticulated beneath, mainly over thrice as long as wide. 1. *T. Borbonia.*
Leaf-blades not reticulated beneath, mainly about twice as long as wide. 2. *T. littoralis.*
Leaf-blades lustrous-pubescent beneath. 3. *T. humilis.*
Peduncles, pedicels and petioles tomentose: fruit less than 1 cm. thick. 4. *T. pubescens.*

1. T. Borbonia (L.) Raf. A large tree with bark broken into flat ridges: leaf-blades elliptic or nearly so, 5–15 cm. long, often acuminate at both ends, bright-green and lustrous above, glaucescent and finely reticulate beneath: sepals ascending, the inner ovate, 2–3 times longer than the outer, acutish: drupe obovoid or globose-obovoid, 1–1.5 cm. long, dark-blue or nearly black, lustrous. [*Persea Borbonia* (L.) Pax] —(RED-BAY. SWEET-BAY. FLORIDA-MAHOGANY. TISSWOOD. LAUREL-TREE.) — Hammocks and swamps, Coastal Plain, Fla. to Tex. and Va.—The bright-red heart-wood, close-grained, heavy, and strong, is used for cabinet-work and construction.

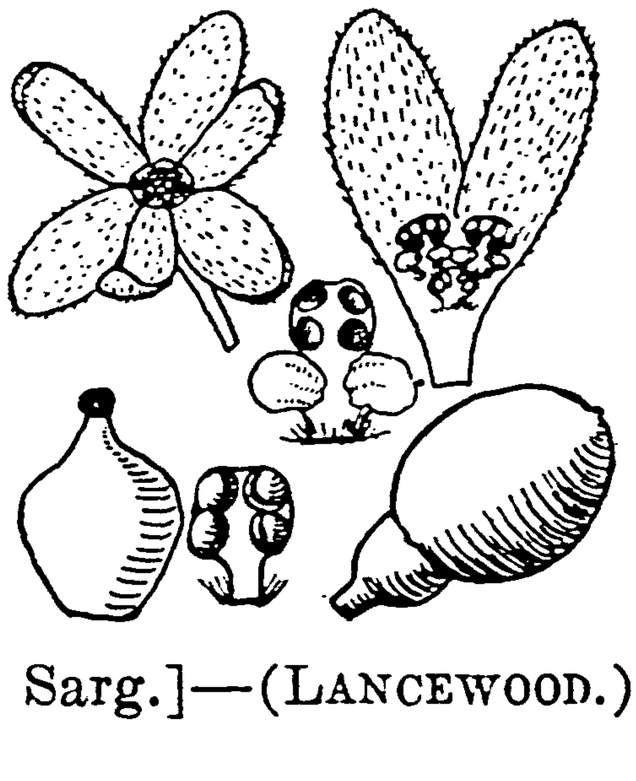


2. T. littoralis Small. Shrub or tree: leaf-blades elliptic, 2–5.5 cm. long, mostly obtuse at the apex, bright-green and lustrous above, pale and glabrous beneath, not reticulate, the lateral veins inconspicuous: drupe globular, 12–14 mm. long, purple-black under the bloom. [*Persea littoralis* Small]—(SHORE-BAY.)—Coastal hammocks, pen. Fla.

3. T. humilis (Nash) Small. Shrub or small tree, the twigs, lower leaf-surfaces and the inflorescence silky-pubescent: leaf-blades elliptic, 4–10 cm. long, more or less revolute, glabrous and shining above, lustrous beneath: sepals erect, obtuse, the inner oblong, 5 mm. long: drupe globular, about 1.5 cm. long, purplish-black under the bloom. [*Persea humilis* Nash]—(SILK-BAY.)—Scrub, C pen. Fla.

4. T. pubescens (Pursh) Small. Shrub or small tree, the twigs, lower leaf-surfaces and inflorescence tomentose: leaf-blades narrowly elliptic or elliptic-lanceolate, or rarely oval, 5–20 cm. long, usually obtuse, often acuminate at the apex, slightly revolute: sepals erect, acutish, the inner elliptic-obovate, about twice as long as the outer: drupe oval, 8–11 mm. long, dark-blue with a thin bloom. [*Persea pubescens* (Pursh) Sarg.]—(SWAMP-BAY. SWAMP RED-BAY.)—Swamps and low hammocks, Coastal Plain and rarely adj. provinces, Fla. to Tex. and N. C. (or Va.?).—The orange-colored and brown-streaked heart-wood, close-grained and heavy, is used like that of *T. Borbonia.*

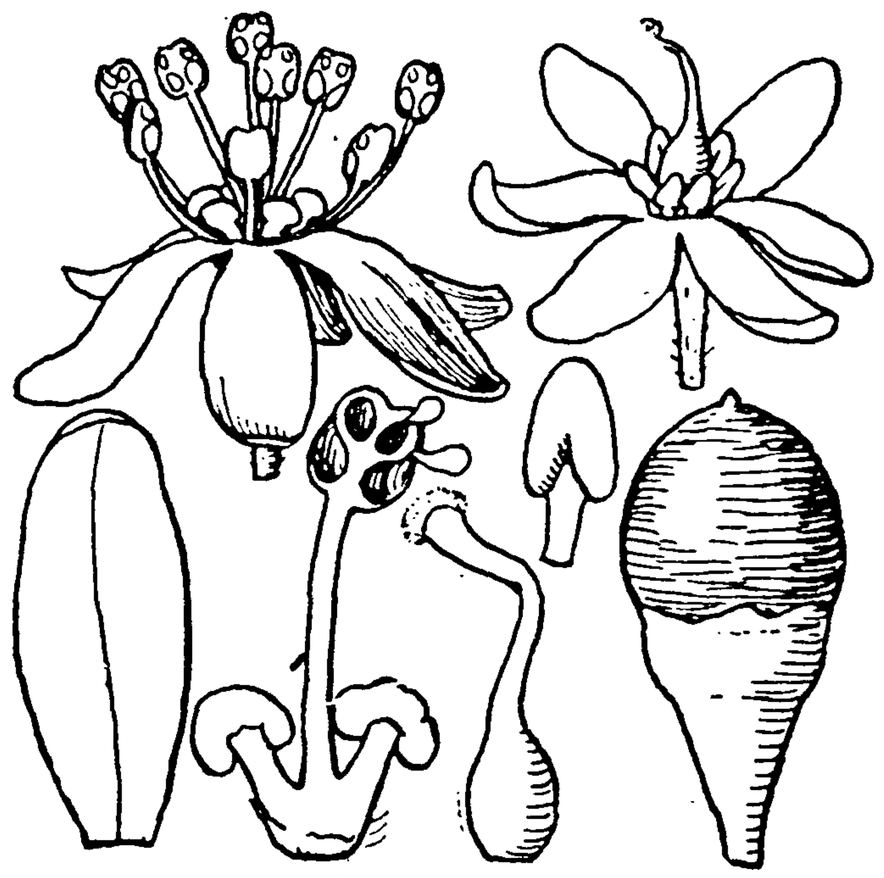
4. NECTANDRA Roland. Shrubs or trees. Leaves alternate, persistent: blades entire. Flowers in panicled cymes, white, fragrant. Sepals 6, nearly similar, somewhat elongate, spreading. Style cylindric: stigma capitate. Drupe somewhat elongate, seated in the cup-like hypanthium from which the calyx has fallen away.—About 300 species, mostly tropical American.



1. N. coriacea (Sw.) Griseb. Shrub or small tree: leaf-blades narrowly elliptic or elliptic-lanceolate, 5–12 cm. long, lustrous above: calyx creamy-white, 8–9 mm. broad; sepals obtuse: drupe subglobose or oval, 10–15 mm. long, dark-blue or black, seated in the red or yellow hypanthium. [*Ocotea Catesbyana* (Michx.) Sarg.]—(LANCEWOOD.)

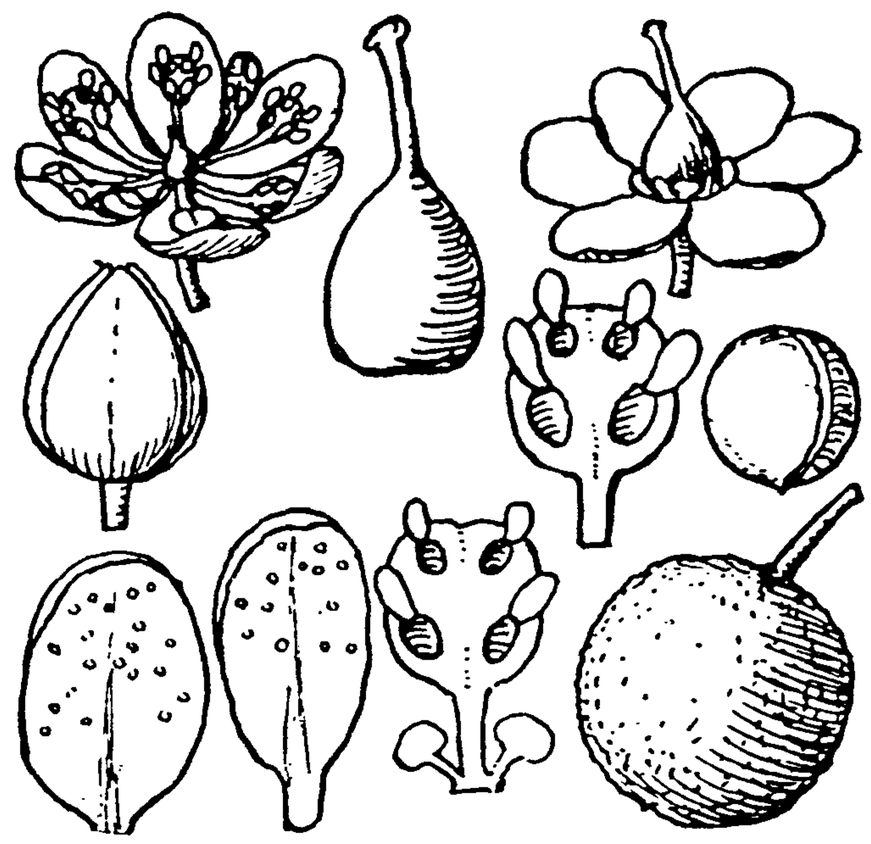
Hammocks, pen. Fla. and the Keys.—(*W. I.*)—Spr.—The dark-brown heartwood, hard, and heavy, is used locally for cabinet-work.

5. **SASSAFRAS** Nees. Trees or shrubs. Leaves alternate, deciduous: blades lobed or partly entire. Flowers in axillary clustered cymes. Style columnar: stigma depressed. Drupe somewhat elongate.—Two species, the following and one Asiatic.



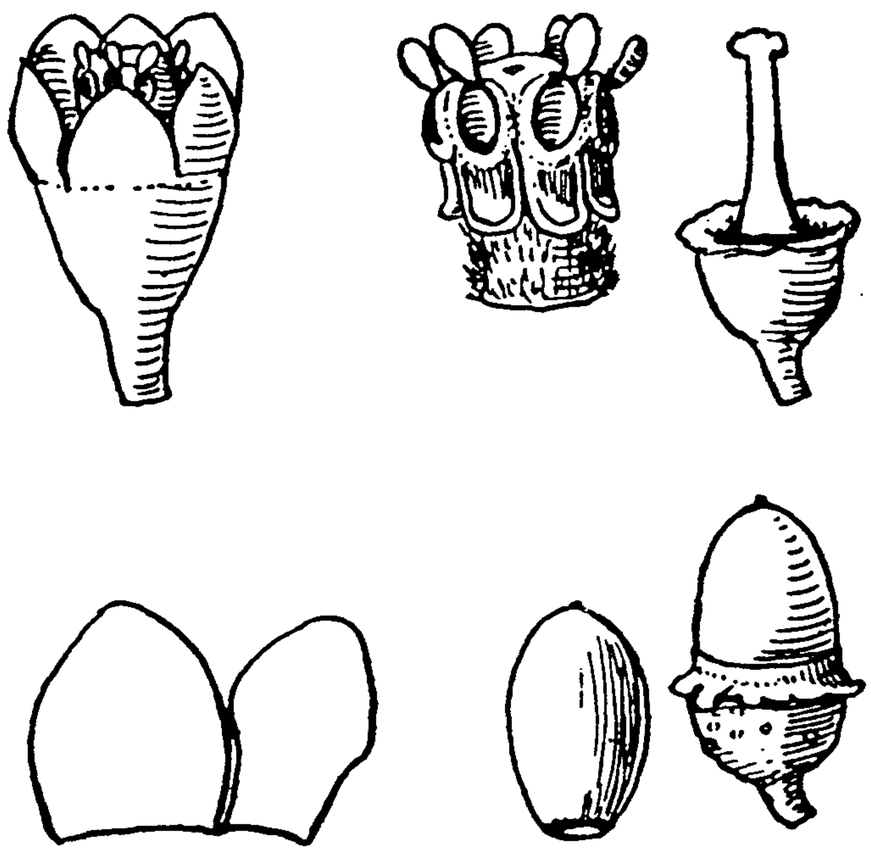
1. S. Sassafras (L.) Karst. Tree or shrub, with ridged bark: leaf-blades 3-lobed, or rarely entire or 2-lobed: flowers greenish-yellow, fragrant: sepals 6, narrowly elliptic, 2.5–3 mm. long: drupe oval, 8–10 long, dark-blue. — (SASSAFRAS. SASSAFRAX. AGUE-TREE.)—Woods, fields, and roadsides, various provinces, N Fla. to Tex., Ia., and Me.—Spr.—Used medicinally and as a flavoring agent. The orange-brown heartwood, coarse-grained, brittle, and weak, is used in boat-construction, cooperage, and for articles requiring lightness.

6. **GLABRARIA** L. Shrubs or trees. Leaves alternate (ours deciduous): blades entire. Flowers in clustered umbel-like involucrate cymes. Style subulate. Drupe (ours) subglobose. [*Malapoena* Adans.]—About 100 species, widely distributed in tropical and warm regions.



1. G. geniculata (Walt.) Britton. Spreading shrub 2–3 m. tall, with zigzag branches: leaf-blades elliptic, 1.5–6 cm. long: flowers 2–4 together: calyx yellow: sepals yellow, 2–3 mm. long: drupe 5–6 mm. in diameter, red.—(POND-SPICE. POND-BUSH.)—Swamps and ponds, Coastal Plain and rarely adj. provinces, Fla. to La., Tenn., and Va.—Wint.–spr.—One of our rarer shrubs of somewhat uncertain relationship. Its closest relatives are tropical.

7. **MISANTECA** Cham. & Schlecht. Shrubs or trees. Leaves alternate, persistent: blades entire. Flowers inconspicuous, in panicled cymes. Sepals 6, nearly similar, short, erect, about as long as the enlarged portion of the hypanthium. Style columnar: stigma minute, surrounded by the 3 erect stamens. Drupe slightly elongate, seated in the cup-like hypanthium which is bordered by the persistent calyx.—Four species, tropical American.



1. M. triandra (Sw.) Mez. Tree with somewhat flaky bark: leaf-blades elliptic or oval, 4.5–11 cm. long, abruptly acuminate, but often blunt, lustrous above: calyx white, 2–2.5 mm. broad; sepals obtuse: fruits

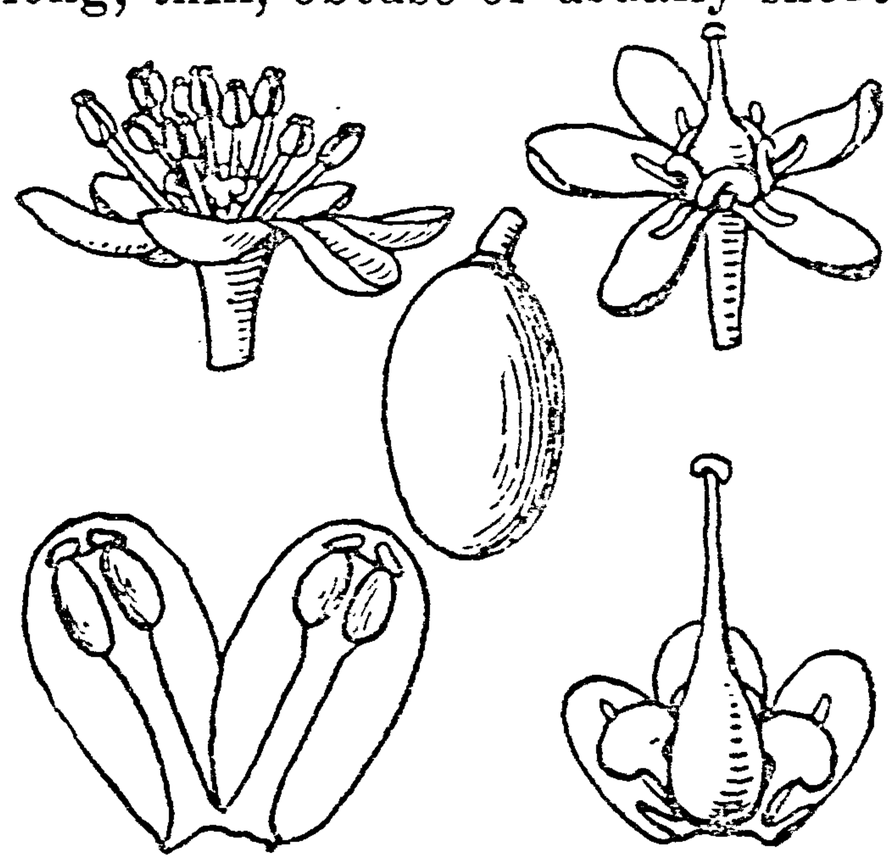
acorn-like, the drupe ovoid or ellipsoid-ovoid, 2–2.5 cm. long, green, the hypanthium reddish.—(MISANTECA.)—Hammocks, Everglade Keys, pen. Fla.—(*W. I.*)—Sum.—Known definitely only from the Brickell hammock, Miami, and now probably destroyed as a result of the real estate developments there.

8. **BENZOIN** Fabr. Shrubs or trees, strong-scented. Leaves alternate, deciduous: blades entire. Flowers yellow, in sessile cluster-like or umbel-like cymes. Style slender-columnar. Drupe somewhat elongate.—Seven species, North American and Asiatic.—Spr.—SPICE-BUSHES. BENJAMIN-BUSHES. SPICE-WOODS.

Leaf-blades tapering at the base: petioles slender and rather long. 1. *B. aestivale.*

Leaf-blades rounded or cordate at the base: petioles stout and rather short. 2. *B. melissaefolium.*

1. B. aestivale (L.) Nees. Shrub 1–3 m. tall, the branches often glabrous: leaf-blades obovate, oval, or elliptic, 5–12 cm. long, thin, obtuse or usually short-acuminate and acute at the apex, often slightly ciliate, acute or acuminate at the base, deep-green and glabrous above, pale or glaucescent and glabrous or sparingly pubescent beneath: flowers in dense clusters appearing before the leaves, 6–8 mm. broad: pedicels 3–5 cm. long: sepals thin, obovate or elliptic, obtuse, truncate or retuse at the apex: drupe oval, about 1 cm. long. [*Lindera Benzoin* (L.) Blume]—(SPICE-BUSH. BENJAMIN-BUSH.)—Wet woods, swamps, and stream-banks, various provinces, Fla. to La., Kans., Ont., and Me.—The bark and twigs are used medicinally and the fruit as a condiment.



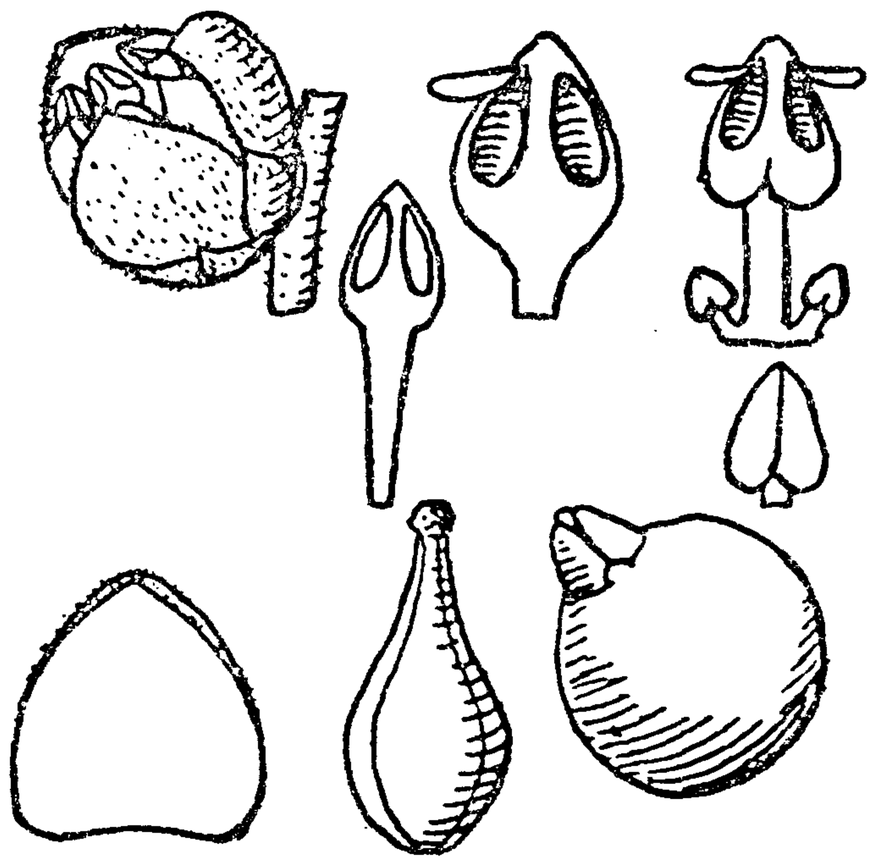
2. B. melissaefolium (Walt.) Nees. Shrub 3–10 dm. tall, the branches pubescent: leaf-blades quite firm, elliptic-ovate or elliptic-lanceolate, 3–12 cm. long, acutish, usually short-acuminate, more or less densely pubescent on both sides, rounded or cordate at the base: flowers in dense lateral clusters, appearing before the leaves: pedicels equalling the sepals or longer: sepals thin, 1–1.5 mm. long: drupe obovoid, nearly 1 cm. long.—(JOVE'S-FRUIT.)—Swamps and pond-margins, Coastal Plain and adj. provinces, Fla. to La., Mo., Ill., and N. C.—Bushes make a brilliant show in early spring.

FAMILY 4. CASSYTHACEAE — CASSYTHA FAMILY

Parasitic vines. Leaves mere scales, or wanting. Flowers perfect, in heads, spikes, or racemes. Calyx of 6 sepals in 2 unequal series, surmounting the accrescent hypanthium. Androecium of 9 stamens with 2-celled anthers, and 3 staminodia. Gynoecium of a single carpel. Drupe included.—One genus and about 15 species, tropical.

1. CASSYTHA [Osbeck] L. Vines with yellow or pale-green stems and branches, clinging to herbs and shrubs.—The flowers and fruits of *Cassytha*, although of quite different structure, resemble those of species of *Rhipsalis*. The drupe of our *Cassytha* resembles the berry of our species of *Rhipsalis* (page 913) in size, shape and color.

1. **C. filiformis** L. Stems matted, yellowish-green: flowers 3–6 in a spike: inner sepals triangular-ovate, 2–3 times larger than the outer: drupe globose, 5–7 mm. in diameter or rarely larger.—(LOVE-VINE. WOE-VINE.) —Coastal sand-dunes, hammocks, scrub, and pinelands, pen. Fla. and the Keys.—(*W. I.*) —This parasite appears to nearly all new acquaintances as a dodder (*Cuscuta*) which it resembles in habit and in color. Besides the technical characters closely associating it with the Lauraceae, it has the spicy fragrance of members of that family. The plants thrive on both herbaceous and woody hosts.



ORDER **MYRTALES** — MYRTAL ORDER

Herbs, shrubs, or trees, sometimes aquatic or amphibious. Leaves alternate or opposite. Flowers regular or irregular, complete or much reduced. Hypanthium merely enclosing the ovary or adnate to it. Androecium of few or many stamens: anthers opening by slits or pores. Gynoecium 1–several-carpellary. Fruit capsular, baccate, or achene-like.

Style present, simple or compound: stigma terminal.	
Anthers opening by pores.	Fam. 1. MELASTOMACEAE.
Anthers opening by longitudinal valves.	
Hypanthium merely enclosing the ovary.	Fam. 2. LYTHRACEAE.
Hypanthium adnate to the ovary or mainly so.	
Cotyledons spirally convolute in the embryo.	
Ovary several-celled: ovules numerous, not pendulous.	Fam. 3. PUNICACEAE.
Ovary 1-celled: ovules 2–5, pendulous.	Fam. 4. TERMINALIACEAE.
Cotyledons not spirally convolute.	
Sepals imbricated, or united and the calyx falling away as a cap.	Fam. 5. MYRTACEAE.
Sepals valvate.	
Leaves stipulate: sepals leathery.	Fam. 6. RHIZOPHORACEAE.
Leaves not stipulate: sepals membranous or herbaceous.	Fam. 7. EPILOBIACEAE.
Styles wanting: stigmas sessile.	Fam. 8. GUNNERACEAE.

FAMILY 1. **MELASTOMACEAE** — MEADOW-BEAUTY FAMILY

Herbs, shrubs, or trees. Leaves opposite: blades with 3–several ribs. Flowers perfect. Calyx of 3–6 sepals surmounting the hypanthium. Corolla of 3–6 oblique petals. Androecium of 6–12 stamens, those opposite the petals sometimes abortive. Gynoecium of 3–5 united carpels. Ovary enclosed in or adnate to the hypanthium. Fruit baccate or capsular.—One hundred and fifty genera and about 2,500 species, most abundant in tropical South America.

Herbs: fruit a capsule.	1. RHEXIA.
Shrubs or trees: fruit a berry.	2. TETRAZYGIA.

1. **RHEXIA** L. Perennial herbs with rootstocks. Leaf-blades usually 3–5-ribbed. Hypanthium urceolate, prolonged beyond the ovary. Sepals 4. Petals 4, deciduous. Ovary 4-celled, free. Capsule included, 4-valved.—About 15 species, natives of eastern North America and Cuba.—MAID-MARIAN. MEADOW-BEAUTIES.—Most of the species grow in highly acid soils.

Anthers relatively short, elliptic, not spurred at the base. 1. ELLIPTICAE.
Anthers elongate, linear, spurred at the base. 2. LINEARES.

I. ELLIPTICAE

Corolla yellow. 1. *R. lutea.*
Corolla purple or rarely white.
  Hypanthium glandular-pubescent: upper surface of the leaf-blades glabrous. 2. *R. serrulata.*
  Hypanthium glabrous: upper surface of the leaf-blades bristly. 3. *R. ciliosa.*

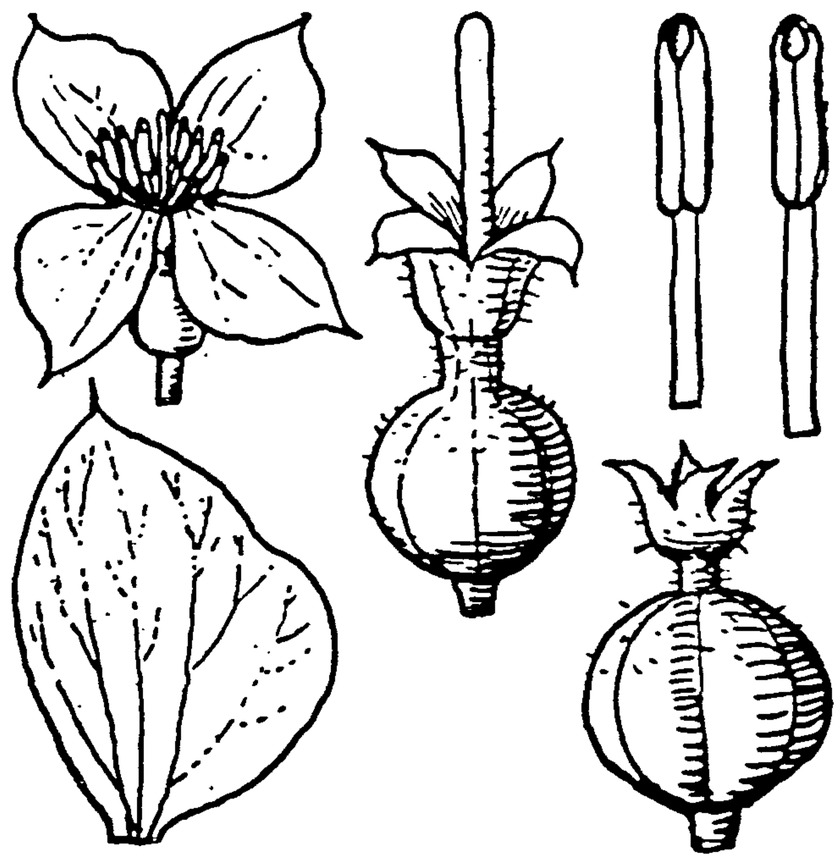
II. LINEARES

Neck of the mature hypanthium as long as the body or longer.
  Leaf-blades narrowly linear, the midrib only prominent and conspicuous. 4. *R. cubensis.*
  Leaf-blades not linear, the 3 nerves prominent and conspicuous.
    Stems rather sparingly pubescent with delicate hairs: leaf-blades nearly glabrous. 5. *R. mariana.*
    Stems densely pubescent with coarse yellow hairs: leaf-blades shaggy-pubescent with hairs like those on the stem. 6. *R. Nashii.*
Neck of the mature hypanthium much shorter than the body.
  Stems and branches terete or nearly so.
    Hypanthium glabrous or with a few scattered hairs.
      Leaf-blades linear to lanceolate. 7. *R. lanceolata.*
      Leaf-blades oval, elliptic, or oblong-ovate, very thin. 8. *R. delicatula.*
    Hypanthium densely glandular-pubescent. 9. *R. Alifanus.*
  Stems sharply angled or narrowly 4-winged.
    Corolla over 2 cm. broad, colored.
      Sepals less than ½ as long as the hypanthium at maturity.
        Stems with pubescent internodes: hypanthium pubescent at maturity. 10. *R. virginica.*
        Stems with glabrous internodes: hypanthium glabrous at maturity. 11. *R. stricta.*
      Sepals fully ½ as long as the hypanthium at maturity. 12. *R. aristosa.*
    Corolla less than 2 cm. broad, white. 13. *R. parviflora.*

1. R. lutea Walt. Stems 1–3 dm. tall: leaf-blades cuneate to elliptic or elliptic-linear, 1–2.5 cm. long: petals yellow, 9–13 mm. long: capsule about 4 mm. long.—Moist pinelands, Coastal Plain, Fla. to La. and N. C.—Spr.–sum.

2. R. serrulata Nutt. Stems 5–30 cm. tall: leaf-blades ovate, oval, or suborbicular, 0.5–1 cm. long: petals purple, about 10 mm. long: capsule about 4 mm. long, subglobose.—Low pinelands and open hammocks, Coastal Plain, Fla. to Miss. and Ga.—Spr.–sum.

3. R. ciliosa Michx. Stems 2–6 dm. tall: leaf-blades broadly ovate to ovate-lanceolate or elliptic, 1–2 cm. long: petals violet-purple or deep-pink, 9–15 cm. long: capsule 4–5 mm. long.—Moist pinelands and sand-hill bogs, Coastal Plain, C Fla. to La. and Md.—Spr.–sum.



4. R. cubensis Griseb. Stems 2–5 dm. tall, glandular-hirsute: leaf-blades linear or nearly so, 1.5–4 cm. long: sepals lanceolate or triangular-lanceolate: petals purple, 11–17 mm. long: capsule 6–7 mm. long. [*R. floridana* Nash]—Sandy and clayey swamps, Coastal Plain, Fla. to Miss. and Ga.—Sum. or all year S.

5. R. mariana L. Stems 2–8 dm. tall, villous-hirsute: leaf-blades narrowly elliptic, lanceolate, or elliptic-lanceolate, 1.5–8 cm. long: sepals ovate to triangular: petals pale-purple or deep-purple, 14–28 mm. long: capsule 6–7 mm. long.—(PALE MEADOW-BEAUTY.)—Swamps, marshes, and ditches, various provinces, Fla. to Tex., Mo., and N. Y.—Spr.–fall.

6. R. Nashii Small. Stems 3–6 dm. tall, densely hirsute: leaf-blades narrowly elliptic-lanceolate, 2–5 cm. long: sepals triangular: petals purple, 14–17 mm. long: capsule 5–6 mm. long.—Swamps, Coastal Plain, Fla. to La.—Sum.

7. R. lanceolata Walt. Stems 1–4 dm. tall, villous-hirsute: leaf-blades oblanceolate, elliptic-oblanceolate, or linear-lanceolate, 1–2.5 cm. long: sepals lanceolate: petals white to pale-purple, 12–17 mm. long: capsule 6–7 mm. long. [*R. filiformis* Small.]—Marshes and swamps, Coastal Plain, Fla. to La., Tenn., and N. C.—Spr.–sum.

8. R. delicatula Small. Stems 1–4 dm. tall, sparingly pubescent: leaf-blades elliptic to ovate, 1–2.5 cm. long: sepals triangular: petals pale-purple, 10–15 mm. long: capsule 4–5 mm. long.—Stream-banks, in the Blue Ridge of Ga. —Sum.

9. R. Alifanus Walt. Stems 3–10 dm. tall, glabrous: leaf-blades lanceolate to linear-lanceolate, 3–8 cm. long: sepals triangular: petals bright-purple, 17–22 mm. long: capsule 6–7 mm. long. [*R. glabella* Michx.]—Moist pinelands, Coastal Plain, N Fla. to La. and N. C.—Spr.–sum.

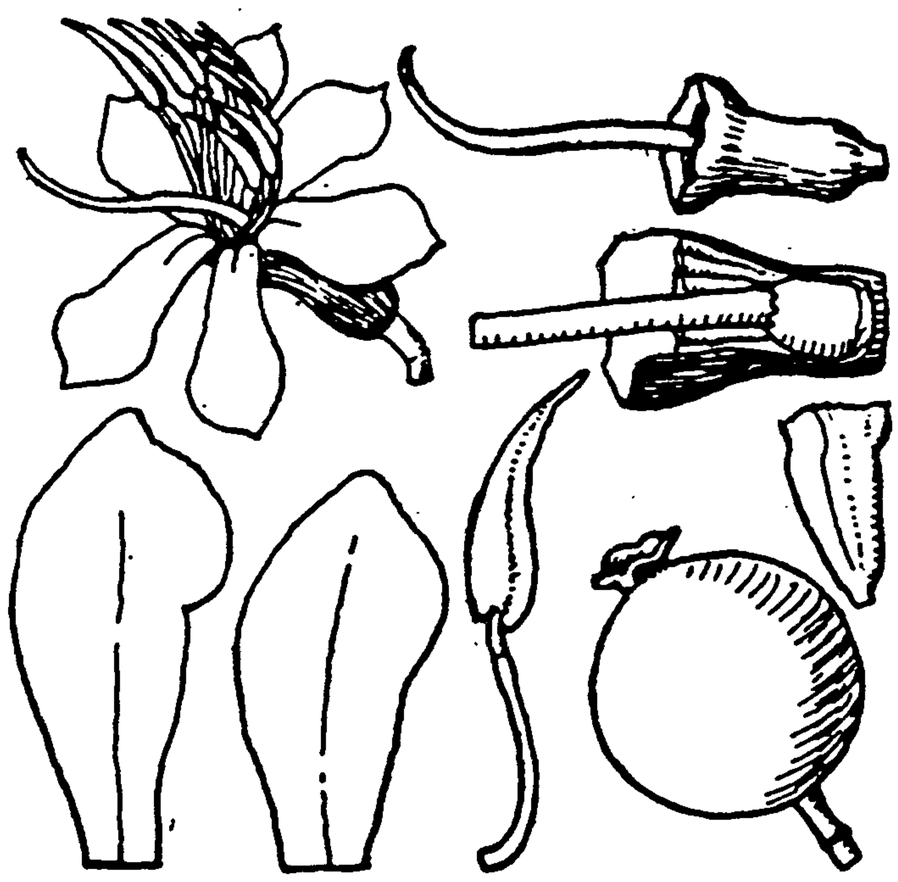
10. R. virginica L. Stems 2–10 dm. tall: leaf-blades elliptic, oval, lanceolate, or ovate-lanceolate, 2–10 cm. long: sepals lanceolate or triangular-lanceolate: petals bright-purple, 11–17 mm. long: capsule 5–6 mm. long.—(DEER-GRASS. MEADOW-BEAUTY. HANDSOME-HARRY.)—Sandy swamps and damp meadows, various provinces, Fla. to La., Mo., and Me.—Spr.–fall.—The entire plant is sometimes red.

11. R. stricta Pursh. Stems 6–13 dm. tall: leaf-blades lanceolate to elliptic-lanceolate, 2–1 cm. long: sepals triangular: petals purple, 12–16 mm. long: capsule 6–7 mm. long.—Moist pinelands and ponds, Coastal Plain, Ga. to Miss. and N. C.—Sum.

12. R. aristosa Britton. Stems 2–6 dm. tall, glabrous: leaf-blades linear to linear-lanceolate or sometimes linear-elliptic, 1–3 cm. long: sepals linear to linear-lanceolate: petals magenta-red, 12–20 mm. long: capsule about 6 mm. long.—Sandy swamps and damp pinelands, Coastal Plain, Ga. to N. J.—Sum.

13. R. parviflora Chapm. Stems 1–3 dm. tall, pubescent: leaf-blades elliptic or nearly oval, 1–2 cm. long: sepals triangular-lanceolate: petals white, less than 10 mm. long: capsule about 3 mm. long.—Shallow ponds, near Apalachicola, Fla.—Sum.

2. TETRAZYGIA L. C. Rich. Shrubs or trees. Leaf-blades 3–5-ribbed, mostly scurfy or tomentose beneath. Sepals, and petals, 4–6. Ovary 4- or 5-celled. Berry included, the hypanthium-neck short.—About 16 species, West Indian.



1. T. bicolor (Mill.) Cogn. Shrub or small tree with scaly bark: leaf-blades lanceolate to elliptic-lanceolate, 8–20 cm. long, silvery beneath, stout-petioled: panicle 1–2 dm. long: calyx about 1 mm. long: petals white, 7–8 mm. long, cuneate: anthers lanceolate, 5–6 mm. long: berry purple or black, the body 8–10 mm. long.—(TETRAZYGIA.)—Hammocks and pinelands, Everglade Keys, Fla.—(*W. I.*)—Sum.—This is one of the conspicuously tropical West Indian plants which are so numerous on the Everglade Keys that, floristically these limestone

islands may be considered a part of the West Indies. In hammocks *Tetrazygia* is usually a small tree; in pinelands it is usually a shrub.

Family 2. **LYTHRACEAE** — Loosestrife Family

Herbs, shrubs, or trees. Leaves mostly opposite: blades usually entire. Flowers perfect. Calyx of 4 or 5 sepals, commonly accompanied by accessory teeth. Corolla of 4 or 5 petals, or wanting. Androecium of few or many stamens: anthers versatile. Gynoecium of mostly 2–6 united carpels. Ovary 2–6-celled, or rarely 1-celled, free from the hypanthium. Fruit a capsule, included in the hypanthium.—Twenty-one genera and about 400 species, widely distributed.

Flowers regular or nearly so: hypanthium symmetrical. Tribe I. Lythreae.
Flowers irregular: hypanthium oblique. Tribe II. Parsonsieae.

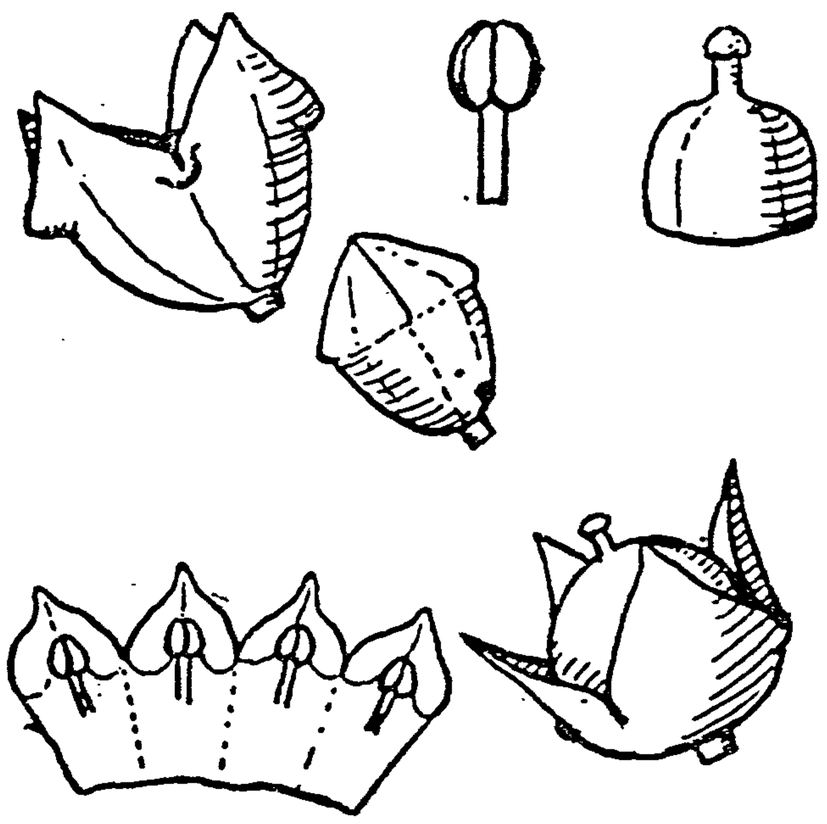
I. Lythreae

Hypanthium campanulate or turbinate, becoming hemispheric or globose.
  Herbs.
    Petals wanting: capsules indehiscent. 1. Didiplis.
    Petals 4, except in *Ammannia latifolia*: capsules dehiscent, sometimes irregularly so.
      Capsules bursting irregularly. 2. Ammannia.
      Capsules septicidally dehiscent. 3. Rotala.
  Shrubs or trees.
    Flowers in axillary cymes: aquatic shrubs. 4. Decodon.
    Flowers in terminal panicles: terrestrial shrubs or trees. 5. Lagerstroemia.
Hypanthium elongate, cylindric or tubular. 6. Lythrum.

II. Parsonsieae

Hypanthium enlarged or spurred on one side: petals unequal. 7. Parsonsia.

1. DIDIPLIS Raf. Flaccid herbs, resembing *Callitriche*. Leaf-blades narrow, entire, pellucid. Flowers solitary in the axils. Sepals 4, without accessory teeth. Petals wanting. Stamens 2–4. Style very short: stigma 2-lobed. Embryo with narrow cotyledons. — One species.

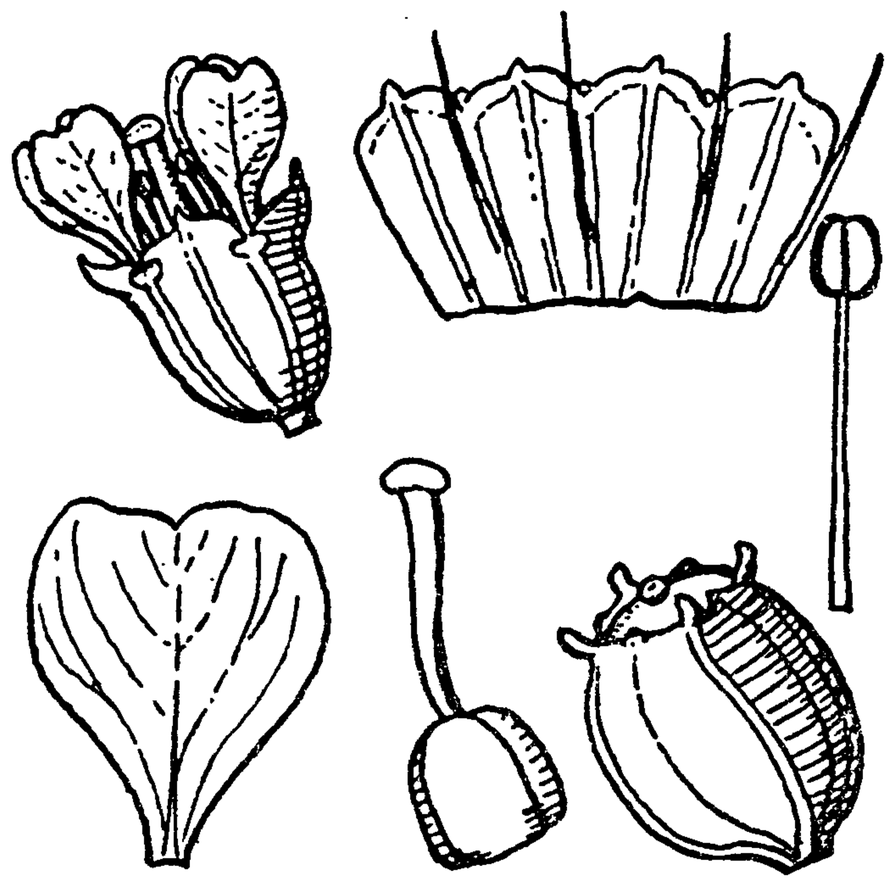


1. D. diandra (Nutt.) Wood. Stem 1–3 dm. long: emersed leaves with linear to linear-spatulate blades, thicker than the submersed ones, 1–2 cm. long: capsule urceolate, about 1 mm. in diameter.—(Water-purslane.) — Ponds and wet shores, various provinces, Fla. to Tex., Minn., and N. C.—(*Mex.*)—Sum.

2. AMMANNIA L. Leathery-succulent herbs. Leaf-blades, narrow, often auricled at the base. Flowers in axillary, sometimes 1-flowered, cymes, greenish, or sometimes tinged with red. Sepals 4, often accompanied with small teeth. Petals 4, early deciduous, or wanting. Stamens 4–8. Style filiform, sometimes short: stigma capitate. Embryo with auricled cotyledons.—About 20 species, most abundant in warm regions.

Corolla present.
  Leaves broadest below the middle: capsule 3–4 mm. in diameter. 1. *A. coccinea.*
  Leaves broadest above the middle: capsule 5–6 mm. in diameter. 2. *A. Koehnei.*
Corolla wanting. 3. *A. latifolia.*

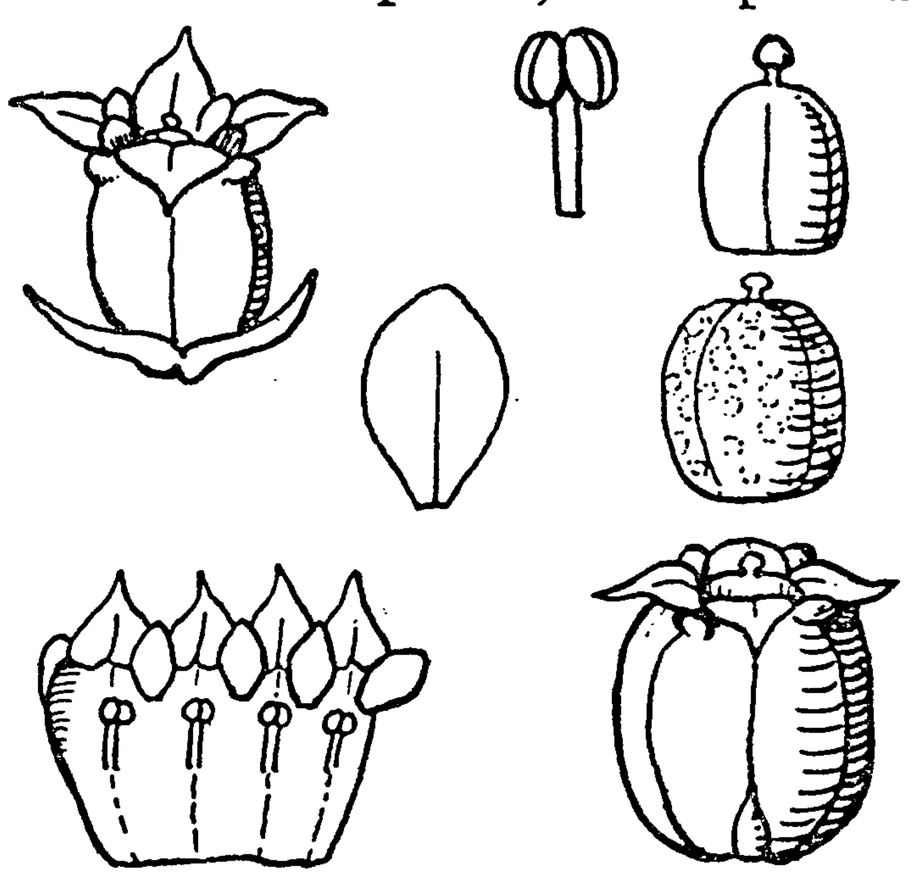
1. A. coccinea Rottb. Plant 1–5 dm. tall: leaf-blades linear to linear-lanceolate, 2–6 cm. long, partly clasping: petals broadly obovate: capsule 3–4 mm. in diameter.—Swamps and low grounds, various provinces, Fla. to Tex., S. D., and N. J.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.



2. A. Koehnei Britton. Plant 1–6 dm. tall: leaf-blades spatulate, oblanceolate or elliptic, 2–8 cm. long, those of the lower ones merely sessile: petals spatulate: stamens and short style included: capsule 5–6 mm. in diameter.—(TOOTH-CUPS.)—Swamps and along streams, Coastal Plain and adj. provinces, Fla. to N. J.—Sum.–fall.

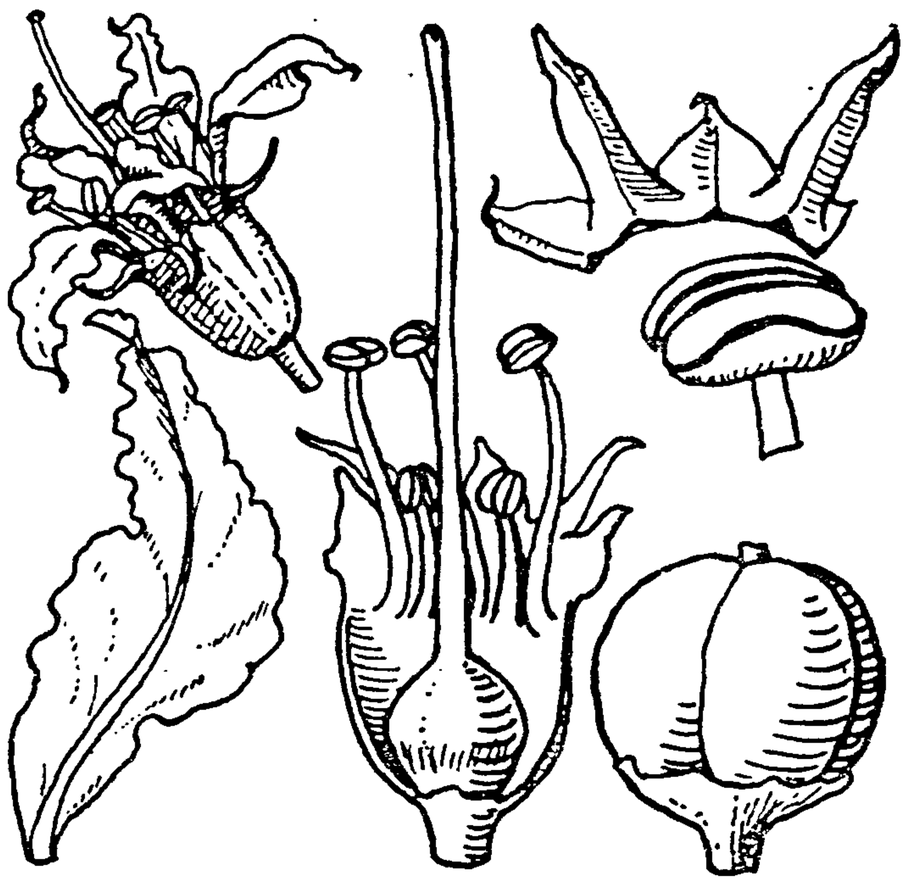
3. A. latifolia L. Plant 2–11 dm. tall: leaf-blades linear-elliptic to linear-lanceolate, mostly 3–7 cm. long, slightly auricled and clasping at the base: corolla wanting; capsule 4–5 mm. in diameter.—Low hammocks, lime-sinks, and swamps, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—All year.

3. ROTALA L. Herbs resembling *Ammannia.* Leaf-blades narrow, entire. Flowers greenish, usually solitary in the axils. Sepals 4, accompanied by appendages in the sinuses. Petals usually 4. Stamens 4. Style very short.—About 30 species, most abundant in warm and tropical regions.



1. R. ramosior (L.) Koehn. Stem 0.5–4 dm. long: leaf-blades elliptic to linear or spatulate, 1–3 cm. long: sepals acute: petals obovate or cuneate, as long as the sepals or longer: capsule 2.5–3.5 mm. in diameter.—Hammocks, wet, sandy places, and swamps, various provinces, Fla. to Tex., Minn., and Mass.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.

4. DECODON J. F. Gmel. Short-lived shrubs or shrubby herbs. Leaves deciduous: blades entire, somewhat elongate. Flowers in axillary peduncled cymes. Sepals 5–7, alternating with small teeth. Petals 5–7. Stamens 10 or rarely 8, alternating short and long, the longer exserted. Capsule loculicidally 3–6-valved. One species.



1. D. verticillatus (L.) Ell. Stem arching, mostly 4–16 dm. long: leaf-blades lanceolate or elliptic-lanceolate, 3–20 cm. long: sepals acuminate: petals purple-pink, lanceolate to ovate, 7–9 mm. long: capsule about 5 mm. in diameter.—(SWAMP-LOOSESTRIFE. WILLOW-HERB. WATER-OLEANDER. PEAT-WEED.)—Swamps and ponds, various provinces, Fla. to La., Minn., and Me.—Sum.

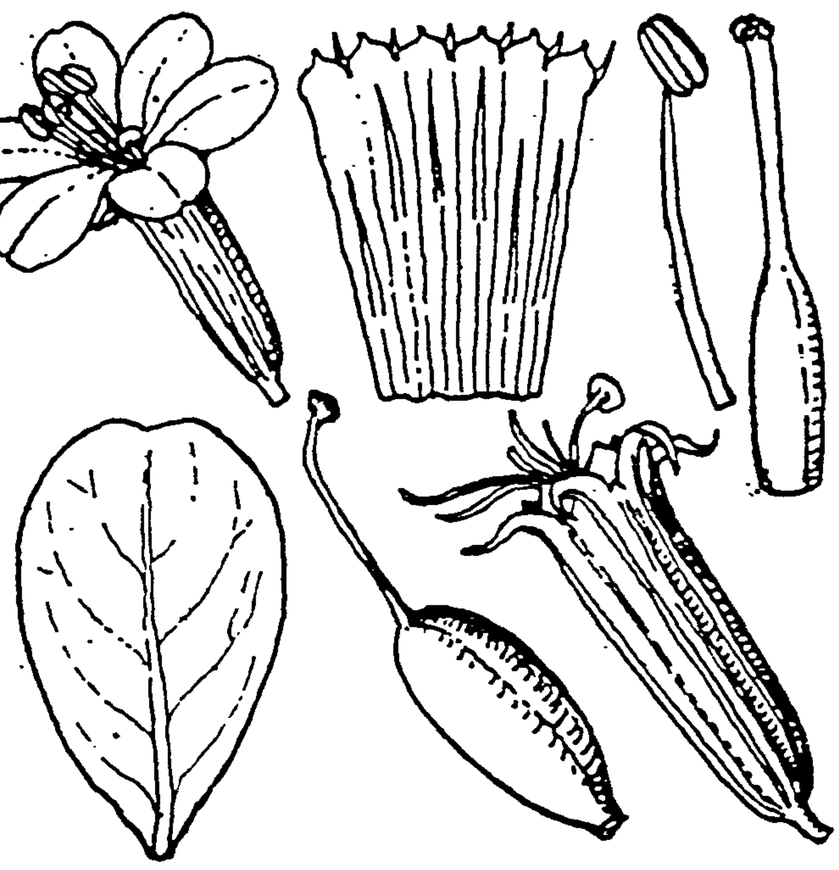
5. LAGERSTROEMIA L. Shrubs or trees. Leaves persistent: blades short. Flowers in terminal panicles. Sepals 5–7. Petals 5–7, the blades crisped. Stamens numerous. Capsule loculicidally 3–6-valved.—About 25 species, in Asia, Africa, and Australia.

1. L. indica L. Small tree or shrub with fluted trunk: leaf-blades obovate or oval, 1–2.5 cm. long, entire: sepals shorter than the hypanthium: petals purple, pink, or white, or rarely red, the blades crisped: capsule oval-globose, 8–9 mm. long.—(CRAPE-MYRTLE. LADIES'-STREAMER.)—Waste-places, cult. ground, old fields, and about gardens, various provinces, Fla. to Tex. and Va. (or Md.?). Nat. of Asia and cult.—Spr.–fall.—Trees are long-lived. They suggest premature age, but are very showy when in flower. They frequently indicate the position of residences or settlements that have long ago disappeared. The thin bark peels off the trunk leaving a smooth clean surface which gives the tree a pale ghostly appearance at night.

6. LYTHRUM L. Herbs or shrubs. Leaf-blades entire. Flowers axillary or in terminal spikes or racemes, rose-purple or white. Sepals 4–6, not involute, alternating with spreading appendages. Petals 4–6, nearly equal.—About 30 species of wide geographical distribution. Spr.–fall or all year S.—LOOSESTRIFES.

Leaves mostly alternate.	
Leaf-blades rounded or cordate at the base.	1. *L. alatum.*
Leaf-blades narrowed at the base.	
Leaf-blades thick, those of the branches numerous, approximate, mostly less than 1.5 cm. long: hypanthium 6–8 mm. long.	2. *L. lanceolatum.*
Leaf-blades thin, those of the branches few, mostly over 1.5 cm. long: hypanthium 3–5 mm. long.	3. *L. Curtissii.*
Leaves mostly opposite.	
Leaf-blades linear or nearly so, those on the flowering branches much reduced.	4. *L. lineare.*
Leaf-blades elliptic to orbicular or rarely cuneate, those on the flowering branches not much reduced.	5. *L. flagellare.*

1. L. alatum Pursh. Stem 3–13 dm. tall: leaf-blades lanceolate, elliptic, or ovate-lanceolate, 1–5 cm. long: mature hypanthium 5–8 mm. long, the appendages slender-subulate, much longer than the triangular sepals: petals obovate or cuneate-obovate, 5–6 mm. long: capsule 4.5–5 mm. long.—(WINGED-LOOSESTRIFE.)—Low grounds, swamps, and ditches, various provinces, Ga. to La., Colo., Minn., Ont., and Mass.—*L. cordifolium* Nieuwl. is based on an aberrant specimen of *L. alatum* from Florida.



2. L. lanceolatum Ell. Stem 6–16 dm. tall: leaf-blades elliptic to linear-elliptic, 1–6 cm. long: mature hypanthium 5–6 mm. long, the appendages subulate, much longer than the triangular sepals: petals obovate to cuneate-obovate, 6–7.5 mm. long: capsule

4.5–5 mm. long.—Ditches, stream-banks, and swamps, Coastal Plain and adj. provinces, Fla. to Tex., Okla., and S. C.

3. **L. Curtissii** Fernald. Similar to *L. lanceolatum* in habit: leaf-blades thin, oval, elliptic, or elliptic-lanceolate, 2–5.5 mm. long: mature hypanthium 3–4 mm. long, the appendages slender-subulate, longer than the minute sepals: petals elliptic to obovate-elliptic, 2.5–3.5 mm. long: capsule about 4 mm. long. —Muddy, often calcareous swamps, Coastal Plain, N Fla. and adj. Ga.

4. **L. lineare** L. Stem 3–12 dm. tall: leaf-blades linear, 1–4 cm. long: mature hypanthium about 4 mm. long, the appendages triangular, about as long as the deltoid sepals: petals cuneate or cuneate-elliptic, 4–5 mm. long: capsule barely 4 mm. long.—Coastal sand-dunes and open hammocks, Coastal Plain, Fla. to Tex. and N. J.

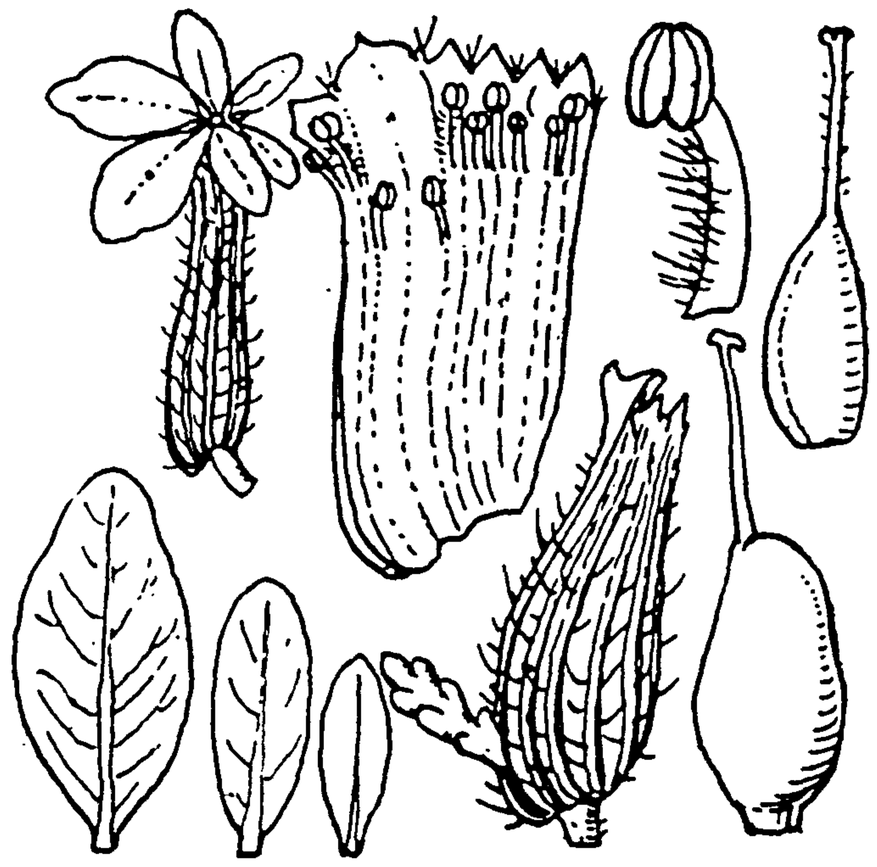
5. **L. flagellare** Shuttlw. Stem creeping: leaf-blades elliptic to orbicular or rarely cuneate, 0.5–1 cm. long: mature hypanthium 6–8 mm. long or longer, the appendages subulate, several times longer than the glabrous sepals: petals purple, cuneate-obovate, 4–5 mm. long: capsule 3–4 mm. long or shorter. [*L. Vulneraria* (Fl. SE. U. S.)]—Low grounds and swamps, S pen. Fla.

7. **PARSONSIA** P. Br. Herbs or woody plants, mostly clammy-pubescent. Leaf-blades entire. Flowers axillary, or in terminal spikes or racemes. Sepals 6, alternating with small teeth. Petals 6, unequal. Stamens adnate to near the top of the hypanthium. Embryo with orbicular cotyledons. [*Cuphea* P. Br.]—About 200 species, American.

Calyx-limb prominently 2-lipped: posterior pair of stamens not reduced.
- Style pubescent: stamens 12; anthers not woolly. 1. *P. petiolata.*
- Style glabrous: stamens 11; anthers of the longer pair densely woolly. 2. *P. procumbens.*

Calyx-limb with 5 equal lobes: posterior pair of stamens often much reduced.
- Plant perennial: hypanthium with glandular hairs all over; calyx more or less spreading: petals 1.5–2 mm. long. 3. *P. lythroides.*
- Plant annual: hypanthium with few simple hairs on the ribs: calyx erect: petals 5–6 mm. long. 4. *P. Balsamona.*

1. **P. petiolata** (L.) Rusby. Plant annual, 1–7 dm. tall: leaf-blades lanceolate to ovate-lanceolate, 1–1.5 cm. long: hypanthium and calyx 8–10 mm. long: flowers rose-purple: upper lip of the calyx much broader than long: upper petals 4.5–5.5 mm. long: capsule 6–8 mm. long.—(WAX-WEED. TAR-WEED. WAX-BUSH. CLAMMY-WEED.)—Dry rocky soil, hillsides, and old fields, various provinces, Ga. to La., Kans., and N. H.—Sum.–fall.



2. **P. procumbens** (Cav.) Small. Plant perennial, 10–12 dm. tall: leaf-blades lanceolate or ovate-lanceolate, 2–6 cm. long: hypanthium and calyx 18–22 mm. long: flowers purple or reddish: upper lip of the calyx about as long as broad: upper petals 12–14 mm. long: capsule 9–10 mm. long.—Waste-places and thickets, Blue Ridge, N. C. Nat. of Mex. and cult.—Sum.–fall.

3. P. lythroides Small. Plant perennial, 2–6 dm. tall: leaf-blades elliptic, 1–2 cm. long: hypanthium and calyx 8–10 mm. long: flowers lavender or white: calyx-lobes deltoid: petals spatulate, 5–6 mm. long, or the upper ones 7–8 mm. long: capsule 3.5–4.5 mm. long.—Low pinelands, M and W Fla.—Spr.–sum.

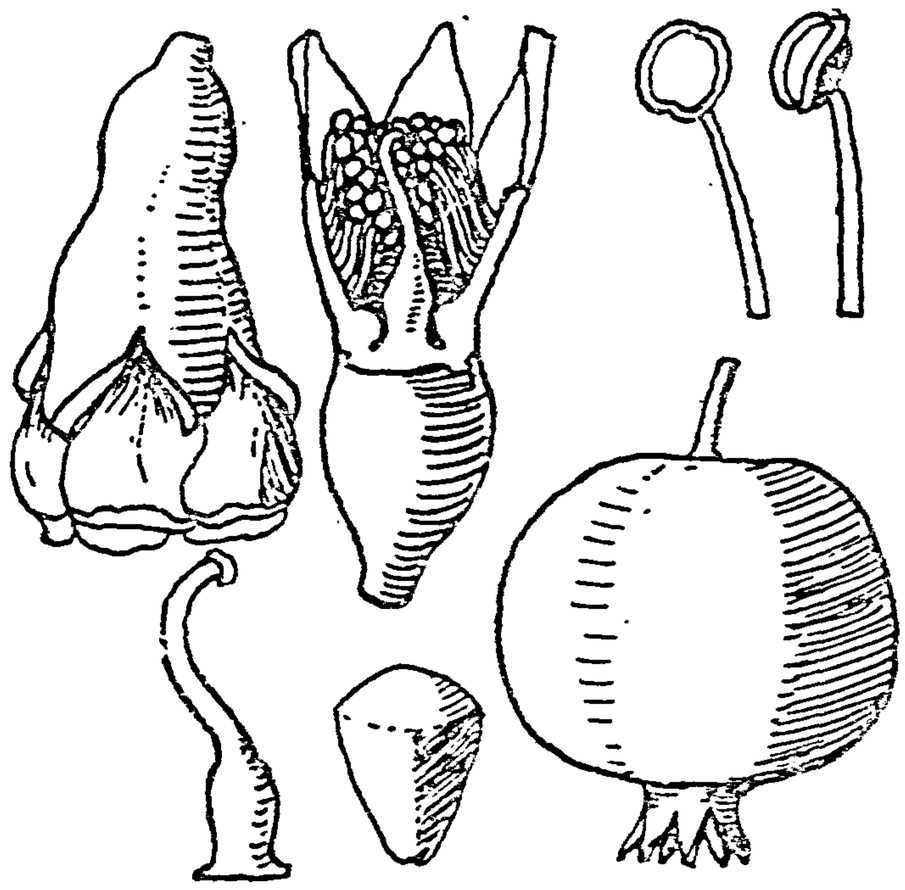
4. P. Balsamona (C. & S.) Standley. Plant annual, 2–9 dm. tall: leaf-blades elliptic to oval, or somewhat obovate, 2–6 cm. long, usually rugose in age: hypanthium and calyx 5.5–6.8 mm. long: flowers bluish: calyx-lobes broadly deltoid: petals elliptic or nearly so 1.5–2 mm, long: capsule 4–5 mm. long.—Low hammocks, lake region, pen. Fla.—(*Mex., C. A., S. A.*)—Spr.–fall.

Family 3. **PUNICACEAE** — Pomegranate Family

Shrubs or trees. Leaves opposite or nearly so, persistent: blades simple. Flowers perfect, solitary or in short-peduncled axillary clusters. Hypanthium leathery. Calyx of 5–7 sepals. Corolla of 5–7 wrinkled petals. Androecium of numerous stamens in several series: anthers versatile. Gynoecium of several united carpels. Ovary inferior. Fruit a several-celled berry crowned with the calyx, the seeds in a watery pulp.—One genus and 2 species, mostly in the Old World tropics.

1. PUNICA [Tourn.] L. Leaf-blades entire. Flowers showy. Sepals persistent on the fruit. Petals deciduous. Berry pendulous.

1. P. Granatum L. Small tree or shrub: leaf-blades oval, elliptic, or elliptic-lanceolate, varying to broadest above or below the middle, 1–8 cm. long: sepals triangular to triangular-lanceolate: petals scarlet, 1.5–2.5 cm. long: berry subglobose or depressed, 5–10 cm. in diameter.—(Pomegranate.)—Old-fields, woods, and waste-grounds, Fla. Nat. of the Orient and cult.—(*W. I.*)—Persistent on old settlement sites and homesteads long after the habitations have disappeared.—This plant in cultivation from prehistoric times has developed into a variety of habits and flower-color, vermilion, yellow, white, and variegated.



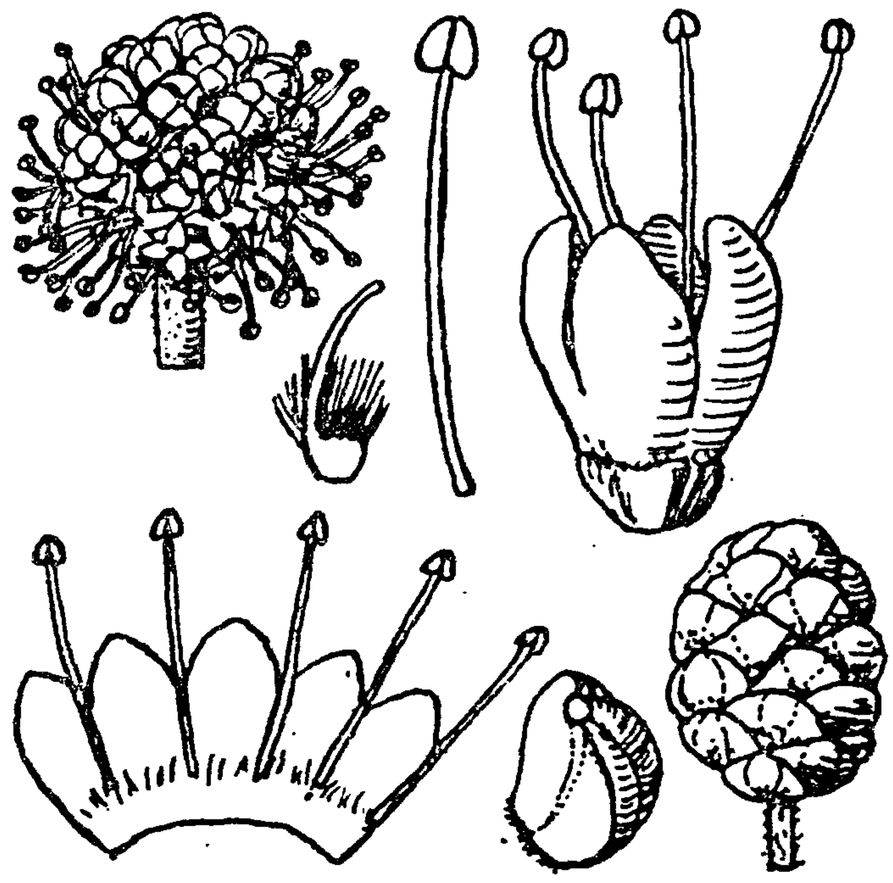
Family 4. **TERMINALIACEAE** — White-mangrove Family

Shrubs or trees, or woody vines. Leaves alternate or opposite: blades simple, leathery. Flowers often apetalous, regular, perfect or polygamous, racemose or capitate. Calyx of 4–5 valvate deciduous or rarely persistent sepals. Corolla of 4–5 petals, or wanting. Androecium of twice, or rarely thrice, as many stamens as the sepals. Filaments distinct. Gynoecium a single carpel. Ovary 1-celled. Style terminal. Stigma entire or nearly so. Fruit drupaceous or berry-like, indehiscent, often crowned with the accrescent calyx.—Fifteen genera and 275 species, mostly tropical.

Sepals deciduous: corolla wanting.
- Flowers in heads: hypanthium flattened: fruit small, in a cone-like head. — 1. Conocarpus.
- Flowers in spikes: hypanthium terete: fruit separate, large. — 2. Terminalia.

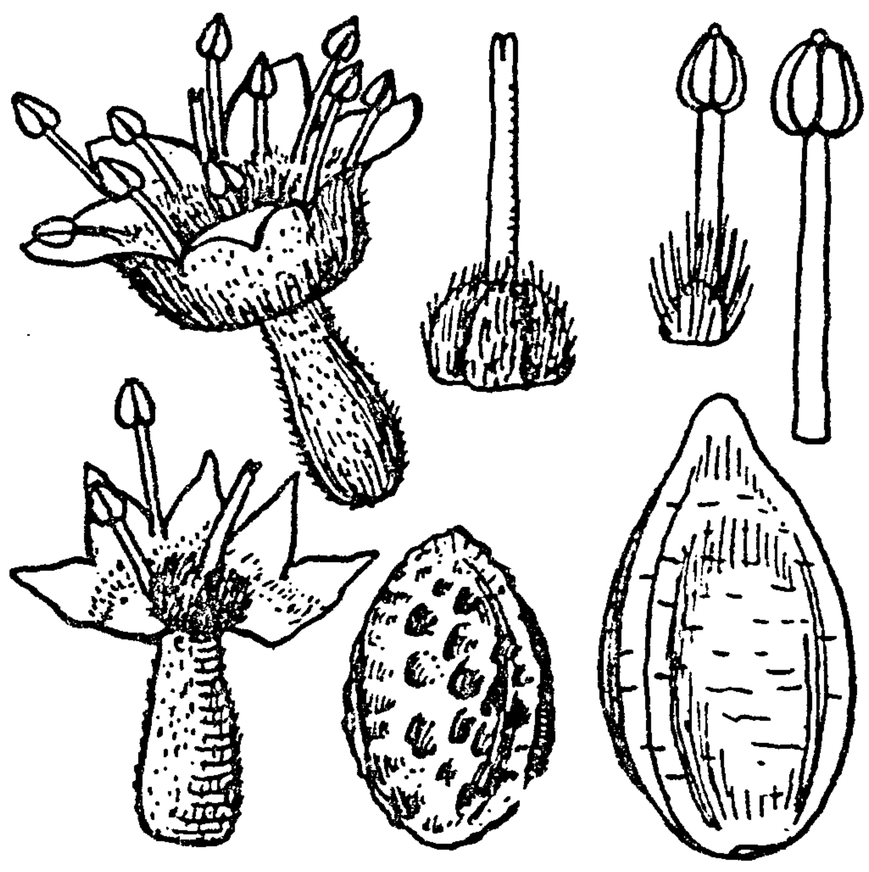
Sepals persistent.
- Corolla wanting: leaves alternate. — 3. Bucida.
- Corolla present: leaves opposite. — 4. Laguncularia.

1. CONOCARPUS L. Shrubs or trees, evergreen. Leaves alternate. Flowers perfect, in spicate or panicled heads. Hypanthium not ribbed. Stamens 5. Fruit capitate.—One species.



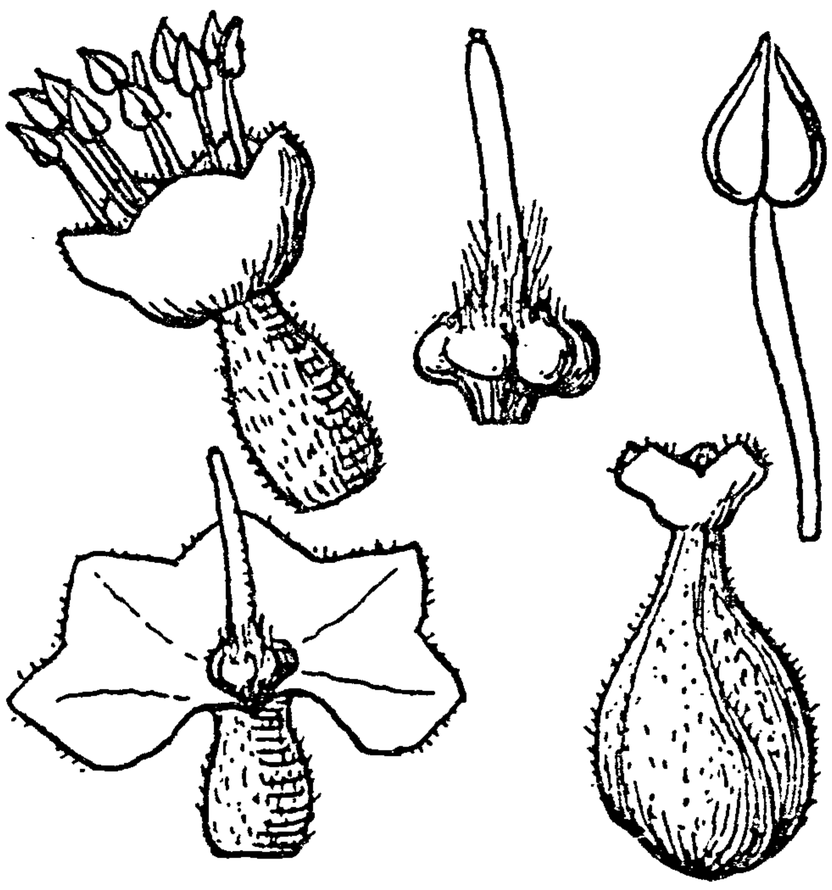
1. C. erecta L. Shrub, or tree sometimes 20 m. tall, with glabrous or fine-silky foliage: leaf-blades elliptic or oval, 2–5 cm. long, entire: heads 9–14 mm. in diameter at maturity: flowers greenish: drupe 2-winged, 4–7 mm. long.—(BUTTONWOOD.)—Coastal hammocks and sandy shores, pen. Fla., Everglade Keys, and Florida Keys.—(*W. I., Mex., C. A., S. A.*)—All year.—The bark is used medicinally and for tanning. The yellow-brown heart-wood, close-grained, very heavy, and hard, is used, in southern Florida for making charcoal.—A silvery pubescent variety occurs on the Florida Keys and on both coasts of the peninsula.

2. TERMINALIA L. Shrubs or trees, deciduous. Leaves clustered near the ends of the branches. Flowers in simple or branched spikes. Hypanthium not ribbed. Stamens 10.—About 100 species, of the Old World tropics.



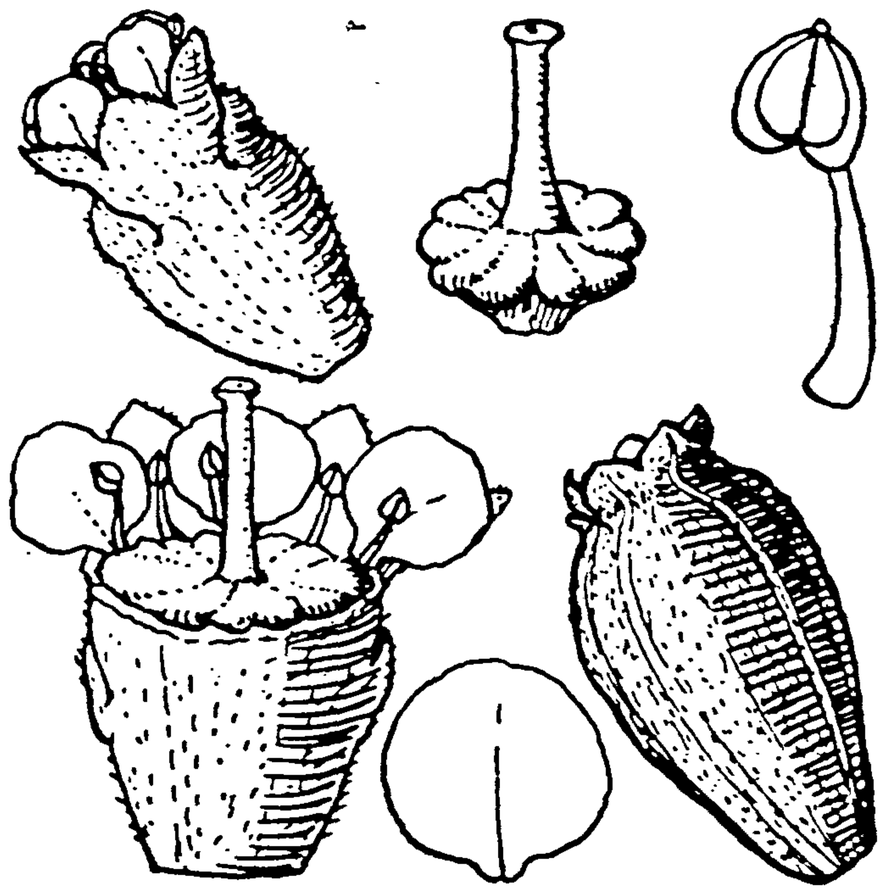
1. T. Catappa L. Shrub, or tree sometimes 17 m. tall: leaf-blades cuneate to oblanceolate: spikes 5–15 cm. long: flowers green or whitish: hypanthium and calyx 8–11 mm. long: drupe elliptic or nearly so, glabrous.—(INDIAN-ALMOND. WEST-INDIAN ALMOND.) Pinelands and old fields, S pen. Fla. and the Keys. Nat. of the E. Indies and Oceanica; escaped from cult.—(*W. I.*)—All year.—The seeds are edible. Although a native of the tropics where storms are usual, this tree never developed a wood or foliage capable of resisting the force of a hurricane. A severe storm will often tear a tree to pieces.

3. BUCIDA L. Shrubs or trees, evergreen. Leaves relatively small, clustered at the ends of the branches. Flowers in simple or branched spikes, often crowded. Hypanthium terete. Stamens 10. Fruit in short spikes.—Two species, West Indian.



1. B. Buceras L. A tree sometimes 15 m. tall: leaf-blades spatulate to obovate, oval, or elliptic: spikes 2–10 cm. long: flowers greenish: hypanthium and calyx 4–5 mm. long: calyx-lobes shorter than the tube: drupe ovoid-conic or flask-shaped, pubescent.—(BLACK-OLIVE.)—Hammocks, upper Florida Keys.—(*W. I., C. A.*)—The light yellow-brown heart-wood is close-grained, very heavy, and hard. Great numbers of trees are used as shade-trees and ornamentals in **Florida.**

2. **LAGUNCULARIA** Gaertn. Shrubs or trees, evergreen. Leaves opposite. Flowers polygamous, in simple or branched spikes. Hypanthium ribbed. Petals mostly shorter than the sepals. Stamens 10. Fruit spicate or paniculate.—One species.



1. L. racemosa Gaertn. f. Shrub, or tree sometimes 20 m. tall: leaf-blades oblong, varying to oval or obovate, 2–5 cm. long, entire, alike or nearly so on both sides: spikes 3–6 cm. long: drupe elliptic-obovoid, 2 cm. long.—(WHITE-MANGROVE. WHITE-BUTTONWOOD.)—Rocky and sandy shores and coastal hammocks, pen. Fla. and the Keys. —(*W. I., Mex., C. A., S. A.*)—Spr.—The white flowers are very fragrant. The dark yellow-brown heart-wood is close-grained, heavy, and hard. The bark is rich in tannic acid.

FAMILY 5. **MYRTACEAE** — MYRTLE FAMILY

Shrubs or trees, or rarely herbs, abounding in pungent and aromatic volatile oil, evergreen. Leaves opposite, or rarely alternate or whorled: blades often simple, pellucid-punctate, flat or often very thick, often with nerves parallel with the margins. Flowers perfect, regular. Calyx of 4 or 5, or many, valvate or imbricate, persistent sepals, or cap-like and deciduous. Petals borne on the margin of a hypanthium or wanting. Androecium of numerous stamens, or very rarely of as many as the sepals. Gynoecium compound. Ovary inferior or partly so, 1–many-celled. Styles united. Fruit sometimes dehiscent, often crowned with the calyx.—Sixty genera and about 1,750 species, widely distributed in the tropics.

Fruit fleshy, baccate: leaf-blades pinnately veined.	
Calyx of several persistent or tardily deciduous, valvate sepals, not lid-like: petals present: disk annular: fruit a berry crowned with the persistent calyx or a capsule with an annular ring.	
Calyx of regularly separating sepals.	Tribe I. EUGENIEAE.
Calyx of irregularly separating sepals.	Tribe II. MYRTEAE.
Calyx lid-like, early deciduous: petals wanting: disk cup-like: fruit crowned with the cup-like disk and hypanthium.	Tribe III. MYRCIEAE.
Fruit dry, capsular: leaf-blades parallel-veined.	Tribe IV. MELALEUCEAE.

I. EUGENIEAE

Inflorescence centripetal: flowers in raceme-like, umbel-like, or contracted clusters: persistent calyx inconspicuous.	1. EUGENIA.
Inflorescence centrifugal: flowers in sessile or peduncled dichotomous cymes: persistent calyx conspicuous.	
Cymes markedly peduncled, the terminal flowers sessile: disk contracted at maturity, the sepals crowded and converging on the top of the fruit: seeds one or two.	2. ANAMOMIS.
Cymes sessile or nearly so, the terminal flowers stalked: disk expanded, the sepals lax, more or less spreading on the top of the fruit: seeds several to many.	3. MOSIERA.

II. MYRTEAE

Leaf-blades prominently ribbed: cymes 1–few-flowered, axillary.	4. PSIDIUM.

III. MYRCIEAE

Leaf-blades obscurely ribbed: cymes several–many-flowered.	5. CALYPTRANTHES.

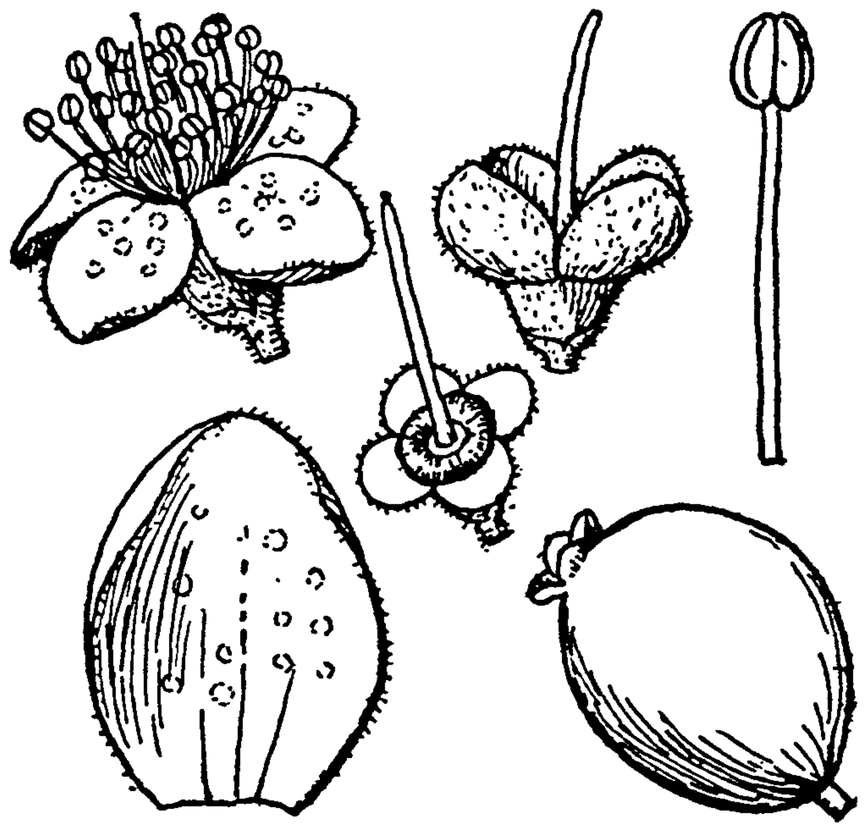
IV. MELALEUCEAE

Tree with thick peeling bark in many papery layers: leaves very numerous: inflorescence conspicuously copiously flowered. 6. MELALEUCA.

1. **EUGENIA** [Mich.] L. Shrubs or trees. Leaf-blades thickish, neither prominently ribbed nor veiny, persistent. Cymes cluster-like, sessile or short-peduncled. Flowers white. Sepals broad, not accrescent. Petals much larger than the sepals. Stamens numerous, borne on the annular disk. Style filiform or subulate-filiform. Berry minutely crowned in the calyx. Seeds 1–4.—About 600 species, mostly of tropical regions.—STOPPERS.

Pedicels short and stout, usually shorter than the flowers and much shorter than the fruits.
  Fruit oval or ellipsoid-oval. 1. *E. buxifolia.*
  Fruit subglobose, sometimes depressed.
    Leaf-blades of a rhombic type, more or less constricted at the base and the tip: fruit depressed, 10–12 mm. in diameter. 2. *E. axillaris.*
    Leaf-blades of an oval or elliptic type, obtuse: fruit subglobose, 6–8 mm. in diameter. 3. *E. anthera.*
Pedicels relatively long and slender, longer than the flowers and usually longer than the fruits.
  Leaf-blades bluntly acuminate, dull above: fruits depressed, 9–16 mm. in diameter. 4. *E. rhombea.*
  Leaf-blades slenderly acuminate, shining above: fruits subglobose or globose-obovoid, 5–8 mm. in diameter. 5. *E. confusa.*

1. E. buxifolia (Sw.) Willd. Shrub or small tree, the bark scaly: leaf-blades cuneate to nearly elliptic, 2–4 cm. long, much paler beneath than above: corolla 4–5 mm. broad; petals longer than wide: fruit oval or ellipsoid-oval, 6–7 mm. broad, black.—(SPANISH-STOPPER.)—Coastal hammocks, S pen. Fla. and the Keys.—(*W. I.*)—The dark-brown heart-wood, close-grained, heavy, and very hard, is used locally in cabinet work.



2. E. axillaris (Sw.) Willd. Shrub or small tree, the bark scaly: leaf-blades elliptic-ovate to nearly elliptic, 3–5 cm. long, slightly paler beneath than above: corolla 5–6 mm. broad; petals mostly wider than long: fruit depressed, 10–12 mm. broad, black.—(WHITE-STOPPER.)—Coastal hammocks, S pen. Fla. and the Keys.—(*W. I.*)—The brown heart-wood, close-grained, heavy, and hard, is used locally for cabinet work.

3. E. anthera Small. Shrub or small tree, the bark pale, rather smooth: leaf-blades oval to elliptic or nearly so, 2–5.5 cm. long, slightly paler beneath than above: corolla 5–6 mm. broad; petals slightly longer than wide: fruit subglobose, 6–7 mm. in diameter, dark red to black.—Hammocks along or near the coast, S pen. Fla.—The brown heart-wood is close-grained and hard.

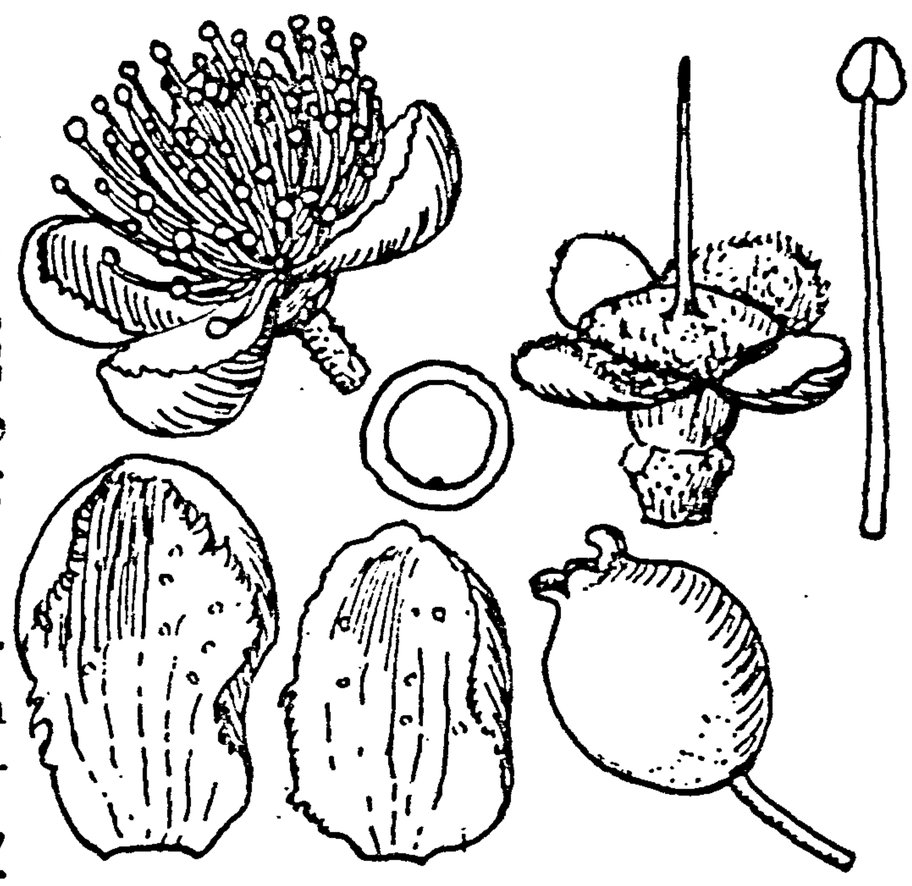
4. E. rhombea (Berg) Urban. Tree, the bark smooth: leaf-blades ovate to elliptic, 3–6 cm. long, slightly acuminate: corolla about 10 mm. broad; petals slightly longer than the sepals: fruit depressed, 9–16 mm. broad, orange tinged with red, or black at maturity.—(RED-STOPPER.)—Hammocks, lower Florida Keys.—(*W. I.*)—The light-brown heart-wood, close-grained, heavy, and hard, is used locally for cabinet work.

5. E. confusa DC. Tree, the bark scaly: leaf-blades ovate, oval-ovate, or elliptic-ovate, 3–5 cm. long, markedly acuminate: corolla 4–6 mm. broad; petals about twice as long as the sepals: fruit subglobose or globose-obovoid, 5–8 mm. broad, scarlet. [*E. Garberi* Sarg.]—(IRONWOOD.)—Hammocks, Everglade Keys, Fla. and the Keys.—(*W. I.*)—The red-brown heart-wood, close-grained, heavy, and very hard, is used locally for cabinet work.

2. **ANAMOMIS** Griseb. Shrubs or trees. Leaf-blades thickish, not ribbed, with rather faint lateral veins. Cymes decidedly peduncled, 1–many-flowered, the branches shorter than the peduncle. Flowers fragrant. Sepals ciliate, one pair much larger than the other. Petals paired, white. Stamens numerous, borne on the small annular disk. Style filiform. Berry crowned with the persistent calyx, red or reddish. Seeds solitary or 2.—About 8 species, West Indian and Floridian.—Spr.—NAKEDWOODS.

Corolla over 1 cm. wide: petals 4.5–6 mm. long: stamens mostly 60–70: cymes several-flowered. 1. *A. Simpsonii.*
Corolla less than 1 cm. wide: petals 2.5–3.5 mm. long: stamens mostly 30–40: cymes few-flowered. 2. *A. dicrana.*

1. A. Simpsonii Small. Tree becoming 20 m. tall, the trunk with pale-tan bark, strongly buttressed at the base: leaf-blades narrowly obovate, elliptic-obovate, or nearly elliptic, 2.5–6.5 cm. long, acutish, obtuse or notched, much paler beneath than above, rather long-petioled: cymes long-petioled in anthesis, 7–14 flowered, the primary bracts small, but leaf-like: calyx 6–7 mm. wide; larger sepals about 3 mm. long: berry ellipsoid, often broadly so, 8–10 mm. long, red.—Hammocks, lower E coast and Everglade Keys, Fla.—The foliage contains a volatile oil, somewhat resembling that of nutmeg in flavor.

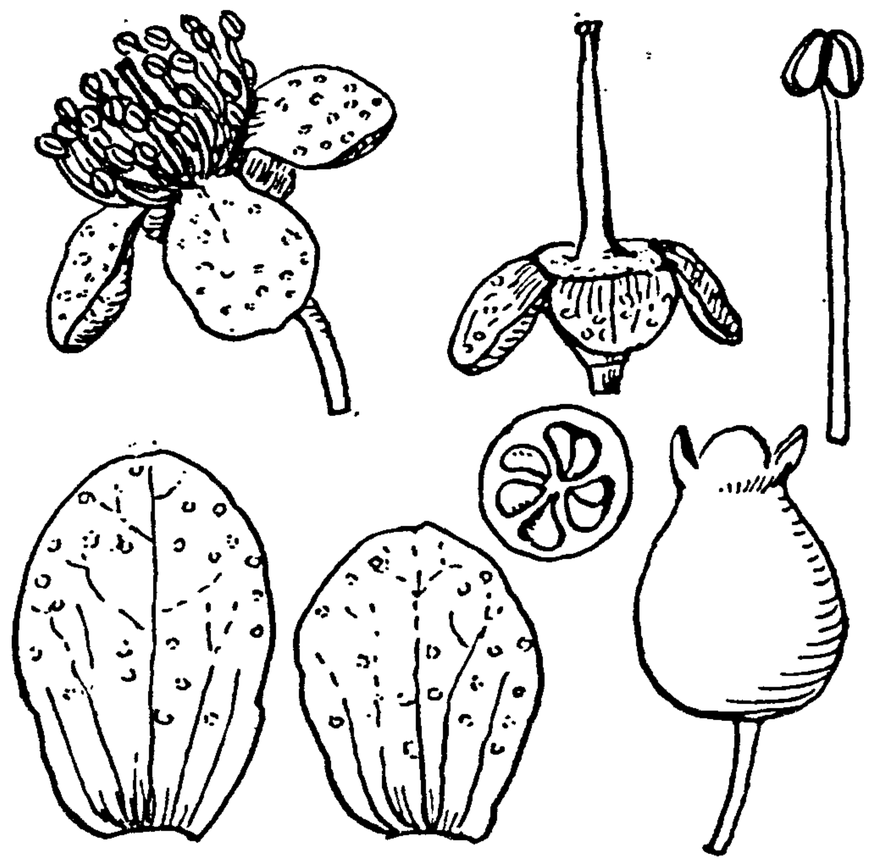


2. A. dicrana (Berg) Britton. Shrub or small tree becoming 8 m. tall, the trunk with a light-red or red-brown bark, not buttressed: leaf-blades cuneate, elliptic-cuneate, or narrowly elliptic, 1–4 cm. long, acute or obtuse, slightly paler beneath than above, short-petioled: cymes short-petioled in anthesis, 3–flowered, the primary bracts minute: calyx 4–5 mm. wide; larger sepals about 2 mm. long: berry globose or ellipsoid, 6–7 mm. long, reddish-brown. [*A. dichotoma* (Fl. SE. U. S.)]—Hammocks, E coast, M pen., Caloosahatchee region to Cape Romano, and Key West, Fla.

3. **MOSIERA** Small. Shrubs or small trees. Leaf-blades thick. obscurely veined, but finely reticulate. Cymes sessile or nearly so, 1–3-flowered, the branches longer than the peduncle. Flowers fragrant. Sepals eciliate, not decidedly paired. Petals nearly equal, white. Stamens numerous, borne on the large annular disk. Style slender-columnar. Berry globular, crowned with the persistent conspicuous calyx, black. Seeds several or many.—Few species, tropical.—STOPPERS.

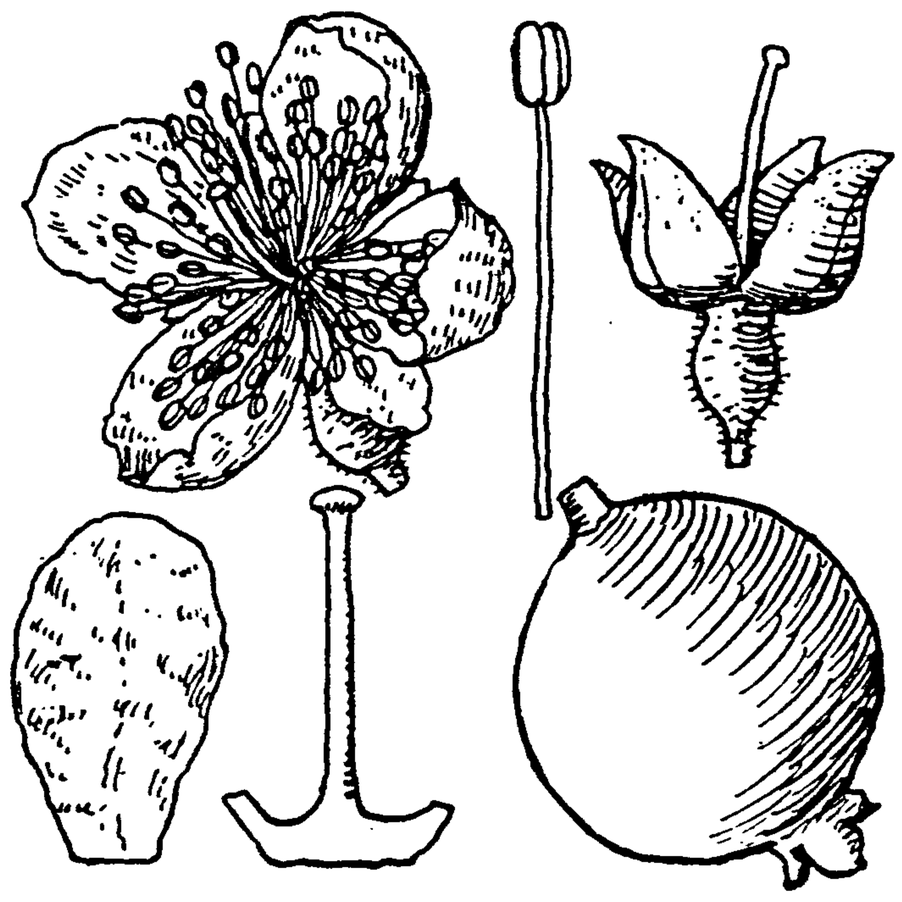
Calyx less than 1 cm. wide: petals more than twice as long as the sepals: shrub with many prostrate-diffuse branches. 1. *M. longipes.*
Calyx over 1 cm. wide: petals less than twice as long as the sepals: shrub with erect branches or small tree. 2. *M. bahamensis.*

1. M. longipes (Berg) Small. Shrub with many wiry often decumbent branches 1–9 dm. long from a short woody base: leaf-blades ovate or oval, mostly 1–3 cm. long, finely reticulate: sepals about 2 mm. long: corolla mostly 10–12 mm. wide: berry globose or obovoid-globose, 6–9 mm. in diameter, black. [*Eugenia longipes* Berg.]—Pinelands, Everglade Keys, pen. Fla. and Florida Keys.—(*W. I.*)



2. M. bahamensis (Kiaersk.) Small. Shrub with erect branches or small tree: leaf-blades orbicular, oval, or elliptic, or somewhat ovate, mostly 2–5 cm. long, often decidedly shining above, minutely reticulate beneath: sepals about 3 mm. long: corolla mostly 1.5 cm. wide: berry subglobose, about 1 cm. in diameter, black (?). [*Eugenia bahamensis* Kiaersk.]—Hammocks and pinelands near hammocks, Everglade Keys, pen. Fla. and Florida Keys.—(*W. I.*)

4. PSIDIUM L. Shrubs or trees. Leaf-blades thickish, prominently many-ribbed. Cymes 1–few-flowered. Sepals separating irregularly. Petals 4 or 5, much larger than the sepals, white. Stamens very numerous, borne on the disk. Style subulate-filiform. Berry fleshy, crowned with the calyx. Seeds very numerous.—About 11 species, mostly tropical.



1. P. Guajava Raddi. Tree sometimes 8 m. tall, with roughish bark, or a shrub with smooth-bark; leaf-blades elliptic or nearly so, 4–8 cm. long, pubescent beneath: sepals 9–15 mm. long: petals 15–20 mm. long: berry globular or pyriform, 3–6 cm. in diameter.—(GUAVA.)—Hammocks, roadsides, pinelands, and old fields, especially in pen. Fla. and the Keys. Nat. of trop. Am. and cult.—(*W. I., Mex., C. A., S. A.*)—Grown extensively in several varieties for its fruit, which is eaten raw or made into a jelly or a preserve.

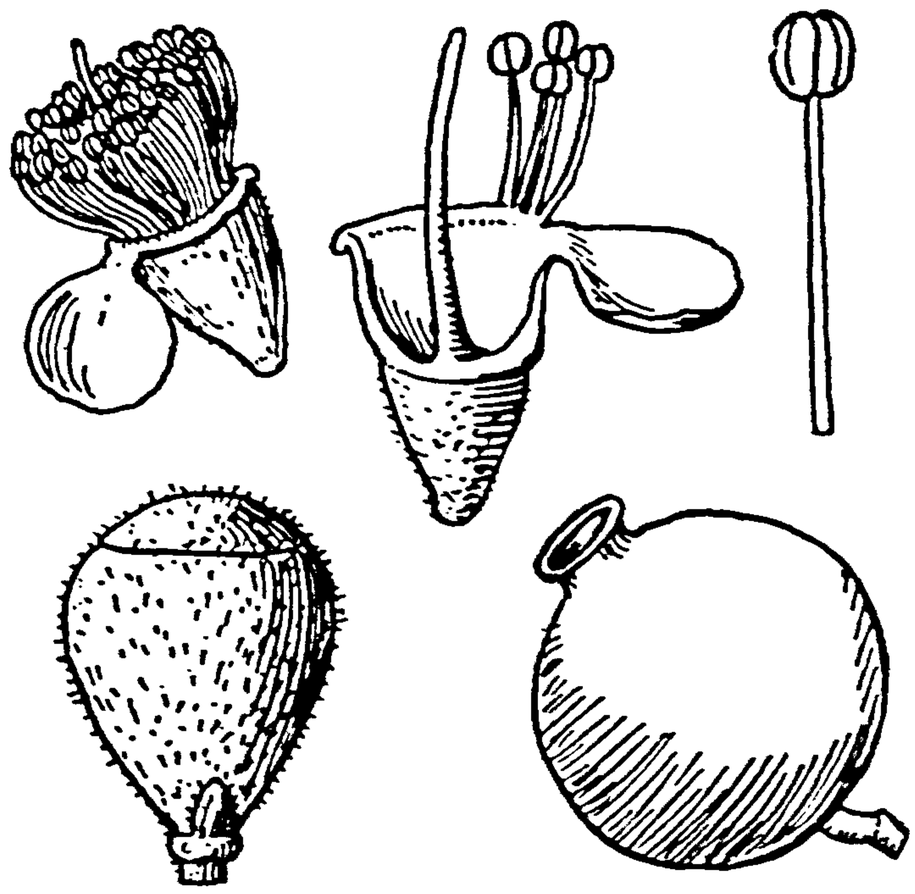
5. CALYPTRANTHES Sw. Shrubs or trees. Leaf-blades thick, faintly veined. Cymes panicle-like. Flowers several or numerous. Hypanthium produced beyond the ovary. Calyx cap-like, deciduous, white. Petals wanting. Stamens numerous, borne on the edge of the cup-like disk. Style slender. Berry conspicuously crowned. Seeds 1, 2, or 3. [*Chytraculia* P. Br.]—About 75 species, of tropical and subtropical America.

Calyx-lid not mammillate, hypanthium pubescent: leaf-blades manifestly petioled. 1. *C. pallens.*

Calyx-lid mammillate: hypanthium glabrous: leaf-blades sessile or nearly so. 2. *C. Zuzygium.*

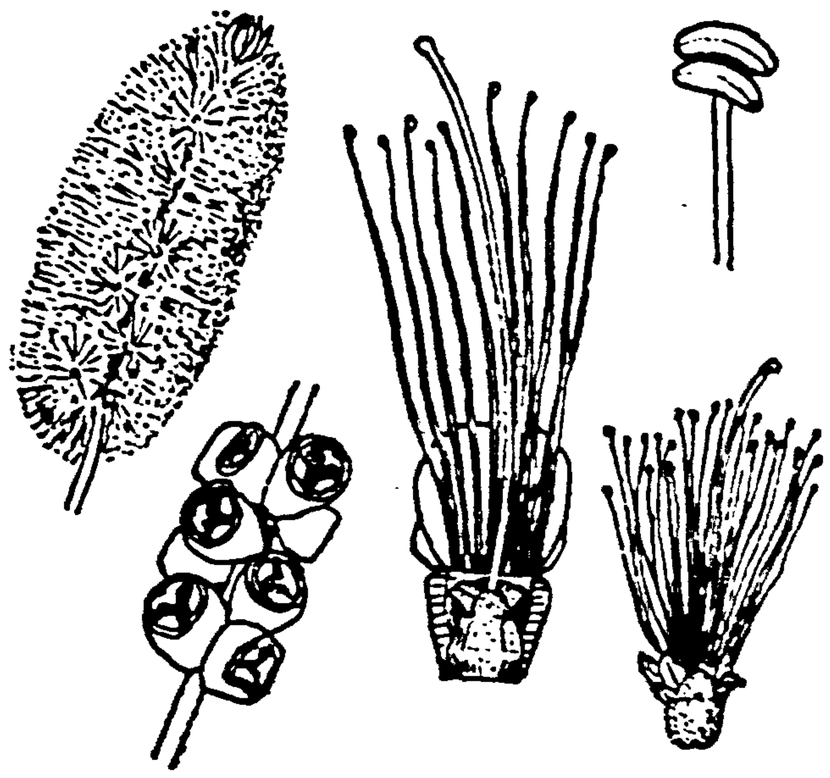
1. C. pallens (Poir.) Griseb. Shrub, or tree becoming 9 m. tall, the bark light-gray or nearly white, smooth or ultimately scaly, the branchlets 2-edged:

leaf-blades elliptic or oval, varying to broader above or below the middle, 3–5 cm. long, or rarely larger, mostly short acuminate, pubescent beneath, at least when young, manifestly petioled: inflorescence pubescent: hypanthium about 2 mm. wide during anthesis: calyx pubescent, less than 2 mm. in diameter: berry subglobose or oval, 5–7 mm. in diameter, pubescent: seed about 4 mm. long. [*Chytraculia chytraculia* (Fl. SE. U. S.)]—(SPICEWOOD.)—Hammocks, coast of S pen. Fla., Everglade Keys, and Florida Keys.—(*W. I.*)—The brown heartwood is close grained, heavy, and hard.



2. C. Zuzygium (L.) Sw. Shrub, or tree becoming 12 m. tall, the bark pale-gray, smooth, the branchlets terete: leaf-blades oval or elliptic, varying to ovate or obovate, 4–6 cm. long, obtuse or abruptly blunt-tipped, glabrous, sessile or nearly so: inflorescence glabrous: hypanthium about 4 mm. wide during anthesis: calyx glabrous, 3.5–4 mm. wide: berry subglobose or depressed, 8–10 mm. in diameter, glabrous: seed about 5 mm. long.—(MYRTLE-OF-THE RIVER.)—Hammocks, Everglade Keys, pen. Fla.—(*W. I.*)

6. MELALEUCA L. Shrubs or trees with much branched stems. Leaf-blades coriaceous, narrow, parallel-veined, persistent. Spikes dense, on woody branchlets, the rachis growing into a leafy shoot after anthesis. Sepals very broad, deciduous. Petals much longer than the sepals. Stamens numerous, borne in five bundles opposite the petals, the free parts of the filaments greatly elongate. Style elongate, nearly filiform. Capsule woody, with an annular orifice. Seeds numerous.—More than 100 species, Australian, many of them cultivated.



1. M. Leucadendra L. Tree with irregular, often drooping branches, the bark thick and spongy, whitish: leaf-blades elliptic, often narrowly so, 4–12 cm. long, acute, bright-green, with short petiole-like bases: spikes many-flowered, conspicuous: sepals ovate-deltoid or orbicular-ovate, about 2 mm. long, obtuse: petals white, obovate, 3–4 mm. long, firm: filaments 1–1.5 cm. long: capsule short-cylindric to nearly hemispheric, 3.5–4.5 mm. long.—(CAJUPUT-TREE. PUNK-TREE. BOTTLE-BRUSH.)—Low grounds, hammocks, and cypress swamps, S Fla. Nat. of Australia.—All year.—Another Australian tree, *Callistemon lanceolatus*, with leaves resembling those of the above species, but with bright-red stamens which are distinct, is cultivated in southern Florida and often spontaneous on old homesteads.

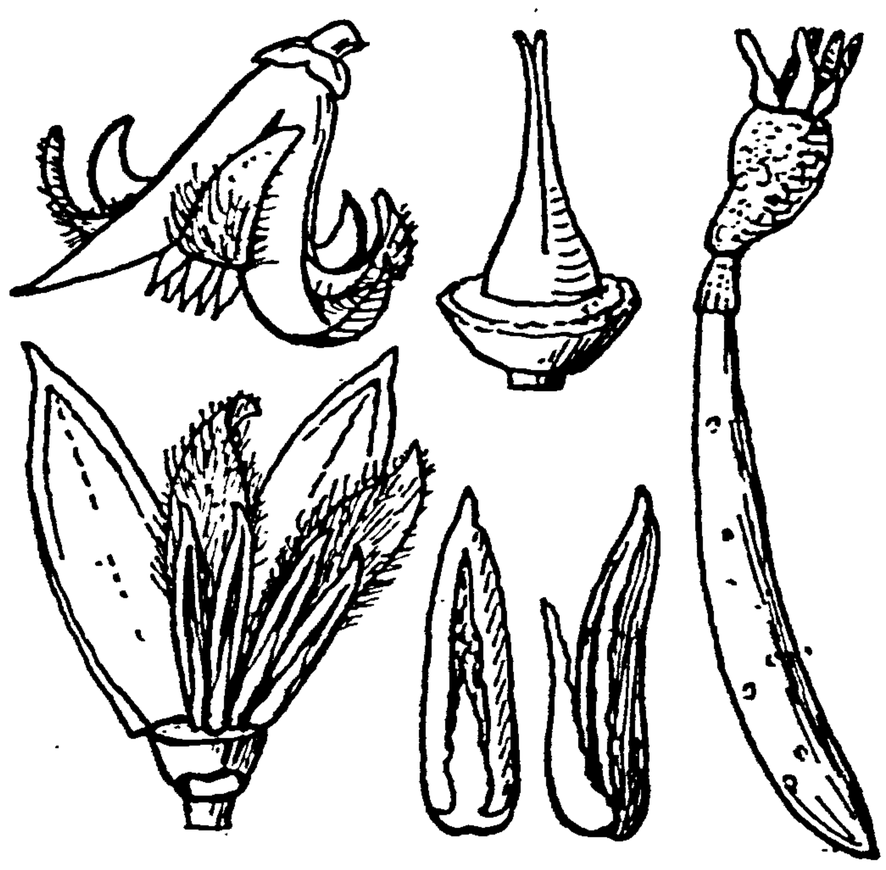
FAMILY 6. RHIZOPHORACEAE — MANGROVE FAMILY

Maritime shrubs or trees. Leaves usually opposite: blades entire or toothed. Flowers perfect, solitary or variously clustered. Calyx of 3 or 4 valvate sepals. Corolla of 3 or 4 petals. Androecium of twice, or

thrice as many stamens as sepals, or of 4 times as many. Gynoecium of 2–5 united carpels. Ovary inferior, at least partly so. Styles united. Fruit a leathery berry crowned with or surrounded by the calyx.—Fifteen genera and about 50 species, of tropical and subtropical regions.

1. **RHIZOPHORA** L. Evergreen trees with aerial roots arising from the trunk and branches, which branch and interlace about the base of the plant. Leaf-blades leathery, entire, persistent. Flowers 2–several in peduncled clusters, nodding. Sepals 4, leathery. Petals 4, leathery. Stamens 4–12. Ovary 2-celled, provided with a fleshy cone at maturity. Fruit pendulous, the seed germinating and sending out a long radicle before the fruits fall.—Three species, natives of tropical regions.

1. **R. Mangle** L. Shrub, or tree becoming 20 m. tall, with pale ultimately furrowed bark, forming impenetrable thickets on salt and brackish shores: leaf-blades elliptic to elliptic-obovate, 5–15 cm. long: sepals lanceolate, about 10 mm. long: petals pale-yellow, linear or nearly so: fruits 2–3 cm. long, the radicle becoming several dm. long.—(MANGROVE. RED-MANGROVE.)—Coasts of pen. Fla., and on the shores of creeks and rivers mostly to the limit of salt or brackish water, and on the Florida Keys.—(*W. I., Mex., C. A., S. A.*) —Grows most extensively in salt water; rarely in fresh water; but reaches its greatest size in brackish water. The bark is used in dyeing and tanning. The reddish-brown and streaked heart-wood, close-grained, heavy, and hard, is used for cabinet work. The clavate precocious embryo when it falls into the water floats in a perpendicular position. When stranded on the muddy bottom it strikes root.



FAMILY 7. EPILOBIACEAE — EVENING-PRIMROSE FAMILY

Herbs or rarely shrubs. Leaves alternate or opposite: blades simple. Flowers typically perfect. Hypanthium often elongate. Calyx of 2–6, usually 4, sepals. Corolla of 2–9, usually 4, petals, or rarely wanting. Androecium of as many stamens as the sepals or twice as many. Gynoecium of several, usually 4, united carpels. Ovary 1–6-celled, usually 4-celled, inferior. Fruit capsular or nut-like.—Forty genera and about 350 species, widely distributed, but most abundant in America.

Floral whorls of 4 parts, or more.
  Fruit a capsule, opening by valves or pores, or by the breaking down of the walls. Tribe I. OENOTHEREAE.
  Fruit dry and indehiscent, nut-like. Tribe II. GAUREAE.
Floral whorls of 2 parts. Tribe III. CIRCAEAE.

I. OENOTHEREAE

Hypanthium not prolonged beyond the ovary.
  Seeds naked, *i.e.*, without a tuft of hairs.
    Stamens 4, in 1 row.
      Leaves opposite: stems prostrate, creeping or floating: flowers sessile or on peduncles longer than the leaves.
        Flowers sessile: petals wanting or very small: leaf-blades petioled: capsules sessile, short, flat at the apex. 1. ISNARDIA.

Flowers long-peduncled: petals conspicuous: leaf-blades sessile: capsule long-peduncled, elongate, curved, with a prominent 4-lobed stylopodium at the apex. 2. LUDWIGIANTHA.
Leaves alternate: stems erect or ascending: flowers sessile, the hypanthium and ovary sometimes narrowed into a pedicel-like base. 3. LUDWIGIA.
Stamens 8–12 in 2 rows. 4. JUSSIAEA.
Seeds furnished with a tuft of silky hairs. 5. CHAMAENERION.
Hypanthium prolonged beyond the ovary.
Seeds with a tuft of silky hairs. 6. EPILOBIUM.
Seeds naked or merely tuberculate.
Flowers with all the stamens equal in length: capsule subcylindric or somewhat tetragonal and tapering to the apex.
Ovules and seeds horizontal, borne in 2 or rarely more rows, prismatic-angled. 7. OENOTHERA.
Ovules and seeds ascending, not angled. 8. RAIMANNIA.
Flowers with the alternate stamens longer: capsule obovoid to clavate, tetragonal, short.
Ovules and seeds numerous, not tuberculate, clustered on slender funiculi.
Corolla yellow: capsules depressed at the apex.
Style terminating in an obscurely lobed stigma: capsule 4-winged. 9. KNEIFFIA.
Style terminating in 4 narrow stigmas: capsule 4-angled. 10. PENIOPHYLLUM.
Corolla red, purple, or white: capsules pointed. 11. HARTMANNIA.
Ovules and seeds few, sessile in 1 or 2 rows. 12. LAVAUXIA.

II. GAUREAE

Herbs with entire, toothed, or pinnatifid leaf-blades: hypanthium dilated upward in anthesis: achene angled. 13. GAURA.

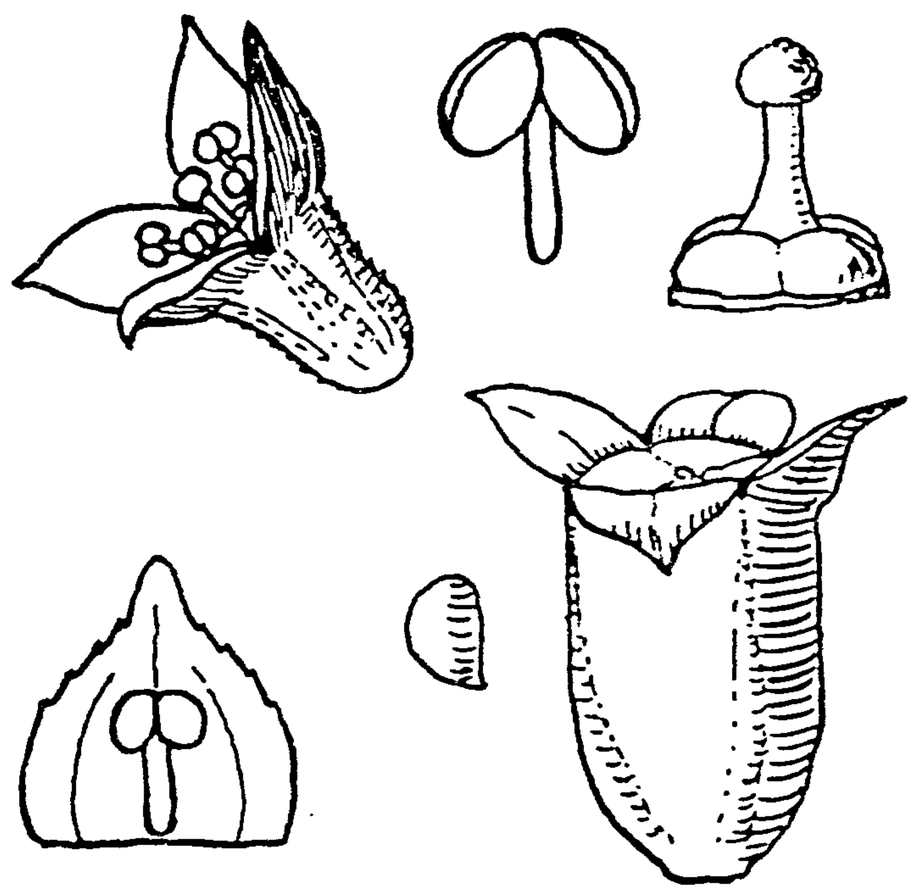
III. CIRCAEAE

Tender herbs with toothed leaf-blades: petals 2-lobed: fruits clavate to pyriform. 14. CIRCAEA.

1. ISNARDIA L. Perennial succulent herbs. Leaf-blades relatively wide. Flowers axillary. Sepals 4, broad. Petals minute, reddish or greenish, or wanting. Filaments very short. Ovary short. Style wanting or nearly so. Capsule obovoid or turbinate.—About 4 species, North American.—MARSH-PURSLANES. WATER-PURSLANES.

Capsule 2.5–6 mm. long; corolla usually wanting.
Plant glabrous: capsule not turgid and not constricted at the top.
Capsule 2.5–3 mm. long: sepals acute. 1. *I. palustris.*
Capsule 5–6 mm. long: sepals acuminate. 2. *I. intermedia.*
Plant pubescent: capsule turgid and constricted at the top. 3. *I. spathulata.*
Capsule 6–7 mm. long: corolla usually present. 4. *I. repens.*

1. I. palustris L. Leaf-blades spatulate to oval or ovate, 1.5–2.5 cm. long: hypanthium glabrous: buds acute: sepals triangular; green or reddish: petals wanting or minute and reddish: capsule 2.5–3 mm. long, short-turbinate.—Ditches, wet shores, and swamps, various provinces, Fla. to Calif., Ore., Man., and N. S.—(*Mex., C. A., S. A., O. W.*)—Spr.–fall.



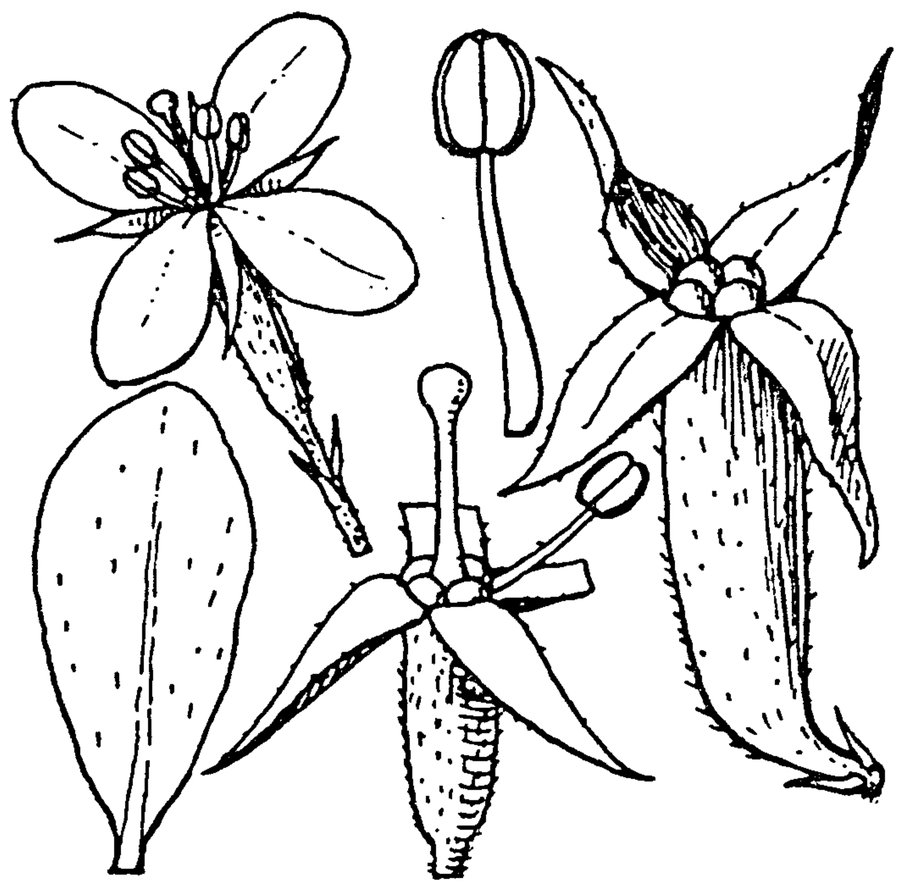
2. I. intermedia Small & Alexander. Plant similar to *I. palustris* in habit, but the flower-buds mostly acuminate: capsule 5–6 mm. long, long-turbinate or subcylindric.—Hammocks, wet shores, and stream-banks, pen. Fla.—All year.

3. I. spathulata (T. & G.) Small. Leaf-blades spatulate to oval, 2–2.5 cm. long: hypanthium pubescent: sepals broader than

long, or as broad as long, green: capsule globose-obovoid or obovoid, 2.5–3 mm. long.—Pineland ponds, M Fla.—Sum.

4. **I. repens** (Sw.) DC. Leaf-blades ovate, elliptic, or oval, 1–3 cm. long: hypanthium obpyramidal: sepals ovate-lanceolate: petals as long as the sepals or wanting: capsule obpyramidal. [*I. natans* (Ell.) Small]—Lime-sinks in hammocks, streams and marshes, Coastal Plain, and rarely adj. provinces, Fla. to Tenn. and N. C.—(*Mex.*)—Spr.–fall.

2. **LUDWIGIANTHA** Small. Perennial fleshy depressed herbs. Leaves numerous: blades narrow, entire. Flowers axillary. Sepals 4, narrow. Petals yellow, conspicuous. Filaments elongate. Ovary long. Style filiform. Capsule clavate.—One or 2 species, of the eastern United States.



1. **L. arcuata** (Walt.) Small. Stem creeping: leaf-blades oblanceolate, to almost linear, 7–25 mm. long, obtuse or acute: peduncles slender, elongate, longer than the leaves: sepals linear-lanceolate, 7–10 mm. long, acuminate: corolla 2–2.5 cm. wide; petals spreading, obovate, slightly clawed: stamens much shorter than the petals: capsule curved, 7–10 mm. long, as long as the persistent sepals or longer.—Swamps, marshes, springy places, and pond-margins, Coastal Plain, Fla. to Va.—Spr.–sum.—A related species, *L. brevipes* Long, from N. J. might occur on the southern Atlantic seaboard.

3. **LUDWIGIA** L. Annual or perennial erect or matted herbs. Leaf-blades entire or rarely shallowly toothed. Flowers axillary or terminal. Sepals generally persistent, green or reddish. Petals usually 4, yellow. Ovary usually 4-celled. Capsule cylindric or prismatic to subglobose.—About 25 species, most abundant in North America.

Corolla conspicuous; flowers peduncled: capsule opening by a terminal pore. I. ALTERNIFOLIAE.
Corolla inconspicuous, obsolete, or wanting: valves of the capsule separating from the disk-like top. II. MICROCARPEAE.

I. ALTERNIFOLIAE

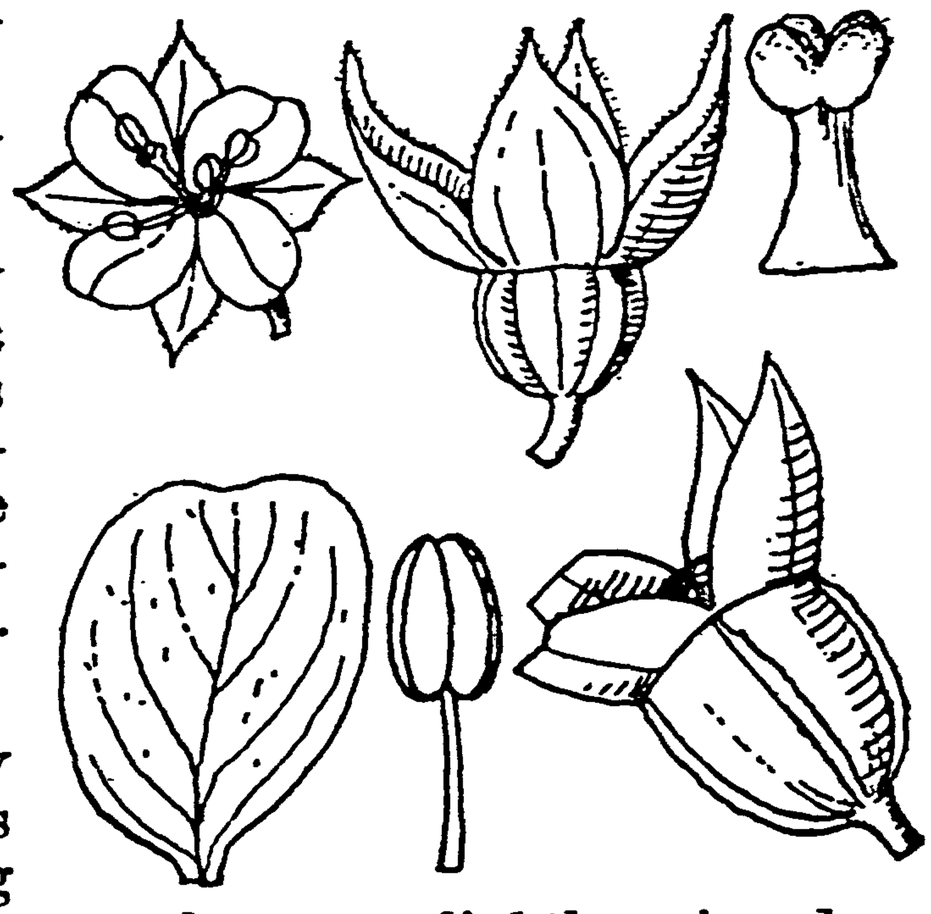
Foliage, sepals, and capsule glabrous, puberulent or minutely appressed-pubescent.
  Stem-leaves with short-petioled blades: petals about as long as the sepals: pedicel shorter than the capsule. 1. *L. alternifolia.*
  Stem-leaves with closely sessile blades: petals about twice as long as the sepals: pedicel longer than the capsule.
    Sepals thrice as long as the hypanthium in anthesis: style longer than the sepals. 2. *L. virgata.*
    Sepals twice as long as the hypanthium in anthesis: style shorter than the sepals. 3. *L. maritima.*
Foliage, sepals, and capsule hirsute. 4. *L. hirtella.*

II. MICROCARPEAE

Petals wanting or minute, shorter than the sepals.
  Capsule 1–3 mm. long; stem-leaves of a spatulate type.
    Leaf-blades entire. 5. *L. microcarpa.*
    Leaf-blades toothed near the apex.
      Leaf-blades broadly spatulate: sepals much shorter than the hypanthium. 6. *L. Simpsonii.*

Leaf-blades narrowly spatulate: sepals about as long as the hypanthium. — 7. *L. Curtissii.*
Capsule 3–8 mm. long.
Blades of the stem-leaves spatulate. — 8. *L. spathulifolia.*
Blades of the stem-leaves not spatulate.
Capsule about as thick as long, not cylindric.
Foliage and fruit glabrous or merely appressed-puberulent.
Flowers in a terminal head or congested panicle. — 9. *L. suffruticosa.*
Flowers in elongate interrupted spikes or axillary.
Capsule turbinate, cubic-turbinate, or obpyramidal.
Capsule slightly longer than broad, the angles rounded or merely square.
Capsule glabrous, the angles rounded: bractlets adnate to the hypanthium. — 10. *L. polycarpa.*
Capsule puberulent, the angles square: bractlets not adnate to the hypanthium. — 11. *L. simulata.*
Capsule slightly broader than long, the angles winged or margined.
Sepals nearly as broad as long, almost as long as the capsule: seeds oval. — 12. *L. alata.*
Sepals broader than long, ½ as long as the capsule: seeds cylindric. — 13. *L. lanceolata.*
Capsule globular. — 14. *L. sphaerocarpa.*
Foliage and fruit copiously pilose-tomentose. — 15. *L. pilosa.*
Capsule cylindric. — 16. *L. glandulosa.*
Petals as long as or longer than the sepals.
Capsule cylindric, terete or nearly so. — 17. *L. linifolia.*
Capsule narrowly obpyramidal. — 18. *L. linearis.*

1. L. alternifolia L. Plant 6–12 dm. tall: leaf-blades lanceolate, 6–12 cm. long: sepals ovate: petals about equalling the sepals: capsule slightly winged on the angles, 5–7 mm. long.—(SEEDBOX.)—Swamps and wet places, various provinces, Fla. to Tex., Kans., Ont., and N. H.—Spr.–fall.



2. L. virgata Michx. Plant fastigiately branched, glabrous or nearly so; leaf-blades linear to lanceolate: sepals 3–4 times as long as the hypanthium, permanently reflexed: style longer than the sepals: capsule very slightly winged on the angles.—Pinelands, Coastal Plain, Fla. to Miss. and N. C.—Spr.–fall.

3. L. maritima Harper. Plant fastigiately branched, glabrous or nearly so: leaf-blades linear to lanceolate: sepals twice as long as the hypanthium, permanently reflexed: capsule very slightly winged on angles, 2 mm. long.—Ditches and low pinelands, pen. Fla.—Spr.–fall.

4. L. hirtella Raf. Plant 3–6 dm. tall: leaf-blades elliptic-lanceolate or ovate-lanceolate, 2.5–3 cm. long: sepals ovate-lanceolate: petals longer than the sepals: capsule cubic above the rounded base, about 5 mm. long.—Moist sand, mainly in acid pinelands, Coastal Plain and adj. provinces, Fla. to Tex., Tenn., and N. J.—Spr.–fall.

5. L. microcarpa Michx. Plant low or depressed: leaf-blades spatulate or obovate-spatulate, 0.5–3 cm. long: sepals triangular: petals wanting: capsule broadly obpyramidal, 1.5–2 mm. long.—Hammocks, limesinks, and marshes, Coastal Plain, Fla. to Miss. and N. C.—Spr.–fall.

6. L. Simpsonii Chapm. Plant weak, often decumbent: leaf-blades 1–2.5 cm. long: sepals triangular: petals wanting: capsule broadly turbinate, about 2 mm. long.—Hammocks, ditches, and low pinelands, pen. Fla.—Spr.–fall.

7. L. Curtissii Chapm. Plant erect or ascending: leaf-blades 1–2 cm. long: sepals lanceolate or triangular-lanceolate: petals wanting: capsule turbinate, 2–3 mm. long.—Everglades, ponds, and ditches, pen. Fla.—Spr.–fall.

8. L. spathulifolia Small. Plant 1.5–8 dm. tall, the stem narrowly ridged: leaf-blades spatulate, 1–2.5 cm. long, those of the basal shoots somewhat broader than those of the stem: sepals deltoid: petals wanting: capsule broadly obpyramidal, about 4 mm. long, the angles blunt.—Wet ground, Everglades, Fla.—All year.

9. L. suffruticosa Walt. Plant 3–10 dm. tall: leaf-blades narrowly elliptic to narrowly lanceolate or linear, 2–10 cm. long: sepals broadly ovate or triangular-ovate: petals minute or wanting: capsule broadly obpyramidal, 4–5 mm. long. [*L. capitata* Michx.]—Wet pinelands, and shores of ponds, Coastal Plain, Fla. to N. C.—Spr.–fall.

10. L. polycarpa Short & Peter. Plant 3–9 dm. tall, the stem winged: leaf-blades narrowly lanceolate, 5–10 cm. long: sepals triangular-lanceolate: petals minute, greenish: capsule 4-sided, the angles rounded, 5 mm. long.—(FALSE-LOOSESTRIFE.)—Swamps, various provinces, Tenn. to Nebr., Minn., Ont., and Mass.—Spr.–fall.

11. L. simulata Small. Plant 4–9 dm. tall, the stem nearly terete: leaf-blades narrowly elliptic to almost linear, 1.5–5.5 cm. long: sepals triangular to ovate-triangular: petals minute: capsule obpyramidal, about 4 mm. long.—Swamps, Coastal Plain, Fla. to N. C.—Spr.–fall.

12. L. alata Ell. Plant 3–9 dm. tall, the stem winged: leaf-blades linear-oblanceolate, to linear-lanceolate, or nearly linear, 2.5–10 cm. long: petals wanting: capsule 3–4 mm. long, the angles winged.—Marshes, Coastal Plain and adj. provinces, Fla. to La., Mo., and N. C.—Spr.–fall.

13. L. lanceolata Ell. Plant 3–9 dm. tall, the stem angled or sometimes winged: leaf-blades linear-oblanceolate to linear-lanceolate or linear, 2–10 cm. long: sepals very broad, acute: petals wanting: capsule 4–5 mm. long, the angles margined.—Everglades, swamps, and marshes, Coastal Plain, Fla. to N. C.—Sum.–fall.

14. L. sphaerocarpa Ell. Plant 6–9 dm. tall, the stem leaf-blades lanceolate, 5–10 cm. long: sepals triangular: petals commonly wanting: capsule about 4 mm. long.—Swamps, often in acid soil, Coastal Plain and adj. provinces, Fla. to La. and Mass.; and Great Lake Lowland, Ind.—Sum.–fall.

15. L. pilosa Walt. Plant 6–12 dm. tall, the stem nearly terete: leaf-blades lanceolate, elliptic, or linear-elliptic, 1–6 cm. long: sepals triangular-ovate: petals minute or wanting: capsule cubic-globose, 4–6 mm. in diameter, hoary.—Swamps and ponds, Coastal Plain, Fla. to La. and N. C.—Sum.–fall.

16. L. glandulosa Walt. Plant 3–9 dm. tall, the stem nearly terete: leaf-blades elliptic-lanceolate, 5–10 cm. long: sepals triangular-ovate, acute: petals wanting: capsules cylindrical, 6–8 mm. long.—Swamps, and marshes, Coastal Plain and adj. provinces, Fla. to Tex., Kans., Ill., and S. C.—Sum. & fall.

17. L. linifolia Poir. Plant 1–5 dm. tall, the stem 4-angled: leaf-blades linear-oblanceolate to linear, 2–6 cm. long: sepals lanceolate or ovate-lanceolate,

acuminate: petals about as long as the sepals: capsule about 10 mm. long.—Pineland swamps, Coastal Plain, Fla. to Miss. and N. C.—Spr.–fall.

18. L. linearis Walt. Plant 3–7.5 dm. tall: leaf-blades narrowly linear, 2.5–5 cm. long: sepals triangular-ovate: petals slightly longer than the sepals: capsule 6–8 mm. long.—Swamps, often in acid soil, Coastal Plain, Fla. to La. (Tex.?), Tenn., and N. J.—Sum.–fall.

4. **JUSSIAEA** L. Perennial herbs or partially woody plants, erect or diffuse and creeping. Leaf-blades usually entire. Flowers axillary. Sepals 4–6, persistent. Petals 4–6, white or yellow, or rarely none. Stamens 8–12. Ovary 4–6-celled. Capsule linear, ellipsoid, or clavate.—About 50 species, mostly of the American tropics.—Spr.–fall or all year S.

Plant diffuse, the stems and branches creeping (rooting) or floating. I. DIFFUSAE.
Plant erect, the stem more or less branched. II. ERECTAE.

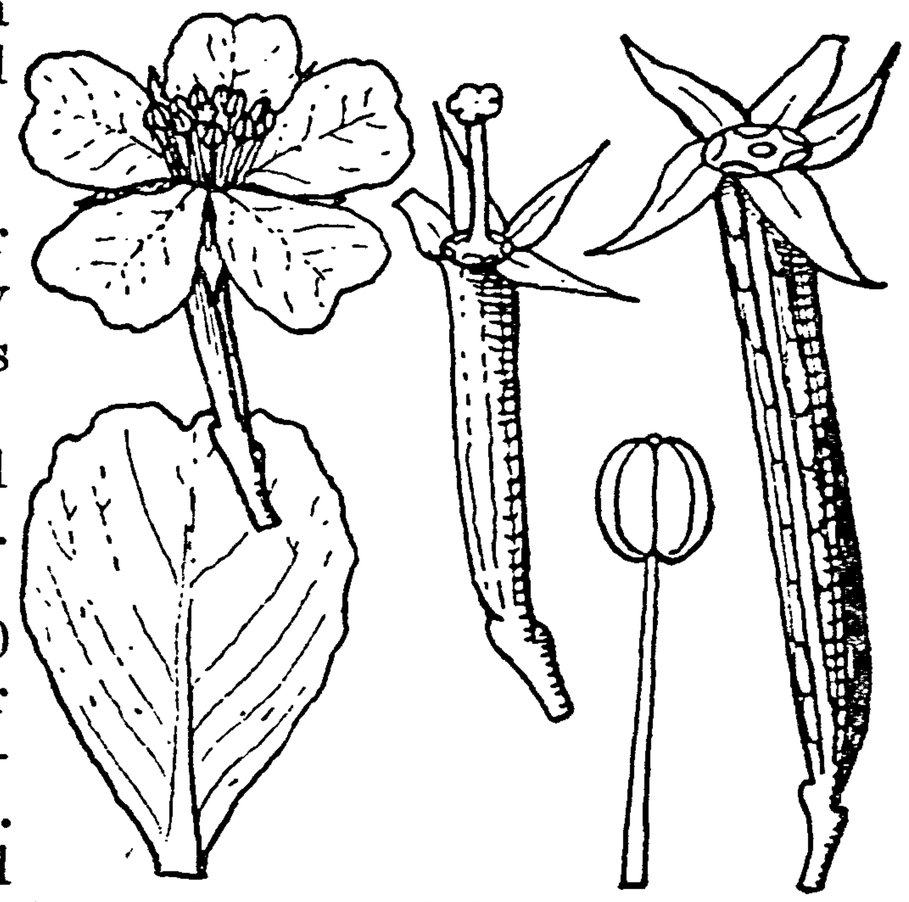
I. DIFFUSAE

Corolla 2–3 cm. broad: leaf-blades long-petioled. 1. *J. diffusa.*
Corolla 4–5 cm. broad: leaf-blades short-petioled. 2. *J. grandiflora.*

II. ERECTAE

Capsule long-clavate, the body narrowly cylindric, more than 3 cm. long.
  Calyx of 5 sepals. 3. *J. leptocarpa.*
  Calyx of 4 sepals.
    Leaf-blades narrow: 4. *J. angustifolia.*
    Leaf-blades broad: 5. *J. scabra.*
Capsule short-clavate, the body obconic or cylindric-obovoid, mostly less than 2 cm. long.
  Leaf-blades sessile, decurrent as wings on the angles of the stem: fruit winged. 6. *J. decurrens.*
  Leaf-blades short-petioled: fruit not winged.
    Corolla about 1 cm. broad. 7. *J. erecta.*
    Corolla 4–6 cm. broad.
      Blades of the upper leaves long and narrow. 8. *J. neglecta.*
      Blades of the upper leaves broad and short. 9. *J. peruviana.*

1. J. diffusa Forskl. Stem glabrous: blades of the upper leaves elliptic to lanceolate, 2.5–10 cm. long: sepals 5–8 mm. long: petals 1–1.5 cm. long: capsule-body 2.5–4 cm. long.—Ponds, Coastal Plain and adj. provinces, Fla. to Tex., Kans., and Ky.—(*W. I.*)



2. J. grandiflora Michx. Stem villous or hirsute: blades of the upper leaves narrowly elliptic or lanceolate, 3–12 cm. long: sepals about 12 mm. long: petals fully 2 cm. long: capsule body 1–2 cm. long.—Ponds and streams, Coastal Plain, Fla. to La. and N. C.

3. J. leptocarpa Nutt. Stem hirsute, 6–20 dm. tall: leaf-blades narrowly elliptic or lanceolate, 3–20 cm. long: hypanthium hirsute: sepals lanceolate: corolla about 15 mm. broad: capsule 3.5–6 cm. long.—Ditches and low grounds, Coastal Plain, Fla. to Tex., Ark., and Ga.—Glabrous forms with very narrow leaf-blades and four-merous flowers occur in S Fla.

4. J. angustifolia Lam. Stem mostly 1–2 m. tall, glabrous or sparingly pubescent: leaf-blades elliptic to almost linear, varying to broadest above the middle or below it, 2–11 cm. long, usually glabrous or nearly so: hypanthium

longer than the calyx in bud, minutely pubescent in anthesis: sepals ovate, mostly less than 1 cm. long: corolla less than 4 cm. wide: capsule 4–6 cm. long, much longer than the pedicel-like base.—Swamps, stream-banks, and low grounds, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall or all year S.

5. J. scabra Willd. Stem hirsute, 6–14 dm. tall: leaf-blades ovate to obovate, 2–6 cm. long: hypanthium hirsute: sepals ovate: corolla 2–2.5 cm. broad: capsule 3–5 cm. long.—Moist soil, Fla.—(*W. I.*)

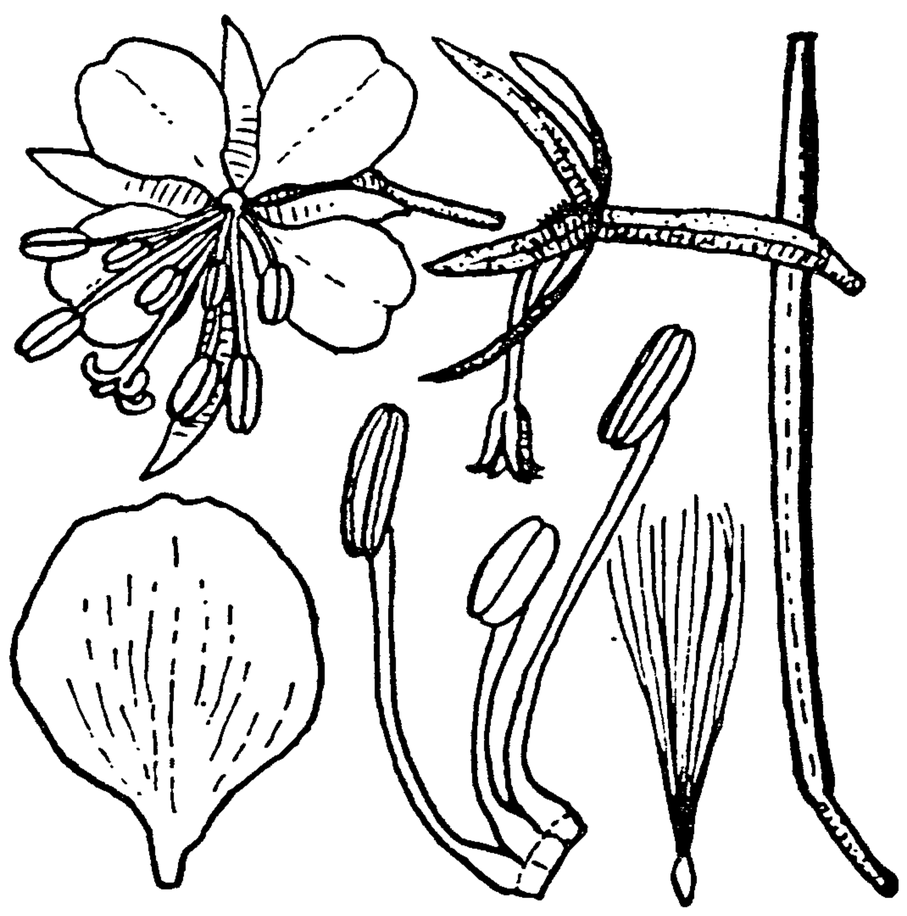
6. J. decurrens (Walt.) DC. Stem 3–6 dm. tall, glabrous: leaf-blades lanceolate, 2.5–10 cm. long: sepals ovate-lanceolate: corolla 8–12 mm. broad: capsule-body 2–2.5 cm. long.—Ditches and low grounds, Coastal Plain and adj. provinces, Fla. to Tex., Ark., Ill., and Md.

7. J. erecta L. Stem 9–20 dm. tall, glabrous: leaf-blades lanceolate to linear-lanceolate, 5–12 cm. long: hypanthium short-pubescent or glabrate: sepals lanceolate, about 5 mm. long: petals about 5 mm. long; capsule-body cylindric, much longer than the base, 1.5 cm. long.—Hammocks, near Manatee, Fla.—(*W. I., C. A.*)

8. J. neglecta Small. Stem mostly less than 1 m. tall, or taller in age, copiously pubescent: leaf-blades elliptic, varying to elliptic-oblanceolate or elliptic-lanceolate, especially on the lower part of the stem, to elliptic-linear or narrowly linear above, mostly 4–15 cm. long, pubescent on both sides: hypanthium shorter than the calyx in bud, copiously pubescent with short and long hairs, in anthesis: sepals broadly ovate, mostly over 1.5 cm. long: corolla over 5 cm. wide: capsule 1–2 cm. long.—Waste-places and river-banks, about seaports, Coastal Plain, Fla. to La. and N. C.—Referred to *J. suffruticosa* in Fl. SE U. S., in error.

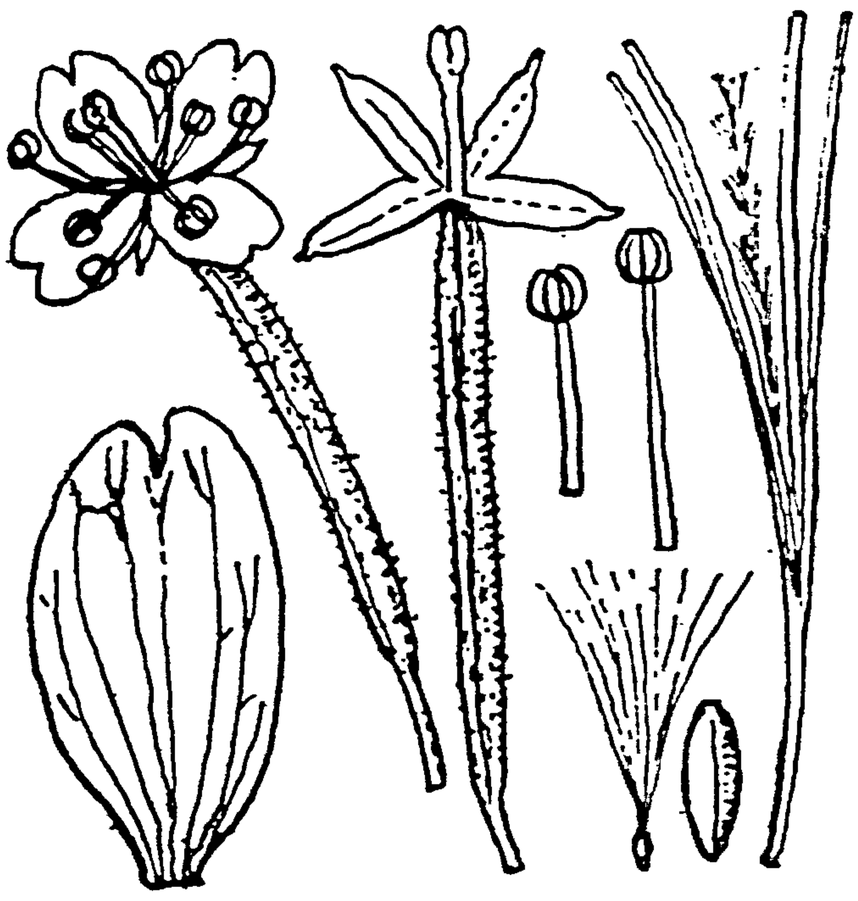
9. J. peruviana L. Stem 1–4 m. tall, hirsute: leaf-blades ovate, oval, lanceolate, or oblong-lanceolate, 4–10 cm. long, or more: hypanthium hirsute: sepals lanceolate to ovate-lanceolate, 10–15 mm. long: petals 2–3 cm. long: capsule-body ellipsoid-obovoid, slightly longer than the base.—Everglades, swamps, and banks of streams, pen. Fla.; and adv. elsewhere along the Gulf Coast.—(*W. I., Mex., C. A., S. A.*)

5. CHAMAENERION Adans. Perennial herbs. Leaf-blades entire or nearly so. Flowers irregular, in showy racemes. Sepals 4, deciduous. Petals 4, entire. Stamens 8, declined. Stigmas 4. Capsule elongate, obtusely angled. Seeds comose.—Four species, of the north temperate zone.



1. C. angustifolium (L.) Scop. Plant 5–25 dm. tall, often clustered: leaf-blades lanceolate, 5–15 cm. long: corolla purple or sometimes white; petals 1–1.5 cm. long: capsule 5–7.5 cm. long: coma of seeds about 10 mm. long. — (FIRE-WEED. SALLY-BLOOM. WILLOW-HERB. WILLOW-WEED.) — Open woods, thickets, and especially clearings and recently burned areas, various provinces, Coastal Plain only N N. C. to N. M., Calif., Alas., Ont., and Lab.—Sum.–fall.—Its abundance in burned over areas has given it the name of fireweed.

6. **EPILOBIUM** L. Perennial herbs or somewhat woody plants. Leaf-blades entire or toothed. Flowers solitary, spicate, or racemose. Sepals 4, short, deciduous. Petals 4, pink or white, often notched. Stamens 8. Stigmas 4, or united and clavate. Capsule elongate, 4-sided. Seeds comose.—About 75 species, chiefly northern.—Sum.–fall.—WILLOW-HERBS. COTTON-WEEDS.

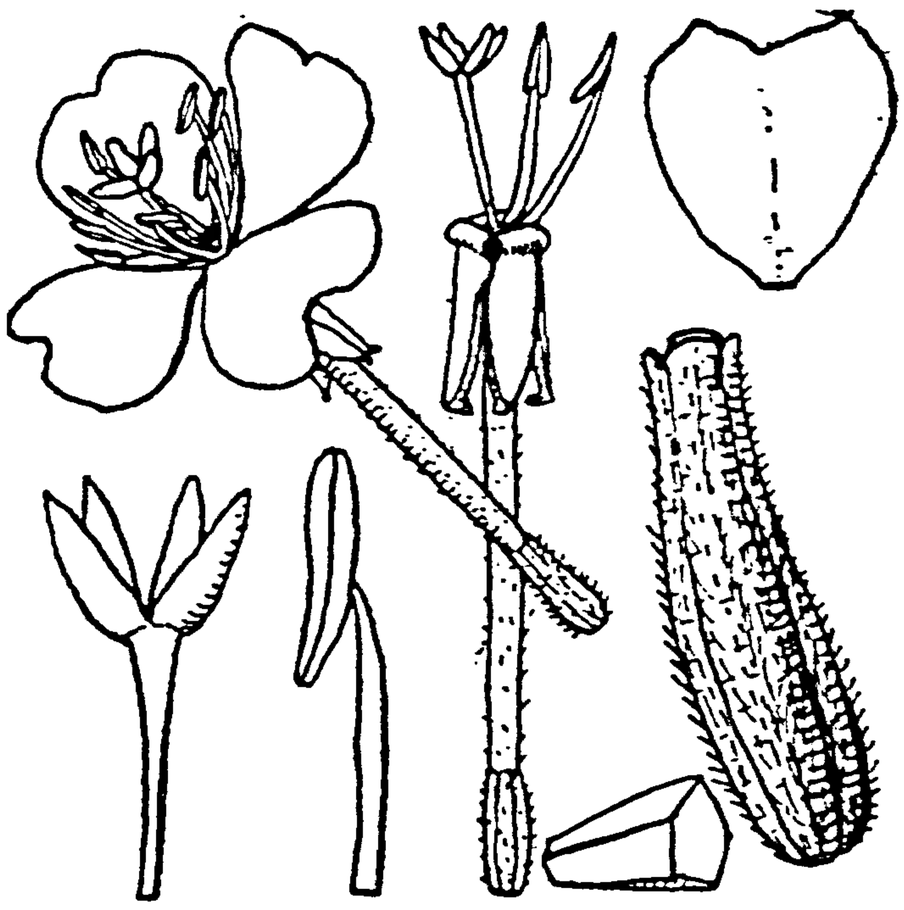


1. **E. coloratum** Muhl. Plant 3–9 dm. tall: leaf-blades lanceolate, 5–15 cm. long: flowers generally nodding: sepals 2.5–3.5 mm. long: petals 3–4 mm. long, shallowly notched: capsule 4.5–6 cm. long.—(BRONZE WILLOW-HERB.)—Meadows and low grounds, various provinces, Ala. to Kans., S. D., Ont., Me. and S. C.

7. **OENOTHERA** L. Annual or biennial large herbs. Leaf-blades undulate or toothed. Buds erect. Flowers nocturnal, spicate. Sepals elongate. Corolla yellow. Capsules 4-sided, tapering. [*Onagra* Adans.]—About 15 species, mostly North American.—Sum.—EVENING-PRIMROSES.—Species additional to the ones given below have been described from the northern States and some may occur within our range. Some species are used in ornamental gardening.

Sepals less than 3 cm. long, the free tips subulate, less than 4 mm. long: corolla 2–5 cm. wide. 1. *O. biennis.*
Sepals over 3 cm. long, the free tips filiform, over 5 mm. long: corolla 8–12 cm. wide. 2. *O. grandiflora.*

1. **O. biennis** L. Stem 13–25 dm. tall, hirsute: leaf-blades elliptic to lanceolate, 2.5–15 cm. long, repand-denticulate: petals bright-yellow, 1–2.5 cm. long: capsule narrowly oblong-conic, 18–25 mm. long, nearly terete.—(WEEDY EVENING-PRIMROSE.)—Fields, roadsides, and thickets, various provinces, Fla. to Tex., Minn., and Lab.—Sum.–fall.



2. **O. grandiflora** Ait. Similar to *O. biennis*, but larger throughout sometimes 3 m. tall: petals 4–6 cm. long, golden-yellow: capsule linear-conic, 3–4 cm. long, 4-sided.—Woods and river-banks, and roadsides, Coastal Plain, Ala.—Sum.–fall.—This species seems to be known in the wild state only in the type region in Alabama where Bartram discovered it late in the eighteenth century. Large flowered forms of *Oe. biennis* are sometimes recorded as *Oe. grandiflora.*

8. **RAIMANNIA** Rose. Annual, biennial, or perennial herbs. Leaf-blades sinuate or pinnatifid. Flowers axillary, sometimes aggregated in a spike, nocturnal. Petals yellow. Ovary slender. Capsule narrowly cylindric, or rarely slightly tapering. Seeds tubercled. [*Oenothera* L. in part.]—About 20 species, American.—Several species are used in horticulture.

Flowers axillary: stem and branches decumbent or prostrate. I. HUMIFUSAE.
Flowers in a terminal bracted spike. II. HETEROPHYLLAE.

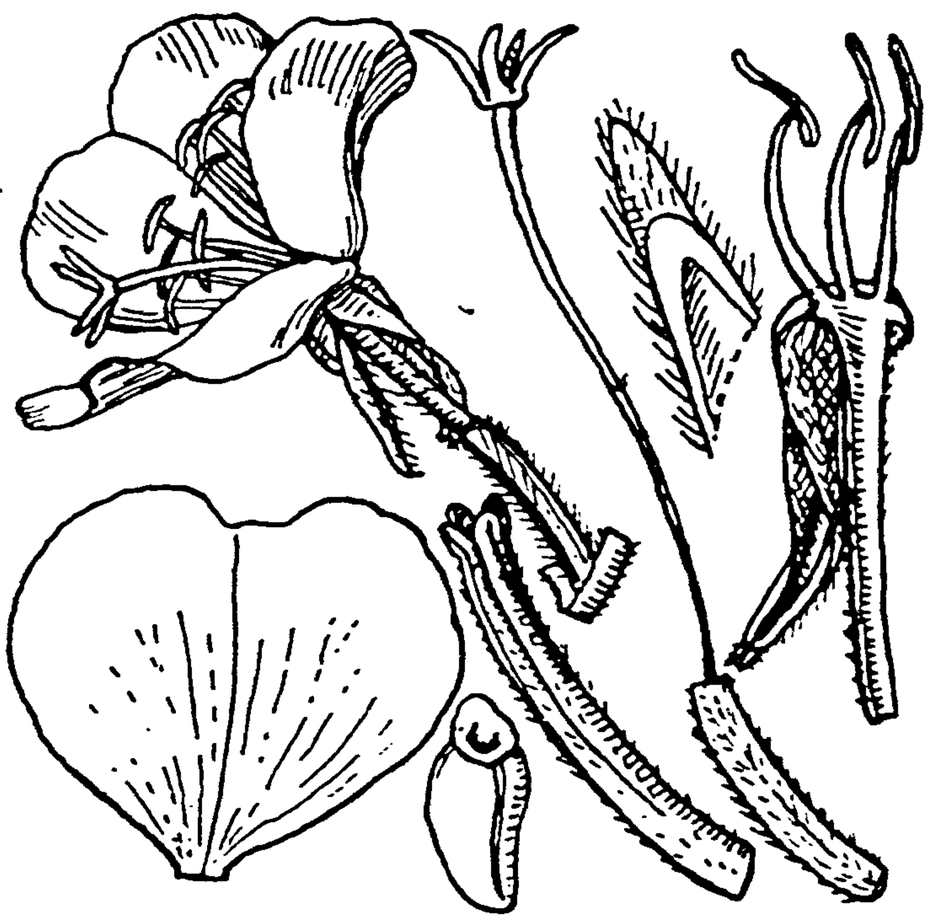
I. HUMIFUSAE

Corolla less than 5 cm. wide.
Leaf-blades entire or sinuate: capsule densely pubescent.
Stem and capsule with appressed silky pubescence: plant appearing grayish. 1. *R. humifusa.*
Stem and capsule with loose, spreading pubescence: plant appearing green. 2. *R. mollissima.*
Leaf-blades mostly pinnatifid: capsule not densely pubescent. 3. *R. laciniata.*
Corolla over 6 cm. wide. 4. *R. Drummondii.*

II. HETEROPHYLLAE

Plant relatively slender: blades of the lower leaves slender-petioled, pinnatifid, those of the upper ones sessile or nearly so, entire or obscurely toothed: capsules in a virgate spike. 5. *R. Curtissii.*

1. R. humifusa (Nutt.) Rose. Stem branched below, the branches spreading or decumbent, 2–5 dm. long, silky-canescent: leaves various, the basal with oblong-spatulate pinnatifid blades, the cauline with oblanceolate to lanceolate acute, undulate repand or toothed blades, 2–3.5 cm. long: flowers axillary: hypanthium 2–3 cm. long: sepals about ½ as long as the hypanthium: corolla 2–3 cm. broad: capsule narrowly cylindric, 2–3 cm. long, somewhat curved upward: seed 1.5–2 mm. long, striate. — (SEASIDE EVENING-PRIMROSE.)—Sea-beaches and sand-dunes, Coastal Plain, Fla. to Miss. and N. J.—(*W. I.*)—All year S.



2. R. mollissima (L.) Sprague and Riley. Stem branched, the branches ascending or decumbent, softly hirsute: leaf-blades elliptic or ovate-elliptic to lanceolate or linear-lanceolate, mostly 2–5 cm. long, acute or acuminate, entire or shallowly toothed: flowers axillary: hypanthium 2.5–3 cm. long: corolla yellow, mostly 3–4 cm. broad: capsule cylindric, 2–2.5 cm. long, copiously pubescent: seed fully 2 mm. long, nearly smooth.—Fields, roadsides and waste-places, Coastal Plain, Fla. to Tex. and Ga. Nat. of S. A.—Spr.–fall.

3. R. laciniata (Hill.) Rose. Stem decumbent or ascending, often branched, 1–5 dm. tall, glabrous or sparingly hirsute: leaf-blades oval, lanceolate, elliptic, or oblanceolate to spatulate at the base of the plant, 2.5–5 cm. long, acute or obtusish at the apex, sinuate-dentate or often pinnatifid: flowers axillary: hypanthium 3–4 cm. long: sepals reflexed: corolla 12–36 mm. broad: capsule linear-cylindric, 2.5–3.5 cm. long, more or less pubescent: seed 1.2–1.5 mm. long, strongly pitted. [*Oenothera sinuata* L.]—Sandy woods, plains, fields, and roadsides, various provinces, Fla. to Tex., S. D., and Vt.—(*W. I., Mex.*)—Spr.–sum.

4. R. Drummondii (Hook.) Rose. Stem branched, the branches decumbent, 2–7 cm. long, pubescent with appressed stiff-silky hairs: leaves various; blades spatulate to lanceolate, or sometimes ovate or obovate towards the ends of the branches, 1–4 cm. long, entire or distantly toothed: flowers axillary: hypanthium stout, 2–4 cm. long: sepals nearly linear, more than ¾ as long as the hypanthium: corolla 7–9 cm. broad: capsule cylindric, 2.5–4 cm. long, spreading, curved upward: seed nearly 1.5 mm. long, pitted.—Sand-dunes, pinelands, and roadsides, Coastal Plain, Fla. to Tex. and N. C. Native only in Tex.—All year S.

5. R. Curtissii Rose. Stem slender, 1 m. tall or less, sparingly appressed-pubescent: leaf-blades lanceolate to almost linear and entire or obscurely

toothed, or oblanceolate at the base of the stem and coarsely toothed or pinnatifid, all narrowed at the base: sepals mostly 9–11 mm. long, with very short free tips, glabrous or with few long hairs: corolla about 3 cm. wide: petals obovate, about 1.5 cm. long: capsule stout-subulate, 12–16 mm. long, decidedly tapering to the apex, curved, appressed-pubescent: seed about 1.5 mm. long.—Dry sand, pinelands, edges of hammocks, and river-banks, Coastal Plain, Fla. and adj. Ga.—Sum.–fall.—Formerly included in *Oenothera heterophylla*, a western species which does not occur in our range.

9. **KNEIFFIA** Spach. Perennial small herbs. Leaf-blades spatulate to linear or ovate, entire or shallowly toothed. Buds mostly erect. Flowers spicate, diurnal. Petals yellow. Ovary clavate or stout. Capsule erect, clavate or with an ellipsoid body, 4-winged, opening in wet weather. Seed not tubercled. [*Oenothera* L. in part.]—About 12 species, mostly of temperate North America.—Sum.—SUNDROPS.

Inflorescence and buds erect: flowers relatively large, the petals of the earlier ones 15–25 mm. long. I. FRUTICOSAE.
Inflorescence, at the tip, and buds nodding: flowers relatively small, the petals of the earlier ones 5–10 mm. long. II. PUMILAE.

I. FRUTICOSAE

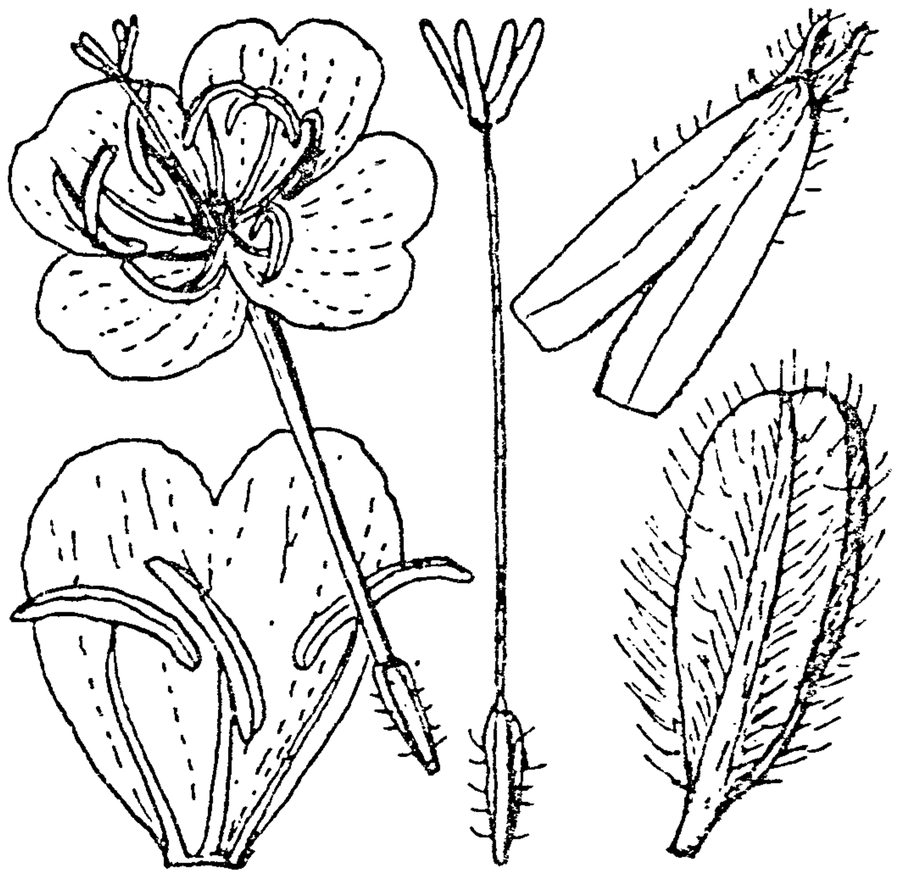
Capsule linear-clavate, not stipitate. 1. *K. pratensis.*
Capsule with a clavate or ellipsoid stipitate body.
  Capsule-body decidedly clavate at maturity, pubescent with incurved glandless hairs, or with interspersed gland-tipped hairs in *K. semiglandulosa.*
    Capsule-body about as wide as long, usually much shorter than the stipe: blades of the basal leaves narrow.
      Capsule with minute appressed hairs: leaves strigillose or glabrous, the basal narrowly oblanceolate: blades of the cauline leaves linear. 2. *K. subglobosa.*
      Capsule hirsute-strigose: leaves densely silvery-silky: blades linear-lanceolate. 3. *K. arenicola.*
    Capsule-body decidedly longer than wide, longer than the stipe or about equalling it: blades of the basal leaves broad.
      Capsule-body and stipe both pubescent with glandless hairs: stipe frequently about equalling the capsule-body.
        Stipe of capsule equalling or somewhat exceeding the permanently pubescent body. 4. *K. fruticosa.*
        Stipe of capsule shorter than the body, which tends to become glabrate.
          Capsule-body pubescent with minute hairs: leaves of the main stem 7–9 cm. long, glabrate. 5. *K. riparia.*
          Capsule-body pubescent with coarse hairs: leaves of the main stem 3–6 cm. long, densely pubescent. 6. *K. brevistipata.*
      Capsule-body pubescent with glandless hairs: stipe with glandular hairs: stipe shorter than the capsule-body. 7. *K. semiglandulosa.*
  Capsule-body ellipsoid or nearly so, pubescent with short straight gland-tipped hairs, sometimes glabrate.
    Leaves of the main stem with linear-lanceolate, lanceolate, or lanceolate-ovate blades, not glaucous: stem pubescent or rarely glabrous: petals of the earlier flowers 1–2.5 cm. long.
      Stem pubescent with long lax or spreading hairs. 8. *K. hybrida.*
      Stem pubescent with short crisped hairs.
        Capsule-body gradually narrowed into the stipe: corolla 2–4 cm. wide. 9. *K. tetragona.*
        Capsule-body abruptly narrowed into the stipe: corolla 4–5 cm. wide. 10. *K. latifolia.*
    Leaves of the main stem with ovate to lanceolate-ovate blades, glaucous beneath: stem glabrous or

rarely pubescent: petals of the earlier flowers 2.5–3 cm. long. 11. *K. glauca.*

II. PUMILAE

Plants with assurgent often gregarious flower-stems and thickish leaf-blades. 12. *K. perennis.*

1. K. pratensis Small. Stem 5–11 dm. tall: leaf-blades narrowly elliptic to elliptic-lanceolate, 3–11 cm. long, undulate or sinuate, acute, thin, hirsute, flat: hypanthium more or less hirsute: sepals 17–22 mm. long, the free tips 2.5–4 mm. long: petals 2–3.5 cm. long: capsule-body clavate, 17–21 mm. long, hirsute.—(MEADOW-SUNDROPS.)—Low grounds, woods and prairies, various provinces, N of Coastal Plain, Tenn. to Ark., Ia., Wis., and Ohio. Introd. in more E States.—Sum.–fall.



2. K. subglobosa Small. Stem 2–3 dm. tall, puberulent, widely stoloniferous: basal leaves 4–10 cm. long, with spatulate undulately toothed blades: stem-leaves often numerous: blades linear or nearly so, 2–7 cm. long, entire or distantly toothed: hypanthium villous or silky: sepals 6–9.5 mm. long: petals 1.5 to almost 2 cm. long: capsule-body globose-obovoid, 6–7 mm. long.—Sandy soil and rocky places, Piedmont, Ga. and Ala.—Sum.–fall.

3. K. arenicola Small. Stem 1.5–4.5 dm. tall, strigillose: leaf-blades linear or nearly so, or some of them narrowly elliptic, 1.5–5 cm. long, entire or essentially so: hypanthium somewhat hirsute: sepals 5.5–8 mm. long: petals 16–23 mm. long: capsule-body globular or obovoid-globose, about 4 mm. long.—Sandhills or dry pinelands, Coastal Plain, Ga. to Miss., Ark., and N. C.—Sum.–fall.

4. K. fruticosa (L.) Raimann. Stem 1–6.5 dm. tall, pubescent with short, usually incurved hairs: basal leaves with oval, elliptic or spatulate blades commonly 2–8 cm. long: stem-leaves not crowded; blades spatulate to linear or linear-lanceolate, undulate or shallowly toothed: sepals 1–1.8 cm. long, finely pubescent: petals 1.5–2.5 cm. long: capsule-body narrowly obovoid to ellipsoid-clavate, 6–14 mm. long. [*O. fruticosa* L. *K. linearis* Spach *K. longipedicellata* Small]—(SUNDROPS.)—Open sandy places or barrens, various provinces, Fla. to Tex., Mo., and N. Y.—Spr.–sum.

5. K. riparia (Nutt.) Small. Stem 5–12 dm. tall: basal leaves with spatulate blades commonly over 10 cm. long: stem-leaves often numerous; blades linear to linear-lanceolate, 5–13 cm. long, or shorter on the branches, entire or undulate denticulate: sepals about 2 cm. long, finely pubescent: petals over 2 cm. long: capsule-body clavate, pubescent all over, with minute hairs, mostly over 2 cm. long.—River banks and swamps, Coastal Plain, Ga. to N. C.—Spr.–sum.

6. K. brevistipata Pennell. Stem 2–4 dm. tall, pubescent, leaves 3–6 cm. long: blades linear, lanceolate, acutish, densely strigose: sepals 7–9 mm. long: petals 12–15 mm. long: capsule-body clavate-ellipsoid, 5–6 mm. long, winged, pubescent with coarse hairs, but becoming glabrate.—Dry pine ridges, Coastal Plain, N Fla. to La.—Sum.

7. K. semiglandulosa Pennell. Stem 3–6 dm. tall, finely pubescent, becoming glandular above, purple-red: leaves 5–9 cm. long; blades lanceolate-linear, acutish, finely pubescent or glabrate: sepals 10–13 mm. long, acuminate: petals 15–25 cm. long: capsule-body clavate, 8–10 mm. long, the wings exceed-

ing the ridges, finely pubescent with gland-tipped and glandless hairs, often nearly glabrous, the stipe-like base shorter than the body.—Pinelands, Coastal Plain, W Fla. to Miss.; introd. in E N. C.—Spr.–sum.

8. K. hybrida (Michx.) Small. Stem 3–10 dm. tall, hirsute, sometimes thinly so: leaf-blades oblanceolate to elliptic or lanceolate, 2.5–11 cm. long, entire, undulate, or denticulate: sepals 10–15 mm. long, the free tip usually about 2 mm. long: petals 14–21 mm. long: capsule-body obovoid-ellipsoid, 4.5–10 mm. long, sharply angled below, winged at the apex, very short-stipitate.—Woods, meadows, and roadsides, various provinces, N. C. to Tenn. and N. S.—Sum.

9. K. tetragona (Roth.) Pennell. Stem 3–9 dm. tall, purple throughout or green above: leaf-blades narrowly elliptic to lanceolate or linear, 2.5–10 cm. long, entire or denticulate: sepals 9–14 mm. long, the free tips about 1 mm. long: petals 10–18 mm. long: capsule-body ellipsoid, 6–12 mm. long, sharply angled and usually winged above, short-stipitate.—Dry soil, barren places, rocky river-banks, and swampy grounds, various provinces, Ga. to Ala., Mo., Mich., and N. Y.—Sum.–fall.

10. K. latifolia Rydb. Stem 3–6 dm. tall, pubescent, purplish or brownish below: leaf-blades elliptic, often narrowly so, to elliptic-lanceolate or ovate-lanceolate, 3–9 cm. long, entire or undulate-denticulate: sepals 12–18 mm. long, the free tips about 1 mm. long: petals 18–22 mm. long: capsule-body ellipsoid 7–9 mm. long, prominently sharply angled below, winged above, usually very short-stipitate.—Woods, Blue Ridge, N. C. and Tenn.—Sum.

11. K. glauca (Michx.) Spach. Stem glaucous, 4–9 dm. high: leaf-blades oval, ovate, or lanceolate-ovate, 5–14 cm. long: sepals 20–25 mm. long: petals 2.5–3 cm. long: capsule-body ellipsoid, 11–13 mm. long, broadly 4-winged. [*K. fruticosa* (Fl. SE. U. S.)]—(BLUE-LEAF SUNDROPS.)—Dry woods, usually on mt. slopes, Blue Ridge to Appalachian Plateau, Ga. to Ky. and Va.—Spr.–fall.

12. K. perennis (L.) Pennell. Stem puberulent, 2–6 dm. tall: basal leaves mostly with oblanceolate or spatulate blades: stem-leaves few or many; blades elliptic to linear, 2–8 cm. long, entire or very nearly so: sepals 5–7 mm. long: petals 6–9 mm. long: capsule-body obovoid or ellipsoid-obovoid, 6–12 mm. long, glabrous or nearly so. [*O. pumila* L. *K. pumila* Spach]—Open woods and moist sandy grounds, Blue Ridge and more northern provinces, N. C. to Minn., Ont., and N. S.—Spr.–sum.

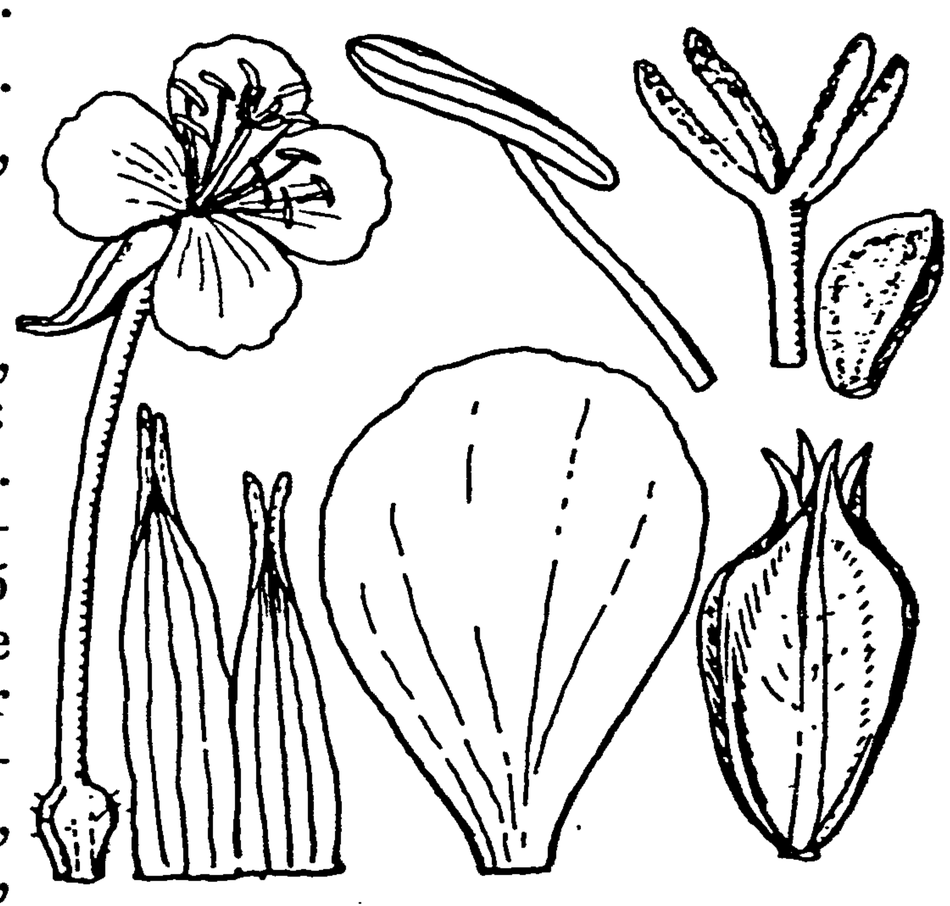
10. PENIOPHYLLUM Pennell. Annual or biennial slender-stemmed herbs. Leaves of two forms, the basal with broad blades, the cauline linear-filiform to filiform, entire. Flowers in terminal spikes. Petals triangular. Stigma capitate, the four lobes scarcely or not distinguishable. Capsule ellipsoid, sharply 4-angled, not stipitate. Seeds angled, irregularly clustered.—One species.

1. P. linifolium (Nutt.) Pennell. Stem 1.5–4.5 dm. tall; basal leaves clustered, with oblanceolate or spatulate blades about 2–5 cm. long: sepals 2–3.5 mm. long: corolla yellow, 6–8 mm. broad: capsule-body ellipsoid, 4–6 mm. long: seed about 1 mm. long, brown. [*Oenothera linifolia* Nutt. *Kneiffia linifolia* (Nutt.) Spach]—Dry rocky hills and prairies, Coastal Plain and adj. provinces, Ga. to Tex., Kans., and Ill.—Spr.–sum.

11. **HARTMANNIA** Spach. Annual or perennial caulescent herbs. Leaf-blades commonly pinnatifid or lyrate. Buds drooping. Flowers spicate, diurnal. Hypanthium funnelform. Petals white, pink or purple. Capsule-body ellipsoid to subglobose, 4-winged, narrowed to a stipe-like base. Seeds not tubercled. About 10 species, American.—Spr.–fall.—PRIMROSES.

1. **H. speciosa** (Nutt.) Small. Plant 2–7 dm. tall: blades of the basal leaves oblanceolate to spatulate in outline, lyrate-pinnatifid: sepals 2–4 cm. long: petals 2.5–5 cm. long: capsules 1–2 cm. long. [*Oenothera speciosa* Nutt.]—Dry soil, fields and roadsides, various provinces, La. to Ariz., Kans., and Mo.; also abundantly naturalized from Miss. to Fla., Ill., and N. C.—(*Mex.*)—Spr.–fall.—Commonly grown in gardens whence it escapes.

12. **LAVAUXIA** Spach. Perennial or annual usually acaulescent herbs. Leaf-blades pinnatifid. Flowers few. Petals white, pink, or pale-yellow. Hypanthium tubular, slender. Ovary short. Capsule short and stout, often winged above. seeds granular, few.—About 6 species, North American.—Spr.–sum.—PRIMROSES.



1. **L. triloba** (Nutt.) Spach. Perennial, nearly glabrous throughout: leaves basal: blades oblong-lanceolate in outline, 7–30 cm. long, runcinate-pinnatifid or sinuate, sometimes ciliate: corolla white or pink, 4–6.5 cm. broad: petals often 3-lobed: capsule ovoid, 20–30 mm. long, manifestly longer than broad, 4-winged above, reticulate-veined. [*Oenothera triloba* Nutt.] — Dry, often calcareous soil, various provinces, Miss to Calif., Wyo., and Ky.—(*Mex.*)

13. **GAURA** L. Annual, biennial, or perennial herbs. Leaf-blades entire, toothed, or pinnatifid. Flowers spicate or racemose. Hypanthium narrow, somewhat prolonged beyond the ovary. Petals unequal, with clawed blades. Stamens 8, declined. Style declined. Stigma 4-lobed, surrounded by a cup-like border. Fruit ribbed or angled.—About 18 species, North American.

Anthers linear to narrowly elliptic, attached near the base. I. BIENNES.
Anthers oval, attached near the middle. II. PARVIFLORAE.

I. BIENNES

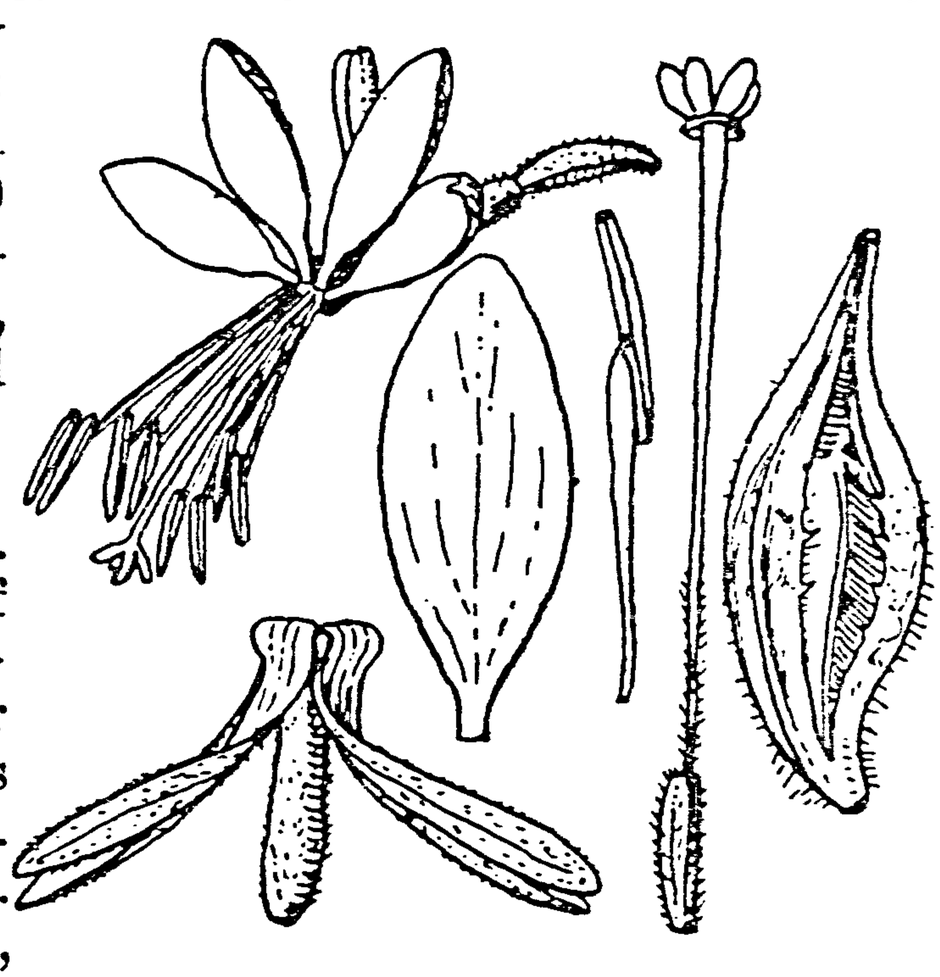
Fruit not stipitate, sometimes with a stout stipe-like base.
  Fruit 6–8 mm. long: flower-buds less than 2 cm. long.
    Fruit with rounded or obtuse angles. 1. *G. biennis.*
    Fruit with sharp angles.
      Fruit pubescent: flower-buds pubescent.
        Stem simple or with few ascending branches above: species ranging from South Carolina to Florida and Alabama. 2. *G. angustifolia.*

Stem diffusely much branched: species of the lower Mississippi valley.	3. *G. filiformis.*
Fruit glabrous: flower-buds glabrous.	
Stem, leaves, and inflorescence-rachis pubescent:	4. *G. simulans.*
Stem, leaves, and inflorescence-rachis glabrous, at least at maturity:	5. *G. Eatonii.*
Fruit 3–4 mm. long: flower-buds over 2 cm. long.	6. *G. longiflora.*
Fruit contracted into a slender stipe which resembles a pedicel.	7. *G. Michauxii.*

II. PARVIFLORAE

Rather coarse herb, with slender elongate spikes of inconspicuous flowers:	8. *G. parviflora.*

1. G. biennis L. Stem 6–15 dm. tall, villous-hirsute: leaf-blades lanceolate, elliptic-lanceolate, or elliptic, 3–10 cm. long, remotely denticulate or merely undulate: buds pubescent: base of the hypanthium villous: sepals 8–9.5 mm. long: petals white, sometimes turning pink, 7–11 mm. long: fruit elliptic to oval-elliptic, 6–10 mm. long, more or less hirsute.—(MORNING-HONEYSUCKLE.)—Dry soil and stream-banks, various provinces, Ga. to Miss., Minn., and Que.—Sum.–fall.



2. G. angustifolia Michx. Stem 7–12 dm. tall, finely appressed-pubescent: blades of the stem-leaves spatulate to linear or linear-lanceolate, 1–6 cm. long, acute, sinuate or nearly entire, sparingly pubescent: buds pubescent: petals white or pink, 5–6.5 mm. long: fruit elliptic, 5–9 mm. long, pubescent.—Dry woods and sandy fields, Coastal Plain, Fla. to Miss. and N. C.—Spr.–fall.

3. G. filiformis Small. Stem 1–2.5 m. tall, canescent-puberulent: leaf-blades linear to narrowly linear-lanceolate, 2–10 cm. long, sharply, but finely toothed, or entire above: buds puberulent, less than 1.5 cm. long: sepals 9–10 mm. long: petals pink-purple, 7–8 mm. long: fruit narrowly elliptic, 6–7 mm. long, canescent.—Sandy soil, Coastal Plain, Miss. to Tex. and Ark.—Sum.–fall.

4. G. simulans Small. Stem 9–20 dm. tall, loosely pubescent below: blades of the stem-leaves oblanceolate or narrowly spatulate to lanceolate or linear-lanceolate, 2–12 cm. long, pinnatifid to sharply toothed: sepals broadly linear, rather obtuse: petals pinkish, 4.5–5 mm. long: fruit 8–10 mm. long, glabrous.—Coastal sand-dunes and pinelands, S Fla.—Sum.–fall.

5. G. Eatonii Small. Stem 3–11 dm. tall, glabrous or with scattered hairs: leaf-blades nearly similar to those of the two preceding species: buds glabrous: sepals narrowly linear, rather acute: petals pinkish, 5–6.5 mm. long: fruit glabrous, the body ellipsoid-ovoid, 7–10 mm. long, 4-angled, contracted into a very short stipe-like base.—Sand-dunes, Punta Rassa, Fla.—Spr.

6. G. longiflora Spach. Similar to *G. angustifolia* in habit: leaf-blades linear, narrowly so above, remotely and inconspicuously toothed or entire, somewhat revolute: buds canescent-puberulent, over 2 cm. long: sepals 11–13 mm. long: petals pink, 9–10 mm. long: fruit oval-elliptic, about 4 mm. long, canescent.—Sandy soil, Coastal Plain, Miss. (or Ala.?), La. and Tex.—Spr.–sum.

7. G. Michauxii Spach. Stem 6–18 dm. tall, puberulent, leaf-blades linear or linear-elliptic, 2.5–8 cm. long, sinuate or remotely dentate: buds canescent: petals white, turning reddish, 4–6 mm. long: sepals 4–6 mm. long: fruit nar-

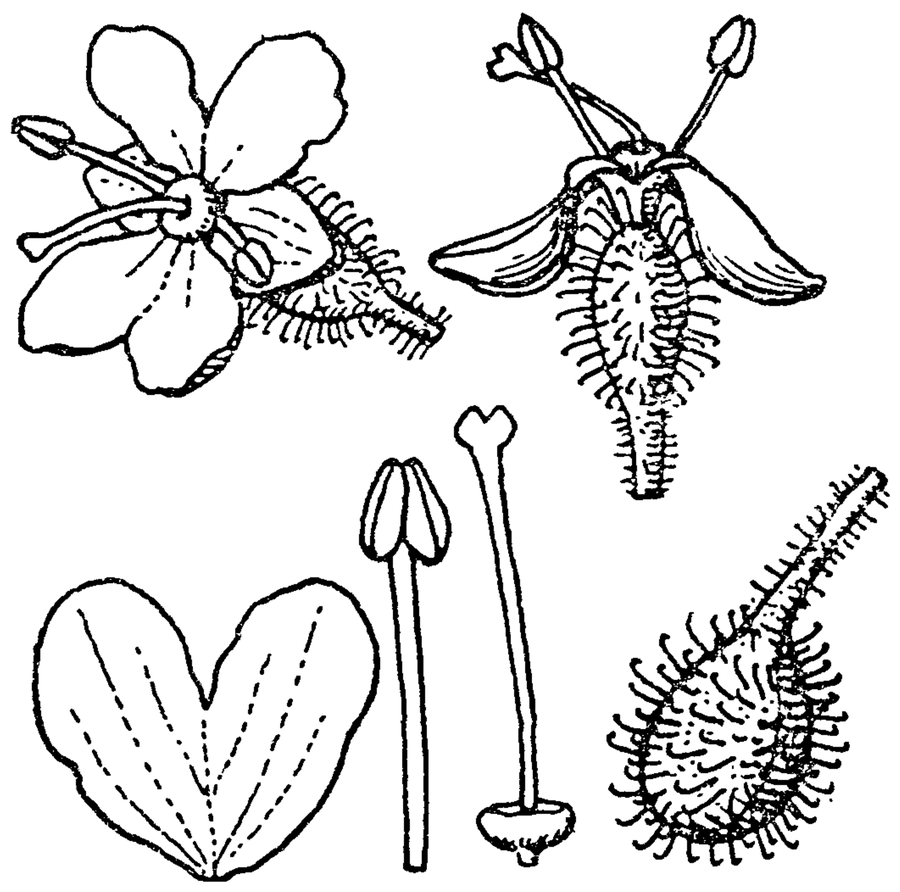
rowly ovoid, puberulent, the body 3–4 mm. long, sharply 4-angled above, narrowed to a pedicel-like base, longer than the body.—Dry woods and fields, various provinces, Fla. to La., Kans., and N. C. (or Va.?).—Sum.–fall.

8. **G. parviflora** Dougl. Stem 6–35 dm. tall, villous-hirsute: leaf-blades lanceolate, ovate-lanceolate or elliptic, 3.5–10 cm. long, repand-dentate, softly pubescent: buds glabrous or nearly so: sepals 2–3 mm. long: petals 1.5–4 mm. long: fruit fusiform, 6–8 mm. long, 4-nerved, obtuse between the angles.—Dry soil, fields, and roadsides, various provinces, Ala. to Calif., Ore., and S. Dak.—(*Mex.*)—Spr.–sum.

14. **CIRCAEA** [Tourn.] L. Perennial herbs. Leaves opposite: blades mostly toothed, petioled. Flowers racemose. Sepals 2. Petals 2, white, notched. Stamens 2, alternate with the petals. Ovary 1–2-celled. Fruit obovoid, usually bristly with hooked hairs—About 8 species, natives of the Northern Hemisphere.

Plant herbaceous: leaf-blades ovate: bracts obsolete: fruit over 3 mm. long, 2-celled. 1. *C. latifolia.*
Plant succulent: leaf-blades cordate: bracts minute: fruit less than 3 mm. long, 1-celled. 2. *C. alpina.*

1. **C. latifolia** Hill. Plant 3–6 dm. tall: leaf-blades ovate, 5–10 cm. long, remotely denticulate: pedicels 4–8 mm. long: corolla about 3 mm. broad: fruit broadly obovoid, about 4 mm. long, with stiff hairs. [*C. lutetiana* (Fl. SE. U. S.)] — (ENCHANTER'S-NIGHTSHADE.) — Rich woods and thickets, various provinces, Ga. to La., Kans., S. D., Ont., and N. S.—Sum. —*C. intermedia* Ehrh. with saliently toothed leaf-blades, the upper ones more or less cordate, and minute bracts, has been reported from Texas and may occur in our range.



2. **C. alpina** L. Plant 0.5–2 dm. tall: leaf-blades ovate, 2.5–5 cm. long, coarsely dentate: pedicels 3–4 mm. long: corolla about 2 mm. broad: fruit narrowly obovoid, about 2 mm. long, with soft hairs.—Cold woods, Blue Ridge and more northern provinces, Ga. to Ind., S. Dak., Alas., and Lab.—(*Eurasia.*)—Sum.–fall.

FAMILY 9. GUNNERACEAE — WATER-MILFOIL FAMILY

Perennial, or rarely annual, aquatic or amphibious herbs. Leaves alternate to whorled: blades entire to dissected, often 2 kinds on the same plant. Flowers perfect or monoecious. Calyx of 2–4 sepals. Corolla of 2–5 small petals, or wanting. Androecium of 1–8 relatively large stamens. Gynoecium of 1 or of 2–4, sometimes united, carpels. Ovary inferior. Stigmas 1–4.—Eight genera and about 100 species, widely distributed.

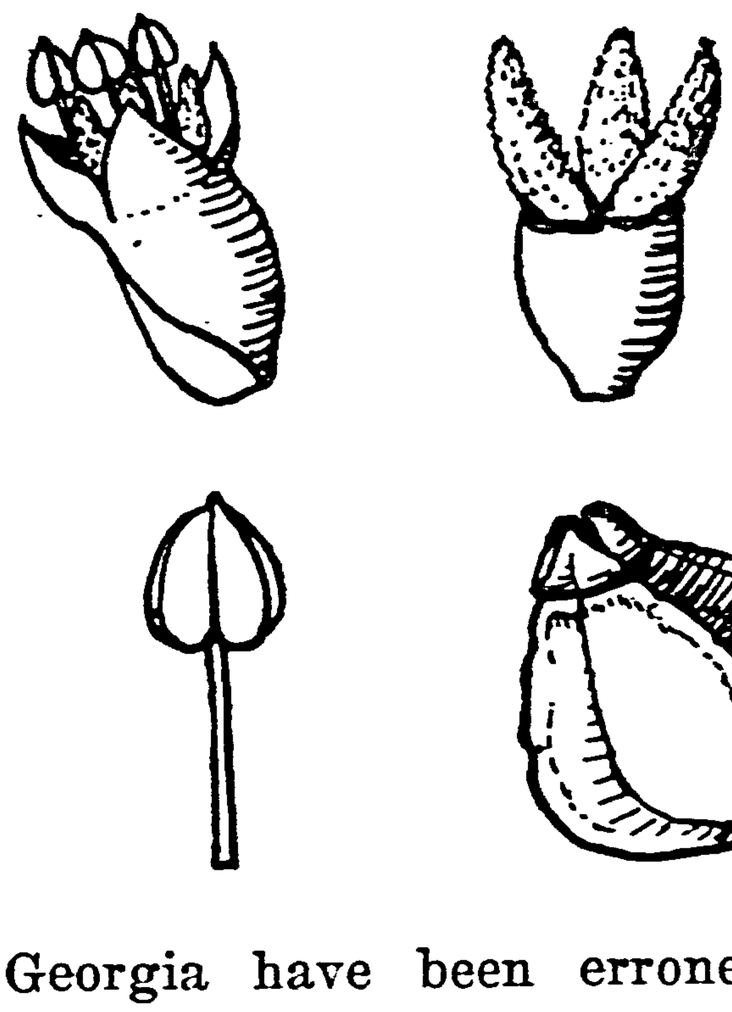
Gynoecium 3-carpellary: stamens 3: flowers perfect. 1. PROSERPINACA.
Gynoecium 4-carpellary: stamens 4 or 8: flowers monoecious or polygamous. 2. MYRIOPHYLLUM.

1. **PROSERPINACA** L. Herbs with stems decumbent or creeping at base. Leaves alternate: blades toothed or pectinate, sometimes both kinds on

one plant. Flowers perfect, with the perianth in 3's, apetalous. Sepals broad, often deltoid, green or sometimes whitish. Stamens 3. Stigmas 3, erect. Fruit 3-carpellary. Four species, North American.—MERMAID-WEEDS.

Leaves all nearly alike and pectinate; blades of those subtending the flowers or flower-clusters finely pectinate: stigmas stout. 1. *P. pectinata.*
Leaves all nearly alike and toothed; blades of those subtending the flowers or flower-clusters serrate or serrulate, or the submersed ones pectinate, in aquatic forms all pectinate or pinnatifid-pectinate: stigmas slender.
  Fruit not auricled; nutlets with even or uneven angles.
    Fruit ovate or suborbicular in outline, with obtuse or rounded angles, and turgid faces. 2. *P. amblygona.*
    Fruit deltoid or rhombic in outline, with acute or margined angles, and concave faces. 3. *P. palustris.*
  Fruit auricled; nutlets with prominently appendaged angles. 4. *P. platycarpa.*

1. P. pectinata Lam. Leaf-blades elliptic to ovate in outline, 1–3 cm. long, one-half as wide or nearly so, the segments slender or filiform-subulate, about as wide as the rachis: fruit ovoid or globose-ovoid, 3–3.5 mm. long, tuberculate-rugose, thick-angled.—Ponds, ditches, and sluggish streams, various provinces, Fla. to La. and Me.—Spr.–fall.—This species is less widely distributed than the two following, and is more decidedly restricted to coastal regions.



2. P. amblygona (Fernald) Small. Leaf-blades linear, elliptic, lanceolate, or spatulate, 1.5–5 cm. long, less than one-half as wide as long, serrate or the submerged ones pinnatifid or pectinate, the segments coarse or slender, but mostly narrower than the rachis: fruit ovoid or subglobose, 3–3.5 mm. long, tuberculate-roughened, thick-angled.—Ponds, swamps, and ditches, various provinces, Ga. to Tex., Mo., and Ont.—Spr.–fall.—Specimens of this species from Georgia have been erroneously referred to *P. intermedia* Mackenzie.

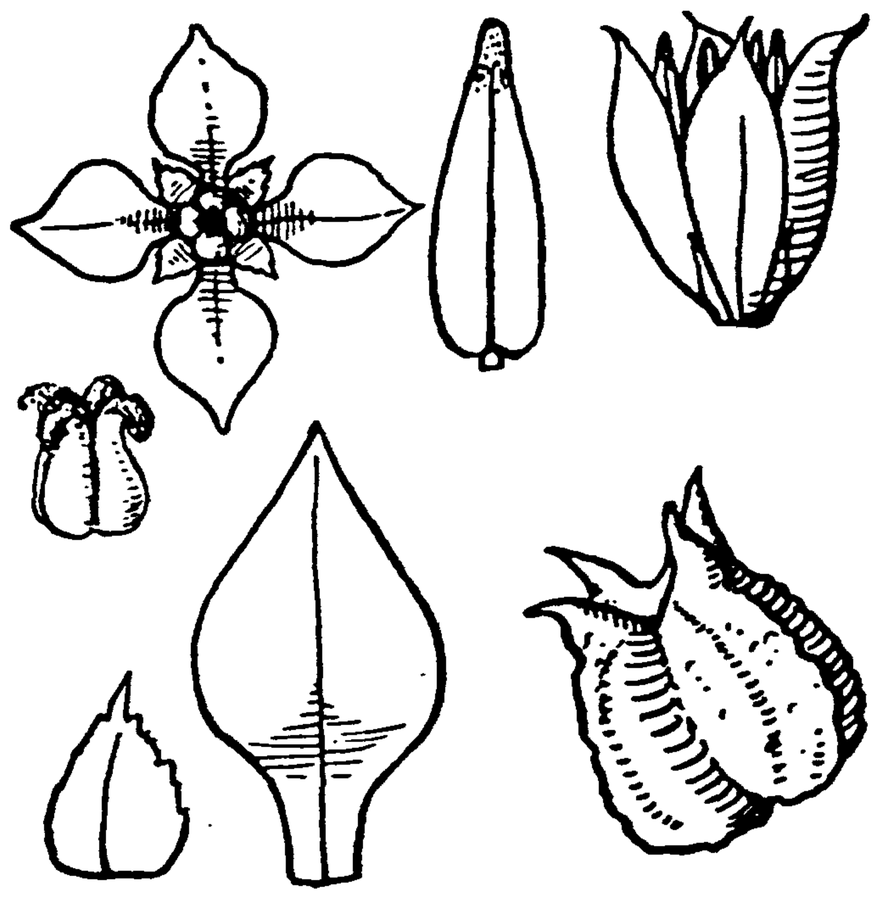
3. P. palustris L. Leaf-blades elliptic, linear, linear-lanceolate or broadened upward, mostly 2–6 cm. long, serrate or serrulate, or the submersed ones pinnatifid or pectinate, the segments slender: fruit pyramidal or rhomboidal, 4–5 mm. long, thin-angled, tuberculate-roughened.—(MERMAID-WEED.)—Moist soil, ponds, ditches, and swamps, various provinces, Fla. to La. (or Tex.?), Minn., and N. S.—Spr.–fall.

4. P. platycarpa Small. Leaf-blades elliptic varying to oblanceolate or obovate, 1–3 cm. long, serrate, or those of the submersed ones, or in aquatic forms all pectinate: fruit broad, mostly obreniform by the auricled angles, the faces sparingly rugose.—Pools, lime-sinks, and cypress swamps, pen. Fla.; perhaps further N along the Atlantic coast.—(*W. I.*)—All year.

2. MYRIOPHYLLUM L. Herbs with mostly submersed stems, or sometimes creeping in the mud. Leaves alternate to whorled: blades of the emersed (floral) ones entire, toothed, or pectinate; those of the submersed ones larger and with finer divisions than the others. Flowers monoecious or polygamous, with the perianth in 4's and the staminate ones petaliferous, green, red, or purplish. Sepals mostly narrow. Stamens 4 or 8. Stigmas 4, recurved. Fruit 4-carpellary.—About 20 species, widely distributed.—WATER-MILFOILS.

Sepals broad and short: plants monoecious or polygamous.
  Stamens 4: corolla persistent.
    Floral leaves with entire or serrate blades: anthers acuminate: petals broadly ovate. 1. *M. heterophyllum.*
    Floral leaves with incised-pinnatifid blades: anthers obtuse: petals elliptic. 2. *M. pinnatum.*
  Stamens 8: corolla deciduous. 3. *M. laxum.*
Sepals long and slender: plants dioecious. 4. *M. proserpinacoides.*

1. M. heterophyllum Michx. Leaves in 4's to 6's; blades of the usually crowded submersed ones with 6–10 pairs of linear-filiform or capillary segments; those of the floral ones elliptic, ovate, linear, or broadened upward, serrate: petals broadly ovate, 2–2.5 mm. long, abruptly pointed: anthers narrowly elliptic, 1.5–2 mm. long: fruit globose-ovoid, 2–2.5 mm. long; carpels with 2 dorsal ridges, tuberculate-roughened.—Ponds and sluggish streams, various provinces, Fla. to Tex., Minn., Ont., and N. J.—(*Mex.*)—Sum.—Forms of *M. heterophyllum* have often been erroneously referred to *M. verticillatum* in our range.



2. M. pinnatum (Walt.) B. S. P. Leaves in 3's to 6's, or some of them scattered; blades of the usually crowded submersed ones with 3–5 pairs of linear-capillary segments; those of the floral ones narrow, incised-pinnatifid, thus jagged-edged; petals elliptic, 1–1.5 mm. long, obtuse: anthers nearly 1 mm. long, obtuse: fruit oval or globose-ovoid, 1.5–2 mm. long; carpels with 2 tuberculate dorsal ridges.—Ponds, ditches, and muddy shores, various provinces, Fla. to Tex., Ia., and Man.—(*W. I.*)—Spr.–sum.

3. M. laxum Shuttlw. Leaves in 4's; blades of the approximate submersed ones with 3–7 pairs of capillary segments; those of the floral ones spatulate: petals elliptic, 2.5–3 mm. long: anthers linear to narrowly elliptic, about as long as the filaments: fruit ovoid-globose, about 1.5 mm. long; carpels minutely warty.—Ponds and lakes, Coastal Plain, N Fla., S Ga. and S Ala.—Sum.

4. M. proserpinacoides Gill. Leaves in 4's and 5's, feather-like; blades of the submersed and floral ones nearly or quite similar, all rather remote, with mostly 10–15 pairs of linear-subulate or rarely linear-spatulate segments: hypanthium subtended by minute or subulate bracts: sepals very slender.—(WATER-FEATHER. PARROT'S-FEATHER.)—Pools, and ditches, Coastal Plain, Fla. to Tex.; also locally as far N as N. Y.—Native of S. Am.—Spr.–fall.

ORDER AMMIALES

Herbs, shrubs, trees, or vines. Leaves alternate or opposite: blades simple or compound. Flowers perfect, polygamous, or dioecious, often borne in umbels. Calyx of typically 5 small sepals surmounting the hypanthium. Corolla typically of 5 petals, or wanting. Androecium of as many stamens as the sepals. Gynoecium 2-carpellary or rarely several–1-carpellary. Ovary inferior. Fruit drupaceous or baccate, or dry and then a cremocarp.

Fruit drupaceous or baccate: gynoecium 1–several-carpellary, if 2-carpellary, stigmas introrse.
  Styles single or united: ovule with a dorsal raphe: leaves mostly opposite; blades entire or merely toothed. Fam. 1. NYSSACEAE.

Styles distinct: ovule with a ventral raphe: leaves mostly alternate; blades lobed or compound. — Fam. 2. HEDERACEAE.
Fruit dry, a cremocarp: gynoecium 2-carpellary: stigmas terminal. — Fam. 3. AMMIACEAE.

FAMILY 1. NYSSACEAE — DOGWOOD FAMILY

Shrubs or trees, or rarely partly herbaceous plants. Leaves opposite or alternate: blades usually entire. Flowers perfect or unisexual, borne in naked or involucrate open or congested cymes. Calyx of mostly 4 or 5 sepals. Corolla of 4 or 5, or rarely more, petals, or wanting. Androecium of usually as many stamens as the sepals. Gynoecium of 1 or of 2–4 united carpels. Styles united. Fruit mostly a drupe.—Sixteen genera and about 90 species, most abundant in the northern hemisphere.

Flowers dioecious or polygamo-dioecious; stigmas lateral: drupe 1-celled. — 1. NYSSA.
Flowers perfect: stigmas terminal: drupe 2-celled, 2-seeded.
  Flowers in open cymes, not subtended by an involucre: fruit surmounted by the style, globular, not red. — 2. SVIDA.
  Flowers in a head, subtended by a large involucre: fruit surmounted by the calyx, elongate, red. — 3. CYNOXYLON.

1. NYSSA L. Shrubs or trees, with terete branches. Leaves alternate, deciduous. Flowers polygamo-dioecious, green, the staminate with 5–several sepals and 5–many stamens, the pistillate with 5 sepals and a 1-celled pistil. Drupe somewhat elongate.—About 8 species, North American and Asiatic.—Spr.

Pistillate flowers 2 or more together: drupe small (1–1.5 cm.), black, beneath a bloom; stone smooth or bluntly ridged. — I. MULTIFLORAE.
Pistillate flowers solitary: drupe large (3–4 cm.), purple to red; stone winged or sharply ridged. — II. UNIFLORAE.

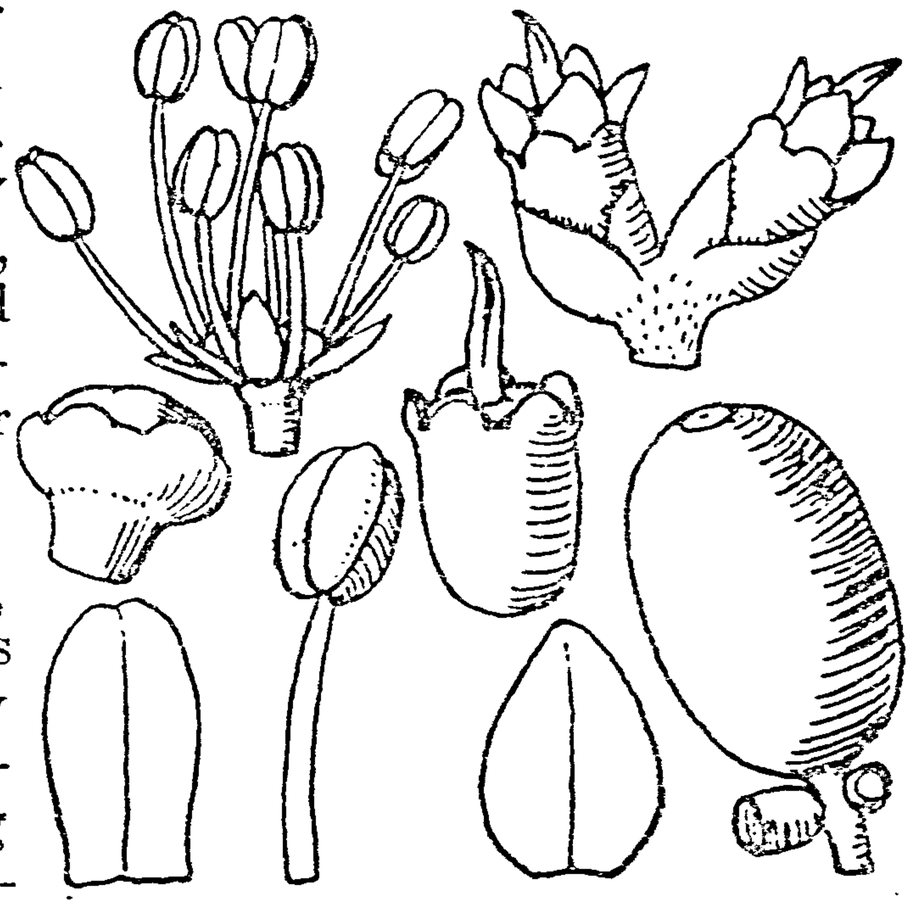
I. MULTIFLORAE

Leaf-blades obovate to ovate: stone nearly ribless. — 1. *N. sylvatica.*
Leaf-blades spatulate, oblanceolate or elliptic: stone ribbed.
  Drupe oval to ellipsoid: leaf-blades mostly 8–12 cm. long. — 2. *N. biflora.*
  Drupe globular: leaf-blades mostly 2.5–7 cm. long. — 3. *N. ursina.*

II. UNIFLORAE

Pistillate flowers short-pedicelled: drupe red; stone winged.
  Leaf-blades narrow, acuminate: shrub with underground stems and erect branches. — 4. *N. acuminata.*
  Leaf-blades broad, obtuse or abruptly pointed: tree with spreading branches. — 5. *N. Ogeche.*
Pistillate flowers long-pedicelled: drupe purple or blue; stone sharp-ridged. — 6. *N. aquatica.*

1. N. sylvatica Marsh. Tree becoming 50 m. tall, with angular-checked bark: leaf-blades oval or obovate, sometimes pubescent beneath, 5–15 cm. long: drupe oval, 10–15 mm. long; stone oval or ellipsoid, rarely broadened upward and slightly curved. — (BLACK-GUM. SOUR-GUM. PEPPERIDGE.)—Rich soil, wet places or dry hillsides, various provinces, Fla. to Tex., Mo., Mich., and Me.—The wood of this and the next following species is used for making various utensils. It is light-yellow or nearly white and soft, but tough.



2. N. biflora Walt. Tree becoming 40 m. tall, with longitudinally ridged bark: leaf-blades oblanceolate, spatulate, or elliptic, mostly 2–12 cm. long: drupe oval or ellipsoid, 10–13 mm. long; stone ellipsoid, 8–10 mm. long or sometimes longer, or rarely smaller.—

(WATER-GUM. WATER-TUPELO. BLACK-GUM.)—Swamps and pond-margins, Coastal Plain and adj. provinces, Fla. to Tex. and Del. (or N. J.).—A form with rather small blunt leaves and roundish drupes 6–7 mm. in diameter from the coastal regions from South Carolina to Virginia may represent an additional species.

3. **N. ursina** Small. Shrub with copiously branched stems or a small much-branched tree: leaf-blades elliptic, often narrowly so, to spatulate, 2.5–7 cm. long, coriaceous, mostly rounded at the apex: drupe globular, 9–12 mm. in diameter, very fleshy; stone oval, 8–10 mm. long.—(BEAR-GUM.)—Pineland swamps, Apalachicola River delta, Fla.—A much-branched shrub with the habit of *Cliftonia* and *Cyrilla*, with which it grows, conspicuous by its numerous small leaves and in flower or fruit, by the very numerous flower clusters or fruits, respectively. The juicy drupes, although intensely bitter, are a favorite food of the bears of the region.

4. **N. acuminata** Small. Shrub becoming 3 m. tall, usually with numerous erect branches: leaf-blades narrowly elliptic or oblanceolate, 4–16 cm. long, acuminate: drupe ellipsoid, about 2 cm. long.—Pineland swamps near the coast, Ga.

5. **N. Ogeche** Marsh. Tree becoming 20 m. tall, the stem crooked; leaf-blades elliptic, varying to oblanceolate or lanceolate, or rarely oval, 5–20 cm. long, usually entire: petioles about 1 cm. long: drupe 3–4 cm. long, red, longer than the pedicel; stone papery-winged. — (OGECHE-LIME. OGEECHEE-PLUM. TUPELO-GUM.)—Wet swamps, Coastal Plain, Fla. to S. C.—The fruits are used to make an acid drink and for a preserve. The wood is white, light, soft and tough.

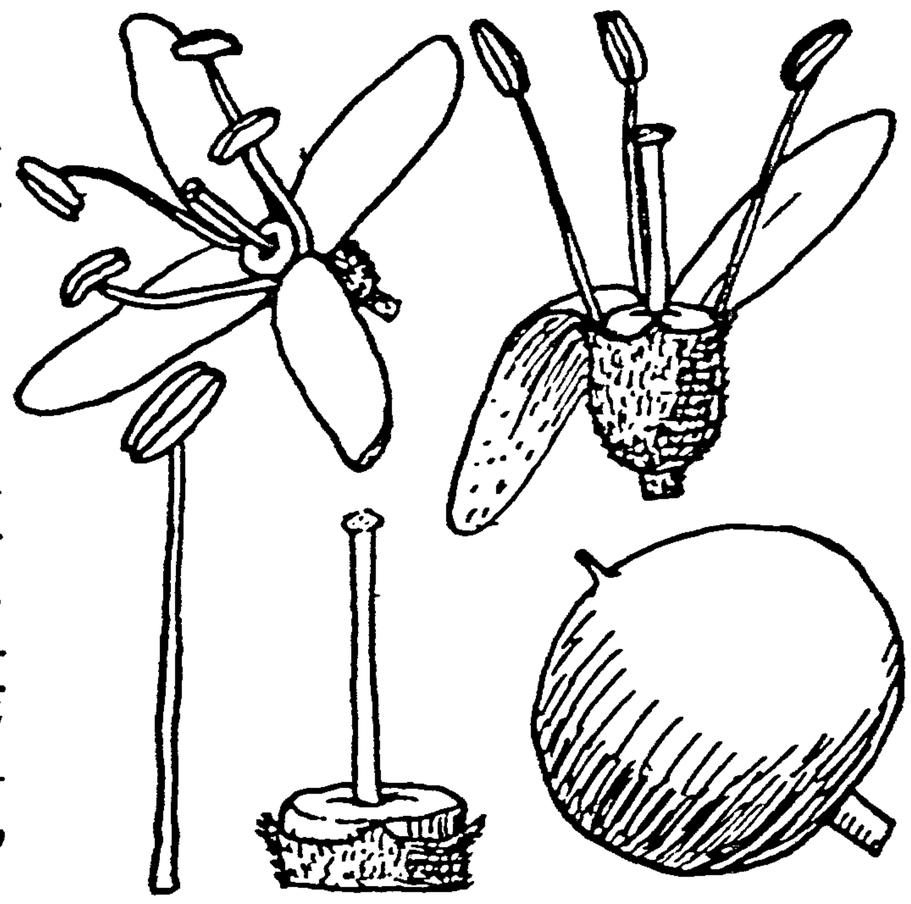
6. **N. aquatica** L. Tree becoming 35 m. tall, the stem erect: leaf-blades ovate to elliptic, 9–30 cm. long, often sinuate or coarsely toothed; petioles 2.5 cm. long: drupe nearly 3 cm. long, dark-purple, shorter than the pedicel; stone sharp-ridged.—(TUPELO-GUM. COTTON-GUM.)—River-swamps, Coastal Plain and rarely adj. provinces, Fla. to Tex., Ill., and Va.—The wood is used for making various utensils. It is light-brown or nearly white, soft, but tough.

2. **SVIDA** Opiz. Shrubs or trees. Leaves opposite or rarely alternate. Flowers in naked corymb-like cymes. Sepals 4, minute. Petals 4, white, spreading. Stamens 4. Drupe globular or depressed. [*Cornus* L. in part.]—About 15 species, North American.—Spr.—CORNELS.—Some species are used medicinally.

Leaves alternate, approximate at the end of the branches: drupe deep-blue or blue-black. 1. *S. alternifolia.*
Leaves opposite, remote: drupe white or pale-blue or light-blue.
  Lower leaf-surfaces glabrous.
    Twigs gray: drupe white: stone broader than long. 2. *S. femina.*
    Twigs reddish-brown: drupe pale-blue: stone mostly longer than broad. 3. *S. stricta.*
  Lower leaf-surfaces with straight or curled hairs.
    Stones longer than broad: drupe 3–4 mm. in diameter.
      Leaf-blades membranous, those below a peduncle elliptic or oval. 4. *S. microcarpa*
      Leaf-blades leathery, those below a peduncle ovate to ovate-lanceolate. 5. *S. Priceae.*
    Stones broader than long: drupe 6–8 mm. in diameter.
      Sepals much shorter than the hypanthium: drupe white: stone sharply 4-angled. 6. *S. asperifolia.*
      Sepals about as long as the hypanthium: drupe pale-blue: stone slightly angled. 7. *S. Amomum.*

1. **S. alternifolia** (L. f.) Small. Shrub, or tree sometimes 9 m. tall: leaf-blades elliptic or oval, varying to ovate or obovate, 5–15 cm. long, whitish be-

neath, prominently ribbed: petals oblong-ovate: drupe depressed-globose, 8–10 mm. in diameter, blue-black.—(PAGODA-CORNEL. UMBRELLA-CORNEL.)—Bluffs, woods and thickets, various provinces, Fla. to Ala., Minn., and N. B.—The brown heart-wood is close-grained and hard.



2. S. femina (Mill.) Small. Shrub with gray twigs: leaf-blades elliptic or lanceolate, 4–15 cm. long: sepals triangular: petals oblong to oblong-lanceolate: drupe subglobose, 4–5 mm. in diameter. [*S. candidissima* (Marsh.) Small]—River-banks, thickets, and roadsides, various provinces, Ga. to Nebr., Minn., and Me.

3. S. stricta (Lam.) Small. Shrub, or small tree with smoothish bark: leaf-blades elliptic, oval, or ovate, 4–12 cm. long: petals linear-oblong to linear-lanceolate: drupe 5–6 mm. in diameter, pale-blue.—Swamps, Coastal Plain, Fla. to Tex., Mo., Ind., and Va.

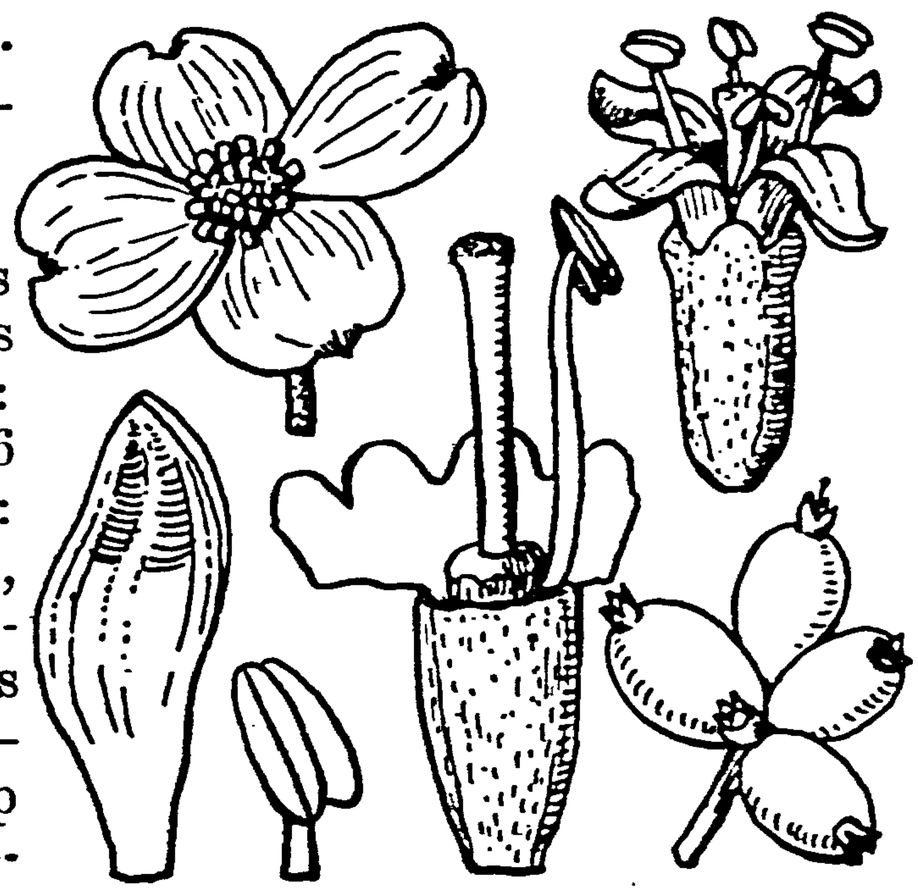
4. S. microcarpa (Nash) Small. Shrub with brownish twigs: leaf-blades oval or elliptic, 3–9 cm. long: petals ovate-lanceolate to lanceolate: drupe about 4 mm. in diameter, light-blue.—Low woods, Coastal Plain, Fla. and Ga.

5. S. Priceae Small. Shrub with red twigs: leaf-blades elliptic, ovate-elliptic, ovate or ovate-lanceolate, 5–12 cm. long: petals narrowly lanceolate: drupe about 3 mm. in diameter, white.—Bluffs and river banks, Interior Low Plateaus, Tenn. and Ky.

6. S. asperifolia (Michx.) Small. Shrub with brownish twigs: leaf-blades ovate to elliptic or oval, 4–15 cm. long: drupe 5–6 mm. in diameter, white.—(ROUGH-LEAF CORNEL.)—Low grounds or moist banks, various provinces W of Blue Ridge, Ala. to Tex., Minn., and Ont.

7. S. Amomum (Mill.) Small. Shrub with purple twigs: leaf-blades lanceolate to broadly ovate, 3–13 cm. long, silky and often somewhat rusty beneath: drupe 6–8 mm. in diameter, pale-blue.—Common, in moist thickets and along streams.—(KINNIKINNIK. SILKY-CORNEL.)—Wet places and stream-banks, various provinces, Fla. to Tex., N. D., and Newf.

3. CYNOXYLON Raf. Trees. Leaves opposite. Flowers perfect, borne in involucrate heads. Sepals 4, broadly ovate to oblong. Petals 4, greenish or yellow-green, recurving. Stamens 4. Drupe elongate. Two species, North American.



1. C. floridum (L.) Raf. Tree sometimes 15 m. tall, with rough black bark, leaf-blades elliptic to oval, 5–18 cm. long, pale beneath: involucral bracts white or pink, obovate, 4–6 cm. long: petals linear, 3–4.5 mm. long: drupe ellipsoid to oval, about 15 mm. long, red. [*Cornus florida* L.]—(FLOWERING DOGWOOD.)—Hammocks and rich woods, various provinces, Fla. to Tex., Minn., and Me.—There is always a black crumple at the tip of each involucral bract. The very close-

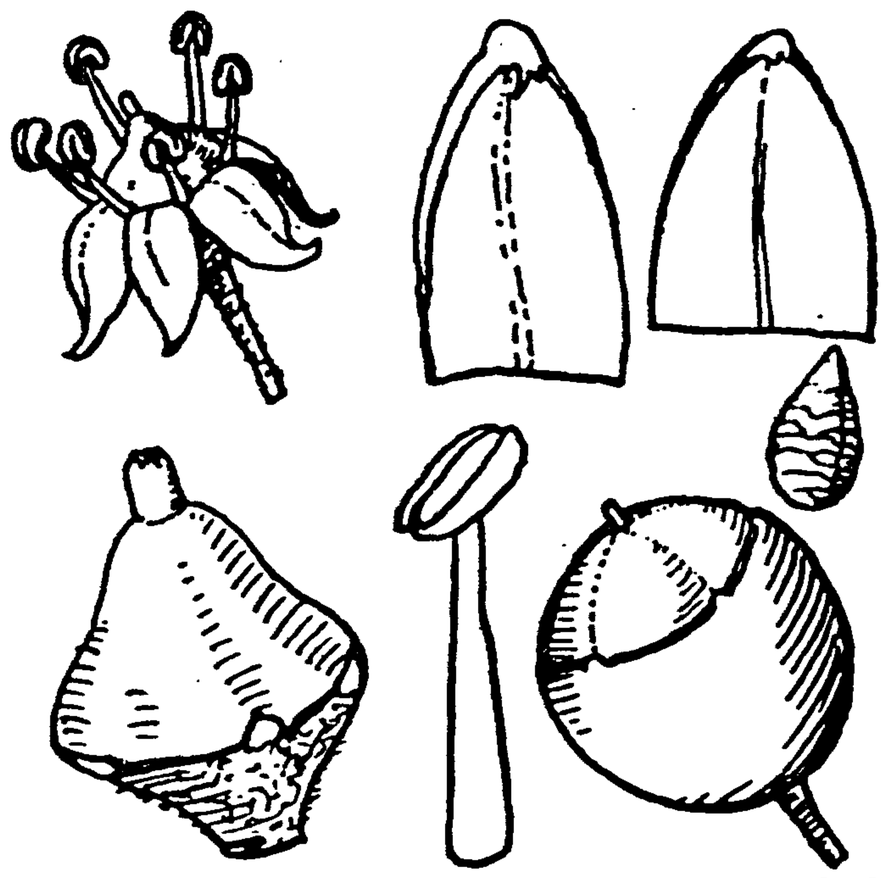
grained wood is sometimes used as a substitute for boxwood, in wood engraving and for a variety of articles.

Family 2. **HEDERACEAE** — Ivy Family

Herbs, shrubs, trees, or vines. Leaves alternate: blades simple or compound. Flowers perfect or polygamous, often umbellate. Calyx of 5 sepals, or obsolete. Corolla of 5 or 10 petals. Gynoecium of 2–5 united carpels. Styles often distinct. Fruit a berry or a drupe.—Fifty-two genera and about 475 species, natives of the north temperate zone.

Vines: leaf-blades simple.
Herbs, shrubs or trees: leaf-blades compound. — 1. Hedera.
  Umbel simple: plant scapose, the bracts whorled: styles 2 or 3. — 2. Panax.
  Umbel compound: plant caulescent, the leaves alternate: styles 5. — 3. Aralia.

1. HEDERA L. Vines. Leaf-blades leathery, entire or lobed. Flowers polygamous, in panicled umbels. Sepals 5, or obsolete. Petals 5. Stamens 5. Ovary 5-celled. Styles united. Fruit angled. —One species, in many cult. varieties.

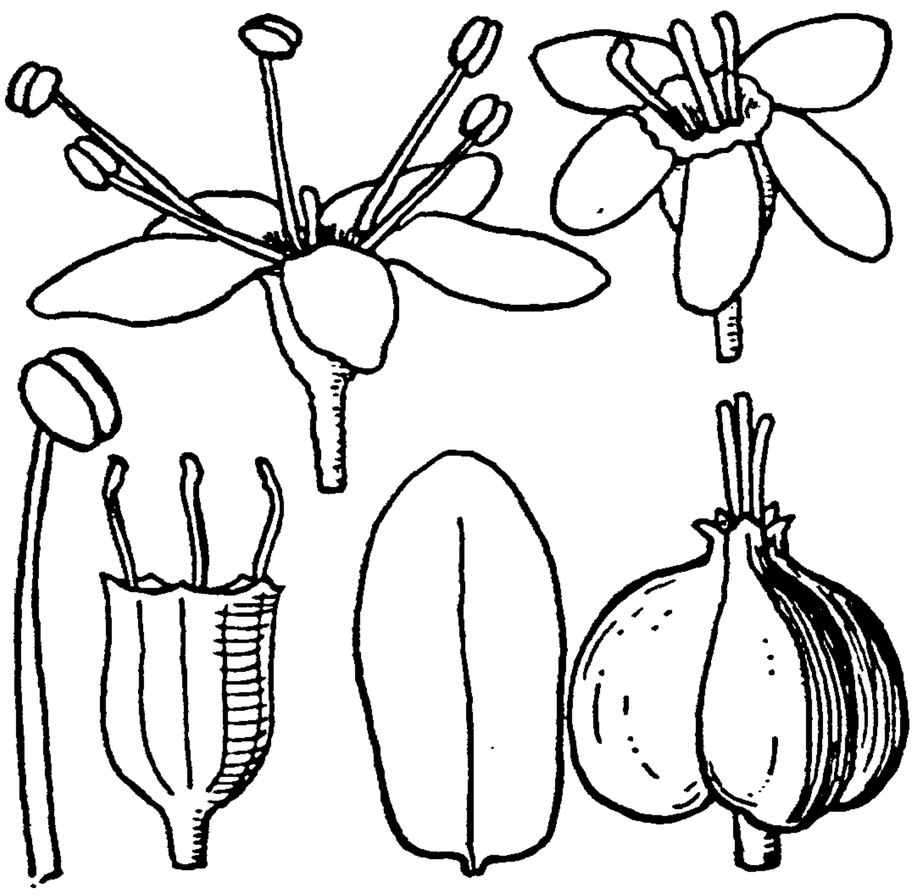


1. H. Helix L. Evergreen vine, with aërial rootlets: leaf-blades ovate to suborbicular, angular or 3–5-lobed, 2–10 cm. long: hypanthium pubescent: petals ovate to elliptic-ovate, yellowish-green, 2–3 mm. long: fruit about 10 mm. in diameter.—(English Ivy.) —About houses, fences, and cemeteries, locally naturalized from Europe, and cult., throughout U. S.—Sometimes used medicinally.—Ivy is a historic plant, its record going back into ancient mythology. The name Hedera comes down through the Romans. In Europe it has furnished a resin for varnish, a dye, and tanning material.

2. PANAX L. Perennial herbs. Leaf-blades palmately compound. Scape topped with a whorl of bracts quite similar to the leaves. Umbel simple. Ovary mostly 2- or 3-celled. Styles distinct. Fruit red, yellowish, or yellow.—Seven species, North American and Asiatic.

Rootstock globular: leaflets sessile, obtuse: berry yellow. — 1. *P. trifolium.*
Rootstock fusiform: leaflets stalked, acuminate: berry red. — 2. *P. quinquefolium.*

1. P. trifolium L. Plant 1–2 dm. tall: bracts 3: leaflets 3, the blades elliptic, 1–8 cm. long: petals white: berry 4–5 mm. broad.—(Dwarf-ginseng. Groundnut.)—Damp places in woods, various provinces, Coastal Plain only N, Ga. to Ill., Minn., and N. S.—Spr.

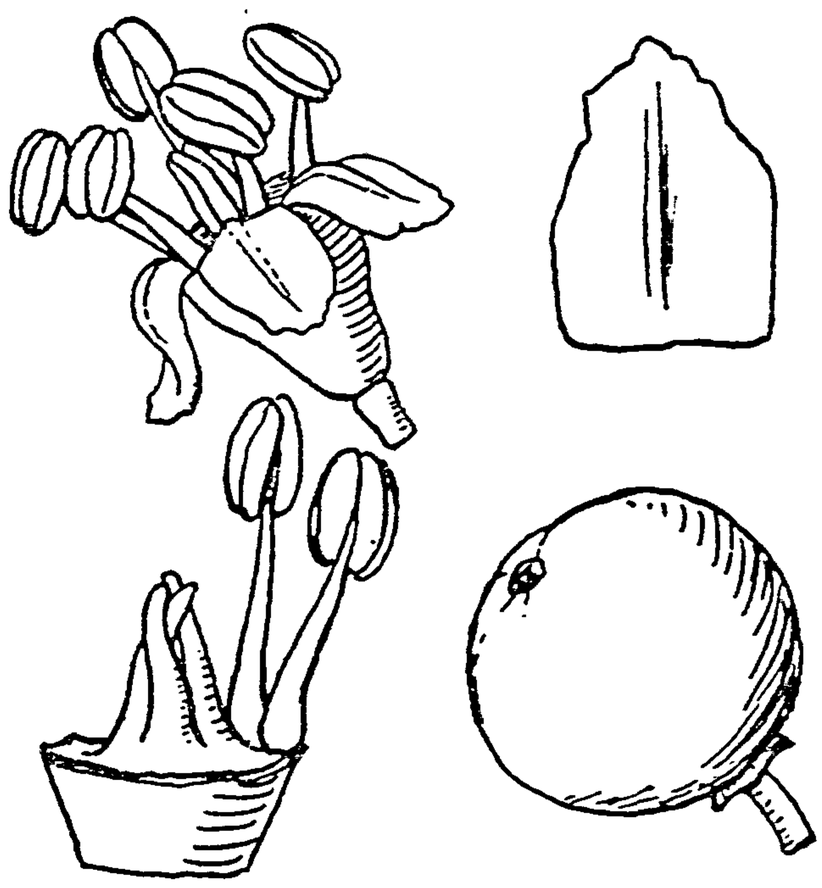


2. P. quinquefolium L. Plant 2–4 dm. tall: bracts 3 or 5: leaflets 5–7, the blades obovate, or those of the basal leaflets oval or suborbicular, 2–12 cm. long: petals greenish: berry 8–10 mm. broad.—(Ginseng. Sang.)—Cool places in rich woods, various provinces, Fla. to La., Nebr., Minn., and Que.—Sum.—The root is exported to China where it is used in superstitious practices. The natural supply being much depleted, the plant is now extensively cultivated.

3. **ARALIA** [Tourn.] L. Perennial herbs, shrubs, or trees, sometimes prickle-armed or spiny. Leaves alternate: blades pinnately or ternately compound. Umbel compound. Flowers white or greenish. Ovary mostly 5-celled. Styles distinct or united at the base. Fruit black. About 30 species, North American and Asiatic.—SPIKENARDS. SARSAPARILLAS.—Several of the species are used in medicine.

Umbels few, in terminal corymbs or few-rayed umbels.
  Plant with elongate rootstock, a peduncle or a leaf, or both, arising together at intervals from the rootstock. 1. *A. nudicaulis.*
  Plant with leafy branches arising from the rootstock. 2. *A. hispida.*
Umbels numerous, in terminal or axillary racemes or panicles.
  Large unarmed herb: leaflets membranous: hypanthium campanulate: anthers globular. 3. *A. racemosa.*
Shrub or small tree, with prickle-armed stems: leaflets leathery: hypanthium broadly turbinate: anthers ellipsoid. 4. *A. spinosa.*

1. A. nudicaulis L. Plant 2–3.5 dm. tall, sparingly soft-pubescent or glabrous: leaf usually solitary: inflorescence overtopped by the leaf: berry 6–8 mm. in diameter: seed 4.5–5 mm. long, very flat.—(WILD SARSAPARILLA.)—Woods and rocky hillsides, various provinces, Ga. to Mo., Man., and Newf.—Spring–sum.



2. A. hispida Vent. Plant 2–9 dm. tall, bristly pubescent: leaves several or many: inflorescence overtopping the leaves: berry rather smaller than those of *A. nudicaulis*: seed 2.5–3 mm. long, swollen.—(WILD-ELDER. BRISTLY-SARSAPARILLA.)—Sandy thickets and rocky woods, various provinces, Coastal Plain only N, N. C. to Ind., Minn., Ont., and Lab.—Sum.

3. A. racemosa L. Large herb 1–2 m. tall, unarmed: blades of the leaflets membranous: hypanthium campanulate: petals rather shorter than the hypanthium: berry 4–5 mm. in diameter: seed about 2.5 mm. long.—(SPIKENARD. HUNGRY-ROOT.)—Rich woods, various provinces, Ga. to Miss., Mo., S. D., and N. B.—Sum.

4. A. spinosa L. Shrub or small tree, prickle-armed: blades of the leaflets leathery: hypanthium broad-turbinate: petals longer than the hypanthium: berry 6–7 mm. in diameter: seed about 4 mm. long.—(PRICKLY-ASH. TOOTHACHE-TREE. HERCULES-CLUB. PRICKLY-ELDER. DEVIL'S-WALKINGSTICK.).—Low grounds and woods, various provinces, Fla., to Tex., Mo., and N. Y.—Sum.—Sometimes cultivated for ornament. The bark and fruits are occasionally used in medicine. The brown heart-wood is streaked with yellow, close-grained but light and soft.

FAMILY 3. AMMIACEAE — CARROT FAMILY

Herbs with hollow stems. Leaves typically alternate: blades dissected, or sometimes merely toothed, or entire. Flowers perfect or polygamous, umbellate. Calyx of 5 tooth-like sepals, or obsolete. Corolla of 5 petals. Androecium of 5 stamens. Gynoecium of 2 united carpels, often with a stylopodium. Fruit dry, a cremocarp, the ribbed or winged carpels separating at maturity.—About 250 genera and more than 2,000 species, widely distributed, but most abundant in the tropics.

Flowers densely capitate: fruit scaly, ribless. Tribe I. ERYNGIEAE.
Flowers evidently umbelled, the umbels sometimes compact: fruit ribbed, or if ribless, not scaly.
  Fruit ribless, covered with hooked prickles or stellate hairs.
    Fruit with hooked prickles, pointed at the apex, the carpels broadly united: leaf-blades pinnately or palmately 3–7-foliolate.
      Fruit with stellate hairs, broadly rounded at the apex, the carpels nearly distinct: leaf-blades lobed. II. SANICULEAE.
  Fruit ribbed, at least on the beak. IIa. BOWLESIEAE.
    Secondary ribs of the carpels more prominent than the primary, armed with prickles, the primary ribs bristly. III. CAUCALIEAE.
    Secondary ribs wanting, the primary ones evident or prominent.
      Fruit narrow, linear or linear-clavate, several times longer than wide. IV. OSMORRHIZEAE.
      Fruit short, ellipsoid to globose, less than twice as long as wide.
        Fruit terete in cross-section or compressed laterally.
          Umbels simple, rarely proliferous: leaves with blades. V. HYDROCOTYLEAE.
          Umbels compound, if simple the leaves mere hollow phyllodia. VI. AMMINEAE.
        Fruit much flattened dorsally, with the lateral ribs more or less strongly winged. VII. ANGELICEAE.

I. ERYNGIEAE

Erect or prostrate herbs, often with bristly or spiny leaves and bracts, the inflorescence frequently highly colored. 1. ERYNGIUM.

II. SANICULEAE

Erect herbs with palmate leaf-blades and irregular umbels, the flowers perfect and staminate. 2. SANICULA.

IIa. BOWLESIEAE

Weak-stemmed herbs, with slender-petioled leaf-blades and short-peduncled, few-flowered axillary umbels. 2a. BOWLESIA.

III. CAUCALIEAE

Sepals obsolete: fruit dorsally flattened. 3. DAUCUS.
Sepals prominent: fruit laterally flattened. 4. TORILIS.

IV. OSMORRHIZEAE

Fruit bristly.
  Fruit with an elongate beak longer than the body, not narrowed at the base. 5. SCANDIX.
  Fruit beakless, narrowed at the base. 6. OSMORRHIZA.
Fruit not bristly.
  Fruit beaked, the beak shorter than the body: oil-tubes wanting. 7. CERFOLIUM.
  Fruit beakless or slightly beaked: oil-tubes present.
    Seed-face concave: leaf-blades decompound: annual plants. 8. CHAEROPHYLLUM.
    Seed-face flat: leaf-blades 3-foliolate: perennial plants. 9. DERINGA.

V. HYDROCOTYLEAE

Fruit without secondary ribs or reticulations: involucre wanting. 10. HYDROCOTYLE.
Fruit with secondary ribs and reticulations: involucre present. 11. CENTELLA.

VI. AMMINEAE

Corolla white, greenish, or pinkish.
  Fruit terete or nearly so.
    Umbel compound: leaves much-divided.
      Ribs of the carpels all corky thickened. 12. CYNOSCIADIUM.

Ribs of the carpels slender, the lateral sometimes corky.
Fruit subglobose. 13. CORIANDRUM.
Fruit ellipsoid. 14. LIGUSTICUM.
Umbel simple: leaves philodia-like, linear or spatulate. 15. LILAEOPSIS.
Fruit laterally flattened.
Fruit tubercled. 16. SPERMOLEPIS.
Fruit smooth.
Carpels strongly flattened laterally, the fruit nearly orbicular. 17. ERIGENIA.
Carpels nearly terete, or only slightly flattened.
Carpels without oil-tubes.
Involucre present: carpel-ribs wavy-margined. 18. CONIUM.
Involucre wanting. 19. AEGOPODIUM.
Carpels with oil-tubes.
Seed-face concave: oil-tubes more than one in the intervals. 20. EULOPHUS.
Seed-face flat or nearly so: oil-tubes usually solitary in the intervals.
Umbels terminal or axillary.
Stylopodium depressed.
Carpels with the lateral ribs largest: leaf-blades bipinnate, the segments lanceolate. 21. CICUTA.
Carpel-ribs nearly equal: leaf-blades pinnate or finely dissected with linear or filiform segments.
Carpel-ribs winged: leaf-blades pinnate. 22. SIUM.
Carpel-ribs not winged: leaf-blades finely dissected into linear or filiform segments. 23. AMMI.
Stylopodium conic.
Carpel-ribs, at least the lateral, corky-thickened.
Fruit narrow; 8–10 mm. long, umbel rays 5 or less. 24. TREPOCARPUS.
Fruit broad; 1.5–4 mm. long, umbel rays numerous. 25. PTILIMNIUM.
Carpel-ribs not corky-thickened. 26. HARPERELLA.
Umbels, at least the lower ones, opposite the leaves.
Carpel-ribs slender winged, stylopodium prominent on the mature fruit. 27. CELERI.
Carpel-ribs corky-thickened, stylopodium not prominent on the mature fruit. 28. CYCLOSPERMUM.
Corolla yellow or greenish-yellow, sometimes purple in *Thaspium*.
Leaf-blades simple, perfoliate: carpels without oil-tubes. 29. BUPLEURUM.
Leaf-blades compound: carpels with oil-tubes.
Fruit not flattened: carpel-ribs winged. 30. THASPIUM.
Fruit flattened laterally: carpel-ribs not winged.
Leaf-segments entire. 31. TAENIDIA.
Leaf-segments toothed, incised, or lobed.
Stylopodium wanting. 32. ZIZIA.
Stylopodium present.
Involucre of 2–4 linear bracts: stylopodium depressed. 33. APIUM.
Involucre wanting: stylopodium conic. 34. FOENICULUM.

VII. ANGELICEAE

Corolla yellow: stylopodium depressed.
Fruit with thick corky lateral ribs and obsolete dorsal ribs: oil-tubes several in the intervals. 35. PLEIOTAENIA.
Fruit with thin-margined lateral ribs and evident dorsal ribs: oil-tubes solitary in the intervals.
Leaf-segments very narrow. 36. ANETHUM.
Leaf-segments broad. 37. PASTINACA.

Corolla white: stylopodium conic (except in *Angelica*).
  Oil-tubes more than one in the intervals.
    Leaf-blades 2–3 pinnately decompound, the segments narrow. 38. CONIOSELINUM.
    Leaf-blades 1–2 ternately divided, the segments broad. 39. ANGELICA.
  Oil-tubes solitary in the intervals.
    Fruit notched at the apex, the carpels very flat. 40. HERACLEUM.
    Fruit not notched at the apex, the carpels not very flat. 41. OXYPOLIS.

1. ERYNGIUM Tourn. L. Biennial or perennial herbs. Leaf-blades spiny-toothed, lobed or incised, or rarely entire. Bracts of the involucre often colored, otherwise often resembling the leaves. Sepals acute or spine-like. Petals 5, blue, white, or greenish, each prolonged into an inflexed tip. Carpels with obsolete ribs and 5 oil-tubes. About 175 species, of tropical and temperate regions.—ERYNGOS. BUTTON-SNAKEROOTS.—Some species are accredited with medicinal properties.

Leaf-blades parallel-veined. I. AQUATICA.
Leaf-blades not parallel-veined.
  Blades of the basal-leaves lobed or parted, the segments spine-tipped.
    Heads subglobose, spiny-bristly: bracts and bractlets 3–5-pronged. II. AROMATICA.
    Heads ovoid to ellipsoid, not bristly: bracts and bractlets not 3-pronged. III. DIVARICATA.
  Blades of the basal leaves entire or merely toothed.
    Stem and branches filiform or very slender, prostrate: plants biennial. IV. PROSTRATA.
    Stem relatively stout, erect or ascending: plants perennial, or, perhaps rarely biennial. V. INTEGRIFOLIA.

I. AQUATICA

Petals ovate, acuminate: bristles on the leaf-margin solitary. 1. *E. aquaticum.*
Petals suborbicular, mucronate: bristles on the leaf-margin mostly 2–4 together. 2. *E. synchaetum.*

II. AROMATICA

Diffuse plant, the branches from the top of the root decumbent: inflorescence near the tip of the branches widely branched. 3. *E. aromaticum.*
Plant erect, the stem corymbosely branched at the top: leaf-blades with 3–5 apical prong-like teeth. 3a. *E. cuneifolium.*

III. DIVARICATA

Prostrate plant, the heads mostly axillary, much longer than wide. 4. *E. divaricatum.*

IV. PROSTRATA

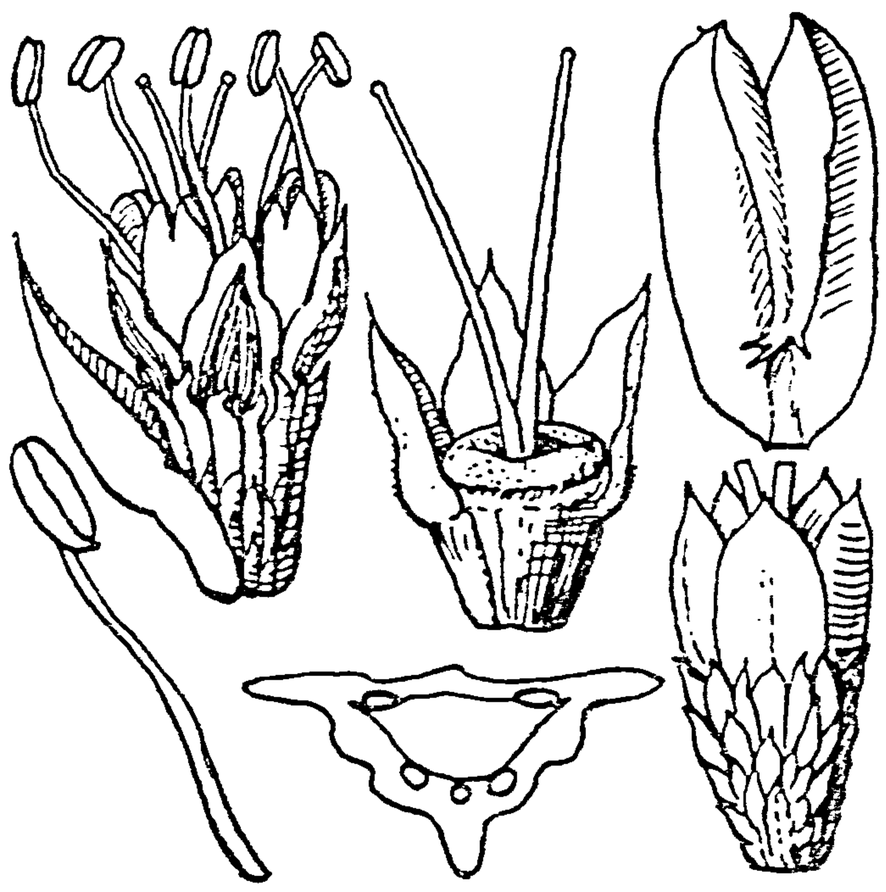
Bractlets longer than the flowers: stem-leaves with narrow blades or segments: fruit strongly tuberculate. 5. *E. Baldwinii.*
Bractlets shorter than the flowers: stem-leaves with broad blades or segments: fruit not strongly tuberculate. 6. *E. prostratum.*

V. INTEGRIFOLIA

Lower leaves with elongated hollow petioles and long blades.
  Bractlets entire. 7. *E. floridanum.*
  Bractlets 3-pronged.
    Teeth of the bractlets unequal, the lateral teeth smaller. 8. *E. virginianum.*
    Teeth of the bractlets about equal. 9. *E. Ravenelii.*
Lower leaves with short petioles and blades.
  Leaf-blades ovate, elliptic or lanceolate, serrate or crenate: heads mostly over 7 mm. high. 10. *E. integrifolium.*
  Leaf-blades linear or linear-spatulate, laciniately toothed, at least near the base: heads mostly less than 7 mm. high. 11. *E. ludovicianum.*

1. E. aquaticum L. Plant 3–18 dm. tall: blades of the lower leaves broadly linear, mostly 2–9 dm. long, stiff: sepals ovate to elliptic-ovate, about 2.5 mm.

long: petals over 2 mm. long: fruit 3.5–4 mm. long.—(CORN-SNAKEROOT. RATTLESNAKE-MASTER.)—Low woods, swamps, and acid meadows, various provinces, Fla. to Tex., Minn., and Conn.—Spr.–fall.—The specific name is somewhat of a misnomer, as the plant often grows in rather dry soil.



2. E. synchaetum (A. Gray) Rose. Plant 3–9 dm. tall: blades of the lower leaves narrowly linear, usually pliable: sepals broadly ovate to deltoid-ovate, 1.5–1.8 mm. long: petals less than 2 mm. long: fruit 2–2.5 mm. long.—Pinelands and prairies, Coastal Plain, Fla. to Tex., Ark., and Ga.—Spr.–fall.—A decoction made from the roots constitutes the ceremonial "black-drink" of the Seminoles.

3. E. aromaticum Baldw. Plant ultimately diffuse, the branches 1–6 dm. long: blades of the lower leaves spatulate in outline, pinnatifid or pinnately parted, 3–4 cm. long, pale-margined: heads becoming 8–10 mm. long: sepals lanceolate, 2–2.3 mm. long, acuminate: petals fully 1.5 mm. long: fruit granular, 1.5–2 mm. long, or rarely smaller.—Dry pinelands, Coastal Plain, Fla. and adj. Ga.—Spr.—Sometimes erroneously accredited to Ala.

3a. E. cuneifolium Small. Plant erect, 2–5 dm. tall: blades of the numerous basal leaves cuneate, long-petioled, the 3–5 apical teeth callous-margined spine-tipped: heads becoming 5–8 mm. in diameter: sepals lanceolate, 1.5–2 mm. long, acuminate: petals about 1.5 mm. long: fruit scarcely 1.5 mm. long.—Scrub, S part of Lake Region, Fla.—Sum.–fall.

4. E. divaricatum H. & A. Plant prostrate: blades of the lower leaves bipinnatifid, those of the upper ones pinnatifid, the segments linear to lanceolate, minutely spine-tipped: heads ovoid, becoming ellipsoid, 1 cm. long or less; bracts of the involucre linear-subulate, spreading: fruit less than 1 mm. long, bristly.—Low grounds and waste-places, around sea-ports, Fla. to N. C. Nat. of Argentina.—Spr.–fall or all year S.

5. E. Baldwinii Spreng. Plant prostrate: blades of the basal leaves elliptic varying to broadest above or below the middle, 2–9 cm. long: heads ovoid to cylindric: bracts of the involucre subulate.—Swamps and wet sandy soil, Coastal Plain, Fla. to La. and Ga.—Spr.–fall.

6. E. prostratum Nutt. Plant prostrate: blades of the basal leaves elliptic or ovate, 2–4 cm. long: heads ellipsoid: bracts of the involucre linear-lanceolate to linear-spatulate.—Low grounds and wet places, Coastal Plain and adj. provinces, Fla. to Tex., Mo., Ky., and Ga.—Sum.

7. E. floridanum Coult. & Rose. Stem 6–9 dm. tall: blades of the lower leaves narrowly elliptic to linear-lanceolate, 3–11 cm. long, entire or nearly so: heads becoming about 1 cm. long: sepals ovate, about 2 mm. long: petals about 1 mm. long: fruit about 2 mm. long.—Brackish marshes, Fla.—Spr.–fall.

8. E. virginianum Lam. Stem 3–9 dm. tall: blades of the lower leaves linear, to oblanceolate, 15–40 cm. long, undulate or toothed, often coarsely so: heads becoming about 1.5 cm. long: sepals lanceolate, about 2.5 mm. long, slender-tipped: petals 1–1.5 mm. long: fruit about 1.5 mm. long. [*E. praealtum* A. Gray]—Low grounds and swamps, Coastal Plain, Fla. to Tex. and N. J.—Spr.–fall.

9. **E. Ravenelii** A. Gray. Stem 5–10 dm. tall: blades of the lower leaves narrowly elongate-linear, 25–50 cm. long, undulate or slightly toothed: heads becoming 1–1.5 cm. long: sepals ovate or ovate-lanceolate, 2–3 mm. long, short-acuminate: petals 1.5–2 mm. long: fruit about 2–2.5 mm. long. [*E. Mettaueri* Wood]—Swampy pinelands, Coastal Plain, Fla. to S. C.—Sum.–fall.

10. **E. integrifolium** Walt. Stem 4–9 dm. tall: blades of the lower leaves ovate to elliptic, 5–8 cm. long, serrate-crenate: heads becoming about 1 cm. long: sepals ovate, about 1.5 mm. long, acute: petals 1–1.3 mm. long: fruit 1.5–2 mm. long. [*E. virgatum* Lam.]—Sandy bogs, Coastal Plain and rarely adj. provinces, Fla. to Tex., Tenn., and N. C.—Sum.–fall.

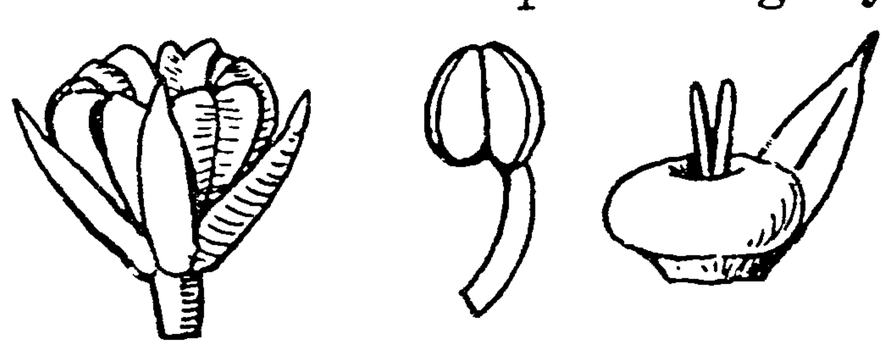
11. **E. Ludovicianum** Morong. Stem more slender than in *E. integrifolium:* blades of the lower leaves linear-spatulate, 3–7 cm. long, laciniately toothed: heads depressed, less than 1 cm. long at maturity: sepals ovate, 1–1.5 mm. long, abruptly pointed: petals 1–1.5 mm. long: fruit about 1 mm. long.—Low pinelands, Coastal Plain, Ga. to Tex.—Sum.–fall.

2. **SANICULA** [Tourn.] L. Biennial or perennial, glabrous or nearly glabrous herbs. Leaves alternate: blades pinnatifid or palmately 3–7-foliolate: leaflets toothed or incised. Umbels irregular, compound, few-rayed. Bracts of the involucres resembling the leaves. Sepals 5, persistent. Petals white, yellowish, or purple. Fruit subglobose or ellipsoid, somewhat dorsally flattened, armed with hooked bristles: carpels ribless: oil-tubes usually 5.—About 25 species, of wide geographic distribution.—Spr.–fall.—SNAKE-ROOTS. BLACK SNAKE-ROOTS SANICLES.—Some species are used in medicine.

Perennial plants: stamens and style exserted.
- Roots slender: leaf-blades 5-divided or 5-foliolate: stamens and styles exserted.
  - Petals and anthers greenish-white: sepals linear-subulate: fruit about 6 mm. long. — 1. *S. marylandica.*
  - Petals and anthers yellow: sepals ovate: fruit about 3 mm. long. — 2. *S. gregaria.*
- Roots tuberous thickened: leaf-blades 3-divided or 3-foliolate: stamens and style short-exserted. — 3. *S. Smallii.*

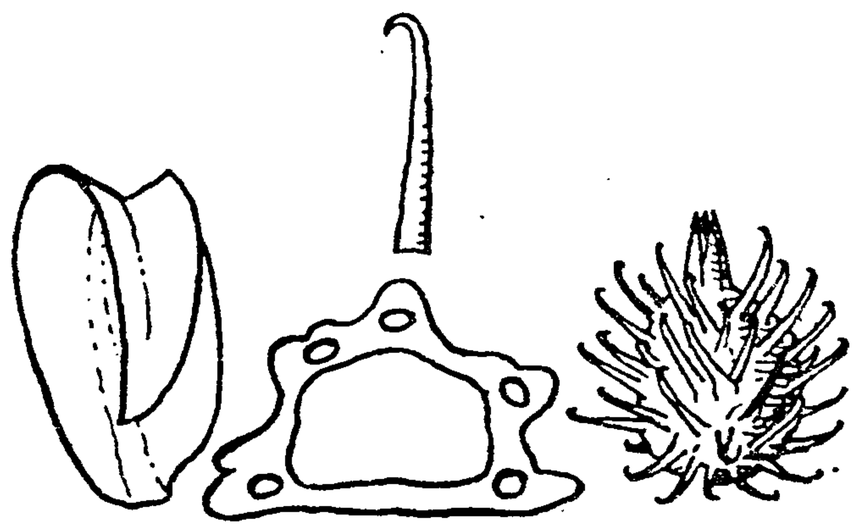
Biennial plants: stamens and style included.
- Pedicels of the staminate flowers 3–4 times the length of the hypanthium and calyx: seed with 2 large oil tubes. — 4. *S. trifoliata.*
- Pedicels of the staminate flowers 1–2 times the length of the hypanthium and calyx: seed with 5 large oil-tubes.
  - Leaf-blades becoming 8–15 cm. broad: leaflets or leaf-segments thin, the teeth weakly aculeate. — 5. *S. canadensis.*
  - Leaf-blades mostly less than 6 cm. broad: leaflets or leaf-segments thickish, the teeth spinulose-cuspidate. — 6. *S. floridana.*

1. **S. marylandica** L. Stem 4.5–13 dm. tall, mostly simple below the inflorescence: leaves bluish-green: involucels of scale-like bractlets: petals slightly longer than the sepals: fruit obovoid, not stipitate.—(BLACK-SNAKEROOT.)—Rich woods and thickets, various provinces, Ga. to Miss., Colo., Alb., Ont., and Newf.



2. **S. gregaria** Bicknell. Stem 3–9 dm. tall, widely branched: leaves bright-green: involucels of foliaceous bractlets: petals much longer than the sepals: fruit broadly obovoid, stipitate.—Moist woods and thickets, various provinces, rarely Coastal Plain, Fla. to Kans., Nebr., Wis., and Vt.

3. **S. Smallii** Bicknell. Stem 2.5–6 dm. tall, widely branched: leaves pale-green: involucels of very small bractlets: petals



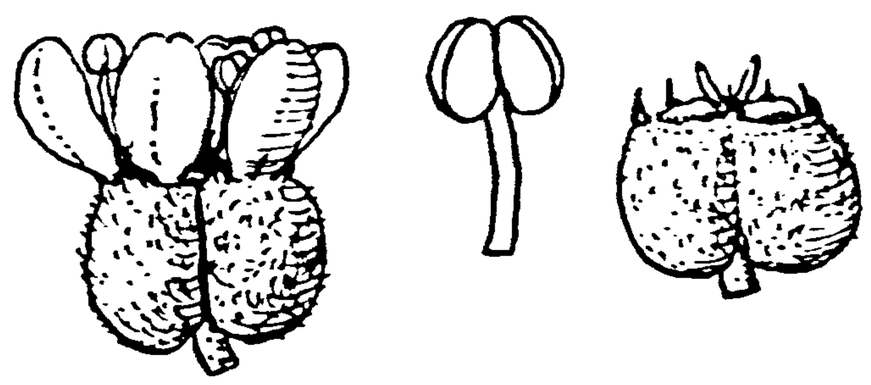
not longer than the sepals, greenish: fruit ovoid.—Rich soil or rocky woods, various provinces, Fla. to Miss., Mo., and N. C.

4. S. trifoliata Bicknell. Stem 3–8 dm. tall: divisions of the leaf ovate or rhombic: involucre of foliaceous bracts: petals greenish: fruits ellipsoid or broader, 7 mm. long at maturity.—Rich woods, various provinces N of Coastal Plain, Tenn. to Ind., Ont., Vt., and Me.

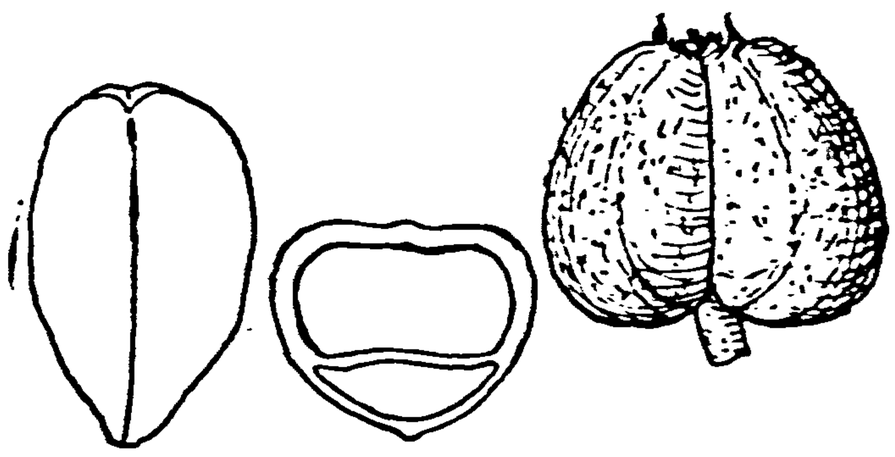
5. S. canadensis L. Stem 3–13 dm. tall: divisions of the leaf-blade cuneate-obovate to narrowly elliptic: involucre of minute bracts: petals greenish: fruit subglobose, 3–5 mm. long, very short-stipitate.—Rich woods and thickets, various provinces, Fla. to Tex., Nebr., Minn., and N. H.—Apparently not in Canada as the name implies.

6. S. floridana Bicknell. Similar to *S. canadensis* in habit, but smaller throughout: divisions of the leaf-blades abruptly cuneate with concave sides: involucre of very small or minute bracts: petals green: fruit smaller than that of *S. canadensis*.—Sandy soil, Coastal Plain, Fla. to Miss. and S. C.

2a. BOWLESIA R. & P. Annual caulescent herbs, with stellate pubescence. Leaves opposite: blades merely lobed. Flowers in simple, few-flowered umbels which terminate axillary peduncles. Sepals 5, prominent. Corolla white. Disk rather flat. Fruit turgid, smooth, stellate-pubescent: carpels ribless, becoming depressed on the back, nearly distinct: oil-tubes wanting or obsolete. Seed dorsally flattened, the face essentially flat.—About a dozen species, mostly South American.



1. B. septentrionalis Coult. & Rose. Stems weak, reclining or decumbent, 0.5–6 dm. long, dichotomously branched: leaf-blades reniform to ovate-cordate, 1.5–3 cm. broad, thin, 3–5-lobed, slender-petioled: umbels short-peduncled, 1–4-flowered; fruit about 2 mm. long, sessile or nearly so.—Rich soil, marshes, swamps, and woods, various provinces, La. to Calif.—Spr.



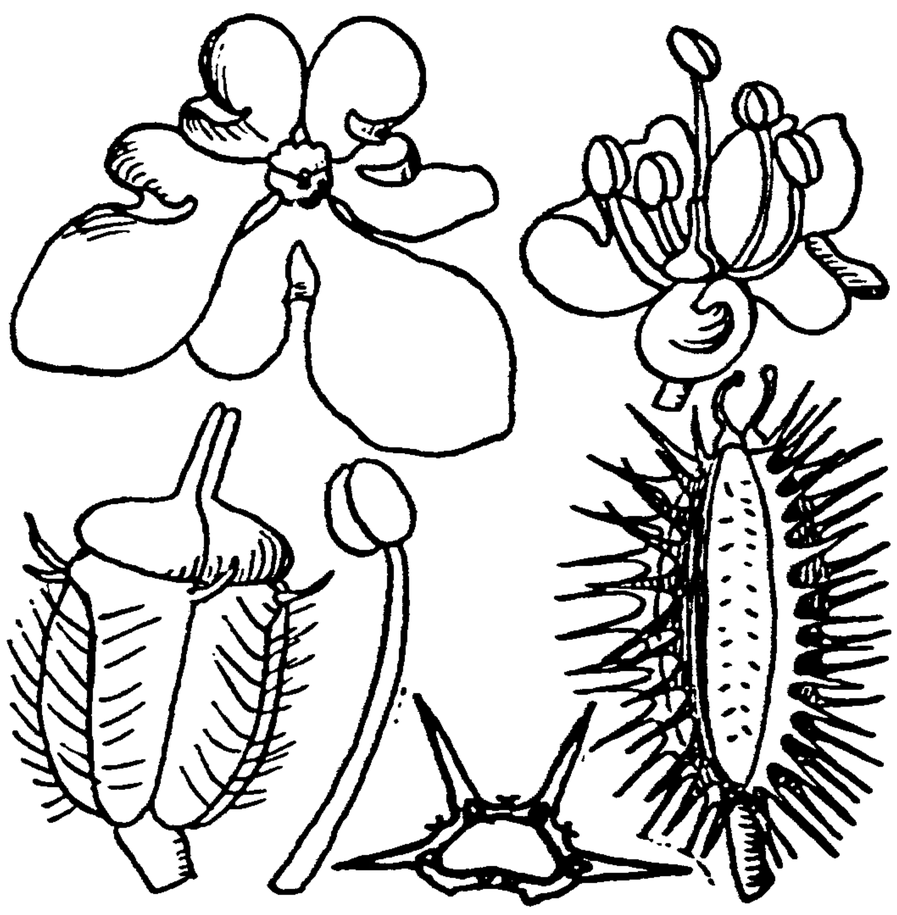
3. DAUCUS [Tourn.] L. Annual or biennial herbs. Leaf-blades pinnately decompound. Umbels compound. Involucres and involucels various, or wanting. Sepals minute or obsolete. Petals white or rarely colored, often unequal, broadest above the middle, inflexed at the apex. Fruit longer than broad: carpels with 5 low primary ribs and 4 winged secondary ribs which are also armed with a row of barbed bristles: oil-tubes solitary under the secondary ribs and 2 on the inner face.—About 25 species, widely distributed.—CARROTS.

Carpels broadest at the middle; wings divided into 12 or more bristle-like prickles. 1. *D. Carota.*

Carpels broadest below the middle; wings parted into 1–8 flat prickles. 2. *D. pusillus.*

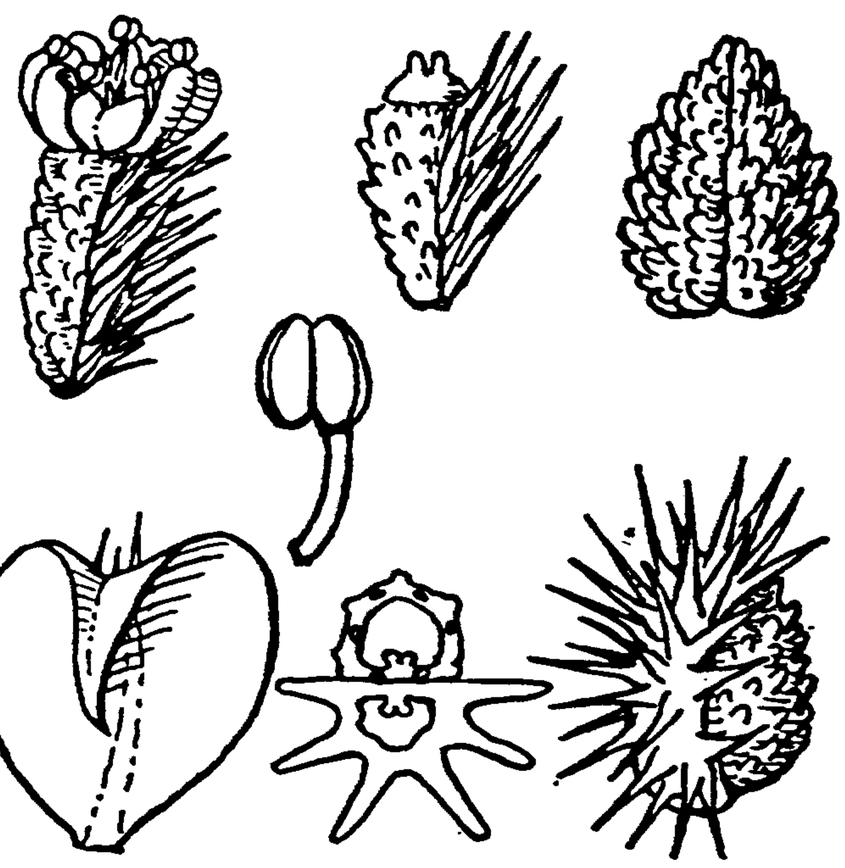
1. D. Carota L. Stem bristly-hispid, erect, 4–12 dm. tall, often branched, channeled: leaf-segments acute or cuspidate, cleft or toothed: rays of the com-

pound umbel numerous: corolla white or rarely pink, a few in each umbel larger than the rest, the central one often purple: petals very unequal, suborbicular, unequally cleft, crisped: fruit 3–4 mm. long, the carpels broadest at the middle, the wings divided into 12 or more bristle-like prickles. — (WILD-CARROT. QUEEN-ANNE'S LACE. DEVIL'S PLAGUE.)—In fields and waste-places, nearly throughout N. A.; except the extreme N and S. Nat. of Eurasia.—(*W. I.*)—Spr.–fall. The root of the cultivated plant is esculent.



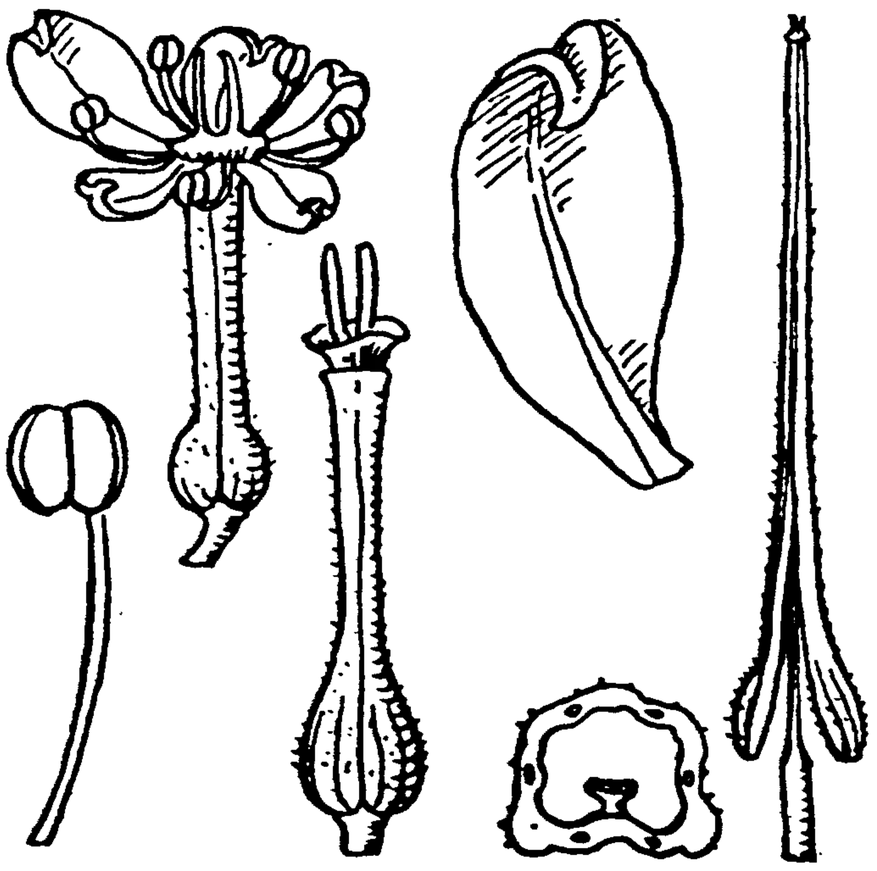
2. D. pusillus Michx. Stem retrorsely hispid, erect, 1–8 dm. tall: umbels long-pedunculed: rays several or numerous, 1–2 cm. long, nearly equal: corolla white, or the central one larger and purple: fruit ovoid-ellipsoid, 3–4 mm. long, the wings parted into 1–8 flat prickles. Fields and waste-places, various provinces, Fla. to Tex., Calif., B. C., and Mo.—Spr.–fall.

4. TORILIS Adans. Annual herbs. Leaf-blades pinnately decompound. Umbels capitate or spreading. Involucres of few bracts or wanting. Involucels of several or many narrow bracts. Sepals acute. Petals white, unequal. Carpels short, with 5 primary ribs and 4 winged secondary ribs. Oil-tubes solitary under the ribs and 2 in the inner face.—About 20 species, natives of the Northern Hemisphere.



1. T. nodosa (L.) Gaertn. Plant diffuse, the branches hispid, 1–4 dm. long: fruit ovoid or elliptic-ovoid, about 3 mm. long, the outer ones spine-armed.—(HEDGE-PARSLEY.)—Waste-places, various provinces, Fla. to Tex., Ia., and Pa., also in Calif. Nat. of Eu. and Afr.—Spr.–sum.

5. SCANDIX [Tourn.] L. Annual herbs. Leaf-blades pinnately dissected; umbel compound. Involucre wanting or nearly so. Involucel of several entire lobed or dissected bractlets. Sepals minute or obsolete. Petals white, unequal. Fruit narrow, much elongate, the body prolonged into a long slender beak, the primary ribs prominent, the secondary ones wanting: oil tubes solitary or wanting.—About 10 species, natives of the Old World.



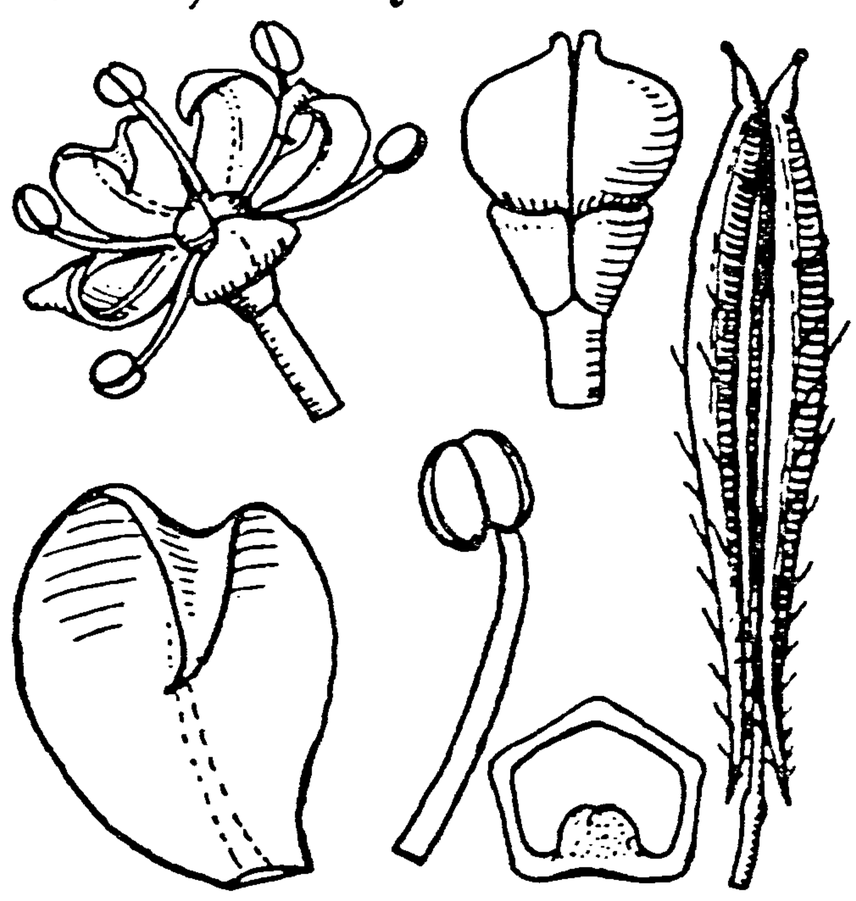
1. S. Pecten-Veneris L. Stem 1–5 dm. tall, pubescent, commonly branched at the base: leaf-blades 2 or 3 pinnately dissected, the lobes acute: umbels usually paired or in threes: fruit needle-like, erect, the body narrow grooved, the beak 4–6 cm. long,

ciliate.—(VENUS'-COMB. LADY'S-COMB. CROW-NEEDLES.)—Waste-places, Atlantic sea-ports, Ga. northward; locally to the Pacific Coast. Native of Eurasia.—(*S. A.*) Sum.–fall.—The shoots are used as salad.

6. **OSMORRHIZA** Raf. Perennial herbs. Leaf-blades ternately compound, the segments broad. Umbels loose, compound. Involucres and involucels of few bracts or bractlets, or wanting. Sepals obsolete. Petals white, inflexed at the apex. Fruits elongate: carpels 5-angled, with barely equal ribs: oil-tubes obsolete or wanting. [*Washingtonia* Raf.]—About 15 species, American and Asiatic.—Spr.—SWEET-CICELIES.

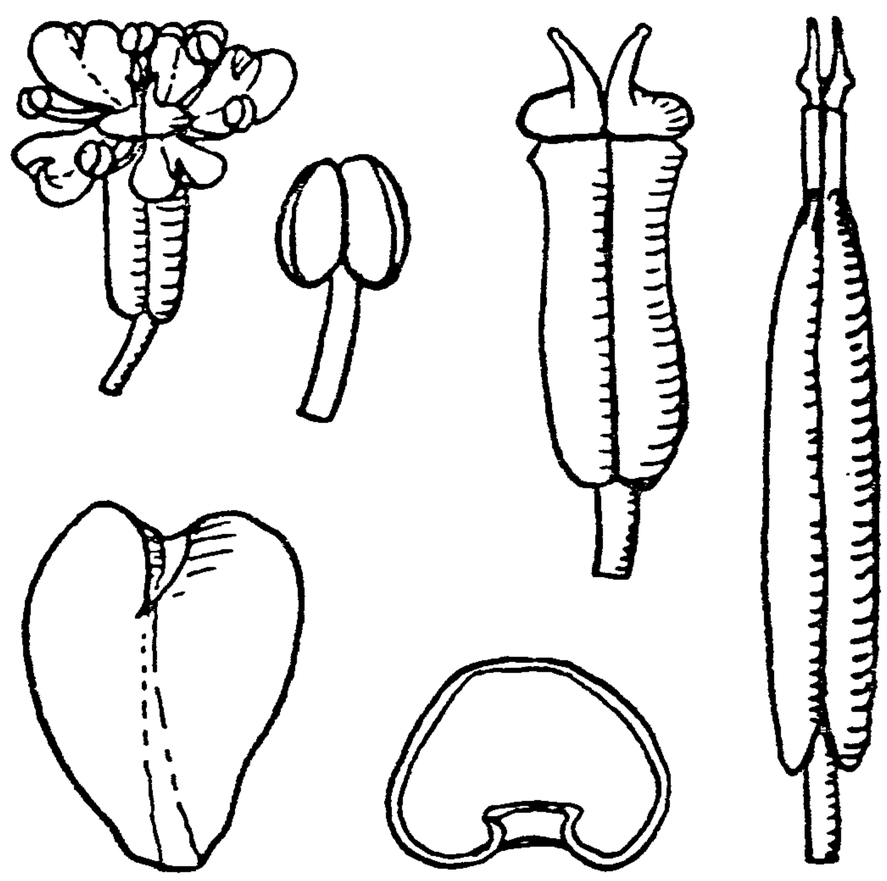
Rachis of the leaf-blades with villous hairs: stylopodium and styles about 1 mm. long. 1. *O. Claytonii.*
Rachis of the leaf-blades glabrous or with short hairs: stylopodium and styles fully 3 mm. long. 2. *O. longistylis.*

1. **O. Claytonii** (Michx.) DC. Roots slightly if at all aromatic: foliage villous-hirsute: stem erect or ascending, 3–9 dm. tall, usually branched: leaf-segments 4–8 cm. long, acute or acuminate, coarsely toothed, cleft, incised, or divided: umbel-rays 4–6, 2–5 cm. long: bracts of the involucres and bractlets, linear to oblong-linear, acute: corolla white, about 4 mm. broad: fruit narrowly oblong, 18–20 mm. long, the body longer than the slender strigose base. — (SWEET JARVIL.) — Rich woods and thickets, various provinces, rarely Coastal Plain, Ala. to Kans., S. D., Ont., N. S., and N. C.



2. **O. longistylis** (Torr.) DC. Root sweet-aromatic: foliage glabrous or finely pubescent: leaf-segments mainly ovate or oblong-ovate, 5–10 cm. long, acute or short-acuminate, coarsely serrate or incised, or even divided: umbel-rays usually 3–6, ascending: corolla white, 4–5 mm. broad: fruit narrowly oblong, 15–18 mm. long: the body longer than the slender very strigose base.—(ANISE-ROOT.)—Rich woods, various provinces, Ala. to Colo., Assina., N. S., and N. C.

7. **CEREFOLIUM** [Rivin.] Haller. Annual herbs, resembling *Chaerophyllum.* Leaf-blades ternately decompound, the segments small. Umbels compound, regular or nearly so. Involucre of toothed or compound bracts. Involucels of narrow, mostly entire, bractlets. Sepals obsolete. Petals white, usually nearly or quite equal, inflexed at the apex. Fruit elongate. Carpels more or less angled, but not ribbed: oil-tubes wanting. [*Anthriscus* Bernh.]—Few species, in the warm and temperate parts of the Old World.



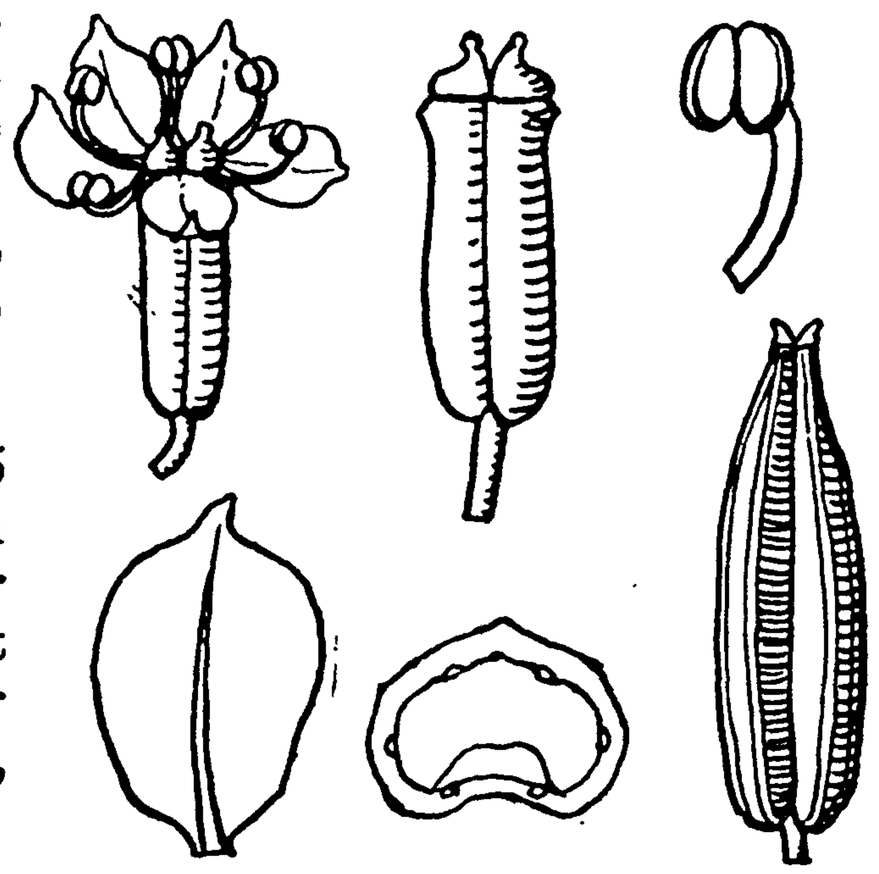
1. **C. Cerefolium** (L.) Britton. Plants 1 m. tall or less, often weak-stemmed: leaf-blades broad, the segments rather numerous, thin: umbels long-peduncled, the rays few, 2–4

mm. long: petals white, obovate, 1.5–2 mm. long: fruit linear-subulate, 8–10 mm. long, shining, slender-beaked.—(CHERVIL.)—Waste places and roadsides, various provinces, La. to Tenn., Ont., and Pa.—Nat. of Eu.—Spr.

8. **CHAEROPHYLLUM** [Tourn.] L. Annual herbs. Leaf-blades ternately decompound, the segments narrow. Umbels irregular, compound. Involucres of 1 or 2 bracts, or usually wanting. Involucels of several small bracts. Sepals obsolete. Petals white, usually unequal, inflexed at the apex. Fruit elongate: carpels 5-angled, the angles equally ribbed: oil-tubes solitary in the intervals and 2 in the inner face. About 40 species, natives, mostly, of the warmer parts of the north temperate zone. Spr.—CHERVILS.

Fruit sometimes contracted below the apex, but beakless: plants glabrous.
  Fruit less than 2 mm. broad, constricted below the apex. 1. *C. procumbens.*
  Fruit fully 2 mm. broad, not constricted below the apex. 2. *C. Shortii.*
Fruit beaked or narrowed to the apex: plants more or less pubescent.
  Fruit with the ribs narrower than the intervals.
    Fruit pubescent. 3. *C. dasycarpum.*
    Fruit glabrous. 4. *C. floridanum.*
  Fruit with the ribs broader than the intervals. 5. *C. Teinturieri.*

1. C. procumbens (L.) Crantz. Stem weak, decumbent or spreading, 1–5 dm. long, simple or sparingly branched: umbels few-rayed, peduncled or nearly sessile: pedicels sometimes 8 mm. long, lax and spreading: fruit narrow, about 8 mm. long, glabrous, contracted below the apex, the ribs narrower than the intervals.—(WILD-CHERVIL.)—Open woods and damp thickets, various provinces, Ala. to Ark., Kans., Mich., and N. Y.



2. C. Shortii (T. & G.) Bush. Stem 2–5 dm. long, spreading or decumbent, often branched: umbels few-rayed, sessile or peduncled: fruit oblong, 5–6 mm. long, not contracted below the apex, the ribs narrower than the intervals.—Thickets and fields, various provinces, Tenn. to Va. and Pa.

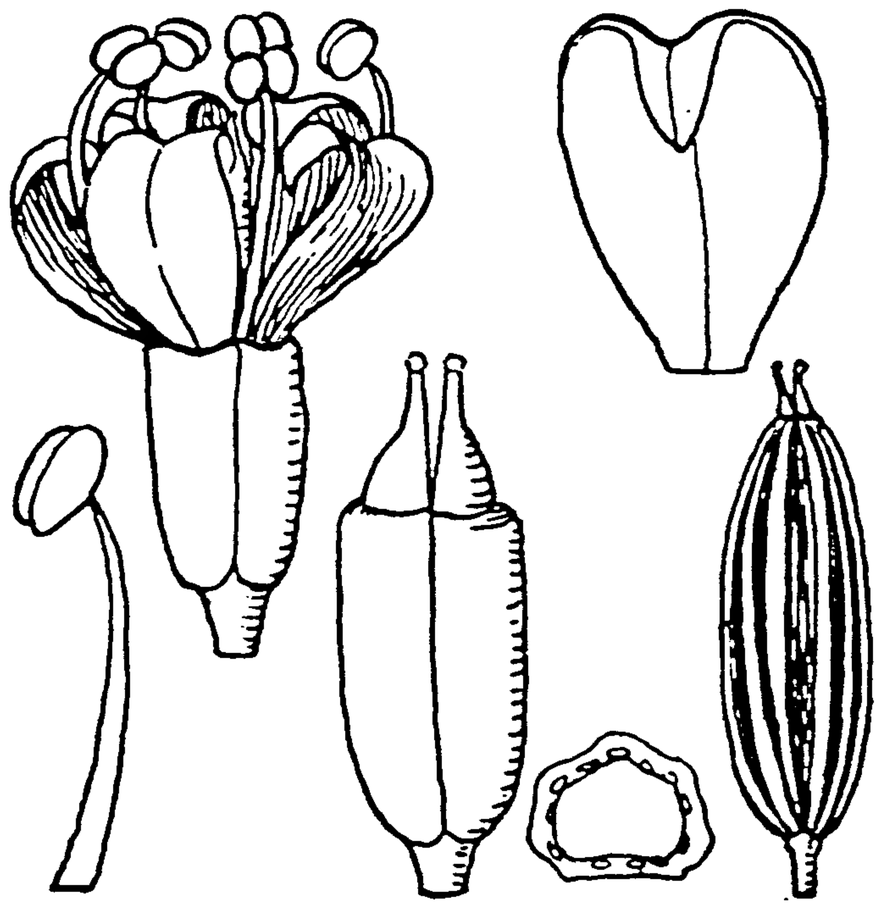
3. C. dasycarpum Nutt. Stem erect, 2–6 dm. tall, branching: umbels sessile or short-peduncled, the rays ascending or spreading, 3–5 cm. long: fruit narrow, 5–6 mm. long, pubescent, beaked, the ribs prominent, narrower than the intervals.—Hillsides and thickets, Coastal Plain, Ala. to Tex.

4. C. floridanum (Coult. & Rose) Bush. Stems erect, 2–6 dm. tall, glabrous or somewhat pubescent: umbels peduncled, the rays 2–5 cm. long: fruit narrow, 7 mm. long, glabrous, the beak one-fourth or one-fifth as long as the body.—Woods, Coastal Plain, Fla. to S. C.; (also in Mo.?).

5. C. Teinturièri Hook. Stem erect, 2–7 dm. tall, more or less branched: umbels sessile or short-peduncled: rays 2–3, 2–5 cm. long: fruit narrow, 6–7 mm. long, beaked, glabrous or nearly so, the ribs prominent, broader than the intervals.—Thickets, cedar-glades, waste-places, and roadsides, various provinces, Fla. to Tex., Ky., and Va.

9. **DERINGA** Adans. Perennial herbs with fibrous roots. Leaf-blades 3-foliolate. Umbels irregular, compound. Involucres and involucels wanting.

Sepals obsolete. Petals white. Fruit elongate: carpels with 5 low ribs, and an oil-tube beneath each rib and in each interval.—One species.

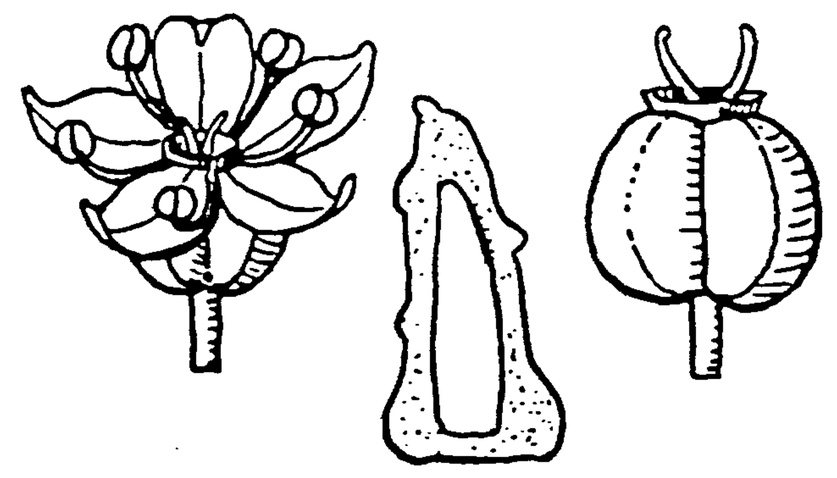


1. D. canadensis (L.) Kuntze. Plant glabrous or nearly so: stem 3–10 dm. tall, finally widely branched: leaf-blades 3-foliolate: leaflets ovate, oval, or elliptic, 4–10 cm. long, acute or abruptly pointed, doubly serrate with sharp teeth, the lateral ones often lobed: umbels peduncled: rays few, slender, unequal in length: pedicels 2–25 mm. long: corolla white, 2–3 mm. broad: fruit oblong 4–6 mm. long, straight, or curved at full maturity.—(HONEWORT.)—Thickets and rich woods, various provinces, Ga. to Tex., S. D., Ont., and N. B.—Spr.–sum.

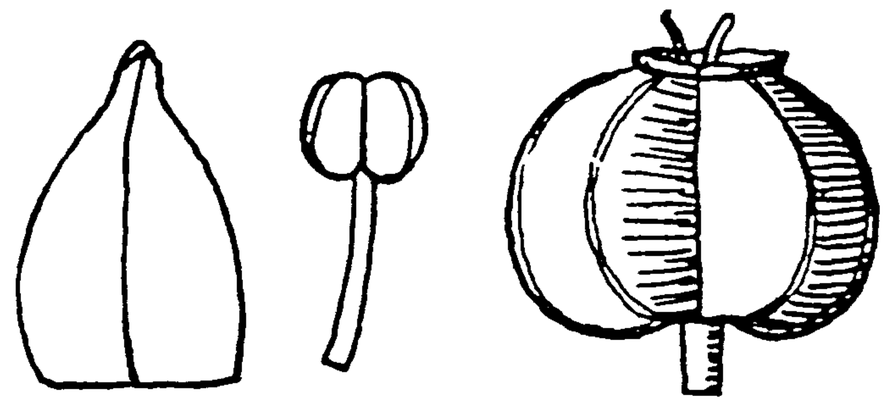
10. HYDROCOTYLE [Tourn.] L. Perennial amphibious herbs. Leaves solitary at each node. Umbels simple or proliferous. Sepals manifest. Petals valvate, white. Carpels with distinct ribs, and oil-bearing tissues beneath the epidermis.—About 75 species, widely distributed.—Sum. or all year S.—MARSH-PENNYWORTS. WATER-PENNYWORTS. NAVELWORTS.—Some species are used medicinally.

Leaf-blades suborbicular to transversely elliptic, peltate.
  Fruit notched at the base and the apex at maturity: intermediate ribs corky.
    Umbels not proliferous, at least not normally so. 1. *H. umbellata.*
    Umbels or most of them proliferous.
      Peduncle produced beyond the first umbel as a single rachis, bearing one or more umbels beyond it. 2. *H. Canbyi.*
      Peduncle produced beyond the first umbel branching and bearing several more or less proliferous umbels. 3. *H. bonariensis.*
  Fruit rounded at the base and the apex or cuneate at the base: intermediate ribs not corky, very slender.
    Fruit rounded or truncate at the base, not cuneate. 4. *H. verticillata.*
    Fruit cuneate at the base. 5. *H. australis.*
Leaf-blades reniform to suborbicular, not peltate.
  Umbel long-peduncled: leaf-blades deeply lobed. 6. *H. ranunculoides.*
  Umbel nearly sessile: leaf-blades shallowly lobed. 7. *H. americana.*

1. H. umbellata L. Leaf-blades suborbicular, 2–5 cm. wide, crenate or crenate-lobed: pedicels slender, 4–12 mm. long: fruit about 3 mm. wide, with corky-thickened ribs.—Swamps, meadows, ditches, and low pinelands, various provinces, Fla. to Tex., Minn., and Mass.—(*W. I., Mex., C. A., S. A., O. W.*)



2. H. Canbyi Coult. & Rose. Leaf-blades 1.5–4 cm. wide, shallowly crenate-lobed: pedicels 1–4 mm. long: fruit between 3 and 4 mm. wide.—Damp places, usually sandy soil, Coastal Plain, Fla. to Miss. and N. J.



3. H. bonariensis Lam. Leaf-blades depressed, orbicular to orbicular-reniform, 3.5–9.5 cm. wide, shallowly lobed, the lobes crenate: fruit about 3 mm. wide.—Waste-places, ponds and ditches, Coastal Plain, Fla. to Tex., Tenn., and N. C.—(*W. I., Mex., C. A., S. A.*)—Often grows very large and forms floating masses.

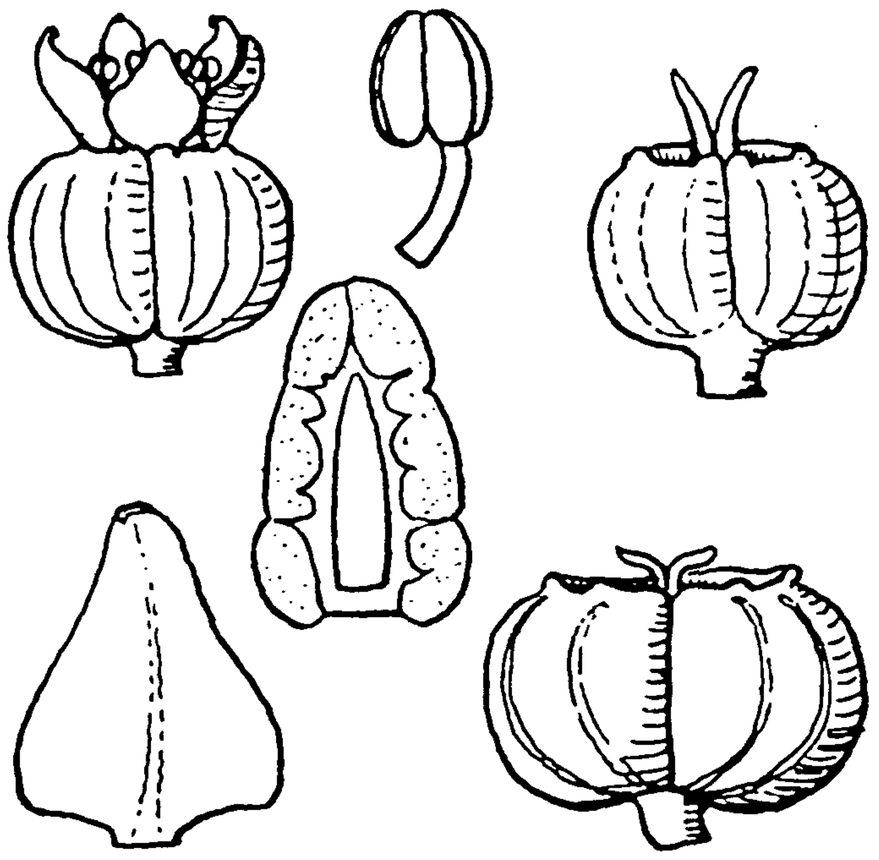
4. H. verticillata Thunb. Leaf-blades suborbicular to oval, 1–6 cm. wide, shallowly crenate: pedicels very short or wanting: fruit 3–4 mm. wide, with slender ribs.—Low grounds, swamps, and ponds, Coastal Plain and adj. provinces, Fla. to Tex., Ark. and Mass.

5. H. australis Coult. & Rose. Similar to *H. Canbyi* in habit: fruit slightly broader than long.—Low grounds, Coastal Plain, Fla. to Tex. and Va.—(*W. I.*)

6. H. ranunculoides L. f. Leaf-blades reniform to orbicular-reniform, 2–5 cm. wide, deeply lobed: petals over 1 mm. long: fruit 2.5–3 mm. wide, obscurely ribbed, oblong in cross-section.—Swamps, ditches, shallow ponds, and muddy shores, various provinces, Fla. to Tex., Ark., and Pa.; also Pacific Coast.—(*W. I., C. A., S. A., O. W.*)

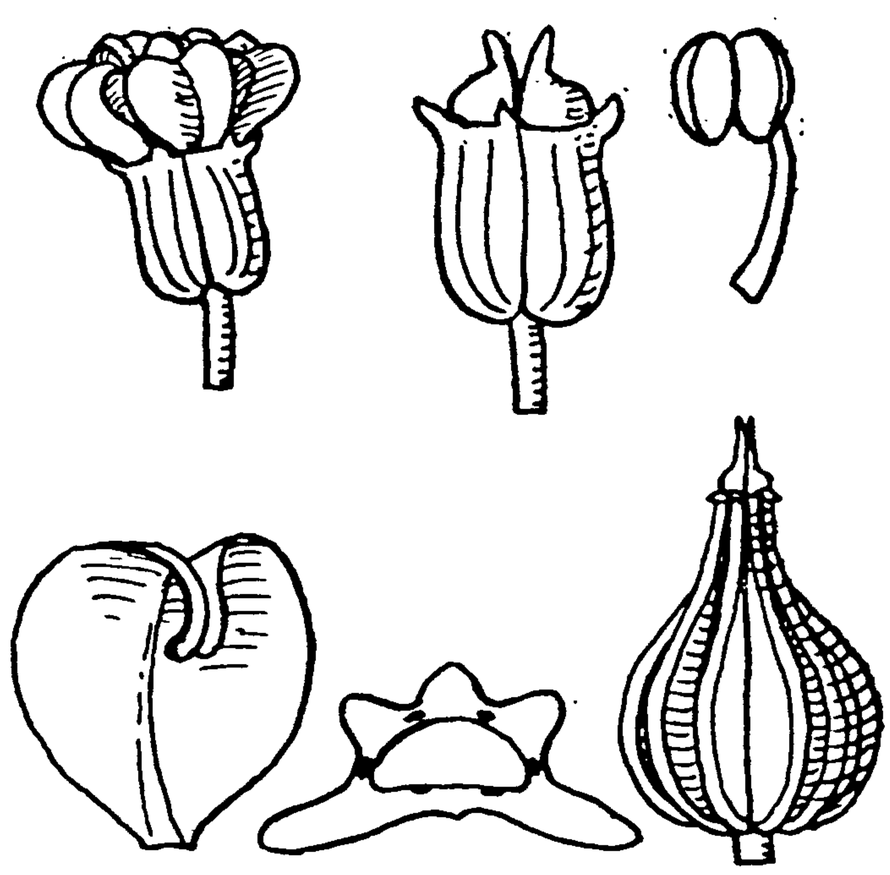
7. H. americana L. Leaf-blades reniform, 2–5 cm. wide, crenate-lobed; petals less than 1 mm. long: fruit 1–1.5 mm. wide, sharply ribbed, oval in cross-section.—(MARSH-PENNYWORT.)—Moist thickets, wet banks, and swamps, various provinces, Coastal Plain only N, N. C. to Tenn., Minn., and N. S.

11. CENTELLA L. Perennial amphibious plants. Leaves clustered at the nodes. Umbels capitate. Sepals obsolete. Petals imbricate, white. Carpels without large oil-tubes, the prominent ribs anastomosing.—About 20 species, most abundant in Southern Africa.



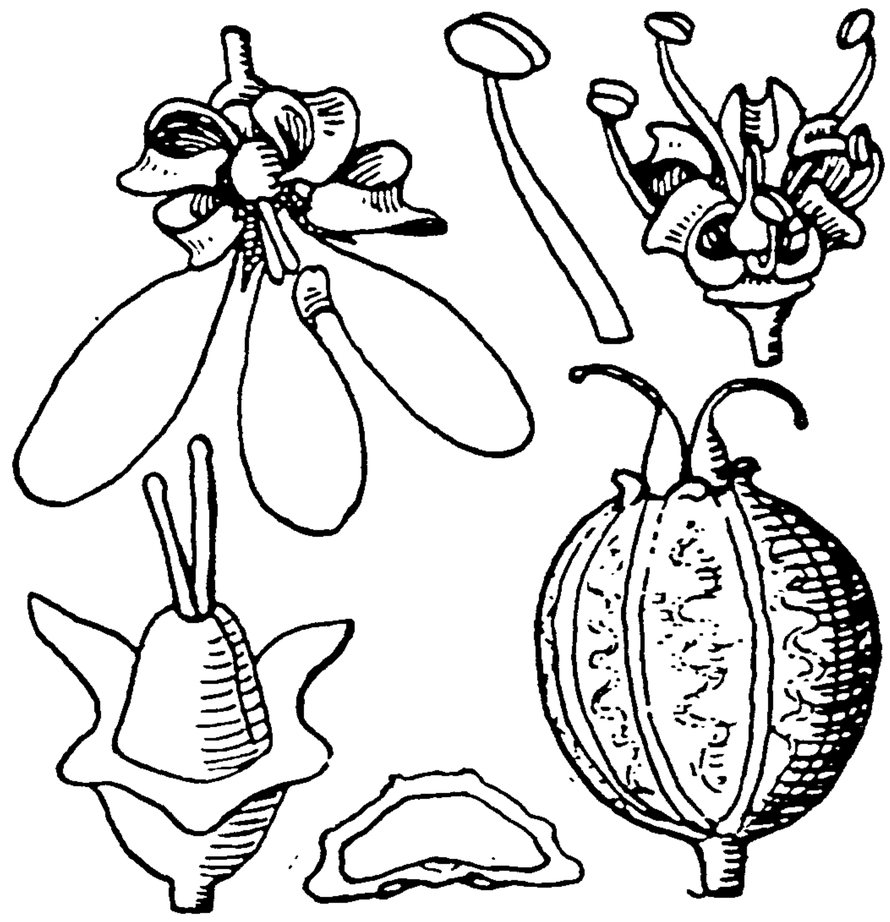
1. C. repanda (Pers.) Small. Leaves clustered; petioles erect, 9–30 cm. long (about 2.5 cm. long, and with larger fruit, in *C. repanda floridana*); blades thickish, ovate, 2–6 cm. long, repand, cordate or nearly truncate at the base: peduncles usually several together, mostly shorter than the petioles: umbels 2–4-flowered: fruit 4–5 mm. wide. [*Hydrocotyle repanda* Pers.]—Moist pinelands, lake-shores, and shallow ponds, Coastal Plain, Fla. to Tex., and Md.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall, or all year S.

12. CYNOSCIADIUM DC. Annual herbs. Leaf-blades pinnately or palmately divided into narrow segments, or the basal leaves with entire blades: umbels compound. Involucres and involucels of persistent or deciduous narrow bracts. Sepals persistent. Petals white, broadest above the middle. Fruit elongate: carpels with strong ribs, the lateral ribs more prominent: oil-tubes solitary in each interval or two in the inner face.—About 10 species, natives of the north temperate zone.



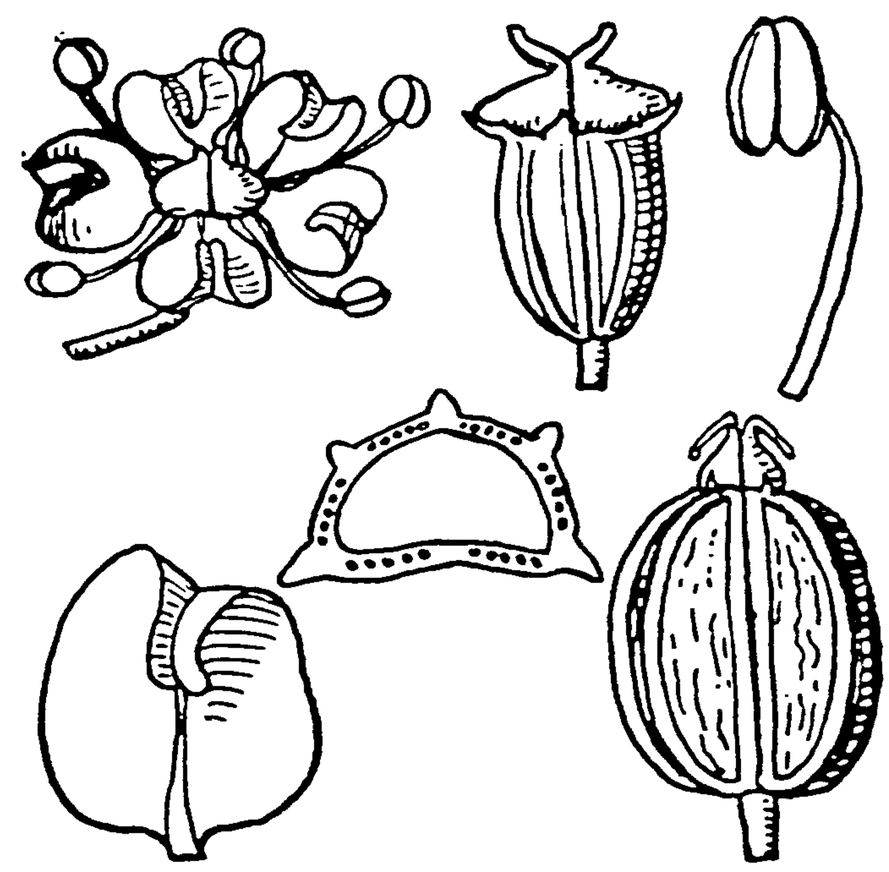
1. C. digitatum DC. Plant 2–6 dm. tall: leaf-blades, or segments, linear to linear-lanceolate: umbel-rays 3–8, 1–3.5 cm. long: pedicels 2–8 mm. long: fruit beaked.—Wet grounds, Coastal Plain and adj. provinces, Ala. to Tex. and Ark.—Spr.–sum.

13. CORIANDRUM [Tourn.] L. Annual slender herbs. Leaf-blades pinnately dissected. Umbels compound. Involucres wanting. Sepals acute, unequal. Petals white, often unequal, broadest above the middle. Fruit sub-globose, not constricted at the commissure: carpels with 5 delicate ribs: oil-tubes solitary under the secondary ribs.—Two species, natives of the Old World.



1. C. sativum L. Stem 2–6 dm. tall: blades of the lower cauline and basal leaves with coarse-toothed, incised, or lobed segments, those of the upper leaves with narrowly linear segments: umbel-rays 4–8, 12–21 mm. long: pedicels 1–3 mm. long: fruit subglobose or ovoid-globose, 3–3.5 mm. long: carpels slightly ribbed.—(CORIANDER.)—Waste-places and cult. grounds, in and about towns and cities, nearly throughout U. S. Nat. of Eurasia.—Sum.—The fruit is used medicinally and as a condiment.

14. LIGUSTICUM L. Perennial herbs with large roots. Leaf-blades ternately compound. Umbels compound. Involucres of a few narrow bracts. Involucres of a few narrow bracts. Involucels of numerous narrow bractlets. Sepals obsolete. Petals white, broadened upward. Fruit more or less elongate: carpels with sharp prominent ribs and 2–6 oil-tubes in each interval.—About 20 species, natives of the Northern Hemisphere.



1. L. canadense (L.) Britton. Stem 5–20 dm. tall: leaflets elliptic, elliptic-oval, or ovate, 3–8 cm. long, coarsely toothed: fruit ellipsoid, oval, or ovate, 4–6 mm. long, the ribs narrow-winged.—(ANGELICO. NONDO. LOVAGE.)—Dry or rich woods, various provinces, rarely Coastal Plain, Ga. to Miss., Mo., and Pa.—Sum.—The root is aromatic.

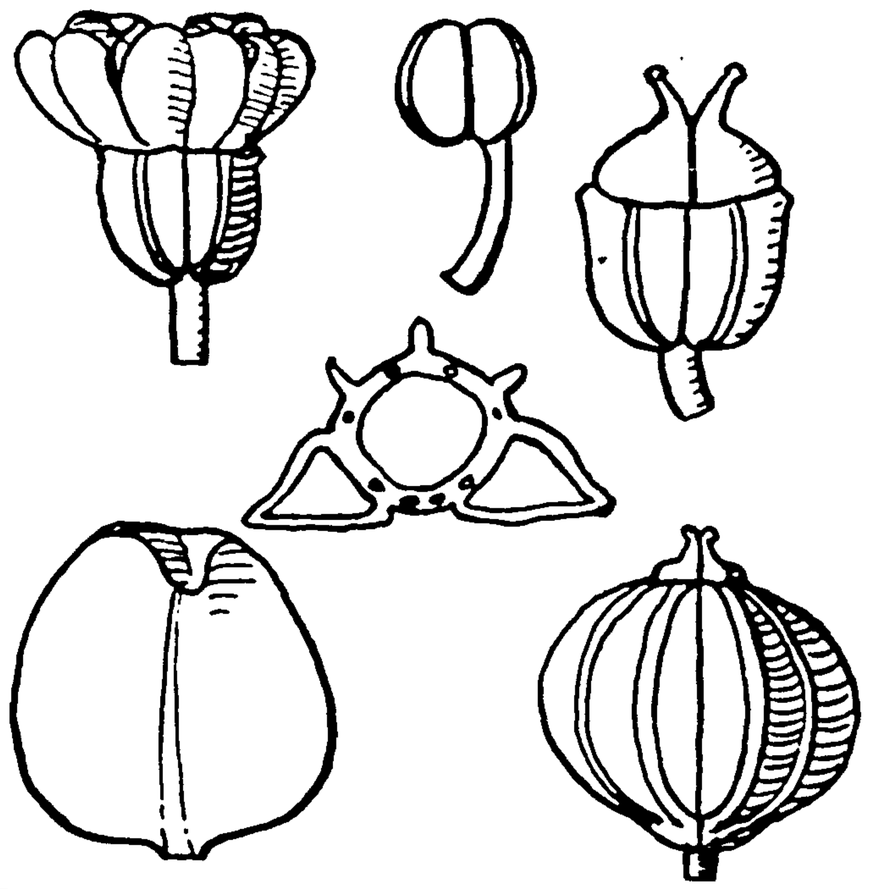
15. LILAEOPSIS Greene. Perennial herbs, with creeping stems. Leaves clustered, reduced to terete clavate, separate organs, sometimes dilated above. Bracts of the involucre several. Umbels several-flowered, simple. Sepals acute. Petals white, concave. Fruit subglobose, or lenticular: carpels with thick corky lateral ribs and filiform dorsal and intermediate ribs or all sometimes corky, with oil-tubes solitary in the intervals. [*Crantzia* Nutt.]—About 10 species.—Sum.

Peduncles surpassing the leaves: fruit pinched at the base; lateral ribs only corky. 1. *L. lineata.*

Peduncles shorter than the leaves: fruit not pinched at the base; all ribs corky. 2. *L. carolinensis.*

1. L. lineata (Michx.) Greene. Stem creeping in the mud: leaves 2–5 cm. long; petioles dilated upward, usually linear-spatulate, barely broadened into

blades, conspicuously cross-partitioned: peduncles 3–7 cm. long, surpassing the leaves: fruit orbicular-ovoid, pinched near the base, about 2 mm. long, the lateral ribs corky, the dorsal not at all corky. [*Crantzia lineata* Nutt.]—Salt or brackish marshes and low grounds, Coastal Plain and New England Coast, Fla. to Miss. and Mass.

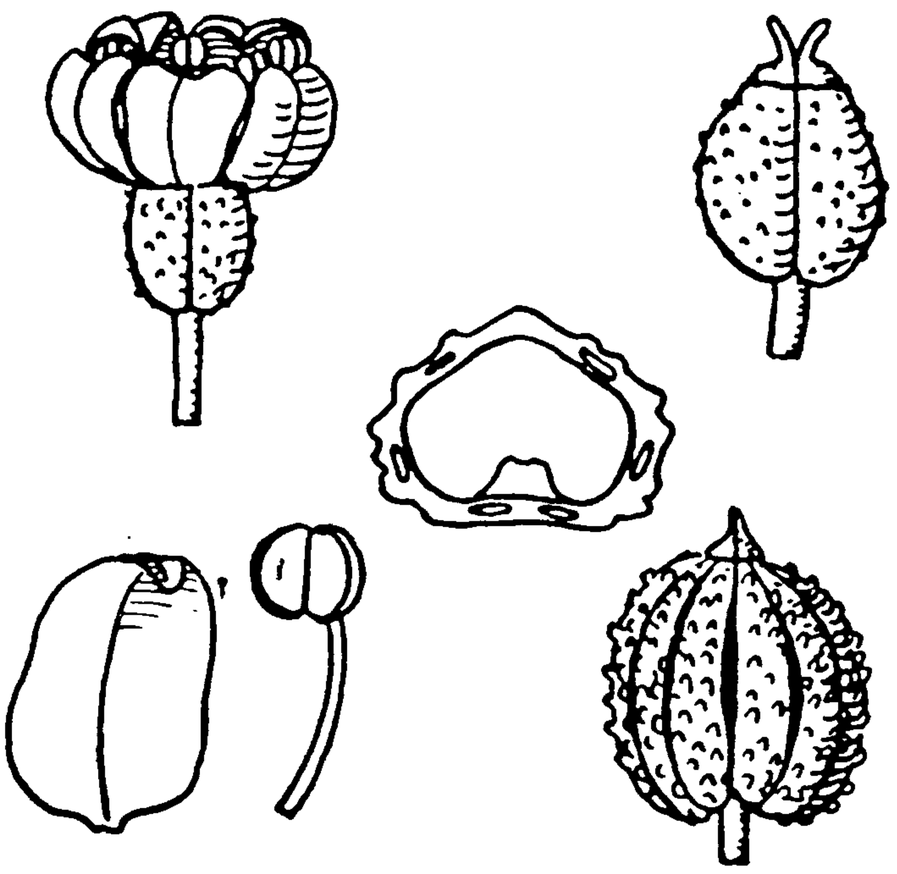


2. L. carolinensis Coult. & Rose. Stem creeping in the mud: leaves 5–25 cm. long; petioles elongate; blades oblong or spatulate, shorter than the petioles: peduncles 1–1.5 cm. long, shorter than the leaves: fruit suborbicular or oval-orbicular, about 3 mm. long, not pinched near the base; all the ribs corky.—Low grounds, Coastal Plain, Fla. to N. C.

16. SPERMOLEPIS Raf. Annual herbs. Leaf-blades finely dissected. Umbels compound. Involucres wanting. Involucels of few narrow bracts. Sepals minute or obsolete. Petals white. Fruit tuberculate or bristly: carpels with 5 prominent or obsolete ribs: oil-tubes solitary in the intervals and sometimes under each rib, except in the inner side where there are two.—Four species, natives of North America.—Spr.

Fruit tubercled.
  Umbel-rays divaricate, the primary ones mostly 3 or 4. 1. *S. divaricata.*
  Umbel-rays erect or nearly so, the primary ones mostly 6–8. 2. *S. patens.*
Fruit covered with short bristly hooked hairs. 3. *S. echinata.*

1. S. divaricata (Walt.) Raf. Stem 1–6 dm. tall, often widely branched, sometimes diffusely so, the branches very slender or nearly filiform: leaf-blades 2–8 cm. long, twice or thrice pinnately parted; segments narrowly linear or filiform: corolla white, about 1 mm. broad: fruit broadest about the middle, about 1 mm. long, tuberculate, prominently ribbed.—Dry or sandy soil, various provinces, Fla. to N. M., Kans., and N. C.

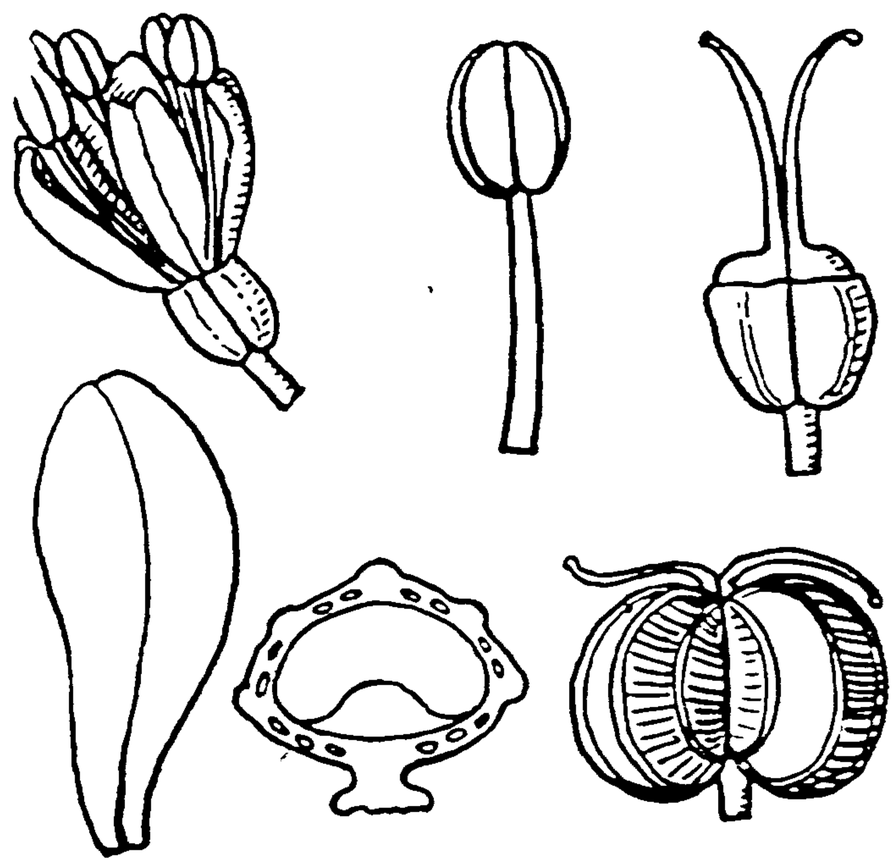


2. S. patens (Nutt.) B. L. Robinson. Stem 2–6 dm. tall: leaf-segments filiform: fruit ovoid, about 1 mm. long, granular.—Dry soil, various provinces, Tenn. to Tex., Nebr., and Ind.

3. S. echinata (Nutt.) Heller. Stem 1–5 dm. tall, more of less diffusely branched: leaf-blades 1–6 cm. long; twice or thrice pinnately parted; segments narrowly linear or filiform: umbels slender-peduncled, 1.5–4 cm. broad: rays slender, more or less variable in length: corolla white, less than 1 mm. broad: fruit broadest below the middle, 2 mm. long, covered with hooked bristles, the ribs obsolete.—Dry soil, various provinces, Ala. to Tex., Calif., and Mo.—(*Mex.*)

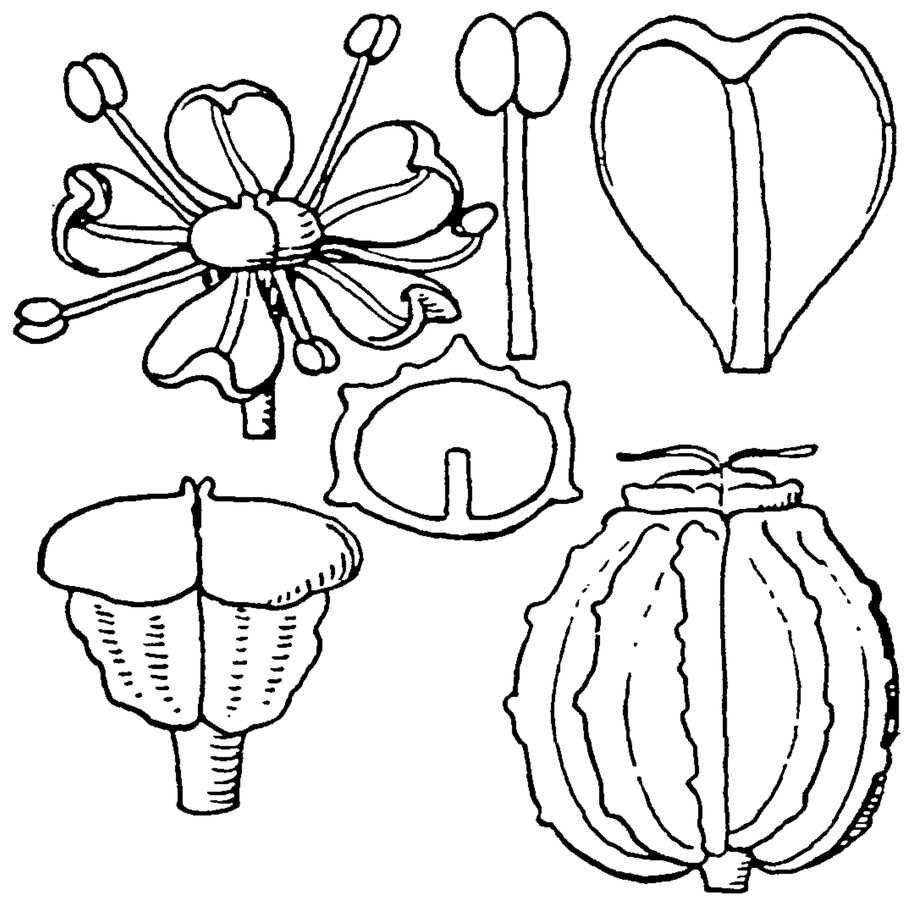
17. ERIGENIA Nutt. Perennial herbs with tuberous roots. Leaf-blades ternately decompound. Umbels few-rayed, compound. Involucres usually of a

single bract. Sepals obsolete. Petals white, broadest above the middle, flat. Fruit broader than high, laterally flattened: carpels with 5 delicate ribs: oil-tubes 2–3 in each interval.—One species.



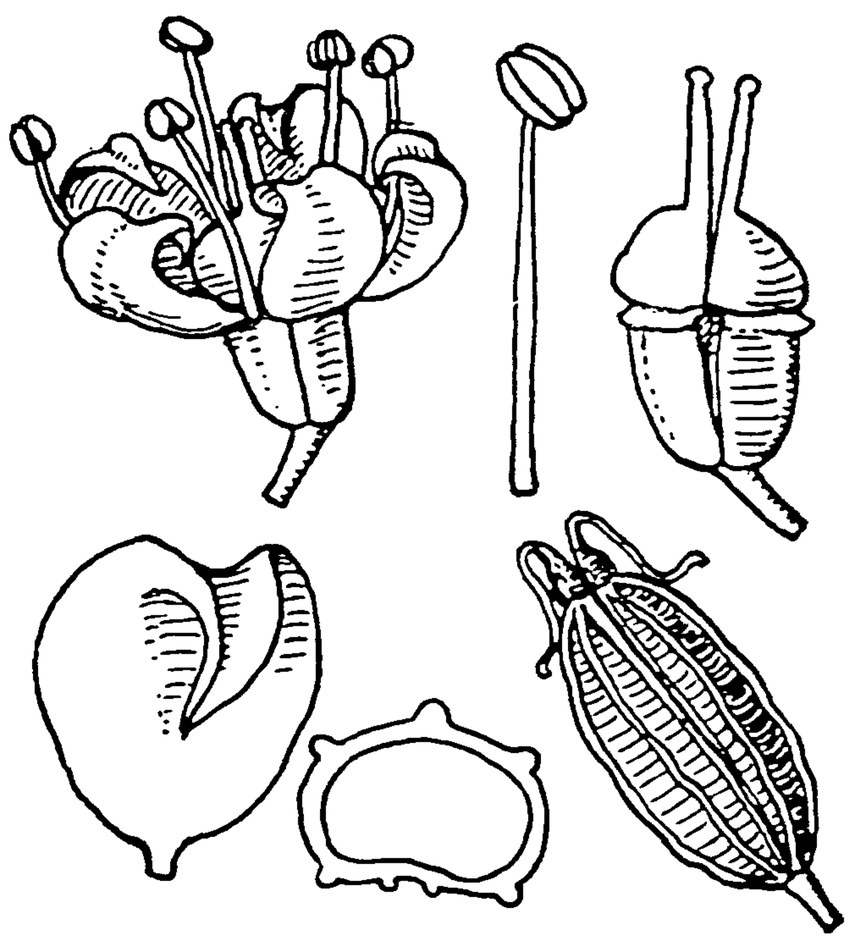
1. E. bulbosa (Michx.) Nutt. Plant 5–20 cm. tall from a depressed tuber: leaf-segments of an elliptic type: fruit about 2 mm. high, 3–4 mm. broad.—(HARBINGER-OF-SPRING. PEPPER-AND-SALT.)—Rich open woods and thickets, various provinces, rarely Coastal Plain, Ala. to Miss., Kans., Minn., Ont., and Md.—Spr.

18. CONIUM L. Biennial large herbs with spotted stems. Leaf-blades broad, pinnately decompound. Umbels compound, the rays unequal. Involucres and involucels inconspicuous, of entire, scarious-margined bracts or bractlets. Sepals minute or obsolete. Petals white, somewhat unequal, broadest above the middle, inflexed at the apex. Fruit short and thick: carpels with prominent wavy ribs: oil-tubes wanting.—One species.



1. C. maculatum L. Plant 1–2 m. tall, the stem usually much branched: leaf-blades broad, the segments very numerous; umbels rather long-peduncled; rays 2–4 cm. long: petals white, obovate or cuneate, mostly about 1 mm. long: fruit ovoid, 2.5–3 mm. long.— (POISON-HEMLOCK.) — Waste-places, cult-grounds, and roadsides, various provinces, Ala. to Tex., Mich., Ont., and Del.; also on Pacific Coast. Nat. of Eu.—(*W. I., Mex., C. A., S. A.*)—Sum. —The fruit is used medicinally.

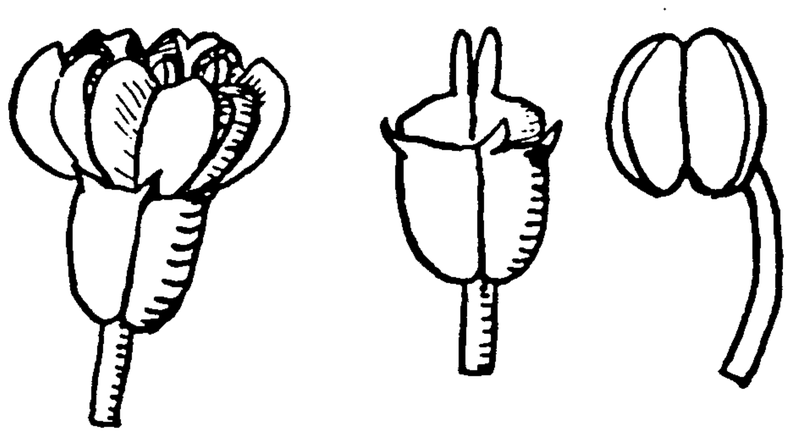
19. AEGOPODIUM L. Perennial caulescent herbs. Leaf-blades ternate, the leaflets or segments large, toothed. Umbel compound, the rays equal or nearly so. Involucres and involucels of narrow bracts and bractlets, or wanting. Sepals minute or obsolete. Petals white, equal or nearly so, broadest above the middle, inflexed at the apex. Fruit short, but longer than thick; carpels turgid, the angles margined: oil-tubes wanting.—One species.



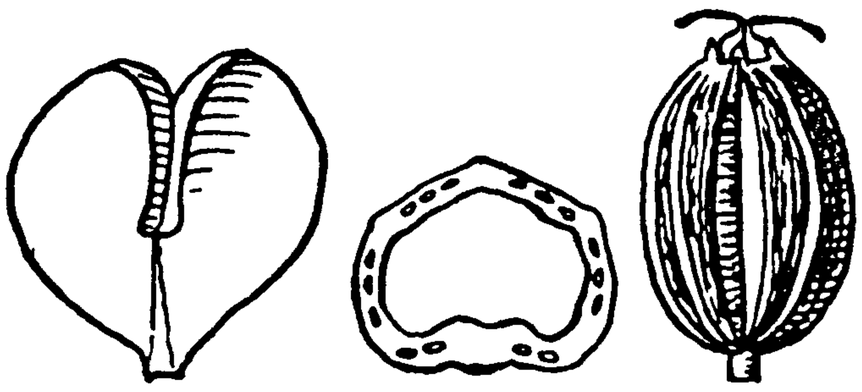
1. A. Podagraria L. Plant 3–11 dm. tall, simple or sparingly branched: leaflets elliptic to ovate, 2.5–9 cm. long, serrate, incised or lobed: umbels long-peduncled; rays 2–4 cm. long: petals white, obovate or orbicular-

obovate, 1–1.5 mm. long: fruit conic-ovoid, about 4 mm. long.—(GOUTWEED.) —Waste-places, roadsides and thickets, N. C. to Pa. and Mass.—Nat. of Eu.—Sum.—A form with variegated leaves is used in gardening.

20. **EULOPHUS** Nutt. Perennial herbs with tuberous roots. Leaf-blades ternately compound. Umbels compound. Involucre wanting or of 1 bract. Involucels usually of 2 bracts. Sepals prominent. Petals white or pink, broadest above the middle, inflexed at the tip. Fruit somewhat elongate, laterally flattened: carpels delicately ribbed: oil-tubes 2–5 in the intervals.—About 8 species, North American.



1. **E. americanus** Nutt. Plant 8–15 dm. tall: segments of the upper leaves much narrower than those of the lower ones: fruit elliptic or elliptic-ovoid, 4–6 mm. long.—Low grounds, various provinces, Tenn. to Ark., Kans. and Ohio.—Sum.

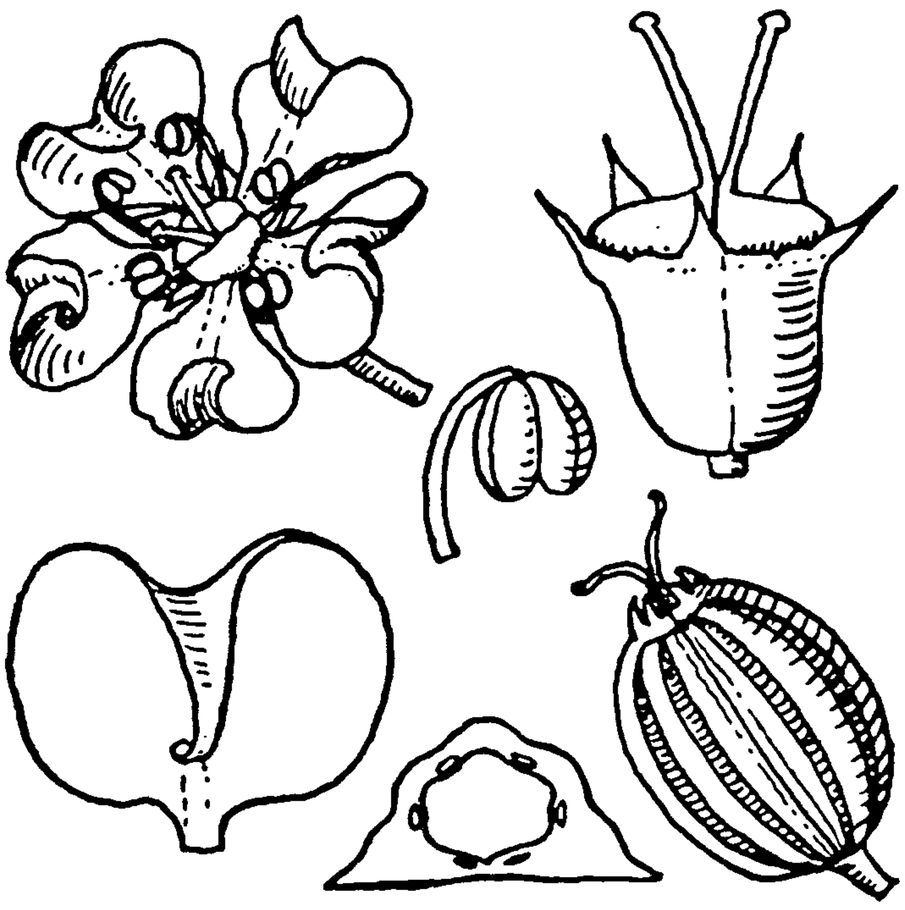


21. **CICUTA** L. Perennial herbs with tuberous roots. Leaf-blades pinnately compound or decompound. Umbels compound. Involucres of few bracts or wanting. Involucels of several small bractlets. Sepals acute. Petals white. Fruit short: carpels with 5 corky ribs, and one oil-tube in each interval and 2 in the inner face.—About 8 species, of the North-temperate zone.—Sum.–fall—WATER-HEMLOCKS.—The roots are poisonous.

Fruit ridged at the commissure, typically oval or ovoid. 1. *C. maculata.*
Fruit grooved at the commissure, typically subglobose or reniform-globose. 2. *C. Curtissii.*

1. **C. maculata** L. Plant stout, 1–2 m. tall: leaf-blades 1–6 dm. long, the veins ending in the notches of the segments: fruit with lateral ribs manifestly much larger than the others and wedge-shaped in section, and contiguous. (SPOTTED-COWBANE. MUSQUASH-ROOT.)—Swamps, low-grounds, and river-banks, various provinces, Miss. to Tex., Man., Ont., N. B., and N. C.

2. **C. Curtissii** Coult. & Rose. Plant resembling *C. maculata*, but with thicker and more reticulate leaf-segments: fruit with apparently equal ribs, the lateral ones neither wedge-shaped nor contiguous.—Swamps and low grounds, Coastal Plain and adj. provinces, Fla. to La., Tenn., (Ky. ?), and Va., also represented by sporadic stations as far North as Nova Scotia.



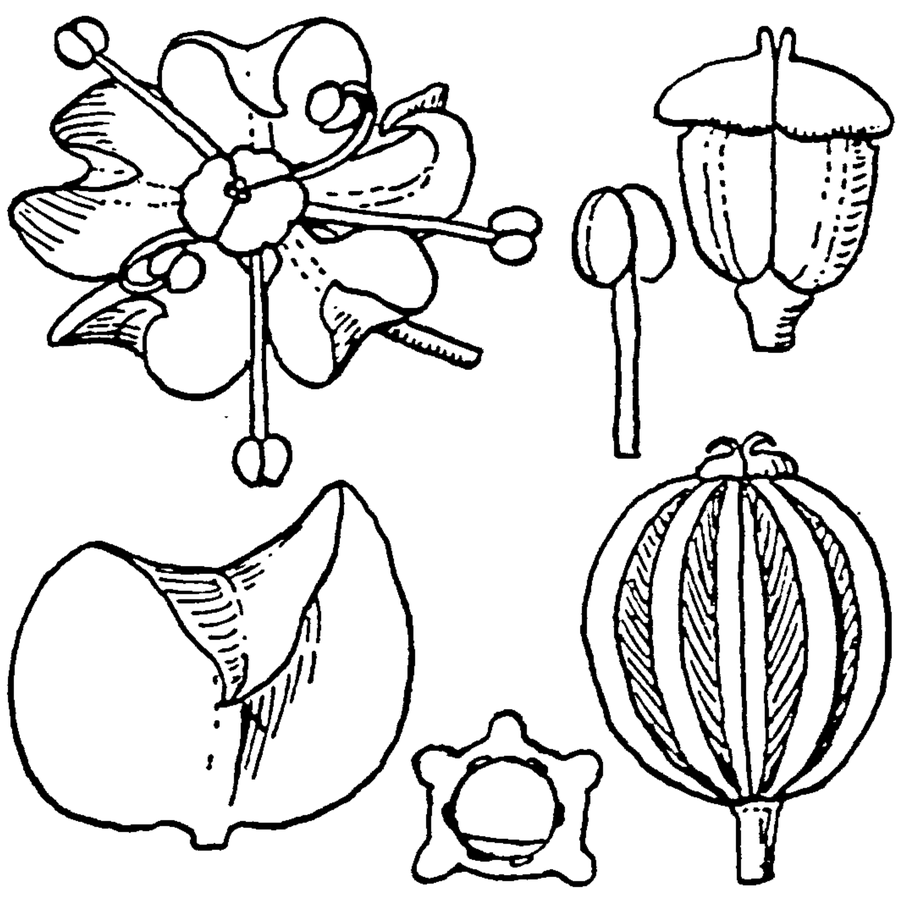
22. **SIUM** [Tourn.] L. Perennial herbs. Leaf-blades pinnately compound. Umbels compound. Involucres and involucels of narrow bracts and bractlets. Sepals small, acute. Petals white. Fruit stout, somewhat laterally

flattened: carpels ribbed, the intervals with 1–3 oil-tubes. Seed 5-angled.—About 8 species, natives of the north temperate zone.

Blades of the leaflets saliently sharp-serrate or incised: larger petals about 1 mm. long: umbels large, the terminal ones at least 5 cm. or more wide in anthesis. 1. *S. cicutaefolium.*

Blades of the leaflets appressed-serrate: larger petals much less than 1 mm. long: umbels small, the terminal ones, at least, 4 cm. wide or less. 2. *S. floridanum.*

1. S. cicutaefolium Schrank. Plant 6–19 dm. tall, glabrous: stem stout, sparingly branched: stipular expansion at base of the petiole auriculate at the top: leaflets 7–17; blades linear to linear-lanceolate, or rarely wider, finely, or usually coarsely and saliently, toothed, or those of the submerged ones coarsely or finely pinnatifid: umbel-rays slender: larger corollas fully 2 mm. wide: fruit oval, 3–3.5 mm. long, prominently 10-ribbed.—(WATER-PARSLEY.)—Swamps, marshes, and ponds, various provinces, N. C. to La., Calif., and S Can.—Sum.–fall.



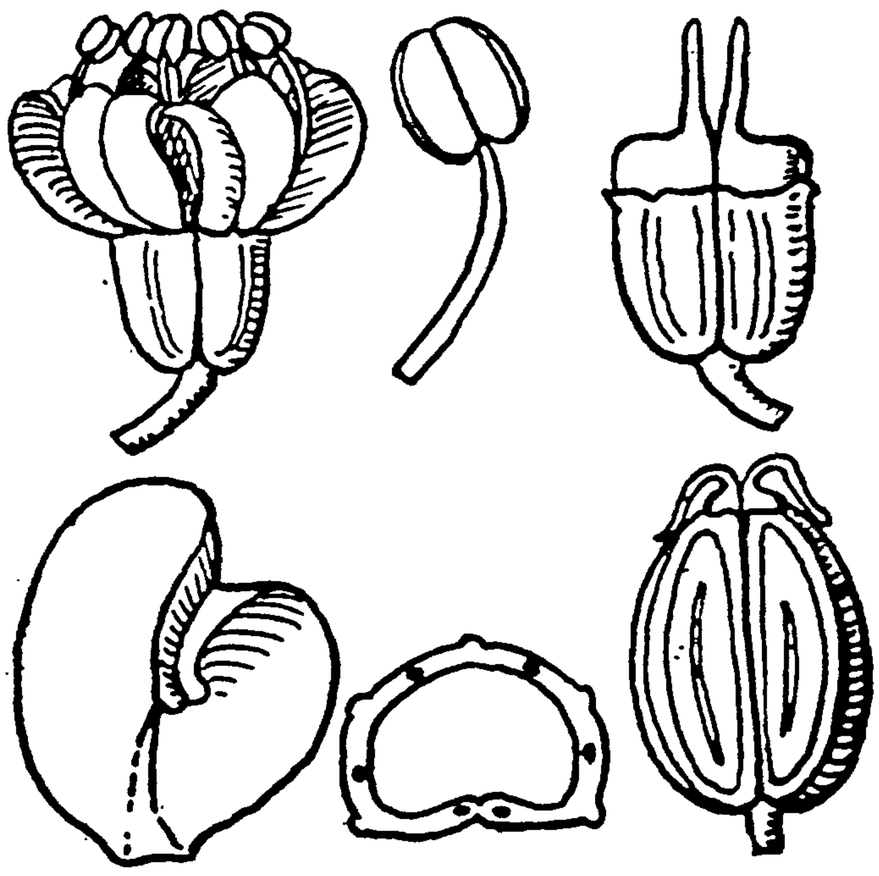
2. S. floridanum Small. Plant smaller and more slender than that of *S. cicutaefolium,* the stem slender, the branches very slender: stipular expansions at base of the petiole oblique at the top: leaflets 3–11; blades ovate, elliptic or elliptic-lanceolate, finely appressed-serrate: umbel-rays filiform: larger corollas less than 2 mm. wide: fruit not seen.—Swamps and banks of the Chipola River, Fla.

23. AMMI L. Herbs resembling *Daucus* in habit and inflorescence. Leaf-blades finely divided or dissected. Flowers perfect, very numerous in compound umbels. Involucres and involucels present, the bracts of the former, at least, divided. Sepals obsolete. Petals white, very unequal, cleft at the apex. Fruit short: carpels 5-angled, with prominent ribs and an oil-tube in each interval.—Seven species, natives of the Old World.—(BISHOP'S-WEEDS.)

Leaf-segments numerous, very narrowly linear or filiform and entire: umbel-rays concreted into a disk-like structure at the base. 1. *A. Visnaga.*

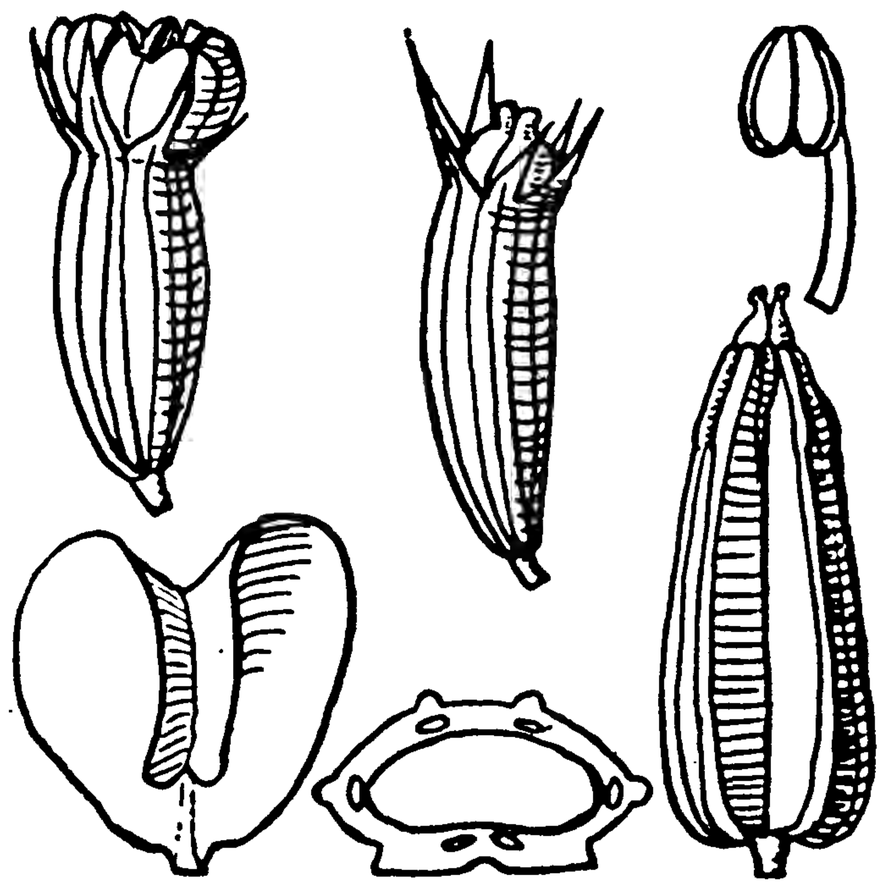
Leaf-segments few, at least in the lower leaves slightly broadened and toothed: umbel-rays not concreted at the base. 2. *A. majus.*

1. A. Visnaga (L.) Lam. Stem 5–12 dm. tall: mature umbels and umbellets contracted, the concreted bases of the rays of the latter 3–4 mm. broad: fruit 2–2.5 mm. long.—Waste-places, Fla. and Gulf State seaports to N. C. Nat. of Eu.—Spr.



2. A. majus L. Stem 3–15 dm. tall: mature umbels and umbellets open, the concreted bases of the rays of the latter barely 2 mm. broad: fruit 1.5–2 mm. long.—Waste-places, Coastal Plain, Ala. to Tex. Nat. of Eu. and cult.—The plants of these species of *Ammi,* like those of very many species of other genera of this family, especially those of the Old World, have been used as medicinal remedies, real or reputed, by both the aborigines and medical men, in all countries.

24. **TREPOCARPUS** Nutt. Annual herbs. Leaf-blades pinnately decompound. Umbels compound. Involucre usually present. Sepals unequal. Petals white, broad. Fruit elongate: carpels with 4 secondary ribs, the primary ribs wanting: oil tubes solitary under the secondary ribs.—One species.

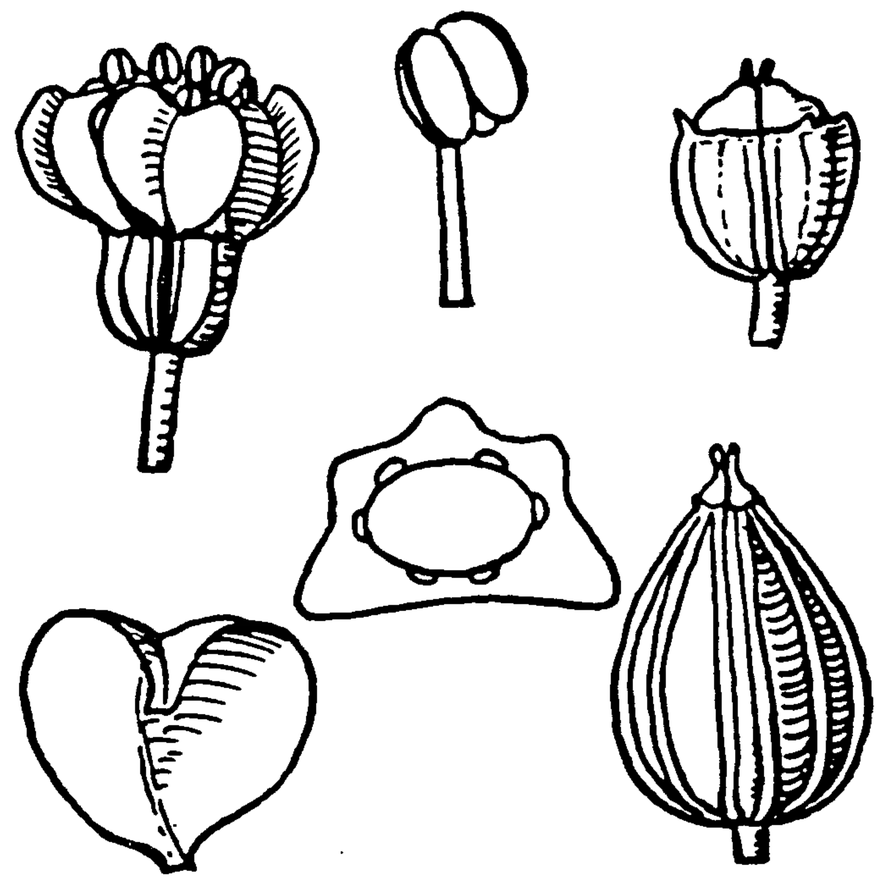


1. **T. Aethusae** Nutt. Stem 1–10 dm. tall, branched: leaf-blades 5–10 cm. long, finely dissected, the lower ones with petioles about equal to them in length, the upper short-petioled, the segments narrowly linear, entire or incised: umbels commonly long-peduncled: rays 2–5, becoming 1–2 cm. long: flowers few in each umbellet: fruit oblong, 8–10 mm. long, sharply ribbed.—Dry soil, Coastal Plain and adj. provinces, Ala. to Tex., Okla., and Ark.—Spr.–sum.

25. **PTILIMNIUM** Raf. Annual, faintly-scented, slender herbs. Leaf-blades 1–3-pinnately or -ternately divided, the ultimate segments entire or nearly so. Umbels compound. Involucres and involucels of several very slender, entire or pinnate bracts, and bractlets. Sepals small, broad or narrow. Petals white, each with a broad body and a short entire inflexed apex. Stylopodium depressed or elongate. Fruit short, as wide as long or nearly so: carpels with prominent separated dorsal and intermediate ribs and thick corky lateral ribs; oil-tubes small between each rib. Seed terete-angled, the inner face convex.—Following are the only known species.—MOCK BISHOP'S-WEEDS.

Sepals deltoid, often broadly so. — 1. *P. capillaceum.*
Sepals subulate to narrowly lanceolate.
- Styles long, much longer than the stylopodium: stylopodium ovoid, together with the styles over 1 mm. long: leaf-blades rather long-petioled. — 2. *P. costatum.*
- Styles short, about as long as the stylopodium: stylopodium depressed, together with the styles, less than 1 mm. long: leaf-blades short-petioled. — 3. *P. Nuttallii.*

1. **P. capillaceum** (Michx.) Raf. Plant 2–8 dm. tall: leaf-segments relatively few and lax: umbel-rays few–several, less than 2.5 cm. long at maturity: bracts lobed: fruit ovoid, about 2 mm. long, acute.—Wet soil, marshes, swamps, and ditches, various provinces, Fla. to Tex., Kans., and Mass.



2. **P. costatum** (Ell.) C. & R. Plant 8–16 dm. tall: leaf-segments narrowly linear, numerous, but not crowded: umbel-rays stout, over 3 cm. long at maturity: bracts entire or lobed: petals fully 1 mm. long: fruit ovoid, 3–4 mm. long or rarely longer, not constricted at the apex.—Swamps, Coastal Plain, Ga. to N. C.—Sum.–fall.

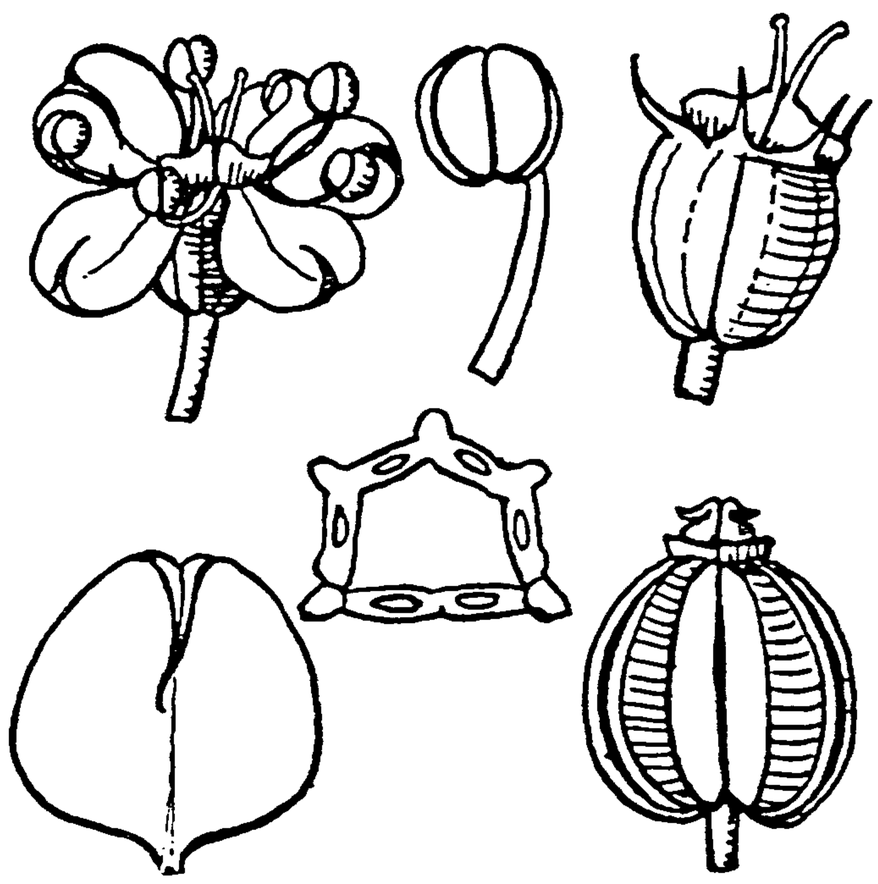
3. **P. Nuttallii** (DC.) Britton. Plant 3–7 dm. tall: leaf-segments almost capillary,

not very numerous, lax: umbel-rays slender, mostly over 3 cm. long at maturity: bracts entire: petals less than 1 mm. long: fruit ovoid, 1.5 mm. long or less, barely constricted at the apex.—Swamps and damp hillsides, various provinces, Ala. to Tex., Kans. and Ill.—Spr.–fall.

26. **HARPERELLA** Rose. Perennial aquatic caulescent herbs. Leaves alternate, reduced to terete jointed phyllodia. Flowers perfect, in compound umbels. Involucres and involucels inconspicuous. Sepals acute, slightly unequal. Petals white, broad. Stylopodium short. Fruit oval, flattened laterally: carpels rather prominently 5-angled: oil-tubes solitary in the intervals and 2 in the inner side.—Three species, natives of the southeastern United States.

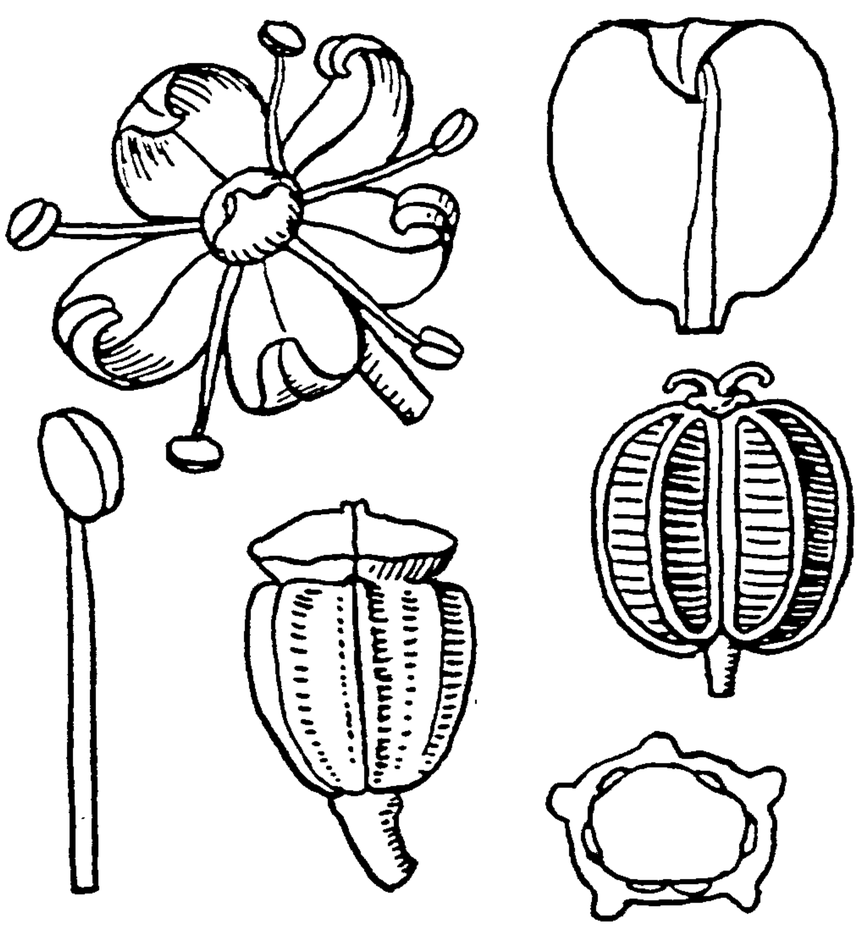
Basal and lower cauline leaves mostly over 2 dm. long: corolla 3–3.5 mm. wide: fruit about 1.5 mm. wide. 1. *H. nodosa.*
Basal and lower cauline leaves mostly less than 1.5 cm. long: corolla 1–1.5 mm. wide: fruit about 1 mm. wide. 2. *H. fluviatilis.*

1. **H. nodosa** Rose. Plant stout, stiff, 3–13 dm. tall, rather freely branched, the stem fluted: basal and lower cauline leaves mostly 2–4.5 dm. long, without bulblets in the axils: peduncles elongate, mostly 2–4 cm. long: umbel-rays 5–15, becoming 1–2.5 cm. long: corolla 3–3.5 mm. wide: anthers barely 0.5 mm. long: fruit about 1.5 mm. wide.—Shallow ponds, Coastal Plain, S W Ga.—Spr.–sum.



2. **H. fluviatilis** Rose. Plant slender, weak, 1–3 dm. tall, sparingly branched, the stem angled: basal and lower cauline leaves mostly 1–1.5 dm. long, with bulblets in their axils: peduncles short, mostly 1–2 cm. long: umbel-rays 2–5, becoming 5–8 mm. long: corolla 1–1.5 mm. wide: anthers barely 0.3 mm. long: fruit about 1 mm. wide.—Rocky beds of streams, in the Appalachian provinces in Ala.—Sum.–fall.

27. **CELERI** Adans. Annual or perennial herbs. Leaf-blades pinnate or ternately decompound. Umbels compound. Involucres present or wanting. Sepals obsolete or minute. Petals white, broad. Fruit somewhat smooth or tuberculate: carpels 5-angled or 5-ribbed, with 1 oil-tube in each interval or 2 in the inner face.—About 5 species, widely distributed.

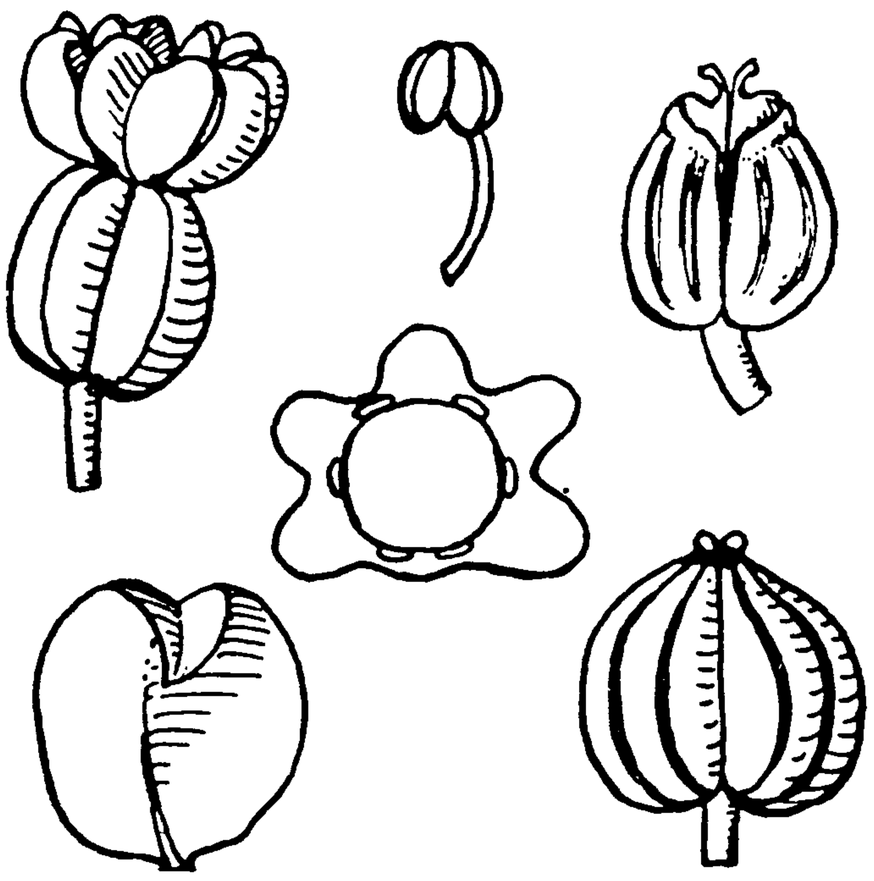


1. **C. graveolens** (L.) Britton. Stem 2–9 dm. tall: leaf-segments cuneate to suborbicular, incised and toothed: petals 0.5–1 mm. long: fruit ovoid, about 1.5 mm. long. [*Apium graveolens* L.]—(Celery.)—Waste-places and fields, near the coast, various provinces, Fla. to N. M., Calif. and Va.—Nat. of Eu.—Spr.–sum.—Used in medicine. The blanched leaves are esculent.

28. **CYCLOSPERMUM** Lag. Annual or perennial herbs. Leaf-blades pinnately or ternately decompound. Umbels compound. Involucre present or wanting. Sepals obsolete or minute. Petals white, broad. Fruit somewhat smooth or tuberculate: carpels 5-angled or ribbed with 1 oil-tube in each interval or two in the inner face. [*Apium* L. in part]—About 6 species, natives of the Old World.—Spr.–sum.

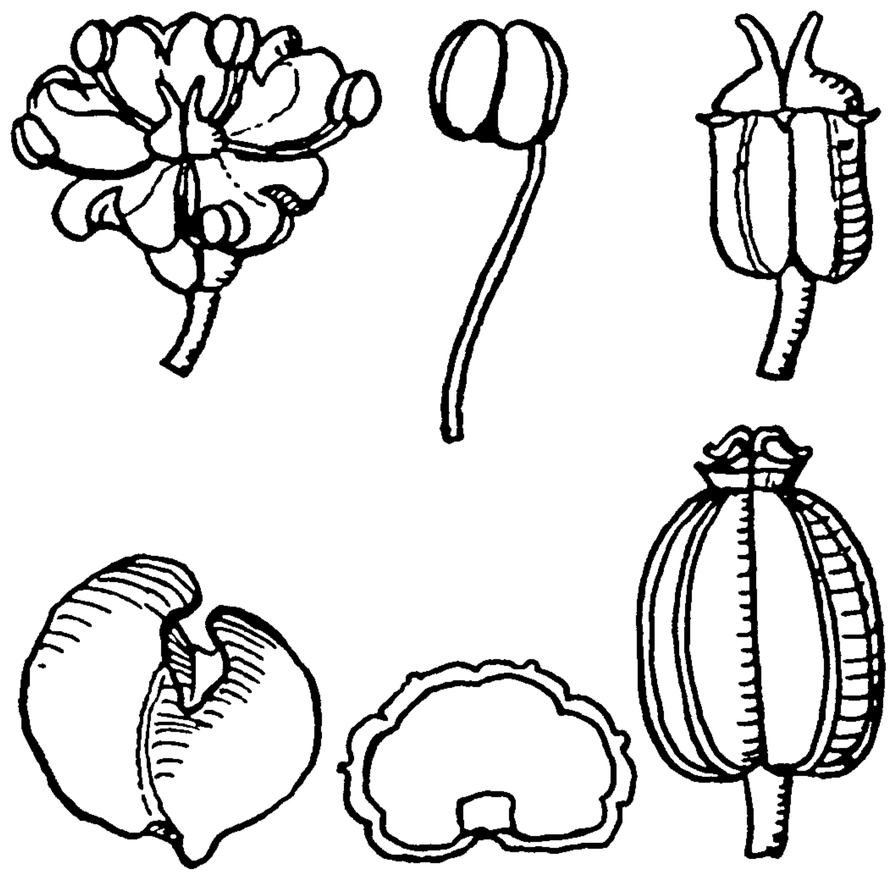
Leaf-blades ternate; segments linear-filiform to filiform. 1. *C. Ammi.*
Leaf-blades pinnate; segments ovate, oval, or elliptic. 2. *C. nodiflorum.*

1. **C. Ammi** (L.) Britton. Stem erect, 1–6 dm. tall, more or less branched: leaf-blades ternately divided; segments filiform or narrowly linear, acute: corolla white, less than 1 mm. broad: fruit oval or ovoid-oval, 1.5–2 mm. long, prominently ribbed. [*A. leptophyllum* (DC.) F. Muell.]—(MARSH-PARSLEY.)—Roadsides and waste-places, various provinces, Fla. to Tex., Mo. and N. Y.—(*W. I., Mex., C. A., S. A.*)



2. **C. nodiflorum** (L.) Koch. Stem prostrate, often creeping, 3–7 dm. long, sparingly branched: leaf-blades pinnately compound, 5–10 cm. long; leaflets oblong, ovate-lanceolate or lanceolate, serrate, mostly acute: umbels opposite the leaves 1.5–3 cm. broad, short-peduncled: bractlets of the involucels 5–6: corolla white, about 1 mm. broad: fruit oval or orbicular-oval, about 2 mm. long.—Ditches and waste-places, near Charleston, S. C., and other seaport towns. Nat. of Eu.

29. **BUPLEURUM** [Tourn.] L. Annual or perennial herbs. Leaf-blades entire. Umbels compound. Involucre wanting (in our species). Involucels conspicuous, of entire bractlets. Sepals obsolete. Petals broad, yellow or greenish. Fruit elliptic or oval: carpels with slender ribs and no oil-tubes in our species.—About 65 species, widely distributed.



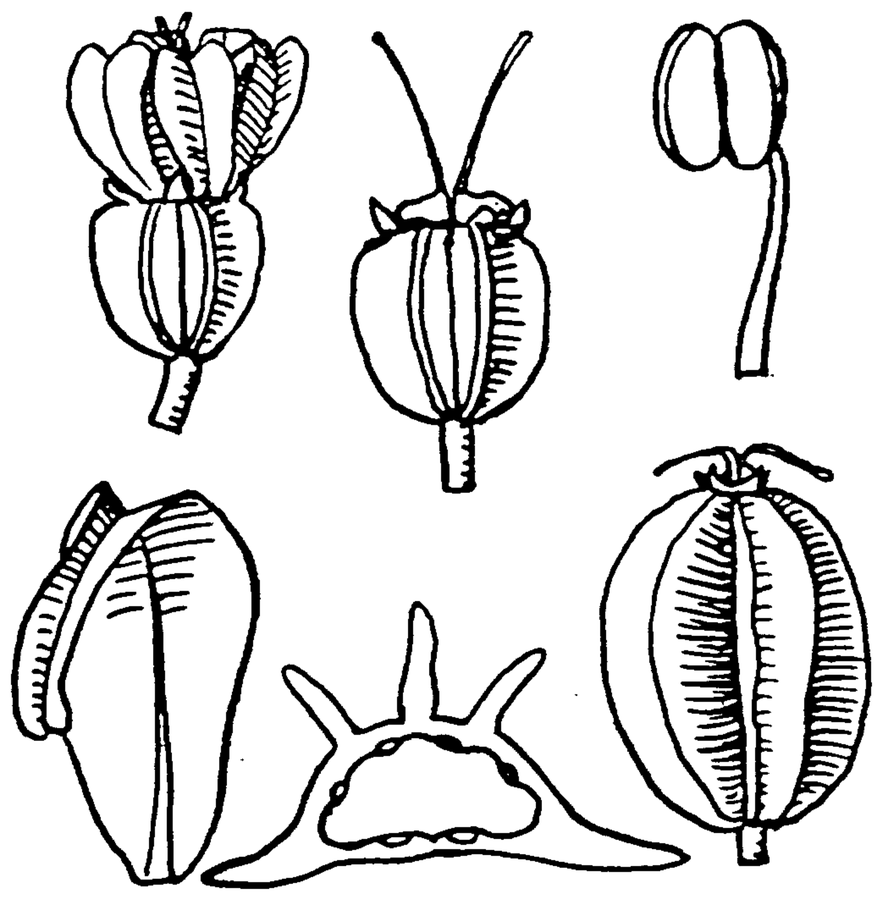
1. **B. rotundifolium** L. Plant 3–10 dm. tall: leaf-blades ovate or elliptic, 2–8 cm. long, perfoliate: corolla yellow: fruit 3–3.5 mm. long, about 2.5 mm. broad.—(HARE'S-EAR. THOROUGH-WAX.)—Roadsides, fields, and waste-places, various provinces N of Coastal Plain, Ala. to Ariz., S. D., N. H., and N. C. Nat. of Eu.

30. **THASPIUM** Nutt. Perennial herbs. Leaf-blades 3-foliolate or ternately compound, or those of the basal leaves sometimes simple. Umbels compound. Involucre of few bracts. Involucels of many bracts. Sepals present.

Petals yellow or rarely purple. Fruit longer than wide: carpels with winged ribs and oil-tubes solitary in the intervals.—Only the following species known.—Sum.—MEADOW-PARSNIPS.

Petal-blades less than 1 mm. long: leaves with ternate blades: leaflets relatively thick, crenate. 1. *T. trifoliatum.*
Petal-blades over 1 mm. long: leaves with biternate blades: leaflets relatively thin, incised or lobed.
  Peduncles and umbel-rays glabrous, except at the nodes, or merely puberulent: fruits, between the wings, glabrous, 5–6 mm. long: leaves 1–2-ternate. 2. *T. barbinode.*
  Peduncle and umbel-rays scabrous-pubescent: fruits, between the wings, permanently pubescent, 4–5 mm. long: leaves 2–3-ternate.
    Blades of the leaflets coarsely divided, the ultimate segments or teeth of an ovate type: styles about 2 mm. long: petals about 1.5 mm. long. 3. *T. Chapmanii.*
    Blades of the leaflets finely divided, the ultimate segments or teeth of a lanceolate type: styles about 1 mm. long: petals about 1 mm. long. 4. *T. pinnatifidum.*

1. T. trifoliatum (L.) A. Gray. Stem 2–7 dm. tall, sparingly branched, often zigzag: leaf-blades various, those of the basal or lower stem-leaves ovate and undivided or 3-foliolate; segments ovate to lanceolate, serrate; petioles slender, often longer than the blades: upper stem-leaves similar to the divided basal leaves; petioles shorter than the blades, winged: umbels peduncled, 2–5 cm. broad: rays variable in length: corolla dark-purple (or yellow in *T. trifoliatum aureum*): fruit oval, 4 mm. long, the ribs prominently winged.—(PURPLE MEADOW-PARSNIP.)—Woods, bluffs, stream-banks, and sunny slopes, various provinces, Fla. to Miss., Wyo., Ill., and R. I.—Sum.

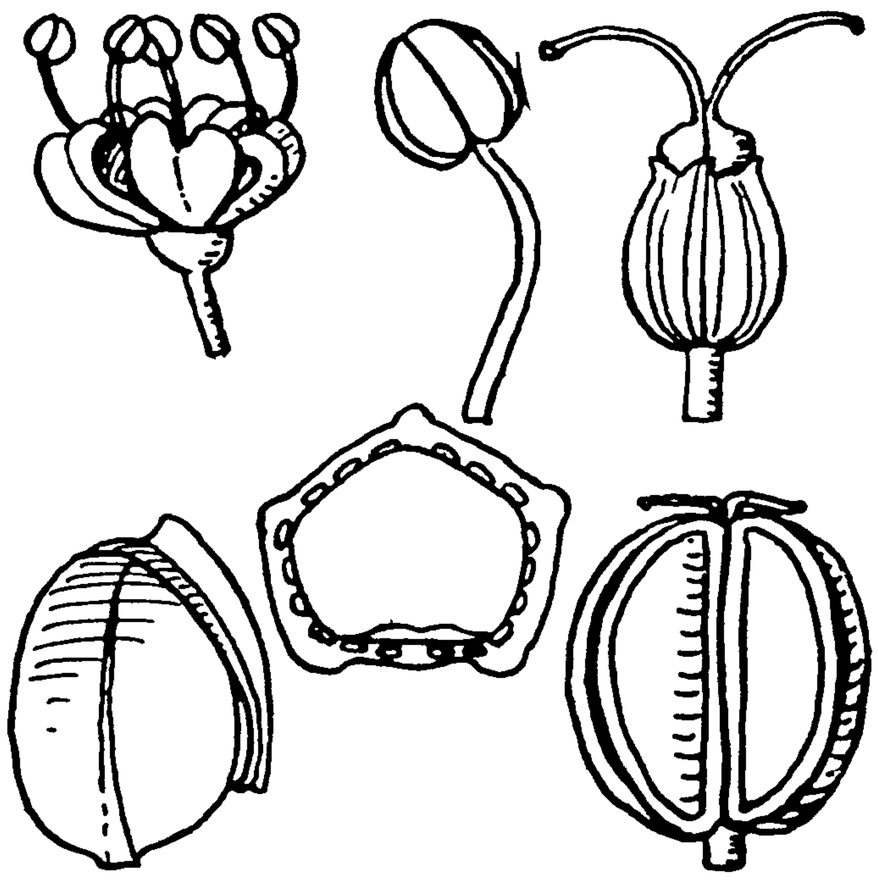


2. T. barbinode (Michx.) Nutt. Stem 3–12 dm. tall, sparingly branched, pubescent at the nodes: leaf-blades 1–2-ternate; leaflets coarsely cut; ultimate segments large, those of the upper leaves mostly 3–6 cm. long, coarsely toothed: mature umbels 3–6 cm. wide: corolla about 3 mm. wide, pale- or light-yellow: fruit ellipsoid or oval, 5–6 mm. long, the lateral wings somewhat wider than the dorsal ones.—A form with pinnatifid leaf-segments grows in Ala.—Wooded hillsides and streams-banks, various provinces, rarely Coastal Plain, Ga. to Miss., Kans., Ont., and N. Y.—Spr.–sum.

3. T. Chapmanii (C. & R.) Small. Stem 8–15 dm. tall, often much-branched, pubescent at the nodes and sometimes sparingly so along the internodes: leaf-blades 2–3-ternate; leaflets much cut; ultimate segments relatively small, those of the upper leaves mostly 1–2.5 cm. long, incised-toothed or pinnatifid: mature umbels 2.5–7 cm. wide: corolla light yellow, fruit elliptic or oval, 4–5 mm. long, the lateral wings much wider than the dorsal ones.—River-bluffs, woods and hillsides, Coastal Plain and Piedmont, Fla. and Ga.—Spr.–sum.

4. T. pinnatifidum (Buckl.) A. Gray. Stem 5–12 dm. tall, finely pubescent about the nodes and sometimes also along the internodes: leaf-blades usually 3-ternate; leaflets finely cut and with narrow divisions; ultimate segments small, those of the upper leaves pinnatifid, the lobes usually lanceolate: mature umbels 3–4 cm. wide: corolla light yellow: fruit ellipsoid, 3–4 mm. long, all the ribs narrowly winged.—Woods, hillsides and river-banks, Blue Ridge to Interior Low Plateaus, Ala. to Ky. and N. C.—Spr.–sum.

31. **TAENIDIA** Drude. Perennial herbs with fibrous roots. Leaf-blades pinnate or ternately compound. Umbels compound. Involucres and involucels wanting: sepals obsolete or minute. Petals 5, their tips inflexed. Fruit oblong: carpels 5-angled, with slender ribs and 3 oil-tubes in the intervals. Seeds nearly terete except the flat face.—One species.

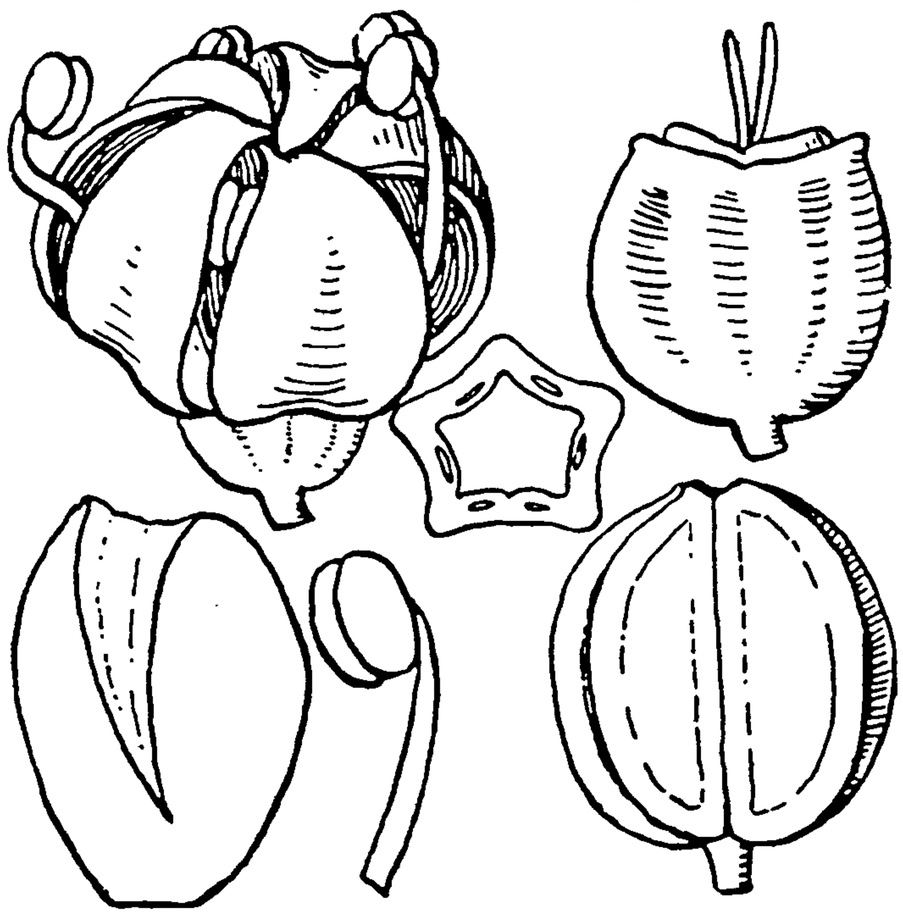


1. T. integerrima (L.) Drude. Plant 3–9 dm. tall, from a tough root: leaflets ovate to elliptic or elliptic-lanceolate, 1–3 cm. long, entire: umbel-rays 10–20, elongate: corolla yellow: fruit broadly ellipsoid, 3.5–4 mm. long. — (YELLOW-PIMPERNEL.)—Rocky hillsides and sandy woods, various provinces, rarely Coastal Plain, Ga. to La., Minn. and Que.—Spr.

32. **ZIZIA** Koch. Perennial erect herbs. Leaf-blades 3-foliolate or ternately compound, or the basal ones sometimes simple. Umbels compound, the central umbellet sessile. Involucres wanting. Involucels of a few bractlets. Sepals prominent. Petals yellow. Fruit somewhat elongate, laterally flattened: carpels with 5 slender wingless ribs and an oil tube in each interval and sometimes under each rib.—Following are the only known species.—Spr.—sum.—MEADOW-PARSNIPS.

Blades of the basal leaves merely toothed cordate.	1. *Z. cordata.*
Blades of the basal leaves ternately compound.	
Blades of the basal leaves 2-ternate.	2. *Z. aurea.*
Blades of the basal leaves 1-ternate.	
Blade of the terminal leaflet much longer than wide, with few or relatively few blunt teeth.	
Fruit ovoid or ellipsoid, 4–4.5 mm. long: longer umbel-rays 2.5–5 cm. long at maturity.	3. *Z. arenicola.*
Fruit suborbicular or broader than high, to ovoid-orbicular, 3–3.5 mm. long: longer umbel-rays 6–11 cm. long at maturity.	4. *Z. Bebbii.*
Blade of the terminal leaflet about as wide as long or wider, with many sharp salient teeth.	5. *Z. latifolia.*

1. Z. cordata (Walt.) DC. Stem 4–10 dm. tall, pale-green: leaf-blades various, those of the basal leaves ovate or suborbicular, 3–10 cm. long, crenate, deeply cordate, long-petioled, those of the cauline leaves mostly 3-foliolate or sometimes 5-foliolate; segments crenate or serrate-crenate: umbels 2–6 cm. broad; rays 7–16, ascending, 1–5 cm. long: corolla yellow, about 2 mm. broad: fruit oval or ovate-oval, 3–4 mm. long, 10-ribbed.—(GOLDEN-PARSNIP.)—Woods, thickets, and prairies, various provinces, rarely Coastal Plain, Ga. to Mo., Ore., Alb., and Conn.



2. Z. aurea (L.) Koch. Stem 3–8 dm. tall, simple or branched above: leaf-blades twice to thrice ternately compound, those of the basal and lower cauline leaves long-petioled, those of the upper stem-leaves once ternate, on short winged petioles; segments oblong-ovate to lanceolate, 2–8 cm. long,

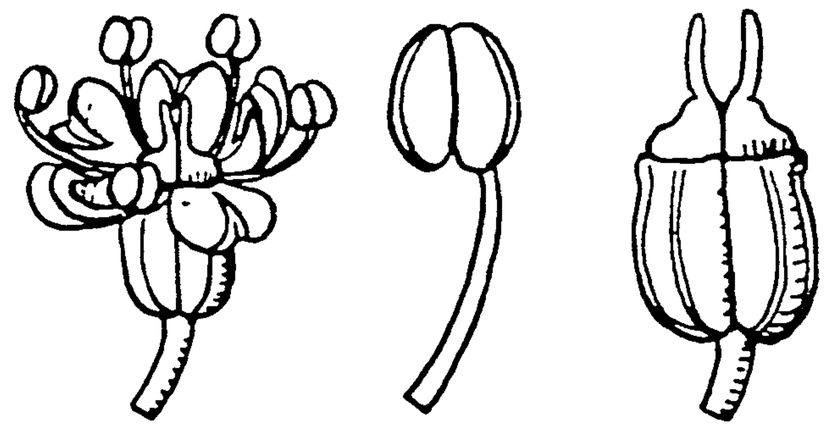
sharply serrate: umbel 3–6 cm. broad: rays 9–25, stiff, ascending, unequal, 2–5 cm. long: corolla yellow, 3–3.5 mm. broad: fruit ellipsoid, 4–4.5 mm. long.—(GOLDEN-ALEXANDERS.)—Meadows, woods, and swamps, various provinces, rarely Coastal Plain, Ga. to Tex., Sask., Ont., and N. B.

3. **Z. arenicola** Rose. Stem 4–7 dm. tall, sparingly branched above: leaf-blades once ternately compound; leaflets 1–6 cm. long, the blades oval or ovate to lanceolate, often rounded at the apex, coarsely toothed: umbels long-peduncled; rays few, slender, nearly equal, 1.5–2.5 cm. long, erect or ascending: fruit ovoid to ellipsoid, 4–4.5 mm. long, prominently ribbed.—Dry woods, Coastal Plain, N Fla. and adj. Ga.

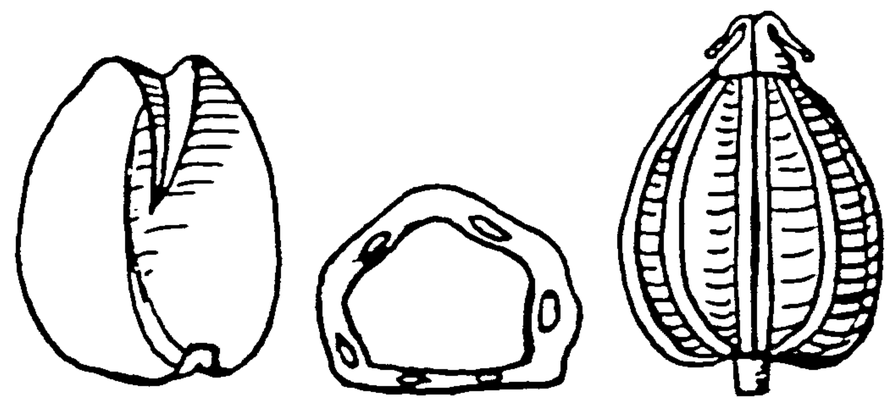
4. **Z. Bebbii** (Coult. & Rose) Britton. Stem often tufted, 1–8 dm. tall, simple or branching, dark-green: leaf-blades once ternately compound, the lower ones long-petioled, the upper with winged petioles: leaflets 1–7.5 cm. long, the blades thickish, oval, elliptic, or lanceolate, serrate or crenate: umbels slender-peduncled, straggling; rays 2–12, filiform, unequal, 2–11 mm. long, unequally spreading: fruit suborbicular or broader than high, to ovoid-orbicular, 3–3.5 mm. long or rarely smaller.—Woods, Blue Ridge to Appalachian Plateau, N. C. to Tenn., W. Va., and Va.

5. **Z. latifolia** Small. Stem mostly 4–6 dm. tall, sometimes sparingly branched, pubescent at the nodes: leaf-blades 3-foliolate, long-petioled, except the uppermost; leaflets 3–6.5 cm. long, the blades ovate, suborbicular or orbicular-reniform, irregularly and sharply toothed, except at the broadly cuneate or truncate base: umbels stout-peduncled; rays stoutish, usually 6–12, mostly ascending, unequal, some usually twice as long as the others, the longer becoming 2–3 cm. long: fruit ellipsoid, 3–3.5 mm. long, ribbed.—Borders of fields, near Bristol, Fla.

33. **APIUM** [Tourn.] L. Annual or biennial herbs. Leaves alternate: blades 1–3-pinnate, the leaflets toothed, incised or lobed. Umbels compound. Sepals minute or obsolete. Petals small, yellow, very broad, excepting the bent tip. Fruit slightly flattened laterally: carpels with 5 slender ribs, with a single oil-tube in each interval and 2 in the inner face.—About 5 species, European.



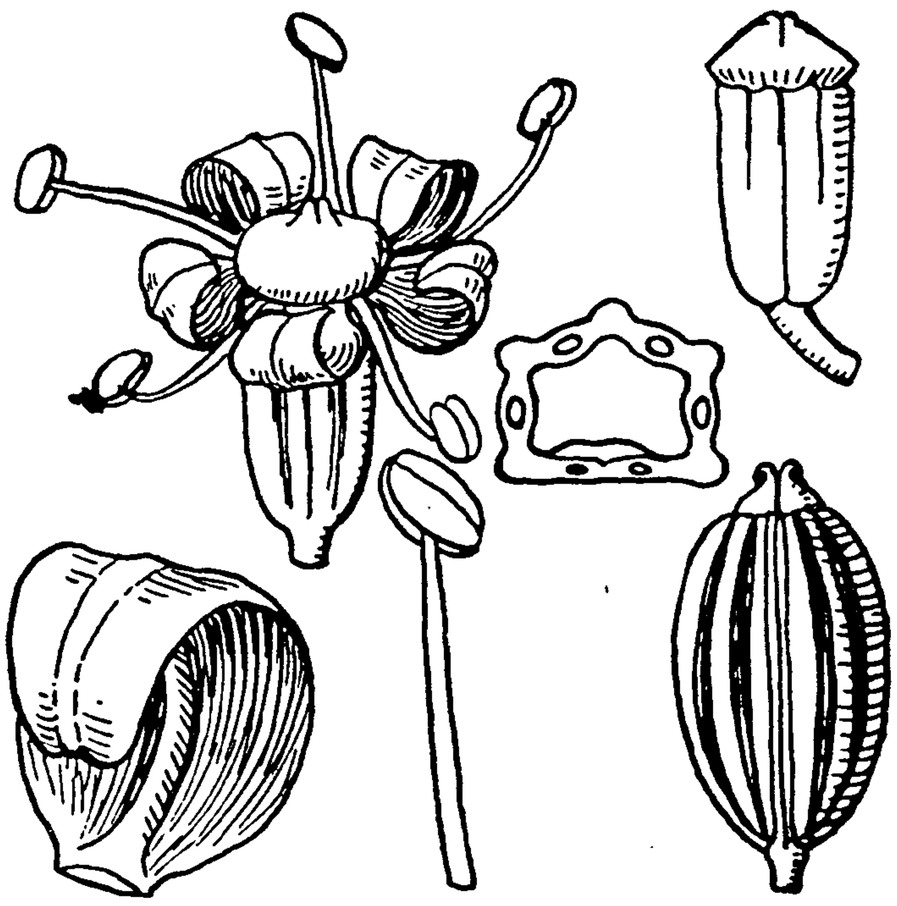
1. **A. Petroselinum** L. Stem 2–5 dm. tall: leaf-segments linear or linear-filiform, or those of the basal leaves cuneate: petals mostly less than 1 mm. long: fruit ovoid, 3.5–4 mm. long.—(PARSLEY. ACHE.)—Waste-places and cult. grounds, various provinces, N. C. to Tex., Ark., and Ont. Nat. of Eu.—Sum.—Used medicinally. The leaves are used in culinary practices.



Aethusa cynapium L. (FOOL'S-PARSLEY), has been found as fugitive on ballast at Mobile, Ala. It differs from the preceding genus by the globose-ovoid fruit which is not flattened either way, and the white flowers.

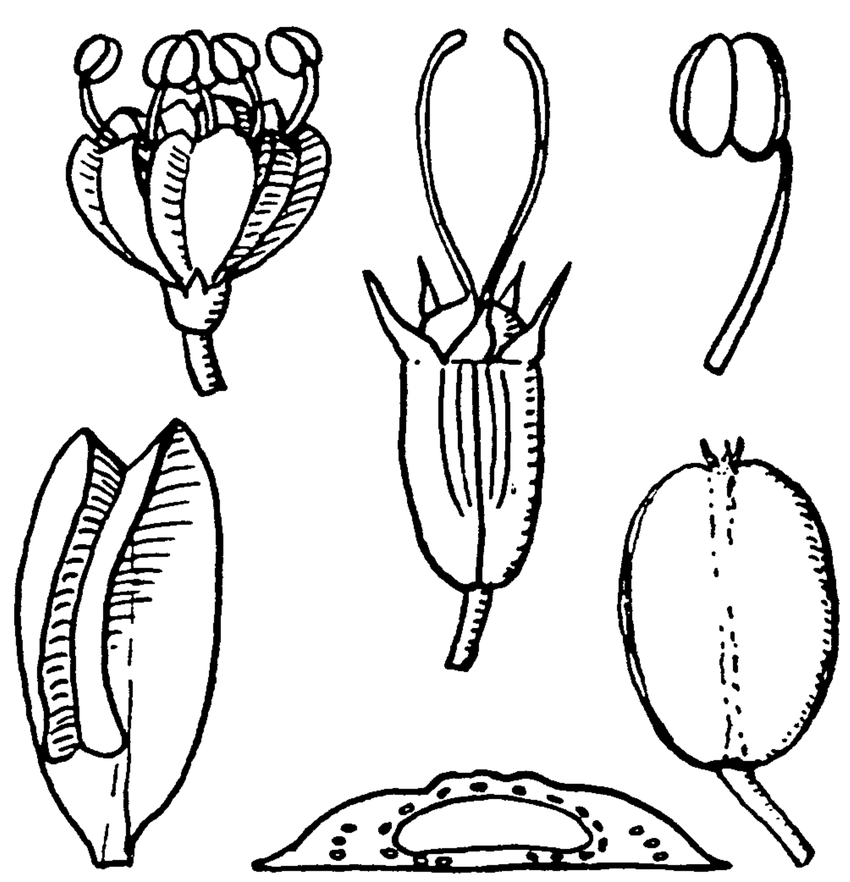
34. **FOENICULUM** Adans. Biennial or perennial herbs. Leaf-blades pinnately decompound, the segments often very slender. Umbels compound.

Involucre and involucels wanting. Sepals obsolete. Petals yellow or yellowish. Fruit elongate: carpels 5-ribbed: oil-tubes solitary in the intervals and 2 on the inner side.—Four species, natives of the Old World.



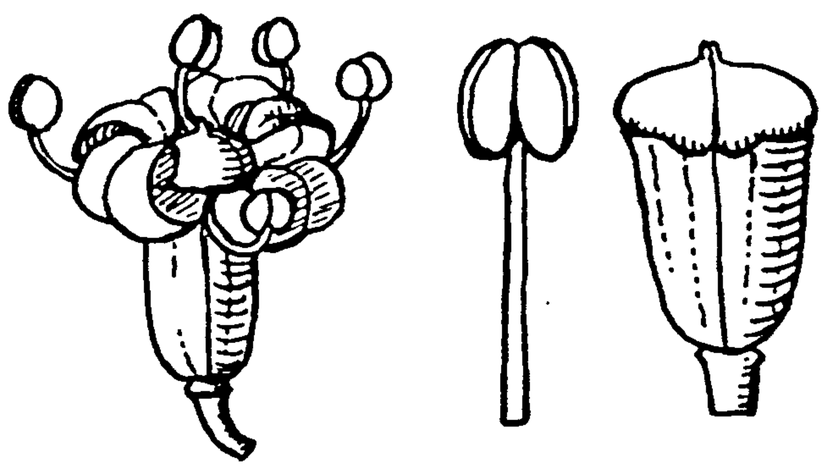
1. F. Foeniculum (L.) Karst. Stem 5–15 dm. tall: leaf-segments filiform or linear-filiform: umbel-rays 5–6: fruits ellipsoid, about 5 mm. long. — (FENNEL.) — Waste-places, roadsides, and fields, various provinces, Fla. to Tex., Tenn. and N. J.—Nat. of Eu.—(*W. I.*)—Sum.–fall.—Used medicinally and as a culinary herb.

35. PLEIOTAENIA Coult. & Rose. Perennial caulescent herbs. Leaf-blades pinnately decompound. Umbels compound. Involucres and involucels of few narrow bracts or the former wanting. Sepals triangular. Petals yellow, broadest above the middle. Fruit broad: carpels with the dorsal and contiguous ribs corky but obscure and thick, broadly winged lateral ribs with a nerve near the margin: oil-tubes numerous, 12–18, accompanied by smaller ones irregularly disposed. — One species.

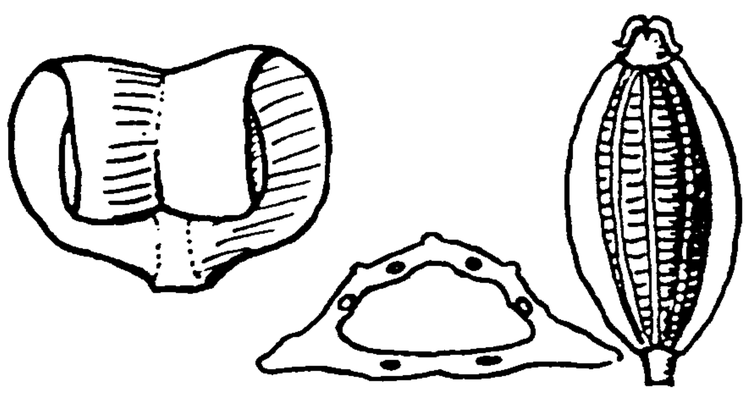


1. P. Nuttallii (DC.) C. & R. Stem 2–9 dm. tall, slightly scabrous: leaf-segments narrowly cuneate: umbel-rays 2–3 cm. long or a few conspicuously short: fruit broadly elliptic, 6–10 mm. long (obovate and thin-winged in *P. Nuttallii texana*). [*Polytaenia Nuttallii* DC.]—Dry soil, prairies, and barrens, various provinces, Ala. to Tex., Ia. and Mich.—Spr.

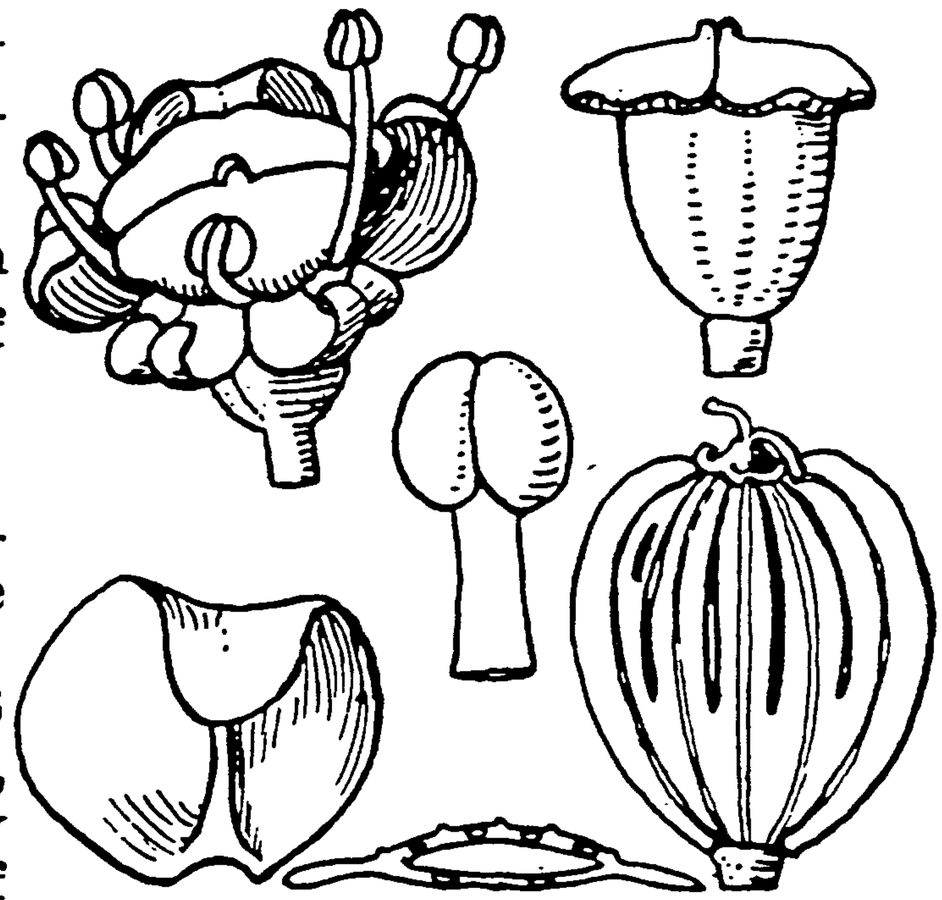
36. ANETHUM L. Annual or biennial herbs. Leaves alternate: blades decompound, the segments narrowly linear or linear-filiform. Flowers in naked compound umbels. Hypanthium truncate. Petals yellow. Stylopodium depressed. Styles short. Fruit slightly elongate, flattened dorsally: carpels ribbed and with narrow lateral wings.—Two species, natives of Eurasia.



1. A. graveolens L. Plant 1 m. tall or less, glaucous: leaf-segments numerous: umbels many-flowered, the rays unequal: sepals minute: petals ovate to orbicular, 1 mm. long or less: fruits ellipsoid to oval-ellipsoid, 4.5–5 mm. long, glaucous.—(DILL. DILLWEED.) — Hammocks and cultivated grounds, S pen. Fla. and the Keys. Nat. of Eu.—(*W. I.*)—The aromatic fruit is used as a condiment.

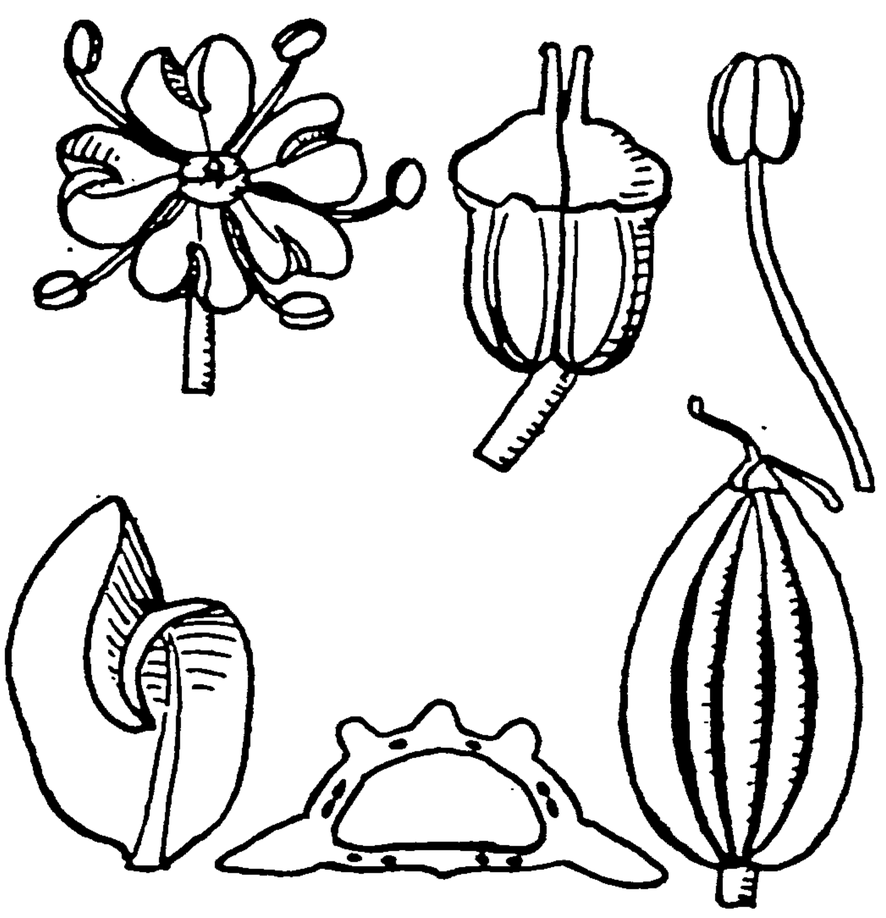


37. PASTINACA L. Annual or biennial herbs. Leaf-blades pinnately compound. Umbels compound. Involucres and involucels usually wanting. Sepals obsolete. Petals yellow. Fruit somewhat longer than broad, much dorsally flattened: carpels with the dorsal and contiguous ribs slender, and thin lateral wings: oil-tubes solitary in the intervals and 2–4 in the inner side.—About 7 species, natives of Eurasia.



1. P. sativa L. Plant coarse, strong-scented, 6–20 dm. tall: leaf-segments ovate or elliptic, crenate-serrate, incised or lobed: fruit obovate, oval, or orbicular-oval, 5–6 mm. long. — (WILD-PARSNIP.) — Roadsides, fields, thickets, and waste-places, nearly throughout U. S. and S. Can. Nat. of Eurasia.—Sum.—The root is esculent.

38. CONIOSELINUM Hoffm. Perennial herbs. Leaf-blades 2–3-pinnately decompound, the alternate segments narrow, incised or lobed. Umbels compound. Involucres and involucels of several narrow bracts, or the former wanting. Sepals obsolete. Petals white. Fruit longer than broad: carpels with the dorsal and contiguous ribs prominent and the lateral ones winged: oil-tubes solitary in the dorsal intervals, 1–several in the lateral, and 4–8 in the inner face.—About 10 species, natives of the north temperate zone.

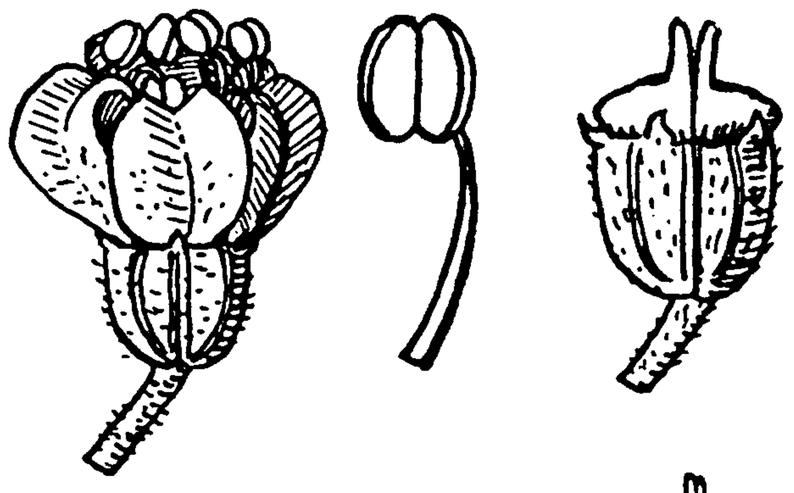


1. C. chinense (L.) B. S. P. Plant 5–15 dm. tall: leaf-segments incised: umbel-rays 2–4 cm. long: fruit oval or ellipsoid-oval, 4–5 mm. long.—(HEMLOCK-PARSLEY.)—Swamps and wet cliffs, Blue Ridge and more northern provinces, N. C. to Ind., Minn., Lab. and Pa.—Sum.–fall.

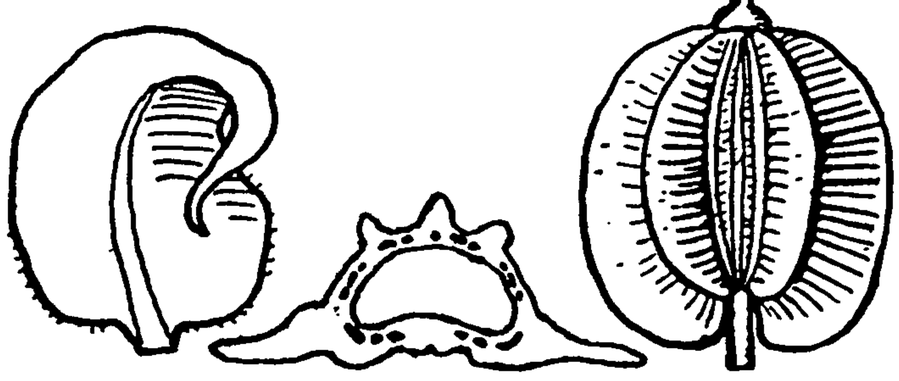
39. ANGELICA L. Perennial caulescent herbs. Leaf-blades pinnate or decompound. Umbels compound. Involucres and involucels present or wanting. Sepals small or obsolete. Petals white or greenish, broadest above the middle. Fruit longer than broad: carpels with the dorsal and contiguous ribs prominent, and broadly winged lateral ribs: oil-tubes solitary or several in the intervals and 2–10, or more, in the inner face.—About 40 species, mostly in the northern hemisphere.—Sum.–fall.—(ANGELICAS.)—The roots and fruits of some species are used medicinally.

Peduncles and rays pubescent. 1. *A. villosa.*
Peduncles and rays glabrous.
  Leaflets thin; lobes ascending: oil-tubes 1–3 in each interval. 2. *A. Curtisii.*
  Leaflets leathery; lobes spreading: oil-tubes about 20, contiguous and continuous. 3. *A. dentata.*

1. A. villosa (Walt.) B. S. P. Plant 6–18 dm. tall: leaflets 2–5 cm. long, the blades thickish, elliptic, elliptic-lanceolate, or oval, 2–5 cm. long, serrate: umbel-rays 2–5 cm. long: pedicels 3–4 mm. long: corolla white: fruit orbicular or orbicular-obovate, 4.5–5 mm. long, pubescent.—(ANGELICO. HAIRY-ANGELICA.)—Dry thickets and woods, various provinces, Fla. to Miss., Ark., Minn., and Conn.—The leaves are used to discourage the use of tobacco.

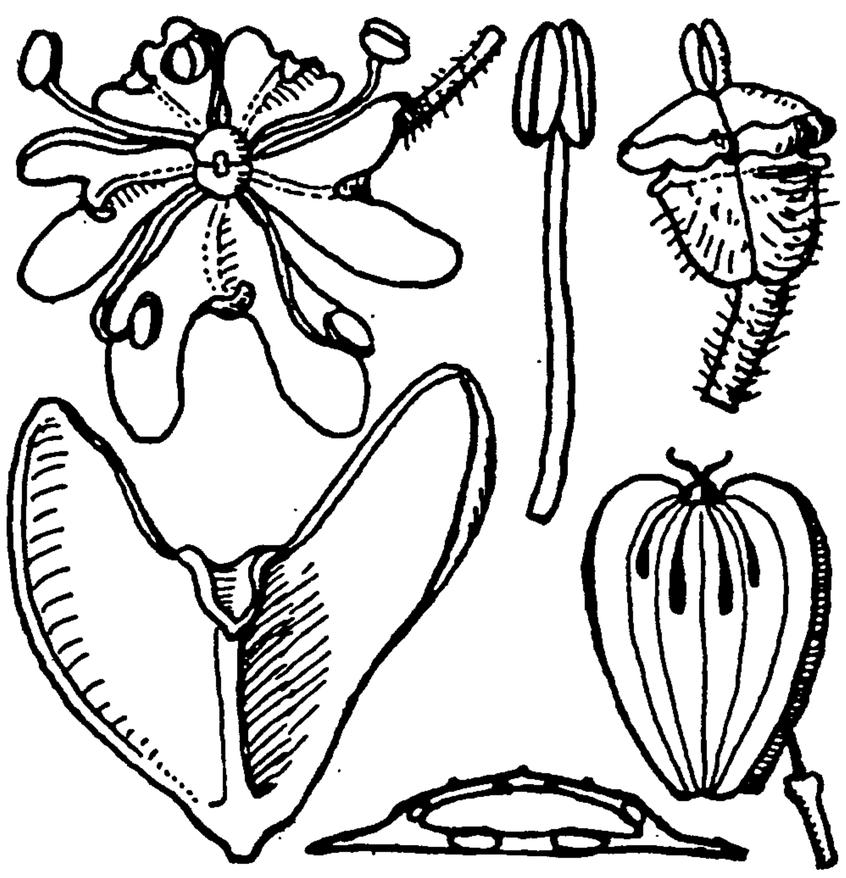


2. A. Curtisii Buckl. Plant 6–18 dm. tall: leaflets with ovate or lanceolate, sharply serrate or incised, acuminate: umbel-rays 12–25: pedicels 6–12 mm. long: corolla greenish: fruit ellipsoid or oval, 4–6 mm. long, glabrous.—(FILMY ANGELICA.)—Woods, mt. slopes and summits, Blue Ridge to Appalachian Plateau, N. C. to Pa.



3. A. dentata (Chapm.) Coult. & Rose. Plant 5–10 dm. tall: leaflets with elliptic to lanceolate, incised or incised-serrate blades, acute: umbel-rays 5–12; corolla white: fruit oval, 5–6 mm. long.—Dry pinelands, Coastal Plain, M Fla. and adj. Ga.

40. HERACLEUM L. Perennial herbs. Leaf-blades ternately compound. Umbels compound. Involucres and involucels of few, often deciduous, bracts and bractlets or the former wanting. Sepals minute or obsolete. Petals white, broadest above the middle, those of the outer and inner flowers different in shape. Fruit usually longer than broad, strongly dorsally flattened: carpels with the dorsal and contiguous ribs slender, and broadly winged lateral ribs, the latter nerved near the outer edge: oil-tubes solitary in each interval, and 2–4 in the outer face, rarely extending beyond the middle of the carpel.—About 60 species, natives of the Northern Hemisphere.

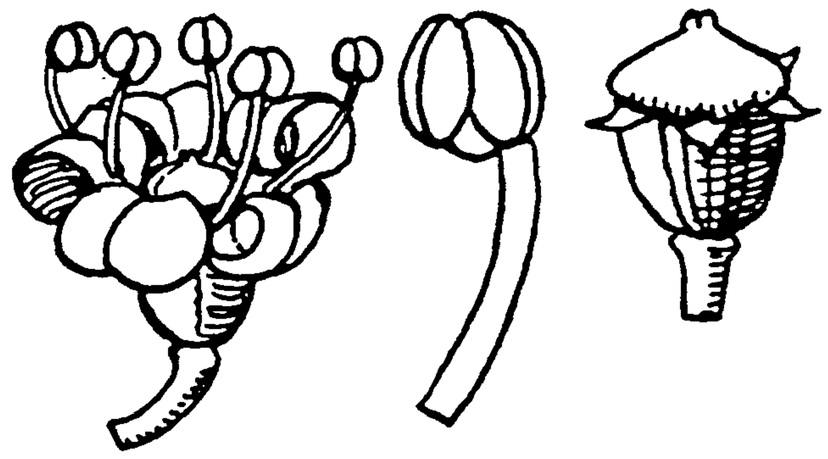


1. H. lanatum Michx. Plant course and heavy-scented, 6–25 dm. tall: leaf-blades 1–4 dm. long, the segments sharply toothed: umbel-rays 8–30, stout, 3–15 cm. long: fruit oval to obovate-oval, 8–12 mm. long.—(COW-PARSNIP.)—Thickets, fence-rows, fields, and waste-places, various provinces, Ga. to Calif., Alas., Ont., and Newf.—Sum.—The roots and fruits are mechanical.

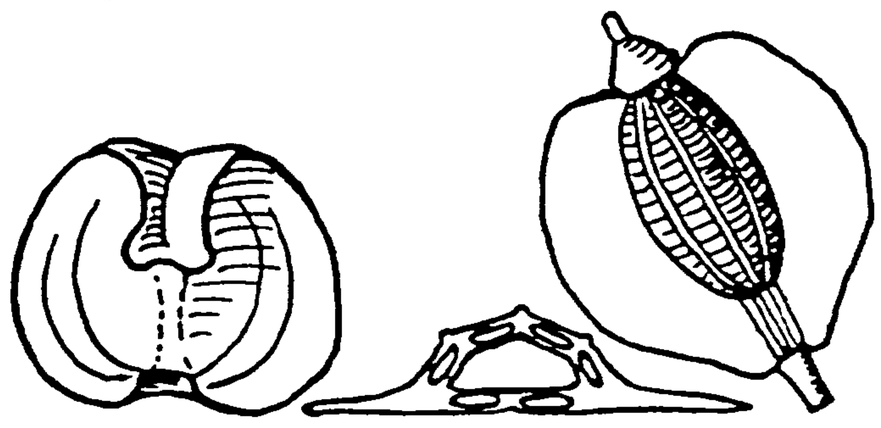
41. OXYPOLIS Raf. Perennial herbs. Leaf-blades pinnate or ternate, or rarely reduced to hollow septate phyllodia. Umbels compound. Involucres and involucels present. Sepals acute. Petals white. Fruit longer than broad, dorsally flattened: carpels with the dorsal and contiguous ribs thin, and winged lateral ribs, the latter nerved near the inner part of the wing: oil-tubes solitary in the intervals and 2–6 in the inner face. [*Tiedemannia* DC.]—Five species, North American.—Sum.–fall or all year S.—DROPWORTS.

Leaves reduced to hollow, terete, transversely-jointed petioles (phyllodia).
1. *O. filiformis.*
Leaves with simple, pinnate or palmate blades.
Leaf-blades simple, or of 3 palmately disposed leaflets at the end of an elongate petiole.
2. *O. ternata.*
Leaf-blades pinnately divided.
Fruit thinnish, the wings papery.
3. *O. rigidior.*
Fruit turgid, the wings corky.
4. *O. turgida.*

1. O. filiformis (Walt.) Britton. Plant 5–18 dm. tall: phyllodia 3–60 cm. long: fruit elliptic-oval or oval obovate, 5–6 mm. long, broadly winged.—(WATER-DROPWORT.) — Low pinelands and shallow ponds, swamps, Coastal Plain, Fla. to La. and S. C.—Erroneously, apparently, reported from further N.



2. O. ternata (Nutt.) Heller. Plant 5–9 dm. tall: leaf-blades, or leaf-segments, linear or filiform: fruit elliptic, 4–5 mm. long.—Low pinelands, Coastal Plain, Fla. to N. C.



3. O. rigidior (L.) Raf. Plant 5–18 dm. tall: leaves with relatively short, often broad segments, the blades entire or saliently toothed, pale beneath: umbel usually many-rayed: fruit elliptic, 4–5 mm. long, thin-winged. — (PIG-POTATO. WATER-DROPWORT. COW-BANE.)—Wet woods, swamps, and cliffs, various provinces, Fla. to La., Minn., and N. Y.—*O. longifolia* seems to be an extreme form of this species with very narrow leaf-segments.

4. O. turgida Small. Plant 4–12 dm. tall: leaves and umbels similar to those of *O. rigidior*: fruit elliptic-oval or elliptic-obovate, 2.5–3 mm. long, thick-winged.—Swamps, Blue Ridge and adj. provinces, S. C. to Va., and Coastal Plain, S E N. Y.

SERIES 2. GAMOPETALAE

Petals more or less united, or occasionally distinct, or very rarely wanting.

ORDER ERICALES — ERICAL ORDER

Herbs, undershrubs, shrubs, or trees, sometimes humus-plants or saprophytes. Leaves alternate, often evergreen: blades simple. Flowers mainly perfect and complete. Calyx of 2–8, usually 5, partially united sepals. Corolla of 2–8, usually 5, mostly united petals. Androecium of as many or twice as many stamens as petals, sometimes partially reduced to staminodia: filaments mostly free. Gynoecium of several united carpels. Fruit capsular, baccate, or drupaceous.

Stamens with free and distinct filaments.
Ovary superior: fruit exposed or enclosed in the calyx.
Gynoecium 3-carpellary: pollen-grains simple.
Fam. 1. CLETHRACEAE.
Gynoecium 4–7-carpellary, but the ovary rarely 1-celled: pollen-grains simple or compound.
Herbaceous root-parasites or saprophytes, with scale-like leaves: plants devoid of chlorophyl: pollen-grains simple.
Fam. 2. MONOTROPACEAE.
Herbs, undershrubs, shrubs, or trees: plants with chlorophyl: pollen-grains compound.

Herbaceous or partly woody plants with rootstocks.	Fam. 3. PYROLACEAE.
Shrubs or trees with erect or diffuse stems.	Fam. 4. ERICACEAE.
Ovary wholly or partly inferior.	Fam. 5. VACCINIACEAE.
Stamens with the filaments wholly or partly adnate to the corolla.	
Androecium without staminodia: caulescent plants.	Fam. 6. DIAPENSIACEAE.
Androecium with staminodia: acaulescent plants.	Fam. 7. GALACACEAE.

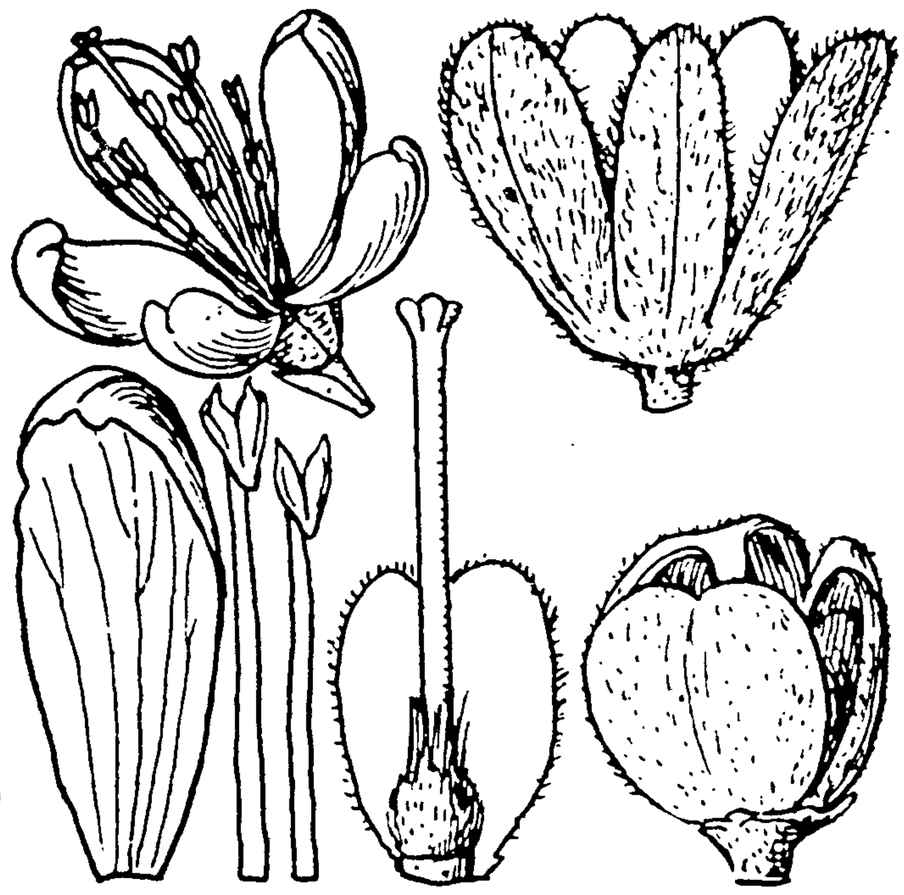
FAMILY 1. **CLETHRACEAE** — WHITE-ALDER FAMILY

Shrubs or trees, the pubescence of branched hairs. Leaves deciduous: blades mostly toothed. Flowers in racemes or panicles. Calyx of 5 persistent sepals. Corolla white, of 5 distinct petals. Androecium of 10 stamens: filaments elongate: anthers inverted in anthesis. Gynoecium of 3 united carpels: stigmas 3. Fruit a 3-valved loculicidal capsule.—Only the following genus, and about 30 species, widely distributed, except in Europe and Africa.

1. **CLETHRA** [Gronov.] L. Erect shrubs or trees, with toothed leaf-blades and elongate racemes or panicles.—Sum.—PEPPERBUSHES. WHITE-ALDERS.

Filaments glabrous: style pubescent: racemes erect.	
Sepals acute: leaf-blades glabrous beneath, or nearly so.	1. *C. alnifolia.*
Sepals obtuse: leaf-blades tomentose beneath.	2. *C. tomentosa.*
Filaments pubescent: style glabrous: racemes nodding.	3. *C. acuminata.*

1. C. alnifolia L. Shrub 1–3 m. tall, the twigs sparingly pubescent: leaf-blades obovate or cuneate, 3–8 cm. long: pedicels 1–3 mm. long: sepals elliptic to lanceolate, 2.5–3 mm. long: petals 5–6 mm. long: capsule subglobose, 2.5–3 mm. in diameter, erect.—(SUMMERSWEET. SWEET-PEPPERBUSH.)—Acid swamps, low sandy woods, and wet pinelands, Coastal Plain and adj. provinces, Fla. to La., Pa. and Me. The flowers are very fragrant. Pink-flowered forms are occasional.



2. C. tomentosa Lam. Shrub 1–3 m. tall, the twigs tomentose: leaf-blades obovate to narrowly or broadly cuneate, 4–10 cm. long: pedicels 2–5 mm. long: sepals oval or ovate-elliptic, 3–3.5 mm. long: petals 5–6 mm. long: capsule spheroidal, 4–4.5 mm. in diameter, drooping.—Swamps, Coastal Plain, N Fla. to Ala. and N. C.—Sometimes this species has an extra flowering season in the winter. The inciting cause is not evident.

3. C. acuminata Michx. Shrub, or tree becoming 6 m. tall, the twigs tomentulose: leaf-blades oval or elliptic, 9–20 cm. long: racemes nodding: pedicels recurved: sepals ovate, 3.5–4 mm. long, acute: petals 6–7 mm. long: capsule ovoid, 4–5 mm. long, drooping.—Woods, ravines, and cliffs of non-calcareous rocks, inner Piedmont to Appalachian Plateau, Ga. to Tenn., W. Va., and Va.

FAMILY 2. **MONOTROPACEAE** — INDIAN-PIPE FAMILY

Saprophytic or humus herbs, with matted roots. Stems scape-like, simple. Leaves reduced to scales. Flowers in racemes, or solitary, nod-

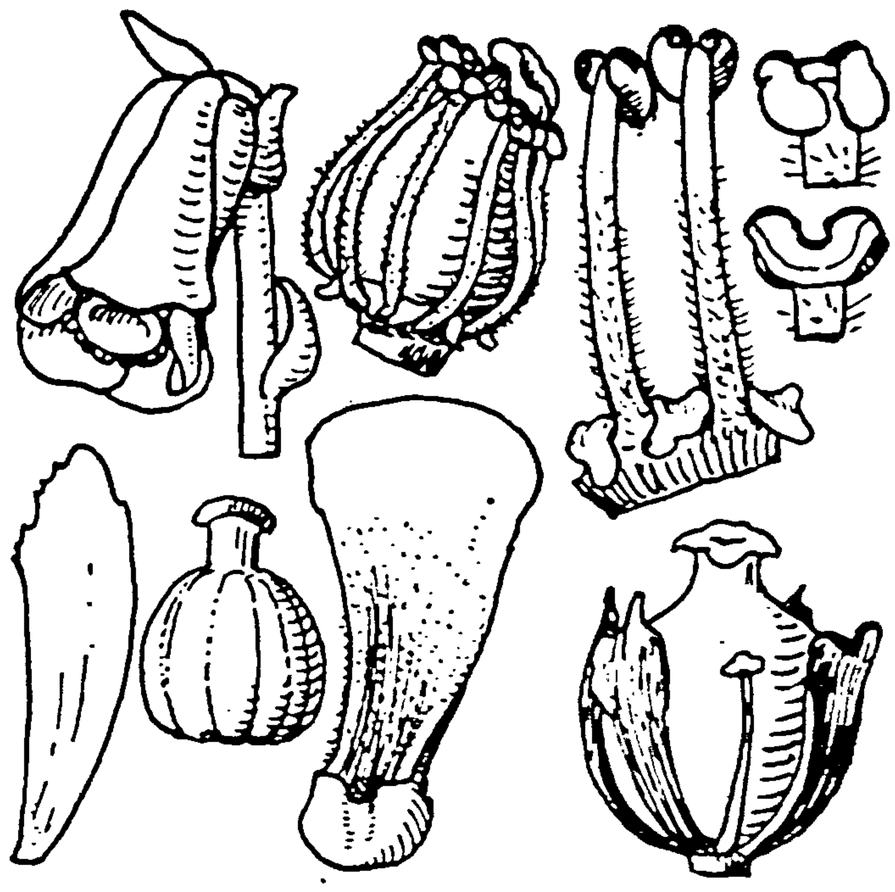
ding. Calyx of 2–6 deciduous sepals. Corolla white or colored, of 3–6 petals, or wanting. Androecium of 6–12 stamens: anthers with valves or pores. Gynoecium of 4–6 united carpels: stigma capitate, disc-like, or funnelform. Fruit a 4–6-valved loculicidal capsule.—About 9 genera and 16 species, most abundant in North America.

Corolla of several distinct petals, deciduous.
  Flowers solitary: plants white or pink (black in drying). 1. MONOTROPA.
  Flowers several: plants yellowish or red. 2. HYPOPITYS.
Corolla gamopetalous, campanulate, persistent. 3. MONOTROPSIS.

1. MONOTROPA L. White or pale-pink wax-like herbs blackening in drying. Flowers colorless, pink, ochroleucous, or salmon-colored. Sepals 2–4, unequal. Petals 5 or 6, saccate at the base, dilated at the apex. Gynoecium glabrous.—About 3 species, in North America and Asia.—INDIAN-PIPES. CORPSE-PLANTS.

Flowers white or pale-pink: petals obscurely ciliate: filaments sparingly pubescent. 1. *M. uniflora.*
Flowers ochroleucous or salmon-colored: petals copiously ciliate and densely pubescent within: filaments copiously pubescent. 2. *M. Brittonii.*

1. M. uniflora L. Stem 0.5–3 dm. tall, white: leaves lanceolate or elliptic-lanceolate, somewhat pointed: sepals and petals deeply saccate at the base, entire or eroded at the top: filaments slightly pubescent with short hairs: lobes of the disk slender, acute, projecting downward: capsule ovoid, 1–1.5 cm. long.—Woods and rich shaded banks, various provinces, N Fla. to Calif., Wash., and Newf.—Sum.—A pink-stemmed form flowering in fall, at higher altitudes in our range, may represent a distinct species.



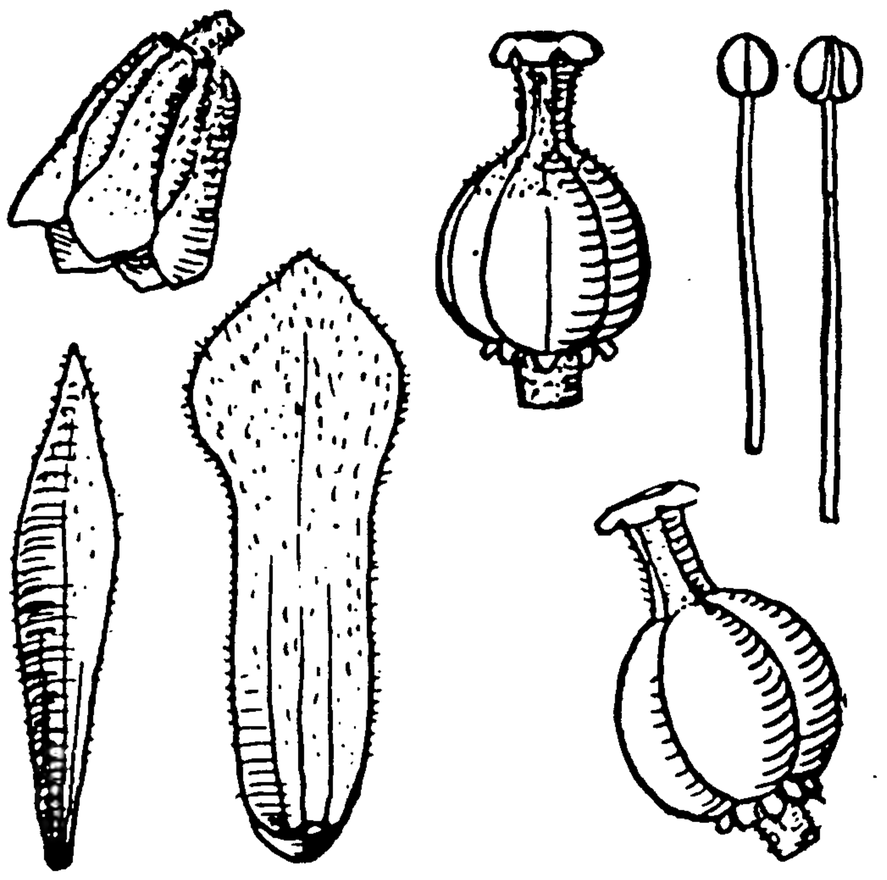
2. M. Brittonii Small. Stem 1–4 dm. tall, ochroleucous: leaves ovate or oblanceolate, or spatulate near the top of the stem, obtuse: sepals and petals shallowly saccate at the base, sometimes toothed at the top: filaments densely pubescent with long hairs: lobes of the disk stout, blunt, projecting outward or upward: capsule ellipsoid-ovoid, 1.5–2 cm. long.—Scrub, Coastal Plain, S pen. Fla. to SE N. C.—Wint.

2. HYPOPITYS Adans. Colored fragrant herbs. Flowers in a terminal raceme, deep-pink, yellow, red, or crimson. Sepals and petals 5 each in the earliest flower, or 4 in the later ones. Gynoecium pubescent.—About 7 species, in the north temperate zone.—Sum.–fall.—PINE-SAPS. FALSE BEECH-DROPS.

Stigma not retrorsely bearded: style sparingly pubescent: sepals and petals with short cilia. 1. *H. americana.*
Stigma retrorsely bearded: style copiously pubescent: sepals and petals with long cilia. 2. *H. lanuginosa.*

1. H. americana (DC.) Small. Plant tawny or yellow, finely pubescent or nearly glabrous, 1–3 dm. tall: sepals 7–10 mm. long: petals sparingly pubes-

cent: capsule oval or oblong-oval, 7–10 mm. long.—Woods, Blue Ridge, N. C. and Tenn. to Md., and various provinces, N. J. to W. Va. and Ont.



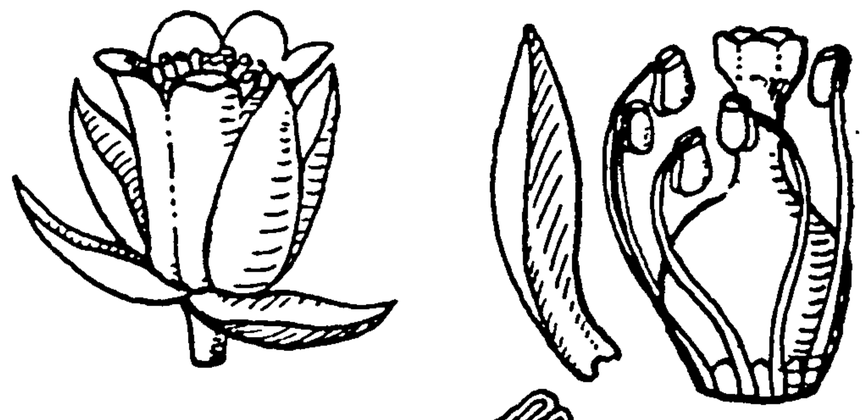
2. H. lanuginosa (Michx.) Nutt. Plant deep-pink and crimson, markedly or copiously pubescent, 0.5–3.5 dm. tall: sepals 6–9 mm. long: petals markedly pubescent: capsule globular, 4–5 mm. long.—Woods and thickets, various provinces, Fla. to La., Ky., Que., and Newf.—A late-blooming and bright-red-flowered species, with flowers and leaves tipped with yellow, has been published as *H. insignata* Bicknell, and may prove to be only a form of the above species, or the original plant of Michaux.

3. MONOTROPSIS Schwein. Colored herbs. Flowers in a raceme, fragrant, white, pink, or purple. Sepals 5, erose near the apex, persistent. Petals partially united: tube 5-saccate at the base.—Three species, given below. —SWEET PINE-SAPS. PYGMY-PIPES.

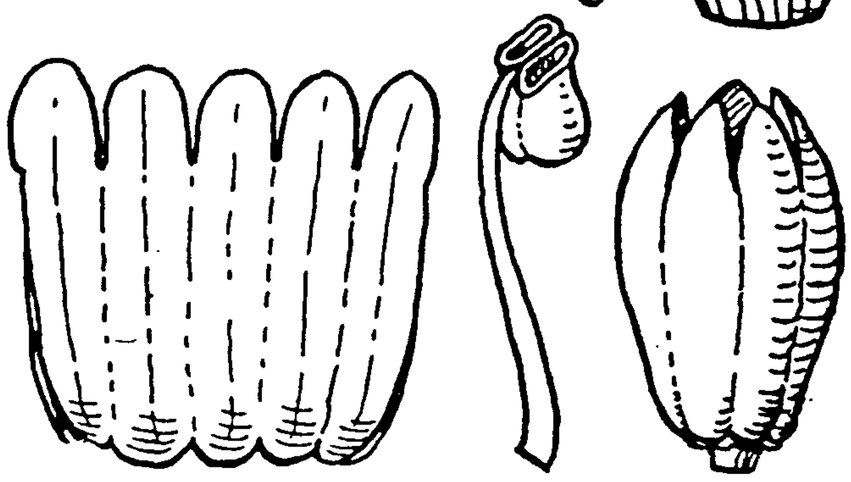
Corolla about as long as the calyx during anthesis or shorter, colored.
- Corolla-lobes much shorter than the tube: calyx and corolla about equal in length. — 1. *M. odorata.*
- Corolla-lobes about as long as the tube: calyx about twice as long as the corolla. — 2. *M. Lehmaniae.*

Corolla about twice as long as the calyx during anthesis, white. — 3. *M. Reynoldsiae.*

1. M. odorata Ell. Stems 5–11 cm. tall, purple or purplish-brown: flowers violet-scented: sepals 7–10 mm. long: corolla 7–8 mm. long, the lobes much shorter than the tube. [*Cryptophila pudica* W. Wolf.] — (CAROLINA BEECH-DROPS.) — Moist acid woods, various provinces, N Ga. to Ala., Ky., and Md.—Early spr.—The corolla is usually pink, but varies to almost white and purplish.



2. M. Lehmaniae Burnham. Stem 4–10 cm. tall, mainly brownish-purple: flowers not fragrant: sepals 7–8 mm. long: corolla mainly pink, the lobes about as long as the tube.—Woods, in Blue Ridge, W N. C.—Fall.



3. M. Reynoldsiae (A. Gray) Heller. Stem 4–12 cm. tall, purple: sepals 2–4 mm. long: corolla 6.5–8 mm. long, the lobes 1/3 as long as the tube.—Woods, E Fla.—Fall.

FAMILY 3. PYROLACEAE — WINTERGREEN FAMILY

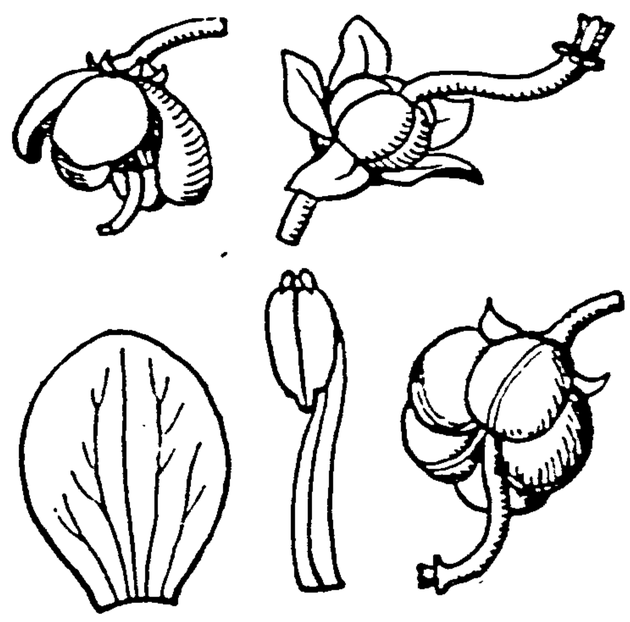
Perennial mostly evergreen herbs, with elongate rootstocks. Leaves alternate, mostly near the base of the stem: blades leathery. Flowers in terminal racemes, corymbs. or umbel-like clusters, or solitary, sometimes irregular. Calyx of 4 or 5 persistent sepals. Corolla white or pink, of 4 or 5 essentially distinct, wax-like petals. Androecium of twice as many stamens as there are petals: anthers inverted in anthesis. Gynoecium of 4 or 5 united carpels: stigmas united. Fruit a 4- or 5-valved loculicidal capsule.—Three genera and about 25 species, natives of the Northern Hemisphere.

Style elongate: flowers racemose: filaments unappendaged: capsule opening from base to top. 1. PYROLA.
Style very short: flowers corymbed or umbelled: filaments appendaged at the base: capsule opening from top to base. 2. CHIMAPHILA.

1. **PYROLA** [Tourn.] L. Leaves with broad blades. Flowers white, greenish, or pink, in elongate racemes. Filaments unappendaged, glabrous. Capsule nodding, the valve-margins cobwebby.—About 18 species, widely distributed in temperate and cool regions.—Sum.—WINTERGREENS. SHIN-LEAFS.

Leaf-blades suborbicular: calyx-lobes mainly longer than the tube: filaments less than twice as long as the anthers. 1. *P. americana.*
Leaf-blades elliptic-oval or oblong: calyx-lobes mainly shorter than the tube: filaments over twice as long as the anthers. 2. *P. elliptica.*

1. **P. americana** Sweet. Plant 2–3 dm. tall: leaf-blades thickish, 2–3 cm. long, mostly shorter than the petiole: sepals elliptic or lanceolate, 2–3 mm. long: petals obovate to orbicular-obovate, 7–9 mm. long: capsule 6–7 mm. wide. [*P. rotundifolia* Michx. not L.]—Woods, Blue Ridge, N. C. and Tenn., various provinces, Va. to Wisc. and N. S.

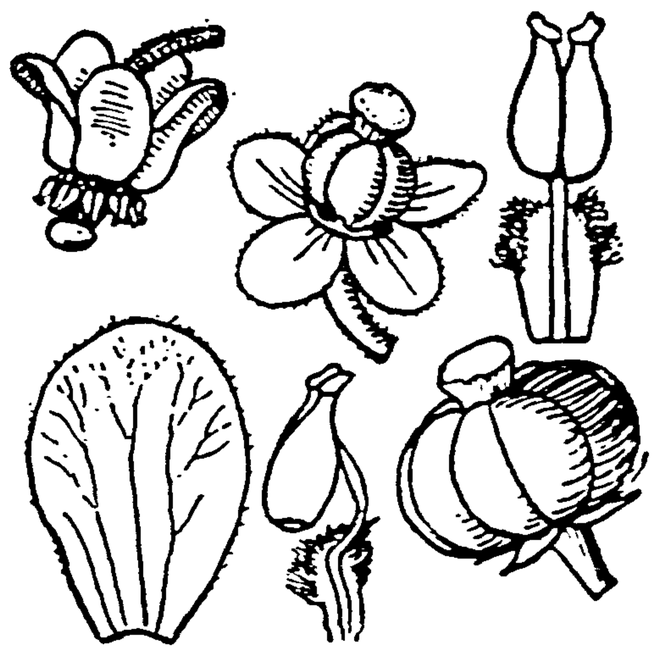


2. **P. elliptica** Nutt. Plant 1–3 dm. tall: leaf-blades thinnish, 3–9 cm. long, mostly longer than the petiole: sepals triangular-ovate: petals oblong to elliptic-obovate, 5.5–7 mm. long: capsule 5–6 mm. wide.—Thickets and woods, Blue Ridge, Tenn., and various provinces, Tenn. to N. M., B. C., Ont., and Va.—The petals of both species are usually white, but pink tinged corollas occur in occasional forms.

2. **CHIMAPHILA** Pursh. Leaves with relatively narrow blades. Flowers white, in corymbs. Filaments with pubescent or erose-ciliate appendages at the base. Capsule erect, the valve-margins glabrous.—About 7 species, distributed from the equator to the Arctic regions.—Sum.—PIPSISSEWAS.

Sepals longer than wide: petals ciliolate all around: filament-appendages pubescent. 1. *C. maculata.*
Sepals wider than long: petals erose-ciliolate and jagged at the apex; filament-appendages erose-ciliate. 2. *C. corymbosa.*

1. **C. maculata** (L.) Pursh. Plant 7–22 cm. tall: leaf-blades lanceolate or sometimes broader, 2–5 cm. long, dark-green with whitish veins: inflorescence usually 1–5-flowered: sepals rounded at the apex, ciliolate: petals white, 10–12 mm. long: filament-appendages narrow.—(SPOTTED-WINTERGREEN.)—Dry woods, various provinces, Ga. to Ala., Minn., and Me.



2. **C. corymbosa** Pursh. Plant 9–32 cm. tall: leaf-blades oblanceolate, cuneate, or obovate-cuneate, 2–10 cm. long, deep yellow-green, not variegated: inflorescence usually 3–10-flowered: sepals not rounded at the apex, erose: petals 9–11 mm. long, white except the pink base: filaments and broad appendages purplish-pink.—(PRINCE'S-PINE.)—Dry acid woods, Blue Ridge, Ga. to N. C., and various provinces, Va. to Wisc. and N. S.—*Chimaphila mexicana* is sometimes included in *C. maculata*. *C. domingensis* and *C. guatemalensis*, of Santo Domingo and Central America, respectively, have sometimes been included in *C. corymbosa*. Hence the ranges of the above species are sometimes extended into the tropics.

Family 4. **ERICACEAE** — Heath Family

Shrubs, trees, or undershrubs. Leaves often persistent: blades commonly leathery. Flowers typically perfect. Calyx of 4–7 distinct or partially united sepals. Corolla of 4–7 distinct or partially united petals, sometimes slightly 2-lipped. Androecium of as many or twice as many stamens as there are petals: anthers opening by pores, chinks, or valves. Gynoecium of 2–7 united carpels. Fruit a capsule, or sometimes baccate or drupaceous.—About 60 genera and 1,100 species, widely distributed.

Calyx not accrescent: capsule exposed.
  Capsule septicidal. — Tribe I. Rhododendreae.
  Capsule loculicidal or marginicidal.
    Anther-sacs opening by apical pores or chinks above the middle: capsule loculicidal: erect shrubs, trees, or vines. — II. Andromedeae.
    Anther-sacs opening lengthwise: capsule marginicidal: prostrate shrub with creeping branches. — III. Epigaeae.
Calyx accrescent, enclosing the capsule and becoming fleshy. — IV. Gaultherieae.

I. Rhododendreae

Corolla of distinct petals.
  Anther-sacs opening by apical pores: petals 6 or 7. — 1. Befaria.
  Anther-sacs opening lengthwise.
    Anthers sagittate: tall shrub with thin-membranous leaf-blades: petals long and narrow. — 2. Elliottia.
    Anthers globular-didymous: low or depressed shrubs with leathery leaf-blades: petals short and broad. — 3. Leiophyllum.
Corolla of partly united petals.
  Corolla decidedly 2-lipped, funnelform. — 4. Azalea.
  Corolla not 2-lipped, campanulate or rotate-campanulate, urceolate or saucer-shaped.
    Flower-body, and usually leaf-buds, scaly-strobilaceous.
      Corolla campanulate or rotate-campanulate.
        Upper corolla-lobe interior: calyx-lobes small, but prominent: leaves persistent; blades leathery. — 5. Rhododendron.
        Upper corolla-lobe exterior: calyx-lobes minute: leaves deciduous; blades membranous. — 6. Biltia.
      Corolla urceolate. — 7. Menziesia.
    Flower-buds, and leaf-buds, not scaly-strobilaceous.
      Calyx persistent: corolla-lobes rounded: capsule depressed. — 8. Kalmia.
      Calyx deciduous: corolla-lobes acute: capsule ovoid. — 9. Kalmiella.

II. Andromedeae

Calyx-lobes imbricate, at least in the bud.
  Capsule depressed: anther-sacs opening by apical pores or chinks.
    Capsule-wall double, the outer layer 5-valved. — 10. Chamaedaphne.
    Capsule-wall single, 5-valved.
      Anthers awned: panicles terminal. — 11. Eubotrys.
      Anthers awnless: panicles axillary. — 12. Leucothoe.
  Capsule elongate: anther-sacs opening by chinks above the middle. — 13. Oxydendron.
Calyx-lobes valvate or separated in the bud.
  Anther-sacs awned: capsule-sutures not thickened.
    Awns of the anther-sacs ascending: seeds smooth. — 14. Zenobia.
    Awns of the anther-sacs deflexed: seeds reticulate or with a loose coat.
      Flowers in terminal compound panicles: filaments subulate, straight or nearly so. — 15. Pieris.
      Flowers in axillary simple raceme-like panicles: filaments much-flattened, sigmoid-curved. — 16. Ampelothamnus.
  Anther-sacs awnless: capsule-sutures thickened.
    Filaments appendaged: corolla about twice as long as the calyx.
      Style fusiform: corolla of an urceolate type: leaf-blades with intramarginal veins: sepals persistent. — 17. Desmothamnus.
      Style columnar: corolla of a cylindraceous-campanulate type: leaf-blades without intramarginal veins: sepals deciduous. — 18. Neopieris.

Filaments unappendaged: corolla several times exceeding the calyx.
Capsule longer than thick, prominently angled: lepidote shrubs with persistent leaves: flowers in axillary clusters. 19. XOLISMA.
Capsule depressed, not angled: pubescent shrubs with deciduous leaves: flowers in panicled racemes. 20. ARSENOCOCCUS.

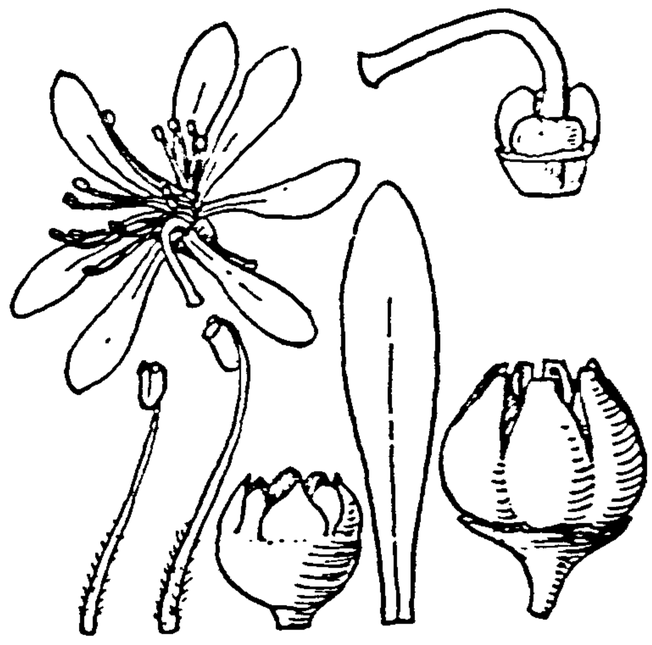
III. EPIGAEAE

Plant with creeping stems and evergreen leaves: flowers in axillary clusters: corolla salverform: calyx-lobes dry. 21. EPIGAEA.

IV. GAULTHERIEAE

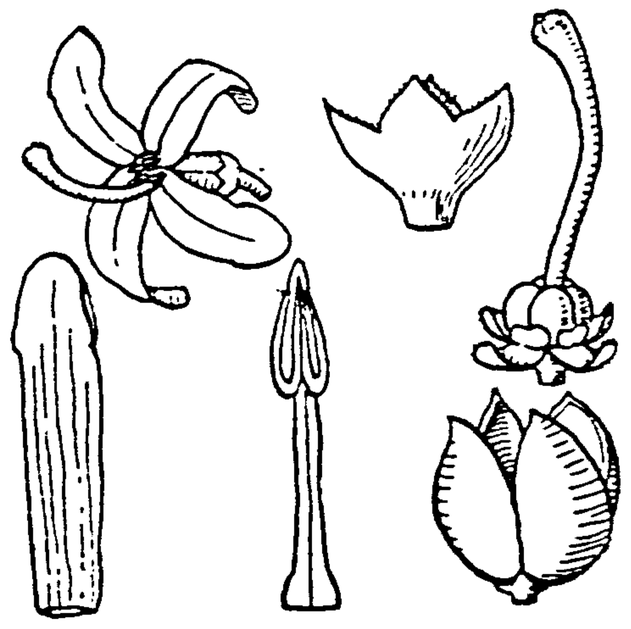
Stem erect from a horizontal rootstock: leaves evergreen: flowers solitary in the axils: corolla urceolate: calyx-lobes fleshy. 22. GAULTHERIA.

1. BEFARIA Mutis. Evergreen shrubs with erect branches. Leaves alternate: blades thick. Flowers large in long erect spike-like racemes. Calyx-lobes 6 or 7. Petals broadened upward, spreading. Stamens 12 or 14: anthers with terminal pores. Ovary 6- or 7-celled. Capsule subglobose.—About 15 species, mostly tropical American.—Sometimes spelled *Bejaria*.



1. B. racemosa Vent. Shrub 1–2.5 m. tall, the branches hirsute: leaf-blades mainly elliptic to oval, 2–5.5 cm. long, often somewhat hirsute: calyx-lobes about 4 mm. long: petals white, sometimes pink-tinged, spatulate to linear-spatulate, 2–3 cm. long, glutinous: filaments pubescent: capsule depressed-globose, 6–9 mm. in diameter.—(TAR-FLOWER, FLY-CATCHER.)—Pinelands, Coastal Plain, Fla. to Ga.—Spr.–fall.—This outlier of a typically Mexican-South American genus is a striking plant when in flower. Bouquets made of the inflorescence as it starts to flower, will continue to bloom for nearly or quite a week.

2. ELLIOTTIA Muhl. Deciduous shrubs, with more or less spreading branches. Leaves alternate: blades thinnish. Flowers small, numerous, in short panicles. Calyx-lobes 3 or 4. Petals not broadened upward. Stamens 4–10: anthers with longitudinal valves. Ovary 3–5-celled. Capsule subglobose.—One species.



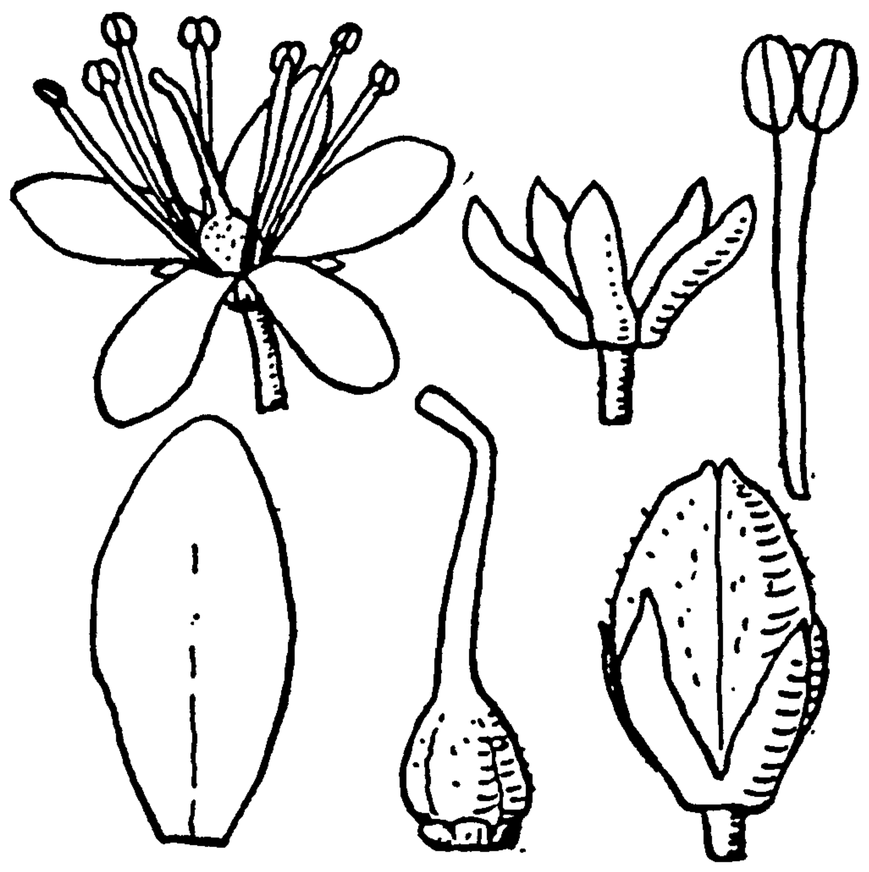
1. E. racemosa Muhl. Shrub 1–5 m. tall, the branches glabrous: leaf-blades elliptic, oval, or elliptic-oblanceolate, 4–12 cm. long: calyx-lobes about 1 mm. long: petals white, linear-elliptic, 12–14 mm. long, not glutinous: filaments glabrous: capsule ovoid-globose.—(ELLIOTTIA.)—Oak ridges and sandhills, Coastal Plain and adj. provinces, Ga. and S S. C.—Sum.—One of the rarest of American shrubs, known to have been found at but 7 or 8 stations, and at some of these now exterminated. At each station but a single individual is represented, although this may often spread into a large patch by its rootstocks. Being sterile to its own pollen, seeds are only produced when cross-fertilization from one clump to another is brought about. Before the coming of the white man, such plants must have grown close enough together for

insects to accomplish this crossing at times, but lumbering and agriculture have destroyed so many, that propagation by seeds seems to have ceased.

3. **LEIOPHYLLUM** Pers. Evergreen shrubs with erect, spreading, or prostrate branches. Leaves alternate or opposite, box-like: blades coriaceous, entire, often shining. Flowers in terminal umbel-like clusters. Calyx-lobes 5, longer than the tube. Petals 5, white or pink, spreading. Stamens 10: anthers opening lengthwise. Style straight. Capsule ovoid. [*Dendrium* Desv.]—Only the following species.—Spr.–sum.—SAND-MYRTLES.

Style slender, fully twice as long as the ovary in anthesis: disk minute: petals elliptic to ovate-elliptic: pedicels glabrous. 1. *L. buxifolium.*
Style stout, less than twice as long as the ovary: disk prominent: petals ovate to rhombic-ovate: pedicels pubescent.
  Leaves mostly opposite: capsule-valves sharp-tuberculate: depressed or diffuse shrub. 2. *L. Lyoni.*
  Leaves alternate: capsule-valves muricate or scabrous: erect shrub. 3. *L. Hugeri.*

1. **L. buxifolium** (Berg.) Ell. A much-branched shrub resembling a dwarf-box plant, 3 dm. tall or less: leaf-blades elliptic or slightly broadened upward, mostly 3–8 mm. long, shining above, paler and dull beneath: calyx-lobes elliptic-lanceolate or lanceolate, about 1 mm. long: petals elliptic to ovate-elliptic, 2–2.5 mm. long: capsule ovoid, about 3 mm. long, more than twice as long as the calyx. [*D. buxifolium* Desv.]—Sandy pine-barrens, Coastal Plain, N. C. to N. J.; recorded from as far south as Fla.



2. **L. Lyoni** Sweet. A low, diffuse or depressed shrub 2 dm. tall or less, the usually numerous branches often prostrate and matted: leaf-blades oval or broadly elliptic, 4–7 mm. long or sometimes smaller: calyx-lobes lanceolate to almost linear, about 1.5 mm. long: petals ovate to oval, about 2.5 mm. long: capsule broadly ovoid to globose-ovoid, 2.5–3 mm. long. [*D. prostratum* (Loud.) Small]—Rocky summits, Blue Ridge, N. C. and Tenn.

3. **L. Hugeri** (Small) K. Sch. A much-branched shrub, 9 dm. tall or less: leaf-blades elliptic or individually elliptic-ovate, 9–15 cm. long: calyx-lobes lanceolate, 2 mm. long or sometimes shorter: petals broadly ovate to rhombic-ovate, 3.5–4 mm. long: capsule ovoid, 3.5–4 mm. long. [*D. Hugeri* Small]—Rocky summits, Blue Ridge and inner Piedmont, S. C. and N. C.

4. **AZALEA** L. Erect deciduous-leaved shrubs, sometimes tardily deciduous at the extreme south. Leaves alternate: blades sometimes bristle-toothed. Calyx deciduous: lobes 5, conspicuously ciliate. Corolla variously colored, funnelform: tube elongate: limb 2-lipped. Stamens 5 or rarely 10, conspicuously exserted: anthers with terminal pores. Style declined. Capsule elongate, opening at the apex.—About 40 species, American and Asiatic.—WILD-HONEYSUCKLES. AZALEAS.—Natural hybrids are to be expected.—Several of the species are much used in horticulture.

Flower-clusters appearing before the leaves or as the leaves unfold. I. NUDIFLORAE.
Flower-clusters appearing after the leaves.
  Twigs strigose: style usually pubescent. II. VISCOSAE.

Twigs glabrous: style usually glabrous.
  Corolla white or pinkish; tube glandular pubescent without. III. ARBORESCENTES.
  Corolla crimson; tube glabrous or nearly so without. IV. PRUNIFOLIAE.

I. NUDIFLORAE

Corolla red, orange, or yellow.
  Flowers appearing as the leaves unfold: scales of the winter-buds glabrous on the back.
    Corolla-tube glandular without, as long as the lobes or shorter; limb yellow to orange or scarlet. 1. *A. calendulacea.*
    Corolla-tube pubescent with glandless hairs without, longer than the lobes; limb scarlet or bright red. 2. *A. speciosa.*
  Flowers appearing before the leaves unfold: scales of the winter-buds pubescent on the back. 3. *A. austrina.*
Corolla white, pink, or carmine.
  Shrubs with tap-roots and erect, usually much-branched stems, mostly 1–2 m. tall: flower-buds without prominent rows of stipitate glands at the apex.
    Corolla pink.
      Corolla-tube hirsute or strigose without. 4. *A. nudiflora.*
      Corolla-tube more or less glandular-pubescent.
        Leaf-blade thick, usually pubescent beneath when mature: capsule softly pubescent and hirsute: corolla-tube abruptly expanded into the limb.
          Leaf-blade softly pubescent beneath when mature, but green. 5. *A. canescens.*
          Leaf-blade white or pale-tomentose beneath when mature, not green. 6. *A. candida.*
        Leaf-blade thin-membranaceous: capsule glandular-hirsute: corolla-tube gradually expanded into the limb. 7. *A. prinophylla.*
    Corolla white. 8. *A. alabamensis.*
  Shrub with horizontal underground stem and low erect simple or nearly simple branches, in small or large colonies (stoloniferous): flower-buds with conspicuous rows of stipitate glands at the apex. 9. *A. atlantica.*

II. VISCOSAE

Twigs pale: scales of the winter-buds few (15 or less), obtuse or acutish, usually brown: leaves usually glabrous beneath: northern plant. 10. *A. viscosa.*
Twigs red-brown: scales of the winter-buds many (15 or more), aristate-mucronate, pale, except the dark margin: leaves often pubescent beneath: southern plant. 11. *A. serrulata.*

III. ARBORESCENTES

Shrub or small tree, with glabrous yellowish-brown or reddish-brown twigs: leaf-blades of an obovate type, usually glaucous beneath. 12. *A. arborescens.*

IV. PRUNIFOLIAE

Shrub with dark purplish-red twigs: leaf-blades of an elliptic or elliptic-lanceolate type, light-green beneath. 13. *A. prunifolia.*

1. A. calendulacea Michx. Shrub 0.5–5 m. tall, the twigs strigillose: leaf-blades oval, elliptic, or obovate, 3–8 cm. long, more or less canescent beneath: calyx-lobes ovate to elliptic, 3–4 mm. long: corolla yellow, orange, or scarlet, often somewhat variegated; tube 1.5–2 cm. long, glandular-pubescent; upper lobe with an orange blotch: capsule ovoid-ellipsoid, 1.5–2.5 cm. long, or sometimes shorter, hirsute. [*A. lutea* L.?] —(FLAME-AZALEA. YELLOW-AZALEA.)—Acid humus, in open woods, inner Piedmont to Appalachian Plateau, Ga. to Ala., Tenn., W. Va., and S N. Y.—Late spr.—A red azalea native in the Cumberland mountains, with pedicel and calyx non-glandular and leaf-blades glaucous beneath, flowering in late June and July, may be distinct.

2. A. speciosa Willd. Shrub 0.5–2 m. tall, the twigs strigillose: leaf-blades obovate to elliptic, 3–6 cm. long, finely pubescent beneath and more or less strigillose on the midrib: calyx-lobes broadly ovate to elliptic, 0.5–3 mm. long, long-ciliate: corolla scarlet or bright-red; tube 2–2.5 cm. long; upper lobe with an orange blotch: capsule 2–3 cm. long, narrowly ovoid to elliptic-ovoid, strigose.—Woods and sandhills, Piedmont and adj. provinces, Ga. and S. C.—Spr.

3. A. austrina Small. Shrub mostly 3 m. tall or less, the twigs sparingly strigose and softly pubescent, and usually glandular: leaf-blades oval, obovate, elliptic, or elliptic-spatulate, 2.5–9 cm. long, rather firm in age, finely pubescent, usually permanently so: calyx-lobes deltoid to triangular-lanceolate, acute, glandular-ciliate: corolla yellow and orange; tube 1.8–2 cm. long, finely glandular-pubescent; lobes broad, acute or abruptly short-acuminate: capsule narrowly cylindric ellipsoid, slightly narrowed upward, 2–2.5 cm. long, finely glandular-pubescent.—Woods and stream-banks, in moderately acid sandy soils, N W Fla. —Spr.—The flowers are slightly fragrant.

4. A. nudiflora L. Shrub 3 m. tall or less, the twigs finely pubescent and more or less strigose: leaf-blades elliptic to obovate or elliptic-obovate, 3–10 cm. long, thick and firm in age, strigose on or near the veins beneath, or glabrous, except the margins: calyx-lobes ovate to half-orbicular, copiously ciliate: corolla pink (or deep-pink or carmine, the tube with some equal gland-tipped hairs in *A. nudiflora glandifera*); tube 2–3 cm. long, pilose or strigose; lobes rather broad, shorter than the tube: capsule ellipsoid, often narrowly so or somewhat narrowed upward, strigose or hirsute-strigose.—(PINXTER-FLOWER. HONEYSUCKLE. EARLY-AZALEA.)—Woods and low grounds, various provinces, N. C. to Tenn., Ohio and Mass.—Spr.—The flowers are scarcely fragrant.

5. A. canescens Michx. Shrub up to 5 m. tall the twigs minutely soft-pubescent and usually also strigose: leaf-blades elliptic, elliptic-oblanceolate, oblanceolate, or narrowly obovate, thickish and firm at maturity, 4–10 cm. long, ciliate, with scattered hairs above or nearly glabrous, permanently tomentose-canescent beneath, (or glabrous, except the margins and the midrib in *A. canescens subglabra*): calyx-lobes deltoid to ovate or half-orbicular, usually about 1 mm. long, ciliate: corolla pink; tube 1.5–2.5 cm. long, or rarely somewhat longer, finely glandular-pubescent, abruptly dilated near the throat; lobes shorter than the tube: capsule cylindric-ellipsoid, narrowed upward, 1.5–2.5 mm. long, canescent and hirsute.—Stream-banks, in rather acid sandy soil, Coastal Plain and adj. provinces, Fla. to Tex., Ark., Tenn., and N. C.—Spr.—The flowers are slightly fragrant.

6. A. candida Small. Shrub 2 m. tall or less, the twigs tomentulose and often somewhat glandular: leaf-blades obovate, obovate-oblanceolate, cuneate, or elliptic, coriaceous at maturity, 1–7 cm. long, thinly fine-pubescent above, glaucous and white- or pale-tomentose beneath and sometimes reticulate-veiny: calyx-lobes deltoid, ciliate, obtuse: corolla white: capsule narrow, gradually narrowed upward, 2–2.5 cm. long, canescent, curved.—Hammocks, Coastal Plain, N Fla. to S Ga.—Spr.—The flowers are slightly fragrant.

7. A. prinophylla Small. Shrub up to 5 m. tall, the twigs finely loose-pubescent and somewhat strigose: leaf-blades oval or elliptic, varying to obovate, 2–8 cm. long, thinnish and not very firm at maturity, ciliate, canescent beneath or glabrate, especially in age: calyx-lobes half-orbicular to deltoid or ovate, sparingly ciliate, obtuse: corolla deep-pink, or sometimes pale; tube 1.5–2 cm. long, thinly villous-tomentose and glandular-pubescent; lobes as long as the tube or slightly shorter: capsule ellipsoid to ovoid-ellipsoid, 1.5–2 cm. long, or smaller, glandular-pubescent. [*A. canescens* (Fl. SE. U. S.) not Michx.]—Woods and rocky banks, various provinces N of Coastal Plain, Tenn. to Ark., Vt., and Va.—Spr.—The flowers are very fragrant.

8. A. alabamensis (Rehder) Small. Shrub up to 1 m. tall, the twigs pale-strigose: leaf-blades obovate to elliptic or elliptic-obovate, 3–6 cm. long, loosely short-pubescent beneath and strigillose on the midrib: calyx-lobes ovate, often broadly so, bristly pubescent: corolla white; tube 2–3 cm. long, usually glandular-pubescent without; lobes shorter than the tube: anthers 2–3 mm. long: capsule cylindric-ellipsoid, about 1.5 cm. long, loosely pubescent and more or less glandular-bristly. [*Rhododendron alabamense* Rehder.]—Dry woods, Coastal Plain and adj. provinces, Ala.—Spr.—The flowers are fragrant.

9. A. atlantica Ashe. Shrub with the more or less gregarious branches usually less than 0.5 m. tall, the twigs sparingly strigillose and sometimes glandular-hirsute: leaf-blades obovate, elliptic-obovate, or sometimes elliptic, 3–6 cm. long, mostly glabrous beneath, except the pubescent midrib, (finely pubescent on both sides and bluish-green in *A. atlantica luteo-alba*): calyx-lobes broadly ovate or elliptic-ovate, 2–4 mm. long, ciliate, often with gland-tipped hairs: corolla white or pink, (purplish-pink in *A. atlantica neglecta*); tube 2–2.5 cm. long or barely longer, glandular-pubescent without; lobes shorter than the tube: anthers 2–3 mm. long: capsule ovoid-ellipsoid, 1.5–2 cm. long, bristly with glandless or gland-tipped hairs.—Low pinelands, Coastal Plain, S. C. to Del.—Spr.—The flowers are very fragrant.—An azalea apparently referable to *A. atlantica luteo-alba* occurs in S Ala.

10. A. viscosa L. Shrub 0.5–5 mm. tall, the twigs loosely pubescent and strigillose (or decidedly hispid in *A. viscosa hispida*); the winter-buds typically glabrous (or densely pubescent, and the leaves up to 6 cm. long in *A. viscosa aemulans*, or silky-pubescent, and the leaves up to 4 cm. long in *A. viscosa montana*): leaf-blades cuneate to obovate or individually elliptic or elliptic-oblanceolate, 2–6 cm. long, thickish, ciliate, strigillose on the midrib beneath, (or finely and rather densely pubescent beneath in *A. viscosa tomentosa*), dull (or small and shining in *A. viscosa nitida*; glaucous on one or both sides in *A. viscosa glauca*): calyx-lobes ovate to semi-orbicular, pectinate-ciliate: corolla white or pink-tinged; tube 1.5–2.5 cm. long, rather abruptly dilated near the limb; lobes much shorter than the tube: capsule ellipsoid-ovoid, 1.5–2 cm. long, glandular-hirsute.—(SWAMP-AZALEA.)—Acid swamps, various provinces, Fla. to Miss., Ohio, and Me.—Late Spr.–sum.—The flowers are very fragrant.

11. A. serrulata Small. Shrub 7 m. tall or less, the twigs red-brown, strigose, and usually also finely villous, the winter-buds with numerous glabrous scales, (or with few and densely gray-pubescent in *A. serrulata georgiana*): leaf-blades elliptic to obovate or obovate-elliptic, or individually elliptic-oblanceolate, 4–9 cm. long, serrulate-ciliate, shining, finely reticulate, glabrous, except for scattered hairs on the midrib beneath: calyx-lobes ovate or broader, long-ciliate, obtuse: corolla white; tube 3–3.5 cm. long, somewhat enlarged near the base, expanded near the limb, glandular-pubescent; lobes narrow, shorter than the tube: capsule ovoid-ellipsoid, 1–1.5 cm. long, glandular-setose.—Wet hammocks, Coastal Plain, Fla. to La. and S. C.—Spr.–sum.—The flowers are very fragrant.

12. A. arborescens Pursh. Shrub with tall stems, (or with low widely branched stems and small very glaucous leaves in *A. arborescens Richardsonii*), or tree becoming 6 m. tall, with the scales of the winter-buds short-mucronate: leaf-blades elliptic, oblanceolate, or cuneate, 4–10 cm. long, glabrous beneath except the midrib and more or less glaucous: calyx-lobes ovate to linear-elliptic, 3–6 mm. long: corolla white or pale-pink; tube 2.5–3 cm. long, densely glandular-hirsute without; lobes acuminate, much shorter than the tube: anthers about 3 mm. long: capsule ellipsoid-ovoid, 1–2 cm. long, stout, bristly-glandular, abruptly narrowed at the apex.—(SMOOTH-AZALEA.)—Stream-banks and rocky woods, in rather acid soil, various provinces, N of Coastal Plain, Ga. to Ala., Ky., and Pa.—The flowers are fragrant and have conspicuous red filaments. The dried leaves give off the fragrance of coumarin.—Late spr.–early sum.

13. A. prunifolia Small. Shrub 3 m. tall or less, with the scales of the winter-buds short-aristate: leaf-blades elliptic or elliptic-lanceolate, varying to somewhat obovate, 2.5–13 cm. long, acute or slightly acuminate, deep-green above, light-green beneath, glabrous, except for scattered hairs on the midrib and on the veins beneath, and the ciliolate margins: calyx-lobes ovate or half-orbicular, about 1 mm. long, coarsely long-ciliate, obtuse: corolla crimson, 2–2.5 cm. long; tube glabrous or merely with scattered hairs, gradually dilated from the base to the limb; lobes broad, abruptly pointed: anthers 2.5–3 mm. long: capsule gradually narrowed upward, about 2 cm. long, strigose and puberulous.—Moist woods, Coastal Plain, Ga. and Ala.—Sum.

5. RHODODENDRON L. Evergreen shrubs or trees. Leaves alternate: blades leathery, not ciliate. Calyx persistent: lobes broad and short. Corolla variously colored, campanulate: tube very short: limb 2-lipped. Stamens usually 10, slightly exserted with terminal pores. Style declined. Capsule elongate, opening at the apex.—About 100 species, most abundant in Asia.—ROSE-BAYS. RHODODENDRONS. Many species are used in horticulture.

Leaf-blades neither glandular-dotted nor scaly. — I. MAXIMA.
Leaf-blades glandular-dotted or scaly. — II. MINORA.

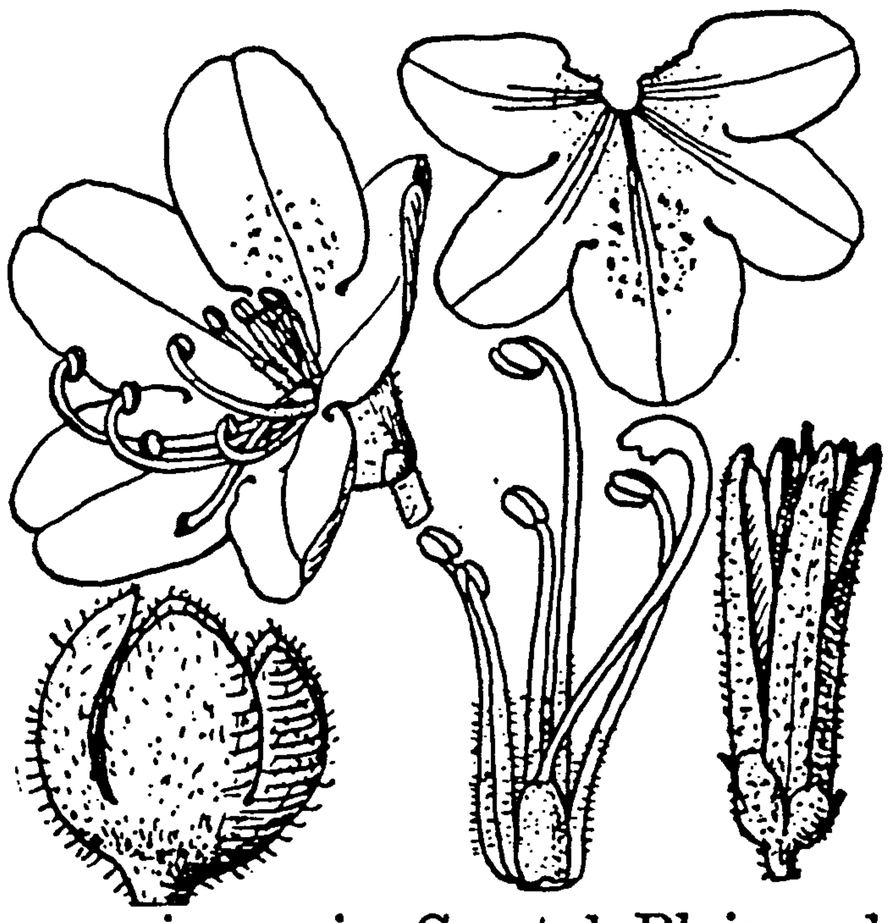
I. MAXIMA

Calyx-lobes longer than wide: corolla mainly white or pink: pedicels viscid. — 1. *R. maximum.*
Calyx-lobes wider than long: corolla rose-purple or lilac-purple: pedicels not viscid. — 2. *R. catawbiense.*

II. MINORA

Flower-clusters appearing after the leafy shoots of the season: leaf-blades acute or acuminate.
Corolla 1.5–2 cm. long: calyx-lobes of a deltoid type. — 3. *R. carolinianum.*
Corolla 2.5–3 cm. long: calyx-lobes of an ovate type. — 4. *R. minus.*
Flower-clusters appearing before the leafy shoots of the season: leaf-blades obtuse or retuse. — 5. *R. Chapmanii.*

1. R. maximum L. An evergreen shrub commonly 5 m. tall, or rarely a small tree, with scurfy-pubescent twigs: leaf-blades elliptic or elliptic-oblanceolate, 10–25 cm. long, acute or short-acuminate, glabrous, or somewhat scurfy beneath, bright-green above, pale-green beneath, abruptly narrowed at the base, the stout petioles tomentulose when young: calyx-lobes ovate to oblong, mostly longer than wide: corolla mainly white or pink, often somewhat greenish in the throat and with yellow or orange spots within, broadly campanulate, 2–3 cm. long; lobes not crisped: filaments slender, the longer ones about 2 cm. long: anthers about 2 mm. long: style elongate: capsule narrowly ellipsoid or cylindric-ellipsoid or slightly narrowed upward, 1–1.5 cm. long: seeds less than 2 mm. long. — (GREAT-LAUREL. ROSE-BAY.)—Acid woods, mt. slopes, and stream-banks, various provinces, in Coastal Plain only N, Ga. to Ala., Ont., and N. S.—Sum..—The hard, close-grained brown heartwood is used for tool handles. The root is used for making tobacco pipes.



2. R. catawbiense Michx. An evergreen shrub commonly 1–3 m. tall, or rarely a small tree, with finely pubescent twigs: leaf-blades elliptic, or nearly so, or oval, 7–16 cm. long, abruptly pointed at the apex, glabrous, dark-green above, pale-green beneath, mostly rounded or subcordate at the base, the stout petioles

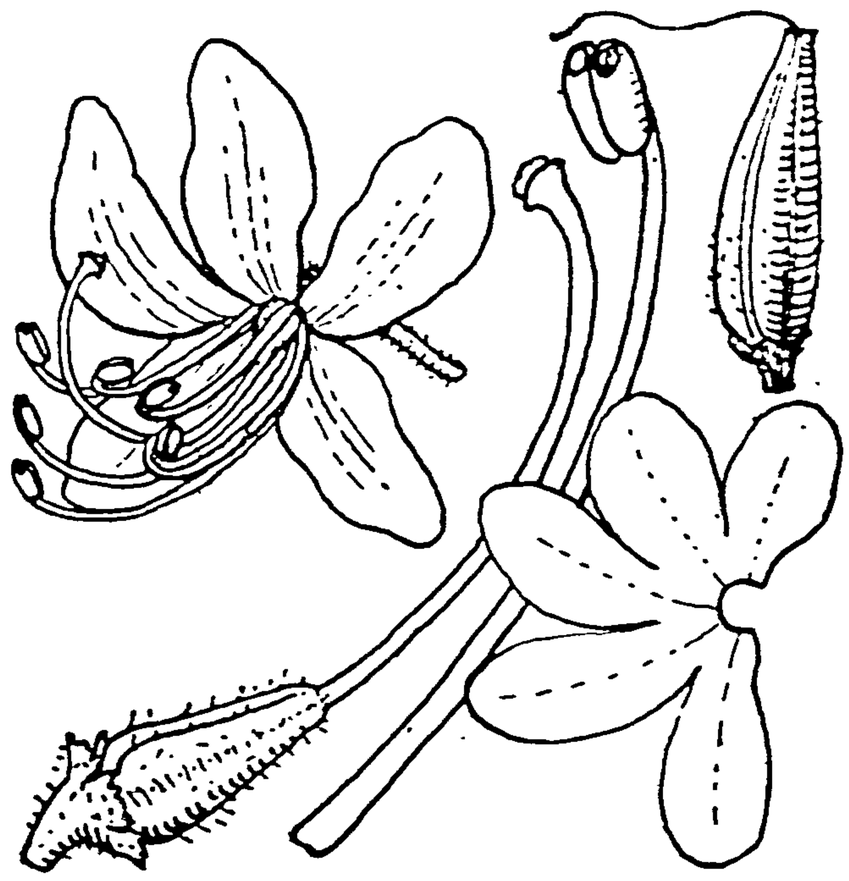
pubescent: calyx-lobes half-orbicular or broadly deltoid, much wider than long: corolla rose-purple or lilac-purple, broadly campanulate, 3.5–5 cm. long; lobes scarcely undulate: filaments slender, the longer ones about 3 cm. long; anthers about 3 mm. long: style elongate: capsule narrowly ellipsoid, or slightly enlarged at the base, 2–2.5 cm. long: seeds less than 3 mm. long.—(PURPLE-LAUREL. MOUNTAIN ROSE-BAY.)—Mt. slopes, summits, bluffs and cliffs, in acid soils, Piedmont to Appalachian Plateau, Ga. to Ala. and W. Va.—Spr.-early sum.—The form growing in the Piedmont is *R. catawbiense insulare*.

3. R. carolinianum Rehder. A much-branched shrub, with resinous-dotted foliage; leaf-blades elliptic or somewhat broadened upward, 8–13 cm. long, acute or acuminate at both ends, somewhat shining above, paler beneath and copiously resinous-dotted; petioles stout but relatively long, resinous-dotted and slightly pubescent above: calyx-lobes ovate, often broadly so: corolla rose-colored, often mottled, 1.5–2 cm. long, broadly funnel-form; tube short: longer filaments less than 2.5 cm. long; capsule ellipsoid-ovoid, 8–12 mm. long.—Woods and mountain summits, Blue Ridge, S. C. to Tenn. and N. C.—Spr.

4. R. minus Michx. A branching straggling shrub, with resinous-dotted foliage: leaf-blades elliptic or oval, 3–12 cm. long, acute or somewhat acuminate at both ends, deep-green above, paler and copiously resinous-dotted beneath; petioles stout, but relatively long, resinous and more or less pubescent at least when young: calyx-lobes deltoid, often broadly so or rarely deltoid-ovate: corolla clear rose-colored, 2.5–3 cm. long, funnelform-campanulate; tube rather long: longer filaments more than 2.5 cm. long: anthers about 2.5 mm. long: capsule ellipsoid or ellipsoid-ovoid, 8–12 mm. long. [*R. punctatum* Andr. *R. Cuthbertii* Small]—Sandy woods, inner Coastal Plain to lower Blue Ridge, Ga. to Ala. and N. C.—Spr.—Albinos of this as of other species occur.

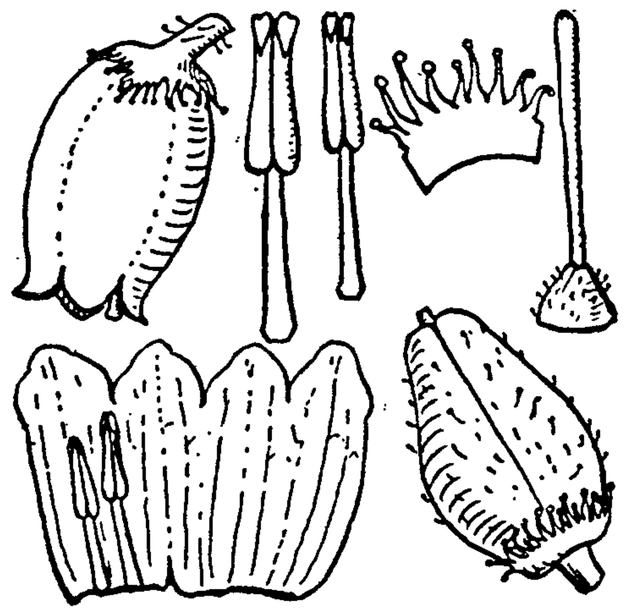
5. R. Chapmanii A. Gray. An evergreen shrub 2 m. tall or less, with glandular-dotted foliage and erect rigid branches: leaf-blades elliptic or oval, 2–5 cm. long, obtuse or retuse at the apex, somewhat lustrous above, glandular-dotted beneath, revolute, abruptly narrowed at the base; petioles short, resinous-dotted, glabrous: calyx-lobes broadly deltoid or rounded, broader than long: corolla rose-colored, 2.5–3 cm. long, funnelform-campanulate; tube rather short and stout: longer filaments more than 2.5 cm. long: anthers less than 2.5 mm. long: capsule nearly 1 cm. long.—Low pinelands, W Fla.—Early Spr.

6. BILTIA Small. Deciduous-leaved shrubs. Leaves alternate: blades thinnish, ciliate. Calyx undulate. Corolla bright-colored, rotate-campanulate: tube short: lobes 5, the 2 lower ones overlapping the others, the middle lobe of the three upper ones exterior. Style declined. Capsule narrowed upward, opening only along the sides, the apex remaining closed.—One species.



1. B. Vaseyi (A. Gray) Small. Shrub 1–5 m. tall, the twigs sparingly pubescent: leaf-blades elliptic, 6–15 cm. long: corolla rose-colored with yellow-orange or reddish-orange spots on the 3 upper spreading lobes: capsule ellipsoid-ovoid, about 10 mm. long. [*Rhododendron Vaseyi* A. Gray. *Azalea Vaseyi* Rehder]—Rocky mt. slopes and summits in rather acid soil, Blue Ridge, N. C.—Spr.—Frequently used in ornamental gardening, under the name PINK-SHELL AZALEA.

7. **MENZIESIA** J. E. Smith. Deciduous-leaved shrubs. Leaves alternate: blades entire. Calyx persistent: lobes 4 or 5, very broad. Corolla regular, white, pink, greenish, or reddish, campanulate or urceolate. Stamens 5, 8 or 10, inclined: anthers elongate. Capsule of an ovoid type.—About 7 species, North American and Japanese.



1. M. pilosa (Michx.) Pers. Shrub 0.5–2 m. tall, the twigs finely pubescent: leaf-blades elliptic to oval or elliptic-oblanceolate, 1.5–5 cm. long, ciliate, gland-tipped: calyx-lobes glandular-ciliate: corolla greenish to reddish, 6–7 mm. long; lobes rounded, much shorter than the tube: capsule ovoid, 5–6 mm. long.—(MINNIE-BUSH.)—Acid woods, Blue Ridge to Appalachian Plateau, Ga. to Tenn. and Pa.—Spr.

8. **KALMIA** L. Evergreen shrubs or trees. Leaves alternate, opposite, or whorled: blades entire. Calyx persistent: lobes 5, leathery. Corolla regular, white, pink, purple, or crimson, rotate, the lobes obtuse: tube short, with 10 sacs. Stamens 10: filaments elastically straightening at maturity: anthers short, attached near the top. Capsule spheroidal.—Six species, North American.—LAURELS.

Corymbs or flower-clusters terminal: corolla large, over 2 cm. wide. I. LATIFOLIAE.

Corymbs or flower-clusters lateral: corolla small, 1.5 cm. wide or less. II. ANGUSTIFOLIAE.

I. LATIFOLIAE

Shrub or rarely a tree: leaf-blades broad: flower-clusters clammy-pubescent: inflorescence compound: filaments short-pubescent, at least above the middle: capsule spheroidal: branchlets terete. 1. *K. latifolia.*

II. ANGUSTIFOLIAE

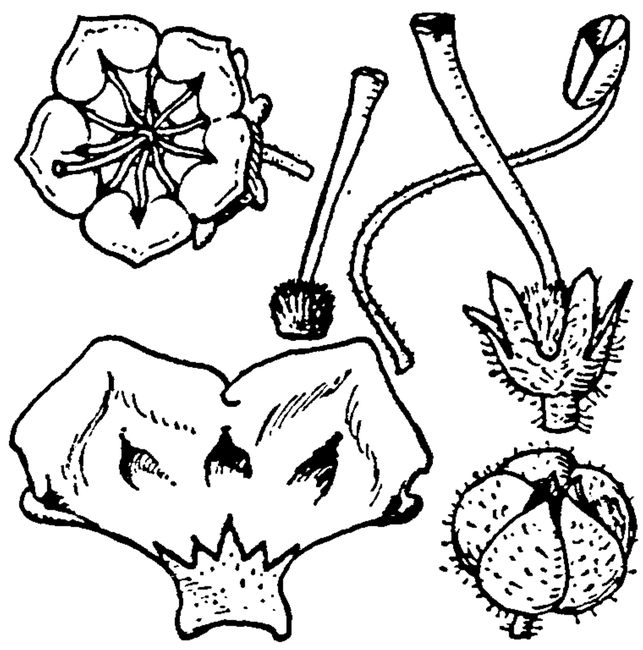
Corolla large, about 1.5 cm. wide: calyx glabrous: leaf-blades of a cuneate or spatulate type. 2. *K. cuneata.*

Corolla small, 5–10 mm. wide: calyx pubescent: leaf-blades of an oblong, oval, or lanceolate type.

Leaf-blades green, and dull above: pedicels and calyx usually glandular: corolla crimson or purplish. 3. *K. angustifolia.*

Leaf-blades glaucous above and shining: pedicels and calyx not glandular: corolla pink or white. 4. *K. carolina.*

1. K. latifolia L. Shrub, or tree becoming 12 m. tall, the twigs often fuzzy when young: leaf-blades elliptic to oval, 5–12 cm. long, glabrous, dark-green: calyx-lobes elliptic to elliptic-ovate, about 2 mm. long: corolla white or pink, 20–25 mm. wide: filaments 10–12 mm. long: capsule 5–7 mm. wide.—(MOUNTAIN-LAUREL. IVY. CALICO-BUSH. SPOON-WOOD.)—Dry rocky woods, hillsides, and prairies, in rather acid soil, various provinces, W Fla. to La., Ont., and N. B.—Spr.—The hard root is used for making tobacco pipes. The hard, brown heart-wood is used for tool-handles.



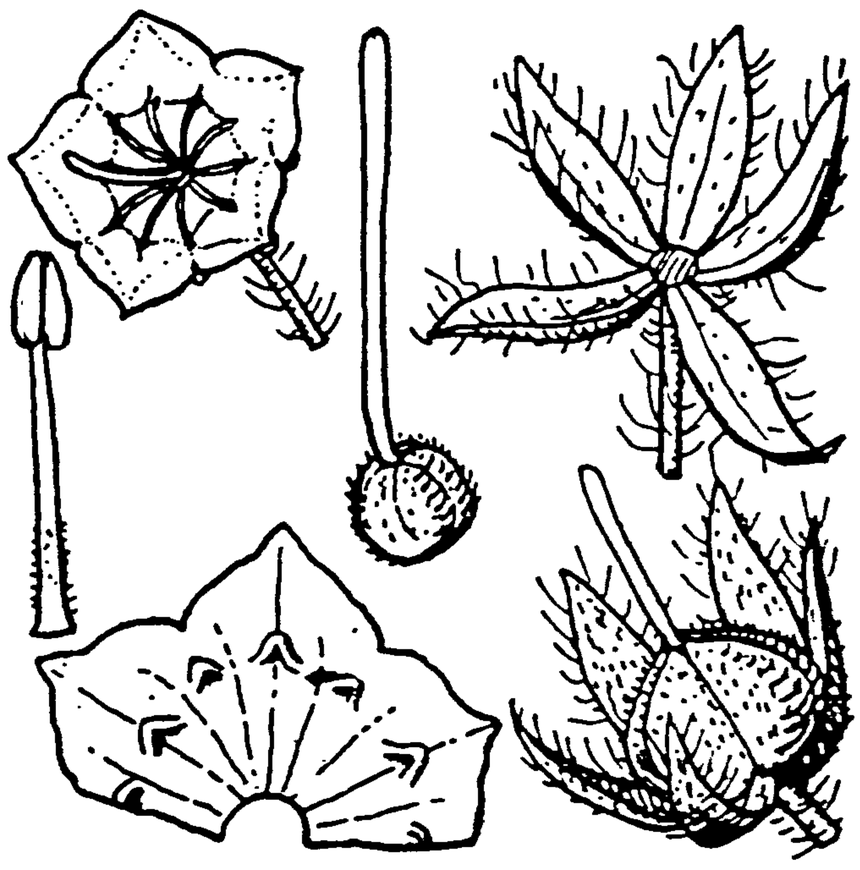
2. K. cuneata Michx. Shrub 2–10 dm. tall, the twigs hispidulous: leaf-blades spatulate to cuneate, 1.5–5 cm. long, sparsely pubescent beneath: calyx-lobes elliptic, 3–3.5 mm. long: corolla mainly white or pinkish, 14–15 mm. wide: cap-

sule 4–5 mm. wide.—(WHITE-WICKY.)—Acid swamps, Coastal Plain, S. C. and S N. C.—Spr.

3. K. angustifolia L. Shrub 2–12 dm. tall, the twigs glabrous or nearly so: leaf-blades elliptic to lanceolate, 2–6 cm. long, pale beneath: calyx-lobes ovate to elliptic-ovate, 1–1.5 mm. long: corolla purple to crimson, 6–10 mm. wide: filaments 3–4 mm. long: capsule 3–3.5 mm. wide.—(SHEEP-LAUREL. LAMBKILL. WICKY.)—Banks, hillsides, pastures and swamps, various provinces, Ga. to Ont. and Lab.—Sum.

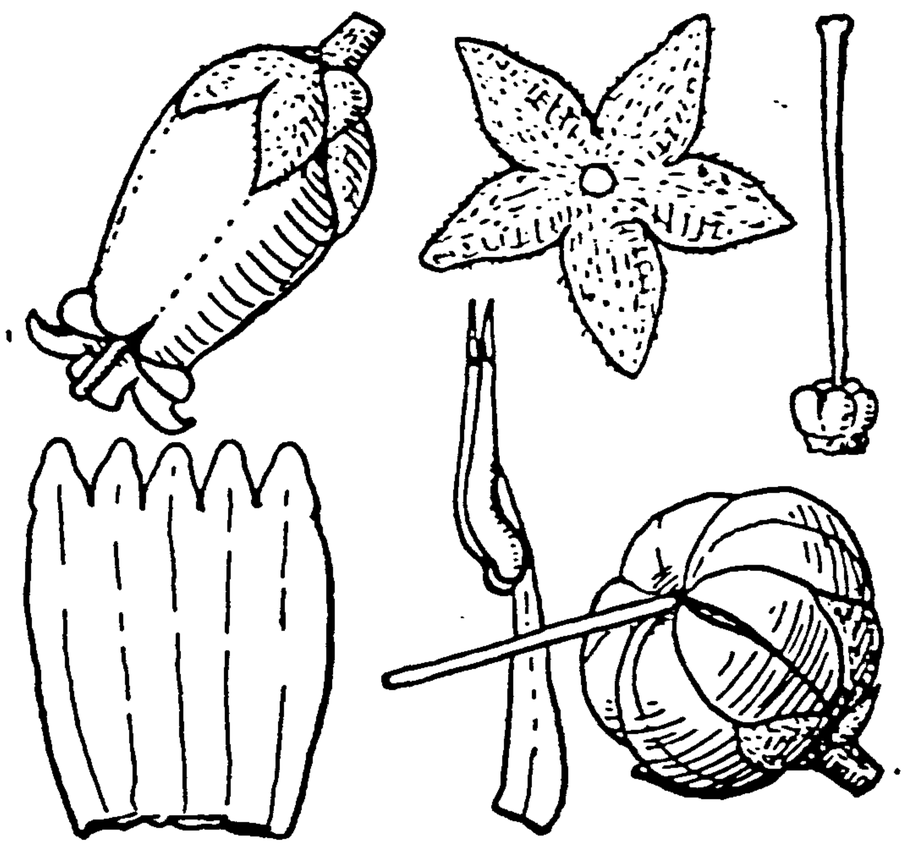
4. K. carolina Small. Shrub similar to *K. angustifolia* in habit, but with copiously fine-pubescent foliage: leaf-blades oval to elliptic, 1.5–4.5 cm. long, canescent-tomentulose beneath: calyx-lobes elliptic-lanceolate, about 2 mm. long: corolla mainly rose-colored, 5–7 mm. wide: capsule 2.5–3.5 mm. wide.—(WICKY.)—Woods, inner margin of Coastal Plain to Blue Ridge, S. C. to S Va.—Sum.

9. KALMIELLA Small. Evergreen low shrubs. Leaves alternate: blades relatively small. Calyx deciduous: lobes 5, foliaceous. Corolla regular, pink or sometimes purplish, mainly similar to that of *Kalmia,* but lobes acute. Stamens 10: filaments elastic, anthers short, attached near the middle. Capsule of an ovoid type.—Three species, the following and two Cuban.



1. K. hirsuta (Walt.) Small. Shrub 1–6 dm. tall or often incumbent, the twigs hirsute: leaf-blades elliptic, lanceolate, or oval-orbicular, 4–10 mm. long: pedicels 4–10 mm. long, hirsute: calyx-lobes elliptic-lanceolate, 5–7 mm. long, acuminate: corolla 10–15 mm. wide: capsule about 3 mm. long.—(WICKY.)—Low pinelands and sandhills, Coastal Plain, Fla. to Miss. and S Va.—Spr–sum.

10. CHAMAEDAPHNE Moench. Evergreen shrubs. Leaves alternate: blades shallowly toothed. Flowers in terminal leafy-bracted racemes. Calyx-lobes 5, much longer than the tube. Corolla white, urceolate; lobes 5, shorter than the tube. Stamens 10, included: anthers awnless, tubular at the apex. Capsule depressed.—One species.

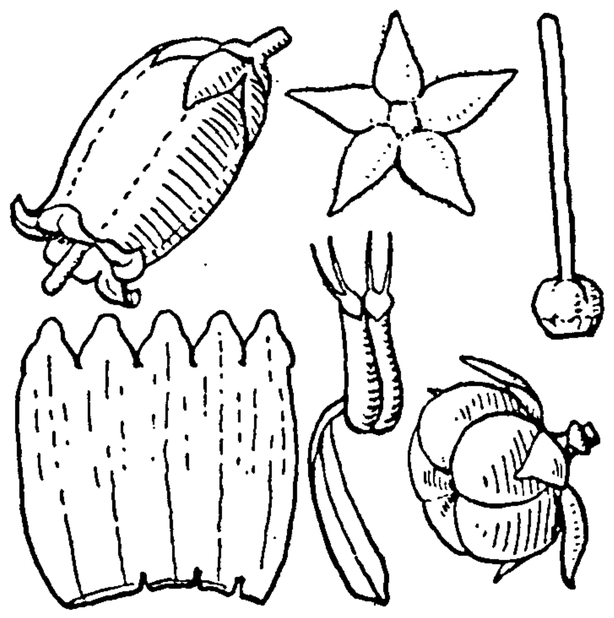


1. C. calyculata (L.) Moench. Shrub 1–12 dm. tall: leaf-blades elliptic, obovate, or oblanceolate, 1–5 cm. long: calyx-lobes triangular or triangular-ovate: corolla 6–7 mm. long; lobes oblong or oblong-ovate: capsule 3–4 mm. wide.—(LEATHER-LEAF.)—Bogs, various provinces, Ga. to Ill., B. C., Alas., Ont., and Newf.—Spr.

11. EUBOTRYS Nutt. Deciduous-leaved shrubs with rigid stems and branches. Leaves alternate: blades finely toothed. Flowers white, in terminal racemes. Calyx-lobes very short. Stamens 10, included: anthers awned. Capsule depressed.—Only the following species.—Spr.—FETTER-BUSHES.

Capsule not lobed; seeds wingless; panicles straight or nearly so.
  Calyx-lobes of an ovate type, less than one-half as long as the corolla; capsule exceeding the calyx. 1. *E. racemosa.*
  Calyx-lobes of a lanceolate type, one-half as long as the corolla or longer; capsule shorter than the calyx. 2. *E. elongata.*
Capsule lobed; seeds winged; panicles curved. 3. *E. recurva.*

1. E. racemosa (L.) Nutt. Shrub 1–4 m. tall, the twigs glabrous, at least in age: leaf-blades elliptic, 2–7 cm. long: calyx-lobes triangular, becoming triangular-lanceolate or deltoid-ovate: corolla 8–9 mm. long: anthers much shorter than the filaments: capsule 4–5 mm. wide.—Acid swamps and bogs, Coastal Plain, and occasionally other provinces, Fla. to La., Pa., and Mass.



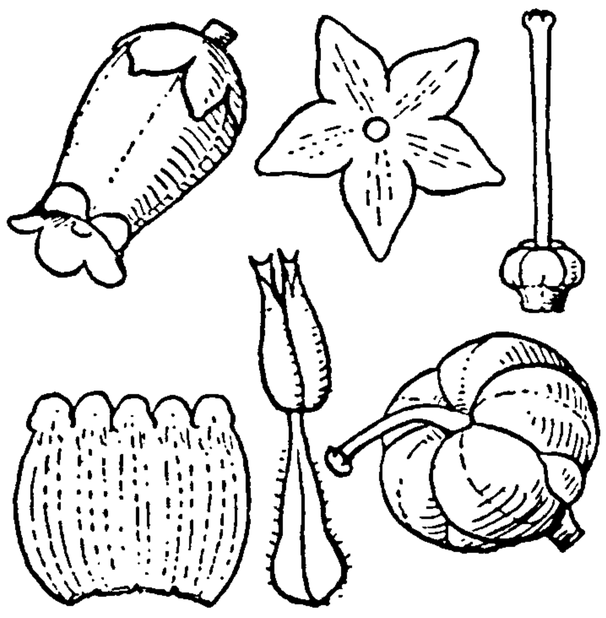
2. E. elongata Small. Shrub 1–3 m. tall, the twigs copiously pubescent: leaf-blades elliptic, or sometimes elliptic-lanceolate or elliptic-ovate, 2–5 cm. long: calyx-lobes lanceolate, often narrowly so: corolla 7–8 mm. long: anthers slightly longer than the filaments: capsule 3–4 mm. wide.—Acid swamps and sandhill ponds, Coastal Plain, Fla. to La. and S Va.

3. E. recurva (Buckl.) Small. Shrub 1–4 m. tall, the twigs glabrous at least in age: leaf-blades oval-elliptic or oval, 4–10 cm. long: calyx-lobes ovate or elliptic-ovate: corolla 6–7 mm. long; lobes ovate: anthers nearly as long as the filaments: capsule 5–6 mm. wide.—Rocky woods, in acid soil, Blue Ridge to Appalachian Plateau, Ga. to Ala., Tenn. and Va.

12. LEUCOTHOË D. Don. Evergreen shrubs with weak stems and branches. Leaves alternate: blades shallowly toothed, sometimes obscurely so, or entire. Flowers in racemes from the axils of the persistent leaves. Calyx-lobes longer than the tube; corolla white, ovoid or mostly urceolate: lobes very short. Stamens 10, included: anthers awnless. Capsule depressed. About 30 species, American and Asiatic.—Spr.—FETTER-BUSHES.

Filaments scabrous or short-pubescent, straight or nearly so: anthers prominently bimucronate.
  Calyx-lobes strongly imbricate in anthesis: leaf-blades abruptly pointed or short-acuminate. 1. *L. axillaris.*
  Calyx-lobes scarcely imbricate in anthesis: leaf-blades long-acuminate. 2. *L. Catesbaei.*
Filaments villous, sigmoid-curved above: anthers obscurely bimucronate: twigs pale: leaf-blades reticulate, acute or short-acuminate. 3. *L. acuminata.*

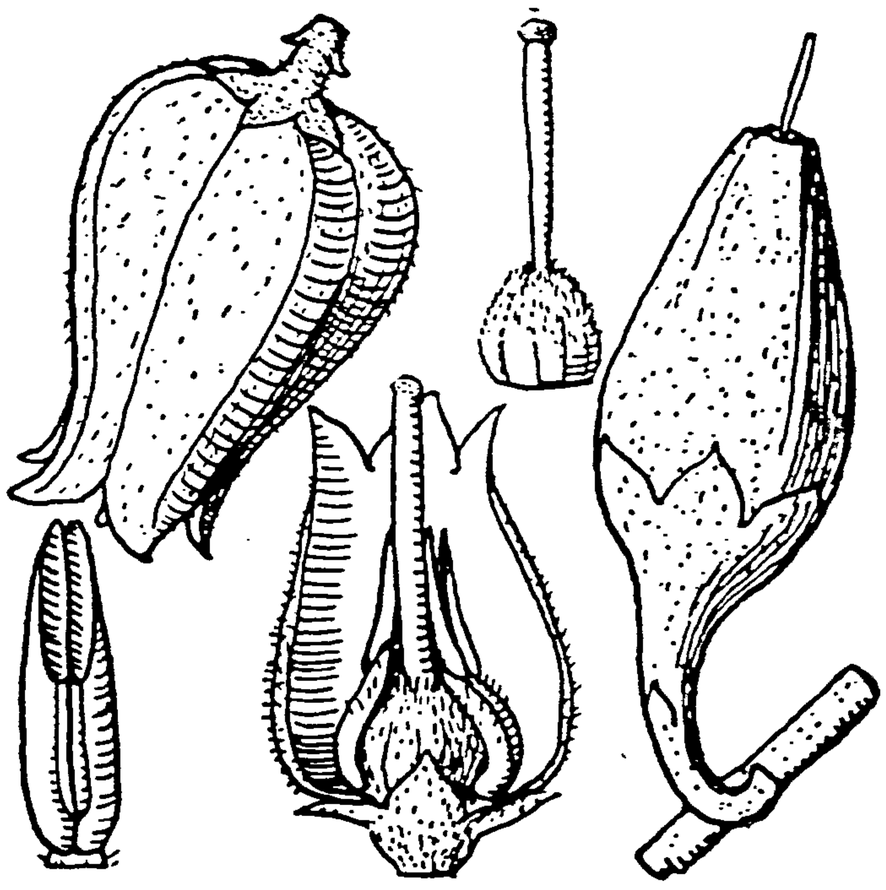
1. L. axillaris (Lam.) D. Don. Shrub 1–2 m. tall: leaf-blades elliptic to elliptic-lanceolate, or rarely suborbicular to broadly elliptic, 4–15 cm. long: larger calyx-lobes ovate: corolla 6–7 mm. long; lobes ovate: capsule 6–7 mm. wide. [*L. platyphylla* Small] —Damp woods, swampy thickets, and stream-banks in rather acid soil, Coastal Plain, Fla. to Miss. and S Va.



2. L. Catesbaei (Walt.) A. Gray. Shrub 1–2 m. tall: leaf-blades lanceolate to narrowly elliptic, 6–15 cm. long: larger calyx-lobes ovate: corolla 5.5–6.5 mm. long; lobes ovate: capsule about 5 mm. wide.—(IVY. SWITCH-IVY. DOG-HOBBLE.)—Wooded slopes, usually along streams, Piedmont to Appalachian Plateau, Ga. to Ala., Tenn., and Va.

3. **L. acuminata** (Ait.) D. Don. Shrub 1–4 m. tall: leaf-blades lanceolate to ovate-lanceolate, 3–10 cm. long: larger calyx-lobes broadly ovate, ciliolate: corolla 8–10 mm. long; lobes ovate: capsule about 5–6 mm. wide.—Swamps, ponds, and low hammocks, Coastal Plain, Fla. to S. C.

13. **OXYDENDRUM** DC. Deciduous-leaved shrubs or trees. Leaves alternate: blades serrate. Flowers drooping in horizontally expanded panicles. Calyx-lobes 5, persistent. Corolla white, ovoid or conic, 5-lobed. Filaments dilated, pubescent all over: anthers linear, awnless, narrower than the filaments. Stigma entire. Capsule ovoid, erect on a recurved pedicel, the valve-margins thickened.—One species.

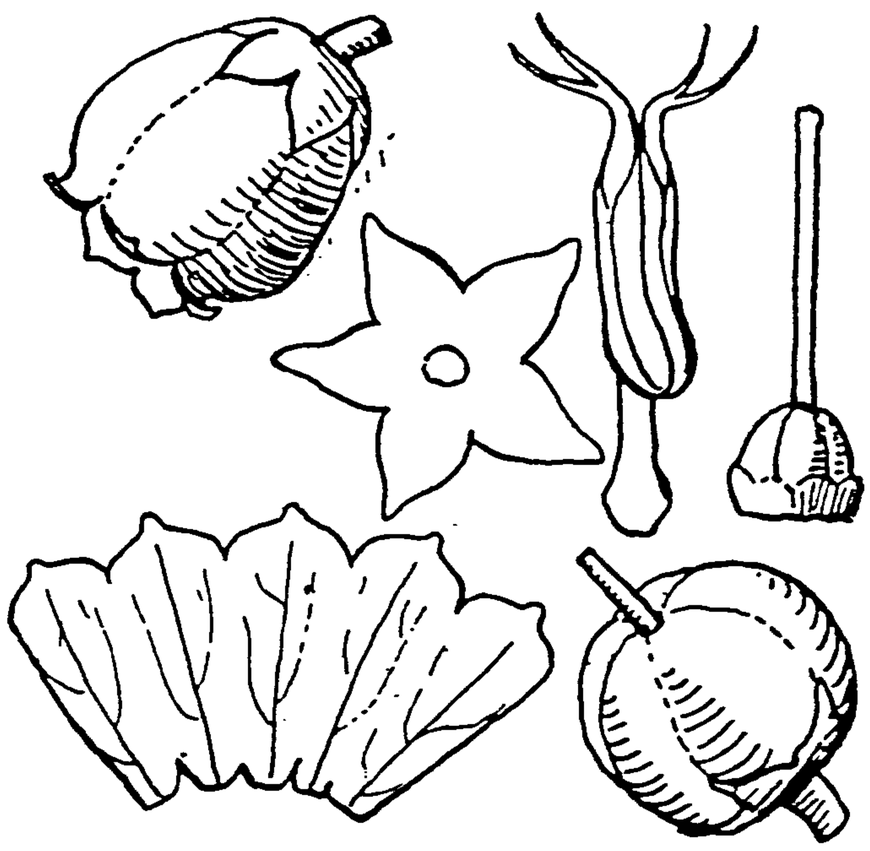


1. **O. arboreum** (L.) DC. Shrub or tree becoming 20 m. tall: leaf-blades elliptic or elliptic-lanceolate, 8–20 cm. long, acuminate: panicles 1–2 dm. long, the pedicels strongly curved at maturity: calyx-lobes ovate: corolla 6–7 mm. long, pubescent like the calyx: capsule 4–6 mm. long, pubescent.—(SOURWOOD. SORREL-TREE. TITI.)—Woods, various provinces, N Fla. to La., Ind., and S Pa.—Sum.—The tree is used in horticulture. The brown, hard, close-grained heartwood is used for tool-handles and machinery. The flowers furnish a very pale honey.

14. **ZENOBIA** D. Don. Deciduous-leaved shrubs. Leaves alternate: blades entire or shallowly toothed. Flowers in clusters from axillary buds. Calyx-lobes 5, longer than the tube. Corolla white or pink, often campanulate: lobes 5, very broad. Stamens 10, included: anthers slender-awned. Capsule depressed.—Only the following species.—Spr.

Pedicels and lower surfaces of the leaf-blades green: calyx less than 7 mm. wide. 1. *Z. cassinefolia.*

Pedicels and lower surface of the leaf-blades densely glaucous: calyx over 7 mm. wide. 2. *Z. pulverulenta.*

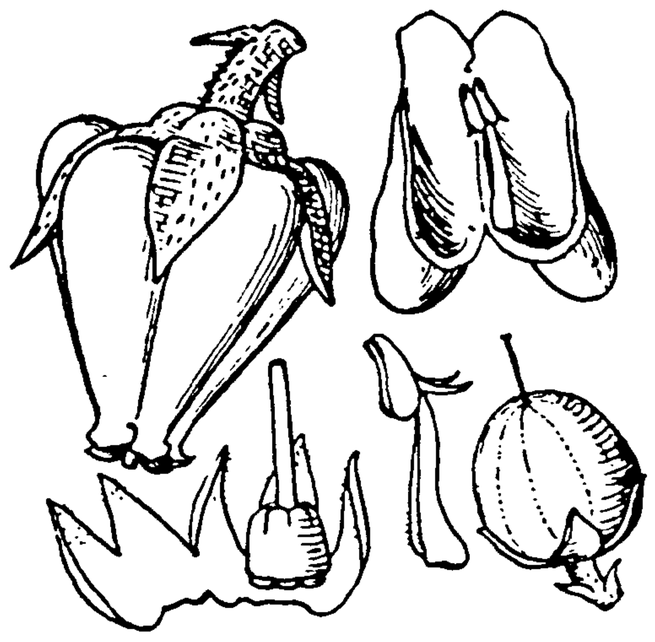


1. **Z. cassinefolia** (Vent.) Pollard. Shrub 1–2 m. tall, the foliage green: leaf-blades elliptic, varying to ovate or obovate, 2–6 cm. long, shallowly serrate: corolla 8–10 mm. long.—Pinelands, Coastal Plain, NE Fla. to N. C.

2. **Z. pulverulenta** (Willd.) Pollard. Shrub 1–2 m. tall, the foliage glaucous: leaf-blades elliptic to oval, 2–7 cm. long, entire or obscurely serrate: corolla 6–7 mm. long.—Pinelands, Coastal Plain, Ga. (or Fla.?) to N. C.—The two zenobias are distinctive among our heaths by the peculiar shades of their foliage. The one is a pale-green the other is glaucous.

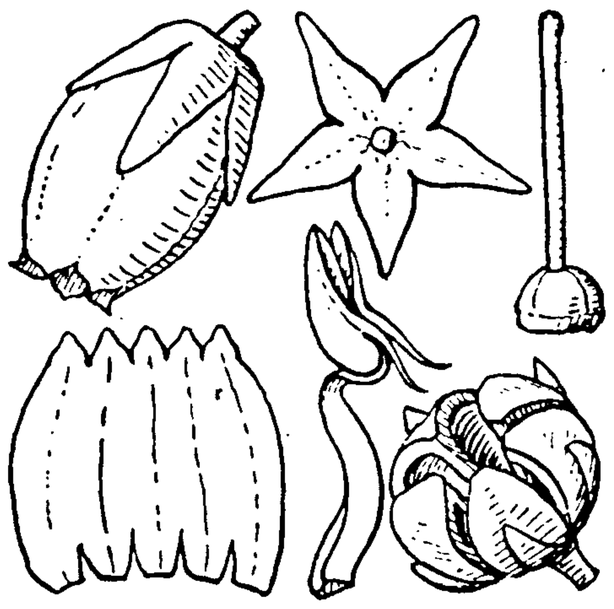
15. **PIERIS** D. Don. Evergreen shrubs. Leaves alternate: blades distinctly toothed. Flowers in axillary and terminal racemes formed the year before they expand. Calyx-lobes 5, much longer than the tube. Corolla white,

of an ovoid type, 5-lobed. Filaments unappendaged: anthers appendaged. Capsule globular, varying to spheroidal or ovoid.—About 6 species, North American and Asiatic.



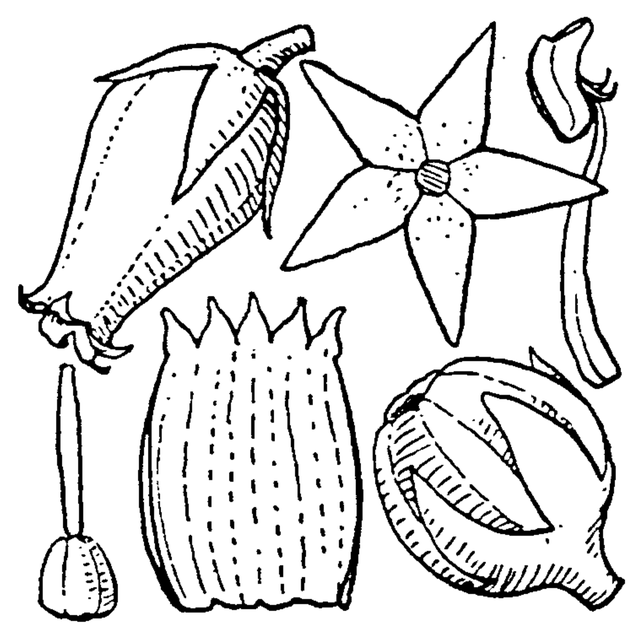
1. P. floribunda (Pursh) Benth. Shrub 3–18 dm. tall, with rigid branches and strigose twigs: leaf-blades elliptic or elliptic-lanceolate, 2–8 cm. long, serrulate all around: calyx-lobes lanceolate or ovate-lanceolate, mostly less than ½ as long as the corolla: capsule 5–6 mm. long, not depressed.—(MOUNTAIN FETTER-BUSH.)—In acid soil, Blue Ridge to Appalachian Plateau, Ga. to Tenn. and S Va.—Spr.–sum.

16. AMPELOTHAMNUS Small. Evergreen shrubs or woody vines, the branches nearly terete. Leaves alternate: blades leathery, more or less toothed above the middle. Panicles raceme-like, borne solitary in the leaf-axils. Calyx-lobes 5, appressed to the corolla, leathery. Corolla white, ovoid, the tube slightly, if at all angled: lobes very short, nearly erect. Filaments flat, broad, sigmoid-curved near the top, unappendaged: anthers appendaged. Capsule spheroidal.—One species.



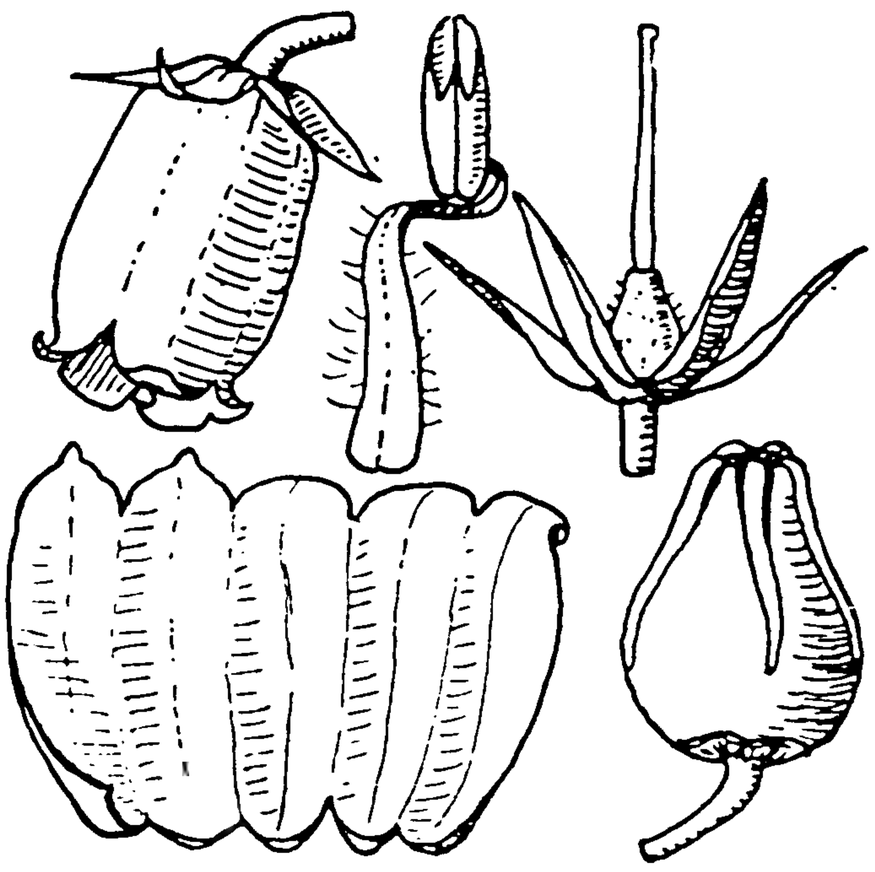
1. A. phillyreifolius (Hook.) Small. Shrub with weak branches and puberulent twigs, or a vine ascending trees by creeping under their bark: leaf-blades elliptic or oval, or rarely elliptic-oblanceolate or obovate, 2–7 cm. long, serrate near the apex: calyx-lobes lanceolate or narrowly triangular-lanceolate, mostly ½ as long as the corolla: corolla 7–8.5 mm. long: capsule slightly depressed, 3–4 mm. long.—Moist pinelands and ponds, Coastal Plain, N Fla., to Ala. and Ga.—Wint.–spr.—Apparently the only climbing vine in this family in our range.

17. DESMOTHAMNUS Small. Evergreen shrubs with prominently angled branches and glabrous foliage. Leaves alternate: blades thick-leathery, entire, with intramarginal veins. Flower-clusters axillary to the leaves of the preceding year. Calyx-lobes 5, narrow, somewhat succulent, persistent. Corolla white, pink, or red, ovoid-conic, urceolate, nodding, constricted at the orifice. Filaments slender above the slightly dilated bases, glabrous, each with a pair of appendages near the top: anthers unappendaged. Style fusiform. Capsule globose or ovoid-globose, rounded at the apex, the sutures thickened.—One species.



1. D. lucidus (Lam.) Small. Shrub 1.5–2 m. tall: leaf-blades leathery, elliptic to oval or obovate, 2–8 cm. long, abruptly acuminate: flower-clusters axillary: calyx-lobes narrowly lanceolate, acuminate: corolla white or rose, 7–9 mm. long, fully twice as long as the calyx: capsule 3.5–4 mm. long. [*Pieris nitida* B. & H.]—(FETTER-BUSH.)—Moist pinelands, swamps, ponds, bays, and scrub, Coastal Plain, Fla. to La. and S Va.—Spr.–sum.

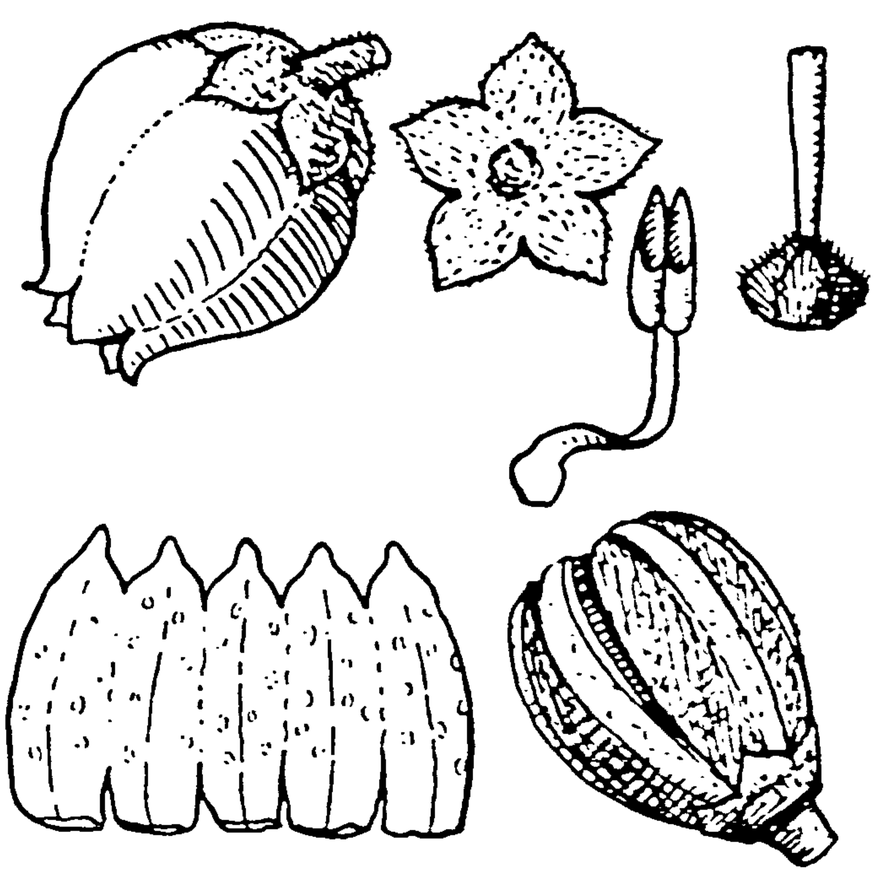
18. **NEOPIERIS** Britton. Deciduous-leaved shrubs with terete branches and sparingly pubescent or glabrate foliage. Leaves alternate: blades thin-leathery, entire, without intramarginal veins. Flower-clusters along the leafless branches of the previous year. Calyx-lobes 5, narrow, deciduous with the leaves. Corolla white or pink, cylindraceous-campanulate, nodding. Filaments flat, pubescent, each with a pair of appendages near the top: anthers unappendaged. Style columnar. Capsule of an ovoid type, truncate at the contracted apex, the sutures much thickened.—One species.



1. N. mariana (L.) Britton. Shrub 1–2 m. tall: leaf-blades membranous, elliptic to oval, or nearly so, 2–6 cm. long, obtuse or apiculate: flower-clusters lateral: calyx-lobes broadly lanceolate, acute: corolla white or pinkish, 10–12 mm. long, less than twice as long as the calyx: capsule 7–9 mm. long.—(STAGGER-BUSH.)—Pinelands and acid prairies, Coastal Plain, and occasionally other provinces, Fla. to Ark., W. Va. and R. I.—Spr.

19. **XOLISMA** Raf. Evergreen shrubs with lepidote foliage. Leaves alternate: blades leathery, entire or nearly so, often reticulate. Flower-clusters in the axils of the persistent leaves of the previous year. Calyx-lobes broad, short, persistent. Corolla white or pink, globular to urceolate, with short spreading or recurved lobes. Filaments tapering up to the anthers, unappendaged. Capsule somewhat elongate, often of an ovoid type, prominently angled.—About 35 species, North American.—Spr. or all year S.—STAGGER-BUSHES.

Leaves slightly reduced toward the ends of the branches; blades inconspicuously reticulate. 1. *X. ferruginea.*
Leaves much reduced toward the ends of the branches; blades prominently reticulate. 2. *X. fruticosa.*



1. X. ferruginea (Walt.) Heller. Evergreen tree sometimes 5 m. tall or shrub: leaves not much reduced in size at the ends of the branches; blades elliptic, oval, obovate, or oblanceolate, 2.5–7 cm. long, scarcely reticulate: corolla 2.5–3 mm. long, angled at the base: capsule 4.5–5 mm. long.—Hammocks with acid humus, sandhills and scrub, Coastal Plain, Fla. to S. C.

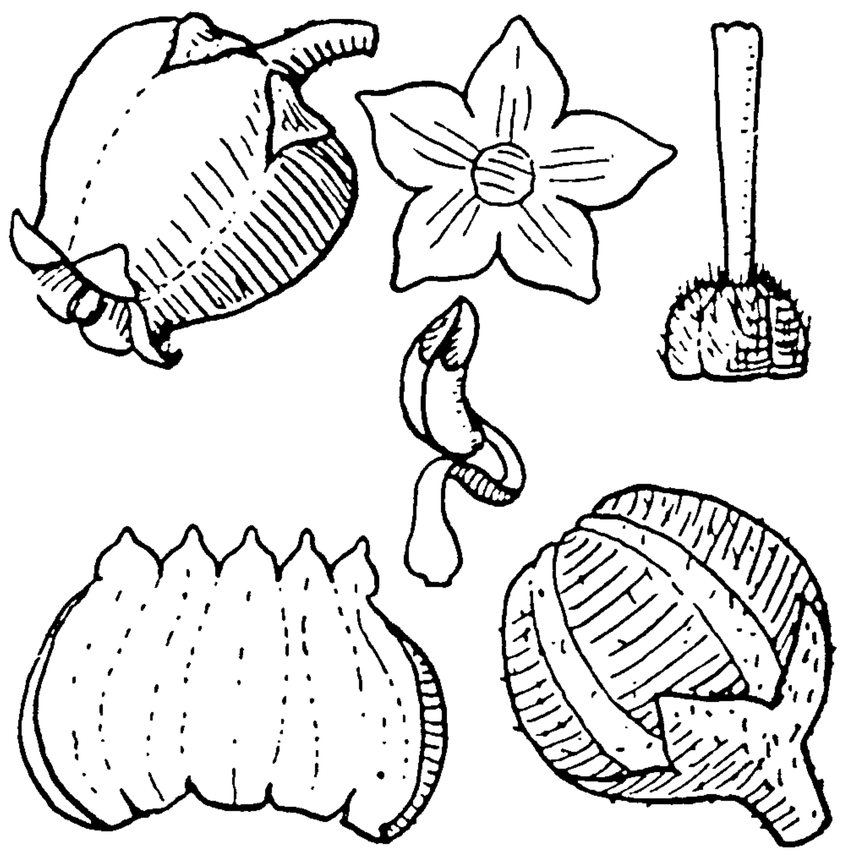
2. X. fruticosa (Michx.) Nash. Evergreen shrub 1–3 m. tall: leaves much reduced toward the ends of the branches; blades oval, obovate, or oblanceolate, reticulate: corolla 3.5–5 mm. long, rounded at the base: capsule 4–4.5 mm. long.—Hammocks and pinelands, Coastal Plain, Fla. to S. C.

20. **ARSENOCOCCUS** Small. Deciduous-leaved shrubs with more or less pubescent foliage. Leaves alternate: blades membranous or thickish. Flower-clusters in terminal panicled racemes. Calyx-lobes broad, short, persistent. Corolla white, urceolate, usually globular or depressed, with very short spreading or recurved lobes. Filaments thickened below the anthers, unappendaged. Capsule depressed, not angled.—Only the following species.—Spr.–sum.—MALEBERRIES.

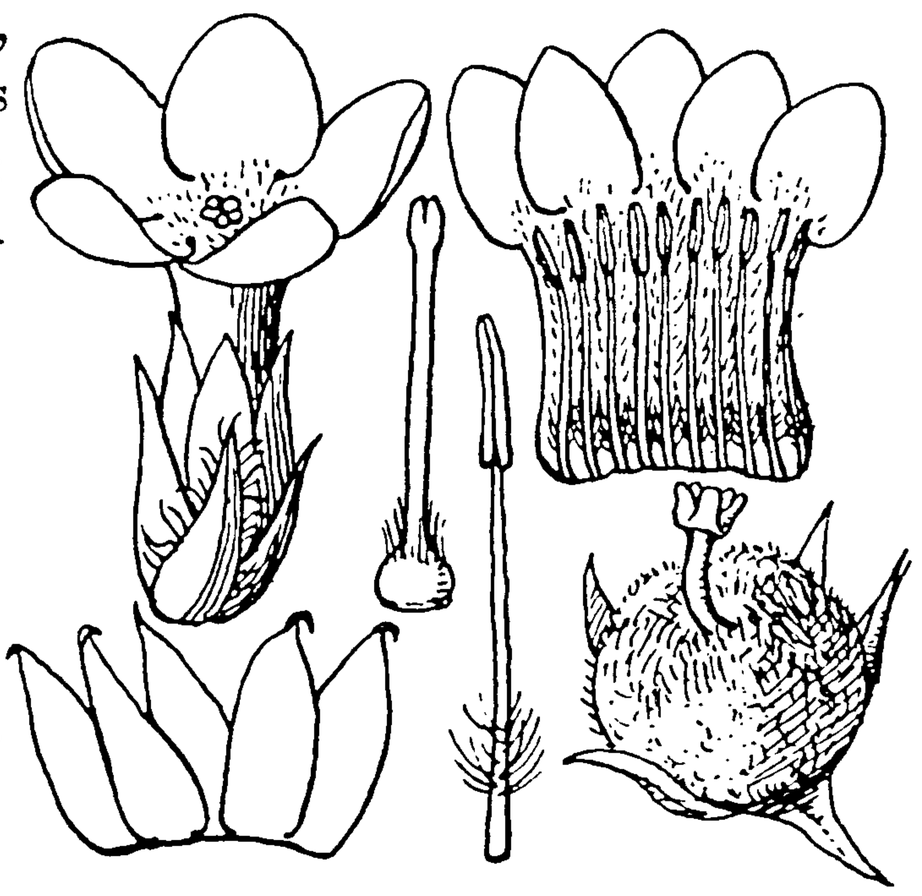
Racemes and panicles leafy-bracted. 1. *A. frondosus.*
Racemes and panicles naked or nearly so. 2. *A. ligustrinus.*

1. A. frondosus (Pursh) Small. Deciduous-leaved shrub 1–4 m. tall: leaf-blades elliptic to narrowly elliptic, or sometimes oval or obovate, 2–8 cm. long, serrulate: corolla mostly less than 3.5 mm. long, often depressed: capsule mainly 2.5–3 mm. wide. [*Andromeda paniculata foliosiflora* Michx.]—Swamps and low pinelands, Coastal Plain, Fla. to La. and S Va.

2. A. ligustrinus (L.) Small. Deciduous-leaved shrub 1–4 m. tall: leaf-blades elliptic or obovate, 3–7 cm. long, entire or indistinctly serrulate: corolla mostly 3.5 mm. long, not appressed: capsule globular, mainly 3–4 mm. wide.—Dry woods and thickets, hillsides, moist thickets, and acid swamps, various provinces, Fla. to Ark., W. Va., and Me.

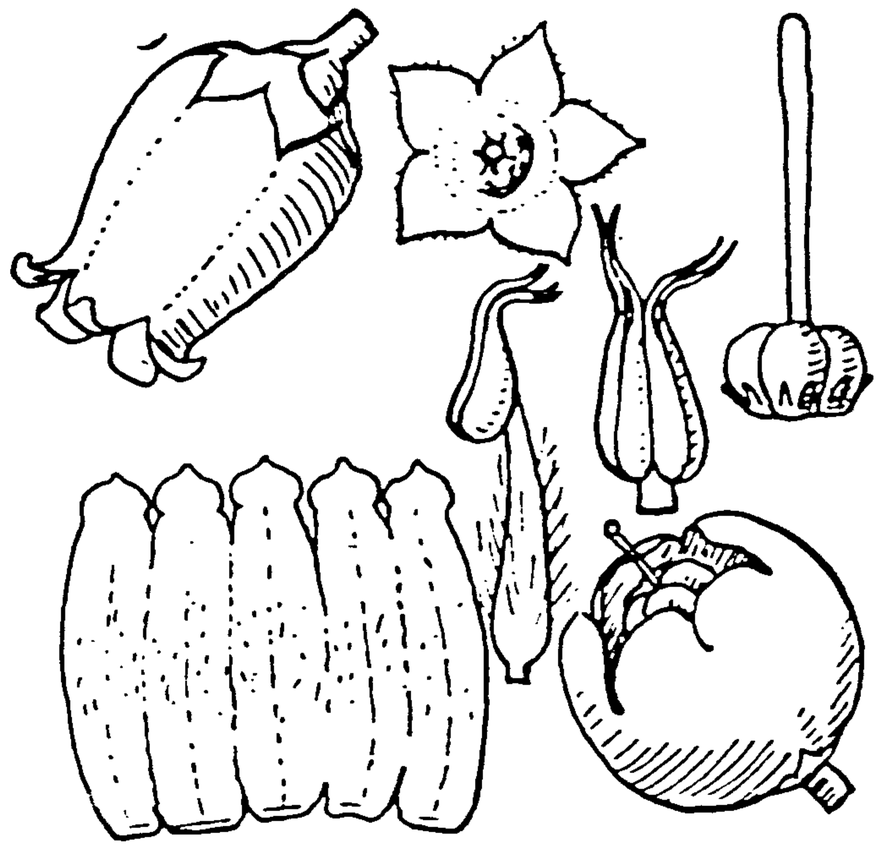


21. **EPIGAEA** L. Evergreen creeping undershrubs, with woody roots, Leaves alternate: blades entire. Flowers perfect or dioecious, in axillary clusters. Calyx-lobes 5, persistent, but scarcely accrescent. Corolla white or pink, salverform, the limb 5-lobed. Filaments slender, with a tuft of hairs near the middle: anthers ellipsoid-ovoid, awnless. Stigma 5-lobed. Capsule depressed.—Two species, the following, and one in Japan.



1. E. repens L. Stem and branches 5–30 cm. long, hirsute: leaf-blades elliptic to elliptic-ovate or suborbicular, 2–10 cm. long, finely reticulate: calyx-lobes lanceolate, acuminate: corolla about twice as long as the calyx; lobes ovate: capsule depressed, 5-lobed.—(TRAILING-ARBUTUS. MAYFLOWER.)—Dry woods and banks, in acid soil, various provinces, Fla. to Miss., Sask., and Newf.—Spr.—One of the very popular spring-flowers, and eradicated in many localities. The flowers are very fragrant.

22. **GAULTHERIA** L. Evergreen undershrubs, with rootstocks. Leaves alternate, approximate near the ends of the branches: blades shallowly toothed.



Flowers axillary. Calyx-lobes 5, persistent and accrescent. Corolla urceolate, 5-lobed. Filaments dilated near the base, pubescent: anthers awned. Capsule enclosed in the accrescent fleshy calyx.—About 100 species, American and Asiatic.

1. G. procumbens L. Plant 3–15 cm. tall: leaf-blades oval or elliptic, varying to ovate or obovate, 1.5–6 cm. long, serrate: calyx-lobes ovate: corolla white, 6–7 mm. long; lobes recurved: fruit globular, 7–11 mm. thick, red or white, spicy.—(WINTERGREEN. CREEPING-WINTERGREEN. CHECKERBERRY. WINTER-BERRY. TEABERRY.)—Woods and swamps, in acid humus, various provinces, in Coastal Plain only northward, Ga. to Ala., Mich., Man., and Newf.

FAMILY 5. VACCINIACEAE — HUCKLEBERRY FAMILY

Shrubs, in some cases with underground stems, or small trees, or rarely trailing or creeping plants. Leaves alternate, in some species evergreen: blades simple. Flowers perfect, regular, either solitary, in racemes, or in panicles, usually nodding. Calyx of 4 or 5 sepals. Corolla of 4 or 5 petals, in most genera partly united. Androecium of twice as many stamens as there are corolla-lobes. Anthers in most species bearing dorsal appendages and apical tubes. Gynoecium of 4 or 5 united carpels. Ovary inferior, or in one genus half-inferior. Styles united. Fruit a berry or drupe.—About 25 genera and 300 species, widely distributed.—Most species thrive best in sandy acid soil.

Ovary 10-celled: fruit a berry-like drupe with 10 nutlets. Tribe I. GAYLUSSACIEAE.
Ovary 4- or 5-celled: fruit a many-seeded berry or in one genus few-seeded berry.
  Ovary wholly inferior: anther-sacs with tubular tips: berry typically colored.
    Petals more or less united: berry variously colored, but when red not markedly acid. II. VACCINIEAE.
    Petals distinct: berry red, very acid. III. OXYCOCCEAE.
  Ovary one-half inferior or less: anther-sacs 2-pronged at the apex: berry white. IV. CHIOGENEAE.

I. GAYLUSSACIEAE

Leaves deciduous; blades entire.
  Inflorescence with deciduous bracts: hypanthium and fruit glabrous. 1. DECACHAENA.
  Inflorescence with persistent bracts: hypanthium and fruit pubescent or glandular. 2. LASIOCOCCOS.
Leaves evergreen; blades toothed. 3. BUXELLA.

II. VACCINIEAE

Petals united nearly to their tips; corolla campanulate to globose, more or less urceolate: berry not red.
  Upright shrubs or trees.
    Corolla campanulate: anthers awned.
      Anthers included: hypanthium jointed to the pedicel, deep: berry black, rather dry. 4. BATODENDRON.
      Anthers exserted: hypanthium continuous with the pedicel, shallow: berry in some species pale, thick-skinned, and bitter, in others sweet, but insipid. 5. POLYCODIUM.
    Corolla urceolate, campanulate-urceolate, or cylindraceous: anthers awnless: berry blue, black, or rarely whitish, juicy and sweet. 6. CYANOCOCCUS.

Trailing shrub.
Petals united only near the base, recurved: corolla rotate: berry red or purplish. 7. HERPOTHAMNUS.

III. OXYCOCCEAE

Slender plants with trailing and creeping stems, and small pink or pinkish corollas: calyx-lobes meeting over the top of the mature ovary. 8. HUGERIA.

9. OXYCOCCUS.

IV. CHIOGENEAE

Aromatic creeping plant with inconspicuous flowers: calyx-lobes not meeting over the top of the mature ovary. 10. CHIOGENES.

1. DECACHAENA T. & G. Resinous-dotted or resinous-coated shrubs, with tap-roots, or with underground stems. Leaves deciduous: blades membranous, entire. Flowers in lax panicles from wood of previous season, the bracts and bractlets small and minute, deciduous. Sepals broad, eciliate. Corolla white, greenish, or red, urceolate to campanulate or conic-urceolate. Filaments narrowed upward. Anthers with tubular tips. Drupe black or blue, glabrous.—Represented by the following species.—HUCKLEBERRIES.—The fruits are often gathered for the market along with blueberries.—This and the two following genera are often included in *Gaylussacia* which, however, technically considered, forms a group of plants confined mostly to northern South America.

Leaf-blades thick-membranous, obtuse or notched at the apex: sepals ovate to deltoid: filaments glabrous: anther-tubes long. I. FRONDOSAE.
Leaf-blades thin-membranous, acute or acuminate: sepals broader than long: filaments pubescent: anther-tubes short. II. URSINAE.

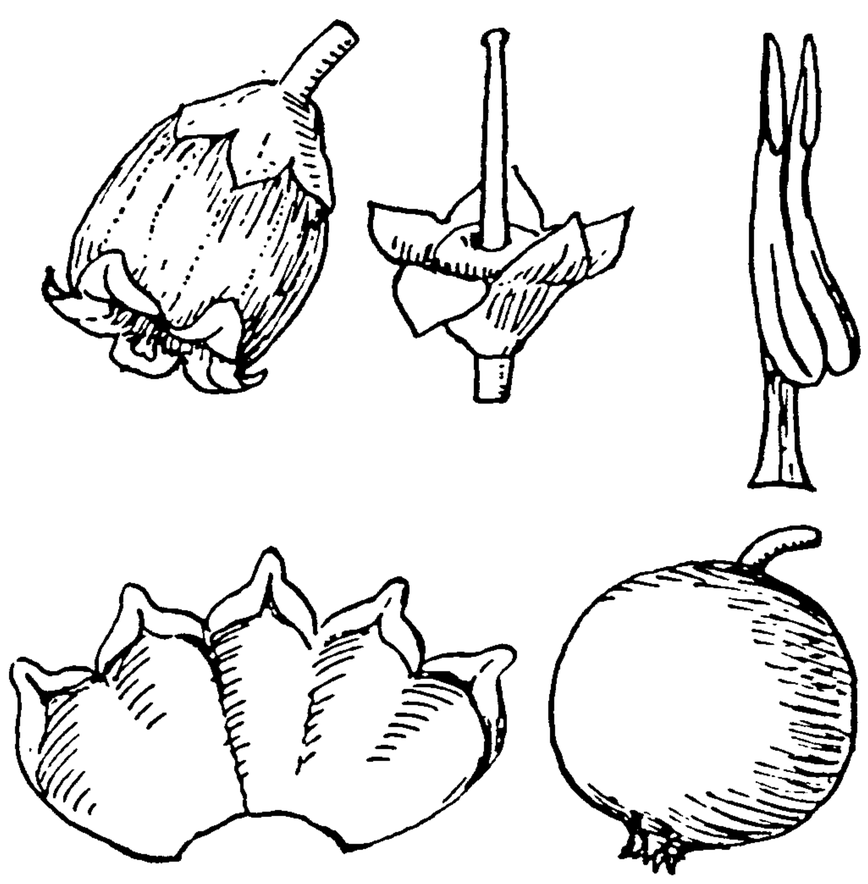
I. FRONDOSAE

Corolla campanulate or globular-campanulate: drupe blue, glaucous.
Corolla about 4 mm. long: sepals about one-third as long as the corolla-tube.
Corolla-lobes about one-fifth as long as the tube: leaf-blades glaucous, and sometimes finely pubescent beneath. 1. *D. frondosa.*
Corolla-lobes about one-third as long as the tube: leaf-blades copiously pubescent beneath. 2. *D. tomentosa.*
Corolla about 3 mm. long: sepals nearly one-half as long as the corolla-tube. 3. *D. nana.*
Corolla conic to cylindraceous: drupe black. 4. *D. baccata.*

II. URSINAE

Slenderly branched shrub: sepals broad, half-orbicular to reniform. 5. *D. ursina.*

1. D. frondosa (L.) T. & G. Stem widely branched, up to 3 m. tall, the young foliage finely pubescent, or the twigs glabrous: leaf-blades elliptic to oval, somewhat rhombic or broadened upward, mostly 3–6.5 cm. long, thickish, permanently fine-pubescent beneath or glabrous, finely rugose: panicles scattered, the branches glabrous or with scattered hairs: hypanthium and calyx glabrous: corolla white: stamens about 3 mm. long: anthers slightly longer than the filaments: drupes 8–10 mm. in diameter, dull, but bright-blue. [*Gaylussacia frondosa* T. & G.]—(BLUE-TANGLE. DANGLEBERRY. TANGLEBERRY.)—Acid swamps and moist woods, various provinces, Fla. to La., Ohio, and N. H.



2. D. tomentosa (Pursh) Small. Stem strict, up to 11 dm. tall, the twigs copiously

tomentose: leaf-blades elliptic to oval, or somewhat broadened upward, 2.5–7 cm. long, rugose, brownish-tomentose: panicles spreading, the branches pubescent: hypanthium and calyx resinous-dotted and often pubescent: corolla white or pinkish: stamens nearly 3.5 mm. long; anthers longer than the filaments: drupe 8–9 mm. in diameter, dull. [*Gaylussacia tomentosa* Small]—Moist pinelands, Coastal Plain, Fla. to Ala. and Ga.

3. **D. nana** (A. Gray) Small. Stem strict, up to 6 dm. tall, the twigs finely pubescent: leaf-blades elliptic to narrowly obovate, 2–3 cm. long, rugose, glaucous: panicles rather numerous, the branches glaucous or resinous-dotted: hypanthium and calyx glabrous, glaucous: corolla white or greenish: stamens about 2.5 mm. long; anthers about as long as the filaments: drupe 6–7 mm. in diameter, dull. [*Gaylussacia nana* Small]—Dry to moist open woods and pinelands, Coastal Plain, Fla. to Ala. and Ga.

4. **D. baccata** (Wang.) Small. Stem much-branched up to 12 dm. tall: leaf-blades elliptic to oval or somewhat obovate or ovate, 2–4.5 cm. long, sticky-resinous and finely pubescent; finely rugose at maturity: panicles spreading, the branches finely pubescent: hypanthium and calyx glabrous, but usually resinous-dotted: corolla pink or reddish: stamens 4 mm. long; anthers and filaments about equal in length: drupe shining, 6–10 mm. in diameter, without bloom (or blue and with bloom, in *D. baccata glaucocarpa*), sometimes shining, sweet. [*Gaylussacia resinosa* (Ait.) T. & G.]—(BLACK-HUCKLEBERRY.)—Rocky woods, thickets, and swamps, usually in acid soil, various provinces, Ga. to La., Sask., Ont., and Newf.

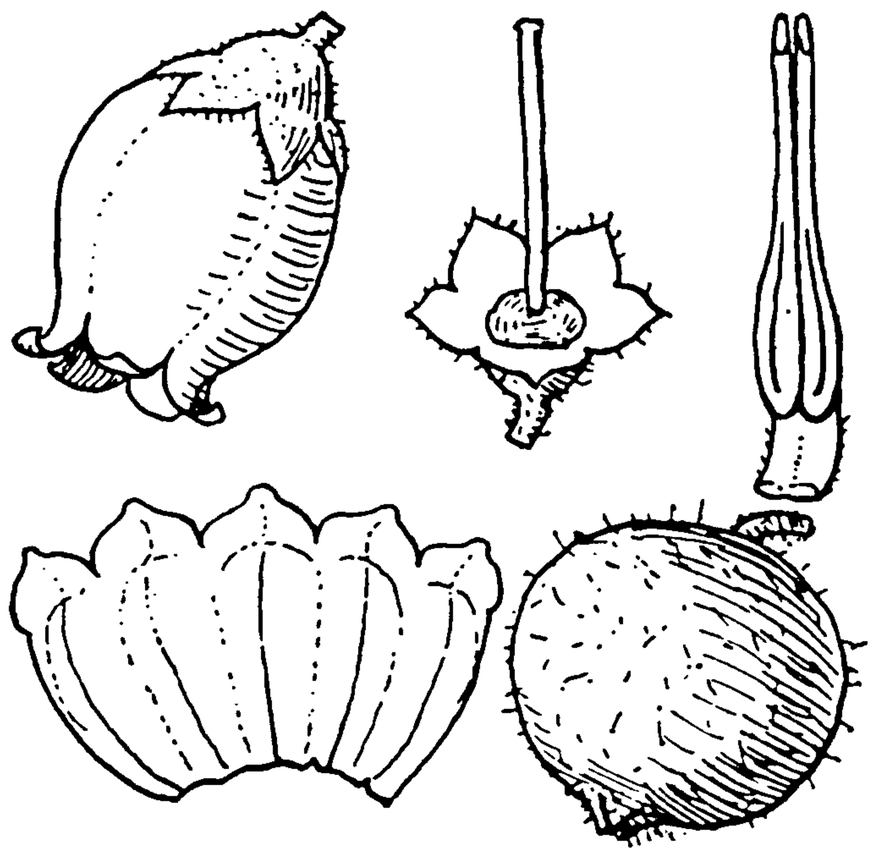
5. **D. ursina** (M. A. Curtis) Small. Stem loosely branched, up to 1.5 m. tall, the twigs finely pubescent: leaf-blades varying from elliptic, to obovate and somewhat rhombic, 4–10 cm. long, thin, bright-green with scattered hairs, especially on the veins: panicles lax, the branches with scattered hairs: hypanthium and calyx glabrous, with resinous globules: corolla greenish, 4–5 mm. long: stamens 3.5–4 mm. long; anthers much shorter than the filaments: drupe 10–12 mm. in diameter, shining, insipid or sometimes sweet and of good flavor. [*Gaylussacia ursina* M. A. Curtis.]—(BEAR-HUCKLEBERRY. BUCKBERRY.)—Wooded slopes and summits, often in acid humus, Blue Ridge and occasionally adj. provinces, Ga. to Tenn. and N. C.—Erroneously reported from Ky.

2. **LASIOCOCCUS** Small. Glandular-pubescent shrubs, often with underground stems, the branches erect. Leaves tardily deciduous: blades thick-membranous, veiny. Flowers in lateral somewhat raceme-like panicles on previous year's wood, with large persistent bracts and bractlets. Sepals glandular-ciliate. Corolla campanulate, white or pinkish. Stamens about equaling the corolla. Anthers much longer than the filaments, with subulate tubular tips exceeding the sacs. Drupe black, shining, pubescent.—Only the following species.—Spr.—GOPHERBERRIES. DWARF-HUCKLEBERRIES.

Hypanthium glandular-puberulent: corolla globular-urceolate, wider than long. 1. *L. dumosus.*

Hypanthium glandular-hirsute: corolla campanulate-urceolate, longer than wide.
- Sepals deltoid, slightly acuminate: corolla-lobes broadly ovate, acute: hypanthium long-hirsute. 2. *L. Mosieri.*
- Sepals ovate-deltoid, obtuse: corolla-lobes reniform acutish: hypanthium short-hirsute. 3. *L. orocola.*

1. **L. dumosus** (Andr.) Small. Stem 1–3 dm. tall or rarely more, the twigs puberulent: leaf-blades obovate to spatulate, or sometimes nearly elliptic or

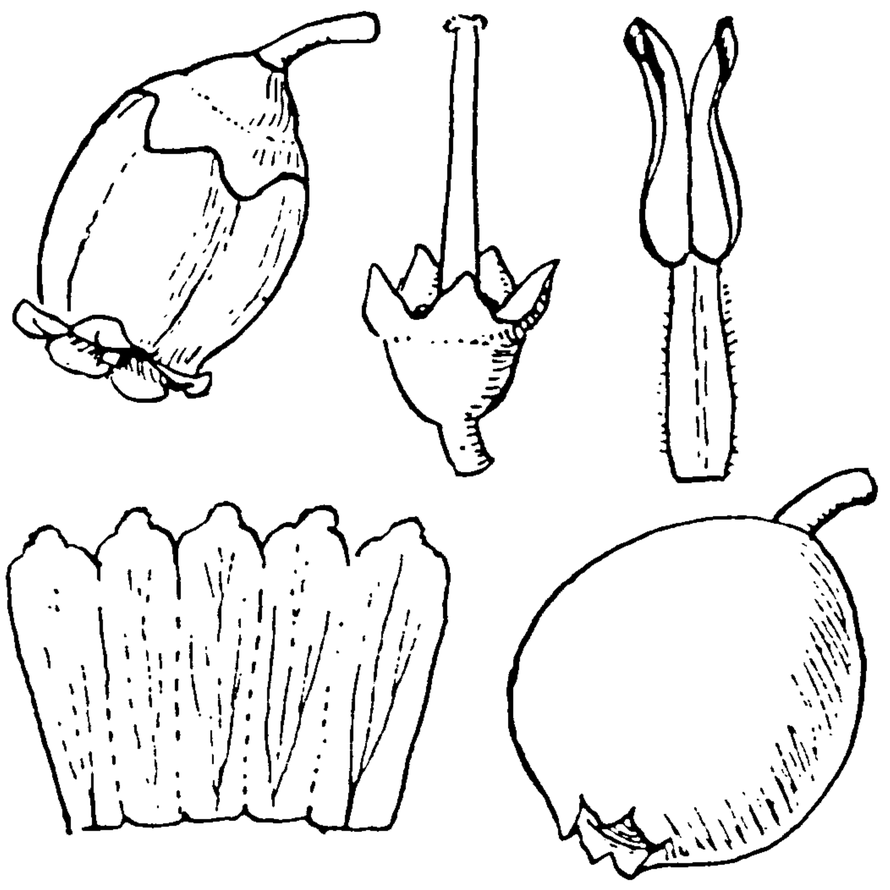


oval, 2–4 cm. long, minutely pubescent, at least when young: hypanthium with granular very short glandular hairs: sepals ovate to deltoid-ovate, often unequal: corolla 5–7 mm. long, the lobes subreniform: stamens between 4 and 5 mm. long; anthers between 3 and 4 mm. long, the tubular appendages slightly longer than the sacs: drupe 6–8 mm. in diameter. [*Gaylussacia dumosa* (Andr.) T. & G.] — (DWARF-HUCKLEBERRY.)—Acid swamps, low pinelands, and scrub, various provinces, though most abundant in Coastal Plain, Fla. to La., W. Va., and Newf.

2. **L. Mosieri** Small. Stem 3–15 dm. tall, the twigs hirsute with silvery, minutely gland-tipped hairs: leaf-blades elliptic to elliptic-spatulate or oblanceolate, 3–6 cm. long, sparsely and minutely pubescent on both sides when young, somewhat veiny in age: inflorescence-branches spreading, often divaricate, pubescent like the twigs: sepals deltoid, slightly acuminate: corolla 8–9 mm. long, the lobes broadly ovate: stamens between 6 and 7 mm. long; anthers between 5 and 6 mm. long, the tubular appendages much longer than the sacs: drupe 8–10 mm. in diameter. [*Gaylussacia hirtella* (Fl. SE. U. S.)]—Hammocks, Coastal Plain, Fla. to La.—A plant from the Big Cypress Swamp, Fla., differs from both the preceeding species in the thicker leaf-blades which are predominately elliptic or oval and not gradually narrowed to the base. It is known locally as woolly-berry.

3. **L. orocola** Small. Stem up to 11 dm. tall, the twigs downy: leaf-blades elliptic or slightly broadened upward, 2–4 cm. long, with minute scattered hairs on both sides, at least when young: inflorescence-branches erect or ascending, softly glandular-pubescent: sepals ovate-deltoid, obtuse: corolla 8–9 mm. long, the lobes reniform: stamens about 6 mm. long; anthers about 5 mm. long, the tubular appendages very slender, much longer than the sacs.—Swamps, Blue Ridge, N. C.

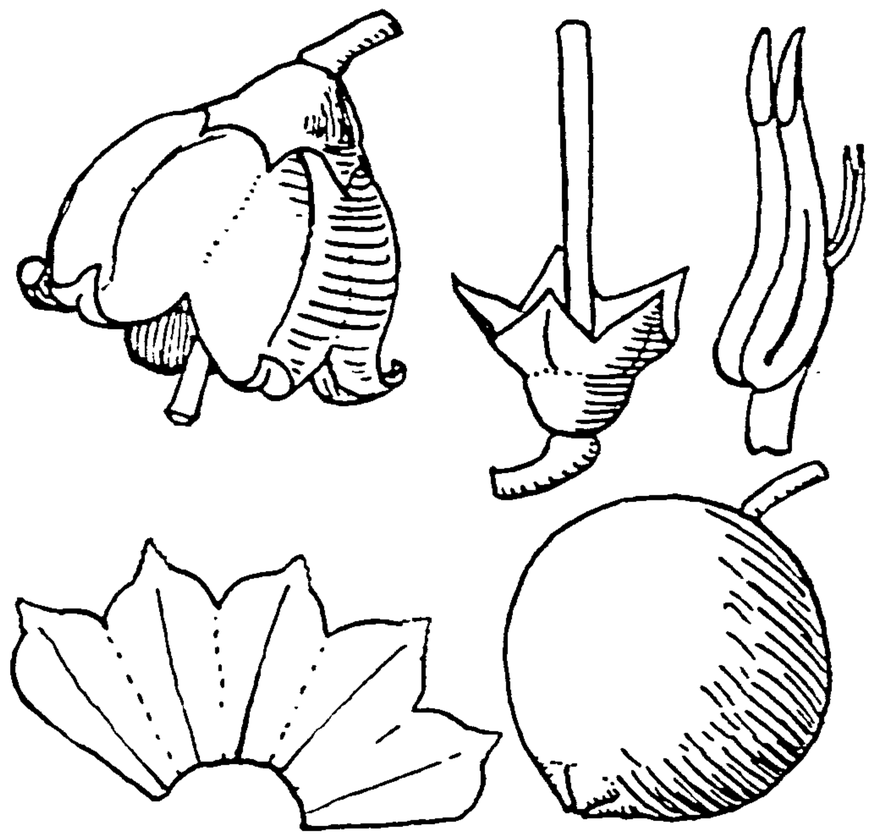
3. **BUXELLA** Small. Nearly glabrous shrubs with extensive underground stems and branches, the branchlets erect or assurgent, sharply ridged. Leaves evergreen: blades coriaceous, toothed. Flowers in axillary congested raceme-like panicles with deciduous bracts. Hypanthium saucer-shaped. Sepals broad, glabrous. Corolla urceolate, pink. Stamens much shorter than the corolla. Anthers shorter than the broad filaments, with apical tubes shorter than the bodies. Drupe dark-blue, usually glaucous, or rarely white with a pink cheek.—One species.



1. **B. brachycera** (Michx.) Small. Plant forming extensive "colonies," the branchlets mostly 2–5 dm. tall, the twigs often puberulent: leaf-blades elliptic to ovate, 1.5–2.5 cm. long, shining above, shallowly crenate-serrate, each tooth with a deciduous stipitate gland: sepals ovate to triangular, acute or obtuse: corolla angled, 5–7 mm. long, the lobes as broad as long or broader, much shorter than the tube: drupe subglobose to pyriform, 7–12 mm. long. [*Vaccinium brachycerum* Michx.

Gaylussacia brachycera A. Gray]—(BOX-HUCKLEBERRY. JERUSALEM-HUCKLEBERRY. JUNIPER.)—Wooded slopes, mostly facing north, in acid soil, various provinces, E Tenn., E Ky., and S border of Va. to Pa., Md., and Del.; best developed in SE W. Va., and occurring elsewhere only in isolated patches, each representing a single plant.—Spr.—Where abundant the berries are made into a preserve.

4. **BATODENDRON** Nutt. Shrubs or small trees, with much-branched stems. Leaves somewhat persistent: blades thin-coriaceous, often glandular denticulate. Flowers in leafy-bracted panicles. Sepals acute. Corolla campanulate, white or pinkish. Stamens shorter than the corolla: anther-sacs longer than the filaments, shorter than the apical-tubes. Berry black, shining, many-seeded.—Two or three species, in the southern United States.



1. B. arboreum (Marsh.) Nutt. Stem and branches rigid, the twigs finely pubescent: leaf-blades oval, elliptic, or obovate, 2.5–5 cm. long, shining above: racemes usually many-flowered, the flowers often profuse, the bracts persistent: corolla 5–6 mm. long; lobes acute or acutish, much shorter than the tube: anthers about 3 mm. long: berry globose, 5–6 mm. in diameter, the pulp rather dry.—(SPARKLEBERRY. FARKLEBERRY. TREE-HUCKLEBERRY. GOOSEBERRY. WINTER-HUCKLEBERRY.)—Woods, various provinces, Fla. to Tex., Mo., and S Va.—Spr.—One of the few plants of this family which can grow in calcareous soil. The brown, hard, very close-grained wood is used for tool-handles.

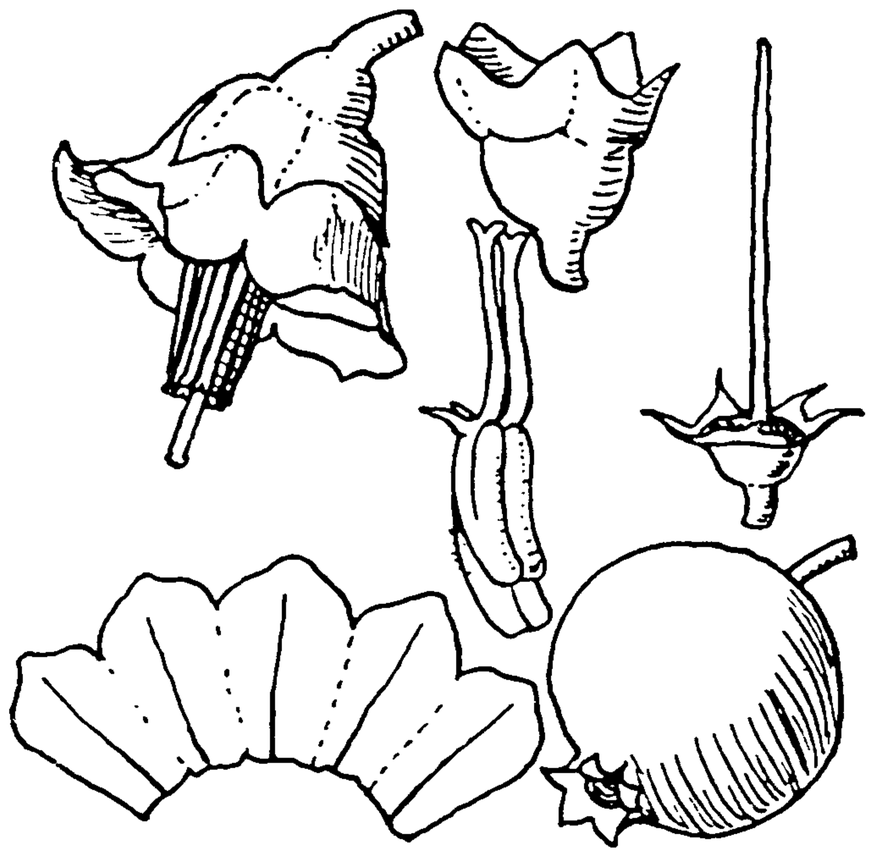
5. **POLYCODIUM** Raf. Shrubs with irregularly branched stems. Leaves deciduous: blades thick-membranous, often pubescent or glaucous, entire. Flowers in leafy panicles. Sepals rounded, acute, or acuminate. Corolla white or greenish, open-campanulate. Stamens longer than the corolla: anther-sacs shorter than the filaments, much shorter than the apical tubes. Berry green, yellow, blue, purple, or black, in many species glaucous, dull, few-seeded.—About 10 species, in eastern North America.—Spr.—BUCKBERRIES. SQUAW-HUCKLEBERRIES. DEERBERRIES. GOOSEBERRIES.

Racemes or panicles with bracts resembling the leaves of the branches and usually about as large: berry greenish or blue.
- Leaves and branchlets pubescent. — 1. *P. floridanum.*
- Leaves and branchlets glabrous. — 2. *P. Ashei.*

Racemes or panicles with bracts conspicuously smaller than the leaves.
- Leaves and branchlets glabrous. — 3. *P. neglectum.*
- Leaves and branchlets pubescent.
  - Sepals deltoid to ovate-deltoid, not exceeding the corolla-sinuses: corolla-lobes usually shorter than the tube.
    - Hypanthium and calyx glabrous, except the ciliolate sepals, green or glaucous: berry green, yellowish, or glaucous.
      - Leaf-blades rather pale-green beneath: berry green or yellowish. — 4. *P. stamineum.*
      - Leaf-blades glaucous, sometimes chalky-white beneath; berry glaucous. — 5. *P. candicans.*

Hypanthium and calyx pubescent: berry plum-purple or nearly black.
Sepals acuminate: plants erect up to 1.5 m. tall.
Corolla about thrice as long as the calyx: sepals about 1 mm. long in anthesis: stamens 7–8 mm. long. 6. *P. melanocarpum.*
Corolla scarcely twice as long as the calyx: sepals about 2 mm. long in anthesis: stamens 3.5–4.5 mm. long. 7. *P. macilentum.*
Sepals obtuse or merely acute: plants depressed. 8. *P. depressum.*
Sepals lanceolate, exceeding the corolla-sinuses: corolla-lobes longer than the tube. 9. *P. leptosepalum.*

1. P. floridanum (Nutt.) Greene. Stem up to 1.5 m. tall, the branchlets loosely fine-pubescent: leaf-blades oval to ovate or obovate, or a few suborbicular, 1.5–4 cm. long, finely pubescent, especially on the whitish lower surface, abruptly narrowed at the base, rounded or even subcordate, closely reticulate-veined: pedicels pubescent: sepals bearded at the apex: stamens 4–5 mm. long: berry subglobose to pyriform, about 10 mm. in diameter. [*P. caesium* Greene]—Pinelands, scrub, and hammocks, Coastal Plain, Fla. to S. C.



2. P. Ashei Harbison. Stem up to usu-usually 1 m. tall, the branchlets glabrous: leaf-blades elliptic to oval, varying to somewhat ovate or obovate, 2.5–5.5 cm. long, glaucous, especially beneath, obtuse or rounded at the base, rather sparingly reticulate-veined: pedicels glaucous: sepals glabrous: stamens mostly 5–6 mm. long: berry subglobose, 9–12 mm. in diameter, with copious bloom.—Pinelands and barren ridges, Coastal Plain and rarely adj. provinces, Ga. to S. C.

3. P. neglectum Small. Stem up to 2 m. tall, with glabrous branchlets: leaf-blades elliptic to oval, elliptic-lanceolate, or cuneate, glabrous: hypanthium glabrous: sepals glabrous: stamens mostly 5–6 mm. long: berry subglobose to globose-obovoid, 5–8 mm. in diameter, green or yellow.—Open woods and thickets, various provinces, Fla. to La., Kans., and S Va.

4. P. stamineum (L.) Greene. Stem up to 2 m. tall, with pubescent branchlets: leaf-blades oval to elliptic, varying to somewhat ovate or obovate, 3–7 cm. long, rounded or abruptly narrowed at the base, usually pale beneath: hypanthium glabrous: sepals very broad, sometimes ciliolate: stamens about 7 mm. long: berry globular, about 10 mm. in diameter, green.—Hillsides and open woods, in rather acid soil, various provinces, Ga. to La., Minn., Sask., and Me.

5. P. candicans Small. Stem up to 2 m. tall, with softly pale-pubescent branchlets: leaf-blades elliptic, sometimes narrowly so, varying to somewhat ovate or obovate, 3–10.5 cm. long, acute or somewhat acuminate, light-green above, white beneath and more or less finely pubescent: pedicels minutely pubescent: hypanthium glaucous: sepals sparingly pubescent or ciliate with simple hairs, and sometimes with slender gland-tipped hairs in addition: stamens 5–6 mm. long: berry globular, about 10–11 mm. in diameter, glaucous.—Acid woods, Piedmont to Appalachian Plateau, Ga. to Ala. and Pa.

6. P. melanocarpum (C. Mohr.) Small. Stem 1–1.5 m. tall, with copiously pubescent branchlets: leaf-blades elliptic to elliptic-lanceolate, elliptic-oblanceo-

late, or a few ovate, 4–11 cm. long, acute or somewhat acuminate, permanently pubescent, at least beneath: pedicels pubescent and sometimes glandular: hypanthium pubescent: sepals pubescent, ciliate and sometimes with large sessile glands on the edges: corolla 6–7 mm. long: stamens 7–8 mm. long: berry globose, about 10 mm. in diameter, pubescent when young, glabrous at maturity.—Sandy woods and pinelands, Coastal Plain and adj. provinces, Ga. to Miss., Mo., and N. C.

7. **P. macilentum** Small. Stem about 1 m. tall, with closely fine-pubescent branchlets: leaf-blades elliptic, sometimes narrowly so, varying to somewhat ovate or obovate, 2.5–8 cm. long, finely pubescent, especially beneath, slightly veiny at maturity: pedicels closely pubescent with glandless hairs: hypanthium and calyx closely pubescent: sepals ciliate: corolla 2–3 mm. long: stamens 3.5–4.5 mm. long: berry not seen mature, but evidently much smaller than in the next preceding species.—Pinelands, in the Coastal Plain of Ala.

8. **P. depressum** Small. Stem 1–3 dm. tall, with finely pubescent branchlets: leaf-blades elliptic or nearly so, or individually broadly elliptic, 2–5.5 mm. long, closely pubescent: pedicels pubescent with curved hairs: hypanthium bristly-pubescent: sepals pubescent: corolla about 4 mm. long: stamens about 7 mm. long: berry not seen.—Pinelands, Coastal Plain, W Fla. to S La.

9. **P. leptosepalum** Small. Stem up to 1 m. tall, with minutely pubescent branchlets: leaf-blades elliptic or slightly broadened upward, 3–6.5 cm. long, somewhat acuminate, finely reticulate beneath, minutely pubescent on the veins on both sides: pedicels pubescent: hypanthium glabrous: sepals lanceolate, more or less pubescent, shaggy-ciliate: corolla about 4 mm. long, the lobes longer than the tube: stamens 5–6 mm. long: berry not seen.—Rich woods, Miss.

Note: Since the above matter was in type species additional to those described here have been proposed by William Willard Ashe in Jour. Elisha Mitchell Sci. Soc. 46: 196–213, 1931.

6. **CYANOCOCCUS** Rydb. Shrubs often with underground stems and erect branches, or small trees, the foliage glabrous or pubescent. Leaves evergreen or deciduous, sometimes tardily so: blades coriaceous or firm-membranous, entire or toothed. Flowers in bracted racemes or panicles, more or less fascicled. Sepals broad, persistent. Corolla urceolate, campanulate-urceolate, or cylindraceous, white to red. Stamens included: filaments pubescent: anthers awnless, with apical tubes. Berry blue or black and glaucous, or rarely red, many-seeded.—About 150 species, widely distributed.—Spr.–very early sum.—BLUEBERRIES. HUCKLEBERRIES.—Herbarium material is yet too meagre for a good interpretation of the species. The plants flowering and fruiting at widely different seasons usually results in the collection of incomplete specimens.—The berries of many species are gathered for the market. Several kinds are cultivated in order to supply the demand.. The following species were heretofore included in *Vaccinium*.

Leaves evergreen: blades fleshy-coriaceous. I. NITIDI.
Leaves deciduous, sometimes partly persistent, with the blades membranous or thin-coriaceous southward.
  Hypanthium and calyx glabrous, often glaucous. II. CORYMBOSI.
  Hypanthium and calyx glandular-pubescent. III. HIRSUTI.

I. NITIDI

Shrub with numerous small green or sometimes glaucous leaves, white or pink corollas, and black or sometimes glaucous fruits. 1. *C. Myrsinites.*

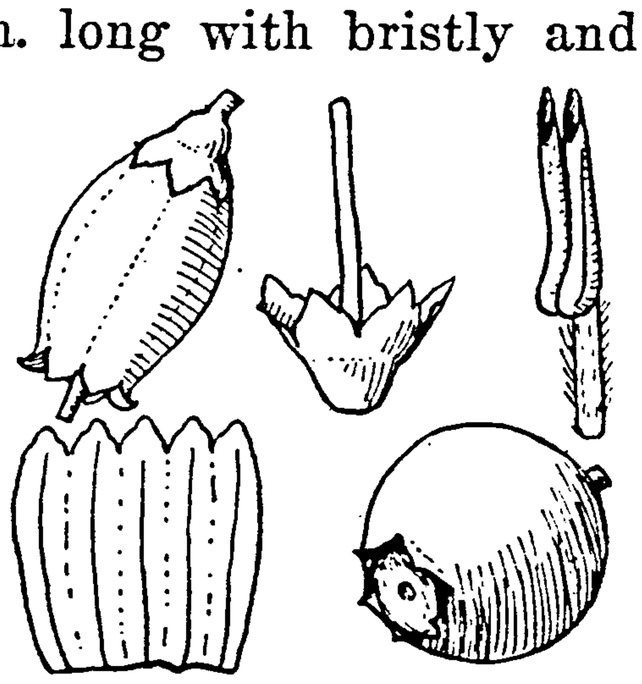
II. CORYMBOSI

Corolla cylindric or cylindraceous, approximately twice as long as thick.
Leaf-blades more or less pubescent beneath, serrulate or individually entire and ciliate.
Leaf-blades thin-coriaceous: corolla red or reddish. 2. *C. fuscatus.*
Leaf-blades membranous, but often firm in age: corolla usually white or pinkish.
Low plant (2–3 dm. or rarely more): leaf-blades decidedly broadened upward. 3. *C. tenellus.*
Taller plants: leaf-blades of an elliptic or oval type, a few, or rarely many, broadened upward: plants widely branched.
Corolla 5–6 mm. long: leaf-blades not over 2.5 cm. long: the branches slender. 4. *C. Elliottii.*
Corolla 7–10 mm. long: leaf-blades usually over 3–8 cm. long: the branches stout. 5. *C. amoenus.*
Leaf-blades glabrous, entire, eciliate. 6. *C. virgatus.*
Corolla urceolate or campanulate, mostly less than twice as long as thick.
Leaf-surfaces pubescent, sometimes mainly or only on the midrib above or beneath.
Tall shrubs, exceeding 1 m. tall: leaf-blades predominantly of an elliptic type.
Peduncle glabrous: juvenile leaf-blades more or less pubescent, but not downy.
Leaf-blades ciliate or serrulate.
Leaf-blades ciliate.
Berry black: branches light-green. 7. *C. atrococcus.*
Berry blue: branches dark-green. 8. *C. corymbosus.*
Leaf-blades serrulate, the teeth often hair-tipped.
Leaf-blades pale or glaucescent beneath and finely pubescent: seeds about 1 mm. wide. 9. *C. simulatus.*
Leaf-blades green beneath, with scattered spine-like hairs on the midrib and veins: seeds about 0.5 mm. wide. 10. *C. Cuthbertii.*
Leaf-blades entire and eciliate, brownish-pubescent beneath: leaves semi-persistent. 11. *C. holophyllus.*
Peduncle closely pubescent: juvenile leaves downy. 12. *C. Margarettae.*
Low shrubs, mostly less than 0.5 m. tall: leaf-blades predominantly oval. 13. *C. vacillans.*
Leaf-blades glabrous on both sides or pubescent on the midrib above.
Leaf-blades pubescent on the midrib above, glabrous beneath.
Leaf-blades ciliate-serrulate: branchlets dark-green. 14. *C. pallidus.*
Leaf-blades entire: branchlets pale-green. 15. *C. liparus.*
Leaf-blades glabrous on both sides.
Leaf-blades narrowed at the base, often cuneate. 16. *C. tallapusae.*
Leaf-blades rounded to cordate at the base. 17. *C. subcordatus.*

III. HIRSUTI

Shrub with copiously pubescent foliage and flowers: bracts somewhat foliaceous, persistent. 18. *C. hirsutus.*

1. C. Myrsinites (Lam.) Small. Stem 2–6 dm. tall, much-branched: leaf-blades obovate, oblanceolate, oval, elliptic, or ovate, 6–20 mm. long with bristly and glandular shallow teeth, green above, paler, veined, and sparingly pubescent beneath (or glaucous and essentially glabrous, and with glaucous berries in *Vaccinium Myrsinites glaucum*): flowers in umbel-like clusters: sepals broadly ovate to deltoid: corolla 6–7 mm. long or smaller: anthers about 5 mm. long: berry globular, 5–8 mm. in diameter. [*V. nitidum* Andr.]—Pinelands, scrub, prairies, and open woods, in acid soil, Coastal Plain, Fla. to La. and N. C. (or Va.?).—Recent collections indicate that *V. nitidum*, maintained in Fl. SE. U. S., is not specifically distinct.



2. C. fuscatus (Ait.) Small. Stem 1–2.5 m. tall, irregularly branched, the branchlets finely pubescent: leaf-blades ovate, oval, or elliptic, varying to

lanceolate or oblanceolate, 3–7 cm. long, or some 12 cm., firm in age, finely pubescent at least beneath, finely and shallowly toothed, or individually entire: sepals ovate to deltoid, or half-orbicular, obtuse: corolla red or reddish, 7–9 mm. long: stamens 6–8 mm. long: berry subglobose, 5–7 mm. in diameter.—Swamp margins, low pinelands, sandhills, and ancient dunes, Coastal Plain, Fla. to La., Ark., and Ga.—Characterized by its erratic branching and irregular leaves with subcoriaceous blades.

3. **C. tenellus** (Ait.) Small. Stem 2–3 dm. tall or rarely more, from underground main stems, the branchlets copiously pubescent: leaf-blades oblanceolate, obovate-oblanceolate, or spatulate, 1–2.5 cm. long, mostly obscurely toothed: sepals ovate to deltoid, corolla ellipsoid-conic, 5–7 mm. long: stamens about 5 mm. long: berry 6–8 mm. in diameter, black beneath the bloom.—Pinelands, open woods and acid swamp-margins, Coastal Plain and adj. provinces, Fla. to Miss., Tenn., and S Va. Often growing in large colonies. The flowers, usually pink or whitish, are sometimes tinged with green.

4. **C. Elliottii** (Chapm.) Small. Stem 1–2.5 m. tall, branched, the branchlets pubescent: leaf-blades ovate, oval, or elliptic, 1–2.5 cm. long, or rarely longer, often conspicuously uniform in size, acute or obtuse, serrulate-ciliate or crenulate, finely pubescent on both sides, or sometimes above only on the midribs: sepals ovate, deltoid, or wider than long, obtuse: corolla pink or pinkish, 5–6 mm. long: stamens 4.5–5.5 mm. long: berry subglobose, 7–8 mm. in diameter, black to bluish-black, but without bloom.—Low pinelands, acid swamps, streambanks, and thickets, Coastal Plain and adj. provinces, N Fla. to Tex., Ark., and Va.—The leaves often suggest those of cassena (*Ilex vomitoria.*)

5. **C. amoenus** (Ait.) Small. Stem 1–5 m. tall, the branches spreading, finely pubescent: leaf-blades variously elliptic, 3–8 cm. long, acute or sometimes short-acuminate, serrulate or serrulate-ciliate, more or less pubescent, especially beneath, usually only on the veins above, the pubescence becoming sparse with age: hypanthium and calyx usually glaucous: sepals deltoid-ovate, ovate or rarely reniform-ovate, usually about as broad as long, mostly acutish: corolla white to pinkish, 7–10 mm. long, cylindraceous-campanulate: stamens 6–9 mm. long: berry globular, 6–10 mm. in diameter, black with a bloom causing it to appear blue. [*V. corymbosum* in part (Fl. SE U. S.)]—Acid bogs, meadows, woods and thickets, various provinces, Fla. to Ark., Mich., and N. S.—Long confused with *C. corymbosus* from which it differs in its serrulate leaves, and its more narrow and differently shaped corolla. A form with non-glaucous hypanthium, calyx and fruit and with the leaf-blades broadest beyond the middle may be a distinct species. A form with glaucous foliage occurs in W Fla., where various forms are cultivated under the name rabbiteye blueberry. *Vaccinium Ashei* Read seems to belong here.

6. **C. virgatus** (Ait.) Small. Stem 1–3 m. tall, branched, with glabrous branchlets: leaf-blades elliptic or oval, or some slightly ovate or obovate, mostly 4–8 cm. long, deep-green above, more or less glaucous beneath, glabrous: sepals deltoid or nearly so, corolla white or whitish, 8–10 mm. long: stamens 8–9 mm. long: berry 7–9 mm. in diameter, glaucous. [*V. australe* Small.]—Rich woods near streams, swamps, and lake shores, Coastal Plain, Fla. to Ala. and S. C.—Flowering before the leaves appear or with their appearance, and characterized by the total absence of hairs on the foliage.

7. **C. atrococcus** (A. Gray) Small. Stem 1–2.5 m. tall, with irregular branches and sparingly pubescent branchlets: leaf-blades elliptic or oval, or slightly broadened upward, 3–7 cm. long, entire, mostly acute or short-acuminate, dark-green above, paler and more or less pubescent beneath: hypanthium and

calyx green: sepals broader than long, obtuse: corolla yellowish-white or pinkish, campanulate or somewhat ovoid, 7–8 mm. long (rarely 5 mm.): stamens 5–8 mm. long: berry globular, 6–10 mm. in diameter, not glaucous.—Swamps and woods, various provinces, Ga. to Ark., Ont., and N. B.—Flowering before the leaves expand, and also fruiting earlier than *C. corymbosus*.

8. C. corymbosus (L.) Rydb. Stem 1–4 m. tall, widely branched, the branchlets finely pubescent: leaf-blades elliptic, oval, or elliptic-lanceolate, 4–8 cm. long, mostly acute or short-acuminate, deep-green above, more or less pubescent, sparingly so in age, beneath, entire: hypanthium and calyx glaucous: sepals broader than long, obtuse or broadly rounded: corolla white to pinkish, 6–10 mm. long, ovoid to open-campanulate: stamens 6–9 mm. long: berry globular, 7–10 mm. in diameter, black, but very glaucous.—Acid bogs, meadows and moist and occasionally rocky woods, various provinces, Ga. to La., Minn., and Newf.—Flowering with the leaves half grown; also readily distinguishable from the next preceding species by the fruit.

9. C. simulatus Small. Stem 1–2 m. tall, with irregular branches and minutely pubescent branchlets: leaf-blades elliptic to oval, varying to elliptic-lanceolate or obovate, 2.5–7 cm. long, acuminate or merely acute, serrulate, bright-green above, glabrous or glabrate and pale or glaucescent beneath: hypanthium and calyx green or glaucescent: sepals reniform, often repand: corolla urceolate, 3.5–4.5 mm. long, white to pinkish-green: stamens 4–5 mm. long: berry globular, 5–7 mm. in diameter, somewhat glaucous.—Acid woods, Blue Ridge to Appalachian Plateau, Ga. to Ala. and S N. Y.—Flowering with the leaves partly grown.

10. C. Cuthbertii Small. Stem up to 2.5 m. tall, widely branched, the branchlets glabrous: leaf-blades elliptic-obovate to oval, 1.5–3.5 cm. long, acute, serrulate, nearly glabrous, with few scattered minute spine-like hairs on the veins beneath, lightly reticulate-veiny beneath: hypanthium and calyx light-green: sepals half-orbicular to orbicular-reniform: corolla white to pink, about 5 mm. long, urceolate: stamens 3–4 mm. long, the filaments short and broad: berry globose, 4–6 mm. in diameter, black.—Swamps, Coastal Plain, Ga. to S. C.—Flowering with the appearance of the leaves.

11. C. holophyllus Small. Stem up to 1.5 m. tall, much-branched, the branchlets softly pubescent: leaf-blades oval to elliptic, or individually broadest above or below the middle, 1–3.5 cm. long, acute, entire, brownish-pubescent on both sides when young, softly and closely pubescent beneath: hypanthium and calyx somewhat glaucous: sepals triangular-ovate to half-orbicular, obtuse: corolla white or pinkish, 6–7 mm. long, cylindraceous: stamens 5–6 mm. long: berry globose, 4–6 mm. in diameter, glaucous.—About river-swamps, Coastal Plain, Fla. and Ga.—Flowering with the appearance of the leaves, which, however, are sometimes partly persistent. The entire leaf-blades are diagnostic.

12. C. Margarettae (Ashe) Small. Stem up to 2 m. tall, with spreading branches, the branchlets closely soft-pubescent: leaf-blades elliptic to oval or ovate, 2–3.5 cm. long, acute or slightly acuminate, entire, closely soft-pubescent beneath, acute or rounded at the base: hypanthium and calyx glaucous: sepals broadly ovate to reniform-ovate: corolla greenish-yellow, more or less striped with red, 5–6 mm. long, or rarely 7 mm., campanulate-urceolate: stamens 4.5–5.5 mm. long: berry globose, 5–6 mm. in diameter, black, shining.—Woods, Piedmont and Blue Ridge, Ga. to Ala. and S. C.—Flowering with the leaves half grown. Plants spread by underground stems.

13. C. vacillans (Kalm) Rydb. Stem less than 0.5 m. tall, widely branched, the branchlets glabrous, or with minute hairs when young: leaf-blades oval,

varying to ovate or obovate, 2–3 cm. long, apiculate to acute, ciliate-serrulate to serrulate, light-green, glabrous or with scattered hairs and more or less glaucous beneath: hypanthium and calyx glaucous: sepals deltoid or deltoid-reniform, obtuse: corolla 4–6 mm. long, reddish-green: stamens 3–5 mm. long: berry globose, 4–7 mm. in diameter, very glaucous.—Woods, usually in dry and moderately acid soil, various provinces, Ga. to Miss., Ark., Mo., Mich., and Me.—Flowering while the leaves are appearing; grows in large patches from underground stems, often conspicuous by the numerous uniform leaves.

14. C. pallidus (Ait.) Small. Stems 1–2.5 m. tall, irregularly branched, the branchlets minutely pubescent: leaf-blades oval or elliptic, varying to ovate or obovate, 2.5–7 cm. long, mostly acute or slightly acuminate, glabrous except on the midrib above, and along the ciliate-serrulate margin, bright-green above, pale or glaucescent beneath: hypanthium and calyx glaucescent: sepals ovate, sometimes broadly so, to triangular: corolla greenish-pink, campanulate-urceolate, 4–5 mm. long: stamens 3.5–4.5 mm. long: berry subglobose, 8–12 mm. in diameter, very glaucous.—Acid woods, Blue Ridge to Appalachian Plateau, Ga. to Ala., Tenn., and Va.—Flowering with the leaves well developed. Most luxuriant and fruitful at high altitudes.—*V. carolinianum* Ashe, known only from scant material, seems to be a form of this species.

15. C. liparus Small. Stem up to 1 m. tall, irregularly branched, the branchlets glabrous or finely pubescent: leaf-blades narrowly obovate or elliptic, 3–7 cm. long, acute, sometimes abruptly pointed, glabrous, except on the midrib above, pale-green or glaucous beneath: hypanthium and calyx glaucous: sepals deltoid or wider than long, obtuse: corolla white to pink, 7–8 mm. long, campanulate-urceolate: stamens 6–7 mm. long: berry globose, 5–7 mm. long, glaucous.—Acid woods, and sometimes in pinelands, Appalachian and New England provinces, E Tenn. to S N. Y. and N. H.—Flowering with the leaves half developed; flowers much larger than those of *C. pallidus*.

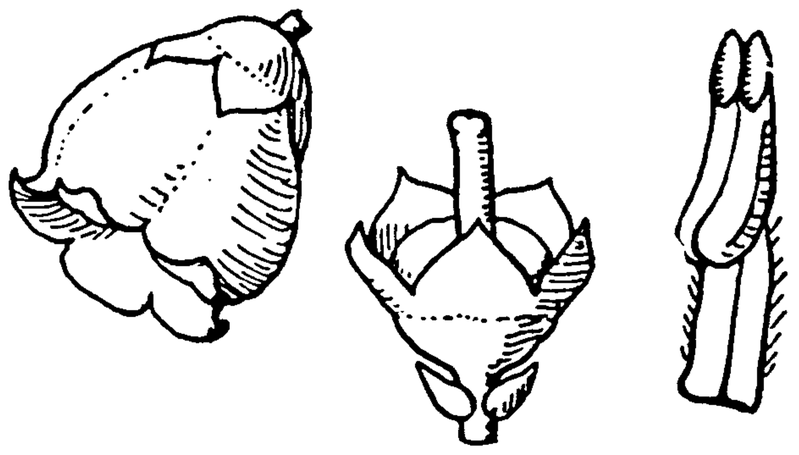
16. C. tallapusae Coville. Stem 15–60 dm. tall, from a thick rootstock, glabrous, or the branches sparingly pubescent in lines: leaf-blades elliptic-lanceolate to ovate-lanceolate, 2–5 cm. long, acute, entire, glabrous or sometimes pubescent above along the midrib or even ciliolate at maturity: sepals oval, sometimes broadly so, obtuse or acutish, entire: corolla greenish-white, sometimes with a blush of pink, campanulate-urceolate, 5–5.5 mm. long: stamens 4.5–5 mm. long: berry globose, 7–10 mm. in diameter or rarely larger, blue.—Oak woods, Piedmont and adj. provinces, W Ga., especially in the vicinity of Tallapoosa, and E Ala.—Flowering as the leaves appear.

17. C. subcordatus Small. Stem apparently less than 1 m. tall, widely branched, the branchlets glabrous or sometimes with few minute hairs: leaf-blades ovate or oval-ovate, 1–3 cm. long, mucronate or acute, bright-green above, glaucous beneath, glabrous, sparingly ciliate-serrulate, rounded to cordate at the base: hypanthium and calyx glaucous: sepals ovate to deltoid: corolla not seen: berry globose, 6–8 mm. in diameter, very glaucous.—Open woods, near Knoxville, Appalachian valley, Tenn.—Distinguished from our other blueberries by the more or less cordate leaf-blades.

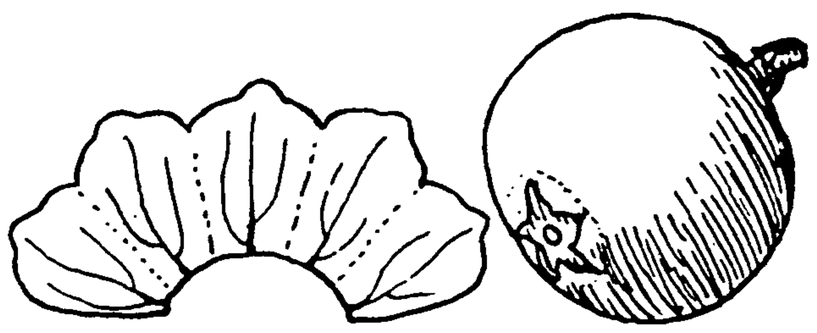
18. C. hirsutus (Buckl.) Small. Stem up to 1 m. tall, irregularly branched, the branchlets copiously soft-pubescent: leaf-blades elliptic to ovate, 2–5 cm. long, mostly acute, entire, softly pubescent on both sides: bracts shaped like the leaves but much smaller: hypanthium and calyx copiously and softly glandular-pubescent: sepals ovate: corolla greenish-white to reddish, 8–9 mm. long, or rarely 7 mm.: filaments with long hairs: berry subglobose, 6–7 mm. in diame-

ter, pubescent, purplish-black.—Open woods, in acid soil, Blue Ridge, N. C. and Tenn.—Distinguished from all our other blueberries by the pubescent fruits.

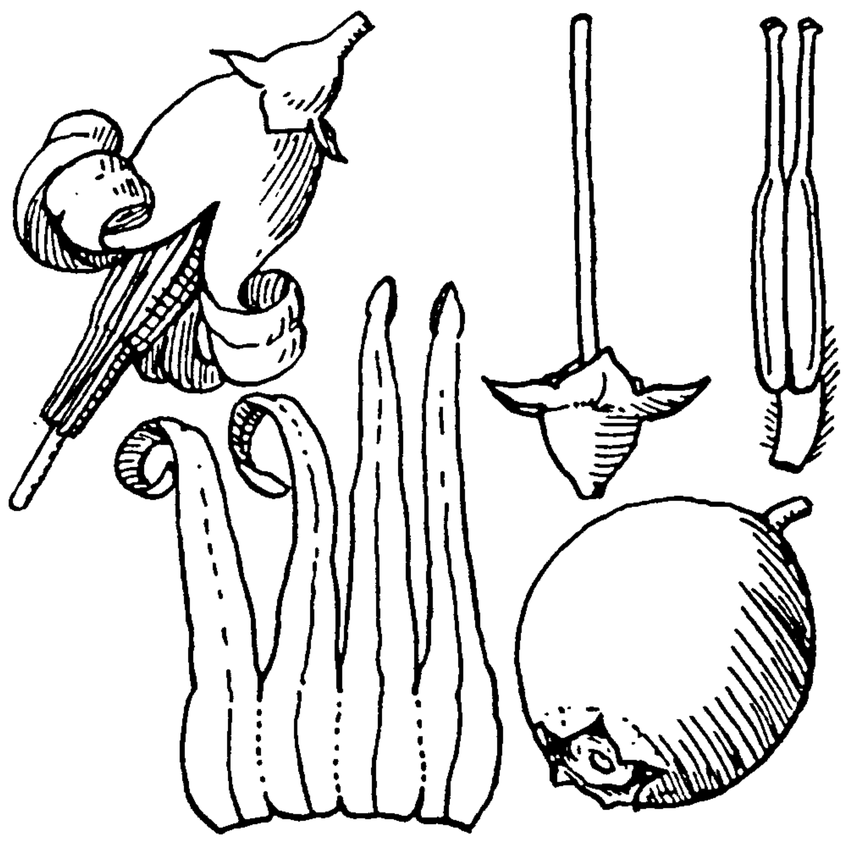
7. **HERPOTHAMNUS** Small. Shrubs with trailing, creeping stems and branches. Leaves evergreen: blades coriaceous, obscurely toothed. Flowers in cluster-like racemes with scale-like bracts. Hypanthium cup-shaped. Sepals very broad, acute. Corolla depressed-urceolate, 5-lobed. Stamens included. Filaments longer than the anthers. Anthers awnless, with short apical tubes. Berry globose, black.—One species.



1. **H. crassifolius** (Andr.) Small. Stem and branches up to 1 m. long, glabrous: leaves numerous; blades oval or elliptic, or sometimes ovate or suborbicular, 3–10 mm. long or sometimes 12 mm., obtuse or acutish, glandular-crenate: flower-clusters not exceeding the leaves: sepals deltoid or broadly triangular, acute: corolla pink, about 3 mm. long, the lobes broadly rounded: stamens 2.5 mm. long: filaments pubescent: berry 3.5 mm. in diameter. [*Vaccinium crassifolium* Andr.]—(CREEPING-BLUEBERRY.)—Pinelands, Coastal Plain, Ga. to N. C.—Spr.



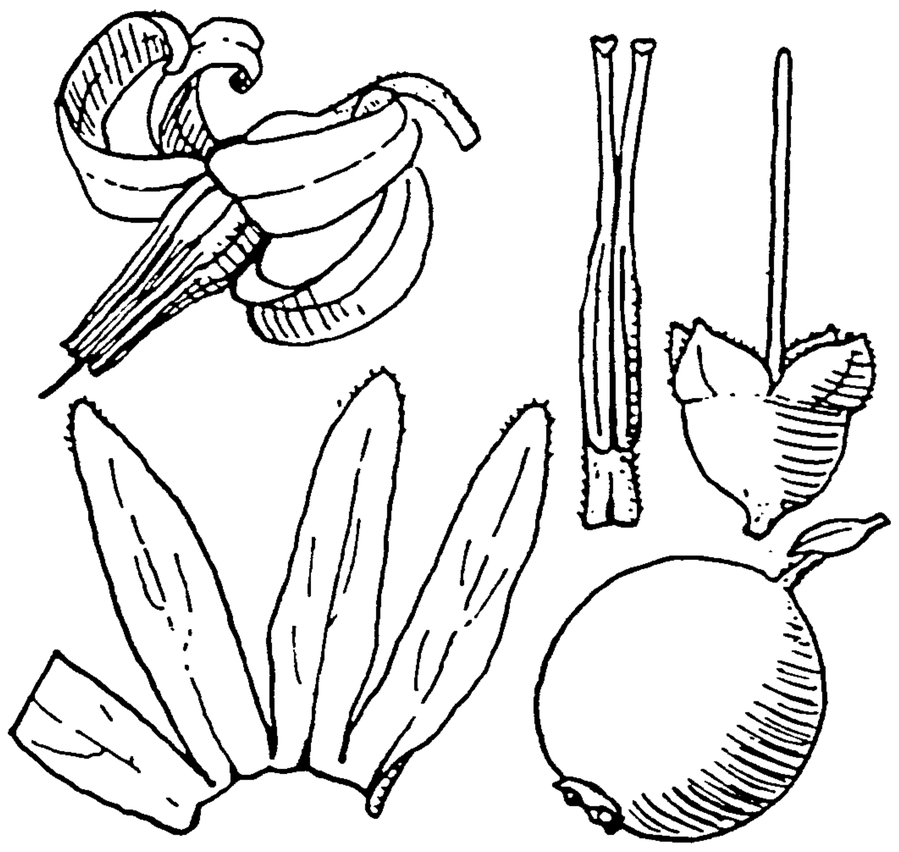
8. **HUGERIA** Small. Shrubs with rigid branches. Leaves deciduous: blades membranous, finely toothed, flat. Flowers solitary on slender pedicels arising from a short peduncle and a pair of bracts. Hypanthium obconic. Sepals of a deltoid type. Corolla rotate, pink or white, with the 4 long lobes curled backward. Stamens conspicuously exserted. Anthers awnless, with very slender apical tubes. Berry globose, red, sometimes turning purple, insipid or sometimes sweet and pleasant tasting.—The following species and one or two others in eastern Asia.



1. **H. erythrocarpa** (Michx.) Small. Stem 1–2.5 m. tall, the twigs mostly pubescent: leaf-blades lanceolate to ovate, 2.5–7.5 cm. long, acuminate, the teeth bristle-tipped: flowers nodding: sepals ciliate, acute: corolla 10–13 mm. long, the lanceolate lobes 4 or 5 times longer than the tube: stamens 10–12 mm. long: berry 5–9 mm. in diameter. [*Vaccinium erythrocarpum* Michx.]—(MOUNTAIN-CRANBERRY. BEAR-BERRY.)—Cliffs, slopes, and summits, in acid soil, Blue Ridge to Appalachian Plateau, Ga. to Tenn., W. Va., and Va.—Spr.–sum.—The flavor and acidity of the fruit is variable. The fruit from different mountains is often quite different in flavor. The better kinds make a delicious jelly. In cultivation the better kinds would doubtless furnish an additional desirable berry.

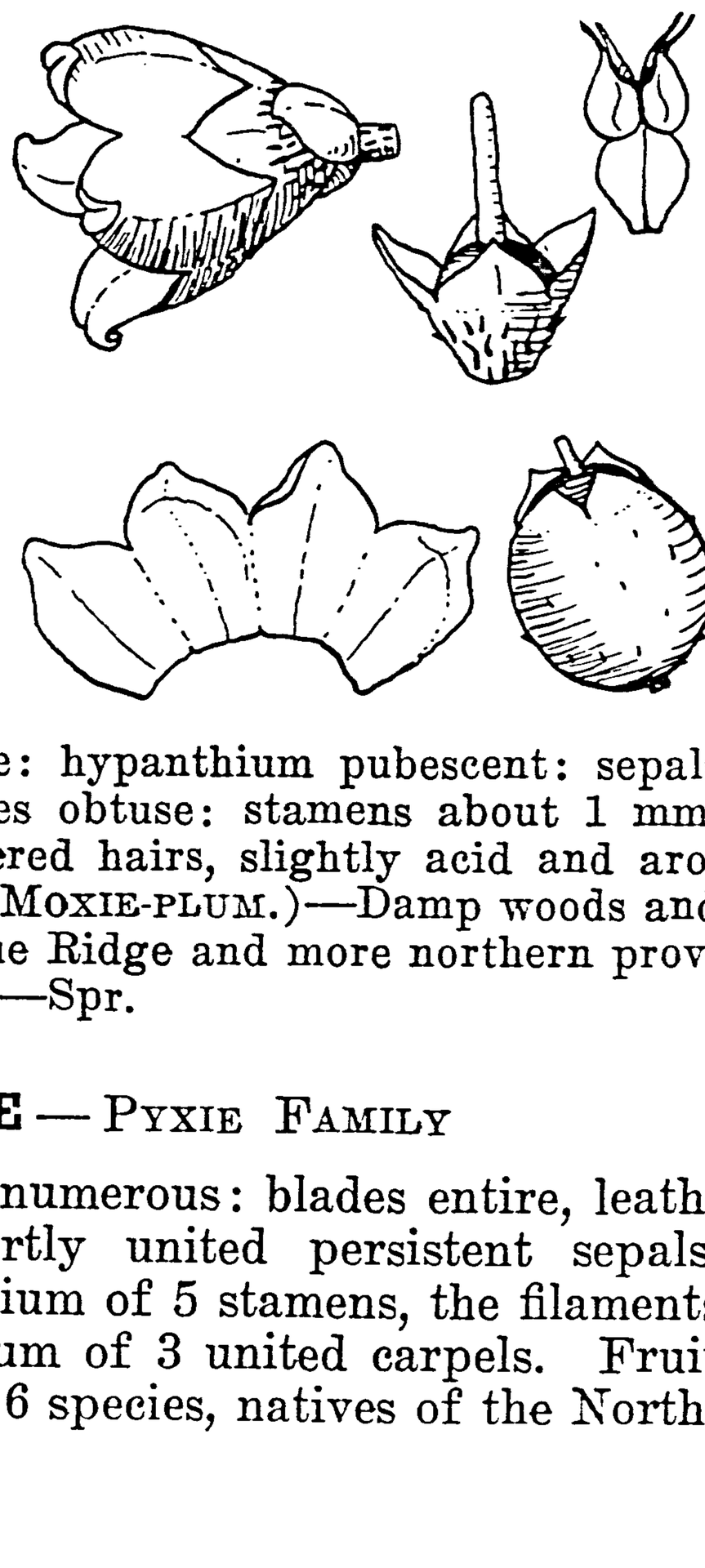
9. **OXYCOCCUS** Hill. Shrubs with slender trailing and creeping stems and branches. Leaves evergreen: blades coriaceous, entire, revolute. Flowers

terminating slender stalks with one or two small bractlets, 1–4 of which arise from terminal scaly buds. Hypanthium cup-shaped. Sepals 4, often of a deltoid type. Corolla white or pinkish, of 4 narrow petals with one or more curled back. Stamens conspicuously exserted. Anthers awnless, with long slender apical tubes. Berry globose or somewhat elongate, red, acid.—About 6 species, natives of the Northern Hemisphere.



1. O. macrocarpus (Ait.) Pursh. Stem up to 1 m. long, often finely pubescent, with erect or ascending flowering branches: leaves numerous: blades elliptic to linear-elliptic, varying to ovate or suborbicular, 6–14 mm. long, pale or whitish beneath: sepals acute, ciliolate: corolla nodding: petals lanceolate to elliptic-lanceolate, 7–10 mm. long: stamens about 6 mm. long: berry 1–2 cm. in diameter. [*Vaccinium macrocarpon* Ait.]—(CRANBERRY.)—Bogs, acid meadows, low sandy woods, and sandy banks, various provinces, in Coastal Plain only N, N. C. to Ark., Ind., Ont., and Newf.—Sum.—The commercial cranberry.

10. CHIOGENES Salisb. Slightly woody plants with slender creeping stems and branches. Leaves evergreen: blades coriaceous, entire. Flowers solitary and sessile in a pair of bractlets terminating a very short axillary peduncle. Hypanthium saucer-shaped. Sepals 4, as wide as long. Corolla greenish-white, campanulate. Stamens included. Filaments and anthers about equal in length, the anther-sacs separate, awnless, each 2-horned at the apex. Berry globose, white.—One species.



1. C. hispidula (L.) T. & G. Stem branched at the base, the branches often numerous, slightly woody: leaves numerous; blades oval to suborbicular, 3–13 mm. long, ciliate and with scattered hairs on the lower surface: hypanthium pubescent: sepals obtuse: corolla about 2 mm. long, the 4 lobes obtuse: stamens about 1 mm. long: berry 5–7 mm. in diameter, with scattered hairs, slightly acid and aromatic.—(CREEPING-SNOWBERRY. CAPILLAIRE. MOXIE-PLUM.)—Damp woods and bogs, in strongly acid humus or acid moss, Blue Ridge and more northern provinces, N. C. to Mich., B. C., Ont., and Newf.—Spr.

FAMILY 6. DIAPENSIACEAE — PYXIE FAMILY

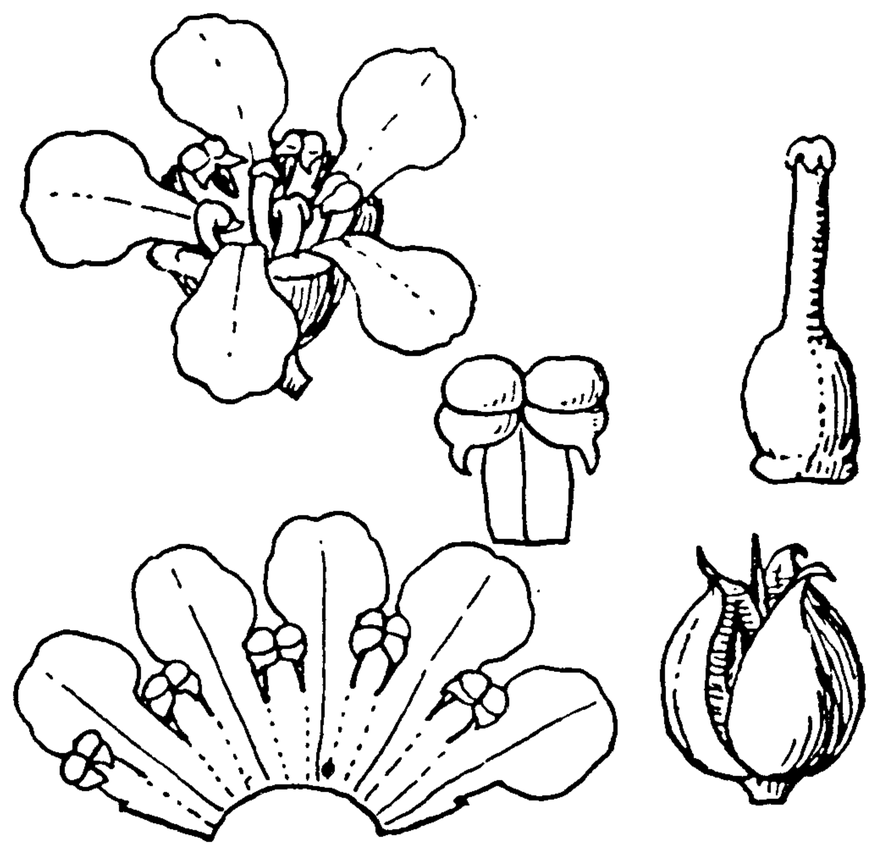
Undershrubs. Leaves alternate, often numerous: blades entire, leathery. Flowers solitary. Calyx of 5 partly united persistent sepals. Corolla of 5 partly united petals. Androecium of 5 stamens, the filaments partly united to the corolla-tube. Gynoecium of 3 united carpels. Fruit a 3-valved capsule.—Two genera and about 6 species, natives of the Northern Hemisphere.

1. **PYXIDANTHERA** Michx. Evergreen plants with creeping stems and branches. Leaves numerous. Calyx-lobes broad and imbricate. Corolla white, persistent: lobes 5, rounded, spreading. Anthers in the sinuses of the corolla. Capsule subglobose.—Two species.—Spr.—PYXIE. FLOWERING-MOSS.

Leaves bright-green: calyx-lobes obscurely ciliolate: corolla-lobes with suborbicular tips. 1. *P. barbulata.*
Leaves lanate, hence hoary: calyx-lobes ciliate: corolla-lobes cuneate. 2. *P. brevifolia.*

1. P. barbulata Michx. Plant forming a mat: leaf-blades linear, linear-oblanceolate, linear-elliptic, or linear-lanceolate, 5–8 mm. long, pubescent and ciliate at the base: bracts ciliate: calyx-lobes 3.5–4 mm. long, green or pink at the tip, ciliolate: corolla 6–7 mm. wide; lobes with suborbicular blades: capsule about 2.5 mm. in diameter.—Pinelands, Coastal Plain, S. C. to N. J.

2. P. brevifolia Wells. Similar to *P. barbulata* in habit, but with the hoary clusters of leaves smaller: leaf-blades linear-elliptic, linear, or linear-lanceolate, 2–4 mm. long, lanate: bracts copiously lanate: calyx-lobes about 3 mm. long, pink, ciliate: corolla 5–6 mm. wide; lobes with cuneate blades: capsule slightly smaller than that of *P. barbulata.*—Sandhills, interior Coastal Plain, N. C.

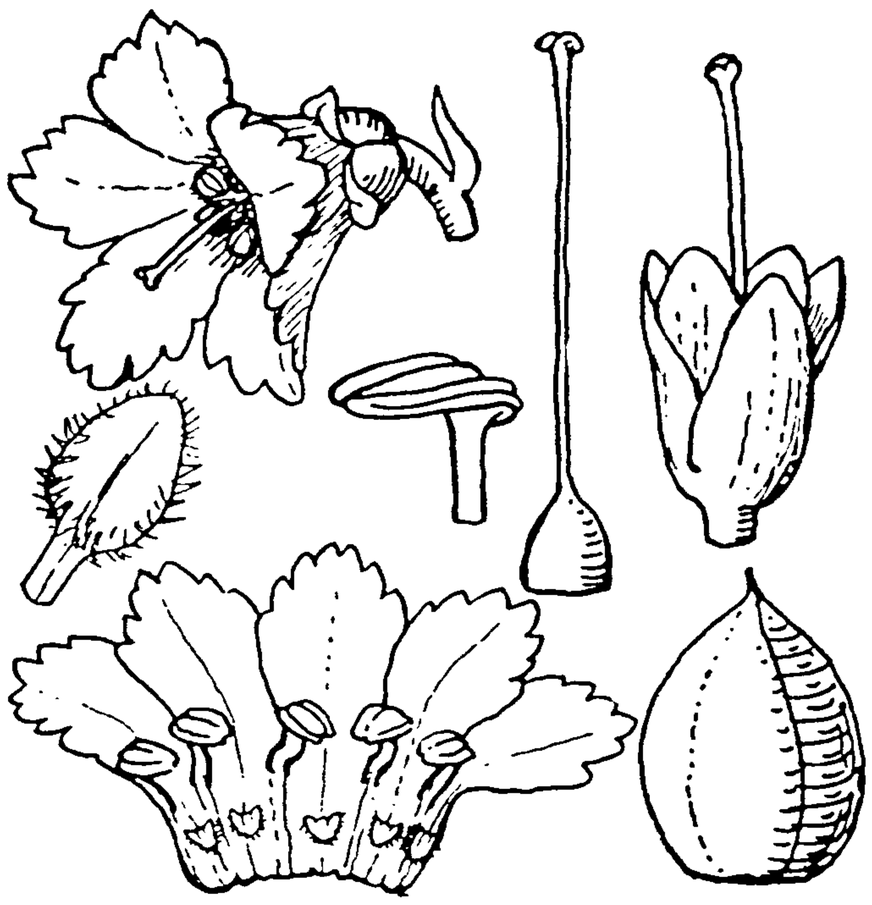


FAMILY 7. GALACACEAE — GALAXY FAMILY

Perennial, evergreen, scapose herbs. Leaves alternate, but few and all basal: blades leathery, toothed. Flowers solitary or in a raceme. Calyx of 5 partly united persistent sepals. Corolla of 5 partly united petals. Androecium of 5 stamens alternating with 5 staminodia, all sometimes partly united into a tube. Gynoecium of 3 united carpels. Fruit a 3-valved capsule.—Four genera, North American and Asiatic.

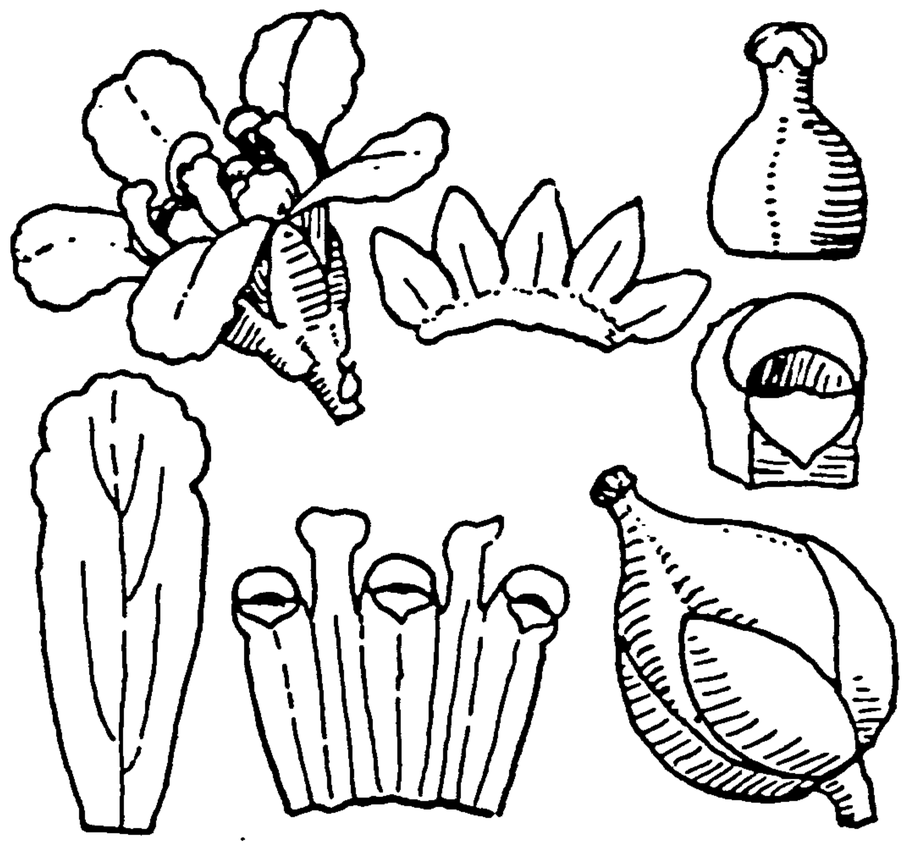
Flowers large, solitary: anthers surpassing the staminodia. 1. SHERWOODIA.
Flowers small, in a long raceme: anthers surpassed by the staminodia. 2. GALAX.

1. SHERWOODIA House. Herbs with short caudices bearing few leaves, with broad long-petioled blades. Flower-stalks bearing few scales and a single flower. Staminodia very short. Style elongate. [*Shortia* T. & G. not Raf.]—Two species, the following and one Asiatic.



1. S. galacifolia (T. & G.) House. Plant gregarious: leaf-blades oval or suborbicular, 2–7 cm. long, crenate-dentate with mucronate teeth, truncate or subcordate at the base: flower-stalk 5–15 cm. tall: calyx-lobes 7–10 mm. long: corolla white, 2–3 cm. wide: capsule 5–6 mm. long, shorter than the calyx. [*Shortia galacifolia* T. & G.]—(SHORTIA. OCONEE-BELLS. ONE-FLOWER COLTSFOOT.)—Ravines and stream-banks, in acid humus, inner Piedmont and Blue Ridge, S. C. and N. C.—Rare.—Spr.

2. GALAX L. Herbs with a short caudex bearing few leaves with broad long-petioled blades. Flowers in an elongate spike-like raceme. Staminodia exceeding the anthers. Style very short.—One species.



1. G. aphylla L. Plant gregarious: leaf-blades suborbicular, 4–10 cm. in diameter, crenate, with apiculate teeth, deeply cordate: flower-stalk 2–7 dm. tall: calyx-lobes 1.5 mm. long: corolla white, 4–5 mm. wide: capsule about twice as long as the calyx.—(GALAX. GALAXY. WAND-FLOWER. COLT'S FOOT. BEETLE-WEED.)—Open woods, in dry acid soil, Piedmont to Appalachian Plateau, Ga. to Ala. and W. Va., extending into Coastal Plain in N. C. and Va.—Sum.—The leaves are gathered in great quantities for use by florists.

ORDER PRIMULALES—PRIMULAL ORDER

Herbs, shrubs, trees, or vines. Leaves alternate or opposite, sometimes all basal. Flowers perfect or polygamo-dioecious, variously disposed. Calyx of 2–several partially united sepals. Corolla of 2–several distinct or partially united petals. Androecium of as many stamens as there are sepals or petals, and sometimes accompanied by staminodia. Gynoecium of 4–6 united carpels, or rarely more. Fruit capsular or drupaceous, or rarely an achene or a utricle.

Styles and stigmas distinct, slender: fruit an achene or an utricle: ovule solitary. Fam. 1. ARMERIACEAE.

Styles united: fruit capsular or drupe-like: ovules several.
- Herbs: ovules and seeds not immersed: fruit capsular. Fam. 2. PRIMULACEAE.
- Shrubs or trees: ovules and seeds immersed: fruit drupe-like.
  - Staminodia at the sinuses of the corolla: fruit containing few to many seeds. Fam. 3. THEOPHRASTACEAE.
  - Staminodia wanting: fruit containing a single seed. Fam. 4. ARDISIACEAE.

FAMILY 1. ARMERIACEAE — LEADWORT FAMILY

Perennial or rarely annual, often partly woody plants with leafy stems or with caudices. Leaves alternate: blades entire. Flowers perfect, in heads, spikes, panicles, or cymes. Calyx of 4 or 5 partly united sepals, the tube ribbed, the limb sometimes corolloid. Corolla of 4 or 5 petals, with the claws nearly distinct or united into a tube. Androecium of 4 or 5 stamens opposite the petals. Gynoecium of 4 or 5 carpels with the bodies at least united. Stigmas distinct. Fruit an achene or utricle, wholly or partly included in the persistent calyx.—Ten genera and 350 species, widely distributed.

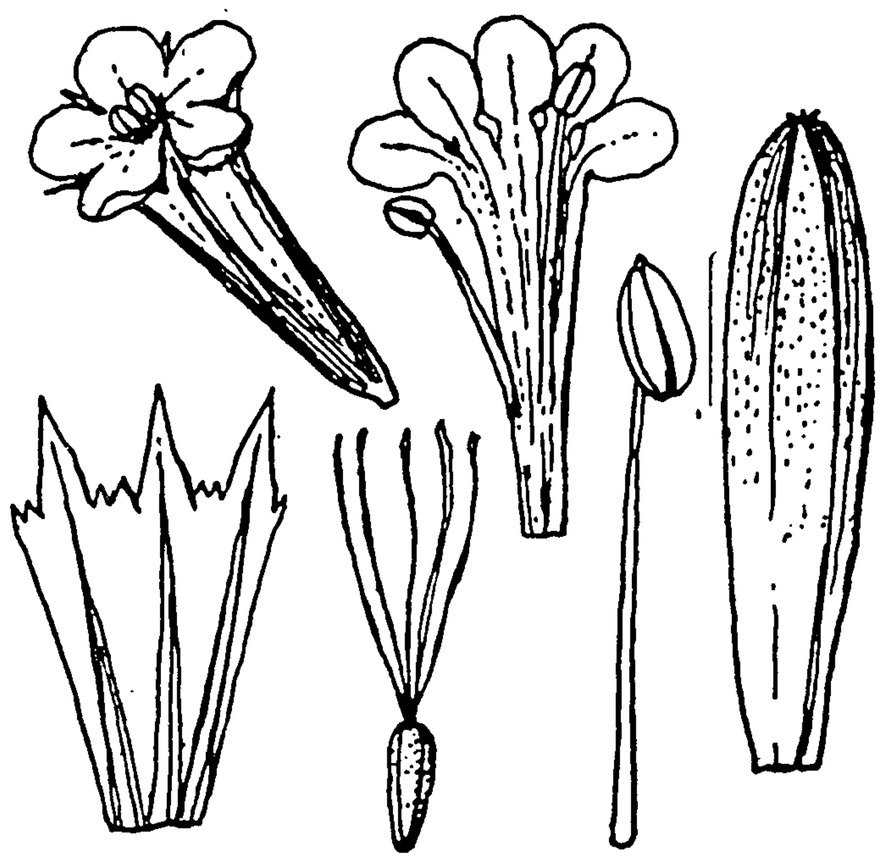
Acaulescent plants with a leafy caudex, the leaves basal: petals with the claws nearly distinct; filaments partly adnate to the petals; anthers broad: styles distinct. 1. LIMONIUM.

Caulescent plants with alternate leaves: petals with the claws united into a slender tube: filaments free: anthers narrow: styles united. 2. PLUMBAGO.

1. LIMONIUM [Tourn.] Hill. Perennial seaside herbs with woody roots and a short leafy caudex which supports several leaves with thick entire blades. Flower-stem erect, nearly naked, branched. Flowers violet or lavender, solitary or 2 or 3 together subtended by several scale-like bracts. Calyx funnelform or trumpet-shaped, persistent, 5-lobed, with teeth in the sinuses. Corolla 5-lobed, the tube very short. Utricle exserted from the calyx. [*Statice* Willd. not L.]—About 120 species, widely distributed.—Spr.–sum. or all year S.—SEA-LAVENDERS. MARSH-ROSEMARYS. CANKER-ROOTS.

Calyx-tube pubescent, at least at the base.
  Calyx 6–6.8 mm. long; lobes ovate-lanceolate, acuminate: panicle much-branched. 1. *L. Nashii.*
  Calyx 4–4.7 mm. long; lobes deltoid-ovate, obtuse: panicle sparingly branched. 2. *L. obtusilobum.*
Calyx-tube glabrous, or rarely with 1 or 2 hairs.
  Calyx-lobes broadly ovate-deltoid, obtuse: innermost bractlet obtuse. 3. *L. carolinianum.*
  Calyx-lobes ovate-lanceolate to deltoid, acute: innermost bractlet acute. 4. *L. angustatum.*

1. L. Nashii Small. Flowering stem 2–8.5 dm. tall, usually branched from near the middle, the branches slightly zigzag: leaf-blades elliptic, elliptic-spatulate, or obovate, 5–18 cm. long, obtuse to retuse: panicle-branches ascending-spreading: outermost bractlet 2 mm. long or nearly so: calyx pubescent at the base and often on 1 or 2 of the ribs up to the middle, the teeth between the lobes deltoid, entire, lobed, or obsolete: corolla violet: capsule about 4 mm. long.—Beaches and coastal salt-marshes, Fla. to Tex. and S. C.—(*Mex.*)



2. L. obtusilobum Blake. Flowering stem about 3 dm. tall, mostly branched near the top: leaf-blades oblanceolate-spatulate, 3.5–4.5 cm. long, mucronate and acute: panicle-branches ascending: outermost bractlet about 1 mm. long: calyx pubescent on the ribs up to the middle; the teeth between the lobes ovate-deltoid, entire: corolla pale-violet: capsule about 3 mm. long.—Salt-marshes, N Fla.

3. L. carolinianum (Walt.) Britton. Flowering stem 2–6 dm. tall: leaf-blades spatulate to elliptic or obovate-elliptic, 5–17.5 cm. long, retuse or obtuse, sometimes mucronate: panicle-branches ascending: outermost bractlet rhombic-ovate, mostly 1.5–2 mm. long: calyx 4.5–5.5 mm. long, the teeth between the lobes ovate to lanceolate, about half as long as the lobes: corolla lavender: capsule mostly 5–6 mm. long. [*S. brasiliensis* A. Gray not Boiss. *L. brasiliense* Small]—Salt-marshes, meadows, and dunes, near the coast, Fla. to N. C.—(*Mex.*?)

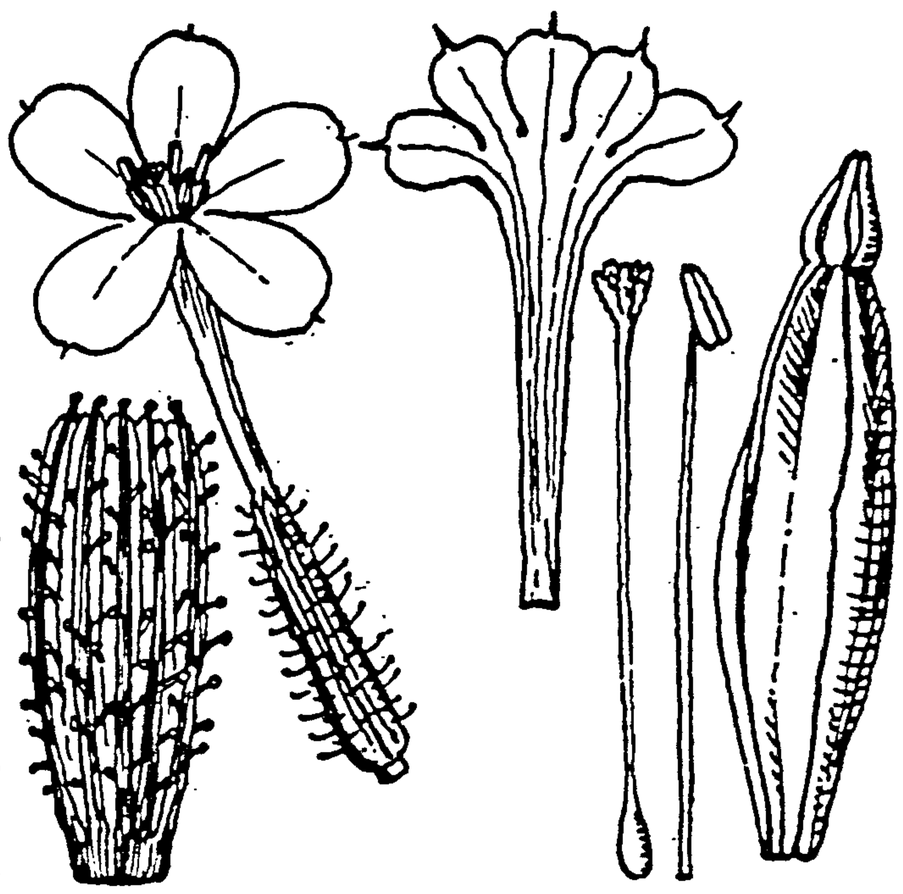
4. L. angustatum (A. Gray) Small. Flowering stem 2–6 dm. tall: leaf-blades linear, narrowly spatulate to narrowly elliptic, 5–8.5 cm. long, obtuse or sometimes cuspidate: panicle-branches ascending: outermost bractlet ovate: calyx 5.5–6.5 mm. long, the teeth between the lobes minute: corolla lavender: capsule about 7 mm. long. [*S. brasiliensis* (Chapm. Fl.)]—Salt-marshes along the coast, Fla. to Tex. and N. C.

2. PLUMBAGO L. Perennial caulescent hammock herbs with somewhat woody, often greatly elongate stems and alternate leaves. Flowers in terminal

spike-like panicles. Calyx tubular, with stalked glands, unevenly 5-lobed, with merely hyaline sinuses. Corolla salverform: tube elongate: lobes broad: capsule included.—LEADWORTS.—About 12 species, widely distributed in warm regions.

Corolla white; tube less than twice as long as the calyx: calyx merely glandular all over. 1. *P. scandens.*
Corolla blue; tube over twice as long as the calyx: calyx finely pubescent and glandular except near the base. 2. *P. capensis.*

1. P. scandens L. Stem erect, decumbent, or climbing, somewhat woody: leaf-blades elliptic, elliptic-lanceolate, or ovate, 2–10 cm. long, acute or short-acuminate: panicles elongate, interrupted: bracts acuminate: calyx scarcely 1 cm. long in anthesis, more than one third the length of the corolla: corolla mostly 3–4 cm. long: capsule linear-prismatic, about 7 mm. long, beaked.—Hammocks, S Fla. and kitchen-middens N along the coasts.—(*W. I., Mex., C. A., S. A.*)—All year.



2. P. capensis Thumb. Stem erect, often diffusely branched or bushy: leaf-blades elliptic, varying to elliptic-spatulate or elliptic-ovate, 3–9 cm. long, obtuse or acutish: panicles compact, short: bracts mucronate: calyx fully 1 cm. long in anthesis, less than one-third the length of the corolla: corolla mostly 4–5 cm. long.—Roadsides and waste-places, S Fla. Nat. of S Afr. and cult.—(*W. I., Mex., C. A., S. A.*)—All year.

FAMILY 2. PRIMULACEAE — PRIMROSE FAMILY

Herbs, various in habit. Leaves alternate, opposite, or whorled, sometimes all basal: blades entire, toothed, or rarely dissected. Flowers perfect. Calyx of 4–9 partially united sepals, commonly persistent. Corolla of 4–9 partially united petals, or rarely wanting. Androecium of as many stamens as there are sepals and alternate with them, sometimes with staminodia. Gynoecium a single pistil, with a central placenta: style single. Fruit a 1-celled, 2–8-valved capsule.—Twenty-eight genera and 400 species, widely distributed in the Northern Hemisphere.

Ovary superior.
  Lobes of the corolla imbricate: ovules attached at the base: leaf-blades dissected. Tribe I. HOTTONIEAE.
  Lobes of the corolla valvate or convolute: ovules attached at the middle: leaf-blades entire or toothed. II. PRIMULEAE.
Ovary half-inferior. III. SAMOLEAE.

I. HOTTONIEAE

Aquatic, rooting, and floating herb: stems and peduncles swollen and inflated: corolla salverform. 1. HOTTONIA.

II. PRIMULEAE

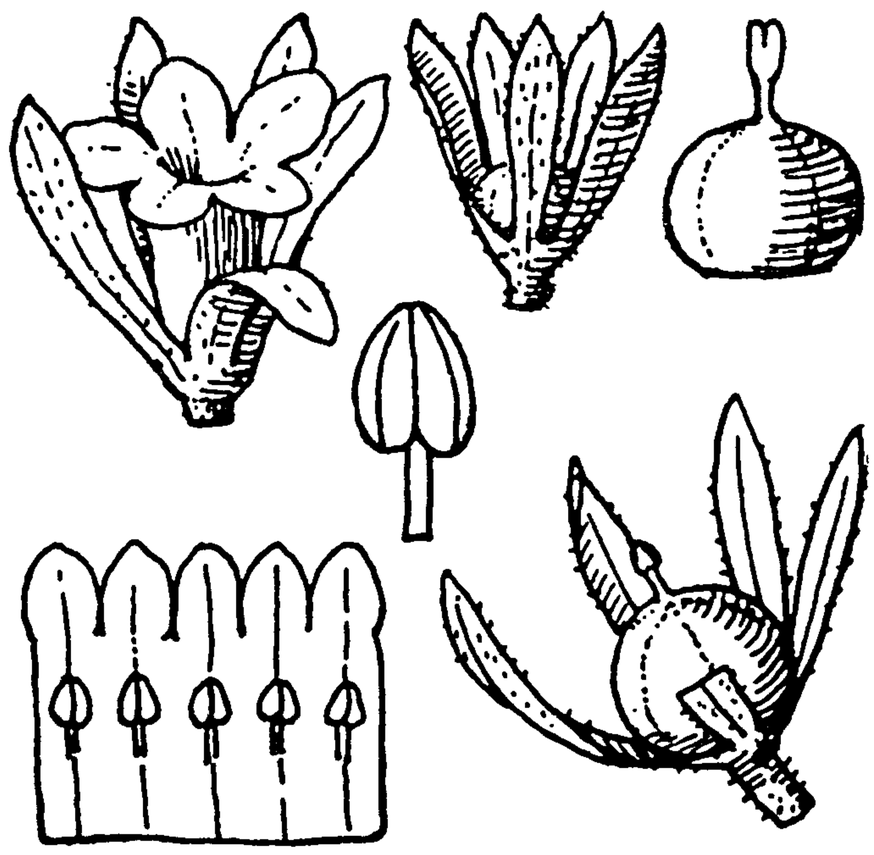
Corolla-lobes erect or merely spreading: anthers not sagittate.
  Capsule opening lengthwise.
    Filaments united below the middle: anthers ovoid. 2. LYSIMACHIA.
    Filaments distinct or essentially so: anthers linear. 3. STEIRONEMA.
  Capsule circumscissile.

Corolla longer than the calyx: style longer than the ovary. — 4. ANAGALLIS.
Corolla shorter than the calyx: style shorter than the ovary.
  Corolla-tube very short: filaments united at the base. — 5. MICROPYXIS.
  Corolla-tube globular, about as long as the lobes: filaments united to above the middle. — 6. CENTUNCULUS.
Corolla-lobes reflexed: anthers sagittate. — 7. DODECATHEON.

III. SAMOLEAE

Staminodia present: corolla-lobes longer than the tube. — 8. SAMOLUS.
Staminodia wanting: corolla-lobes shorter than the tube. — 9. SAMODIA.

1. HOTTONIA L. Aquatic herbs. Leaves crowded: blades pinnately dissected: petioles inflated. Flowers whorled. Calyx-lobes 5, narrow, persistent. Corolla white, salverform: lobes shorter than the tube. Filaments adnate to the lower part of the corolla-tube. Capsule subglobose.—Two species, the following and an Eurasian.



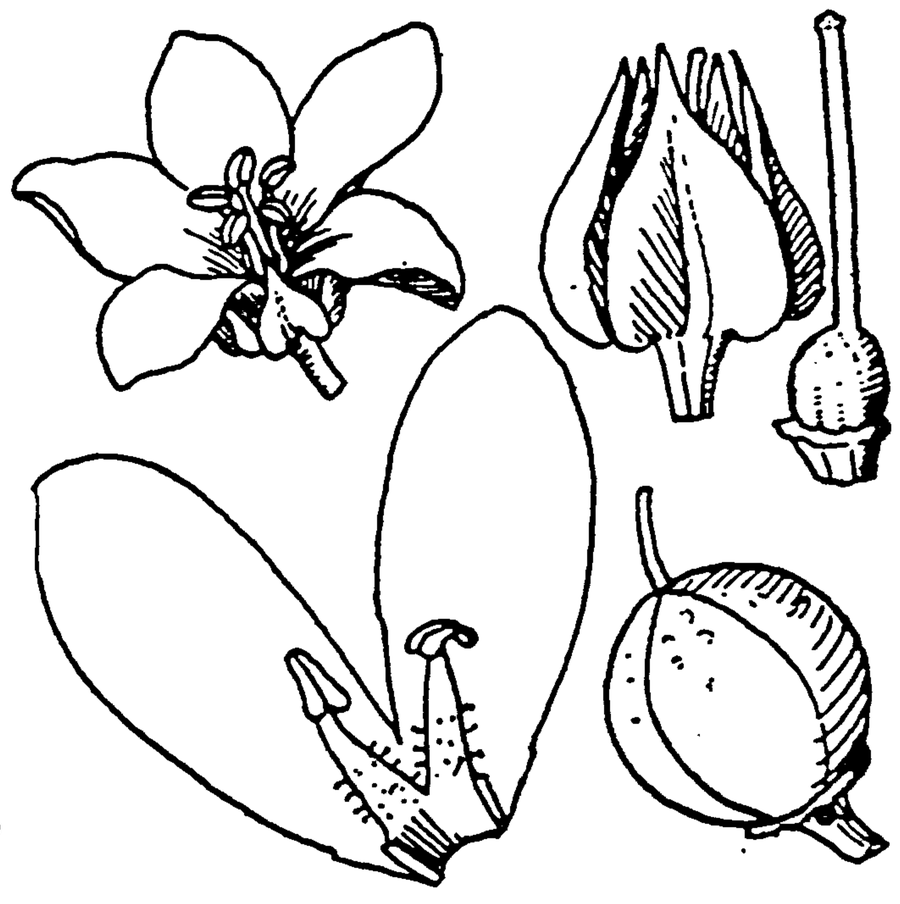
1. H. inflata Ell. Stem 2–6 dm. long, fistulous: leaf-blades ovate to elliptic in outline, the segments filiform. Calyx-lobes linear, 3–3.5 mm. long, or longer at maturity, glandular-ciliate below: corolla about 3 mm. long: capsule 3 mm. in diameter.—(FEATHERFOIL.)—Ponds, pools, and ditches, Coastal Plain and New England Coast, Fla. to La., Mo., and Me.; and Great Lake Lowland, Ohio and Ind.—Rare.—Spr.–sum.

2. LYSIMACHIA [Tourn.] L. Perennial or rarely annual herbs, the foliage glandular-punctate. Leaves opposite or apparently whorled. Corolla yellow, rotate or nearly so: lobes entire, acute or obtuse. Filaments partially united. Staminodia wanting. Anthers ovoid.—About 70 species, mostly natives of the Northern Hemisphere.—Sum.—LOOSESTRIFES.

Calyx-lobes ovate: stem and branches creeping. — 1. *L. Nummularia.*
Calyx-lobes lanceolate, elliptic-lanceolate or linear: stems erect.
  Flowers in a terminal raceme, the raceme sometimes leafy-bracted: corolla streaked.
    Inflorescence extending nearly the length of the plant: flowers axillary to leaf-like bracts. — 2. *L. quadrifolia.*
    Inflorescence a terminal virgate raceme: flowers axillary to small bracts.
      Staminodia manifest, but minute.
        Pedicels shorter than the bracts: corolla-lobes 6–7 mm. long. — 3. *L. producta.*
        Pedicels longer than the bracts: corolla-lobes 8–9 mm. long. — 4. *L. terrestris.*
      Staminodia wanting.
        Corolla-lobes 5–6 mm. long: pedicels longer than the bracts. — 5. *L. Loomisii.*
        Corolla-lobes 10–11 mm. long: pedicels shorter than the bracts. — 6. *L. asperulaefolia.*
  Flowers in a terminal panicle: corolla without dots or streaks. — 7. *L. Fraseri.*

1. L. Nummularia L. Stem and branches 1–7 dm. long: leaf-blades suborbicular, 0.8–3 cm. long: calyx-lobes ovate, 8–9 mm. long, cordate at the base:

corolla-lobes 11–14 mm. long, obovate to ovate: capsule about 4 mm. thick.—(MONEYWORT.)—Moist banks and about gardens, various provinces, Ga. to Mich. and Newf.—Nat. of Eu. and cult.



2. L. quadrifolia L. Stem 2–9 dm. tall: leaf-blades lanceolate to oval, 1.5–9 cm. long: pedicels shorter than the bracts: calyx-lobes lanceolate, 5–6 mm. long, acuminate: corolla-lobes elliptic to ovate-elliptic, exceeding the calyx: capsule 2.5–3 mm. thick.—(CROSSWORT. WHORLED-LOOSESTRIFE.)—Thickets and woods, various provinces, Ga., to Ala., Ont., and N. B.

3. L. producta (A. Gray) Fernald. Stem 3–6 dm. tall: blades lanceolate or elliptic-lanceolate, 2–8 cm. long: pedicels shorter than the bracts: calyx-lobes narrowly elliptic-lanceolate, 3 mm. long, acute or acutish: corolla-lobes ovate to elliptic-ovate, more or less notched at the apex: capsule subglobose, about 2 mm. thick. [*L. foliosa* Small]—Damp woods and stream-banks, various provinces, N. C. to Mich. and Me.

4. L. terrestris (L.) B. S. P. Stem 5–8 dm. tall: leaf-blades lanceolate, elliptic-lanceolate, or narrowly elliptic, 2–6 cm. long, abruptly smaller near the inflorescence: pedicels longer than the bracts: calyx-lobes elliptic-lanceolate, about 2 mm. long: corolla-lobes elliptic-lanceolate: capsule about 2 mm. thick.—(SWAMP-CANDLES.)—Wet, sandy soil and swamps, various provinces, Ga. to Ark., Man., and Newf.

5. L. Loomisii Torr. Stem 3–8 dm. tall: leaf-blades linear, 1–3 cm. long, blunt: pedicels longer than the bracts: calyx-lobes lanceolate, 2.5–3 mm. long: corolla-lobes elliptic to ovate-elliptic, eciliate; capsule about 2.5 mm. thick. [*L. angustifolia* Michx. not Lam.]—Low grounds, Coastal Plain and Piedmont, Ga. to N. C.

6. L. asperulaefolia Poir. Stem 2–6 dm. long: leaf-blades lanceolate, 2–5 cm. long, acute or acuminate: pedicels shorter than the bracts: calyx-lobes lanceolate, 4–5 mm. long: corolla-lobes lanceolate to elliptic-lanceolate, ciliolate: capsule 3.5–4.5 mm. thick.—Pinelands, Coastal Plain, Ga. to N. C.

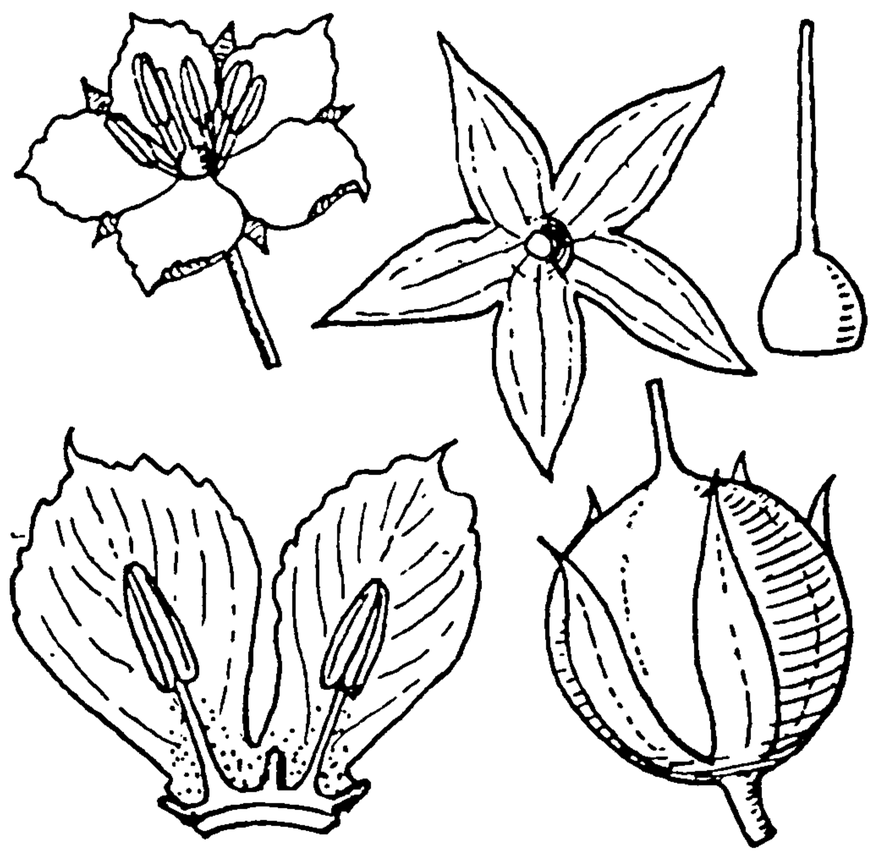
7. L. Fraseri Duby. Stem 8–20 dm. tall, glandular near the nodes: leaf-blades lanceolate, narrowly elliptic or oblanceolate, or sometimes ovate-lanceolate, 6–15 cm. long: panicle broad: calyx-lobes lanceolate, about 5 mm. long: corolla-lobes elliptic to ovate, 7–8 mm. long: capsule 3–4 mm. thick.—Woods and slopes, over non-calcareous rocks, Blue Ridge to Appalachian Plateau, Ga. (and Ala.?) to Tenn. and S. C.

3. STEIRONEMA Raf. Perennial herbs, the foliage not glandular-punctate. Leaves opposite. Corolla yellow, rotate: lobes erose or erose-ciliate, mucronate. Filaments distinct or nearly so, alternating with manifest staminodia. Anthers linear. Six species, North American.—Sum.—LOOSESTRIFES.

Bracts with ovate or broadly lanceolate blades.
  Calyx-lobes less than 5 mm. long: corolla 8–10 mm. wide. 1. *S. radicans.*
  Calyx-lobes over 5 mm. long: corolla 15–25 mm. wide.
    Staminodia ovate: corolla-lobes 7–8 mm. long. 2. *S. tonsum.*

Staminodia subulate: corolla-lobes 10–12 mm. long. 3. *S. ciliatum.*
Bracts with linear, elliptic or narrowly lanceolate blades.
Staminodia ovate: capsule 2.5–3 mm. thick. 4. *S. lanceolatum.*
Staminodia lanceolate to subulate: capsule 3.5–4.5 mm. thick.
Cauline leaves not narrowed into petioles, the blades of the upper ones mostly narrower than those of the lower. 5. *S. heterophyllum.*
Cauline leaves narrowed into petioles, the blades of the upper ones not much narrower than those of the lower. 6. *S. hybridum.*

1. S. radicans (Hook.) A. Gray. Stem 3–8 dm. long, ultimately reclining or creeping: leaf-blades ovate to lanceoláte, 2–8 cm. long: calyx-lobes lanceolate, 3.5–4 mm. long: corolla-lobes obovate or orbicular-obovate, 4.5–5.5 mm. long, truncate or emarginate at the apex: capsule about 3 mm. thick.—Swamps and wet river banks, Coastal Plain and occasionally other provinces, Miss. to Tex., Mo., and Va.—Sum.



2. S. tonsum (Wood) Bicknell. Stem 2–7 dm. tall: leaf-blades ovate to ovate-lanceolate, 1.5–8 cm. long, like the petioles eciliate: calyx-lobes broadly lanceolate, 5.5–6 mm. long: corolla-lobes suborbicular, erose-lacerate: capsule about 4 mm. thick. [*S. tonsum simplex* Kearney]—Dry woods, cliffs, and bluffs, various provinces, rarely Coastal Plain, Ga. to Ark., Tenn., and Va.—Spr.–sum.

3. S. ciliatum (L.) Raf. Stem 2–15 dm. tall: leaf-blades ovate, elliptic-ovate, or broadly lanceolate, 4–12 cm. long, like the petioles ciliate: calyx-lobes narrowly lanceolate, 6–7 mm. long: corolla-lobes ovate or obovate, erose-ciliate: capsule about 5 mm. thick.—Stream-banks and damp thickets, various provinces, Fla. to Tex., Ariz., B. C., Ont., and N. S.—Spr.–sum.

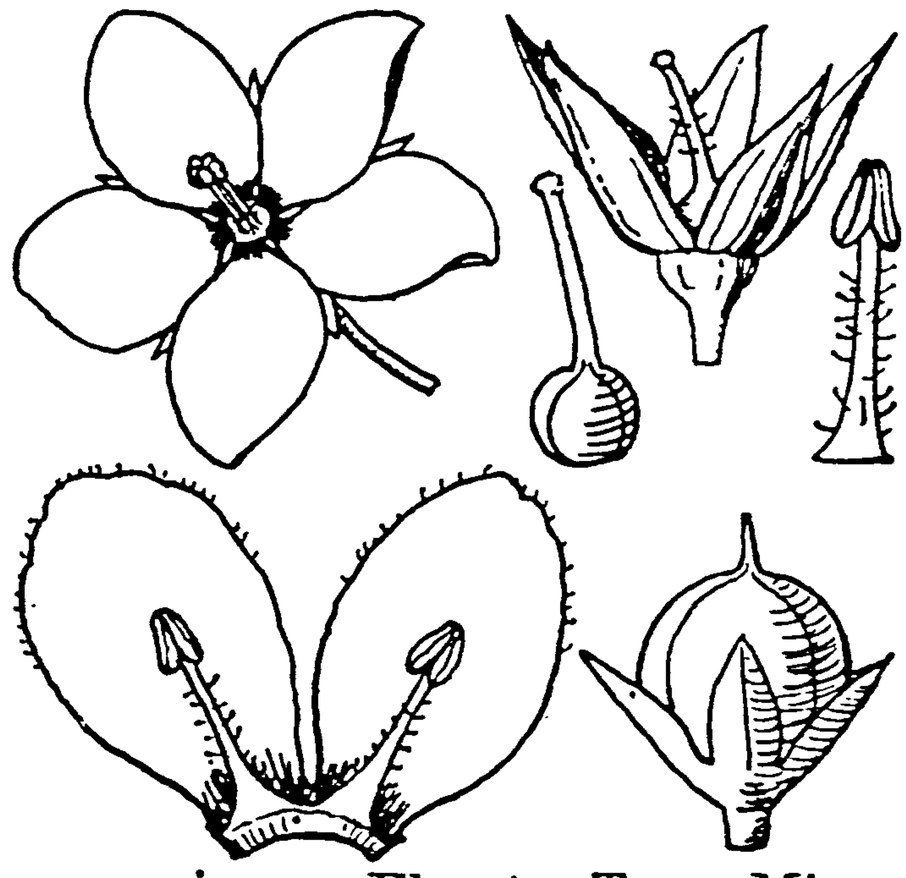
4. S. lanceolatum (Walt.) A. Gray. Stem 2–6 dm. tall: lower cauline leaves with elliptic or lanceolate blades; upper cauline leaves much longer than the lower ones, the blades mainly linear, 3–10 cm. long, the petiole-like bases only or mainly ciliate near the stem: calyx-lobes 4–5 mm. long: corolla-lobes 5–8 mm. long: staminodia ovate: capsule 2.5–3 mm. thick.—Thickets, borders of woods, and low grounds, various provinces, Ga., to Miss., Ont., and Me.—Sum.

5. S. heterophyllum (Michx.) Raf. Stem 0.5–5 dm. tall: lower cauline leaves with oval, obovate, or spatulate blades; upper cauline leaves conspicuously longer than the lower ones: blades narrowly elliptic to linear, 4–15 cm. long, not narrowed to petioles: calyx-lobes 5–6 mm. long: corolla-lobes 5–8 mm. long: staminodia lanceolate to subulate: capsule 3.5–4 mm. thick.—Woods, meadows, and shaded banks, Coastal Plain and adj. provinces, Fla. to Miss., Ark., and Va.—Spr.–fall.

6. S. hybridum (Michx.) Raf. Stem 1–9 dm. tall: leaf-blades lanceolate to linear-lanceolate, or sometimes broader near the base of the stem, 3–7.5 cm. long, each more or less abruptly narrowed into a copiously ciliate petiole: calyx-lobes 6–7 mm. long: corolla-lobes 6–9 mm. long: staminodia lanceolate to subulate: capsule 4–4.5 mm. thick.—Thickets and moist soil, various provinces, Fla. to Tex., Ariz., Minn., and Me.—Spr.–sum.

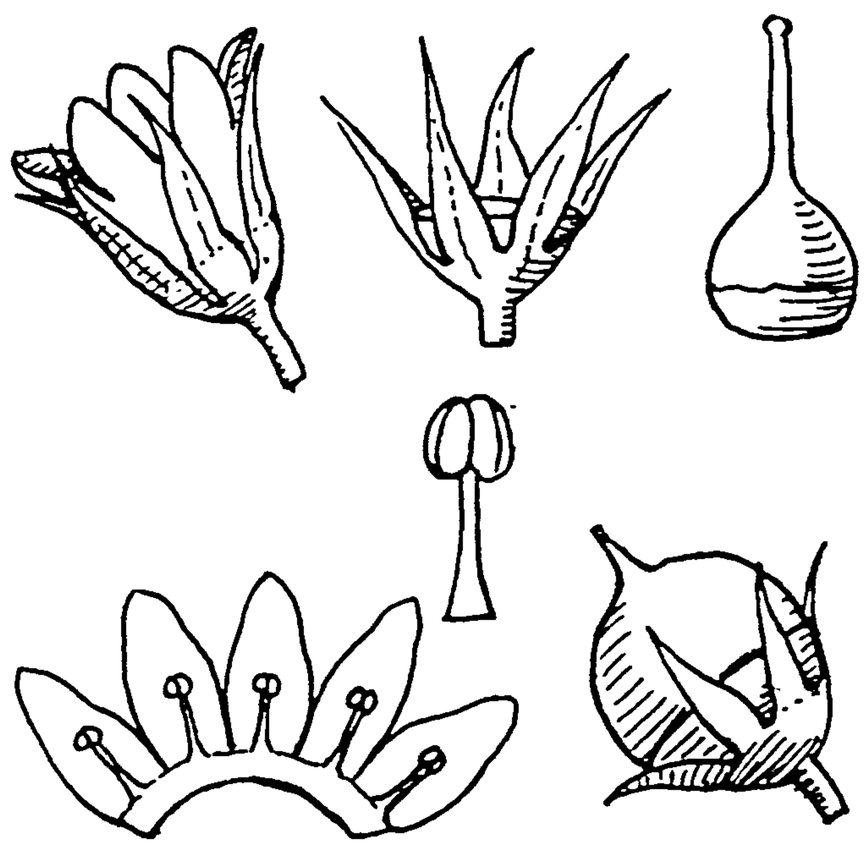
4. **ANAGALLIS** [Tourn.] L. Annual or rarely perennial herbs of cultivated or waste-places. Leaves mostly opposite: blades thinnish. Corolla

rotate, longer than the calyx; lobes dilated. Filaments pubescent: anthers ellipsoid.—About 15 species, mostly natives of the Old World.



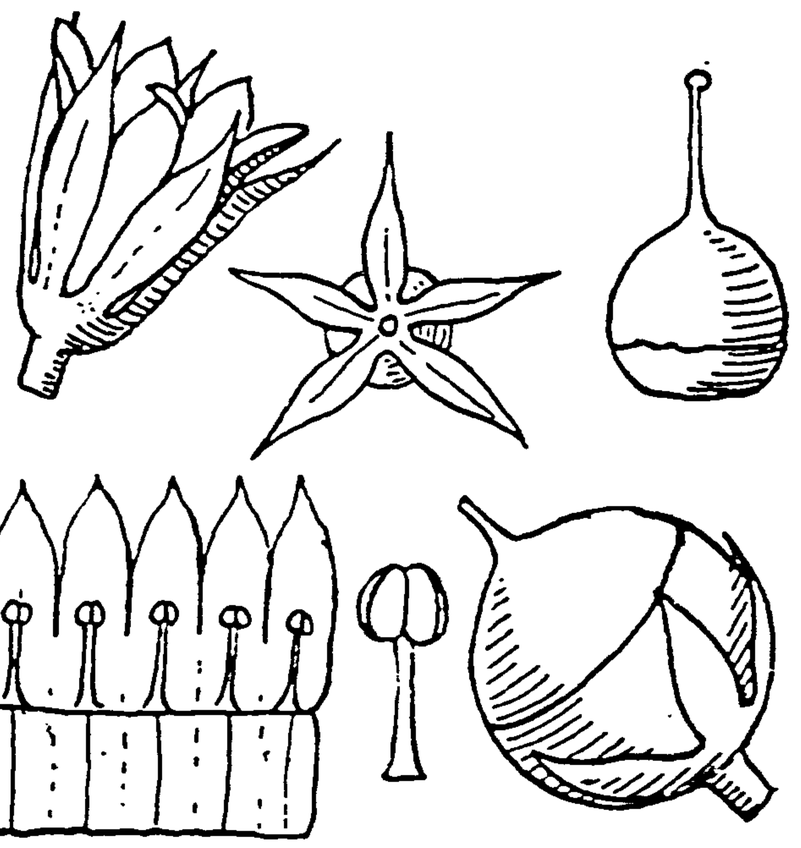
1. **A. arvensis** L. Stem and branches 5–30 cm. long: leaf-blades ovate, or oval, 5–20 mm. long, entire, sessile: calyx-lobes lanceolate, about 2 mm. long: corolla scarlet or rarely white (blue in *A. arvensis coerulea*), 5–7 mm. wide; lobes glandular-ciliate: capsules about 4 mm. in diameter, on recurved pedicels. — (POOR-MAN'S WEATHER-GLASS. SHEPHERD'S WEATHER-GLASS. PIMPERNEL.) —Waste-places, fields, and roadsides, various provinces, Fla. to Tex., Minn., and Newf.; also Pacif. States. Nat. of Eurasia.—Spr.–sum.

5. **MICROPYXIS** Duby. Annual small herbs. Leaves alternate or some of the lower ones opposite: blades thickish. Corolla inconspicuous, rotate, shorter than the calyx: tube very short: lobes narrowed upward. Filaments united only at the base. Anthers didymous.—One species.



1. **M. pumila** (Sw.) Duby. Stem 5–20 cm. tall: leaf-blades oval to suborbicular, 3–10 mm. long, apiculate: flowers slender-pedicelled: calyx-lobes elliptic-ovate, abruptly pointed: corolla white or greenish: capsule less than 2 mm. in diameter. '[*Centunculus pentandrus* R Br.]—(FALSE-PIMPERNEL.)—Low grounds, pen. Fla.—(*W. I., Mex., C. A., S. A., O. W.*)—Spr.–fall.

6. **CENTUNCULUS** L. Annual small herbs of low grounds. Leaves alternate, or some of the lower ones opposite: blades thickish. Corolla inconspicuous, not exceeding the calyx, with a globular tube and 5 narrow spreading lobes. Filaments united above the middle. Anthers didymous.—Two species, widely distributed.



1. **C. minimus** L. Stem 2–15 cm. tall: leaf-blades spatulate, elliptic, or obovate, 3–8 mm. long, acute or obtuse: flowers sessile or nearly so: calyx-lobes narrowly lanceolate, 2–2.5 mm. long: corolla pink or nearly white; lobes lanceolate, acuminate: capsule usually fully 2 mm. in diameter.—(CHAFFWEED. FALSE-PIMPERNEL.)—Low grounds and moist soil, various provinces, Fla. to Tex., B. C., Minn., and Ill.—*W. I., Mex., C. A., S. A., O. W.*)—Spr.—fall.

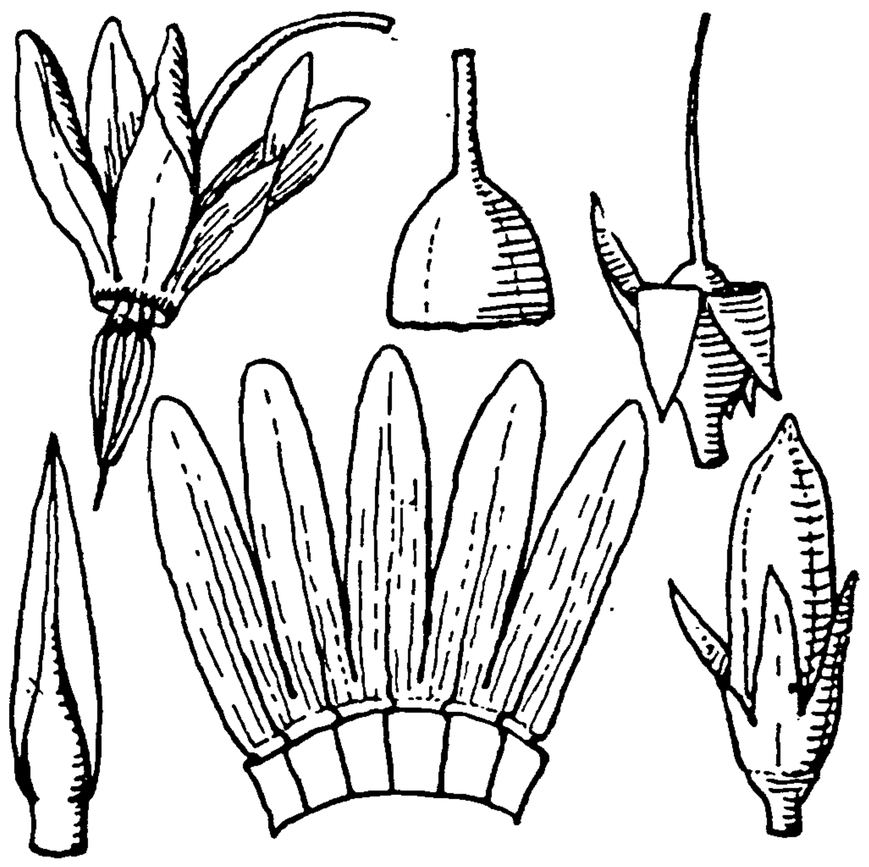
7. **DODECATHEON** L. Perennial scapose herbs with erect flower-stalks. Leaves on a short caudex: blades entire to coarsely toothed. Flowers showy,

in a terminal umbel, nodding. Calyx-lobes reflexed in anthesis. Corolla with a very short tube and reflexed elongate lobes. Stamens erect.—About 30 species, North American and Asiatic.—MEDIAS. SHOOTING-STARS. AMERICAN-COWSLIPS.

Anthers slender (mostly over 7 mm. long); connective-body broader than the anther-sacs: capsule elongate, much exceeding the calyx.
- Connective-body lanceolate: corolla typically pink-purple. 1. *D. Meadia.*
- Connective-body ovate: corolla typically white. 2. *D. Hugeri.*

Anthers stout (mostly less than 7 mm. long); connective-body narrower than the anther-sacs: capsule short, about equaling the calyx. 3. *D. brachycarpa.*

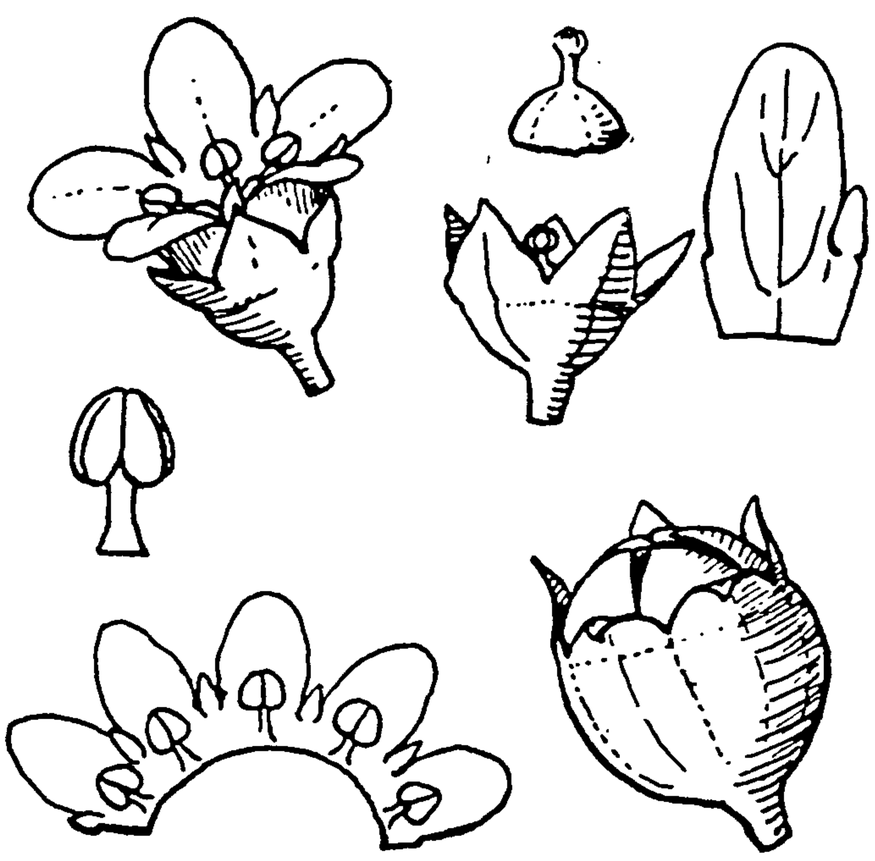
1. D. Meadia L. Leaf-blades spatulate to elliptic, 5–20 cm. long, entire to coarsely crenate: scapes overtopping the leaves: calyx-lobes linear to linear-lanceolate, much longer than the tube: corolla pink-purple; lobes 1–1.5 cm. long: capsule ellipsoid-cylindric, 1.2–1.5 cm. long; much longer than the calyx.—Gravelly fields, open woods, bluffs, cliffs, and rocky river-banks, often in rich or calcareous soil, various provinces, rarely Coastal Plain, Ga. to Tex., Wis., and Pa.—Spr.–sum.—Sometimes cultivated in gardens.



2. D. Hugeri Small. Leaf-blades spatulate, elliptic, or elliptic-lanceolate, 5–40 cm. long, often undulate or repand-crenate: scapes mostly 2–4 dm. tall: calyx-lobes lanceolate: corolla white, or sometimes purple-tinged; lobes 1.5–2 cm. long: anthers slender-subulate, 7.5–8.5 mm. long; connective-body abruptly narrowed at the apex: capsule ellipsoid-conic, 1–1.5 cm. long.—Woods, bluffs, and cliffs, various provinces N of Coastal Plain, Ga. to Ala., Ohio, and Md.—Spr.

3. D. brachycarpa Small. Leaf-blades spatulate or elliptic, entire or undulate: scapes 2–4 dm. tall: calyx-lobes lanceolate to triangular-lanceolate: corolla pink-purple; lobes linear or nearly so, 1–1.5 cm. long: anthers stout-subulate, 5.5–6.5 mm. long; connective-body lanceolate: ovary-apex flattened: capsule ovoid, less than 1 cm. long.—Plains and prairies, various provinces, Ala. to Ark.—Spr.–sum.

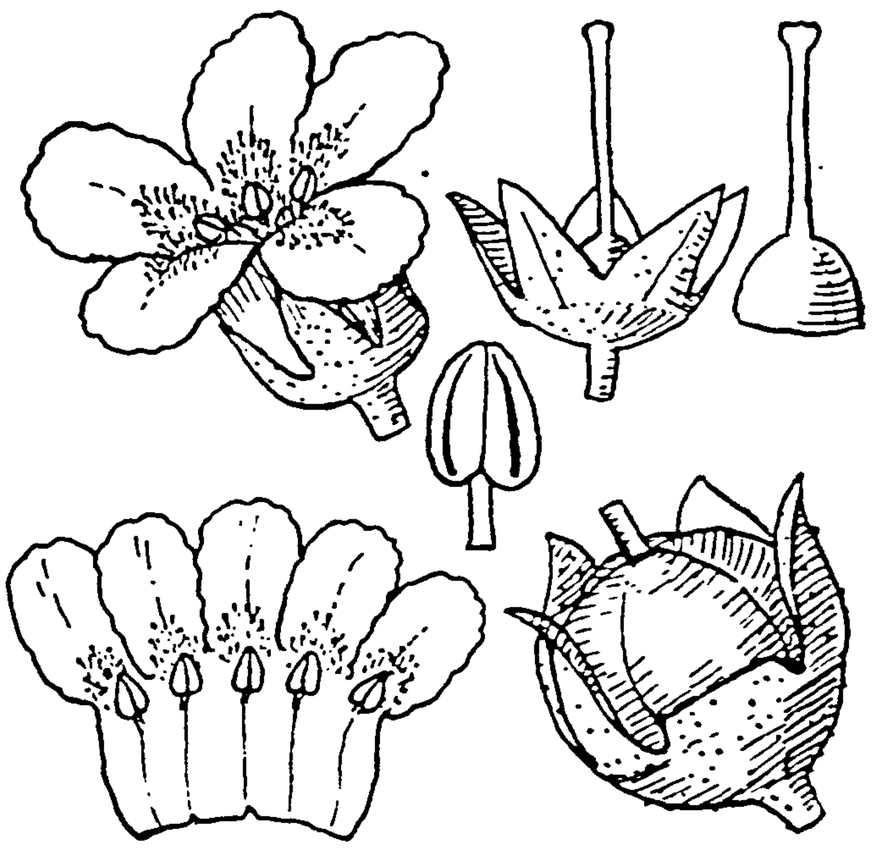
8. SAMOLUS [Tourn.] L. Caulescent herbs. Leaves alternate: blades entire. Flowers in simple or branched, sessile or nearly sessile racemes. Calyx perigynous: lobes 5. Corolla perigynous: lobes 5, with staminodia at the sinuses. Stamens 5: filaments very short, adnate to the base of the very short corolla-tube. Ovary and capsule ½ inferior.—About 4 species, widely distributed.



1. S. floribundus H.B.K. Plant glabrous, 1–6 dm. tall: leaf-blades spatulate to oval or ovate, mainly 3–15 cm. long: sepals ovate or triangular-ovate, barely 1 mm. long, acute: corolla white, 3 mm. wide; lobes elliptic: capsule 2.5–3 mm. in diameter.—(WATER-PIMPERNEL. BROOK-WEED.) — Wet

soil, swamps, and streams, various provinces, Fla. to Tex., Calif., B. C., Ont., and Newf.—(*W. I., Mex., C. A., S. A.*)—Spr.–sum.

9. **SAMODIA** Baudo. Caulescent herbs, of low grounds. Leaves alternate: blades entire. Flowers in simple or branched long-peduncled racemes. Calyx perigynous: lobes 5. Corolla white or pink, perigynous, without staminodia: lobes 5. Stamens 5: filaments adnate to above the middle of the relatively long corolla-tube. Ovary and capsules ½ inferior.—About 6 species, widely distributed.

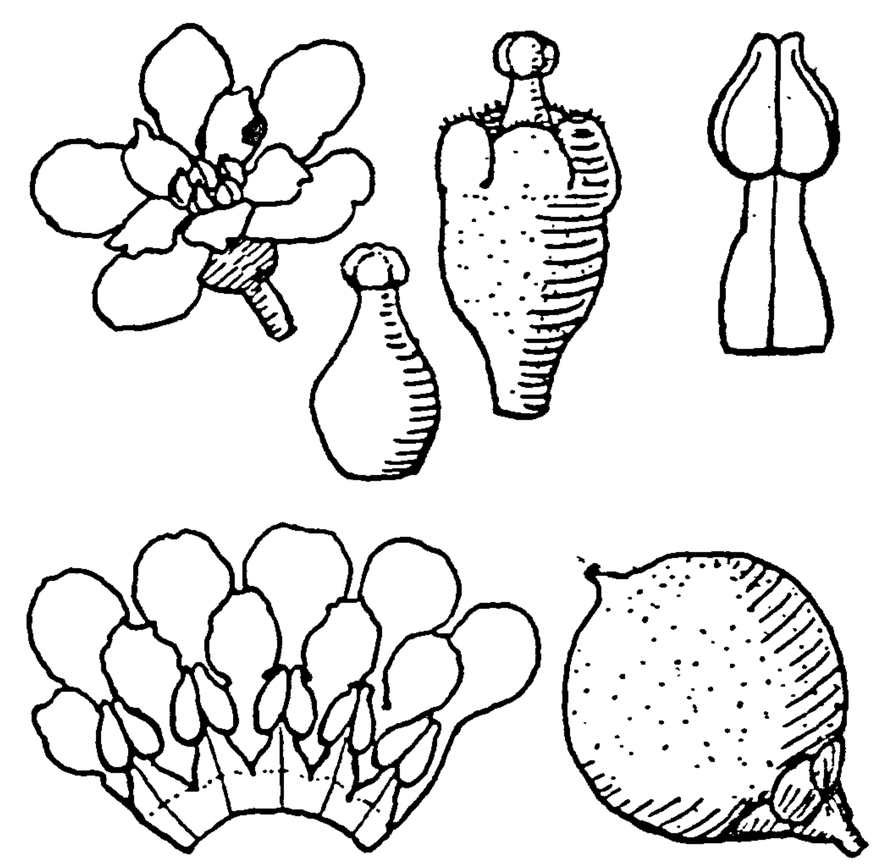


1. S. ebracteata (H.B.K.) Baudo. Plant 1–3 dm. tall: leaf-blades spatulate or obovate, 3–10 cm. long, obtuse or apiculate: corolla 6–7 mm. wide; lobes more or less retuse at the apex. [*Samolus ebracteatus* H.B.K.]—Low pinelands, swamps, prairies and edges of salt marshes, Coastal Plain, Fla. to Texas.—(*W. I., Mex.*)

Family 3. **THEOPHRASTACEAE** — Joe-wood Family

Shrubs or trees. Leaves opposite, persistent: blades leathery, entire. Flowers perfect, in racemes, corymbs, or panicles. Calyx of 5 imbricate sepals. Corolla campanulate or rotate-salverform, of 5 partly united petals. Androecium of 5 stamens partly adnate to the corolla-tube, and 5 staminodia. Gynoecium of 5 united carpels. Fruit a drupe-like berry.—Five genera and about 50 species, of tropical distribution.

1. **JACQUINIA** L. Leaves usually numerous: blades entire, thick and very brittle. Flowers erect. Calyx persistent. Corolla deciduous. Anthers extrorse. Staminodia very broad. Berry erect.—About 25 species, tropical American.



1. J. keyensis Mez. Shrub, or tree becoming 5 m. tall, the bark pale, the twigs very brittle: leaf-blades cuneate-spatulate or elliptic-obovate, 1–5 cm. long, shining: calyx-lobes 2–3 mm. long, orbicular-ovate: corolla straw-colored; lobes longer than the tube: staminodia elliptic, erose: berry subglobose, 8–10 mm. in diameter.—(Joe-wood. Cudjoe-wood.)—Hammocks along the coast, S pen. Fla., Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—All year.—The wood is brown, hard, and very close-grained. The flowers are very fragrant.

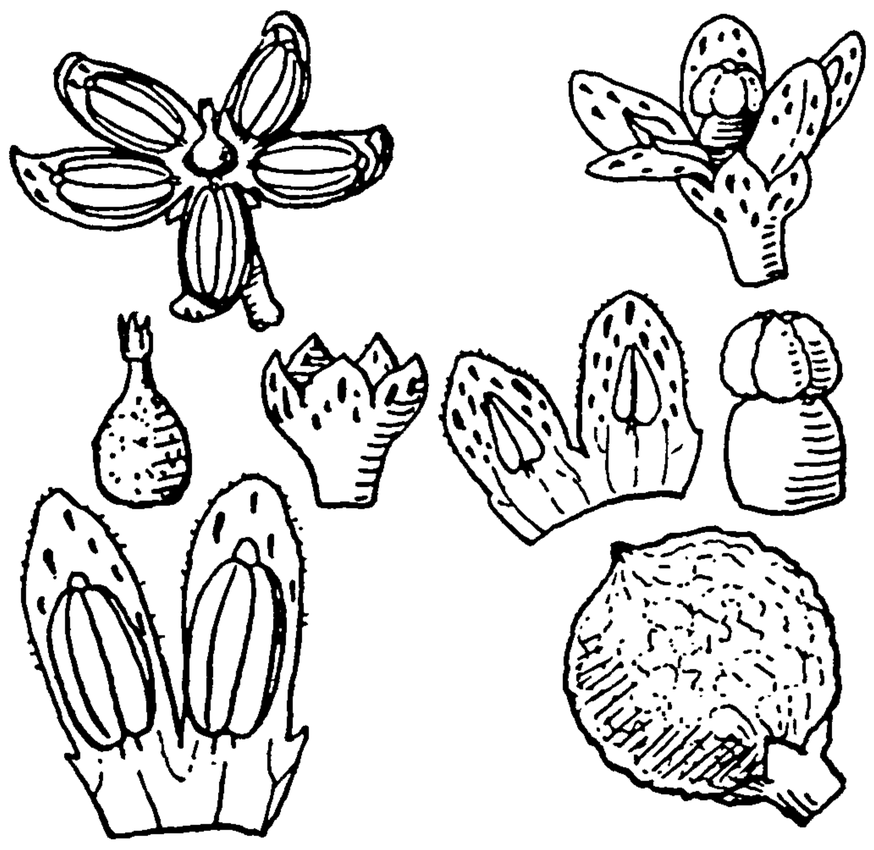
Family 4. **ARDISIACEAE** — Myrsine Family

Shrubs or trees. Leaves mostly alternate, ours persistent: blades leathery, entire. Flowers perfect or polygamo-dioecious, in racemes, corymbs, or cymes, sometimes clustered on scaly spurs. Calyx of usually

4–6 sepals. Corolla of usually 4–6 partly united petals, short-salverform or rotate, often streaked or dotted. Androecium of mostly 4–6 stamens, partly adnate to the corolla-tube. Gynoecium of mostly 4–6 united carpels. Fruit a drupe-like berry.—Twenty genera and 450 species, mostly of tropical distribution.

Flowers on scattered spurs: corolla-lobes not reflexed: stigma lobed. 1. RAPANEA.
Flowers in terminal panicles: corolla-lobes reflexed: stigma entire. 2. ICACOREA.

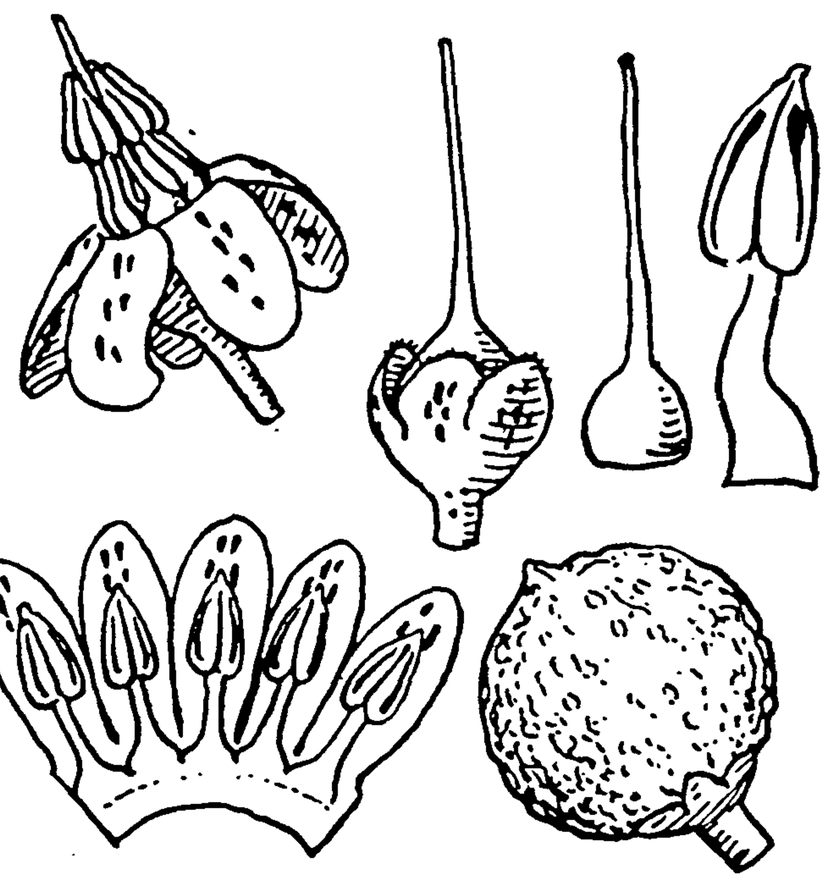
1. **RAPANEA** Aubl. Shrubs or small trees. Flowers inconspicuous, clustered on scaly spurs, stout-pedicelled. Corolla white or nearly so: lobes ascending or spreading. Stamens with ascending or spreading anthers. Style very short: stigma lobed.—More than 80 species, mostly tropical.



1. R. guayanensis Aubl. Shrub or small tree, with grayish bark: leaves mostly near the ends of the branchlets: blades obovate-elliptic or nearly elliptic, 4–10 cm. long: flower-clusters scattered along the branchlets: sepals broadly ovate: corolla-lobes elliptic, unequal: berry about 4 mm. in diameter. [*Myrsine Rapanea* R. & S.]—(MYRSINE.)—Coastal hammocks, pen. Fla., hammock islands in the Everglades, and Everglade Keys, and Florida Keys.—(*W. I., C. A., S. A.*)—All year.

Ardisia polycephala Wall., native of the East Indies, is an evergreen shrub up to six or eight feet tall, with oblanceolate spatulate or somewhat elliptic coriaceous leaf-blades: flowers in axillary cluster-like cymes: corolla white or pinkish, with ovate or elliptic-ovate pointed lobes: stamens erect, yellowish: berry depressed-globose, about 1 cm. in diameter, purple-black or almost black, shining.—Hammocks and old homesteads, pen. Fla.—*Ardisia* differs from *Rapanea* in the contorted corolla-lobes and the slender-tipped anthers.

2. **ICACOREA** Aubl. Shrubs or trees. Flowers conspicuous, in panicles, cymes, or clusters, slender-pedicelled. Corolla white or pink, and often purple-streaked: lobes recurved. Stamens with converging anthers. Style elongate: stigma minute, entire.—More than 200 species, of tropical and subtropical regions.



I. paniculata (Nutt.) Sudw. Shrub or small tree, with white or whitish bark: leaves scattered; blades oblanceolate to elliptic, 4–18 cm. long: panicles terminal: calyx-lobes ovate to obovate: corolla-lobes elliptic: berry 7–8 mm. in diameter. [*Ardisia Pickeringia* T. & G.]—(MARLBERRY. CHERRY.)—Coastal hammocks, pen. Fla., pinelands, and hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I., Mex.*)—All year.

Order **EBENALES**—Ebenal Order

Shrubs or trees. Leaves alternate, opposite, or whorled: blades simple. Flowers perfect, monoecious, or dioecious. Calyx of 3–12 partly united sepals. Corolla of 3–12 partly united petals. Androecium of as many stamens as there are corolla-lobes or twice as many or more, sometimes accompanied by staminodia. Gynoecium of 3–several united carpels. Fruit capsular or baccate.

Styles or stigmas distinct: flowers mostly monoecious or dioecious.	Fam. 1. Ebenaceae.
Styles and stigmas united: flowers mostly perfect.	
Stamens as many as the corolla-lobes, at least in our representatives.	Fam. 2. Sapotaceae.
Stamens twice as many as the corolla-lobes or more.	
Stamens in several series.	Fam. 3. Symplocaceae.
Stamens in 1 series.	Fam. 4. Styracaceae.

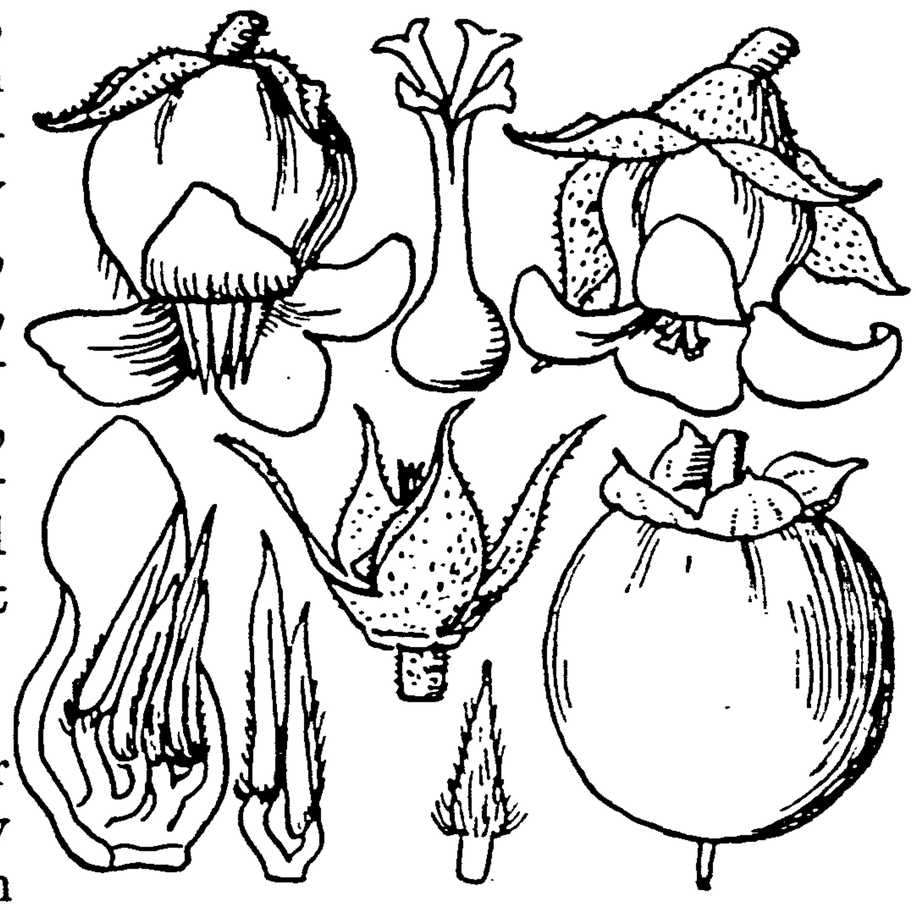
Family 1. **EBENACEAE** — Ebony Family

Shrubs or trees. Leaves mostly alternate: blades entire. Flowers solitary or in cymes. Calyx of 3–7 partly united sepals, persistent, accrescent. Corolla of 3–7 partially united petals, often urceolate. Androecium of 3 or 4 times as many stamens as there are corolla-lobes. Gynoecium of 3–several united carpels. Fruit a berry or sometimes capsular.—Six genera and about 275 species, mostly of tropical regions.

1. DIOSPYROS L. Shrubs or trees. Leaves scattered: blades entire. Calyx 3–7 lobed. Corolla urceolate, white. Stamens with pubescent filaments: anthers opening lengthwise. Berry spheroidal or elongate. Seeds oblique. —About 160 species, mostly Asiatic.—Persimmons. Date-plums. Simmons. Possumwoods.—Spr.

Larger anthers slender-subulate, 6–7 mm. long: seeds much longer than wide.	1. *D. virginiana.*
Larger anthers stout-subulate, 4–5 mm. long: seeds slightly longer than wide.	2. *D. Mosieri.*

1. D. virginiana L. Tree becoming 35 m. tall, with dark furrowed bark, or sometimes a shrub: leaf-blades ovate, oval, or elliptic, 8–20 cm. long, acute or acuminate, glabrous or sometimes pubescent, especially beneath: staminate flower with lanceolate or triangular-lanceolate calyx-lobes and a corolla 9–11 mm. long: berry subglobose, varying to depressed or elongate, 3–4 cm. in diameter, thin-skinned: seed flat, elliptic.—Woods, fields, road-sides, oak-ridges, and hammocks, various provinces, Fla. to Tex., Ia., and Conn.—The dark-brown or nearly black heart-wood is used for various tools and utensils. The fruit is edible when ripe.



2. D. Mosieri Small. Tree nearly similar to that of *D. virginiana,* but usually smaller, or a shrub: staminate flower with ovate or deltoid-ovate calyx-lobes and a corolla 6–8 mm. long: berry depressed-

globose, 2.5–3.5 cm. in diameter, thick-skinned: seed turgid, oval and somewhat rhombic.—Hammocks and pinelands, pen. Fla.

Family 2. **SAPOTACEAE** — Sapodilla Family

Shrubs or trees, with milky sap, sometimes thorny. Leaves mostly alternate: blades entire. Flowers perfect or rarely polygamous, clustered. Calyx of 4–12 slightly united sepals. Corolla of 4–12 partially united petals, with or without appendages at the sinuses of the lobes. Androecium of usually as many stamens as there are corolla-lobes, commonly accompanied by staminodia. Gynoecium of several united carpels. Fruit a several-celled berry, or by suppression 1-celled.—About 35 genera and 425 species, most abundant in the tropics.

Corolla-lobes without dorsal appendages.	
Staminodia wanting.	Tribe I. Chrysophylleae.
Staminodia present.	Tribe II. Sideroxyleae.
Corolla-lobes with dorsal appendages.	Tribe III. Mimusopeae.

I. Chrysophylleae

Shrubs or trees with leaves green above and copiously pubescent with golden, copper-colored or silvery hairs beneath.	1. Chrysophyllum.

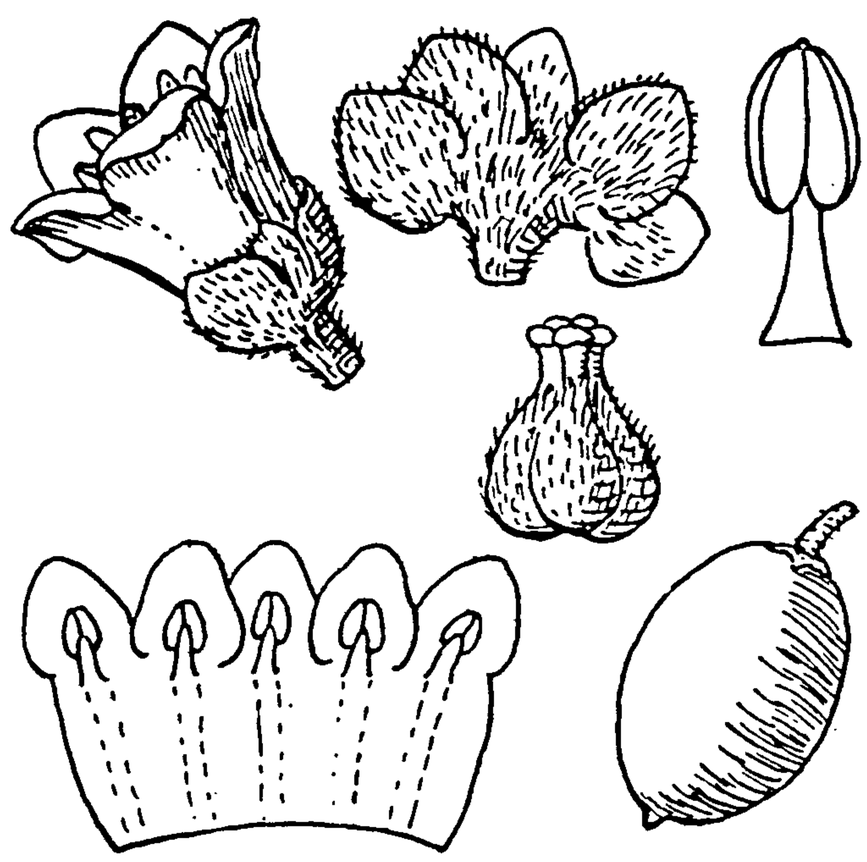
II. Sideroxyleae

Ovary 10–12-celled: staminodia broad, petal-like.	2. Sapota.
Ovary 2–5-celled.	
Corolla-lobes entire: staminodia scale-like or filament-like.	
Seeds with endosperm: staminodia scale-like.	3. Sideroxylon.
Seeds without endosperm: staminodia filament-like.	4. Lucuma.
Corolla-lobes with a large median lobe and 2 smaller lateral lobes: staminodia petal-like.	
Ovary glabrous: endosperm copious.	5. Dipholis.
Ovary pubescent: endosperm wanting or scant.	6. Bumelia.

III. Mimusopeae

Shrubs or trees with broad many-veined leaf-blades: the young fruits conspicuously tipped with the style.	7. Mimusops.

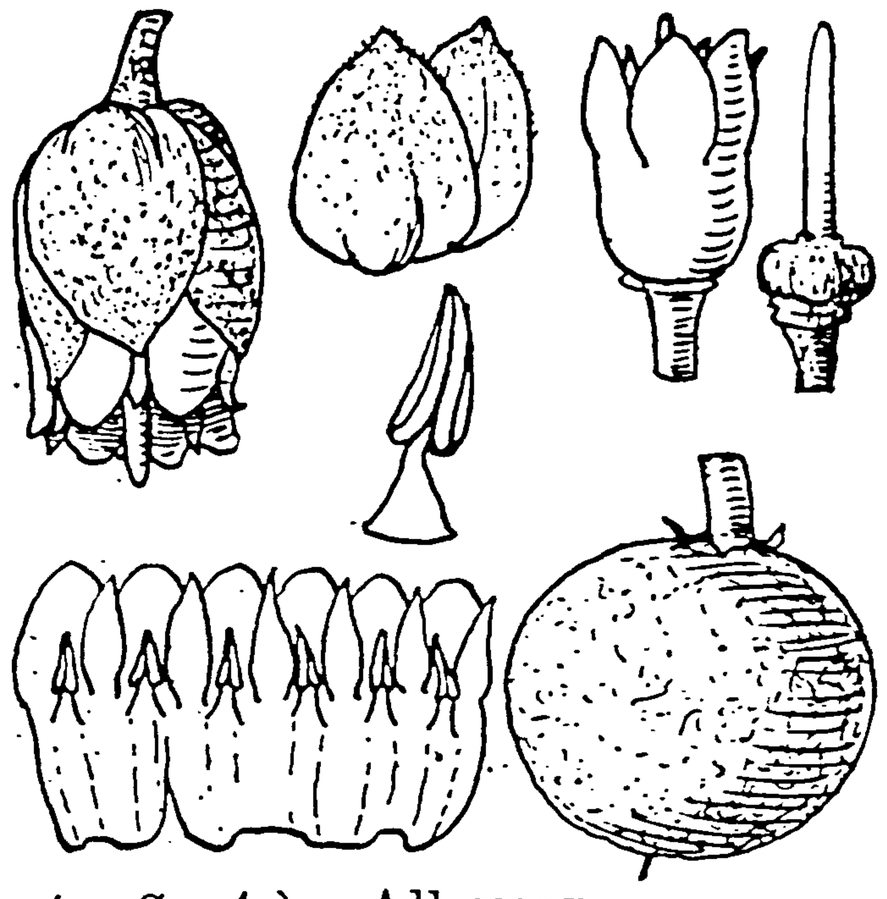
1. CHRYSOPHYLLUM L. Shrubs or trees. Leaf-blades commonly lustrous-pubescent beneath. Calyx-lobes mostly 5. Corolla, like the calyx, often pubescent: lobes mostly 5, entire. Anthers emarginate and apiculate. Style wanting: stigma lobed.—More than 60 species, mostly tropical American.



1. C. olivaeforme L. Evergreen shrub, or tree becoming 10 m. tall, the twigs pubescent: leaf-blades coriaceous, elliptic or oval, 3–10 cm. long, shining above, lustrous-pubescent beneath: calyx-lobes suborbicular, 1.5 mm. long: corolla white, about 5 mm. wide; lobes suborbicular: berry oval, about 2 cm. long, dark-purple. [*C. monopyrenum* Sw.]—(Satinleaf.)—Hammocks, S pen. Fla.; pinelands and hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—All year.—The light-brown, hard, and close-grained heart-wood is used locally in cabinet-work.

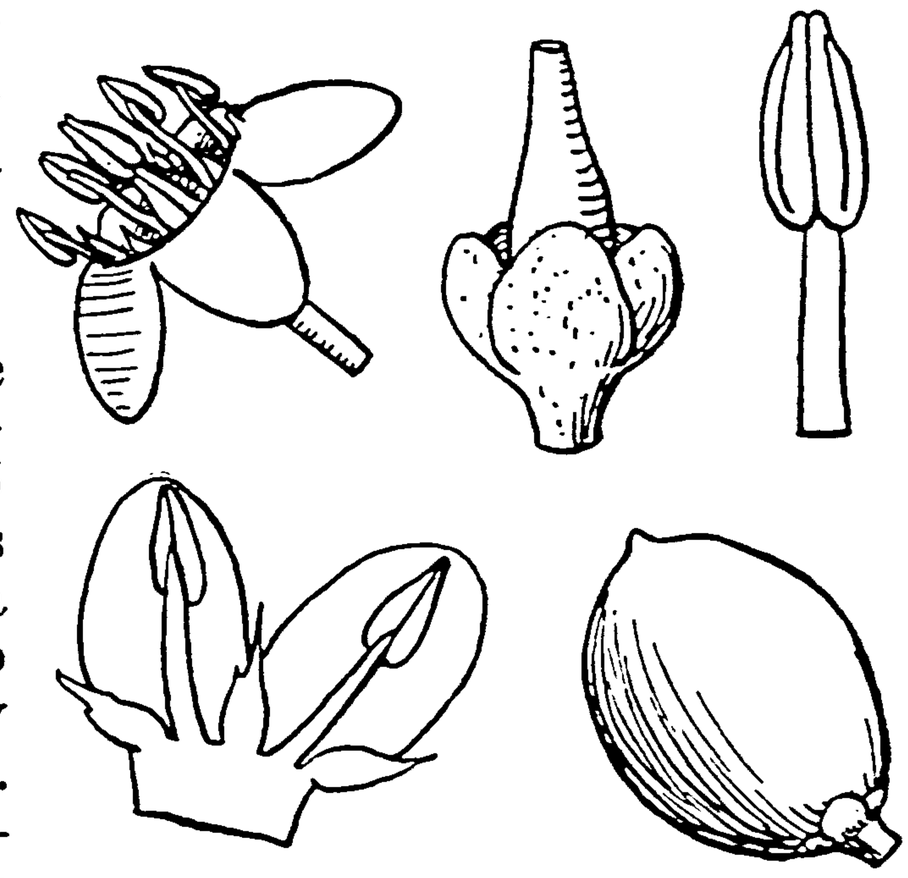
2. SAPOTA Mill. Trees. Leaf-blades glabrous. Calyx-lobes 6, or rarely 5, pubescent. Corolla glabrous: lobes 6, or rarely 5, toothed. Anthers blunt.

Staminodia nearly as long as the corolla-lobes. Style elongate: stigma minute. Berry spheroidal, rough.—One species.



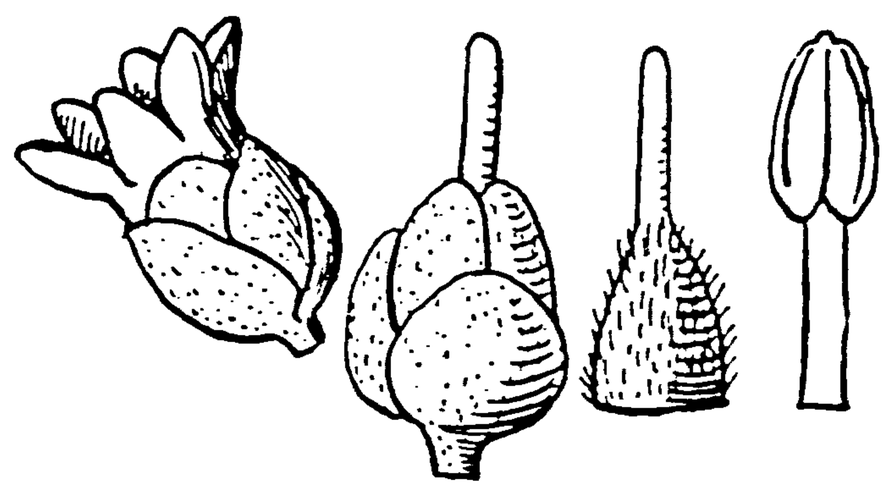
1. S. Achras Mill. Tree with rusty-tomentose twigs: leaves and flowers approximately at the ends of the branchlets; blades elliptic, varying to broadest above or below the middle, 5–12 cm. long: pedicels rusty-tomentose, about as long as the petioles: calyx-lobes 8–10 mm. long: corolla white, 8–10 mm. long; lobes about ½ as long as the tube: berry 4–8 cm. in diameter.—(SAPODILLA. DILLY.)—Hammocks, old fields, and cult. grounds, Everglade Keys, Fla. and Florida Keys.—Nat. of W. I., and cult.—(*Mex., C. A., S. A.*)—All year.

3. SIDEROXYLON [Dill.] L. Shrubs or trees. Leaf-blades not lustrous-pubescent. Calyx-lobes 5 or 6. Corolla glabrous: lobes 5 or 6, entire. Anthers notched. Staminodia much shorter than the corolla-lobes. Style columnar: stigma truncate.—About 75 species, of warm and tropical regions.

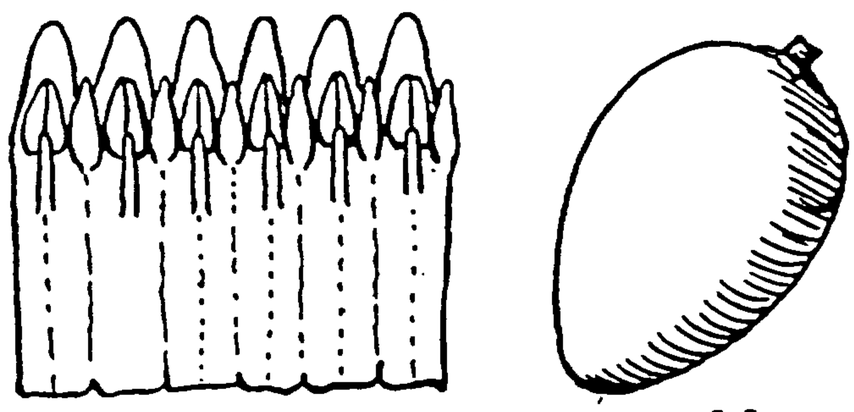


1. S. foetidissimum Jacq. Evergreen tree becoming 25 m. tall: leaf-blades thin-coriaceous, elliptic to oval or rarely ovate, 4–15 cm. long, glabrous at maturity: calyx-lobes suborbicular, about 2 mm. long: corolla light-yellow, 6–7 mm. wide; lobes elliptic to ovate-elliptic: staminodia lanceolate: berry oval or globose, 2–2.5 cm. long, yellow. [*S. mastichodendron* Jacq.]—(MASTIC. WILD-OLIVE.)—Hammocks, S pen. Fla. and the Keys.—(*W. I.*)—Spr.–sum. or all year.—The orange-colored, heavy, and strong heart-wood is used locally for cabinet-work and boat-building.

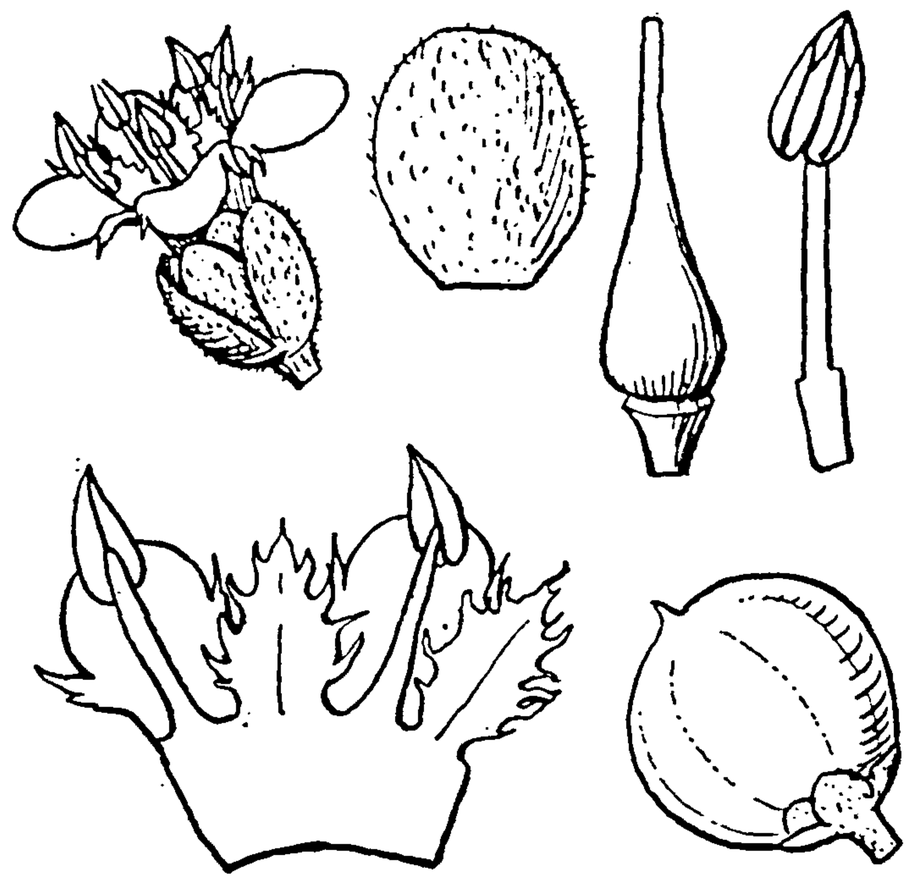
4. LUCUMA Juss. Trees. Leaf-blades more or less elongate, usually broadened upward. Calyx-lobes 5, in 1 or 2 series. Corolla white or pale: lobes 5, entire or nearly so. Staminodia slender, shorter than the corolla-lobes. Ovary 5-celled, or sometimes 4–6-celled: style columnar: stigma slightly dilated. Berry globular, or slightly elongate, smooth.—Fifty species or more, mostly of tropical America.



1. L. nervosa A. DC. Leaf-blades elliptic, 10–20 cm. long, acute or acutish: calyx-lobes 5, the inner ones rounded at the apex: corolla 7–9 mm. long; lobes ovate: staminodia subulate: berry globose-ovoid, 5–7 cm. long, smooth, usually 2- or 3-seeded.—(EGG-FRUIT.)—Hammocks, Florida Keys. Nat. of S. A. and cult.—(*W. I.*)—The name egg-fruit refers to the resemblance of the flesh of the fruit to the yolk of a hard-boiled egg.



5. **DIPHOLIS** A. DC. Shrubs or small trees. Leaf-blades mostly glabrous. Calyx-lobes 5, pubescent. Corolla-lobes 5, each 3-lobed, shorter than the tube. Staminodia petaloid. Endosperm copious.—About 10 species, West Indian.



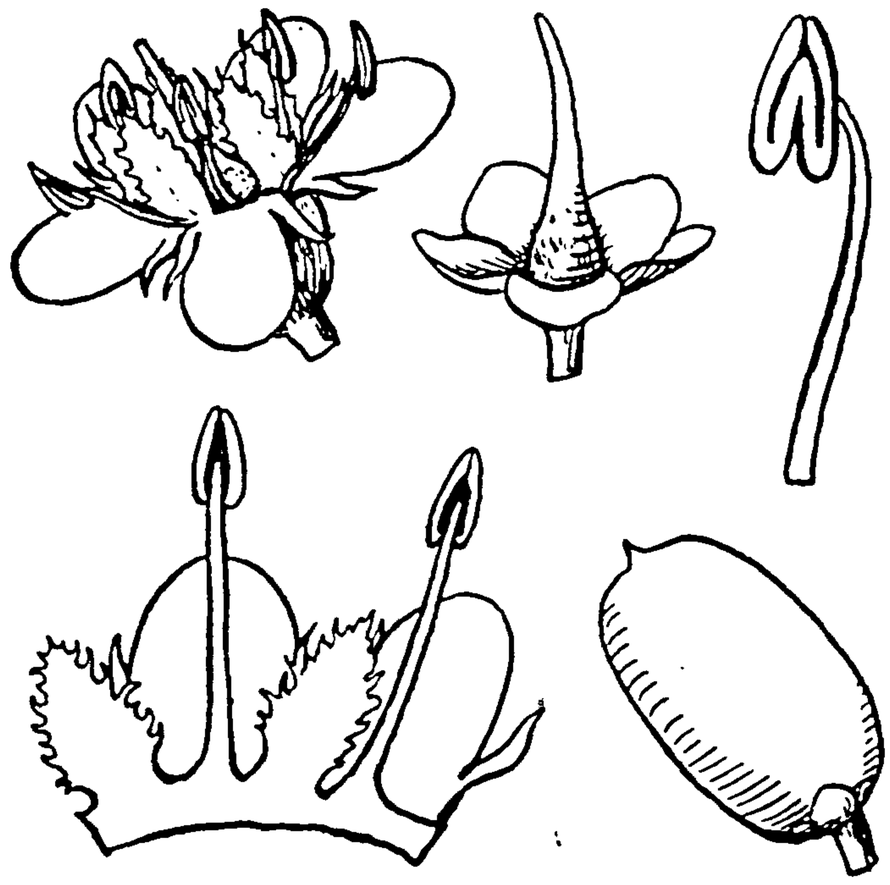
1. D. salicifolia (L.) A. DC. Evergreen shrub, or tree becoming 16 m. tall: leaf-blades elliptic or elliptic-oblanceolate, 5–12 cm. long: calyx-lobes ovate to elliptic, 1.5 mm. long: corolla white, 4 mm. wide; lobes elliptic or oval: staminodia ovate to ovate-lanceolate, laciniate-toothed: berry oval or subglobose, about 8 mm. in diameter, black. —(BUSTIC. CASSADA.) —Hammocks and pinelands, Everglade Keys, Fla., and Florida Keys.—(*W. I., Mex.*)—All year.—Flowers very fragrant.—The red or dark-brown, very heavy heart-wood is used in cabinet-work.

6. **BUMELIA** Sw. Shrubs or trees, usually with thorny branches. Leaf-blades often pubescent beneath. Calyx-lobes 5. Corolla white: lobes 5, each 3-lobed, the middle lobe suborbicular, longer than the tube. Staminodia petaloid. Endosperm wanting or very scant.—About 35 species, American.—BUCKTHORNS.

Leaf-blades glabrous, or merely with scattered hairs or slight cobwebby beneath.
- Fruit ellipsoid-cylindric. — 1. *B. angustifolia.*
- Fruit subglobose or oval.
  - Leaf-blades of an obovate or spatulate type, mainly broadest above the middle.
    - Twigs copiously pubescent with deep-red hairs. — 2. *B. rufotomentosa.*
    - Twigs glabrous or soon becoming so.
      - Fruit less than 8 mm. long.
        - Corolla-lobes about 1.5 mm. long: leaf-blades blunt: fruit 5 mm. long. — 3. *B. microcarpa.*
        - Corolla-lobes about 2 mm. long: leaf-blades retuse: fruit 6–7 mm. long. — 4. *B. reclinata.*
      - Fruit over 9 mm. long. — 5. *B. megacocca.*
  - Leaf-blades of an elliptic type broadest at the middle. — 6. *B. lycioides.*

Leaf-blades manifestly or copiously pubescent beneath.
- Pubescence woolly, not at all lustrous. — 7. *B. lanuginosa.*
- Pubescence lustrous, white, becoming tawny or coppery.
  - Pedicel longer than the berry, slender: calyx-lobes of a suborbicular type. — 8. *B. tenax.*
  - Pedicel shorter than the berry, stout: calyx-lobes of an ovate type. — 9. *B. lacuum.*

1. B. angustifolia Nutt. Evergreen shrub, or tree becoming 8 m. tall, the twigs glabrous: leaves relatively few and not crowded; blades oblanceolate to oblanceolate-spatulate, 2–4 cm. long, smooth and glabrous: calyx-lobes ovate, 2 mm. long: corolla about 4 mm. wide; lateral divisions of the lobes narrowly lanceolate, irregularly toothed: staminodia 2.5 mm. long, lacerate: berry 17–20 mm. long.—(SAFFRON-PLUM. ANTS-WOOD. DOWNWARD-PLUM.)—Coastal hammocks, S pen. Fla., hammocks, Everglade Keys, Fla., and Florida Keys.—(*W. I.*)—All year.—The light-brown, hard, heart-wood is used for cabinet-work. The flowers are fragrant.



2. B. rufotomentosa Small. Evergreen shrub, the twigs red-tomentose: leaf-blades

obovate or oval, 1.5–2 cm. long, reticulate and sparingly pubescent beneath with red hairs: calyx-lobes suborbicular, nearly 1.5 mm. long: corolla about 3 mm. wide: lateral divisions of the lobes ovate or ovate-lanceolate, acutish; staminodia slightly over 1 mm. long: berry about 5 mm. in diameter.—Pinelands, pen. Fla.—Spr.–sum.

3. B. microcarpa Small. Evergreen shrub, the twigs becoming glabrous: leaf-blades spatulate, oblanceolate, or rarely oblong-obovate, 1–3.5 cm. long, cobwebby pubescent beneath: calyx-lobes suborbicular, about 1.5 mm. long: corolla about 2.5 mm. wide; lateral divisions of the lobes ovate-lanceolate, almost 1 mm. long: staminodia 1.5 mm. long, erose: berry subglobose, 5 mm. in diameter.—Sandy woods, pen. Fla.—Spr.–sum.

4. B. reclinata Vent. Evergreen erect, diffuse, or depressed, shrub, the twigs glabrous: leaf-blades thinnish, oblanceolate, varying to spatulate, obovate, or ovate, 2–5 cm. long, somewhat reticulate and glabrous beneath: calyx-lobes broadly ovate or orbicular-ovate, 1.8 mm. long: corolla about 4 mm. wide; lateral divisions of the lobes broadly lanceolate, fully 1.5 cm. long: staminodia ovate, 2 mm. long, erose: berry oval, 6–7 mm. long.—Pinelands, hammocks, and sandhills, Coastal Plain, Fla. to La. and Ga.—Spr.–sum. or all year S.

5. B. megacocca Small. Evergreen shrub, the twigs glabrous: leaf-blades thick, obovate to elliptic-oblanceolate, 1–3.5 cm. long, reticulate and glabrous beneath: flowers not seen: berry globose to broadly oval, 11–13 mm. long.—Sandy woods, pen. Fla.—Spr.–sum.

6. B. lycioides (L.) Gaertn. Deciduous-leaved or partly evergreen shrub or small tree, the twigs glabrous: leaf-blades elliptic or rarely oblanceolate, 4–12 cm. long, dull and prominently reticulate on both sides: calyx-lobes oval or orbicular-ovate, 2 mm. long: corolla about 5 mm. wide; lateral divisions of the lobes lanceolate or broadly lanceolate, 1.5 mm. long, entire: staminodia ovate, 2–2.5 mm. long, entire: berry oval, fully 10 mm. long.—(BUCKTHORN. MOCK-ORANGE. IRONWOOD. SHITTIMWOOD.)—Rich open woods and river-banks, various provinces, rarely Blue Ridge, Fla. to Tex., Ark., Ill., and S. Va.—Spr.—The yellow or light-brown heart-wood is close-grained, heavy, and hard.

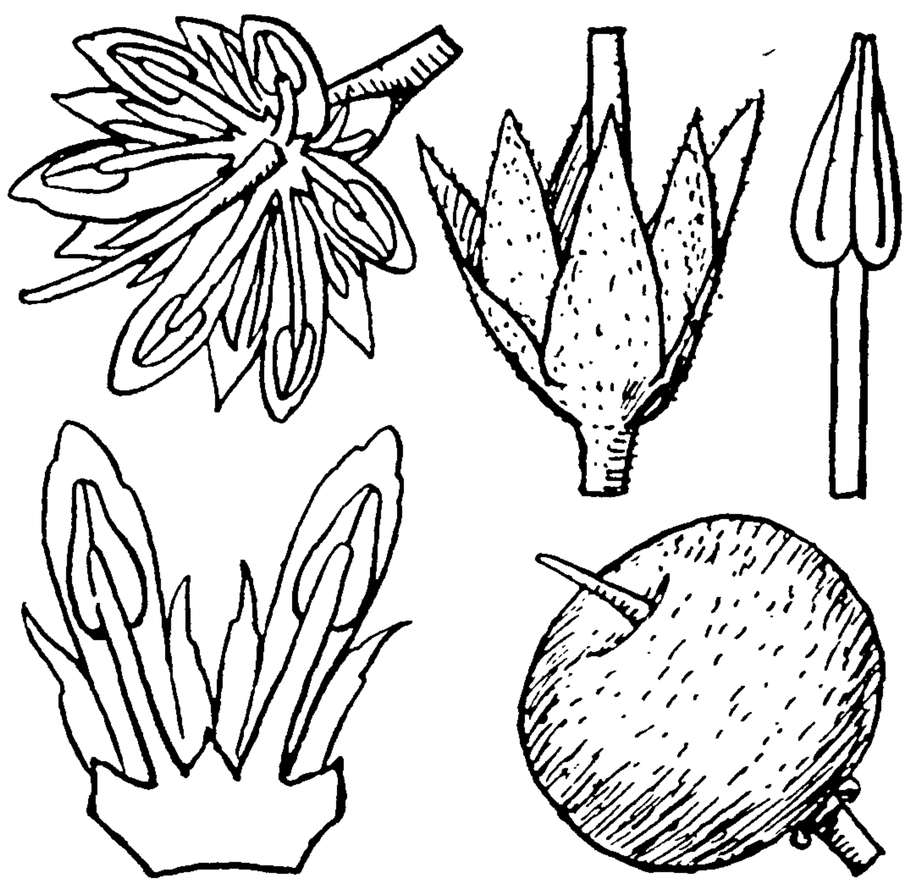
7. B. lanuginosa (Michx.) Pers. Evergreen (or deciduous-leaved northward) shrub, or tree becoming 20 m. tall, the twigs dull-tomentose: leaf-blades elliptic-oblanceolate, elliptic-obovate, or elliptic, 3–8 cm. long, dull-tomentose beneath: calyx-lobes, suborbicular or orbicular-ovate, about 3 mm. long: corolla about 5 mm. wide;, lateral divisions of the lobes lanceolate, fully 1.5 mm. long: undulate: staminodia ovate, 2 mm. long, acute or acutish: berry oval or obovoid-ellipsoid, 10–15 mm. long.—(GUM-ELASTIC. BLACK-HAW. SHITTIMWOOD.)—Rocky, gravelly, and sandy woods, Coastal Plain and occasionally other provinces, Fla., to Tex., Kans., Ill., and Ga.—Sum.—The yellow or light-brown heart-wood is close-grained, but rather soft.

8. B. tenax (L.) Willd. Evergreen (or deciduous-leaved northward) shrub, or tree becoming 9 m. tall, the twigs lustrous-silky, the hairs white, becoming tawny or copper-colored: leaf-blades oblanceolate, obovate-spatulate, or obovate, 2–7 cm. long, lustrous-silky beneath: calyx-lobes suborbicular to orbicular-ovate, about 2 mm. long at maturity: corolla about 5 mm. wide; lateral divisions of the lobes ovate or ovate, fully 1.5 mm. long, undulate: staminodia ovate-deltoid, 2 mm. long, obtuse: berry obovoid or ellipsoid-obovoid, 11–14 mm. long.—(TOUGH-BUCKTHORN. IRONWOOD. BLACK-HAW.)—Sandy. woods and hammocks, Coastal Plain, Fla. to N. C.—Spr.—The light-brown and white-streaked heart-wood is hard and close-grained.

9. B. lacuum Small. Evergreen shrub, 0.5–3 m. tall, the twigs copper-colored or dark-tawny: leaf-blades cuneate to spatulate, 1–2.5 cm. long, or larger on

shoots, lustrous-silky beneath, often becoming brown: calyx-lobes elliptic-ovate to ovate, about 2 mm. long at maturity: corolla about 4 mm. wide; lateral divisions of each lobe lanceolate, about 1.5 mm. long, toothed at the apex: staminodia ovate, about 1.5 mm. long, obtuse: berry oval, 8–10 mm. long.—(SANDHILL-BUCKTHORN.)—Sandhills, usually in scrub, C. pen. Fla.—Spr.

7. MIMUSOPS L. Shrubs or trees. Leaf-blades leathery, finely many-veined. Calyx-lobes 6 or 8, the outer ones valvate. Corolla with dorsal appendages; lobes 6 or 8, each with 2 very small lateral lobes. Staminodia petaloid.—About 40 species, mostly of tropical regions.



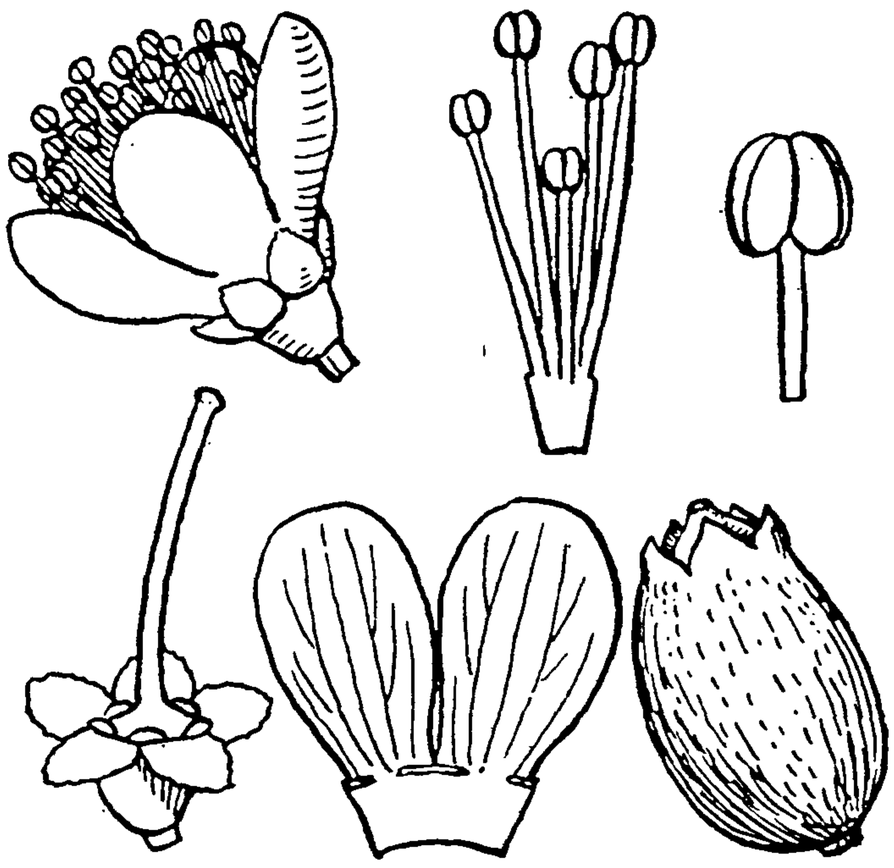
1. M. emarginata (L.) Britton. Evergreen shrub or small tree: leaves clustered at the ends of the branchlets; blades elliptic, 3–10 cm. long: calyx, like the pedicels, red-tomentose; lobes lanceolate to ovate-lanceolate: corolla light-yellow, 1.5–2 cm. wide: staminodia triangular: berry spheroidal, nearly 3 cm. thick. [*M. Sieberi* A. DC.]—(WILD-DILLY. WILD-SAPODILLA.) — Hammocks, Florida Keys.—(*W. I.*)—Wint.-spr. The dark-brown heart-wood is close-grained.

FAMILY 3. SYMPLOCACEAE—SWEETLEAF FAMILY

Shrubs or trees, the hairs, when present, simple. Leaves alternate: blades usually leathery, entire or toothed. Flowers polygamo-dioecious or perfect, in close or open clusters. Calyx of 5 partly united sepals. Corolla of 5 more or less united petals. Androecium of numerous stamens in several series, partly adnate to the corolla-tube. Gynoecium of 2–5 carpels, the ovary superior. Fruit baccate or drupaceous.—Consists of the following genus and 200 species, most abundant in South America.

1. SYMPLOCOS Jacq. Leaves often persistent: blades thick. Inflorescence congested or open. Calyx often persistent. Corolla deciduous, yellow or yellowish. Stamens conspicuous. Style columnar. Fruits, often crowned with the calyx, drupe-like or nut-like.

1. S. tinctoria (L.) L'Her. Evergreen or partly evergreen shrub or small tree: leaf-blades elliptic or elliptic-oblanceolate, 4–15 cm. long, undulate or shallowly toothed, tomentose beneath: flowers densely clustered: calyx 2–2.5 mm. long; lobes shorter than the tube: corolla yellowish; lobes obovate or obovate-spatulate, 6–8 mm. long: stamens exserted: drupe 10–14 mm. long.—(SWEETLEAF. HORSE-SUGAR. WILD-LAUREL. YELLOW-WOOD.)—Hammocks, bluffs, cliffs, and rock outcrops, Coastal Plain to Blue Ridge, Fla. to La., Ark., and Del.—Spr.—The brown or red heart-wood is close-grained, but light and soft. The sweet leaves are eaten by horses and cattle, and, like the bark, yield a yellow dye.—Further study may show the coastal and mountain plants to represent two species instead of one.



Family 4. **STYRACACEAE** — Styrax Family

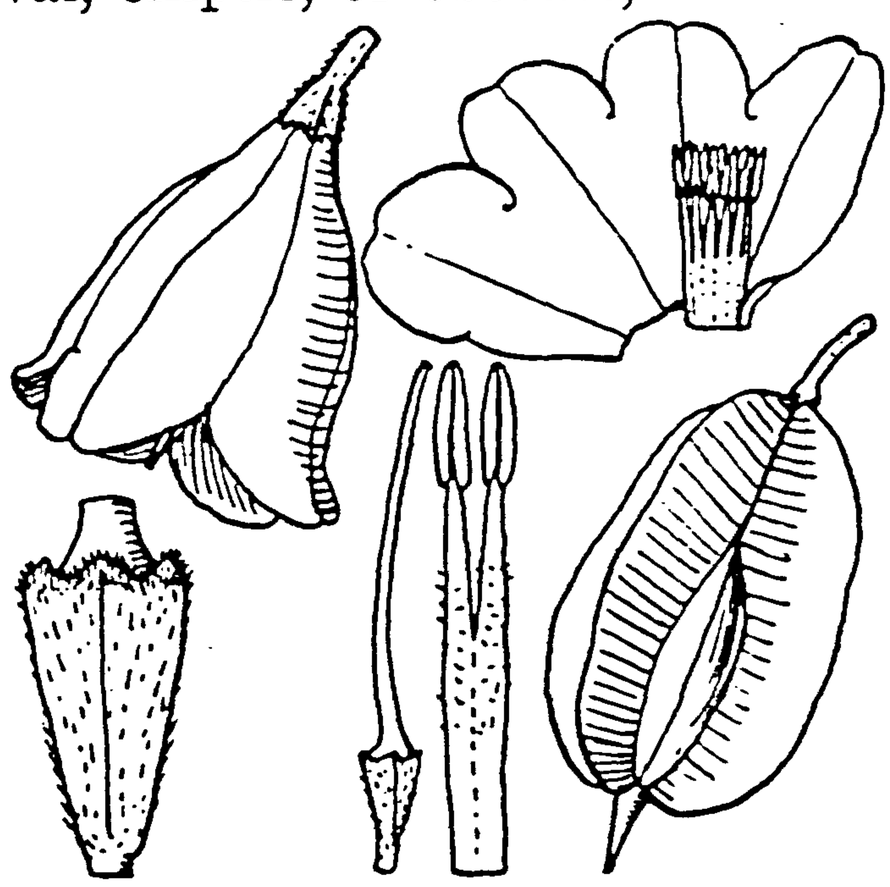
Shrubs or trees, the hairs when present branched or scurfy. Leaves alternate: blades entire or shallowly toothed. Flowers perfect, in racemes, panicles, cymes, or clusters. Calyx of 5, or 4–8, partly united sepals. Corolla of 5, or 4–8, distinct or partly united petals. Androecium of 8–16 stamens in one series, partly adnate to the corolla. Gynoecium of 2–5 carpels, the ovary sometimes inferior. Fruit drupaceous or capsular.—Seven genera and about 75 species, mostly of tropical regions, but most abundant in South America.

Ovary inferior: fruits nut-like, elongate, winged. 1. Halesia.
Ovary superior: fruits drupaceous, subglobose. 2. Styrax.

1. HALESIA Ellis. Shrubs or trees. Leaves with thinnish blades, deciduous. Inflorescence not leafy-bracted. Calyx with relatively large lobes. Corolla white, with nearly erect lobes. Anthers elliptic. Ovules 4 in each cavity, 1 pair ascending, 1 pair drooping. [*Mohrodendron* Britton.]—Three species, as follows.—Spr.—Silverbell-trees. Bell-trees.

Corolla-lobes shorter than the tube: fruit 4-winged.
  Fruit ellipsoid or somewhat obovoid: corolla 1–2.5 cm. long. 1. *H. carolina.*
  Fruit clavate: corolla less than 1 cm. long. 2. *H. parviflora.*
Corolla-lobes longer than the tube: fruit 2-winged. 3. *H. diptera.*

1. H. carolina L. Small tree with a reddish-brown, ridged and scaly bark, or shrub, the winter-buds acute: leaf-blades oval, elliptic, or obovate, 7–15 cm. long, or longer on shoots, serrate: calyx 5–6 mm. long; corolla 15–20 mm. long: filaments and style glabrous: fruit ellipsoid to ellipsoid-obovoid, 3.5–4.5 cm. long, 4-winged, short-beaked. [*H. tetraptera* L. *M. carolinum* Britton]—(Wild-olive tree. Opossum-wood. Rattlebox. Calicowood. Tisswood.)—Woods and stream-banks, various provinces, Fla. to Tex., Ill., and S W Va.—Spr.—The plant of the Blue Ridge and the Appalachian Highlands, with usually larger corollas, has been described as *H. monticola* (Rehder) Sarg.—The light-brown heart-wood is close-grained, but light and soft.



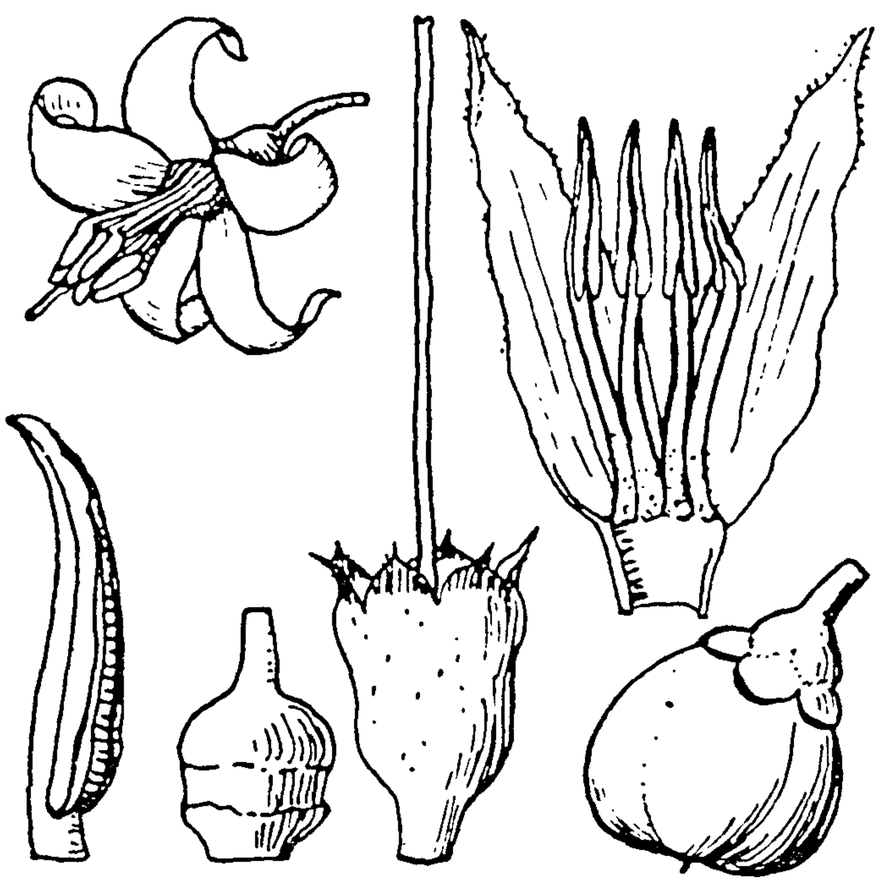
2. H. parviflora Michx. Small tree with dark-brown or nearly black bark, or a shrub, the winter-buds obtuse: leaf-blades elliptic, elliptic-ovate, or slightly obovate, 3–7 cm. long, finely serrate: calyx 2.5–3 mm. long, pubescent: corolla 10–12 mm. long: fruit clavate, mostly 1.5–3 cm. long, narrowly winged. [*M. parviflorum* Britton]—Woods and hillsides, Coastal Plain and adj. provinces, N Fla. to Miss., Okla., and S Ga.—Early spr.

3. H. diptera Ellis. Small tree with brown, fissured and scaly bark, the winter-buds obtuse, or a shrub: leaf-blades oval, elliptic, or obovate, or sometimes ovate, 4–15 cm. long, rather coarsely toothed: calyx 3–4 mm. long, pubescent: corolla about 2.5 cm. long, copiously pubescent without: filaments and style pubescent: fruit narrowly ellipsoid, 4–5 cm. long, 2-winged, scarcely beaked. [*M. dipterum* Britton.]—(Snowdrop-tree. Cow-licks.)—Hammocks and stream-banks, Coastal Plain and adj. provinces, N Fla. to Tex., Ark., and S. C.—Spr.—The wood is similar to that of *H. carolina.*

2. STYRAX [Tourn.] L. Shrubs or trees. Leaves with thickish blades, but deciduous. Inflorescence leafy-bracted. Calyx with minute lobes. Corolla white, with recurved petals or lobes. Anthers linear. Ovules several, ascending. —About 75 species, American and Eurasian.—Spr.—STORAXES.

Corolla-lobes valvate in the bud. 1. *S. americana.*
Corolla-lobes manifestly imbricate or convolute in the bud.
  Bracts of the inflorescence mostly leaf-like: leaf-blades slightly pubescent beneath. 2. *S. pulverulenta.*
  Bracts of the inflorescence only leaf-like at the base of the panicle or raceme: leaf-blades densely pubescent beneath. 3. *S. grandifolia.*

1. S. americana Lam. Shrub with sparingly stellate twigs: leaf-blades oval or elliptic, varying to ovate or obovate, 2–10 cm. long, entire or distinctly and shallowly toothed: pedicels glabrous or nearly so: calyx much shorter than the pedicel: corolla-lobes elliptic or lanceolate-elliptic, acute: drupe 6–8 mm. in diameter. —Swamps and stream-banks, Coastal Plain and adj. provinces, Fla. to La., Ill., and S Va.—The flowers are fragrant.



2. S. pulverulenta Michx. Shrub with densely stellate twigs: leaf-blades ovate, oval, or obovate, 2–8 cm. long, sharply serrate or undulate: pedicels canescent or hoary: calyx about as long as the pedicel: corolla-lobes elliptic or elliptic-lanceolate, rather obtuse: drupe 7–9 mm. in diameter. —Wet pinelands about swamps and streams, Coastal Plain, Fla. to Tex., Ark., and S Va.

3. S. grandifolia Ait. Shrub or small tree, with densely stellate twigs: leaf-blades ovate, oval, or sometimes elliptic, 9–20 cm. long, coarsely toothed or nearly entire: pedicels canescent: corolla-lobes elliptic: drupes 8–10 mm. in diameter.—Woods, sandy river-banks, and hammocks, Coastal Plain and adj. provinces, Fla. to La. and S Va.

ORDER **OLEALES**—OLEAL ORDER

Shrubs, trees, undershrubs, or partially herbaceous plants. Leaves opposite, or rarely alternate or whorled: blades simple or compound. Flowers perfect, polygamous, or dioecious. Calyx of 4 or more partially united sepals, or wanting. Corolla of 2–6 distinct or partially united petals, or wanting. Androecium of 2–4 stamens partially adnate to the corolla when it is present. Gynoecium of 2 united carpels, the ovary superior. Fruit a capsule, a samara, or a berry, usually 1-celled by suppression.

FAMILY 1. **OLEACEAE** — OLIVE FAMILY

Woody or partially woody plants with erect or climbing stems. Leaves predominantly opposite: blades simple and entire or toothed, or pinnately compound.—About 22 genera and 525 species, widely distributed in temperate and tropical regions.

Shrubs or trees: fruits not didymous.
  Fruit dry, an indehiscent or dehiscent capsule.
    Fruit a loculicidal capsule: leaf-blades simple. — Tribe I. SYRINGEAE.
    Fruit indehiscent, a samara: leaf-blades pinnate. — Tribe II. FRAXINEAE.
  Fruit fleshy, a drupe or a berry. — Tribe III. OLEAE.
Woody vines, with compound leaf-blades: fruits didymous. — Tribe IV. JASMINEAE.

I. SYRINGEAE

Shrubs: flowers conspicuous, numerous in ovoid or pyramidal thyrsoid panicles. — 1. SYRINGA.

II. FRAXINEAE

Shrubs or trees: flowers mostly inconspicuous, apetalous, in dense racemes or panicles from the axils of last year's leaves. — 2. FRAXINUS.

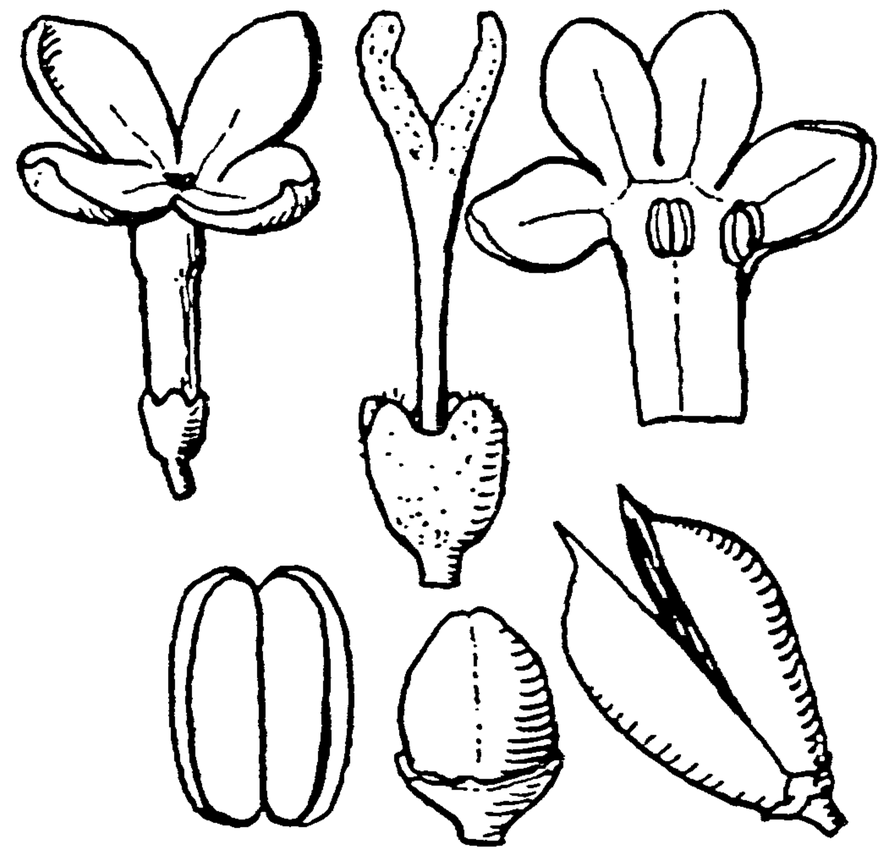
III. OLEAE

Flowers apetalous or sometimes with 1 or 2 small petals, mainly polygamo-dioecious: styles slender. — 3. FORESTIERA.
Flowers with a corolla, perfect or polygamous: styles short or stout.
  Corolla rotate, with elongate strap-like nearly distinct petals: leaves deciduous. — 4. CHIONANTHUS.
  Corolla funnelform or salverform, with short lobes: leaves mostly persistent.
    Corolla funnelform, white; lobes induplicate-valvate. — 5. LIGUSTRUM.
    Corolla salverform, greenish; lobes imbricate. — 6. AMAROLEA.

IV. JASMINEAE

Leaf-blades pinnate, sometimes 1-foliolate: calyx-lobes and corolla-lobes 5 or more. — 7. JASMINUM.

1. SYRINGA L. Shrubs. Leaves opposite: blades broad, entire. Flowers in terminal panicles. Calyx-lobes broad, shorter than the tube. Corolla white or purple: tube longer than the lobes. Stigma 2-lobed. Capsule longer than wide. —Twelve species, Eurasian.



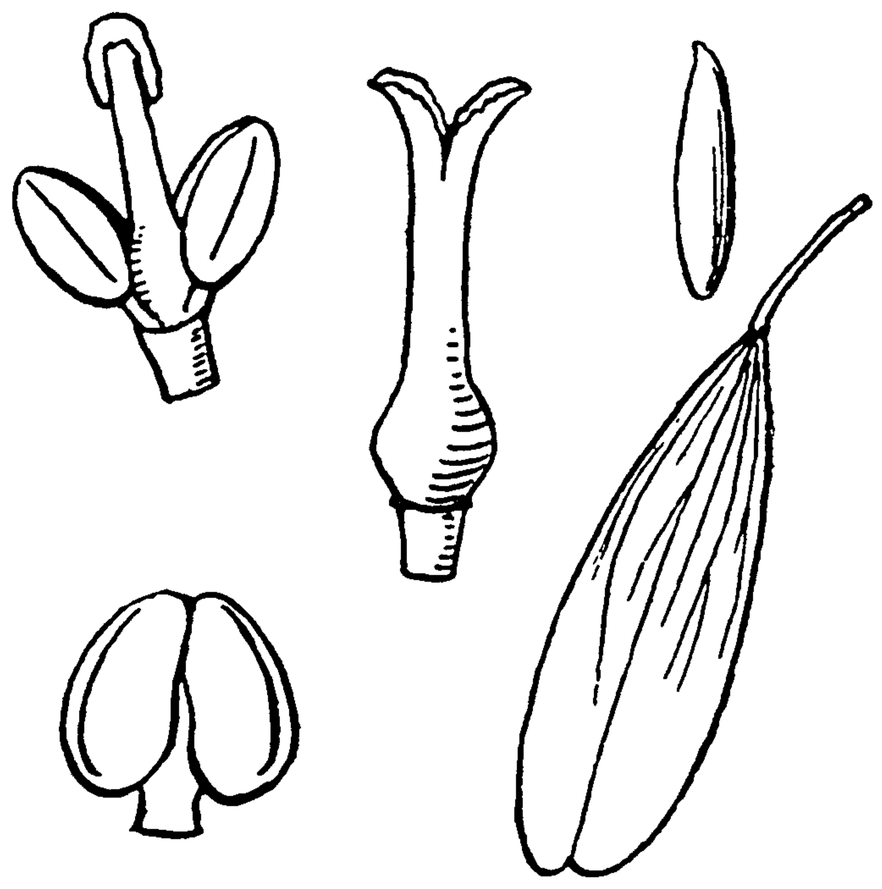
1. S. vulgaris L. Stems commonly 2–3 m. tall, usually clustered: leaf-blades ovate, 4–10 cm. long, acuminate: panicles 1–3 dm. long: calyx 2–2.5 mm. long; lobes ovate or triangular: corolla 9–11 mm. long; lobes ovate to obovate: capsule ellipsoid, 14–16 mm. long. — (LILAC. COMMON-LILAC.)— Waste-places, thickets, and gardens, various provinces, E U. S. Nat. of Eu. and cult. —Spr.

2. FRAXINUS [Tourn.] L. Shrubs or trees. Leaves opposite: blades unequally pinnate. Flowers polygamous, dioecious, or rarely perfect, in clusters or panicles. Calyx unequally 4-lobed or obsolete. Corolla greenish, of 2–4 petals, or wanting. Stamens 2 or rarely 3 or 4. Stigma 2-lobed. Samara winged at the tip or all around.—About 50 species, mostly of the north temperate zone.—Spr.—ASHES.

Body of the samara flat, the wing extending to its base or around it.
  Leaflets 7–11: twigs 4-sided: samara rounded or obtuse at the base. — 1. *F. quadrangulata.*
  Leaflets 5–7: twigs terete: samara narrowed or acute at the base.
    Samara spatulate or elliptic-spatulate. — 2. *F. pauciflora.*
    Samara elliptic to ovate or obovate. — 3. *F. caroliniana.*
Body of the samara terete or slightly compressed, the wing terminal or slightly decurrent.

Wing of the samara decurrent on the sides of the body.
  Samara-wing linear, sometimes elongate-linear. 4. *F. Darlingtonii.*
  Samara-wing spatulate to elliptic.
    Samara-body terete.
      Body of the samara narrow.
        Samara broadly spatulate: blades of the leaflets thick, entire. 5. *F. Michauxii.*
        Samara narrowly linear: blades of the leaflets thin, serrate. 6. *F. pennsylvanica.*
      Body of the samara stout, ellipsoid. 7. *F. Smallii.*
    Samara-body compressed. 8. *F. profunda.*
Wing of the samara terminal or nearly so.
  Twigs and leaves glabrous or nearly so. 9. *F. americana.*
  Twigs and leaves densely pubescent. 10. *F. biltmoreana.*

1. F. quadrangulata Michx. Tree, rarely becoming 36 m. tall, the twigs glabrous: leaflets 7–11; blades of the lateral ones lanceolate, elliptic, or ovate, 5–15 cm. long, serrate, short-petioluled: samaras 3–4 cm. long, the wing linear-elliptic or elliptic-cuneate.—(BLUE-ASH.)—Rich woods, often in calcareous soil, various provinces, rarely Coastal Plain, Ala. to Miss., Ark., Minn., Ont., and Ohio.—The light-yellow and brown-streaked heart-wood is used in construction and wagon-building. The inner bark yields a blue dye.



2. F. pauciflora Nutt. Tree becoming 10 m. tall or shrub, the twigs glabrous: leaflets 5–7; blades of the lateral ones lanceolate, elliptic, or some of them ovate, 4–15 cm. long, undulate or repand: samaras 4–6 cm. long, the wing elliptic to spatulate, longitudinally veined.—(SWAMP-ASH.)—Swamps, Coastal Plain, Fla. to La., and Ga.—The wood is nearly similar to that of the next following species.

3. F. caroliniana Mill. Tree sometimes 12 m. tall or shrub, the twigs often pubescent: leaflets 5–9, usually 5–7; blades of the lateral ones elliptic-lanceolate, 4–12 cm. long, shallowly serrate or nearly entire: samaras 4–5 cm. long, the wings elliptic, or nearly so, varying to ovate or obovate, pinnately veined.—(WATER-ASH. POP-ASH.)—Swamps, and low grounds, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and S Va.—The white or yellow-tinged heart-wood is close-grained but soft and weak.

4. F. Darlingtonii Britton. Tree up to 20 m. tall, the twigs glabrous, or pubescent in more northern forms: leaflets 5–7; blades thin, lanceolate to oblong-lanceolate or ovate-elliptic, 11 cm. long or less, usually acuminate, entire, bright green, often pubescent beneath: samaras 5–7.5 cm. long, each with a narrowly elongate-linear wing which is decurrent on the upper part of the slender fruit-body.—Swamps, woods, and stream-banks, various provinces, Ala. to La., Kans., Ill., Pa., N. Y., Mass., and N. C.

5. F. Michauxii Britton. Tree up to 12 m. tall, the twigs velvety or glabrous: leaflets 5–7; blades thick, ovate, oval, ovate-lanceolate, or elliptic-lanceolate, 15 cm. long or less, usually acuminate, entire, deep-green above, paler and pubescent beneath: samaras 3.5–5 cm. long, each with a spatulate, usually broadly spatulate wing which is decurrent on the stoutish fruit-body.—Swamps, meadows, and stream-banks, various provinces, La. to Md., N. Y., and N. J.

6. F. pennsylvanica Marsh. Tree sometimes 20 m. tall, the twigs velvety pubescent (or glabrous in *F. pennsylvanica lanceolata*): leaflets 5–7; blades of the lateral ones lanceolate or sometimes elliptic, 5–20 cm. long, entire, or ser-

rate, especially near the apex: samaras 3.5–6 cm. long, the wing spatulate, decurrent to the middle of the linear body or near it.—(RED-ASH. GREEN-ASH.)—Low woods and stream-banks, various provinces, N. C. to Ala., Kans., S. Dak., and N. B.; reported also from Miss.—The light-brown, coarse-grained heart-wood, hard and heavy, is used in a variety of ways.

7. **F. Smallii** Britton. Tree becoming 16 m. tall, the twigs glabrous: leaflets 5–7; blades thinnish, elliptic-lanceolate, ovate-lanceolate, ovate, or elliptic-ovate, 15 cm. long or less, acuminate, entire or nearly so, bright-green above, pale and more or less pubescent beneath, slender-petioled: samaras 3–5 cm. long, each with an elliptic or linear-elliptic, usually acute wing which is decurrent on the upper half of the stout seed-body.—River-banks, bottoms, and swamps, Coastal Plain and adj. provinces, N Fla., to La., Mo., and N. C.

8. **F. profunda** Bush. Tree sometimes 35 m. tall, the twigs pubescent: leaflets 7–9; blades of the lateral ones lanceolate-ovate or elliptic, 6–12 cm. long, entire or undulate: samaras 4–5 cm. long, the wing linear-elliptic or elliptic-spatulate.—(PUMPKIN-ASH.)—Swamps and river-banks, various provinces N of Coastal Plain, Ga. to Ala., Mo., and W N. Y.—A plant closely related to *F. profunda*, but with thinner and relatively broader leaflets and smaller fruits (3–3.5 cm.) has been described as *F. catawbiensis* Ashe. It occurs in the Piedmont of Ga. and the Carolinas.

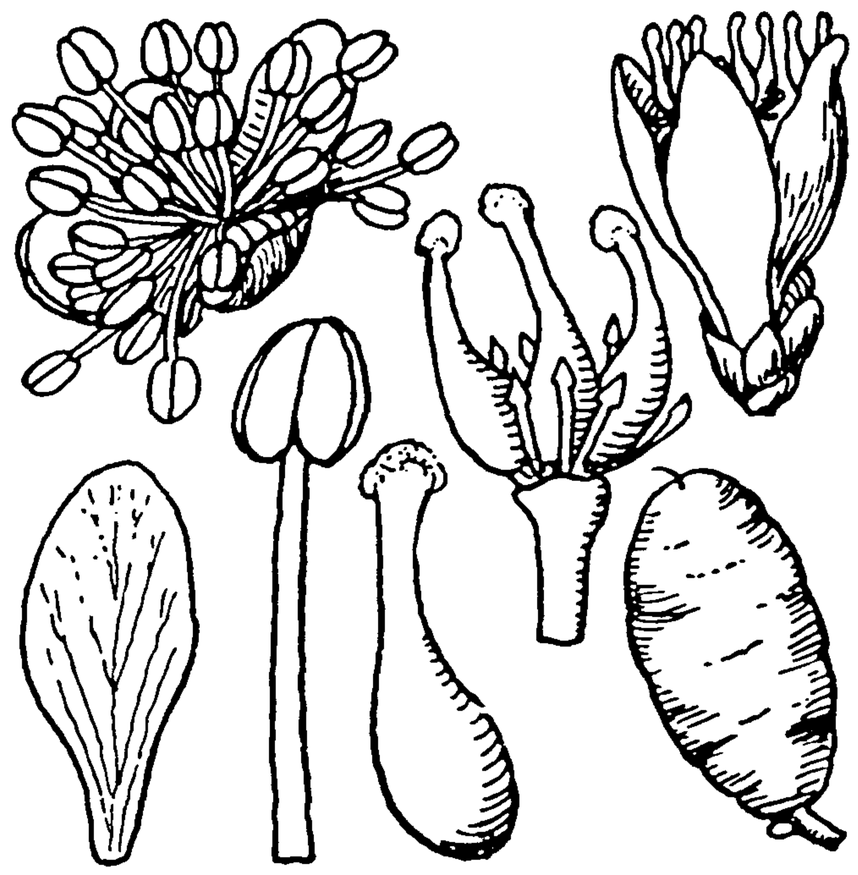
9. **F. americana** L. Tree becoming 40 m. tall, the twigs glabrous: leaflets 5–9; blades of the lateral ones lanceolate or elliptic, 5–15 cm. long, relatively thin, entire or shallowly toothed: samaras 2.5–3.5 cm. long, (less than 2 cm. long and seedless in *F. americana Curtissii*), the wing linear-spatulate or elliptic-spatulate, terminal or nearly so on the ellipsoid-cylindric body.—(WHITE-ASH.)—Rich or moist woods, various provinces, Fla. to Tex., Minn., and N. S.—The brown heart-wood, close-grained, tough and strong, is used in a great variety of ways. Our most valuable ash.

10. **F. biltmoreana** Beadle. Tree becoming 18 m. tall, the twigs densely soft-pubescent: leaflets 7–9; blades of the lateral ones ovate to elliptic-lanceolate, 7–14 cm. long, relatively thick, entire or obscurely toothed: samaras 3.5–5 cm. long, the wing linear or nearly so, terminal or nearly so on the stout elliptic body.—Woods on river-banks, Blue Ridge to Appalachian Plateau, Ga. to Ala. and Pa.

3. **FORESTIERA** Poir. Shrubs or trees. Leaves opposite: blades simple. Flowers mostly polygamo-dioecious, in lateral clusters, green or whitish. Calyx minute, 4–6-lobed, or obsolete. Corolla wanting, or rarely of 1–2 deciduous petals. Stamens 2–4. Stigma 2-lobed. Drupe ellipsoid to globular. [*Adelia* P. Br.]—About 15 species, American.

Leaf-blades acuminate at both ends: drupe much longer than thick, narrowly ellipsoid. 1. *F. acuminata.*
Leaf-blades obtuse: drupe as thick as long or slightly longer than thick, globose to oval.
  Leaves deciduous; blades toothed, membranous, not punctate.
    Leaf-blades pubescent on the veins beneath and often with scattered hairs between: pistillate flowers and drupes very short-pedicelled or sessile. 2. *F. ligustrina.*
    Leaf-blades copiously pubescent beneath: pistillate flowers and drupes markedly pedicelled. 3. *F. pubescens.*
  Leaves persistent; blades entire, coriaceous, punctate.
    Drupe oval or ovoid.
      Leaf-blades elliptic or elliptic-spatulate. 4. *F. porulosa.*
      Leaf-blades linear, linear-elliptic, or oblanceolate. 5. *F. pinetorum.*
    Drupe globular. 6. *F. globularis.*

1. F. acuminata (Michx.) Poir. Tree sometimes 10 m. tall or shrub, the twigs glabrous: leaf-blades 3–10 cm. long, elliptic-oval to ovate-elliptic, slightly serrate: bracts rhombic, 5–6 cm. long: drupe narrowly ellipsoid, 12–15 mm. long; stone tapering to the apex.—(FORESTIERA.)—River-swamps, stream-banks, and ponds, various provinces, Fla. to Tex., Ill., and S. C.—Spr.



2. F. ligustrina (Michx.) Poir. Shrub 1–3 m. tall, the twigs usually brown or purplish, glabrous or nearly so: leaf-blades 1–4 cm. long, elliptic oval or approaching obovate, finely serrate: bracts ovate or rhombic, about 2.5 mm. long, eciliate: drupe broadly globose-oval, 7–8 mm. long; stone oval.—Sandy or rocky soil and river-banks, various provinces, Fla. to Tenn. and Ga.—Sum.

3. F. pubescens Nutt. Shrub mainly 1–2 m. tall, the twigs yellowish, pubescent: leaf-blades 1–4 cm. long, elliptic-oval or elliptic-obovate, somewhat serrate: bracts obovate, 2–2.5 mm. long, or rarely longer, ciliate: drupe ellipsoid, 6–7 mm. long; stone narrowly ellipsoid.—River-banks, Coastal Plain, Fla. to Tex. and Ark.—Spr.

4. F. porulosa (Michx.) Poir. Small tree or shrub 1–3 m. tall, the twigs glabrous or nearly so: leaf-blades 1.5–5 cm. long, elliptic to elliptic-spatulate, mostly 2.5–6 cm. long, entire: bracts oval or sub-orbicular, about 1.5 mm. long, ciliate: drupe ellipsoid, 7–8 mm. long. [*Adelia segregata* (Fl. SE. U. S.)]—(FLORIDA-PRIVET.)—Hammocks and sand-dunes, S Fla.—Spr.

5. F. pinetorum Small. Shrub with short rigid, sometimes virgate branches 0.2–1 m. tall, the twigs puberulent, gray: leaf-blades 1–2.5 cm. long, linear-elliptic or oblanceolate, entire, thin-coriaceous: bracts obovate to orbicular-cuneate, 1.5–2 mm. long, ciliate: drupe oval, 5–7 mm. long, equilateral, black: stone ellipsoid.—(WILD-OLIVE.)—Pinelands, S pen. Fla.—Fall–Spr.

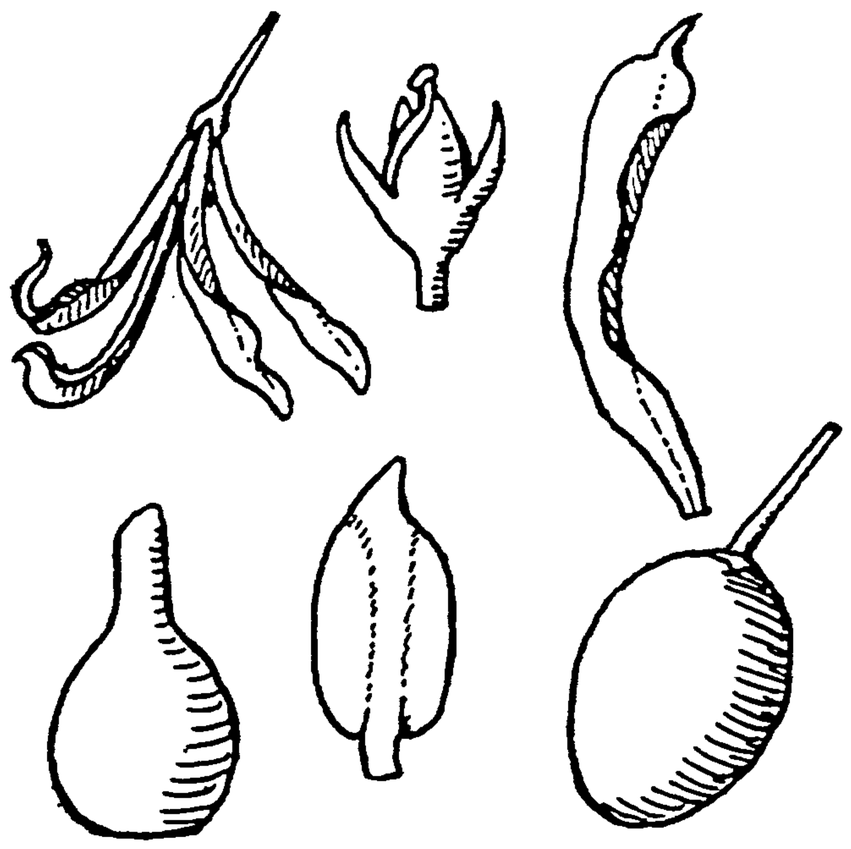
6. F. globularis Small. Shrub with intricately branched stems, 1–3 m. tall, the twigs pale-gray and striate, glabrous: leaf-blades elliptic or slightly broadened upward, coriaceous-fleshy, mainly 1–2 cm. long, paler beneath than above: flowers few, nearly sessile: bracts oval to suborbicular, 2–2.5 mm. long, ciliate: drupe globular, 7–9 mm. in diameter, blue; stone globose or oval-globose.—Dune-hammocks, E Fla.—Spr.

4. **CHIONANTHUS** L. Shrubs or trees. Leaves opposite, deciduous: blades simple. Flowers perfect or polygamous, in drooping festoon-like panicles. Calyx deeply 4-lobed. Corolla white: lobes narrow, many times longer than the tube. Stamens 2: filaments adnate to the corolla-tube. Stigma notched or 2-lobed. Drupe oval to subglobose.—Two species, American.—FRINGE-TREES. OLD-MAN'S BEARDS. FLOWERING-ASHES. GRANDSIR-GRAYBEARDS.—Spr.

Corolla-lobes 2–3 cm. long: anthers acuminate: drupe 1–1.5 cm. long. 1. *C. virginica.*

Corolla-lobes about 1 cm. long: anthers abruptly blunt-tipped: drupe 2–2.5 cm. long. 2. *C. pygmaea.*

1. C. virginica L. Tree up to 10 m. tall or a tall shrub with a taproot: leaf-blades oval to elliptic, varying to obovate, mostly 8–18 cm. long, becoming thick-membranous, rather long-petioled: panicles with persistent bracts which are often 2–4 cm. long: anthers fully 2 mm. long: drupe ellipsoid.—Swampy woods, rocky bluffs, and stream-banks, often in acid soil, various provinces, Fla. to Tex., Mo., and N. J.—The light-brown heart-wood is close-grained and hard.

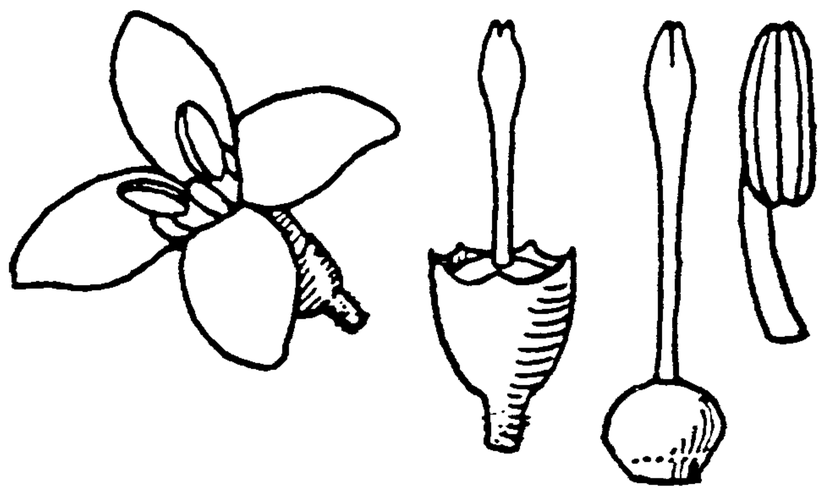


2. C. pygmaea Small. Shrub with underground stems, the branches 2–4 dm. tall, simple below, sparingly branched throughout: leaf-blades elliptic or nearly so, 3–9 cm. long, becoming thin-coriaceous, short-petioled: panicles with very small deciduous bracts: anthers less than 2 mm. long: drupe oval.—Scrub, inland sandhills, S end of lake region, Fla.

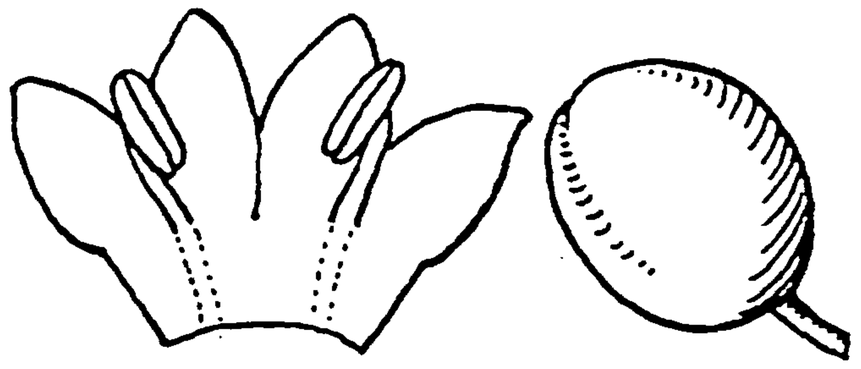
5. LIGUSTRUM [Tourn.] L. Shrubs or trees. Leaves opposite: blades simple, entire. Flowers perfect, in erect panicles. Calyx shallowly 4-lobed or nearly truncate. Corolla white or greenish, funnelform: lobes broad, about as long as the tube or much shorter. Stamens 2: filaments adnate to the corolla-tube. Stigma 2-lobed. Drupe mostly subglobose.—About 35 species, natives of the Old World.

Corolla-lobes as long as the tube or nearly so: anthers oval. 1. *L. vulgare.*
Corolla-lobes much shorter than the tube: anthers linear. 2. *L. ovalifolium.*

1. L. vulgare L. Shrub becoming 3 m. tall: leaves tardily deciduous; blades elliptic, elliptic-lanceolate, lanceolate, or individually broadest above the middle, 1–5 cm. long, or rarely larger, obtuse or acutish, slender-petioled: panicles many-flowered, compact: bracts somewhat persistent: calyx-lobes minute, acute: corolla 5–6 mm. long; lobes broadly ovate: anthers less than 2 mm. long: drupes subglobose, 6–8 mm. in diameter, black.—(PRIVET. PRIM.)—Roadsides, old-fields, and thickets, various provinces, N. C. to Tex., Ont. and Me. Nat. of O. W., and cult.—Spr.–sum.



2. L. ovalifolium Hassk. Shrub or small tree: leaves very tardily deciduous or evergreen; blades ovate, elliptic or oval, 3–7 cm. long, mostly acute or acutish; stout-petioled: panicle many-flowered, open: bracts caducous: calyx-lobes obsolete: corolla 7–8 mm. long: lobes narrowly ovate: anthers over 2 mm. long: drupes mostly oval to ovoid, 6–8 mm. long, nearly black.—(CALIFORNIA PRIVET.)—Cult. grounds, waste-places, and fence-rows, Coastal Plain, Fla. to Tex. Nat. of Japan, and cult.—Sum.



Ligustrum sinense Lour. A shrub differing from *L. vulgare* in the densely pubescent young branches and inflorescence, and with the midrib of the leaves pubescent beneath and the stamens much longer than the corolla-lobes, occurs as an escape in S La.

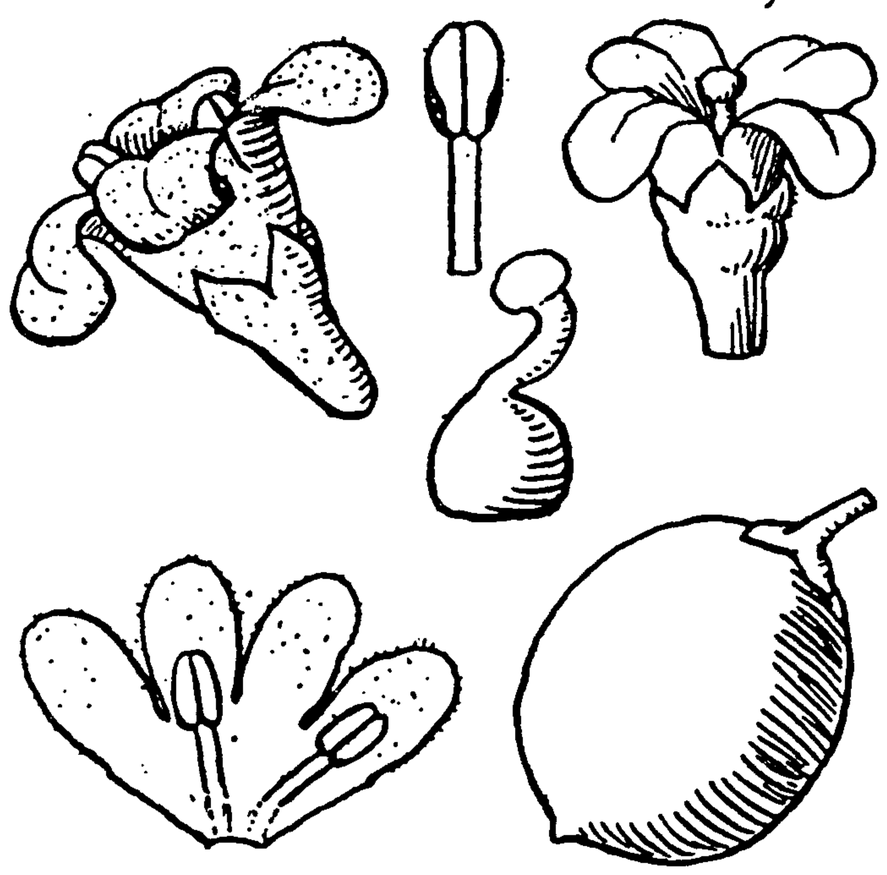
Ligustrum lucidum Ait., a shrub or small tree, with large, ovate or ovate-lanceolate leaf-blades, often 6–12 cm. long, large erect panicles of sessile flow-

ers, and drooping clusters of bluish-black fruits, is widely cultivated in southern coastal regions. It is a native of China and Japan, and is occasionally spontaneous about towns where it is grown on the coasts of North Carolina and Louisiana.

6. **AMAROLEA** Small. Shrubs or small trees. Leaves opposite, persistent: blades simple, entire. Flowers polygamous, in small axillary scaly-bracted panicles. Calyx prominently 4-lobed. Corolla funnelform, greenish-white or white: lobes broad, nearly as long as the tube. Stamens 2: filaments partly adnate to the corolla-tube: anthers notched. Stigma capitate. Drupe oval or globose, very bitter.—Only the following 2 species.—Spr.—WILD-OLIVES. DEVIL-WOODS.—Differs from *Osmanthus* by the coralloid inflorescence, the subsessile flowers, the introrse anthers, and the capitate stigma.

Drupe oval or ellipsoid, 1 cm. in diameter or less: stone acute at both ends. (See note.) 1. *A. americana.*
Drupe globose, 2–2.5 cm. in diameter: stone acute at the base. 2. *A. megacarpa.*

1. **A. americana** (L.) Small. Tree becoming 15 m. tall or shrub, the bark pale: leaf-blades narrowly elliptic, varying to oblanceolate or lanceolate, 5–15 cm. long, entire, lustrous above: inflorescence-branches and calyx usually finely pubescent: corolla 3–4 mm. long: drupe 10–15 mm. long, dark-purple; stone ellipsoid, less than 1 cm. in diameter. [*Osmanthus americana* B. & H.] —Hammocks, wooded bluffs, and swamps, Coastal Plain, Fla. to La. and N. C.—The dark-brown heart-wood is close-grained and hard.—*Osmanthus floridana* Chapm. is said to differ from this species in its yellowish-green fruit.—A plant of the coastal region of NE Florida with a small globose drupe, about a centimeter in diameter and a stone scarcely pointed at the base, may represent another species.



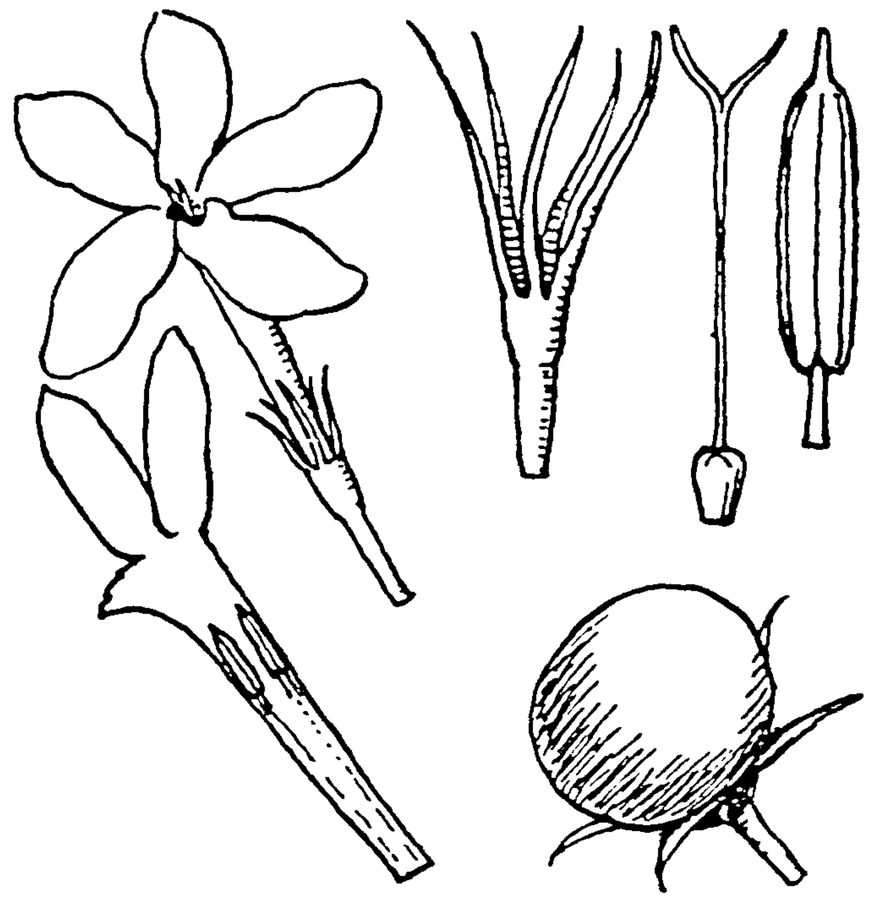
2. **A. megacarpa** Small. Shrub or small tree with a trunk-diameter usually less than 1 dm., the bark pale-green: leaf-blades elliptic or slightly broader above the middle, mostly 9–15 cm. long, very coriaceous: drupe globose, 2–2.5 cm. long, dull-purple; stone globose-obovoid, more than 1 cm. in diameter. [*Osmanthus megacarpa* Small.]—Scrub, S end of the lake region, pen. Fla.

7. **JASMINUM** [Tourn.] L. Shrubs or woody vines. Leaf-blades 3–7-foliolate or sometimes 1-foliolate. Flowers mostly in terminal compound cymes. Calyx with 4–9 short or elongate, often narrow, lobes. Corolla salverform, the limb 4–12-lobed. Filaments adnate to the corolla-tube. Fruit didymous.—About 100 species, natives of the Old World.

Leaves with 3 or more leaflets, usually 5–7-foliolate: anthers slender, long-tipped. 1. *J. grandiflorum.*
Leaves reduced to a single leaflet, thus 1-foliolate: anthers stout, short-tipped.
  Calyx much less than half the length of the corolla-tube: corolla-lobes narrowly elliptic, acute or short-acuminate. 2. *J. undulatum.*
  Calyx about half the length of the corolla-tube or more: corolla-lobes oval, ovate, or orbicular, obtuse. 3. *J. Sambac.*

1. **J. grandiflorum** L. Plant partly erect or diffusely reclining, glabrous or nearly so: leaflets mostly 5–7; blades ovate to oval, mucronate, except the

usually ovate-lanceolate or narrowly ovate, acute or acuminate terminal one: calyx 4–8 mm. long; lobes subulate, often unequal: corolla white; tube 17–21 mm. long; lobes mostly elliptic to oval, obtuse.—(ITALIAN-JESSAMINE. CATALONIA-JESSAMINE. ROYAL-JESSAMINE. SPANISH-JESSAMINE.) — Pinelands, thickets, and waste-places, S pen. Fla. Nat. of E. I., and cult.—(*W. I., Mex., C. A., S. A.*)—All year.



2. **J. undulatum** Ker. Plant climbing, the stems and branches closely fine-pubescent: leaflets 2–8 cm. long; blades ovate to ovate-lanceolate, acute or acuminate at the apex, rounded, truncate, or subcordate at the base: cymes few–several-flowered: calyx-lobes 5 or 6, filiform-subulate, much longer than the tube: corolla white; tube 15–20 mm. long; lobes narrowly elliptic or nearly so, acute or short-acuminate.—Roadsides and thickets, N Fla. Nat. of E. I., and cult.—Sum.–fall.

3. **J. Sambac** (L.) Soland. Plant climbing, the stems and branches finely pubescent: leaflets 4–13 cm. long; blades oval to ovate or elliptic, mostly acute at the apex, obtuse or rounded at the base: cymes few–several-flowered: calyx-lobes 7–many, longer than the tube, very narrowly linear: corolla white; tube 10–15 mm. long; lobes oval, ovate, or orbicular, mostly obtuse.—(ARABIAN-JESSAMINE. NASSAU-JESSAMINE.)—Woods and thickets, S pen. Fla. Nat. of E. I., and cult.—(*W. I.*)—All year.

ORDER **GENTIANALES** — GENTIANAL ORDER

Herbs, shrubs, or trees, sometimes aquatic or humus plants or vines. Leaves mainly opposite: blades simple. Flowers mostly perfect, solitary or in cymes. Calyx of 5 partially united sepals, or fewer. Corolla of 5 partially united petals, or fewer. Androecium of as many stamens as there are corolla-lobes: filaments often partially adnate to the corolla-tube. Gynoecium of 2 more or less united carpels. Fruit capsular, baccate or drupaceous.

Ovary 2-celled: leaves stipulate or with stipular lines.	Fam. 1. SPIGELIACEAE.
Ovary 1-celled: leaves not stipulate.	
Corolla-lobes convolute or imbricated in the bud.	Fam. 2. GENTIANACEAE.
Corolla-lobes induplicate-valvate in the bud.	Fam. 3. MENYANTHACEAE.

FAMILY 1. **SPIGELIACEAE** — LOGANIA FAMILY

Herbs, vines, or woody plants. Leaves typically opposite. Flowers in open or compact clusters. Calyx of 4 or 5 partially united sepals. Corolla of 4 or 5 partially united petals. Androecium of 4 or 5 stamens. Gynoecium of 2 united carpels, or rarely more: ovary 2-celled or rarely 4-celled. Fruit capsular and 2-valved, or baccate or drupaceous.—Thirty genera and about 400 species, most abundant in warm and tropical regions.

Woody vines: stigmas 4: corolla yellow.	Tribe I. GELSEMIEAE.
Herbs or erect shrubs: stigma entire or slightly 2-lobed: corolla not yellow, at least without.	II. SPIGELIEAE.

I. GELSEMIEAE

Stem diffusely twining: leaves persistent.	1. GELSEMIUM.

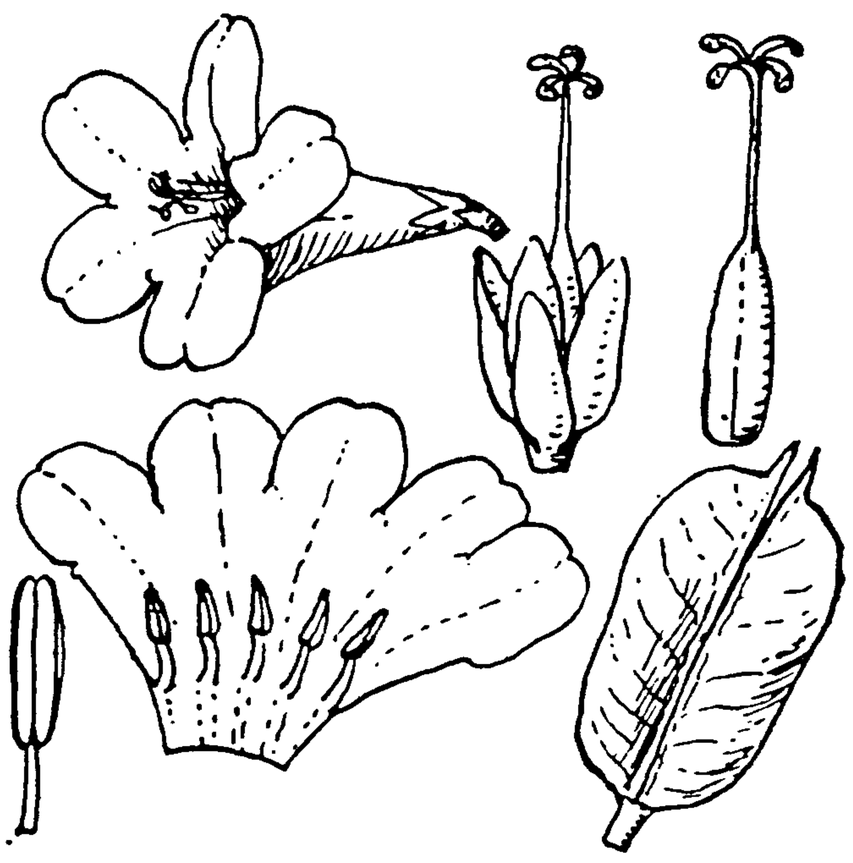
II. SPIGELIEAE

Corolla-lobes valvate.
  Corolla funnelform or salverform: styles permanently united.
    Flowers in the forks of leafy branches: style jointed near the middle. 2. COELOSTYLIS.
    Flowers in terminal spikes or spike-like racemes: style jointed near the base. 3. SPIGELIA.
  Corolla urn-shaped: styles soon distinct. 4. CYNOCTONUM.
Corolla-lobes imbricate.
  Annual herb: sepals nearly distinct: capsule loculicidal. 5. POLYPREMUM.
  Shrubs, or partly woody herbs: sepals chiefly united: capsule septicidal. 6. ADENOPLEA.

1. GELSEMIUM Juss. Evergreen vines. Flowers dimorphous, in axillary cymes, or solitary. Calyx 5-lobed. Corolla funnelform, straight. Filaments with the free portion much longer than the adnate portion. Stigmas 4. Capsule flattened contrary to the septum, septicidal. Seeds winged.—Three species, the following and 1 Asiatic.—Wint.–spr.—YELLOW-JESSAMINE. EVENING TRUMPET-FLOWER.

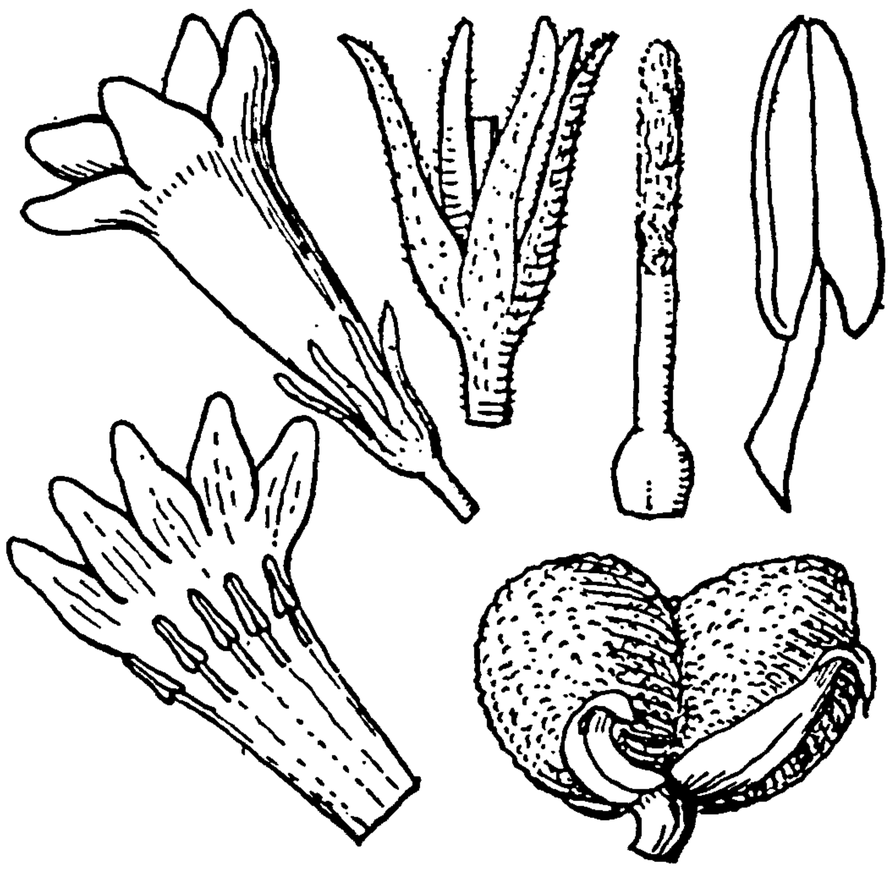
Leaf-blades narrowed at the base: calyx-lobes obtuse: anthers elliptic-ovate: capsule short-beaked: seed winged. 1. *G. sempervirens.*
Leaf-blades rounded at the base: calyx-lobes acuminate: anthers lanceolate: capsule long-beaked: seed wingless. 2. *G. Rankinii.*

1. G. sempervirens (L.) Ait. f. Stem and branches often tangled and matted, the flowering shoots reddish-brown: leaf-blades lanceolate to elliptic-lanceolate, 1.5–7 cm. long, entire: pedicels scaly throughout: calyx-lobes 3–4 mm. long, elliptic to ovate-elliptic: bud blunt: corolla deep-yellow, 3–4 cm. long; tube gradually dilated: capsule-body veiny, 19–22 mm. long, the beak 1–1.5 mm. long: seed 8–9 mm. long, the body about as long as the wing.—Hammocks, thickets, bluffs, and swamps, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and Va.—Wint.–spr.—The flowers are very fragrant.



2. G. Rankinii Small. Plant with the same habit as *G. sempervirens*, the flowering shoots green: leaf-blades lanceolate to ovate, 1.5–7 cm. long, entire: pedicels scaly at the base: calyx-lobes about 4 mm. long, lanceolate: bud acute: corolla deep-yellow, 2.5–3 cm. long; tube abruptly dilated: capsule-body veinless, 10–11 mm. long, the beak 3–4 mm. long: seed 3–4 mm. long.—Swamps and river banks, Coastal Plain, N Fla. to La. and N. C.—Wint.–spr.—The flowers are not fragrant.

2. COELOSTYLIS T. & G. Annual erect herbs. Flowers in the forks of leafy branches, or in the leaf axils. Calyx-lobes narrow. Corolla white or whitish, narrowly funnelform, plicate in the bud. Filaments adnate to about the middle of the corolla-tube.—Two species, North American.

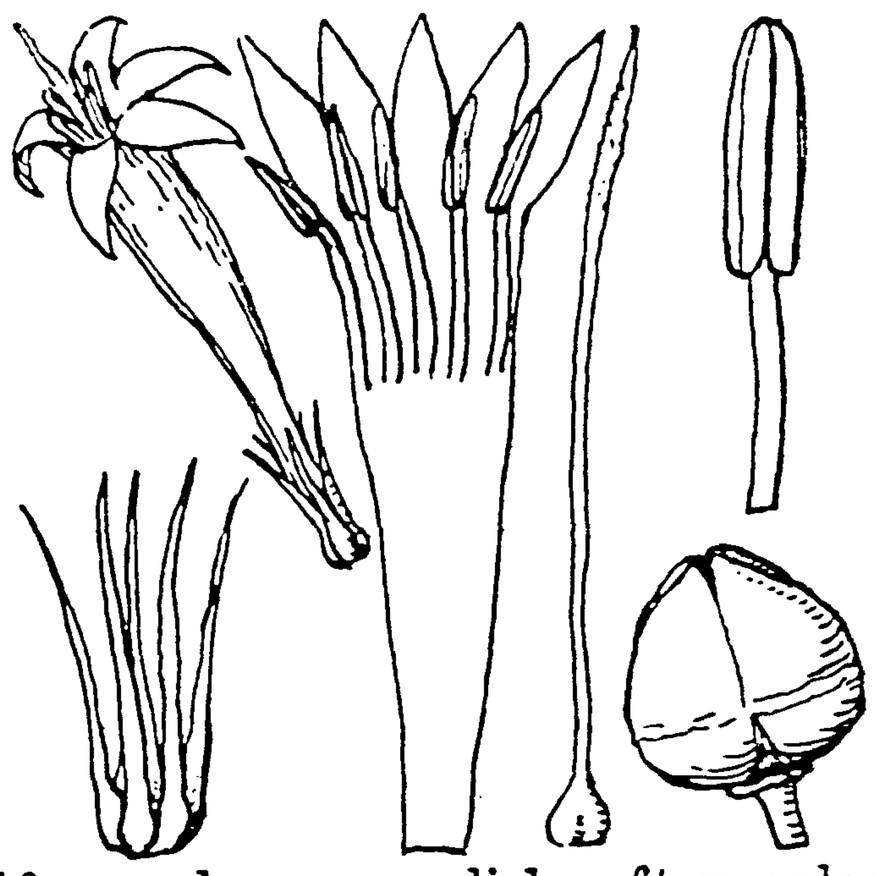


1. C. loganioides T. & G. Plant 1–3 dm. tall, glabrous: leaf-blades oval to elliptic or lanceolate, 1.5–3.5 cm. long: calyx-lobes narrowly linear, about ⅓ as long as the corolla, denticulate: corolla-lobes lanceolate: capsule about 6 mm. wide.—Pinelands, E Fla.

3. **SPIGELIA** L. Erect herbs. Flowers in solitary or clustered spikes or spike-like racemes. Calyx-lobes narrow. Corolla colored, rarely pale, tubular-funnelform, scarcely if at all plicate in the bud. Filaments adnate to above the middle of the corolla-tube or to near the top.—About 35 species, American.

Plant perennial: inflorescence not subtended by a whorl of bracts.
  Corolla scarlet without, 4–5 cm. long: anthers exserted. 1. *S. marylandica.*
  Corolla purplish without, 1.5–2.5 cm. long: anthers included. 2. *S. gentianoides.*
Plant annual: inflorescence subtended by a whorl of bracts. 3. *S. Anthelmia.*

1. S. marylandica L. Plant 2–6 dm. tall: leaf-blades ovate to lanceolate, or sometimes elliptic, 3–10 cm. long: calyx-lobes 10–11 mm. long: corolla red without, yellow within; lobes lanceolate: capsule about 9 mm. wide.—(INDIAN-PINK. CAROLINA-PINK. PINK-ROOT. WORM-GRASS.)—Rich woods and hillsides, Fla. to Tex., Ind. and Md. (or N. J.)—Spr.



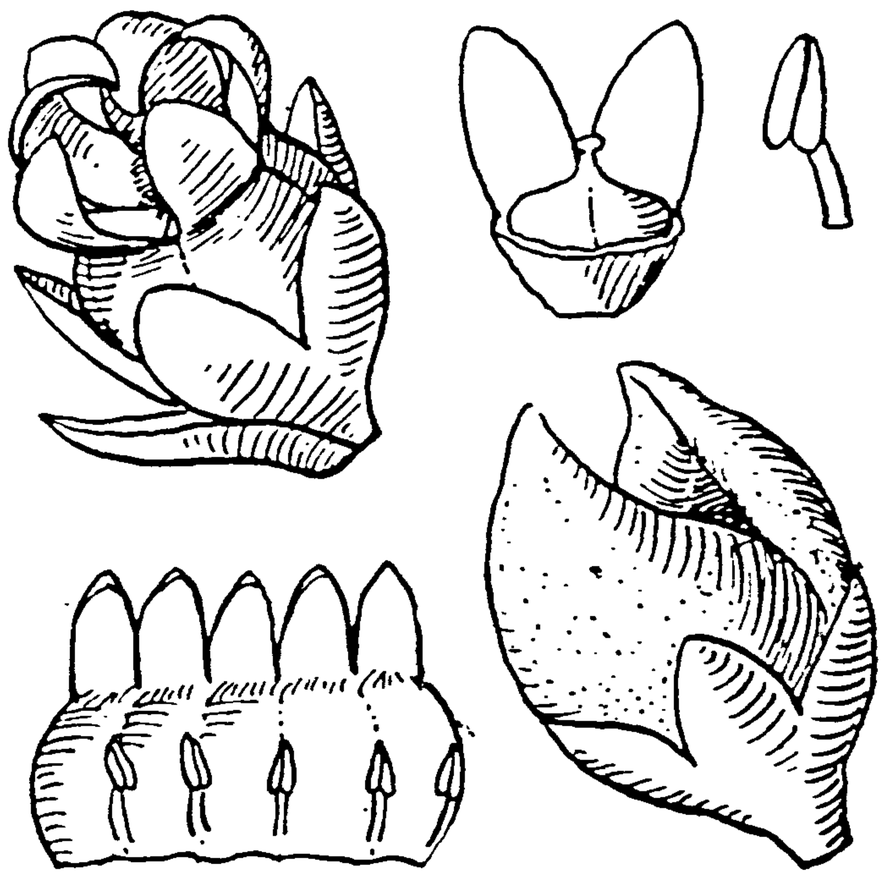
2. S. gentianoides Chapm. Plant 2–3 dm. tall: leaf-blades ovate, or sometimes oval-lanceolate near the base of the stem or almost orbicular, 1.5–5 cm. long: calyx-lobes 7–9 mm. long: corolla pink; lobes deltoid or ovate-deltoid.—Dry soil, W Fla.—Spr.

3. S. Anthelmia L. Plant 1–4 dm. tall: leaf-blades lanceolate, 3–12 cm. long: inflorescence subtended by a whorl of large bracts: calyx-lobes 1.5–2 mm. long: corolla 6–10 mm. long, purplish, often pale: capsule 5–6 mm. wide, tuberculate.—(WEST-INDIAN PINK-ROOT. WORM-GRASS.)—Hammocks and cult. grounds, Florida Keys.—(*W. I., Mex., C. A., S. A.*)

4. **CYNOCTONUM** J. F. Gmel. Annual (ours) erect herbs. Flowers in terminal cymes, secund. Calyx usually 5-lobed. Corolla white or pink, urceolate, somewhat longer than the calyx. Filaments almost completely adnate to the corolla-tube. Styles united by their tips in anthesis, ultimately distinct. Capsule miter-shaped.—About 5 species, of warm regions.—MITERWORTS.

Leaf-blades narrowed into petiole-like bases: inflorescence lax. 1. *C. Mitreola.*
Leaf-blades sessile: inflorescence dense.
  Leaf-blades ovate to orbicular: corolla-lobes ovate. 2. *C. sessilifolium.*
  Leaf-blades narrowly elliptic to almost linear: corolla-lobes lanceolate to linear-lanceolate. 3. *C. angustifolium.*

1. C. Mitreola (L.) Britton. Stem 1–7 dm. tall: leaf-blades thin, elliptic, lanceolate, or ovate, or sometimes narrower, 1.5–8 cm. long, acute or acuminate: corolla-lobes ovate to elliptic-lanceolate: capsule 2–2.5 mm. long.—Damp soil, muddy banks, low pinelands and lime-sinks, Coastal Plain, and rarely adj. provinces, Fla. to Tex., Ark., and S Va.—(*W. I., Mex., C. A., S. A.*)—Sum, or all year S.

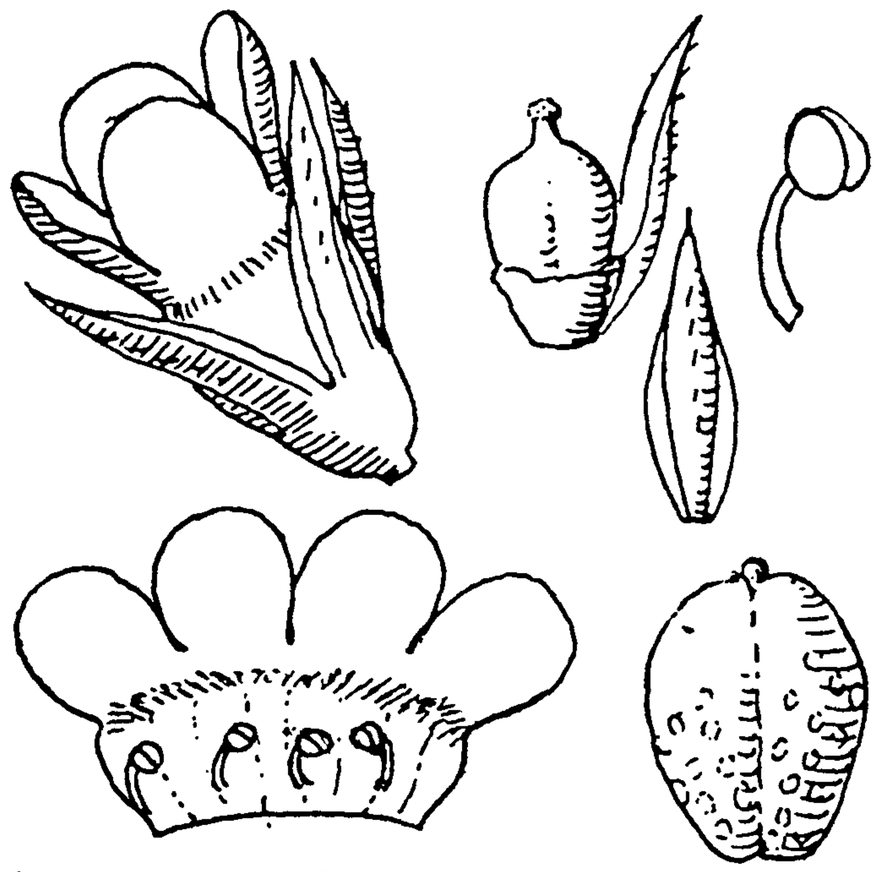


2. C. sessilifolium (Walt.) J. F. Gmel. Stem 1–5 dm. tall: leaf-blades thick, ovate to orbicular, 1–5 cm. long, obtuse or apiculate: corolla-lobes ovate, mainly shorter than the tube: capsule about 4 mm. long.—Pinelands and wet places, Coastal Plain, Fla. to La.—Sum.

3. C. angustifolium (T. & G.) Small.

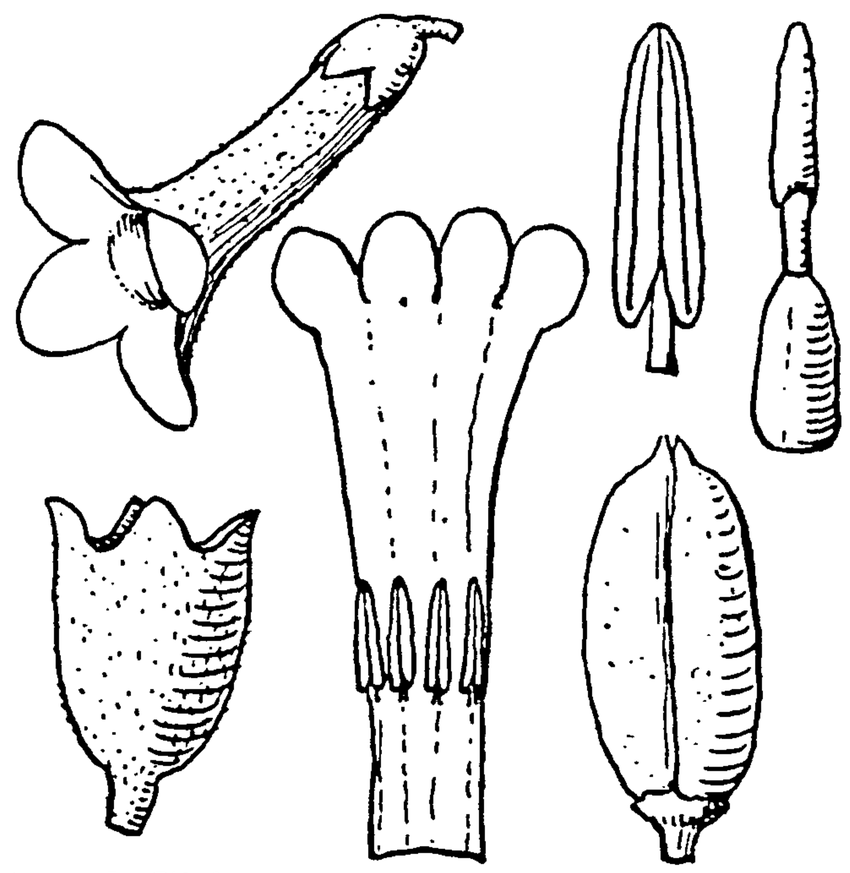
Stem 2–6 dm. tall: leaf-blades thick, narrowly elliptic to lanceolate or nearly linear, 2–4 cm. long, obtuse or acutish: corolla-lobes lanceolate or linear-lanceolate, mainly longer than the tube: capsule about 4 mm. long.—Wet places, Coastal Plain, Fla. and S Ga.

5. **POLYPREMUM** L. Annual diffuse herbs. Flowers solitary in the forks of the branches and in the leaf-axils. Calyx-lobes 4 or 5, narrow. Corolla white, campanulate, shorter than the calyx. Filaments adnate to the corolla-tube for about ½ their length. Styles very short, permanently united. Capsule obovoid or subglobose.—One species.



1. P. procumbens L. Stem and branches 1–3 dm. long: leaf-blades narrowly linear to subulate, scabrous-margined: calyx-lobes narrowly lanceolate, about 3 mm. long: corolla-lobes suborbicular, slightly shorter than the tube: capsule about 2 mm. long.—Waste-places, roadsides, fields, and pond-margins, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Pa.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall.

6. **ADENOPLEA** Radlk. Shrubs or partly woody plants. Flowers in lax or dense cymes borne in racemes or panicles. Calyx-lobes 4, shorter than the tube. Corolla trumpet-shaped, curved. Filaments adnate to below the middle of the corolla-tube. Capsule thick, septicidal.—Few species, of tropical regions.



1. A. Lindleyana (Fort.) Small. Stem diffusely branched, 1–2 m. tall, the branches angled: leaf-blades ovate to lanceolate, 3–9 cm. long, entire, glabrous: panicles 1–3 dm. long, often partly drooping: calyx about 2.5 mm. long: corolla purplish, violet, or reddish, 12–16 mm. long, the tube curved: capsule 4–5 mm. long. [*Buddleia Lindleyana* Fort.]—Roadsides, cult. grounds, and waste-places, Coastal Plain, Fla. to Tex. and Ga. Nat. of China, and cult.—(*W. I.*)—Sum.–fall.

FAMILY 2. GENTIANACEAE — GENTIAN FAMILY

Annual or perennial caulescent herbs or rarely shrubs. Leaves typically opposite: blades entire, sometimes connate. Flowers perfect, solitary or variously clustered. Calyx of 2, 4 or 5, or more, partially united sepals, persistent. Corolla of 4 or 5 or more, partially united petals, varying from rotate to tubular. Androecium of as many stamens as there are corolla-lobes, the filaments partially adnate to the corolla-tube. Gynoecium of two united carpels. Fruit a capsule.—Seventy genera and 700 species, most abundant in temperate regions.

Corolla-lobes convolute in the bud: leaves not scale-like. Tribe I. GENTIANEAE.
Corolla-lobes imbricate in the bud: leaves mere scales.
  Stigmas 2, distinct: plant green or purple-tinged. Tribe II. OBOLARIEAE.
  Stigmas united, dilated: plant white, not green. Tribe III. LEIPHAIMEAE.

I. GENTIANEAE

Style filiform, mostly deciduous: anthers recurving or twisting at maturity.
  Stigmas roundish, much shorter than the style.
    Corolla-tube surpassing the calyx. 1. CENTAURIUM.
    Corolla-tube much shorter than the calyx. 2. EUSTOMA.
  Stigmas linear or nearly so, about as long as the style.
    Flowers pedicelled, when more than one, paniculate: anthers coiled. 3. SABBATIA.
    Flowers sessile, when more than one, capitate: anthers curved. 4. LAPITHEA.
Style stout, short or wanting: anthers straight at maturity.
  Corolla not furnished with nectariferous structures.
    Corolla without plaits in the sinuses of the lobes: calyx without an interior membrane.
      Sepals unequal, the inner much broader than the outer and thin-margined: corolla-lobes fimbriate or erose. 5. ANTHOPOGON.
      Sepals essentially equal, or if unequal the inner narrower than the outer: corolla-lobes entire or merely toothed. 6. GENTIANELLA.
    Corolla with plaits in the sinuses of the lobes: calyx with an interior membrane. 7. DASYSTEPHANA.
  Corolla furnished with nectariferous pits, glands, or scales, 1 or 2 for each lobe. 8. FRASERA.

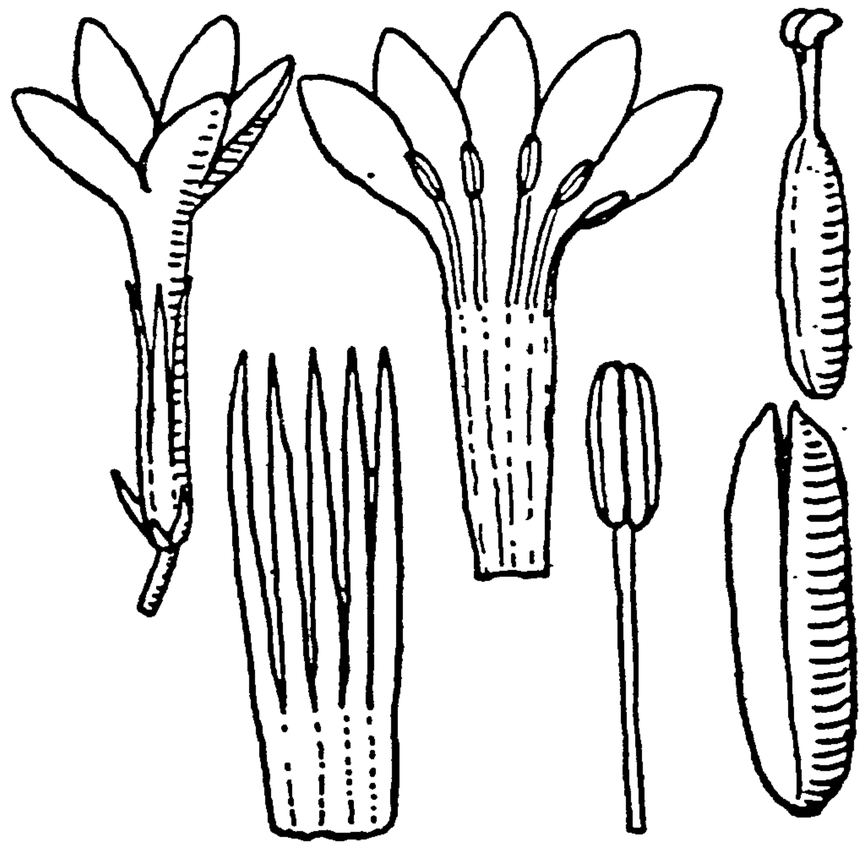
II. OBOLARIEAE

Calyx-lobes 4, narrowed upward: petals slightly united. 9. BARTONIA.
Calyx-lobes 2, broadened upward: petals well united. 10. OBOLARIA.

III. LEIPHAIMEAE

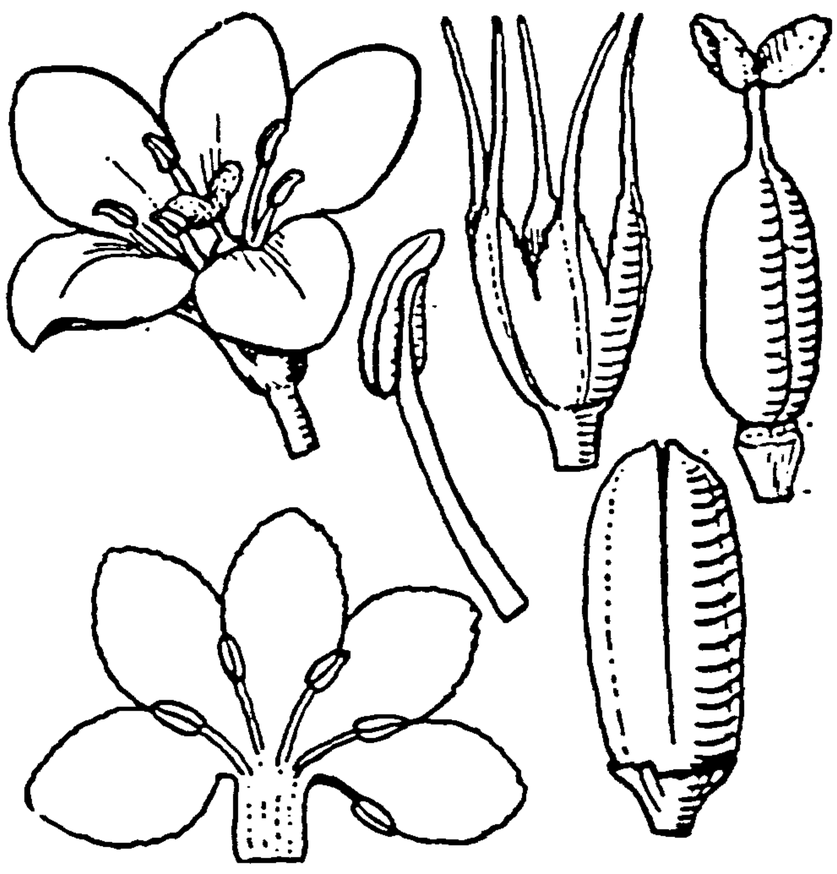
Humus plant with slender stems and small, colored flowers. 11. LEIPHAIMOS.

1. CENTAURIUM Hill. Annual, biennial, or sometimes perennial, relatively small herbs. Flowers in terminal cymes. Calyx-lobes 4 or 5, keeled. Corolla white, or commonly deep-pink or rose-purple, salverform: lobes 4 or 5, shorter than the tube, often strongly involute, acuminate.—About 25 species, widely distributed.



1. C. pulchellum (Sw.) Druce. Stem 3–25 cm. tall: blades of the upper leaves elliptic to ovate, 5–20 mm. long, obtuse: calyx 6–8 mm. long: corolla 9–10 mm. long; lobes elliptic-ovate, obtuse: capsule 7.5–8 mm. long. [*Erythraea pulchella* (Sw.) Fries.]—(CENTAURY.)—Fields and waste-places, various provinces, Miss. to La., Ill., and N. Y. Nat. of Eu.—(*W. I.*)—Sum.–fall.

2. EUSTOMA Salisb. Annual relatively large herbs. Flowers solitary or in open panicles. Calyx-lobes 5 or 6, narrow. Corolla white, pink, violet, or purple, campanulate-funnelform: lobes 5 or 6, usually erose-denticulate, longer than the tube.—Five species, North American.



1. E. exaltatum (L.) Griseb. Stem 1–9 dm. tall: blades of the upper leaves elliptic to elliptic-lanceolate, 1.5–7 cm. long: calyx-lobes 10–12 mm. long: corolla rose-purple; lobes elliptic or oval, 17–20 mm. long: capsule 2–2.5 cm. long.—Pinelands, coastal sand-dunes, and hammocks, pen. Fla. and Florida Keys.—(*W. I.*)—All year.—Albino forms occur.

3. **SABBATIA** Adans. Annual or biennial, relatively slender herbs. Flowers solitary or in cymes. Calyx-lobes 4–12, narrow. Corolla white, or pink to lilac, or magenta, often with a distinct eye, rotate: lobes entire, longer than the tube.—About 20 species, North American.

Calyx-lobes and corolla-lobes usually 4 or 5. — I. ANGULARES.
Calyx-lobes and corolla-lobes 8–12. — II. DODECANDRES.

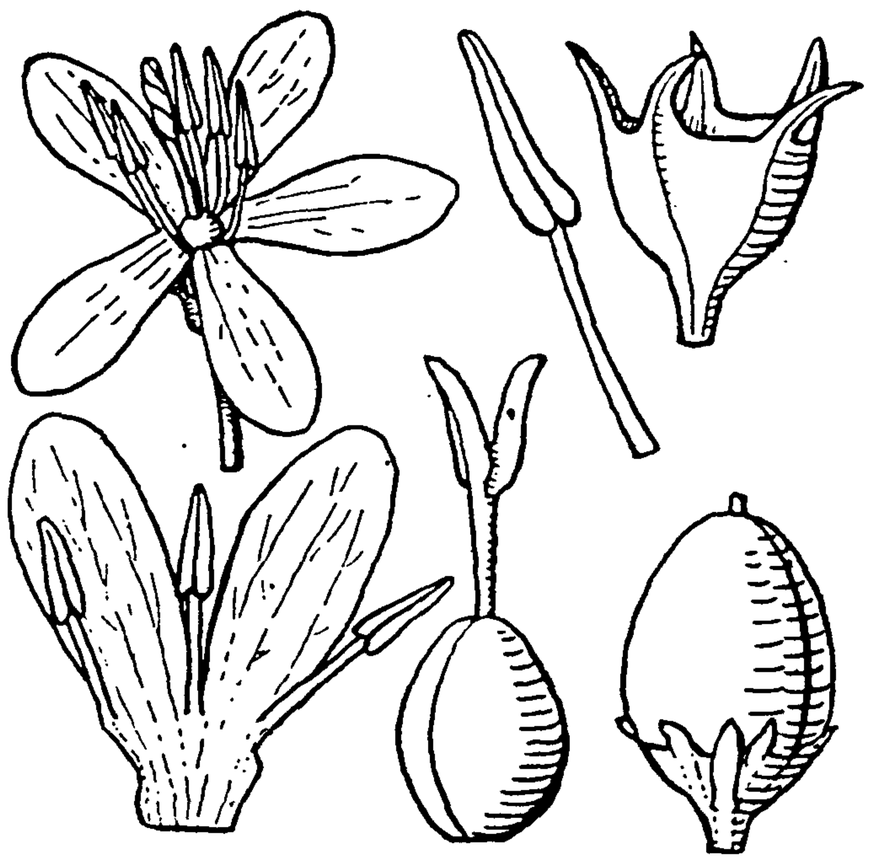
I. ANGULARES

Upper part of the stem with opposite branches.
  Stem and branches terete.
    Calyx-lobes shorter than the tube, erect: style and stigmas about equal in length. — 1. *S. macrophylla.*
    Calyx-lobes longer than the tube, recurved: style much shorter than the stigmas. — 2. *S. recurvans.*
  Stem and branches 4-ridged or 4-winged.
    Corolla-lobes elliptic to spatulate: upper leaves with narrow blades.
      Corolla white.
        Leaf-blades rounded at the base. — 3. *S. difformis.*
        Leaf-blades truncate and somewhat auricled at the base. — 4. *S. paniculata.*
      Corolla rose. — 5. *S. brachiata.*
    Corolla-lobes oval to obovate: upper leaves with broad blades. — 6. *S. angularis.*
Upper part of the stem with alternate branches.
  Corolla-lobes of a spatulate or oblanceolate type.
    Calyx-lobes foliaceous, mostly broadened upward. — 7. *S. calycina.*
    Calyx-lobes not foliaceous, narrowed upward. — 8. *S. Elliottii.*
  Corolla-lobes of an elliptic or oval type.
    Calyx-lobes typically about as long as the corolla-lobes: corolla mainly less than 3 cm. broad. — 9. *S. campanulata.*
    Calyx-lobes typically much shorter than the corolla-lobes: corolla mainly over 3.5 cm. broad. — 10. *S. grandiflora.*

II. DODECANDRES

Corolla-lobes elliptic-spatulate to oblanceolate, less than 25 mm. long, usually acutish at the tip.
  Calyx-lobes much shorter than the corolla.
    Calyx-lobes linear or slightly narrowed upward. — 11. *S. dodecandra.*
    Calyx-lobes linear-spatulate. — 12. *S. Harperi.*
  Calyx-lobes as long as the corolla or nearly so. — 13. *S. foliosa.*
Corolla-lobes obovate-spatulate, over 25 mm. long, usually rounded at the tip. — 14. *S. decandra.*

1. S. macrophylla Hook. Stem 6–10 dm. tall: blades of the upper leaves elliptic to elliptic-lanceolate or ovate-lanceolate, 2–6 cm. long, acute: calyx 2–3 mm. long; lobes shorter than the tube: corolla white; lobes 6–8 mm. long: capsule 3–4 mm. long.—Wet pinelands or acid bogs, Coastal Plain, Fla. to La. and Ga.—Sum.



2. S. recurvans Small. Similar to *S. macrophylla* in habit: calyx 4–5 mm. long; lobes longer than the tube: corolla white; lobes 5–6.5 mm. long: capsule 3.5–4.5 mm. long.—Low or moist pinelands, Coastal Plain, Fla. and Ga.—Sum.

3. S. difformis (L.) Druce. Stem 4–9 dm. tall: blades of the upper leaves ovate to lanceolate or linear-lanceolate, 1–4 cm. long, apiculate or acute: calyx 7–9.5 mm. long; lobes much longer than the tube: corolla white, drying yellowish; lobes 12–18 mm. long: capsule 5–6 mm. long. [*S. lanceolata* (Walt.) T. & G.]—Wet pinelands, and acid bogs, Coastal Plain, Fla. to Tenn. and N. J.—Spr.–sum.

4. S. paniculata (Michx.) Pursh. Stem 1–4 dm. tall: blades of the upper leaves elliptic to elliptic-lanceolate or nearly linear, 1–3 cm. long: calyx 6.5–7.5 mm. long; lobes somewhat longer than the tube: corolla white; lobes 10–14 mm. long; capsule 7–9 mm. long.—Acid meadows and pinelands, Coastal Plain, Fla. to Ala. and S Va.—Spr.–sum.

5. S. brachiata Ell. Stem 1–4 dm. tall: blades of the upper leaves elliptic to linear-lanceolate, 1.2–3.5 cm. long: calyx 7–8 mm. long; lobes much longer than the tube: corolla rose to white; lobes 11–15 mm. long: capsule 5–7 mm. long. [*S. angustifolia* (Michx.) Britton]—Moist soil, often in pinelands, Coastal Plain, and adj. provinces, Fla. to La., Mo., and N. C.—Spr.–sum.

6. S. angularis (L.) Pursh. Stem 3–8 dm. tall: blades of the upper leaves ovate to ovate-lanceolate, 1.5–3 cm. long: flowers fragrant; calyx 7–8 mm. long; lobes much longer than the tube: corolla typically deep-pink; lobes 10–18 mm. long: capsule 4.5–5.5 mm. long.—(ROSE-PINK. BITTER-BLOOM.)—Sterile woods, thickets, and meadows, various provinces, Fla. to La., Okla., Ont., and N. J.—Sum.

7. S. calycina (Lam.) Heller. Stem 1–4 dm. tall: blades of the upper leaves elliptic to elliptic-lanceolate, 2–6 cm. long: calyx 15–25 mm. long; lobes linear-oblanceolate or some of them merely linear, much longer than the tube: corolla rose or nearly white; lobes spatulate to elliptic-spatulate, mostly shorter than the calyx lobes: capsule 7–8 mm. long.—River-swamps and low hammocks, Coastal Plain, Fla. to Tex., Ark. and Va.—Spr.–sum.

8. S. Elliottii Steud. Stem 2–7 dm. tall: blades of the upper leaves elliptic to linear, 0.5–2 cm. long: calyx 7–8 mm. long; lobes about twice as long as the tube: corolla white or cream; lobes spatulate to oblanceolate, 10–13 mm. long, much longer than the calyx-lobes: capsule 4–5 mm. long.—Pinelands, Coastal Plain, Fla. to Ala., and Va.—Sum.–fall.

9. S. campanulata (L.) Torr. Stem 1–4 dm. tall: blades of the upper leaves narrow, but typically broader than the diameter of the stem or branches: calyx with filiform or nearly filiform lobes, typically about as long as the corolla: corolla deep-rose or magenta, with a yellow eye; lobes elliptic to spatulate-elliptic: capsule 6–8 mm. long.—Pinelands, sandy places. swamps, and meadows, various provinces, Fla., to La., Tenn., and Mass.—Sum.–fall.—A foliose variety with the blades of the lower leaves obovate to spatulate and of the upper leaves lance-elliptic varying to linear and with calyx lobes much shorter than the corolla occurs at various localities in the Coastal Plain from Fla. to La. and S N. C. This has sometimes been included in *S. stellaris* Pursh.

10. S. grandiflora (A. Gray) Small. Stem 8–12 dm. tall: blades of the upper leaves typically stout-filiform or nearly so, mainly narrower than the diameter of the stem and the branches, 3–10 cm. long: calyx with filiform or very narrow lobes much shorter than the corolla: corolla deep-rose or magenta, the eye yellow; lobes oval or elliptic-oval to rhombic-obovate: capsule 8–10 mm. long.—Everglades, low pinelands, and prairies, pen. Fla.—All year.

11. S. dodecandra (L.) B. S. P. Stem 2–4 dm. tall: blades of the upper leaves narrowly lanceolate to linear, 2–4 cm. long: calyx-lobes linear or nearly so: corolla rose-purple or white, the eye yellow; lobes spatulate to elliptic-spatulate, 2–2.5 cm. long: capsule 8–9 mm. long.—Pinelands, Coastal Plain, Fla. to La. and S N. Y.—Sum.–fall.

12. S. Harperi Small. Stem 2–6 dm. tall: blades of the upper leaves elliptic-lanceolate to lanceolate, 1.5–3.5 cm. long: calyx-lobes linear-spatulate: corolla bright-pink or whitish, the eye yellow; lobes spatulate to elliptic-spatulate, much longer than the calyx-lobes: capsule 5–7.5 mm. long.—Swamps or pond-margins in pinelands, Coastal Plain, N Fla. and Ala. to S. C.—Spr.

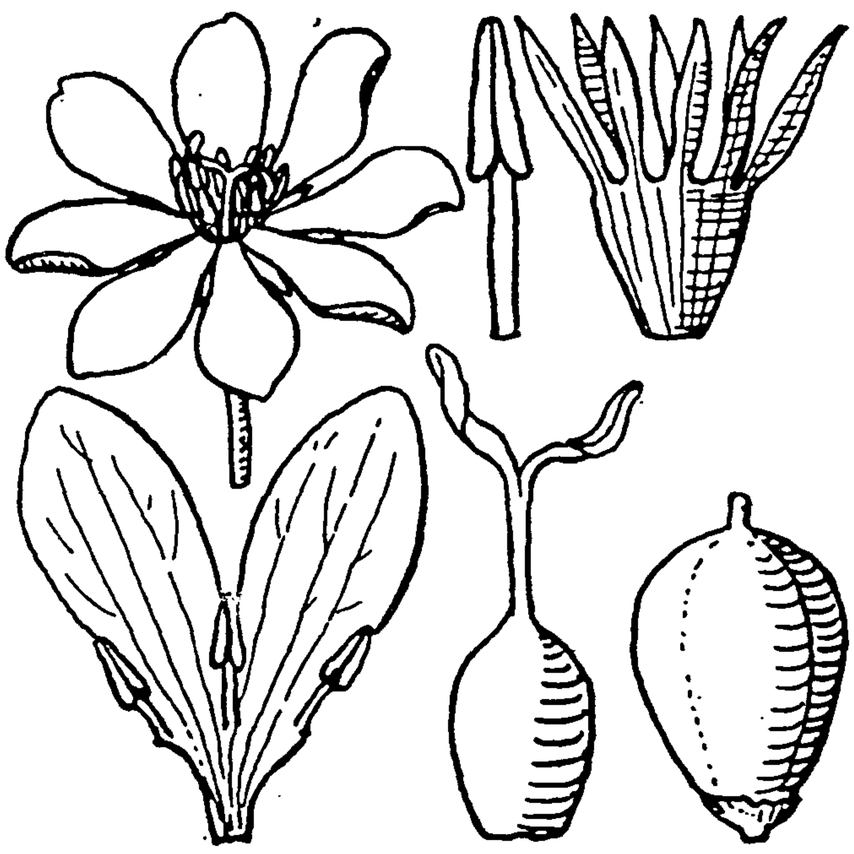
13. S. foliosa Fernald. Stem 1–5 dm. tall: blades of the upper leaves linear-elliptic to linear-lanceolate or almost linear, 2–6.5 cm. long: calyx-lobes linear: corolla rose, the eye yellow; lobes oblanceolate to elliptic-spatulate, about as long as the calyx-lobes: capsule 5–7 mm. long.—Low grounds, Coastal Plain, Fla. and Ala.—Spr.–fall.

14. S. decandra (Walt.) Harper. Stem 6–9 dm. tall: blades of the upper leaves linear-subulate, 3–10 cm. long, lower leaves spatulate: calyx-lobes subulate: corolla deep-rose to white, the eye yellow: lobes obovate-spatulate, 2.5–3.5 cm. long: capsule about 10 mm. long.—Shallow pineland ponds, Coastal Plain, Fla. to Ala. and S. C.—Sum.–fall.

4. LAPITHEA Griseb. Annual or biennial herbs. Flowers solitary or in a congested cyme. Calyx-lobes mostly 7–10, narrow, unequal. Corolla red, purple, or pink, rotate: lobes mostly 7–10, longer than the tube.—Only the following species:

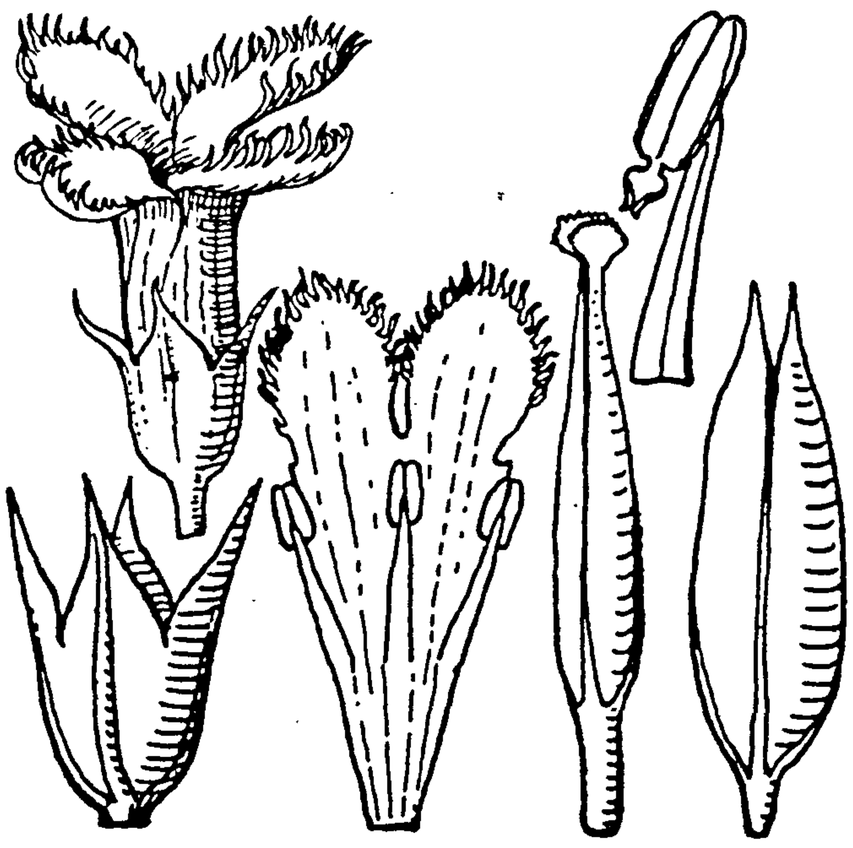
Blades of the cauline leaves above the lower part of the stem elliptic to elliptic-lanceolate: bracts of the involucre linear-elliptic to lanceolate. 1. *L. capitata.*
Blades of the cauline leaves above the lower part of the stem narrowly lanceolate: bracts of the involucre narrowly linear-attenuate. 2. *L. gentianoides.*

1. L. capitata (Raf.) Small. Stem 2–4 dm. tall: blades of the upper leaves elliptic to elliptic-lanceolate, 1.5–4 cm. long: bracts oval or elliptic: calyx-lobes linear or linear-lanceolate: corolla pink or whitish; lobes broadly spatulate, 15–20 mm. long. [*Pleienta capitata* Raf. *Sabbatia Boykinii* A. Gray *L. Boykinii* Small]—Rich woods, Blue Ridge to Appalachian Plateau, Ga. and Ala.—Sum.–fall.



2. L. gentianoides (Ell.) Griseb. Stem 2–7 dm. tall: blades of the upper leaves linear, 3–10 cm. long: bracts linear: calyx-lobes linear-subulate: corolla reddish, lilac or pink-purple; lobes spatulate or elliptic-spatulate, 20–25 mm. long. [*Sabbatia gentianoides* Ell.]—Low pinelands, Coastal Plain, Fla. to Tex. and Ga.—Sum.

5. ANTHOPOGON Neck. Annual, biennial, or rarely perennial herbs. Flowers solitary at the ends of the stem and its branches, the whorls mostly of 4 parts each. Calyx relatively large: lobes keeled, unequal, the inner ones broader than the outer and hyaline or scarious-margined. Corolla salverform to funnelform: lobes shorter than the tube, without plaits in the sinuses. Stigmas very broad.—About 50 species, widely distributed.



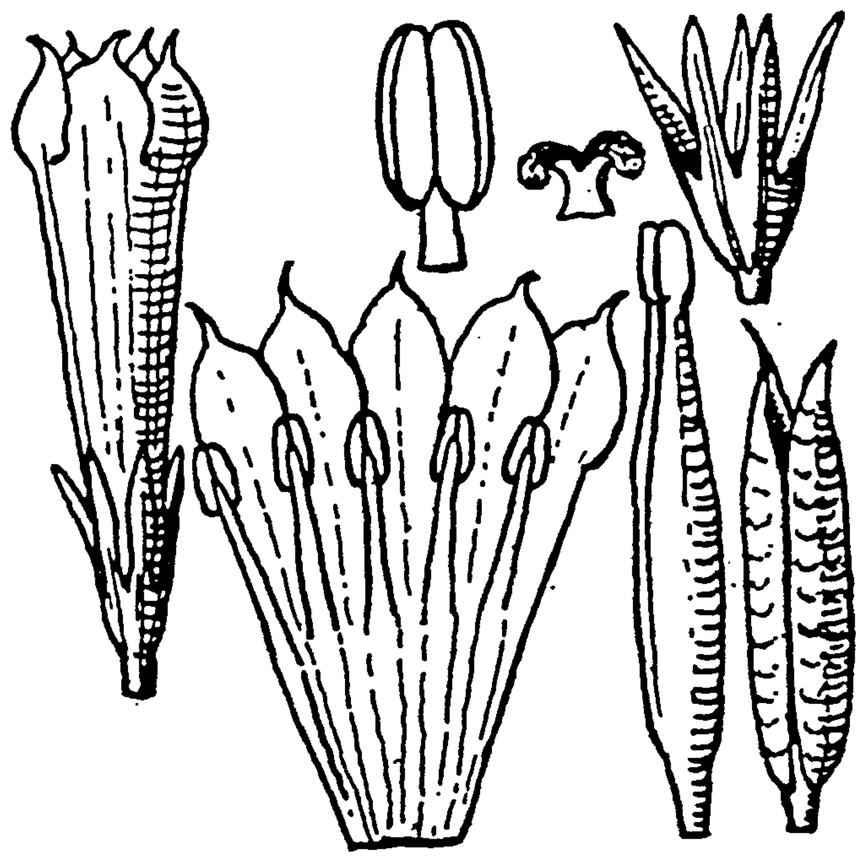
1. A. crinitum (Froel.) Raf. Stem 2–5 dm. tall, mostly branched: leaf-blades ovate to lanceolate, mainly 2–5 cm. long, partly clasping: calyx 25–30 mm. long: corolla sky-blue, 4–5 cm. long lobes fimbriate; capsule about 3 cm. long. [*Gentiana crinata* Froel.]—(FRINGED-GENTIAN.)—Swamps, moist

thickets, and meadows, various provinces, Coastal Plain only N, Ga. to N. D. and Que.—Fall.

6. **GENTIANELLA** Moench. Annual, biennial, or perennial herbs. Flowers solitary or in open or contracted cymes, the whorls of 4 parts each, or sometimes of 5 parts. Calyx relatively small: lobes essentially equal or the outer ones broader than the inner. Corolla blue or pale bluish-purple, funnelform or salverform: lobes shorter than the tube, with plaits in the sinuses, but often filamentose at the base.—Numerous species of wide geographic distribution.

Calyx-lobes shorter than the tube: corolla-lobes ovate. 1. *G. quinquefolia.*
Calyx-lobes longer than the tube: corolla-lobes lanceolate. 2. *G. occidentalis.*

1. **G. quinquefolia** (L.) Small. Stem 1–11 dm. tall, mostly branched, 4-winged; leaf-blades ovate to lanceolate, 2–3 cm. long, partly clasping; calyx-lobes spatulate, 2–3 mm. long: corolla blue or purplish-blue, 18–20 mm. long: capsule about 14 mm. long. [*Gentiana quinqueflora* Lam.] — (AGUE-WEED. STIFF-GENTIAN.) — Rich woods or moist calcareous soil, various provinces, rarely Coastal Plain, Fla. to Mo., Mich., Ont., and Me.—Sum. & fall.



2. **G. occidentalis** (A. Gray) Small. Similar to the preceding species in habit: flowers larger: calyx-lobes linear or linear-lanceolate, 8–11 mm. long: corolla 22–24 mm. long, pale-blue: capsule fully 15 mm. long. —Moist soil, various provinces, Miss. to La., Minn., and Ohio.—Sum.–fall.

7. **DASYSTEPHANA** Adans. Annual, biennial, or perennial herbs. Flowers in a compact terminal cyme and axillary cymes or solitary, the whorls mainly of 5 parts each. Calyx persistent: lobes minute or foliaceous, more or less unequal. Corolla funnelform or clavate, with neither glands at the base of the tube nor filaments at the base of the lobes: lobes much shorter than the tube, with plaits at the sinuses. Stigmas narrow. Capsule stipitate.—About 75 species, natives of the north temperate zone.—Fall.—GENTIANS.

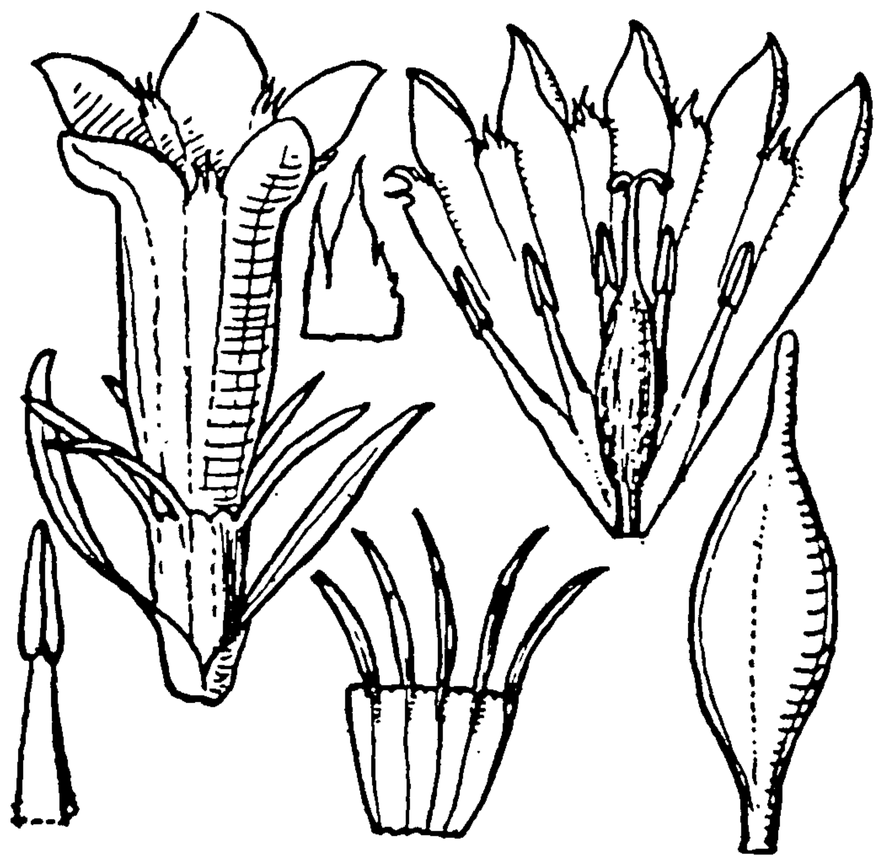
Flowers sessile, clustered: corolla-lobes shorter than the plaits in their sinuses or decidedly longer, erect, ascending, or converging. I. LATIFOLIAE.
Flowers pedicelled, solitary: corolla-lobes much longer than the plaits, spreading, or reflexed. II. ANGUSTIFOLIAE.

I. LATIFOLIAE

Corolla open funnelform: anthers separate. 1. *D. puberula.*
Corolla campanulate-funnelform to clavate: anthers cohering in a tube or a ring.
  Corolla blue.
    Corolla-lobes larger and longer (only slightly so in *D. Saponaria*) than the plaits.
      Corolla-lobes decidedly longer than the plaits: stem pubescent.
        Calyx-tube glabrous.
          Leaf-blades rounded or subcordate at the base: corolla-plaits with 2 unequal fimbriate lobes. 2. *D. parvifolia.*
          Leaf-blades narrowed at the base: corolla-plaits with 2 equal, nearly entire lobes. 3. *D. latifolia.*
        Calyx-tube pubescent. 4. *D. decora.*
      Corolla-lobes slightly longer than the plaits: stem glabrous. 5. *D. Saponaria.*
    Corolla-lobes very small, mostly smaller and shorter than the plaits. 6. *D. Andrewsii.*

Corolla white, more or less tinged with green or yellow, or greenish-white or purplish-green.	
Calyx-lobes shorter than the tube: leaf-blades broad at the base and more or less clasping: seeds winged.	7. *D. flavida.*
Calyx-lobes longer than the tube: leaf-blades narrowed at the base: seeds wingless.	8. *D. villosa.*
II. ANGUSTIFOLIAE	
Corolla-limb deep-blue: free portions of the filaments lanceolate.	9. *D. Porphyrio.*
Corolla-limb white: free portions of the filaments subulate.	10. *D. tenuifolia.*

1. D. puberula (Michx.) Small. Plant 2–4.5 dm. tall, finely pubescent or puberulent: blades of the upper leaves lanceolate or elliptic-lanceolate: calyx 18–26 mm. long; lobes linear to narrowly linear-lanceolate, about as long as the tube: corolla rose-purple, 3.5–5 cm. long; lobes broadly ovate, ascending; plaits cleft and laciniate, much shorter than the lobes: capsule-body about 2 cm. long.—Dry prairies and stony soil, various provinces N of Coastal Plain, Ga. to Kans., S. Dak., and Md.—Differs from our other blue-flowered species in the widely open corolla-throat and large ascending lobes which conspicuously exceed the narrow deeply-lobed plaits.



2. D. parvifolia (Chapm.) Small. Plant 2–7 dm. tall, finely pubescent: blades of the upper leaves ovate to lanceolate or elliptic-lanceolate, 1.5–4 cm. long: calyx 25–30 mm. long; lobes linear to linear-elliptic, much longer than the tube: corolla rose-purple or blue, 4.5 cm. long; plaits cleft and erose-toothed: lobes rounded: capsule-body about 2.5 cm. long. [*Gentiana Elliottii* Chapm.]—River-banks, wet woods, and ditches, Coastal Plain, Fla. to Ala. and Va.—Somewhat resembles the preceding in the shape of the corolla; but differs in the small narrow slightly lobed and decidedly toothed plaits.

3. D. latifolia (Chapm.) Small. Plant 3–8 dm. tall, finely pubescent: blades of the upper leaves elliptic to broadly elliptic or sometimes nearly linear, 2–8 cm. long: calyx 15–25 mm. long; lobes linear to linear-lanceolate, commonly shorter than the tube or fully as long: corolla rose-purple, 4–5 cm. long; lobes acute; plaits cleft and somewhat erose: capsule-body nearly 2.5 cm. long. [*Gentiana Elliottii latifolia* Chapm.]—Moist soil, Coastal Plain, Fla. to Ala. and S Va.—Larger than the next preceding, with more typically elliptic leaf-blades, and with larger scarcely toothed corolla-plaits.

4. D. decora (Pollard) Small. Plant similar to that of *D. latifolia* in habit: leaf-blades thinner, more decidedly acuminate: calyx less than 15 mm. long; lobes subulate to linear-subulate or lanceolate, shorter than the tube: corolla purple, 2.5–3 cm. long; lobes longer than the plaits: plaits very broad, rather truncate and erose: capsule-body about 2 cm. long.—Moist mt. woods, Blue Ridge, Ga. to Va.—Differs from all the preceding species and from the next following in the small calyx-lobes and from all related species in the small corolla-lobes which are separated by wide broadly 2-lobed erose plaits.

5. D. Saponaria (L.) Small. Plant 3–8 dm. tall, glabrous: blades of the upper leaves lanceolate to ovate-lanceolate or elliptic, 2.5–7.5 cm. long: calyx 15–22 mm. long; lobes spatulate to linear-spatulate, as long as the tube or shorter: corolla blue or purplish-blue, 3.5–4 cm. long; lobes mainly shorter than the plaits: plaits narrow, cleft and incised-laciniate: capsule-body fully 1.5 cm. long. [*Gentiana Saponaria* L.]—(SOAPWORT-GENTIAN.)—Moist shaded banks

and woods, often in acid soil, various provinces, Ga. (or Fla.?), to La., Minn., Ont., and Conn.—Readily distinguished from related species by the large lobed and somewhat laciniate corolla-plaits which about equal the corolla-lobes.

6. **D. Andrewsii** (Griseb.) Small. Plants 3–10 dm. tall, glabrous; blades of the upper leaves lanceolate, elliptic-lanceolate, ovate-lanceolate or ovate, mainly 4–9 cm. long: calyx mostly 11–19 mm. long; lobes elliptic, oval, or ovate, shorter than the tube, rather loosely spreading: corolla blue or purplish-blue or exceptionally white, 2.5–4 cm. long; lobes inconspicuous, very short, much broader than long, abruptly pointed, much exceeded by the broad, somewhat truncate unequally 2-lobed and erose toothed plaits: capsule-body 2–2.5 cm. long. [*Gentiana Andrewsii* Griseb.]—Moist woods, meadows, prairies and swampy thickets, often in calcareous soil, various provinces, in Coastal Plain only northward, Ga. to Ark. (Kans.?), N. Dak., and Me.—Easily distinguished from all our other species by the small inconspicuous corolla-lobes which are much exceeded by the large broad-topped plaits.

7. **D. flavida** (A. Gray) Britton. Plants 2–9 dm. tall, glabrous: blades of the upper leaves lanceolate to ovate, not of an obovate type, 5–11 cm. long: calyx 11–20 mm. long; lobes ovate to orbicular-ovate, shorter than the tube, reflexed-spreading: corolla white, or sometimes tinged with yellow, 3–4 cm. long; lobes deltoid-ovate to reniform-ovate, longer than the coarsely and irregularly few-toothed plaits: capsule-body about 2 cm. long.—Woods, prairies, moist banks and somewhat acid meadows, various provinces N of Coastal Plain, N. C. to Ark., Mo., Ont., and W Pa.—May be distinguished from our other species by the white or yellow-tinged corolla and the short and broad calyx-lobes.

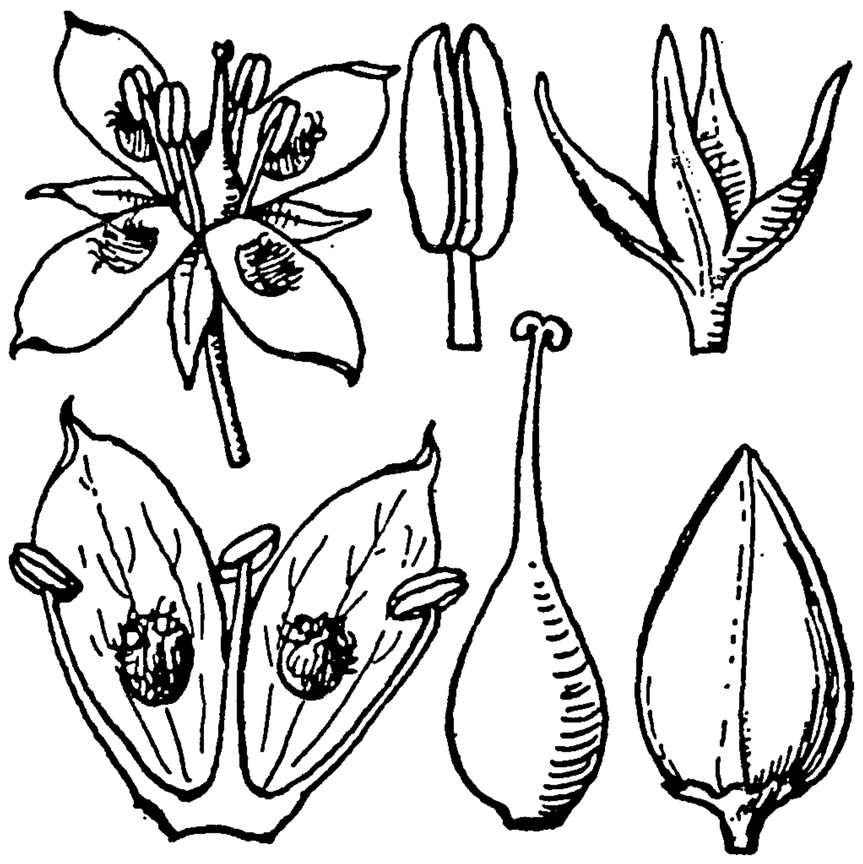
8. **D. villosa** (L.) Small. Plant 1–6 dm. tall, glabrous: blades of the upper leaves elliptic, oval, cuneate-obovate, or obovate, not of an ovate type, 2–8 cm. long: calyx 25–40 mm. long; lobes linear to linear-spatulate, longer than the tube, erect or nearly so: corolla greenish-white or purplish-green, 4–5 cm. long; lobes ovate to deltoid-ovate, much longer than the entire or merely 2-lobed plaits: capsule-body 2.5–3 cm. long. [*Gentiana ochroleuca* Froel.]—Grassy thickets, acid open woods, and pinelands, various provinces, Fla. to La., Tenn., and N. J.—Differs from our other species in the mainly greenish-white corolla and narrow calyx-lobes.

9. **D. Porphyrio** (J. F. Gmel.) Small. Plant mostly 2–4.5 dm. tall, the stem simple or rarely branched: leaf-blades narrow, those of the lower leaves spatulate, those of the upper linear-spatulate to linear: calyx-lobes linear-subulate: corolla deeply colored, the limb deep-blue; lobes ovate, entire or obscurely erose: plaits rather sparingly laciniate: capsule-body 1.5–2 cm. long.—Pinelands, and margins of acid pools, Coastal Plain, S. C. to N. J.—This and the following species differ from all the preceding in the funnelform corolla and laciniate plaits.

10. **D. tenuifolia** (Raf.) Pennell. Plant mostly 1–2 dm. tall, the stem usually simple: leaf-blades very narrow, those of the lower leaves linear-spatulate, those of the upper narrowly linear: calyx-lobes linear-subulate: corolla white or greenish-white, the limb white; lobes ovate, evidently erose-toothed: plaits rather copiously laciniate: capsule-body about 1.5 cm. long.—Low pinelands, M Fla.—Most readily separated from the next preceding species by its low stature and white or greenish-white corolla-limb.

8. **FRASERA** Walt. Biennial or perennial herbs, usually coarse and with hollow stems. Flowers in panicled cymes. Calyx-lobes 4, narrow. Corolla

white, yellowish, or bluish, rotate: lobes 4, longer than the tube, each with 1 or 2 glands.—Five species, North American.

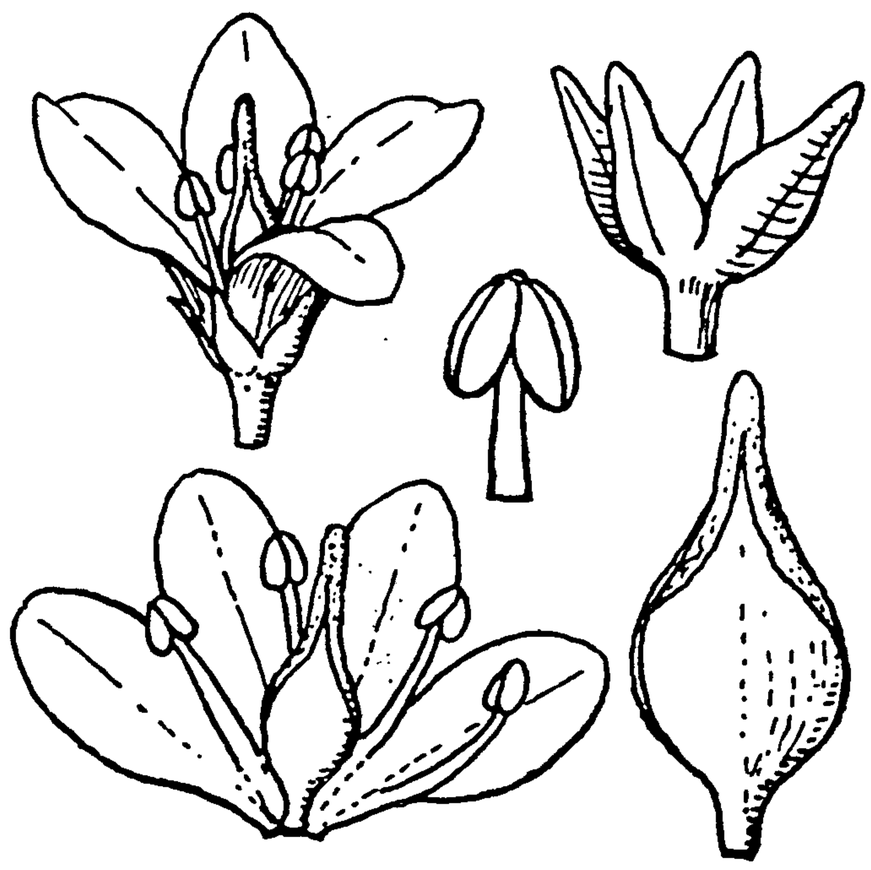


1. F. carolinensis Walt. Stem 1–2.5 m. tall: leaves usually in whorls of 4; blades spatulate to elliptic or elliptic-lanceolate, 1–3 dm. long: calyx-lobes linear to linear-lanceolate, acuminate: corolla ochroleucous and purple-dotted; lobes broadly elliptic to oval, 13–16 mm. long, each with a fringed gland below the middle: capsule ovoid, about 2 cm. long. —Rich woods, and dry, calcareous slopes, various provinces, Ga. to La., Ont., and W N. Y.—Spr.–sum.—This plant is usually triennial, blooming the second year after the seed germinates, and dying as soon as the new seed is perfected.

9. BARTONIA Muhl. Annual or biennial, slender wiry herbs. Leaves mere narrow scales. Flowers in racemose or panicled cymes, or solitary, each subtended by a narrow bract. Calyx-lobes 4, keeled, narrowed upward. Corolla white or yellowish, rotate: lobes 4, longer than the tube.—Four species, of eastern North America.—Sum.–fall.

Corolla 6 mm. long or more; lobes spatulate to obovate-spatulate. 1. *B. verna.*
Corolla 5 mm. long or less; lobes lanceolate to elliptic.
  Corolla-lobes elliptic, more or less erose, abruptly pointed: branches and pedicels stiff. 2. *B. virginica.*
  Corolla-lobes lanceolate, entire, acute or acuminate: branches and pedicels lax. 3. *B. lanceolata.*

1. B. verna (Michx.) Muhl. Plant 0.5–3 dm. tall: leaves (scales) opposite, 1–2 mm. long: calyx-lobes linear-lanceolate: corolla white: lobes 7–10 mm. long: capsule 5–6 mm. long.—Moist pinelands, prairies, and lake shores, Coastal Plain, Fla. to La. and Va.—Wint.–spr.

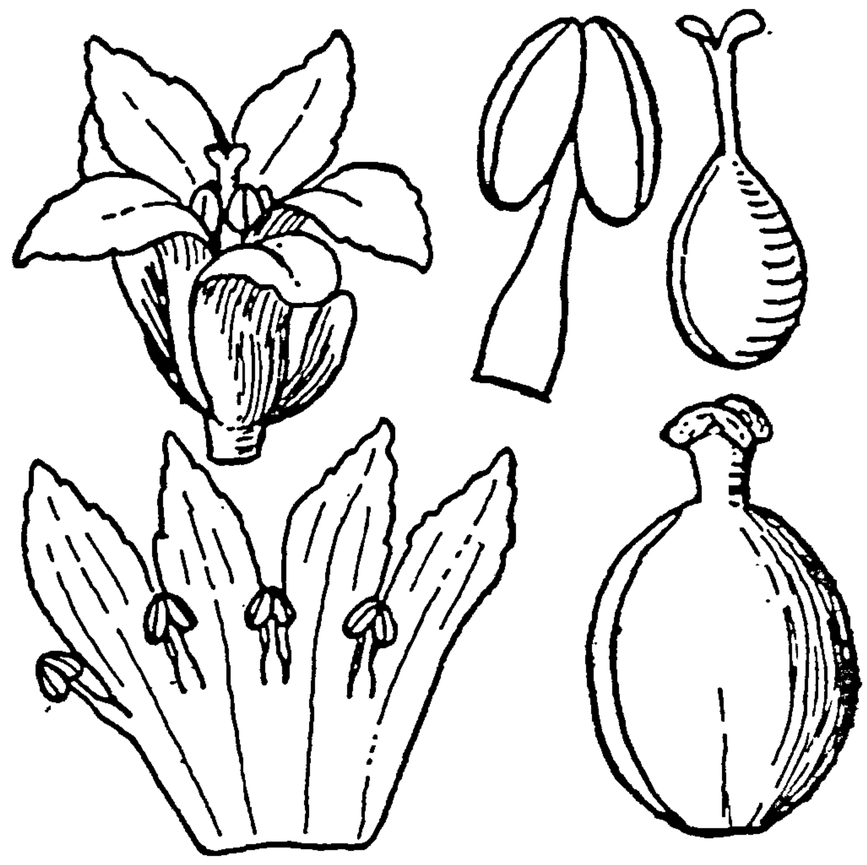


2. B. virginica (L.) B. S. P. Plant 1–4 dm. tall: leaves (scales) opposite, or alternate on small plants: calyx-lobes subulate or lanceolate-subulate: corolla yellowish-white; lobes mostly 2–2.5 mm. long: capsule 3–5 mm. long.—Open woods, swamps, and grassy banks, in acid soil, various provinces, Fla. to La., Minn., and Newf.

3. B. lanceolata Small. Plant 2–6 dm. tall: leaves (scales) opposite or alternate: calyx-lobes similar to those of *B. virginica*: corolla greenish-white; lobes mostly 2.5–3 mm. long: capsule 4–5 mm. long.—Wet pinelands and swamps, Coastal Plain and rarely adj. provinces, Fla. to Ark. and N. Y.—In this and the next preceding species the plants are often yellowish, containing little chlorophyl and apparently living, at least in part, as saprophytes in decaying organic matter.

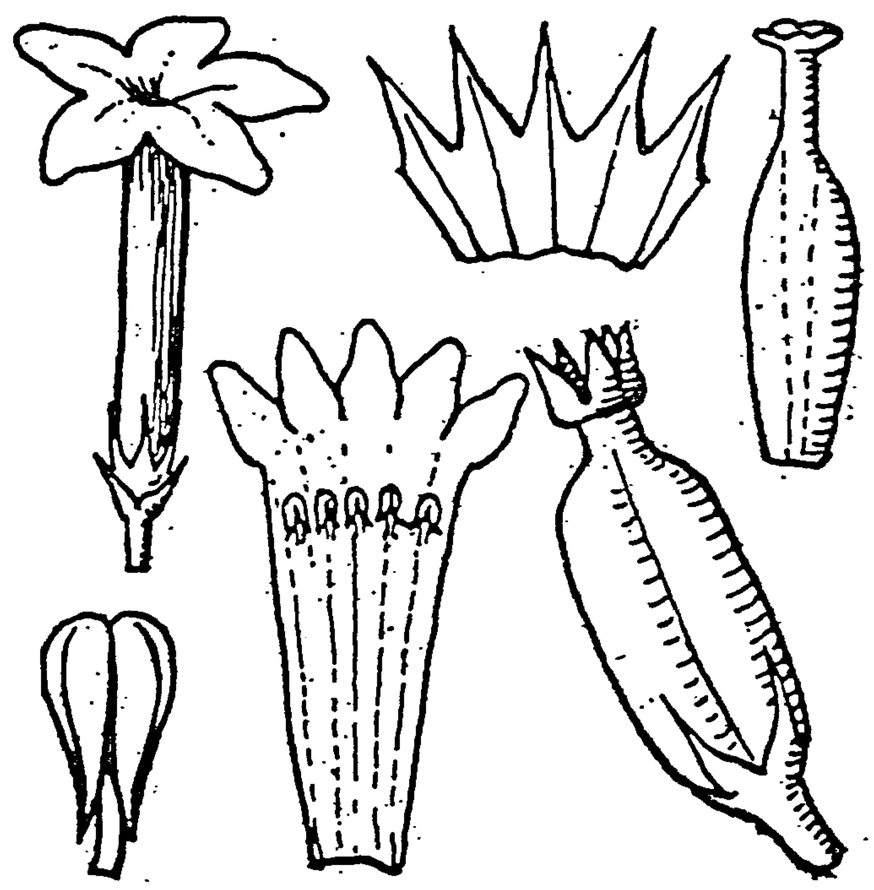
10. OBOLARIA L. Perennial small, but stout succulent herbs. Leaves mere dilated scales. Flowers in spike-like cymes, each subtended by a dilated

bract. Calyx-lobes 2, dilated upward. Corolla white, pinkish, or purplish, broadly funnelform: lobes 4, about as long as the tube.—One species.



1. **O. virginica** L. Plant purplish-green, 5–20 cm. tall: leaves (scales) 5–10 mm. long, the upper ones broadened upward, longer than the lower ones: calyx-lobes spatulate or elliptic-spatulate: corolla 7–10 mm. long: lobes nearly as long as the tube, acute: capsule 5–6 mm. long.—(PENNYWORT.)—Moist thickets and rich woods, various provinces, Fla. to Tex., Ill., and N. J.—Spr.

11. **LEIPHAIMOS** Schlecht. & Cham. Annual or perennial humus-plants. Leaves mere scales. Flowers solitary or in cymes. Calyx-lobes 4 or 5, narrow, commonly about as long as the tube. Corolla white or variously colored, salverform: lobes 4 or 5, much shorter than the tube.—About 20 species, mostly tropical American.



1. **L. parasitica** Schlecht. & Cham. Plant pale, 1–4 dm. tall: leaves (scales) opposite, 3–5 mm. long: calyx-lobes lanceolate, acute: corolla white or pink, 6–8 mm. long, about twice as long as the calyx; lobes triangular to lanceolate: capsule 5–6 mm. long. [*Voyria mexicana* Griseb.]—Hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—All year.

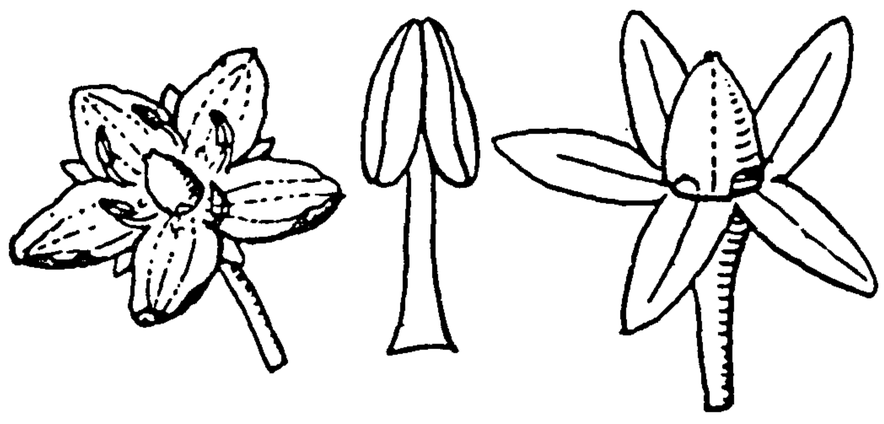
FAMILY 3. MENYANTHACEAE — BOGBEAN FAMILY

Perennial aquatic or bog herbs. Leaves alternate; blades simple or 3-foliolate. Flowers perfect, solitary, or in clusters or racemes. Calyx of 5 partly united sepals. Corolla white or colored, rotate or funnelform. Androecium of 5 stamens, with the filaments partly adnate to the corolla-tube. Gynoecium of 2 united carpels. Style very short. Fruit a capsule, sometimes indehiscent.—Five genera and about 35 species, widely distributed.

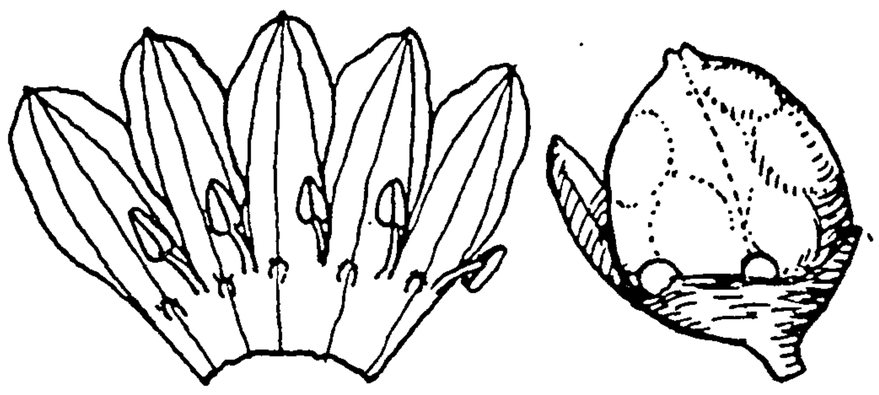
1. **NYMPHOIDES** [Tourn.] Hill. Aquatic herbs. Leaves with elongate petioles and broad blades with a deep basal sinus. Flower-clusters sometimes tuber-bearing, borne on a petiole-like stalk. Calyx-lobes narrow. Corolla rotate. Filaments adnate to near the middle of the corolla-tube or above it. Capsule ellipsoid to ovoid. [*Limnanthemum* J. F. Gmel.]—About 20 species, widely distributed in temperate and tropical regions.—FLOATING-HEARTS.

Leaf-blades relatively small: corolla about twice as long as the calyx: capsule slightly longer than the calyx: seed smooth. 1. *N. lacunosum.*
Leaf-blades relatively large: corolla about thrice as long as the calyx: capsule about twice as long as the calyx: seed tuberculate. 2. *N. aquaticum.*

1. N. lacunosum (Vent.) Kuntze. Leaf-blades ovate or orbicular-ovate, 2–4.5 cm. long: flower-clusters usually with tubers: corolla white: filaments adnate to above the middle of the corolla-tube, the free portion longer than the anther: capsule about 4 mm. long. [*L. lacunosum* Griseb.] —Shallow water, various provinces, Fla. to La., Minn., Ont., and Me.—Spr.–fall.



2. N. aquaticum (Walt.) Kuntze. Leaf-blades suborbicular to reniform, 5–15 cm. in diameter: flower-clusters usually without tubers: corolla white: filaments adnate to below the middle of the corolla-tube, the free portion shorter than the anther: capsule about 6 mm. long. [*L. trachyspermum* A. Gray]—Ponds and slow streams, Coastal Plain, Fla. to Tex. and N. J.—Spr.–sum.



Order **ASCLEPIADALES**—Asclepiadal Order

Herbs, shrubs or trees, commonly with a milky juice. Leaves alternate or opposite: blades entire. Inflorescence cymose, sometimes umbellate. Calyx of usually 5, partially united, sepals. Corolla of usually 5 partially united petals. Androecium of 5 distinct or monadelphous stamens. Pollen granular, or in waxy masses. Gynoecium of usually 2 carpels sometimes only united at the apex. Stigma terminal. Fruit a pair of follicles, or drupaceous.

Styles united: stamens distinct: pollen loosely granular. Fam. 1. Apocynaceae.
Styles distinct: stamens monadelphous: pollen united into waxy masses. Fam. 2. Asclepiadaceae.

Family 1. **APOCYNACEAE** — Dogbane Family

Perennial herbs, vines, shrubs or trees, mostly with a milky acrid juice. Leaf-blades simple. Androecium of 5 stamens with the anthers converging around the stigma or partly adhering to it. Filaments partially adnate to the corolla-tube. Pollen-grains simple. Gynoecium of 2 distinct carpels or 2 united carpels. Styles united. Stigmas simple. Fruit usually of 2 follicles or drupes. Seed often appendaged.—About 130 genera and 1,100 species, widely distributed but mostly tropical.

Carpels distinct: fruit a pair of follicles or drupes, sometimes single by abortion.
  Anthers unappendaged at the base, not connected with the stigma: corolla-lobes sinistrorsely convolute. I. Vinceae.
  Anthers appendaged at the base, converging around the stigma and partially adherent to it: corolla-lobes dextrorsely convolute. II. Echitideae.
Carpels united: fruit a 1-celled capsule. III. Allamandae.

I. Vinceae

Fruit drupaceous: shrubs or trees.
  Corolla salverform, relatively small; lobes equilateral, shorter than the tube. 1. Vallesia.
  Corolla funnelform, relatively large; lobes inequilateral, longer than the tube. 2. Cerbera.
Fruit a pair of follicles: herbs, sometimes partially shrubby.
  Flower without a disk: leaves alternate. 3. Amsonia.
  Flower with a 2-lobed disk: leaves opposite.

Anther with a foliaceous connective: carpels 6–8-ovuled: stigma glabrous: corolla funnelform. 4. VINCA.
Anther with an inconspicuous connective: carpels several-ovuled: stigma pubescent: corolla salverform. 5. CATHARANTHUS.

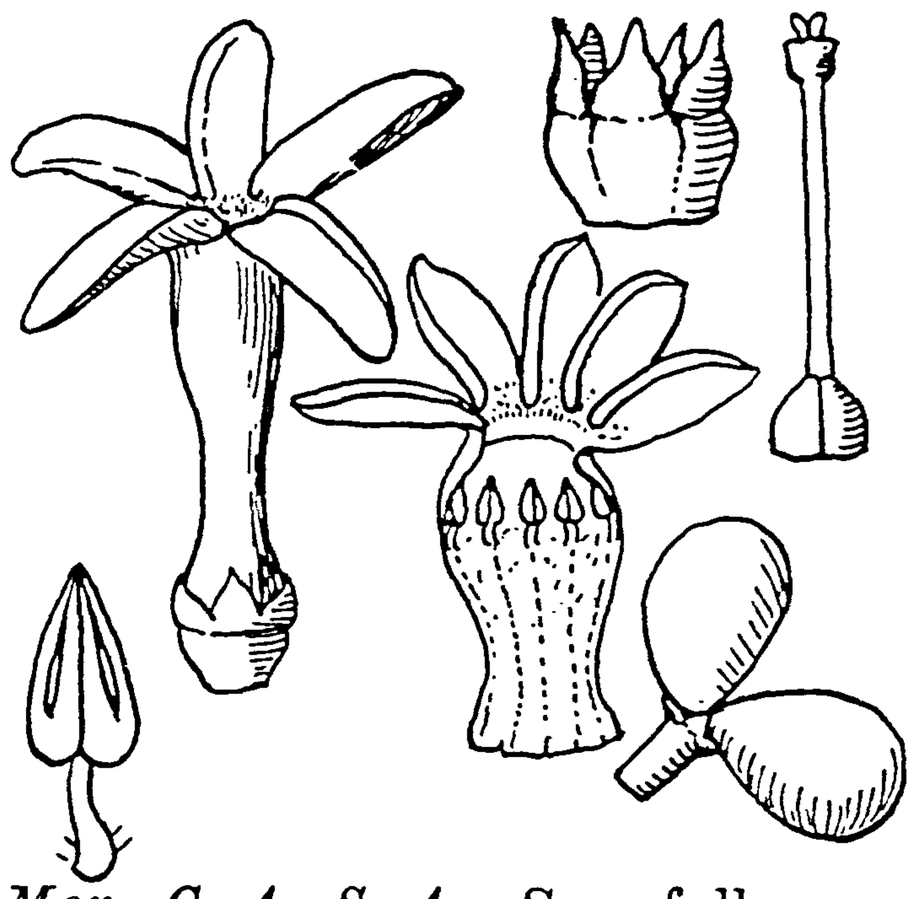
II. ECHITIDEAE

Shrubs or trees. 6. NERIUM.
Herbs or vines.
Corolla appendaged within: calyx-tube partially attached to the gynoecium by the thick disk: upright herbs. 7. APOCYNUM.
Corolla unappendaged: calyx-tube wholly free: vines.
Stigmas appendaged with a reversed cup or 5 lobes.
Corolla funnelform, the throat widened upward.
Calyx-lobes relatively long and narrow: scale-like glands borne at the base of the calyx within. 8. URECHITES.
Calyx-lobes relatively broad and short: scale-like glands wanting. 9. RHABDADENIA.
Corolla salverform, the throat narrowed upward. 10. ECHITES.
Stigma merely thickened. 11. TRACHELOSPERMUM.

III. ALLAMANDAE

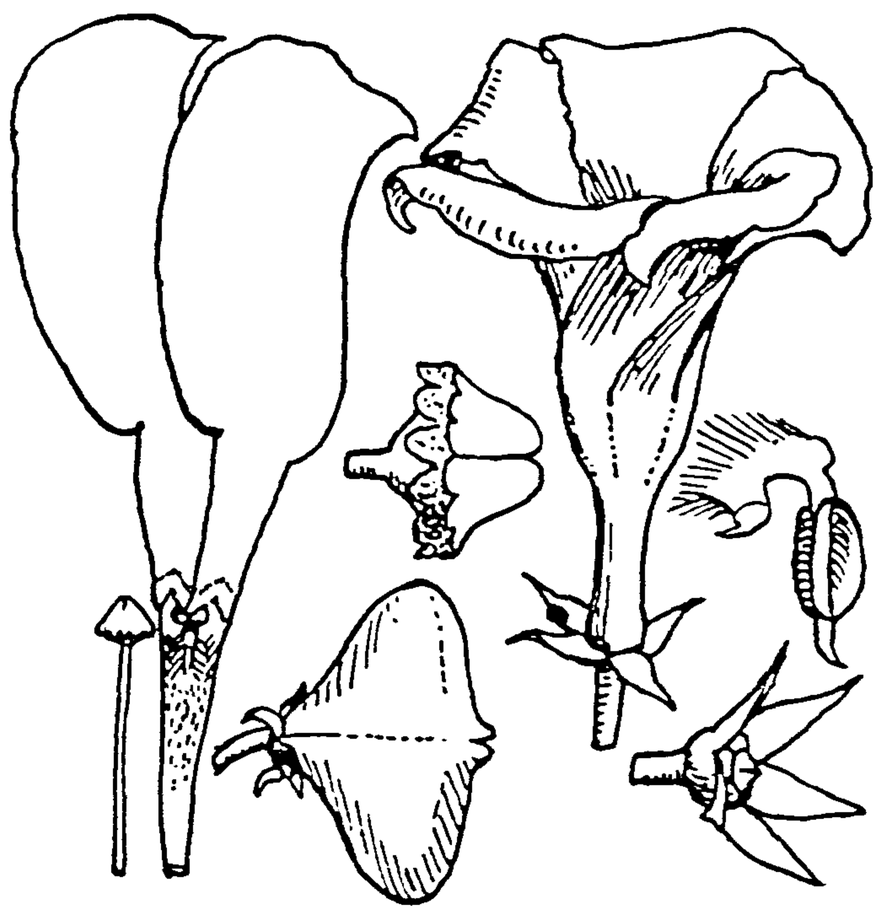
Shrub with opposite, sometimes whorled leaves, yellow funnelform corollas, and echinate capsules. 12. ALLAMANDA.

1. **VALLESIA** R. & P. Shrubs. Leaves alternate: blades relatively broad. Calyx-lobes short. Corolla salverform, the throat contracted at the mouth: lobes shorter than the tube, equilateral. Stamens adnate up to the throat of the corolla: anthers cordate: disk wanting. Carpels 2. Drupe narrow. Seeds clavate, unappendaged.—Two species tropical American.



1. **V. glabra** Cav. Shrub 3 m. tall or less, the branches sometimes elongate and vine-like: leaves remote; blades elliptic to elliptic-lanceolate, 4–7 cm. long: calyx-lobes deltoid to ovate-deltoid, less than 1 cm. long: corolla white; tube 5–6 mm. long; lobes linear-elliptic, 3–4 mm. long; drupe 10–14 mm. long.—Hammocks, Florida Keys.—(*W. I.*) *Mex.*, *C. A.*, *S. A.*—Spr.–fall.

2. **CERBERA** L. Shrubs or trees. Leaves alternate: blades relatively narrow. Calyx-lobes long. Corolla funnelform, the throat not constricted at the mouth. Drupe broad. Seeds angular. [*Thevetia* L.]—About 7 species, tropical American.



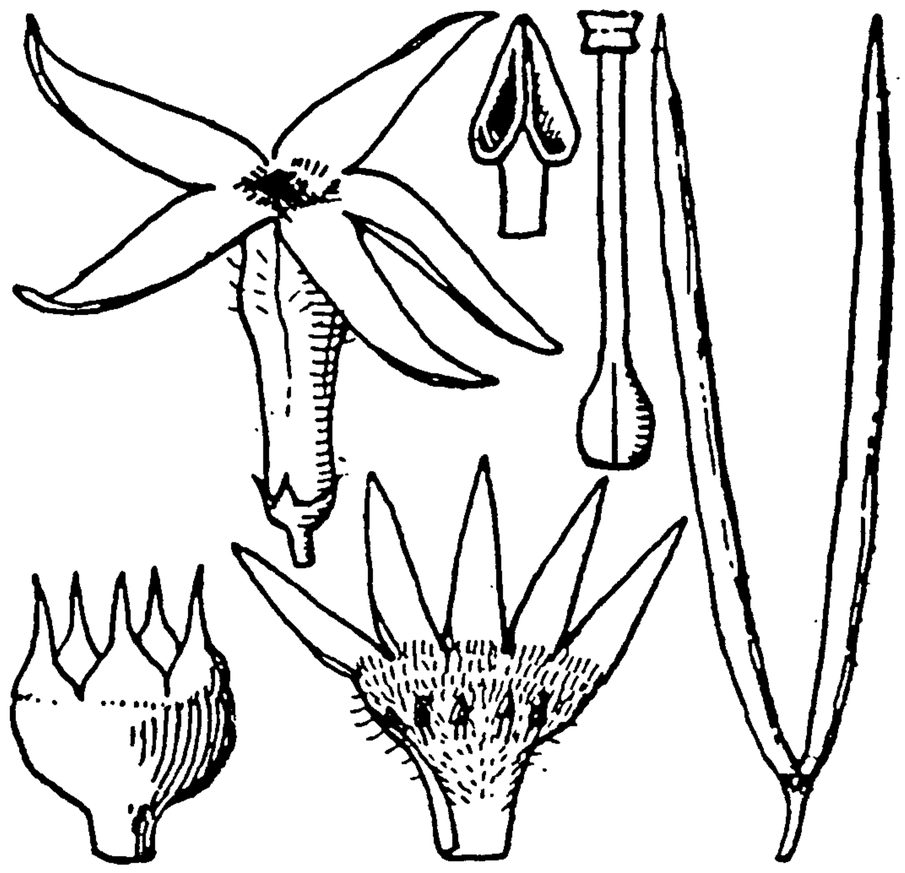
1. **C. Thevetia** L. Shrub: leaves approximate; blades narrowly linear, 8–16 cm. long: calyx-lobes lanceolate, 5–7 mm. long: corolla saffron-colored or rarely yellow or white; tube 2–2.5 cm. long; lobes very broad, 3–4 cm. long: drupe depressed, 3–4 cm. broad.—(TRUMPET-FLOWER. YELLOW-OLEANDER.)—Pinelands, cult. grounds, and waste-places, S. pen. Fla. and Florida Keys. Nat. of Trop. Am.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)—All year.—Known as lucky-nut in the West Indies and in southern Florida.

3. **AMSONIA** Walt. Herbs. Leaves alternate: blades various. Calyx-lobes deltoid to lanceolate. Corolla mainly salverform, blue or purple-blue; lobes narrow.—About 8 species, North American and Asiatic.—BLUE-DOGBANES. BLUE-STARS.

Corolla pubescent without.
- Leaf-blades glabrous or nearly so, at least at maturity: follicles glabrous.
  - Leaf-blades broad, ovate, oval, or broadly elliptic-lanceolate. — 1. *A. Amsonia.*
  - Leaf-blades narrow, elliptic, elliptic-lanceolate, lanceolate, or linear-lanceolate. — 2. *A. salicifolia.*
- Leaf-blades tomentose beneath, permanently pubescent beneath: follicles pubescent, at least on the upper part. — 3. *A. ludoviciana.*

Corolla glabrous without.
- Leaves elongate; blades elliptic-lanceolate, linear-lanceolate, linear, or linear-filiform, those of the upper ones at least sessile. — 4. *A. ciliata.*
- Leaves short; blades elliptic, oval, or ovate, distinctly petioled. — 5. *A. rigida.*

1. **A. Amsonia** (L.) Britton. Plant 6–13 dm. tall, glabrous or nearly so: leaves relatively few; blades relatively broad, oval to broadly elliptic-lanceolate, 6.5–13 cm. long: corolla purplish-blue; tube 6–8 mm. long; lobes shorter than the tube; follicles 9–12 cm. long. [*A. Tabernaemontana* Walt.]—(TEXAS-STAR.)—River banks and rich woods, various provinces, Fla. to Tex., Kans., and S. C., naturalized as far N as Mass.—Spr.–sum.



2. **A. salicifolia** Pursh. Plant 6–12 dm. tall, glabrous: leaf-blades relatively narrow, lanceolate to linear-lanceolate, 7–16 cm. long; corolla purplish-blue; lobes as long as the tube or longer; follicles 8–12 cm. long.—Low grounds and thickets, in somewhat acid soil, various provinces, Fla. to Tex., Kans., and Va.—Spr.–sum.

3. **A. ludoviciana** Vail. Plant 5–11 dm. tall, pubescent at least when young: leaves relatively few; blades broadly elliptic to oval-elliptic, 6–9 cm. long, white-tomentose beneath: corolla bluish; tube 6–7 mm. long; lobes about as long as the tube: follicles 8–10 cm. long.—Moist grounds, often in open woods, Coastal Plain and adj. provinces, Miss. to La. and Ark.—Spr.—The flowers are very fragrant.

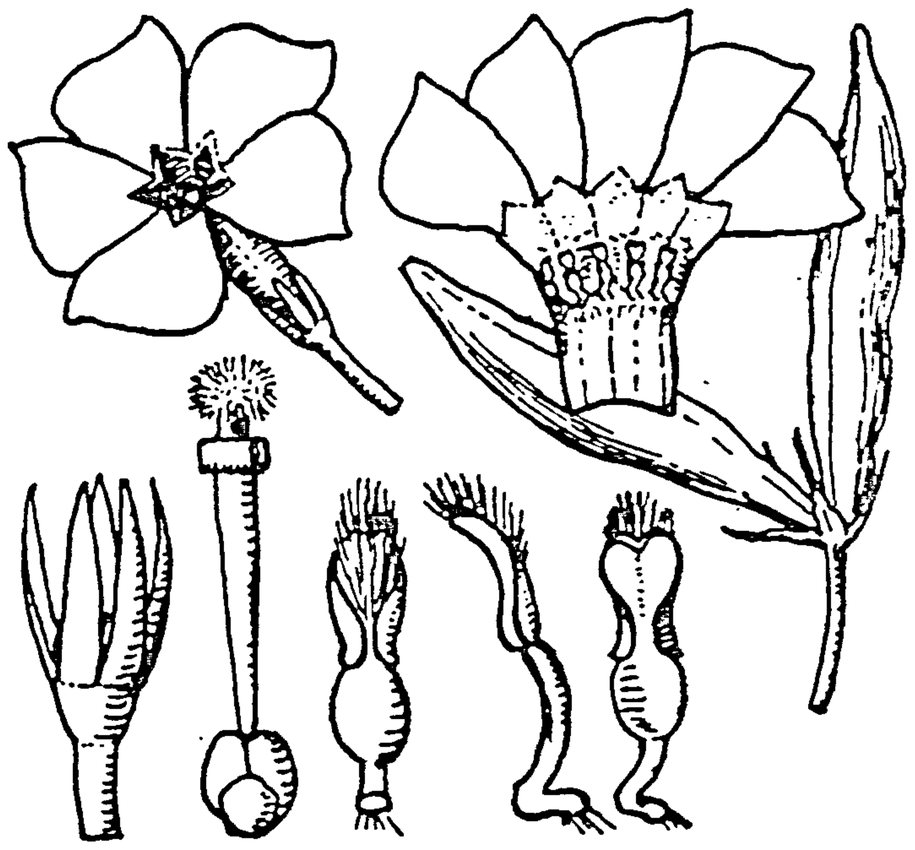
4. **A. ciliata** Walt. Plant 2–8 dm. tall, often much-branched, pubescent: leaves numerous; blades linear to linear-filiform on the upper part of the plant (almost filiform in *A. ciliata filifolia*), 4–7 cm. long: corolla purplish-blue, tube 6–8 mm. long, the lobes ovate to elliptic-ovate, mostly shorter than the tube: follicles 8–16 cm. long.—Dry pinelands, Coastal Plain, and adj. Piedmont, Fla. to Tex., Ark., and N. C.—Spr.–sum.

5. **A. rigida** Shuttlw. Plant 8–13 dm. tall, glabrous: leaves very numerous; blades elliptic, oval, or ovate, 2.5–5 cm. long: calyx-lobes about 1 mm. long: corolla purplish-blue; tube 4–6 mm. long; lobes as long as the tube or longer: follicles 7–12 cm. long.—Moist pinelands and shallow ponds, Coastal Plain, Fla. and Ga.—Spr.–sum.

4. **VINCA** L. Trailing or creeping herbs. Leaves opposite. Corolla blue, or rarely white: tube dilated at the mouth.—About 12 species, natives of the Old World.—Spr.–sum.—PERIWINKLES. MYRTLES.

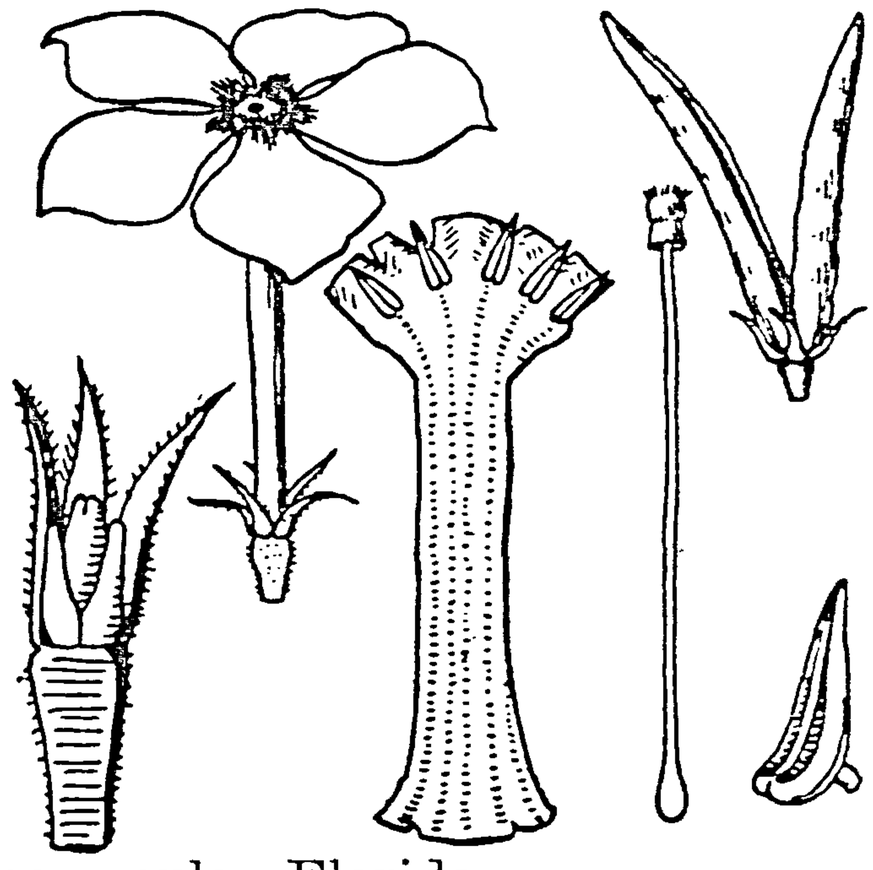
Leaf-blades elliptic to elliptic-ovate, eciliate: calyx-lobes eciliate: follicles beakless — 1. *V. minor.*
Leaf-blades ovate to deltoid-ovate, ciliate: calyx-lobes ciliate: follicles beaked. — 2. *V. major.*

1. V. minor L. Leaf-blades subcoriaceous, 1–5 cm. long, narrowed to a short petiole: calyx-lobes lanceolate, 3–4 mm. long, glabrous: corolla 1.5–2 cm. wide: follicle 2.5 cm. long or less.—Roadsides, shaded banks, and cult. grounds, various provinces, Ga. to Ark. and Ont.—Nat. of Eu.



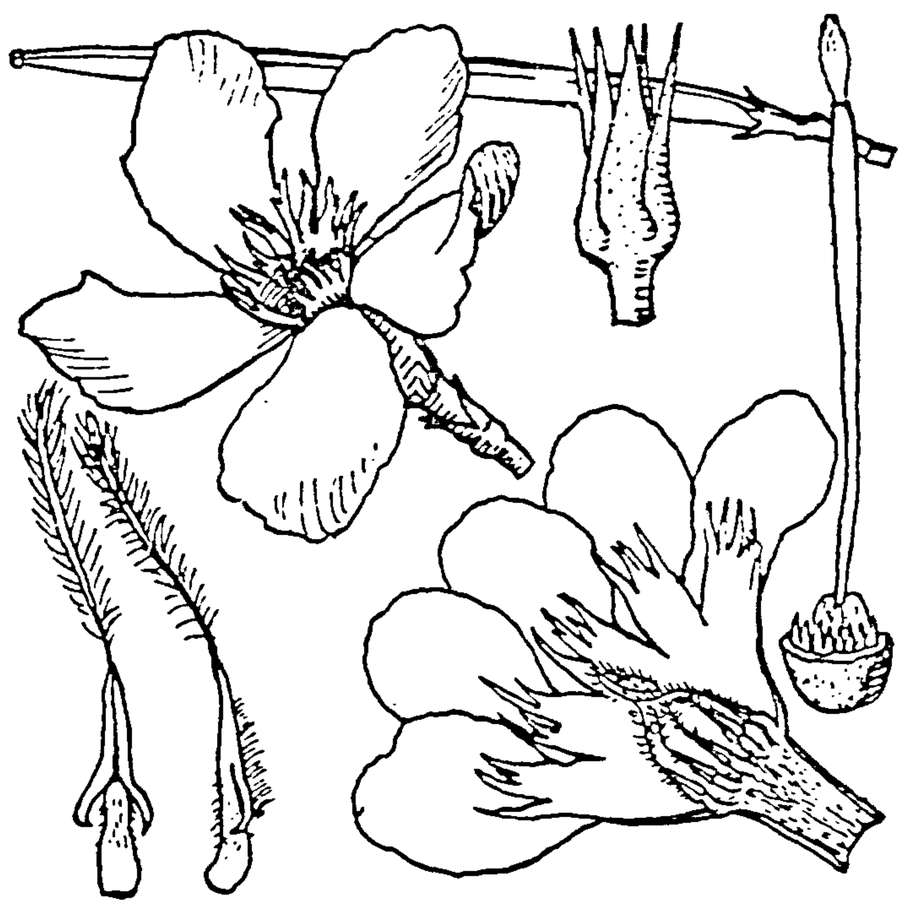
2. V. major L. Leaf-blades membranous, 4–7 cm. long, manifestly petioled: calyx-lobes subulate, 9–15 mm. long, bearded at the tip: corolla 4–5 cm. wide: follicle 3 cm. long or more.—Woods and roadsides, Coastal Plain, Ga. and S. C.—Nat. of Eu.—These periwinkles were brought to America from Europe by the early settlers in the eastern United States. By means of the creeping stems, plants soon spread from gardens to roadsides and even into woodlands.

5. CATHARANTHUS G. Don. Erect herbs. Leaves opposite. Corolla variously colored or white: tube with a contracted mouth. Follicle narrow.—Three species, the following and two in the Old World tropics.



1. C. roseus (L.) G. Don. Stems 2–7 dm. tall: leaf-blades oblong to oblong-cuneate, 4–8 cm. long: calyx-lobes linear-subulate, 3–4 mm. long: corolla white, pink, or rose-purple, with an eye; tube 27–34 mm. long: lobes abruptly pointed: follicle 2–3 cm. long. [*Vinca rosea* L. *Ammocallis rosea* Small]—(Periwinkle. Old-maid.)—Pinelands, hammocks, waste-places, roadsides, and cult. grounds, pen. Fla. and the Keys. Nat. of Madagascar (?).—(*W. I., Mex., C. A., S. A.*)—This showy plant has taken possession of acres of scrub land in southern peninsular Florida.

6. NERIUM [Tourn.] L. Shrubs or trees. Leaves opposite: blades relatively narrow. Corolla salverform, the throat campanulate, with toothed scales at the mouth: the lobes spreading, broad. Follicles elongate.—Three species, Eurasian.

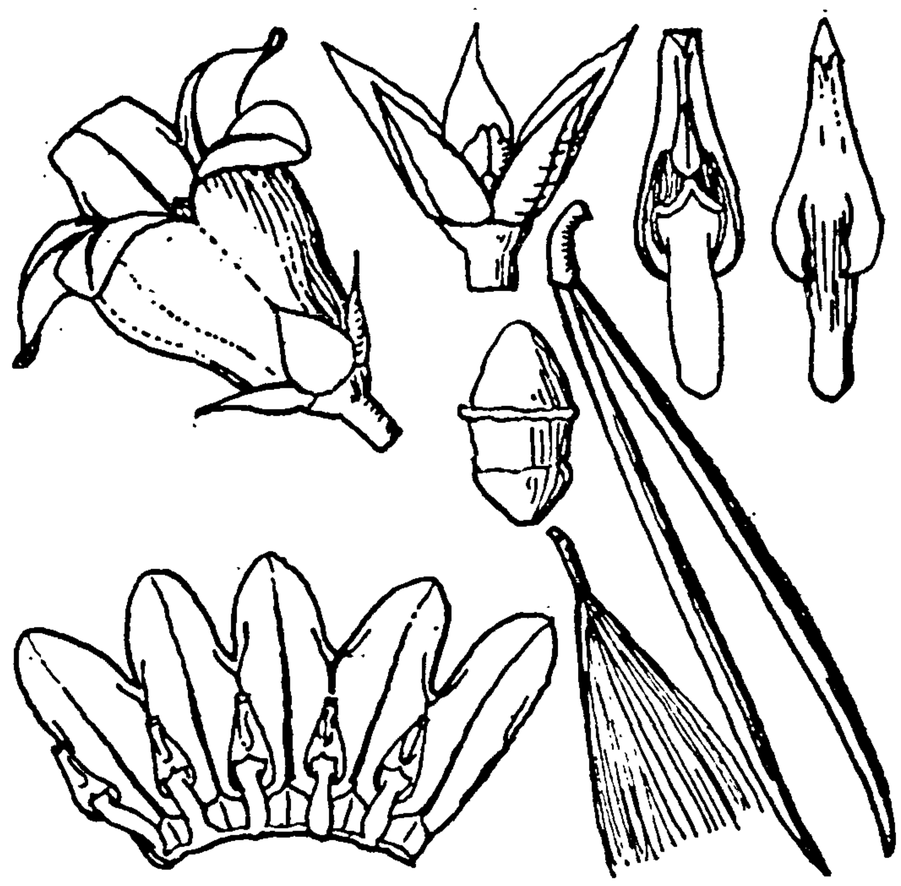


1. N. Oleander L. Tree becoming 10 m. tall, or shrub: leaf-blades narrowly elliptic to linear-elliptic, 6–15 cm. long, many-veined: calyx-lobes lanceolate, 4.5–6 mm. long: corolla white to rose-purple or crimson; limb 3–4.5 cm. wide, the lobes obliquely apiculate: follicles 1–2 dm. long.—(Oleander.)—Roadsides, fields, and edges of woods, Coastal Plain, Fla. to La. Nat. of the Levants and cult.—(*W. I.*)—All year.—The sap is exceedingly poisonous. In some varieties the leaves contain a good percentage of rubber, in others practically none.

7. **APOCYNUM** [Tourn.] L. Upright herbs. Leaves opposite: blades relatively broad. Corolla campanulate to urceolate, with entire appendages near the base, the lobes erect or recurved, narrow.—About 12 species, in the north temperate zone.—Sum.—DOGBANES. INDIAN-HEMPS.

Corolla white, or pink within, 5–9 mm. long.
  Corolla-lobes revolute: flowers nodding: corolla pink within: leaves spreading. 1. *A. androsaemifolium.*
  Corolla-lobes spreading: flowers slightly or not at all nodding: corolla usually white: leaves erect. 2. *A. medium.*
Corolla white or greenish, 2.5–4 mm. long: lobes usually erect: leaves and branches erect. 3. *A. cannabinum.*

1. A. androsaemifolium L. Plant 3–15 dm. tall: leaf-blades ovate, elliptic, or oval, 4–11 cm. long: cymes rather long: calyx-lobes ovate to ovate-lanceolate, 2–2.5 mm. long: corolla-lobes nearly as long as the tube: follicles 10–17 cm. long.—Thickets, fields, and fence-rows, various provinces, in Coastal Plain only northward, Ga. to Tex., B. C., Ont., and N. B.



2. A. medium Greene. Plant intermediate between the preceding and the following species: leaf-blades elliptic to ovate-elliptic, 4–9 cm. long: cymes somewhat dense: calyx-lobes lanceolate, 2–2.5 mm. long: corolla-lobes nearly as long as the tube: follicles 8–13 cm. long.—Thickets, fields, fencerows, and low grounds, various provinces, in Coastal Plain only northward, N. C. to Mo., Minn., and Newf.

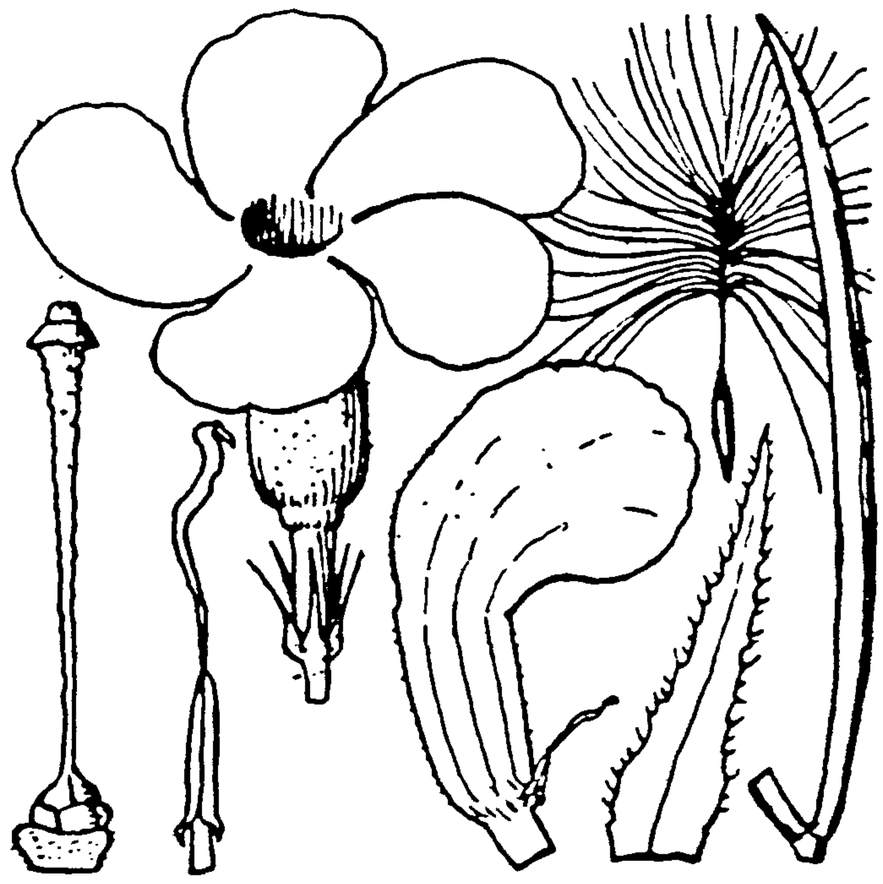
3. A. cannabinum L. Plant 8–18 dm. tall: leaf-blades elliptic to elliptic-ovate or elliptic-lanceolate, 5–12 cm. long: cymes rather dense: calyx-lobes lanceolate, 2.5–3 mm. long: corolla-lobes about half as long as the tube: follicles 12–20 cm. long.—Thickets, open woods, and stream-banks, various provinces, Fla. to Tex., B. C., Ont., and N. B.—The several proposed segregates of this species do not prove to be definitely distinct, all variations being found between the several segregates.

8. **URECHITES** Muell.-Arg. Vines, or erect woody plants. Leaves opposite: blades flat, entire. Calyx-lobes 5, relatively long and narrow. Corolla showy, large, the short tube dilated into a longer campanulate throat, the limb prominently lobed. Anthers sagittate, longer than the filaments, each usually with a much elongate narrow apical appendage. Follicles elongate, very slender, more or less incurved. Seeds numerous, slender-beaked.—About 6 species, tropical American.

Calyx permanently copiously pubescent: corolla pubescent without: basal lobes of the anther over 1 cm. long. 1. *U. pinetorum.*
Calyx glabrous, at least ultimately so: corolla glabrous without: basal lobes of the anther less than 1 cm. long. 2. *U. lutea.*

1. U. pinetorum Small. Plant gray-green, the stem underground, the branches erect, or when more elongate reclining, simple or nearly so, copiously fine-pubescent: leaf-blades obovate, oval, or elliptic, 3–7.5 cm. long, dull above, copiously fine-pubescent beneath: cymes usually solitary, 1–few-flowered, with very narrow bracts: calyx-lobes lanceolate-subulate, 8–10 mm. long, acuminate: corolla deep-yellow, mostly 6–9 cm. wide: anthers about 6 mm. long, the basal lobes slender:

follicles 9–19 cm. long. — (WILD-ALLAMANDA.)—Pinelands, Everglade Keys, Fla. —Spr.–sum.

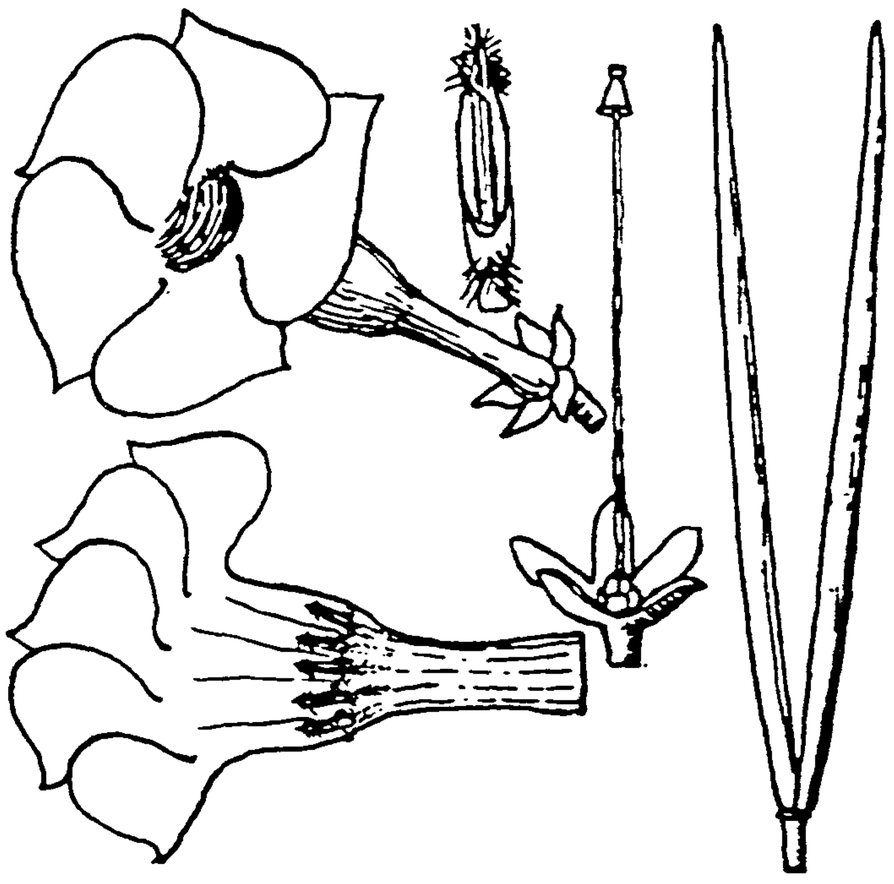


2. U. lutea (L.) Britton. Plant bright-green, the stem and branches high-twining, glabrous or inconspicuously pubescent: leaf-blades obovate, elliptic, oval, or ovate, or sometimes suborbicular, mostly 4–7 cm. long, shining above, sometimes inconspicuously pubescent beneath: cymes several or numerous, several- to many-flowered, with foliaceous bracts: calyx-lobes subulate or lanceolate, 9–11 mm. long, acuminate: corolla bright-yellow, mostly 4–5 cm. wide: anthers 4–5 mm. long, the basal lobes stout: follicles 12–15 cm. long. [*Echites Andrewsii* Chapm.]—Hammocks, S pen. Florida and the Keys.—(*W. I.*)—All year.—An imperfect specimen collected many years ago and recorded as coming from Key West represents an extremely pubescent form of this plant, or another species. Several forms of this plant, or perhaps species occur in our range: In one the plant leaves and inflorescence are essentially glabrous; in another the leaf-blades are sparingly pubescent beneath and the inflorescence bristly pubescent; in a third form the leaf-blades are closely often velvety pubescent beneath and the inflorescence is softly fine-pubescent.

9. **RHABDADENIA** Muell.-Arg. Vines, sometimes nearly erect. Leaves opposite. Calyx-lobes relatively broad and short. Corolla-tube gradually dilated into the funnelform throat.—About 10 species, tropical American.

Corolla-limb white, 4.5–5 cm. wide: twining vine, the branches glabrous. 1. *R. biflora.*
Corolla-limb yellow, 2.5–3 cm. wide: erect herb, the branches pubescent. 2. *R. corallicola.*

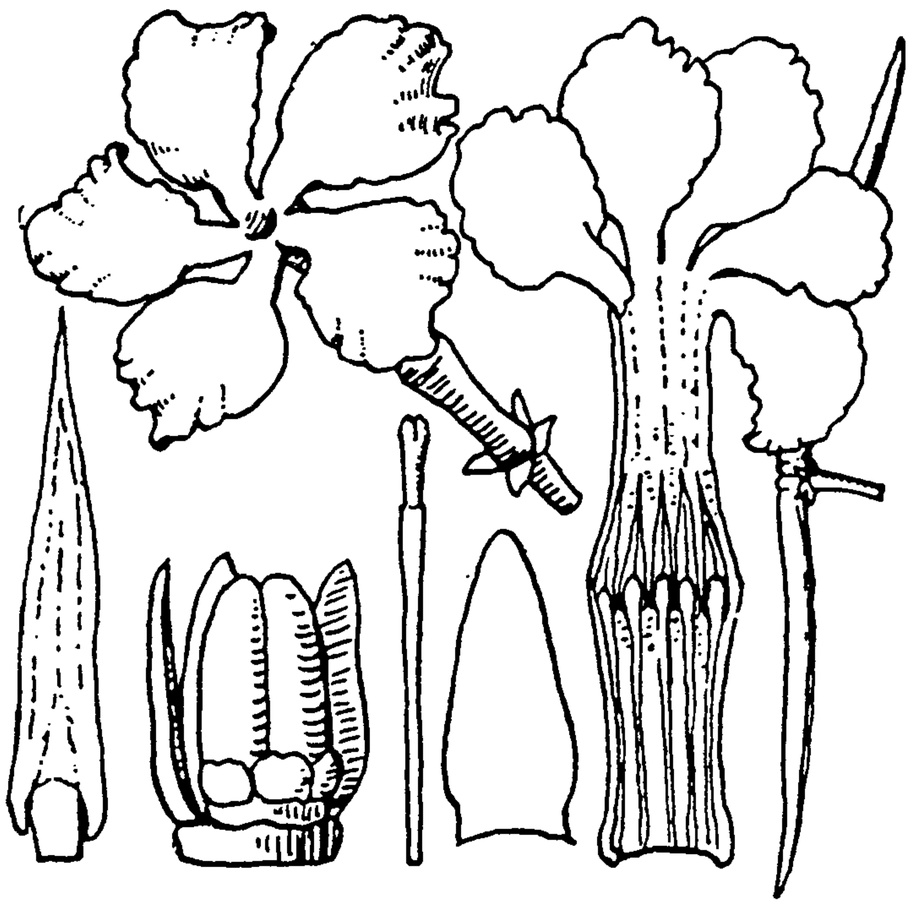
1. R. biflora (Jacq.) Muell.-Arg. Stem greatly elongate: leaf-blades elliptic or elliptic-lanceolate, 4–9 cm. long, apiculate: calyx-lobes elliptic or nearly so, 4–5 mm. long: corolla 5–6 cm. long, white, except the yellow tube within; lobes 2.5–3 cm. wide: follicles 12–15 cm. long.—(RUBBER-VINE.)—Coastal hammocks, S pen. Fla. and the Keys.—(*W. I.*)—All year.



2. R. corallicola Small. Stem 3–11 dm. long: leaf-blades elliptic or nearly so, 1–3 cm. long, more or less revolute: calyx-lobes deltoid ovate, 2–2.5 mm. long: corolla 2.5–3 cm. long, yellow; lobes 1–1.5 cm. wide: follicles 8–11 cm. long.—Pinelands, Everglade Keys and Big Cypress swamp region, Fla. and lower Florida Keys.—All year.—Fragmentary specimens apparently of a related species, *R. Sagraei,* of the Bahamas and Cuba, were collected on "Pine Key" many years ago by Dr. Blodgett. It differs from *R. corallicola* in the twining stem, the broader calyx-lobes, the shorter free portions of the filaments, and the stout-beaked seeds.

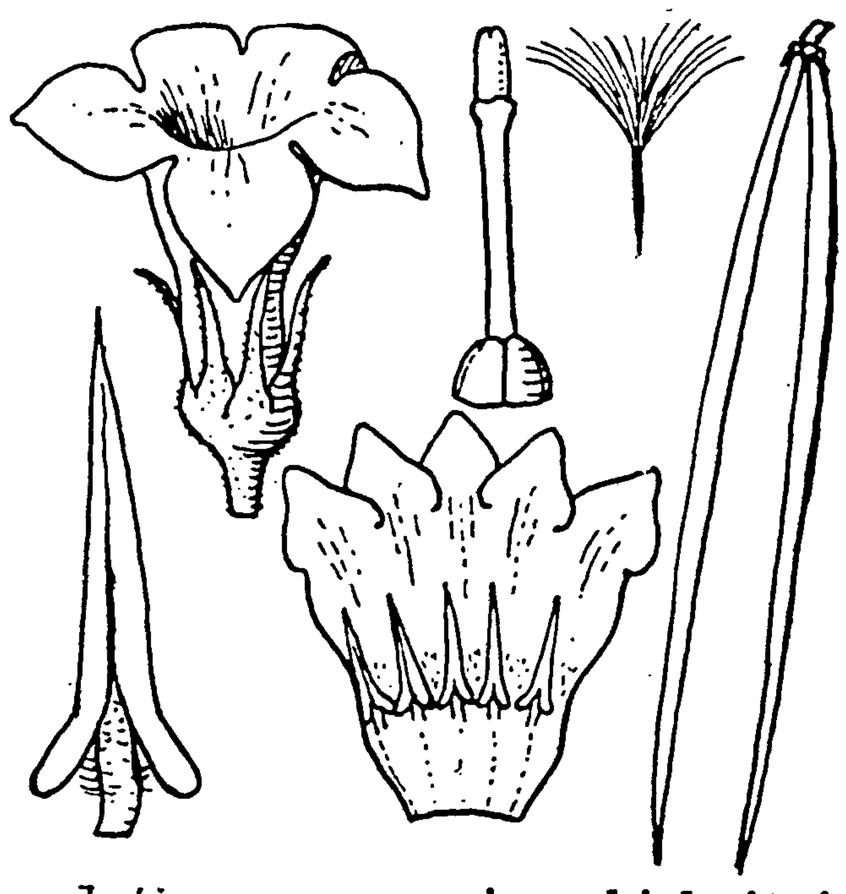
10. **ECHITES** P. Br. Vines. Leaves opposite. Flowers relatively large. Calyx with glands within. Corolla salverform, the throat narrowed to the

mouth.—About 40 species, tropical American.



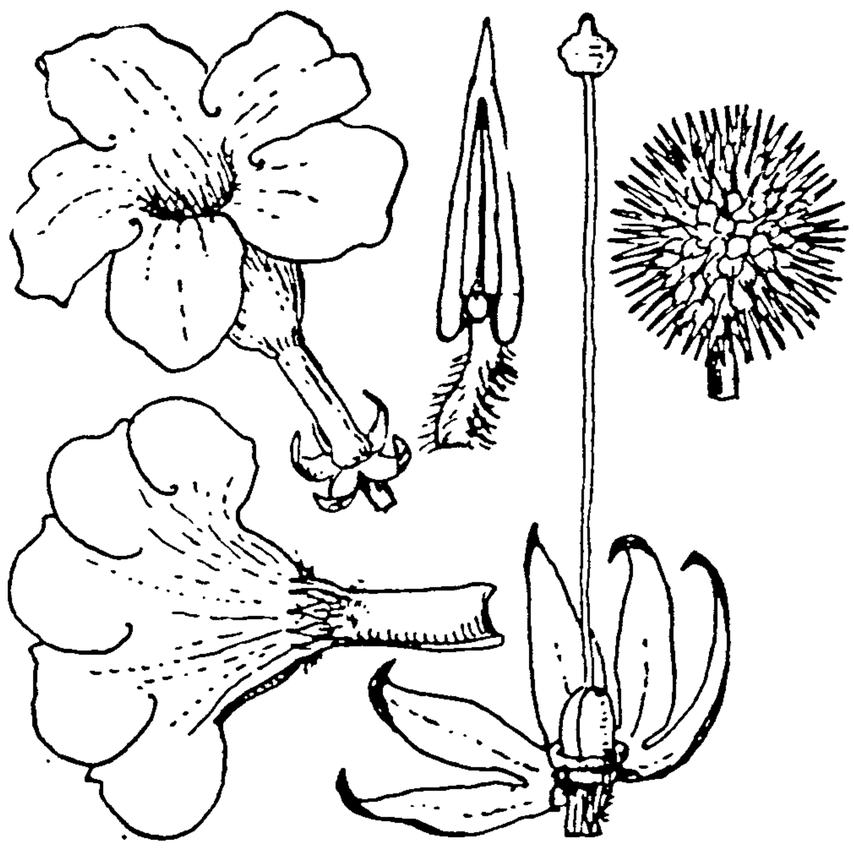
1. E. Echites (L.) Britton. Stem from a tuber-like root, widely twining: leaf-blades ovate to oval, 4–9 cm. long: calyx-lobes triangular, 2.5–3.5 mm. long: corolla white or greenish-white; tube 5–6 cm. long; lobes 1.5–2.5 cm. long: follicles 15–20 cm. long. [*Echites umbellata* Jacq.]—(DEVIL'S-POTATO. RUBBER-VINE.)—Pinelands, Everglade Keys, Fla., and hammocks and pinelands, Florida Keys.—(*W. I.*)—All year. This vine, particularly in the pinelands, is often very vigorous. Its stems and numerous branches are intricately intertwined.

11. **TRACHELOSPERMUM** Lemaire. Vines with slender woody stems. Leaves opposite. Flowers relatively small. Calyx with glands within. Corolla funnelform.—About 6 species, North American and Asiatic.



1. T. difforme (Walt.) A. Gray. Stem extensively twining: leaf-blades ovate or oval to elliptic or lanceolate, 3–9 cm. long: calyx-lobes lanceolate-subulate, 3–4 cm. long; corolla greenish; tube 5–6 mm. long; lobes ovate, shorter than the tube: follicles 15–22 cm. long. [*Forsteronia difformis* A. DC.]—River-banks, low grounds, and swamps, Coastal Plain, and adj. provinces, Fla. to Tex., Ark., Ind., and Del.—(*Mex.*)—Spr.–sum. The true relationships of this vine are uncertain. It has no close relatives geographically. Its associates in the present genus are in eastern Asia; the species of *Secondatia*, a genus in which it is sometimes included are South American.

12. **ALLAMANDA** L. Shrubs, trees, or woody vines. Leaves opposite, sometimes whorled. Flowers large, often showy. Calyx-lobes rather narrow. Corolla funnelform, with a cylindric tube, a campanulate throat, and broad lobes. Capsule subglobose, more or less compressed, echinate.—About 12 species, tropical.



1. A. cathartica L. Shrub mostly 1–3 m. tall, the twigs finely pubescent: leaf-blades oblanceolate to elliptic, 5–12 cm. long, mostly abruptly short-acuminate, glabrous except the veins beneath: flowers short-pedicelled: calyx-lobes lanceolate to elliptic-lanceolate: corolla yellow, 7–10 cm. long, the tube and throat about equal in length: the limb 6–8 cm. wide: capsule 4–6 cm. in diameter, densely prickly.—(ALLAMANDA.)—Roadsides and hammocks, pen. Fla. Nat. of S. Am. and cult.—(*W. I., Mex., C. A.*)—All year.

FAMILY 2. **ASCLEPIADACEAE** — MILKWEED FAMILY

Perennial herbaceous or woody plants, with usually umbel-like cymes. Androecium of usually 5 stamens, with the anthers more adherent to the stigma than in *Apocynaceae,* the filament-appendages forming a crown with 5 lobes. Gynoecium of 2 carpels with the stigmas united; only one carpel usually maturing.—About 240 genera and 2,000 species, widely distributed.

Pollen granular, the grains grouped in 4's: caudicles spoon-shaped, without a corpuscle. — I. PERIPLOCEAE.

Pollen united in 2 waxy masses (pollinia): caudicles united by a corpuscle.

- Pollinia pendulous: stigma not saucer-shaped nor cup-like: anthers tipped with a scarious membrane, the sacs lower than the top of the stigma. — II. ASCLEPIADEAE.
- Pollinia horizontal or nearly so: stigma saucer-shaped or cup-like: anthers scarcely or not at all tipped with a scarious membrane, the sacs on the margin of or close under the stigma. — III. VINCETOXICEAE.

I. PERIPLOCEAE

- Corolla rotate: follicles long-subulate, nearly terete, erect: cymes several–many-flowered. — 1. PERIPLOCA.
- Corolla funnelform: follicles short and stout, irregularly angled, divergent: cymes few-flowered. — 2. CRYPTOSTEGIA.

II. ASCLEPIADEAE

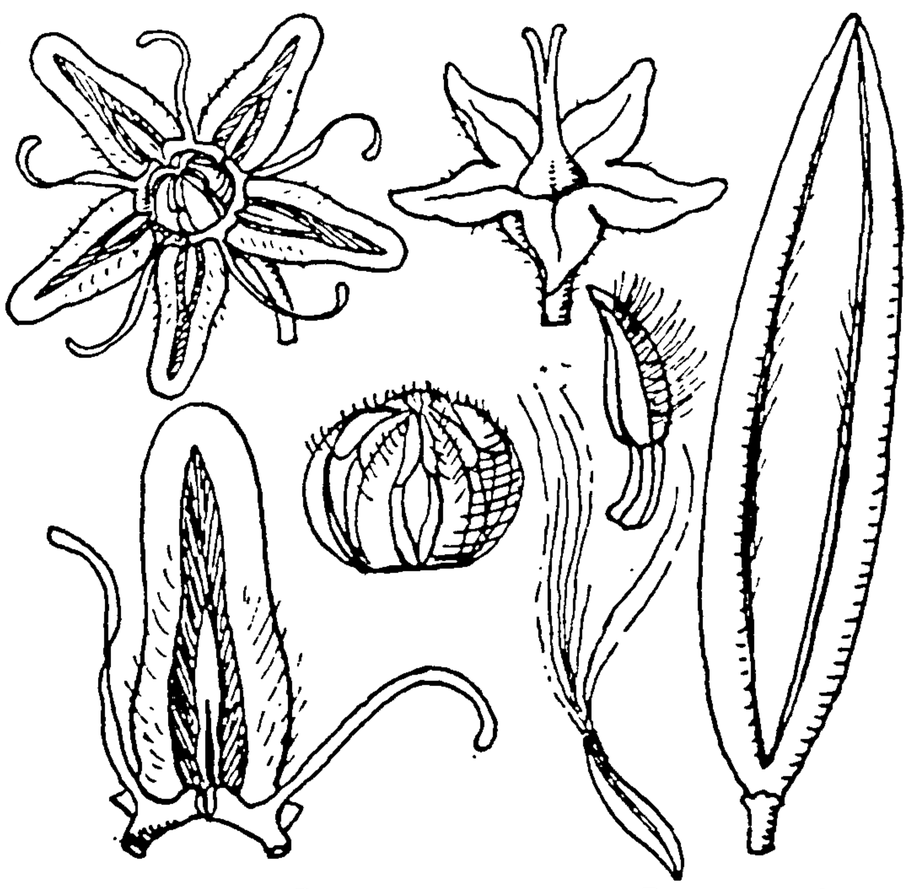
- Crown double, the outer a shallow ring, the inner consisting of 5 fleshy hook-like scales. — 3. FUNASTRUM.
- Crown single.
  - Erect, ascending, or spreading herbs.
    - Corolla ellipsoid-campanulate: lobes erect. — 4. PODOSTIGMA.
    - Corolla rotate, the lobes spreading or reflexed in anthesis.
      - Corolla-lobes reflexed during anthesis: hoods of the crown crestless or each with a horn-like process.
        - Anther-wings corneous: pollinia longer than the caudicles.
          - Hoods of the crown without horns or crests. — 5. ACERATES.
          - Hoods of the crown each with an internal projecting horn.
            - Hoods scoop-like or trowel-like, with free edges, the horn free or partly adnate to the hood: flower-buds not flat-topped. — 6. ASCLEPIAS.
            - Hoods saccate or with the sides conduplicate and thus dorso-ventrally flattened, the tip of the horn protruding from the groove or slit on the inner side of the hood.
              - Hoods subglobose, inflated, the horn protruding from the groove between the 2 sacs: flower-buds flat-topped. — 7. BIVENTRARIA.
              - Hoods elongate, dorso-ventrally flattened, the horn protruding from the slit between the conduplicate edges: flower-buds not flat-topped. — 8. OXYPTERYX.
        - Anther-wings membranous or papery: hoods of the crown ellipsoid-clavate, ascending and incurved over the anthers, each with a lamelliform crest within: pollinia shorter than the caudicles. — 9. ANANTHERIX.
      - Corolla-lobes erect-spreading during anthesis: hoods of the crown pendulous or saccate at the base, curved upwards, obtuse, crested within, at least in the upper part.
        - Hoods of the crown involute, and hooded at the apex, crested above the middle: anthers rounded at the base. — 10. ASCLEPIODORA.
        - Hoods of the crown concave, open at the apex: anthers sagittate at the base. — 11. ASCLEPIODELLA.

Twining vines.
  Petals slightly united at the base: column not elongate.
    Crown-lobes each with an entire or cleft terminal appendage. — 12. GONOLOBUS.
    Crown-lobes entire or lobed.
      Corolla-lobes glabrous within: crown-lobes broad.
        Stigma flat: crown-lobes not notched. — 13. AMPHISTELMA.
        Stigma conic: crown-lobes notched at the apex. — 14. LYONIA.
      Corolla-lobes pubescent within: crown-lobes narrow. — 15. METASTELMA.
  Petals united to about the middle: column elongate. — 16. EPICION.

III. VINCETOXICEAE

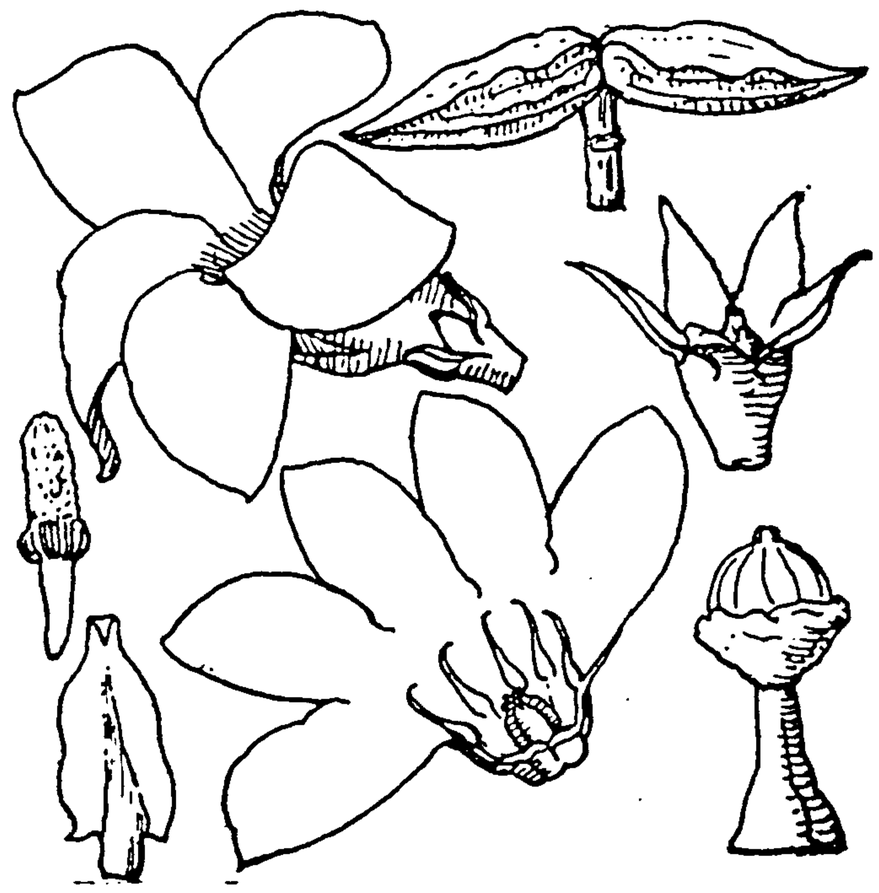
Crown disk-like or saucer-shaped, obscurely, if at all ridged.
  Corolla reticulate: column distinct, appendaged at the base or ridged. — 17. CYCLODON.
  Corolla not reticulate: column nearly obsolete, neither appendaged nor ridged. — 18. VINCETOXICUM.
Crown cup-shaped or incurved at the tip, usually crested or appendaged on the inner side.
  Cymes long-peduncled, many-flowered: leaves large. — 19. ODONTOSTEPHANA.
  Cymes sessile, 1–5-flowered: leaves small. — 20. EDISONIA.

1. PERIPLOCA L. Slender twining, partly woody, vines. Leaf-blades broad, membranous. Cymes broad. Calyx-lobes spreading. Corolla rotate, inconspicuous, lobes pubescent within. Crown with lobed scales, each slender-appendaged, adnate to the corolla. Anthers merely connected at the apex, pubescent. Follicles slender.—About 12 species, Eurasian and African.



1. P. græca L. Stem slender: leaf-blades elliptic to ovate, 6–10 cm. long, acuminate: Calyx-lobes ovate to deltoid: corolla-lobes broadly linear, 9–11 mm. long, brownish-purple and green-margined within: crown-appendages nearly as long as the corolla-lobes: follicles curved: seed fusiform, 9–11 mm. long.—(SILK-VINE.)—Waste-places, fence-rows, and cult. grounds, various provinces, Fla. to Okla., Kans., and Mass. Nat. of Eu.—Sum.

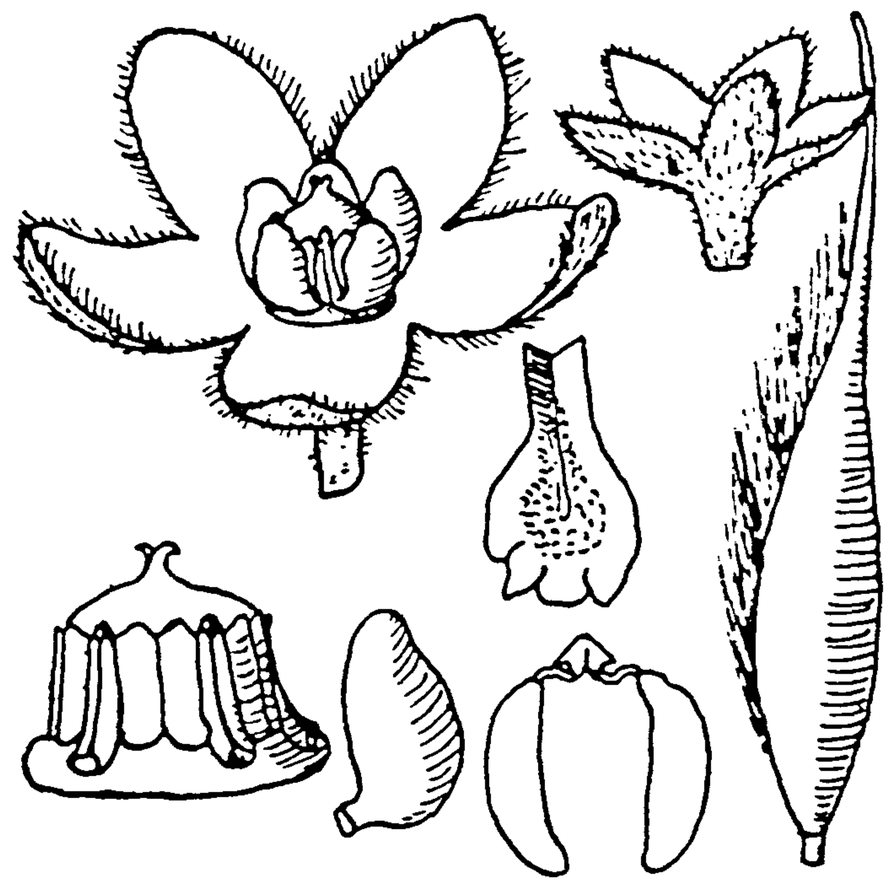
2. CRYPTOSTEGIA R. Br. Stout woody sprawling vines. Leaf-blades broad, coriaceous. Cymes narrow. Calyx-lobes erect. Corolla funnelform, showy: lobes glabrous within. Crown with 5 entire or 2-lobed scales attached to the corolla. Anthers connate around the stigma, glabrous. Follicles stout.—Two species, in the Old World tropics.



1. C. grandiflora R. Br. Stem stout: leaf-blades oval, elliptic, or ovate, 5–10 cm. long, blunt: calyx-lobes lanceolate to ovate, acuminate: corolla-lobes broad, often ovate, 2–3 cm. long, about as long as the throat, white, pink, or rose-purple: crown-appendages shorter than the corolla-throat: follicles straight, 10–15 cm. long: seeds bottle-shaped,

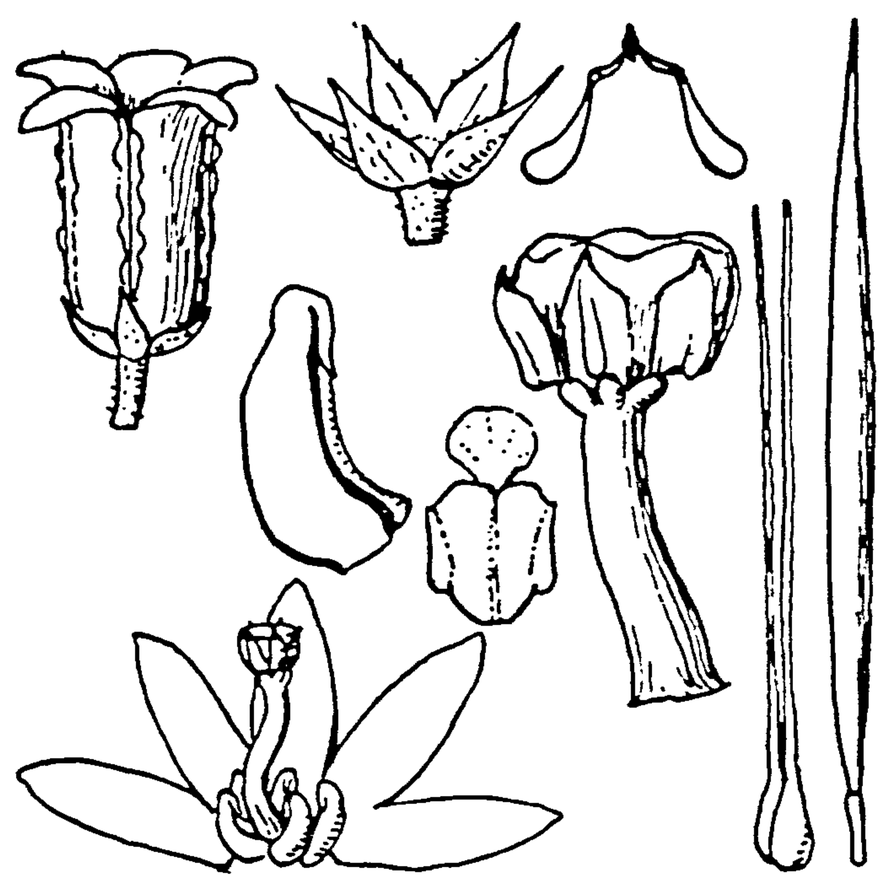
7–8 mm. long.—(PINK-ALLAMANDA. RUBBER-VINE.)—Hammocks, roadsides, and waste-places, S Fla. Nat. of Africa?—(*W. I.*)

3. **FUNASTRUM** Fourn. Vines with narrow or broad leaf-blades. Calyx 5-lobed. Corolla rotate: lobes broad, glabrous within. Anthers coherent. [*Philibertia* B. & H. not H.B.K. *Philibertella* Vail.]—About 30 species, of tropical and subtropical America.



1. F. clausum (Jacq.) Schlecht. Leaf-blades 3–8 cm. long, ovate-elliptic to elliptic-lanceolate, rounded or subcordate at the base: peduncles twice as long as the leaves or more: calyx-lobes elliptic-lanceolate: corolla white; lobes elliptic to ovate, 4–5 mm. long: follicles 5–7 cm. long: seeds about 3 mm. long. [*Philibertia viminalis* A. Gray *Philibertella clausa* Vail]—Coastal hammocks and lake regions, pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—All year.

4. **PODOSTIGMA** Ell. Erect herbs, with narrow leaf-blades. Calyx-lobes 5. Corolla campanulate. Hoods incurved; blades remote from the anthers which are elevated on a slender column.—One species.

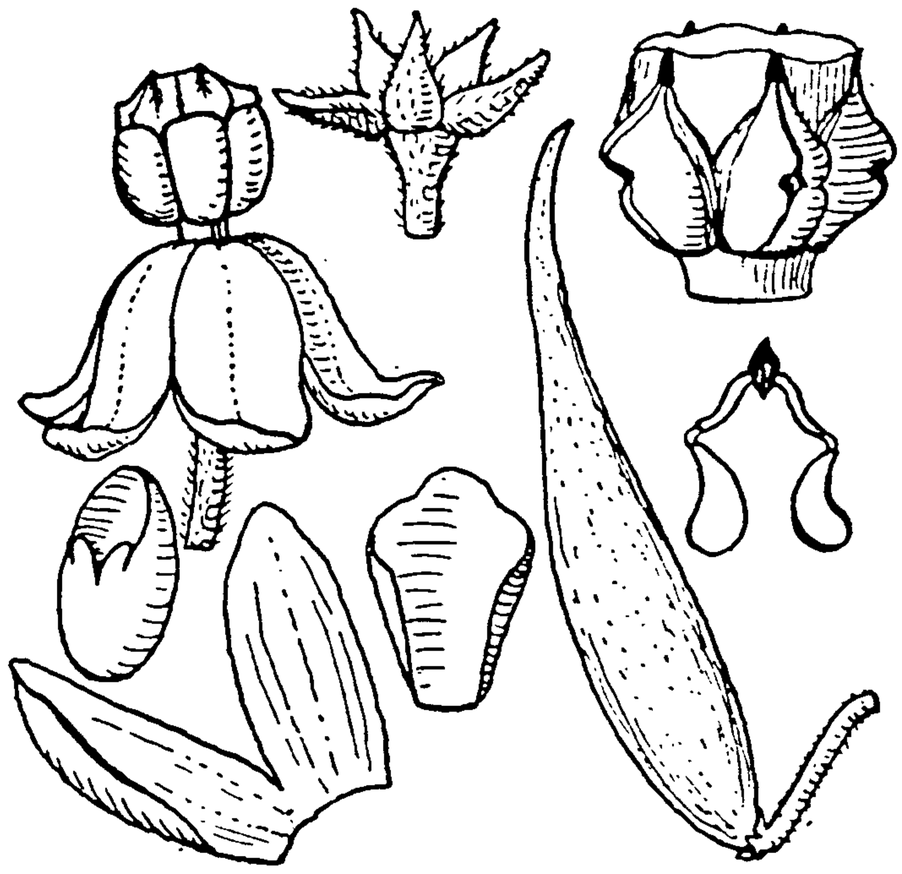


1. P. pedicellata (Walt.) Vail. Stem usually simple, 2–4 dm. tall; leaf-blades linear, lanceolate, or linear-elliptic, 2–6 cm. long: calyx-lobes lanceolate or elliptic-lanceolate, 2–2.5 mm. long: corolla yellowish or greenish-yellow; lobes linear-elliptic 7–8 mm. long: hoods 2.5–3 mm. long: follicles 11–15 cm. long.—Low pinelands, Coastal Plain, Fla. to N. C.—Spr.–fall.—A peculiar plant in our flora, the erect cylindraceous yellow or greenish-yellow corollas being unlike those of the other genera. The plants grow in pineland submerged parts of the year and send their elongate roots far down in the wet sand.

5. **ACERATES** Ell. Erect or spreading herbs, with narrow or relatively narrow leaf-blades. Calyx-lobes 5. Corolla rotate, green: lobes reflexed. Hoods approximate to the anthers, the column very short and stout, or slender, or wanting: follicles fusiform.—About 8 species, North American.—GREEN-MILKWEEDS.

Crown stalked; hoods oval or obovate: pollinia with short thick bases.
  Hoods with erect tips: pedicels with curved-appressed hairs.
    Crown ellipsoid: androecium much exceeding the crown. 1. *A. floridana.*
    Crown globose or depressed: androecium slightly exceeding the crown. 2. *A. delticola.*
  Hoods with spreading tips: pedicels with spreading hairs. 3. *A. hirtella.*
Crown not stalked; hoods elliptic to lanceolate: pollinia with slender stalk-like bases. 4. *A. viridiflora.*

1. A. floridana (Lam.) A. Hitchc. Plant 2–7 dm. tall, finely cinereous: leaf-blades narrowly linear, often elongate, to rarely narrowly linear-lanceolate: umbels usually slender-peduncled: pedicels strigillose: calyx-lobes triangular-ovate: corolla-lobes about 5 mm. long, or sometimes shorter, elliptic; crown about 2.5 mm. in diameter: follicles 9–11 cm. long: seed 10–11 mm. long. [*A. longifolia* Ell.]—Damp pinelands and prairies, Coastal Plain, and rarely adj. provinces, Fla. to Tex., Ark., and Del.—Spr.–sum. or all year S.



2. A. delticola Small. Plant similar to *A. floridana* in habit: leaf-blades lanceolate: umbels rather slender-peduncled: pedicels sparingly strigillose: calyx-lobes deltoid-ovate: corolla-lobes broader than in *A. floridana*: crown about 3.5 mm. in diameter: follicles not seen.—Low grounds, New Orleans, La.—Spr.–sum.

3. A. hirtella Pennell. Plant 6–10 dm. tall, densely cinereous: leaf-blades narrowly linear-lanceolate to linear, often numerous and elongate: umbels stout-peduncled: pedicels hirsutulous: calyx-lobes ovate-lanceolate: corolla-lobes fully twice the length of the calyx-lobes: crown somewhat more than half the length of the androecium: follicles 9–10 mm. long: seeds about 8 mm. long.—Prairies and roadsides, various provinces, Ala. to Okla., Ill., and Mich.—Sum.

4. A. viridiflora (Raf.) Eaton. Plant 2–6 dm. tall: leaf-blades lanceolate to ovate, elliptic, or oval, 4–12 cm. long: calyx-lobes lanceolate: corolla-lobes 5–6 mm. long: hoods 3–4 mm. long: anther-wings about 4 mm. long: follicles 8–12 cm. long: seed 7–8 mm. long.—Dry sterile soil, various provinces, Fla. to Tex., N. Mex., Sask., and Mass.—Spr.–sum.

6. ASCLEPIAS [Tourn.] L. Erect or spreading herbs, with narrow or broad leaf-blades. Calyx-lobes 5. Corolla rotate: lobes reflexed. Hoods of the crown trowel-like or scoop-like, erect or spreading, not adnate to the anther-column, the horn free, or partly adnate to the hood. Anther-wings salient at the base. Follicles ovoid or fusiform.—About 95 species, mostly American.—Sum.—MILKWEEDS. SILKWEEDS.

Crown longer than the androecium or slightly shorter; hoods rounded, obtuse, or truncate at the apex.
  Corolla bright-colored, rarely white: crown white, maroon, or bright-colored, not green.
    Follicles erect on deflexed pedicels.
      Follicles smooth, glabrous or pubescent.
        Leaves mostly scattered, not opposite: plant copiously pubescent. — I. TUBEROSAE.
        Leaves mostly opposite or whorled.
          Corolla orange-scarlet, red, or purple. — II. RUBRAE.
          Corolla white or greenish-red.
            Umbel solitary on an elongate terminal peduncle, or an accessory umbel sometimes present: hoods maroon. — III. AMPLEXICAULES.
            Umbels usually several, axillary and terminal: hoods pale.
              Stem prostrate: leaves vertical; blades sessile and cordate-clasping. — IV. HUMISTRATAE.
              Stem erect: leaves not vertical; blades petioled and tapering at the base. — V. EXALTATAE.

Follicles echinate-warty, sometimes only near the tip. — VI. SYRIACAE.
Follicles erect on erect pedicels.
Flowers scarlet and yellow. — VII. CURASSAVICAE.
Flowers purplish, pink, or white.
Leaves merely opposite, not whorled. — VIII. INCARNATAE.
Leaves, at least at some of the nodes, whorled in 4's or 6's. — IX. QUADRIFOLIAE.
Corolla green: crown green, greenish-white or yellow-tinged.
Follicles erect on deflexed pedicels. — X. TOMENTOSAE.
Follicles erect on erect pedicels. — XI. VERTICILLATAE.
Crown about half as long as the androecium: hoods deeply sinuate by the projection of 2 acuminate lateral lobes: column none. — XII. CINEREAE.

I. TUBEROSAE

Leaf-blades acute or acutish, lanceolate or lance-elliptic: horn very slender.
Calyx-lobes 1/3 the length of the corolla-lobes or less: hood narrowly elliptic. — 1. *A. decumbens.*
Calyx-lobes nearly as long as the corolla-lobes: hoods obovate. — 2. *A. tuberosa.*
Leaf-blades obtuse and broadly rounded, pandurate: horn very stout. — 3. *A. Rolfsii.*

II. RUBRAE

Corolla and crown orange-scarlet. — 4. *A. lanceolata.*
Corolla and crown red or purple.
Leaf-blades glabrate, or least beneath.
Leaf-blades ovate, ovate-lanceolate, or elliptic-lanceolate, acuminate, distinctly petioled. — 5. *A. rubra.*
Leaf-blades lanceolate to linear-lanceolate, attenuate, truncate or nearly cordate-clasping at the base. — 6. *A. laurifolia.*
Leaf-blades densely and softly pubescent beneath. — 7. *A. purpurascens.*

III. AMPLEXICAULES

A stiffly erect plant with spreading glossy leaves, the blades with crisped margins. — 8. *A. amplexicaulis.*

IV. HUMISTRATAE

Plant with one or several prostrate stems, the vertically placed leaves with white veins. — 9. *A. humistrata.*

V. EXALTATAE

Umbel loosely flowered, the pedicels more or less nodding: flowers greenish-red. — 10. *A. exaltata.*

VI. SYRIACAE

Tall herb with broad spreading leaves and with many-flowered umbels in the axils of some of them. — 11. *A. syriaca.*

VII. CURASSAVICAE

Tall plant with bright-green leaves and showy flowers, the scarlet corolla and yellow crown very conspicuous. — 12. *A. curassavica.*

VIII. INCARNATAE

Flowers pink or purplish: leaf-blades abruptly narrowed at the base, short-petioled or nearly sessile.
Plant nearly glabrous: leaf-blades narrow, lanceolate to lance-elliptic or nearly linear. — 13. *A. incarnata.*
Plant softly and copiously hirsute: leaf-blades rather broad, broadly lanceolate to elliptic or ovate-lanceolate. — 14. *A. pulchra.*
Flowers white: leaf-blades tapering to a long petiole. — 15. *A. perennis.*

IX. QUADRIFOLIAE

Slender plant with few leaves, the relatively few-flowered umbels with very slender pedicels. — 16. *A. quadrifolia.*

X. TOMENTOSAE

Hoods much exceeding the androecium, the projecting tip slightly recurved: horn at about the middle of the hood. — 17. *A. obovata.*
Hoods about equalling the androecium, turgid, truncate and slightly fornicate; horn at the top of the hood.
Horn with the triangular or triangular-lanceolate tip only slightly exserted. — 18. *A. aceratoides.*
Horn with the subulate tip much exserted. — 19. *A. tomentosa.*

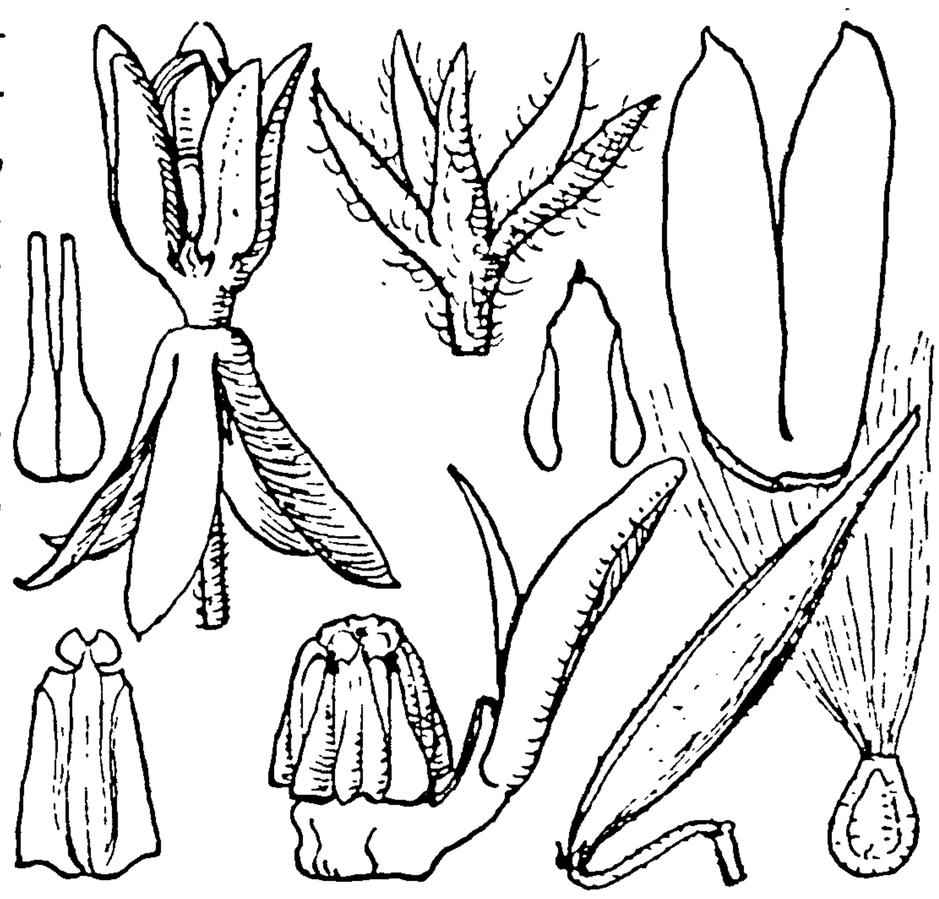
XI. VERTICILLATAE

Hoods nearly equalling the androecium, the much exserted slender horns converging over its top: column about 1 mm. long.
  Upper leaves predominantly opposite; blades flat. 20. *A. linearis.*
  Upper leaves predominantly whorled in 3's to 6's; blades revolute. 21. *A. verticillata.*
Hoods much exceeding the androecium, the horns not much exserted, flattened: column scarcely 0.5 mm. long.
  Umbels usually several in the upper leaf-axils: hoods erect or nearly so. 22. *A. viridula.*
  Umbels usually terminal and solitary: hoods somewhat spreading. 23. *A. Michauxii.*

XII. CINEREAE

Slender-stemmed plant with few pairs of leaves and few-flowered umbels: corolla-lobes tardily reflexed. 24. *A. cinerea.*

1. **A. decumbens** L. Stem decumbent or procumbent, 3–6 dm. long, hirsute or hispid: leaf-blades mainly elliptic to lanceolate with more or less hastate base, 3–19 cm. long, acutish: corolla-lobes 6–7 mm. long: horn arising above the hood-auricles, included only near the base: follicles mostly over 10 cm. long.—Dry fields, various provinces, Fla. to Tex., Ill., and N. Y., probably also further north.—Sum.—Corolla orange or nearly so.



2. **A. tuberosa** L. Stem mostly erect or ascending, 3–6 dm. tall, hirsute: leaf-blades usually lanceolate, varying to lanceolate-elliptic to linear-lanceolate, 3–9 cm. long, acute: corolla-lobes 5–6 mm. long: horn arising opposite the hood-auricles, about ⅓ included: follicles mostly less than 10 cm. long.—(BUTTERFLY-WEED. PLEURISY-ROOT.)—Dry fields, various provinces, Fla. to Tex., Ariz., Minn., Ont., and Me.—Sum.–fall.—Corolla bright-orange or yellow.

3. **A. Rolfsii** Britton. Stem erect or ascending, 1–3 dm. tall, hirsute: leaf-blades mainly broadly or narrowly pandurate, 3–7 cm. long, truncate or cordate at the base: corolla-lobes elliptic, 6–7 mm. long: horn arising below the hood-auricles, very stout, about ½ included: follicles 9–14 cm. long.—Pinelands, Coastal Plain, Fla. to S. C.—Spr.–sum. or all year S.—Corolla orange.

4. **A. lanceolata** Walt. Stem 4–11 dm. tall, glabrous or nearly so: leaves few, distant; blades elongate-linear, linear-lanceolate, or narrowly lanceolate, mostly 1–2.5 dm. long, tapering to the base: corolla-lobes elliptic, 8–9 mm. long, red: hoods ovate, less than twice as long as the androecium, orange-red, rounded at the apex: horn narrowly lanceolate, much shorter than the hood: follicles 7–10 cm. long.—In acid swamps, Coastal Plain, Fla. to Tex. and N. J.—Sum.

5. **A. rubra** L. Stem 3–12 dm. tall, glabrous: leaf-blades ovate, ovate-lanceolate, or elliptic-lanceolate, 7–20 cm. long: corolla-lobes purple-red or rarely purplish-green, 7–8 mm. long: hoods lanceolate, about 6 mm. long, orange-tinged, about twice as long as the androecium: horn slender-subulate, nearly as long as the hood: follicles 9–11 cm. long.—Acid swamps and moist grounds, Coastal Plain and rarely inland provinces, Fla. to Tex., W. Va., and N. J.

6. **A. laurifolia** Michx. Stem 8–11 dm. tall, almost glabrous: leaf-blades lanceolate to linear-lanceolate, mostly 1–3 dm. long: corolla- lobes reddish-purple, 9–10.5 mm. long: hoods 4–4.5 mm. long, purplish, much exceeding the androe-

cium, rounded at the apex; horn subulate, much shorter than the hood: follicles 8–11 cm. long.—Swamps and low pinelands, Coastal Plain, Fla. to Tex. and Ga.—Spr.–sum.

7. A. purpurascens L. Stem 3–12 dm. tall, pubescent in lines or becoming glabrous: leaf-blades mainly ovate or elliptic-ovate, 9–20 cm. long: corolla-lobes purple, 8–10 mm. long: hoods 4.5–5 mm. long, fully twice as long as the androecium, ovate at the entire apex; horn much shorter than the hood, with a horizontal subulate tip: follicles 10–12 cm. long.—(PURPLE-MILKWEED.)—Dry grounds, various provinces, N. C. to Okla., Kans., Minn., and N. H.; reported also from Miss.—Sum.

8. A. amplexicaulis J. E. Smith. Stem erect, 3–10 dm. tall, glaucous: leaf-blades horizontal, elliptic, 6–12 cm. long, sessile and clasping: corolla-lobes greenish-red or greenish-purple, 7–9.5 mm. long: hoods about 4 mm. long, maroon, exceeding the androecium, shallowly several lobed at the truncate apex; horn subulate, much exserted; follicles 8–16 cm. long. [*A. obtusifolia* Michx.] —In dry or sandy soil, various provinces, Fla. to Tex., Nebr., and N. H.

9. A. humistrata Walt. Stem prostrate, 3–9 dm. long, glaucous: leaf-blades vertical, alike on both sides, ovate, 5–13 cm. long, glaucous, white-veined: corolla-lobes gray or greenish-purple, 6–7 mm. long: hoods about 3.5 mm. long, white, much exceeding the androecium, broadly rounded; horn broad and flat, scarcely exserted: follicles 8–15 cm. long.—Pinelands, scrub and sandhills, Coastal Plain, Fla. to Miss. and N. C.—Spr.–sum.

10. A. exaltata (L.) Muhl. Stem 9–15 dm. tall, sometimes pubescent in lines above: leaf-blades ovate, oval, elliptic or elliptic-lanceolate, 1–2.5 cm. long: corolla-lobes greenish or greenish-purple, 7–10 mm. long: hoods 3.5–4 mm. long, white or flushed with pink, about equalling the androecium, truncate, the broad top irregularly lobed, the lateral lobes the longest; horn with a much exserted subulate incurved tip: follicles 10–16 cm. long.—(POKE-MILKWEED.)—In thickets and moist woods, various provinces, Ga. to Miss., Minn., and Me.

11. A. syriaca L. Stem 5–15 dm. tall, usually sparingly pubescent: leaf-blades elliptic or elliptic-ovate, 9–25 cm. long: corolla-lobes pinkish-purple, 6–8 mm. long: hoods usually white, sometimes pink-tinged, 3–4 mm. long, exceeding the androecium, obtuse; horn subulate, shorter than the hood: anther-wings much longer than wide; follicles 7–9 cm. long, echinate.—(COMMON-MILKWEED.)—Fields and waste-places, various provinces, Ga. to Kans., Sask., and N. B.

12. A. curassavica L. Stem 3–19 dm. tall, sometimes minutely pubescent above: leaf-blades elliptic to elliptic-lanceolate, 5–12 cm. long or more, glabrous or nearly so: corolla-lobes scarlet, 6–8 mm. long: column 1–1.5 mm. long: hoods ovate, 3.5–4 mm. long, yellow, exceeding the androecium; horn stout, incurved, exceeding the hood: follicles 6–10 cm. long.—In sandy soil, Coastal Plain, W Fla. and La.—All year.

13. A. incarnata L. Stem 6-11 dm. tall, glabrous or nearly so: leaf-blades mainly elliptic-lanceolate, lanceolate, or linear-lanceolate, 4–17 cm. long, glabrous or nearly so: corolla-lobes pink or rarely white, 4–6 mm. long: hoods ovate, purplish-pink, 2.5–3 mm. long, somewhat exceeding the androecium; horn slender, much longer than the hood: follicles 7–9 cm. long.—(SWAMP-MILKWEED.)—Swamps, various provinces, N. C. to La., N W Terr., Ont., and N. B.—Sum.

14. A. pulchra Ehrh. Stem 5–15 dm. tall, closely pubescent: leaf-blades broadly lanceolate to elliptic, 6–12 cm. long, pubescent: corolla-lobes bright-pink to purple or rarely white, 5–6 mm. long: hoods ovate, deep-pink, about 2.5 mm. long, slightly exceeding the androecium; horn slender, much longer than the hood: follicles 5–8 cm. long.—In moist fields and swamps, various provinces, Ga. to Minn. and Me.—Sum.–fall.

15. A. perennis Walt. Stem 3–9 dm. tall, often branched, puberulent in lines above: leaves opposite; blades elliptic, elliptic-lanceolate, or lanceolate, 5–15 cm. long, glabrous or nearly so: umbels solitary or few in a terminal corymb, the pedicels glabrous: corolla-lobes mainly white, 2.5–3.5 mm. long: hoods about 2 mm. long, scarcely exceeding the androecium; horn very slender, much exceeding the hood: column nearly 1 mm. long: follicles 5–8 cm. long: seeds 9–12 mm. long.—Moist woods and swamps, often in clayey soil, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Ind.—Spr.–sum.

16. A. quadrifolia Jacq. Stem 3–6 dm. tall, simple, sometimes puberulent in lines: leaves opposite, or whorled in 3's or 4's at one or more nodes; blades ovate-elliptic or lanceolate, 4–10 cm. long: umbels solitary or 2 or 3, the pedicels mostly 1.5–2 cm. long: corolla-lobes pink or nearly white, 5–6 mm. long: hoods 3.5–4 mm. long, about twice as long as the androecium; horn slender, much shorter than the hood: follicles 10–12 cm. long: seeds 5–6 mm. long.—Dry soil, woods and thickets, various provinces, N. C. to N Ala., Ark., Minn., Ont., and Me.—Spr.

17. A. obovata Ell. Stem 4–11 dm. tall, softly pubescent: leaf-blades obovate to oval or elliptic, 3–10 cm. long, closely pubescent: umbels terminal and in the upper leaf-axils, the densely hairy pedicels up to 1 cm. long: corolla-lobes greenish-yellow, 9–10 mm. long: hoods 5–6 mm. long, nearly twice as long as the androecium; horn falcate or lanceolate, arising about the middle of the hood, horizontally spreading: anthers about 2.5 mm. long: follicles 8–12 cm. long.—Dry grounds, Coastal Plain, Fla. to Tex. and S. C.—Sum.

18. A. aceratoides M. A. Curtis. Stem 3–5 dm. tall, tomentulose: leaf-blades oblanceolate to elliptic or elliptic-ovate, 7–12 cm. long: umbels few-flowered, very lax: corolla-lobes greenish, 8–10 mm. long: hoods truncate, about 4 mm. long, scarcely equalling the androecium; horn very broad, horizontally incurved: follicles not seen.—Sandy pine woods, Coastal Plain, S. C. and N. C.—Spr.

19. A. tomentosa Ell. Stem 3–12 dm. tall, softly pubescent: leaf-blades mainly elliptic to ovate, 5–8 cm. long: umbels several–many-flowered, rather lax: corolla-lobes greenish, 9–11 mm. long: hoods about 4 mm. long, truncate, about equalling the androecium; horn broad, horizontal and slightly incurved: follicles 10–13 cm. long.—Dry sandy soil and high pinelands, Coastal Plain, Fla. and Ga.—Spr.–sum.

20. A. linearis Scheele. Stem solitary or few together, 2–8 dm. tall, minutely pubescent in lines: leaf-blades narrowly elongate-linear, 4–12 cm. long: umbels usually several in the upper leaf-axils, the pedicels about 1 cm. long: corolla-lobes greenish-white, elliptic, 3–3.5 mm. long: hoods nearly 1.5 mm. long, about equalling the androecium; horn about twice as long as the hood: column about 1 mm. long: follicles 7–9 cm. long. [*A. galioides* (Fl. SE. U. S.)]—In damp clay soil, Coastal Plain, Ala. to Tex.—Sum.–fall.

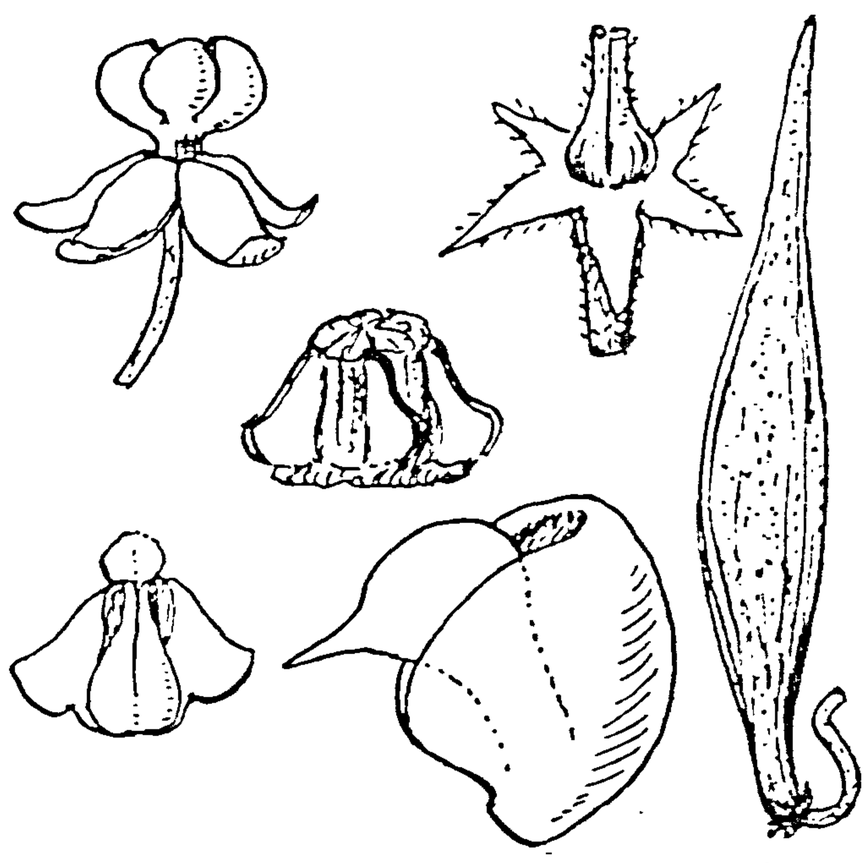
21. A. verticillata L. Stem 3–8 dm. tall, commonly pubescent in lines: leaf-blades very narrowly linear to linear-filiform, 2–6 cm. long: umbels few to several in the upper leaf-axils: corolla-lobes greenish-white, 3–4 mm. long: hoods about 1 mm. long, about equalling the androecium or shorter; horn slender, about twice as long as the hood: follicles 7–12 cm. long.—In dry and sterile soil, various provinces, Fla. to Tex., Nebr., Sask., Ont., and Mass.—Spr.–sum. or all year S.

22. A. viridula Chapm. Stems often solitary, 3–7 dm. tall, pubescent in lines, at least above: leaf-blades narrowly linear, 2.5–10 cm. long: umbels usually 3 or more in the upper axils, few-flowered, the pedicels up to 1 cm. long: corolla-lobes greenish, elliptic or obovate-elliptic, 3–4 mm. long: hoods 2.5–3 mm. long, exceeding the androecium; horn flat, equalling the hood: follicles 8–10 cm. long.—Wet pinelands, Appalachicola region, Fla.—Sum.–fall.

23. **A. Michauxii** Decne. Stems usually several together, 1–13 dm. tall, minutely pubescent: leaf-blades linear, often narrowly so, 4–9 dm. long: umbels many-flowered, the pedicels 1–1.5 cm. long: corolla-lobes greenish, elliptic, 5–6 mm. long: hoods 3–3.5 mm. long, exceeding the androecium; horn stoutish, shorter than the hood: column about 0.5 mm. long: follicles 8–14 cm. long.—Pinelands and sandhills, Coastal Plain, Fla. to Miss. and S. C.—Spr.

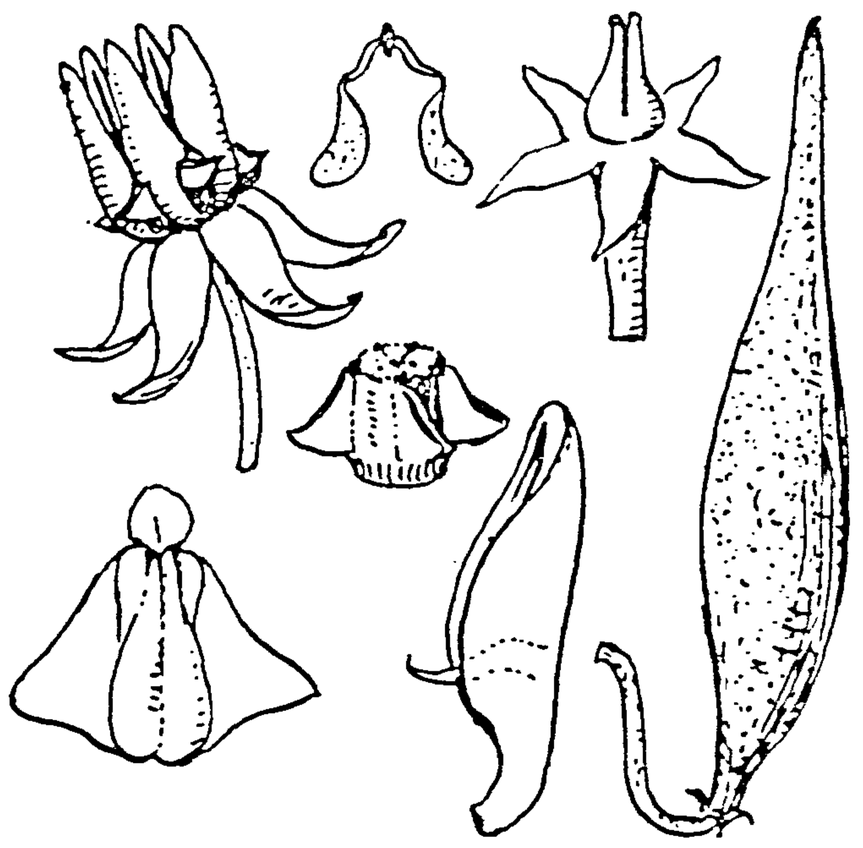
24. **A. cinerea** Walt. Stem 3–5 dm. tall, sometimes slightly pubescent in lines: leaf-blades narrowly linear or filiform, 3–9 cm. long: umbels usually paired at the top of the stem and additional ones often in the upper axils, the pedicels mostly 1.5–2 cm. long: corolla-lobes purplish, 5–7 mm. long: hoods about 3 mm. high, much shorter than the androecium, each with 2 lateral acute lobes which exceed the broad horn: anthers about 2 mm. long: follicles 8–10 cm. long.—Rather dry pinelands, Coastal Plain, Fla. to Miss. and S. C.—Spr.–sum.

7. **BIVENTRARIA** Small. Erect herbs with broad leaf-blades. Umbels solitary or paired, or sometimes 3 or 4 at the top of the stem. Calyx-lobes 5. Corolla rotate: lobes reflexed. Hoods erect, free, saccate, the two inflated sacs flat on the back, with a groove on the inner side from which the flat horn projects horizontally. Anther-wings curved upward from the base and salient just below the middle. Follicles fusiform. Seed with a coma.—One species.



1. **B. variegata** (L.) Small. Stem 3–9 dm. tall, glaucous, sometimes pubescent above: leaf-blades typically oval, varying to ovate or obovate, 6–14 cm. long: corolla-lobes white, 6–8 mm. long: hoods about 3 mm. long, inflated, at the broadly rounded apex, much exceeding the androecium; horn very broad, protruding horizontally: follicles 8–14 cm. long. [*Asclepias variegata* L.]—Dry shaded grounds, in rather acid soil, various provinces, Fla. to Tex., Ill., and Conn.—Spr.–sum.

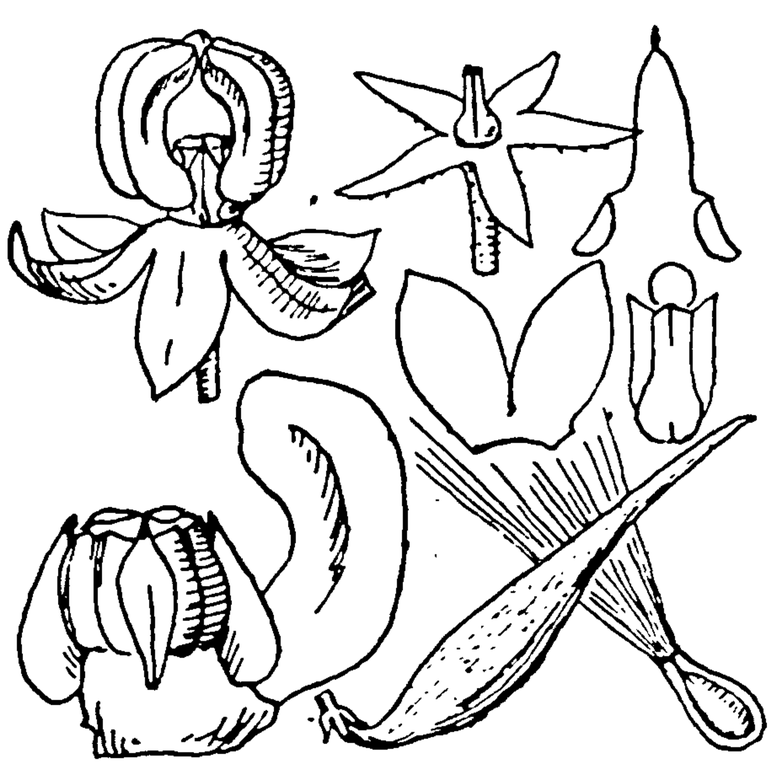
8. **OXYPTERYX** Greene. Erect herbs with the habit of *Acerates*, the leaf-blades broad. Umbels mostly lateral. Calyx-lobes 5. Corolla rotate: lobes reflexed. Hoods erect, elongate, free, distinctly stalked, with the sides conduplicate, the body thus dorsiventrally flattened, the free tip of the horn which is adnate to the midrib of the hood up to the middle, horizontally protruding from the slit between the edges of the hood and curved upward near the apex. Anther wings deltoid, protruding between the hood-claws. Follicles erect, fusiform. Seed with a coma.—One species.



1. **O. Curtissii** (A. Gray) Small. Stem decumbent or ascending, 5–7 dm. long, minutely pubescent, sometimes widely branched: leaf-blades broadly elliptic to oval, varying to broadest above the middle or below it, 3–5 cm. long, glabrous or

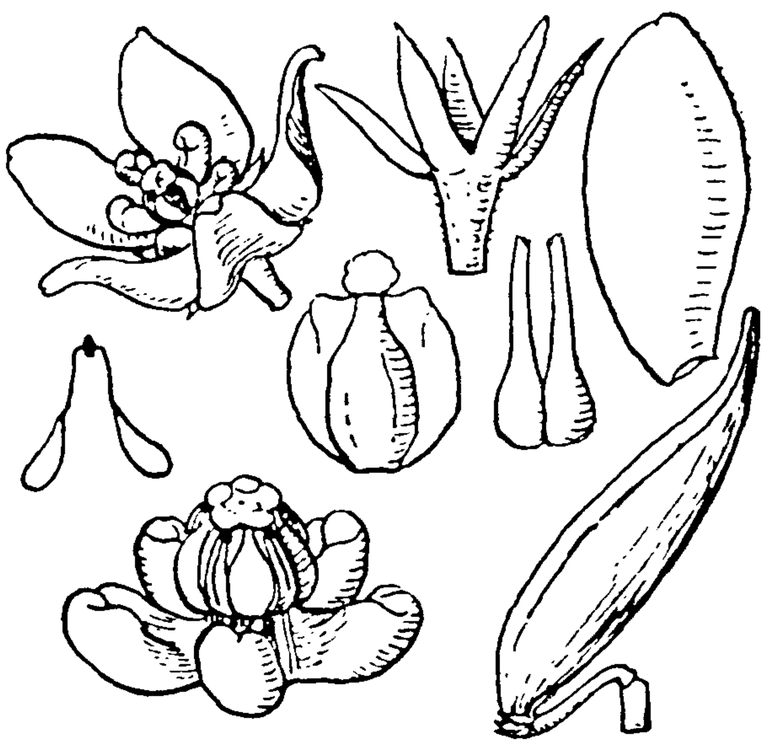
nearly so: umbels many-flowered, the pedicels slender, sparingly pubescent: corolla-lobes greenish-white, lanceolate, 5.5–6 mm. long: hood lanceolate, 4–4.5 mm. long, fully twice as long as the androecium: anthers about 1.5 mm. long: follicles 8–11 cm. long. [*Asclepias Curtissii* A. Gray *A. aceratoides* Nash *A. arenicola* Nash]—Sandhills and scrub, pen. Fla.—Spr.–fall.

9. **ANANTHERIX** Nutt. Upright herbs, with relatively narrow leaf-blades. Calyx-lobes 5. Corolla rotate: lobes reflexed. Hoods relatively long, the tips converging high over the stigma. Pollinia shorter than the caudicles. Follicles fusiform.—One species.



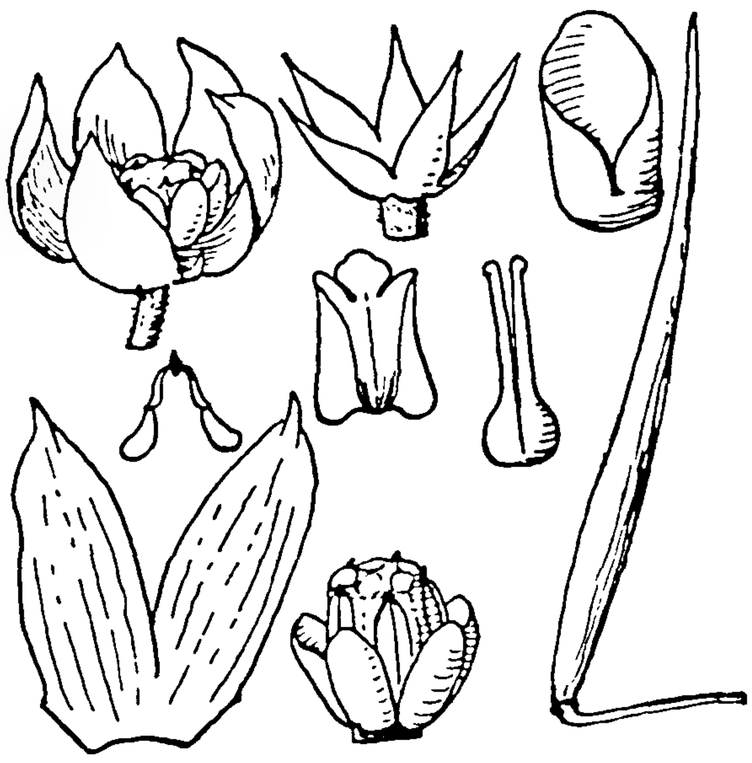
1. **A. connivens** (Baldw.) Feay. Plant 3–6 dm. tall: leaf-blades elliptic to lanceolate, 3–8 cm. long, fleshy: peduncles longer than the pedicels: umbels 2–6, borne along the naked or nearly naked upper part of the stem: corolla greenish; lobes 9–10.5 mm. long: hoods white, incurved, 8 mm. long: anthers 3.5 mm. long; follicles 8–9 cm. long.—Moist pinelands and bogs, Coastal Plain, Fla. to Miss. and Ga.—Sum.—The perpendicular root is deep-seated in wet sand.

10. **ASCLEPIODORA** A. Gray. Spreading herbs with alternate leaves. Calyx-lobes 4. Corolla rotate: lobes spreading. Hoods involute and hooded at the apex, with an internal ridge above the middle. Anthers equalling the gynostegium: wings rounded at the base.—About 6 species, North American.



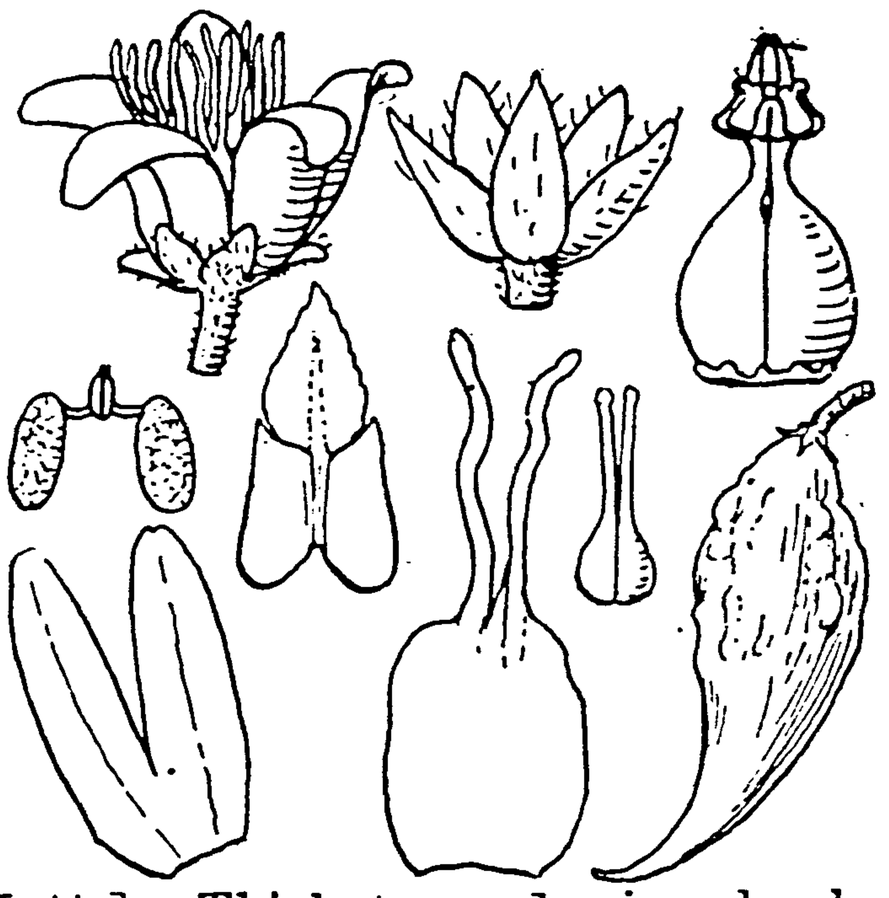
1. **A. viridis** (Walt.) A. Gray. Stem 2–6 dm. long, stout: leaf-blades elliptic to lanceolate, 6–10 cm. long, rather thin: calyx-lobes about 4 mm. long, ciliolate: corolla-lobes greenish, 10–11 mm. long: hoods about 4.5 mm. long, purplish or violet: anther-wings 2.5 mm. long: follicles 6–11 cm. long.—Pinelands, open woods, and fields, various provinces, Fla. to Tex., Kans., Tenn., and S. C.—Spr.–sum.

11. **ASCLEPIODELLA** Small. Upright herbs, with opposite leaves. Calyx-lobes 5. Corolla rotate: lobes spreading. Hoods concave, open at the apex, ridged within mainly below the middle. Anthers curving over the top of the gynostegium: wings sagittate at the base.—One species.



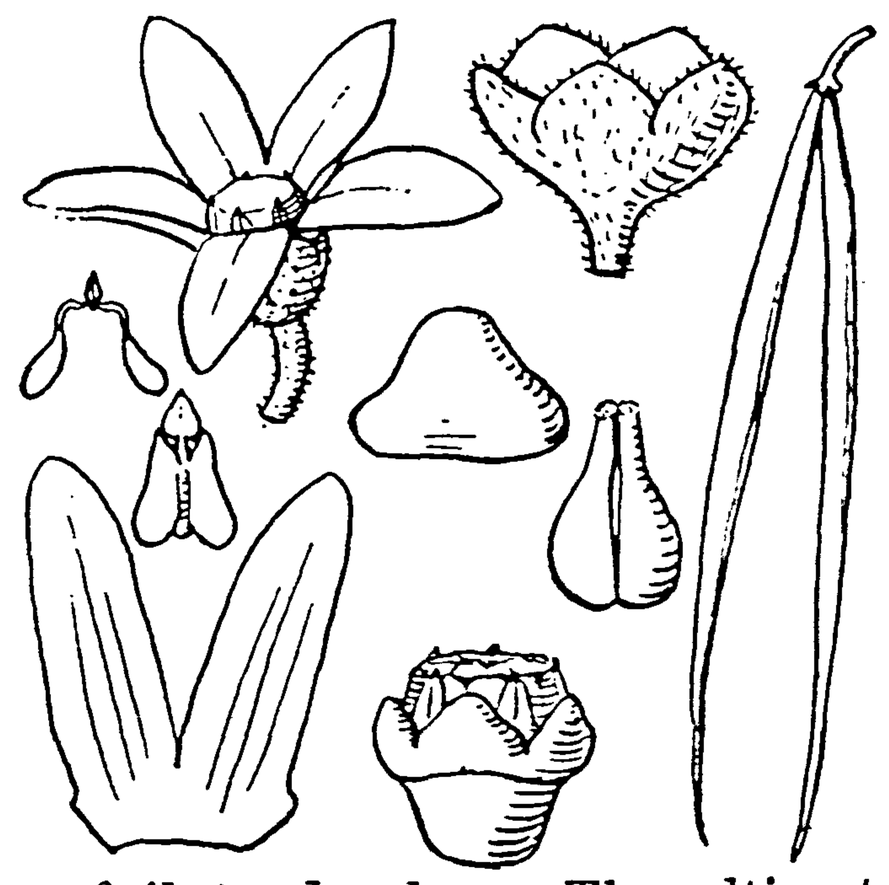
1. **A. Feayi** (Chapm.) Small. Stem 2–4 dm. tall, slender: leaf-blades linear-filiform, 3–10 cm. long: calyx-lobes 1.5–2 mm. long: corolla-lobes white, 6–7 mm. long: hoods 2.5–3 mm. long, white: anther-wings barely 3 mm. long: follicles 3–4.5 cm. long. [*Asclepiodora Feayi* Chapm.]—Pinelands, Fla.—Spr.–fall.—This small milkweed is nowhere plentiful, but occurs as scattered plants in the open pinewoods. The slender stem and very slender leaves are out of proportion to the rather large pale flowers.

12. GONOLOBUS Michx. Vines, with broad leaf-blades. Calyx-lobes longer than the corolla-tube. Corolla campanulate: lobes spreading or reflexed at the tip. Crown borne near the base of the anthers: lobes each terminating in an entire or cleft appendage. Anther-wings salient at the base. Stigma with an elevated lobed top. Follicles wing-angled.—Three species, North American.



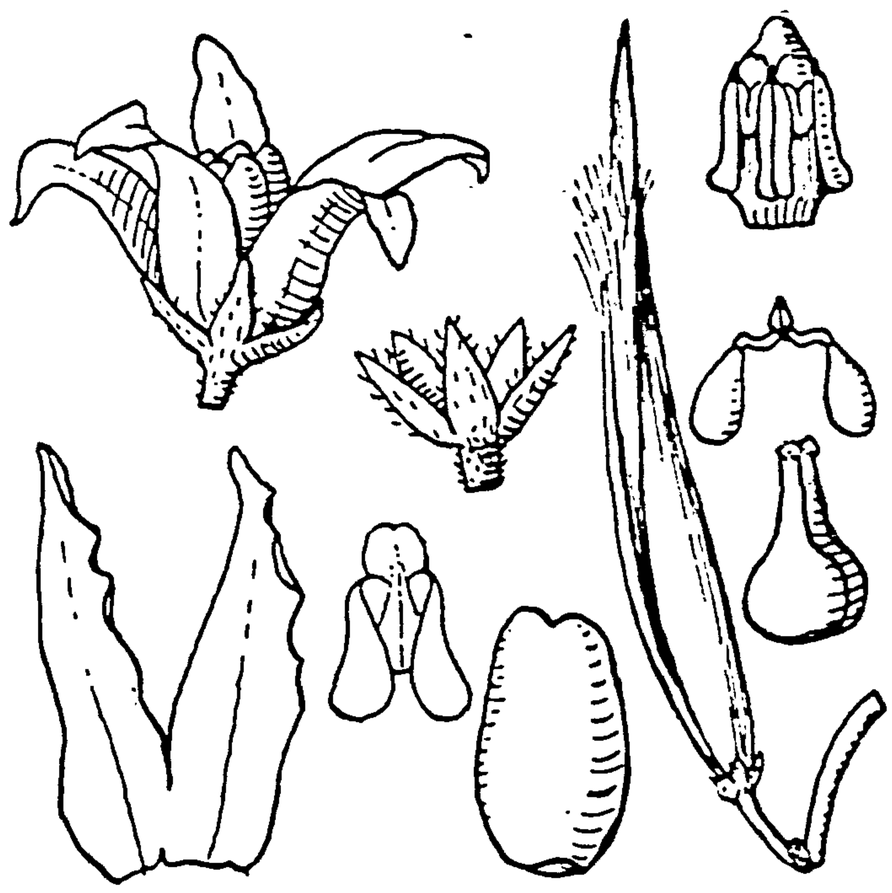
1. G. laevis Michx. Leaf-blades ovate, 4–15 cm. long, acuminate at the apex, cordate at the base: calyx-lobes 2–2.5 mm. long: corolla whitish; lobes 4–4.5 mm. long, linear-lanceolate: crown-lobes about 4 mm. long, the slender appendages quite as long as the body: anther-wings barely 1 mm. long: follicles 9–10 cm. long. [*Enslenia albida* Nutt.]—Thickets and river-banks, various provinces, Fla. to Tex., Kans., and Pa.—Sum.

13. AMPHISTELMA Griseb. Slender vines, with narrow leaf-blades. Calyx-lobes longer than the corolla-tube. Corolla rotate-campanulate: lobes glabrous within. Crown adnate to the column, sessile on the base of the corolla, cup-like: lobes very broad, surpassed by the androecium. Stigma flat.—About 25 species, tropical American.



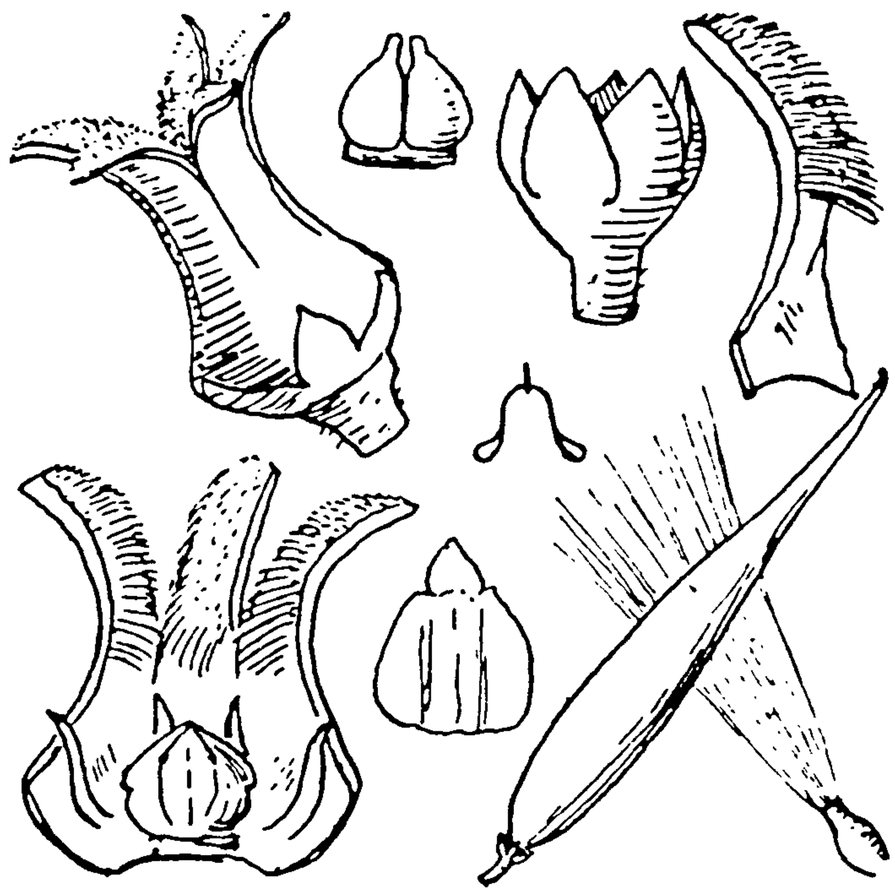
1. A. scoparia (Nutt.) Small. Diffuse vine: leaf-blades narrowly linear, 2–5 cm. long: calyx-lobes about 1 mm. long, deltoid, corolla-lobes greenish, 1.5–2 mm. long: crown-lobes about 0.5 mm. long: follicles 3.5–4.5 cm. long.—Hammocks, Coastal Plain, Fla. to S. C.—Spr.–fall.—This plant is often quite leafy when young, but as it develops and makes myriad branches, the leaves fall off or fail to develop. The ultimate growth is sometimes sufficiently abundant to smother a host.

14. LYONIA Ell. Slender vines, with narrow leaf-blades. Calyx-lobes longer than the corolla-tube. Corolla rotate-campanulate: lobes spreading at the tip, glabrous within. Crown adnate to the short column: lobes naked at the apex, longer than the androecium. Stigma conic.—One species.



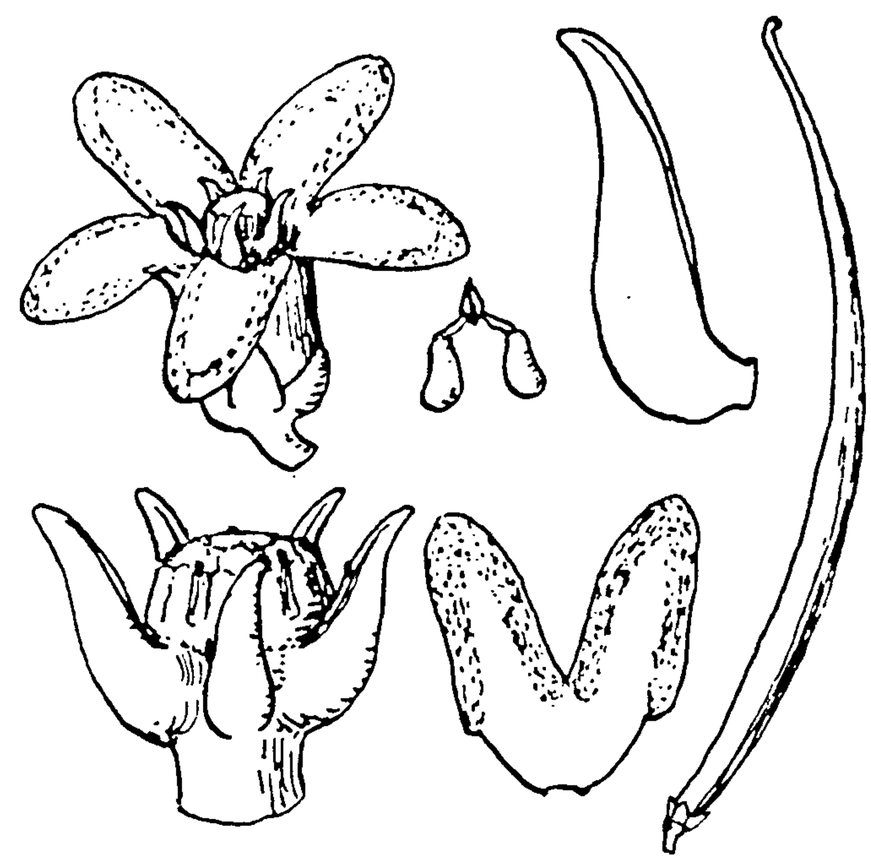
1. L. palustris (Pursh) Small. Leaf-blades linear, 2–7 cm. long, acute, pendent: calyx-lobes lanceolate, about 2.5 mm. long: corolla-lobes purplish or greenish-white, 3–4 mm. long: crown-lobes 1.5–2 mm. long, retuse or emarginate at the apex: anther-wings about 1 mm. long: follicles 4.5–5.5 cm. long. [*Seutera maritima* Decne. *S. palustris* Vail] —Hammocks and salt-marshes, Coastal Plain, Fla. to Tex. and N. C.—(*W. I.*)—Spr.–fall.

15. **METASTELMA** R. Br. Slender vines, with narrow leaf-blades. Calyx-lobes longer than the corolla-tube. Corolla rotate-campanulate: lobes pubescent within. Crown adnate to the base of the corolla-tube: lobes slender, curved over the anthers. Stigma flat.—About 25 species, mostly tropical American.



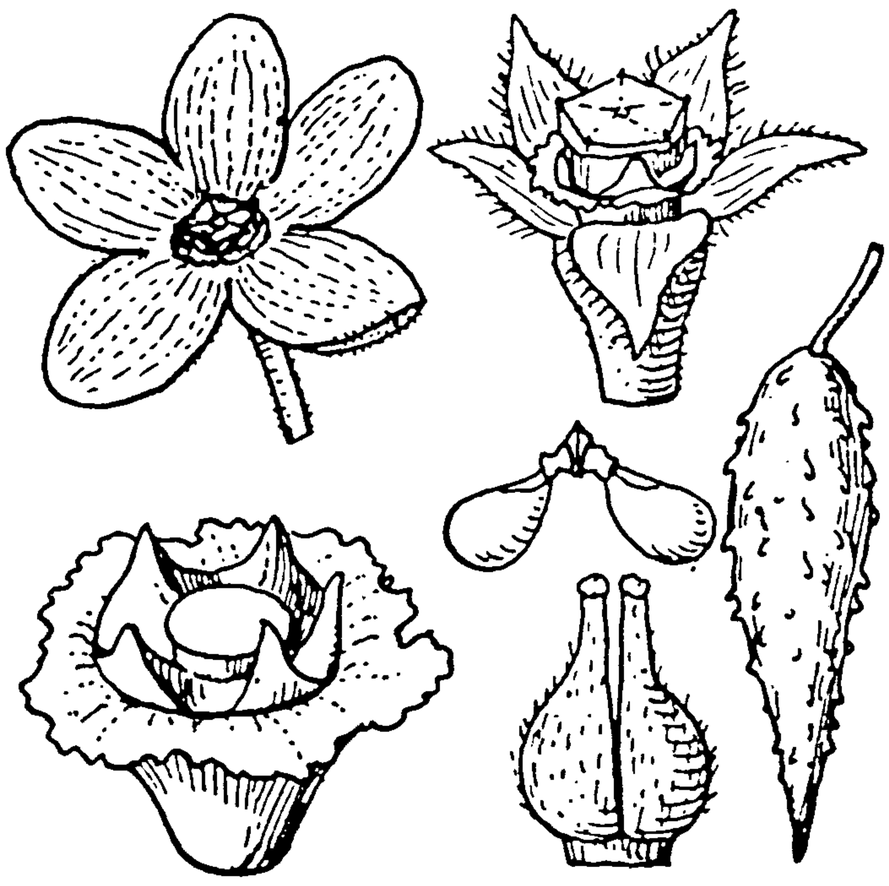
1. **M. Blodgettii** A. Gray. Leaf-blades linear or linear-lanceolate, 8–27 mm. long: calyx-lobes broadly ovate about 1 mm. long: corolla whitish; lobes 2–2.5 mm. long, penicillate-bearded within: crown-lobes subulate: follicles 4–5 cm. long.—Hammocks and sand-dunes, S Fla. and S Tex.—Spr.–fall.—As in the case of *Amphistelma* this plant often makes copious growth over bushes, but it generally holds its leaves.

16. **EPICION** Small. Slender vines, with relatively broad leaf-blades. Calyx-lobes shorter than the corolla-tube. Corolla campanulate: lobes pubescent within. Crown adnate to the top of the elongate column: lobes narrow. Stigma flat or depressed.—Three or four species, tropical American.



1. **E. Northropiae** (Schlecht.) Small. Leaf-blades elliptic to oval, 1.5–2.5 cm. long, slender-petioled: calyx-lobes ovate, 1.5 mm. long: corolla white; lobes 2.5–3 mm. long, longer than the tube, obtuse: crown-lobes 1.5 mm. long: follicles 5–6.5 cm. long. [*Metastelma Northropiae* Schlecht.]—Hammocks and pinelands, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—All year.—*E. bahamense*, formerly recorded for Florida, is confined to the Bahamas and Cuba. It has smaller flowers than *E. Northropiae*, with a short corolla-tube and a very short gynostegium.

17. **CYCLODON** Small. Stout twining vines. Leaf-blades broad, with an open basal sinus. Cymes few-flowered, short-peduncled. Calyx-lobes 5, longer than the corolla-tube. Corolla rotate, glabrous within: lobes relatively wide. Crown an irregularly 5-lobed disk, the lobes erose. Column distinct, with 5 horn-like appendages free or adnate at its base. Follicles armed.—Several species, mainly tropical.



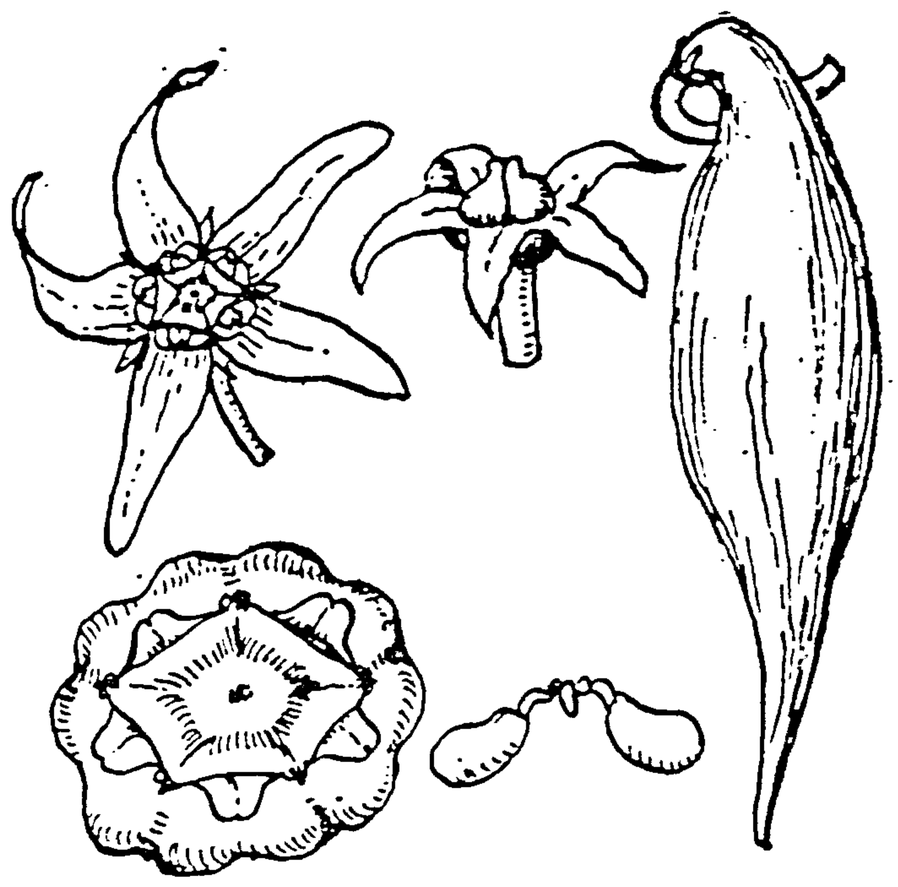
1. **C. alabamense** (Vail) Small. Stem short-pubescent: leaf-blades ovate to elliptic-ovate, 6–15 cm. long, the basal lobes not overlapping: calyx-lobes ovate, hirsute, the basal glands in pairs: corolla mainly greenish-yellow; lobes elliptic, 6–7 mm. long,

pubescent without, reticulate: follicles stout-fusiform, about 9 cm. long, covered with fleshy spines: seeds nearly 1 cm. long. [*Vincetoxicum alabamense* Vail]—Hillsides and thickets, Coastal Plain, Ala.—Sum.–fall.

18. **VINCETOXICUM** Walt.[1] Stout twining, usually pubescent vines. Leaves with broad cordate blades. Cymes usually peduncled. Calyx-lobes 5, usually glabrous, longer than the corolla-tube. Corolla rotate, glabrous or puberulent within: lobes relatively narrow. Crown a fleshy disk at the base of the gynostegium, 5-lobed, with an obscure rib dividing each lobe, thus making it appear 10-lobed. Follicles unarmed, wing-ridged toward the apex, glabrous.—Several species, mainly North American.—ANGLE-PODS.—Spr.–sum.

Corolla-lobes glabrous within, more than twice as long as the calyx-lobes. 1. *V. gonocarpos.*
Corolla-lobes pubescent within, twice as long as the calyx-lobes or less. 2. *V. suberosum.*

1. V. gonocarpos Walt. Leaf-blades broadly ovate to ovate-elliptic, 7–18 cm. long, the basal sinus sometimes broad or with the lobes overlapping; petioles pubescent: flowered-buds long-conic: calyx-lobes glabrous, rarely ciliate near the tip, 2–4 mm. long: corolla greenish; lobes glabrous, lance-linear, 9–14 mm. long: follicles smooth, 8–10 cm. long. [*Gonolobus macrophyllus* Michx.]—River-banks and thickets, various provinces, Ga. to Tex., Mo., and Ky.



2. V. suberosum (L.) Britton. Leaf-blades elliptic-ovate to elliptic-oval, 6–12 cm. long, the basal sinus shallow, the lobes not overlapping: petioles glabrate: flower-buds broadly conic: calyx-lobes 3–4.5 mm. long: corolla brown-purple or yellowish with a dark center; lobes pubescent within, lanceolate, 6–9 mm. long: follicles smooth, 10–14 cm. long. [*Gonolobus suberosus* R. Br.]—Thickets and river-banks, Coastal Plain, Fla. to La. and Va.

Metalepis cubensis (A. Rich.) Griseb. of Cuba, a vine with ovate to hastate leaf-blades, a single crown in the flower and ovoid, oval, or obovoid melon-like fruits 1–2 dm. long, has been found in Brickell Hammock, Miami, Fla.

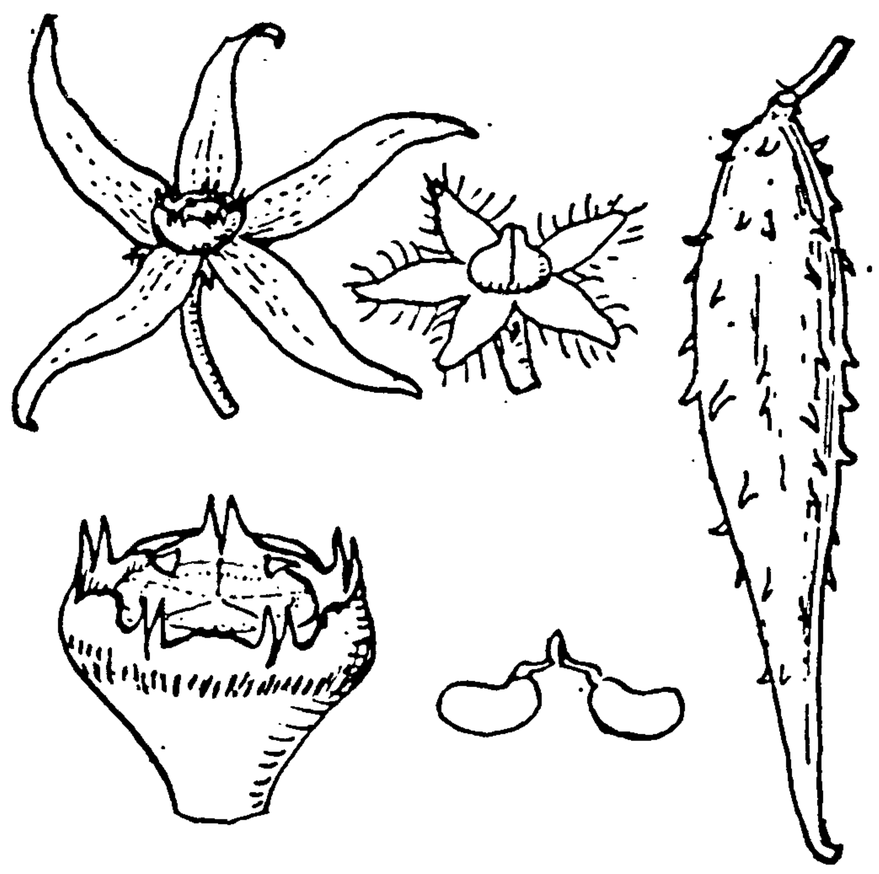
19. **ODONTOSTEPHANA** Alexander.[1] Stout twining vines resembling *Vincetoxicum*, the stems usually pubescent. Leaves with broad, usually large, cordate blades. Cymes dense, peduncled. Calyx-lobes 5, pubescent, longer than the corolla-tube. Corolla rotate, pubescent without: lobes relatively narrow. Crown cup-shaped, usually appearing 10-lobed, the longer lobes usually erect and toothed with the shorter lobes usually incurved, toothed or entire, and also crested or appendaged on the inside, the appendage as broad as the lobe. Follicles armed with fleshy spines. [*Vincetoxicum* Walt. in part.]—Several species, American—SPINY-PODS.—Sum. or spr. S.

Crown appearing 10-lobed, each lobe entire or 2-toothed.
  Corolla purple, brownish or reddish; crown thick-fleshy, the lower lobes entire.
    Narrower lobes of the crown prominently 2-toothed, markedly longer than the broader lobes.
      Corolla-lobes usually 10–15 mm. long, lance-linear: buds ellipsoid-ovoid to conic. 1. *O. decipiens.*

[1] Contributed by Edward Johnston Alexander.

Corolla-lobes usually 7–10 mm. long, narrowly elliptic: buds short-ovoid. 2. *O. carolinensis.*
Narrower lobes of the crown truncate or emarginate, not markedly longer than the broader lobes.
Crown undulate-lobed, the crest double. 3. *O. obliqua.*
Crown crenate-lobed, the crest if present, a narrow fold or ridge. 4. *O. Shortii.*
Corolla white or yellowish: crown-thin, the lower lobes 2-toothed.
Lower lobes only cleft to above the middle, the teeth of the slender lobes far surpassing them. 5. *O. Baldwiniana.*
Lower lobes cleft well below the middle, surpassed by the broader bluntly toothed lobes. 6. *O. flavidula.*
Crown appearing 5-lobed, each lobe 4-toothed. 7. *O. floridana.*

1. O. decipiens Alexander. Leaf-blades ovate, 7–12 cm. long, the sinus narrow or closed: flower-buds ellipsoid-ovoid or conic: calyx-lobes about 3 mm. long: corolla brown-purple; lobes lance-linear, 10–15 mm. long: crown with the longer lobes usually 2-toothed, the broader lobes appendaged or crested; follicles 8–10 cm. long.—Woods and stream-banks, in rather acid soil, Coastal Plain and occasionally adj. provinces, S. C. to Okla., Mo., and Md.—The variability of the crown of this and the following species is most confusing, but the larger flowers and narrower corolla lobes of this species easily separate it.



2. O. carolinensis (Jacq.) Alexander. Leaf-blades ovate, 5–11 cm. long, the sinus open or closed: flower-buds short-ovoid: calyx-lobes about 3 mm. long: corolla reddish or rarely pale; lobes narrowly elliptic, 7–10 mm. long: crown with the longer lobes usually 2-toothed, the broader lobes entire, crested or appendaged within: follicles 9–11 cm. long. [*Cynanchum carolinense* Jacq. *Gonolobus carolinensis* R. Br. *G. hirsutus* Michx. *V. hirsutum* Britton *V. floridanum* Vail.]—Woods and thickets, various provinces, Fla. to Miss., Tenn., and Md.—The crown of this and the preceding species is extremely variable, from fleshy to thin, and with the crest of the shorter lobes, from a mere ridge to a ligule-like appendage, sometimes with a fringe-like appendage on the outside as well.

3. O. obliqua (Jacq.) Alexander. Leaf-blades broadly ovate to orbicular-ovate, 7–20 cm. long, the basal lobes mostly forming a closed sinus by the overlapping edges: calyx-lobes about 3 mm. long: corolla reddish-purple; lobes lance-linear, 9–14 mm. long: crown with the longer lobes truncate or emarginate: follicles 7–9 cm. long: seeds about 7 mm. long. [*Gonolobus obliquus* R. Br. *Vincetoxicum obliquum* Britton]—Woods, thickets, and river-banks, in rich soil, various provinces, N of Coastal Plain, Tenn. to Ohio, Pa., and N. C.

4. O. Shortii (A. Gray) Alexander. Leaf-blades broadly ovate, 5–14 cm. long, the basal lobes often forming a narrow sinus: calyx-lobes about 4 mm. long: corolla greenish-purple; lobes lance-linear, 11–15 mm. long: crown with the longer lobes truncate or emarginate: follicles 8–10 cm. long: seeds about 8 mm. long. [*Gonolobus Shortii* A. Gray *Vincetoxicum Shortii* Britton]—Dry woods, Appalachian provinces, Ga. to Ky. and Pa.—The flowers are said to have the scent of *Calycanthus* flowers.

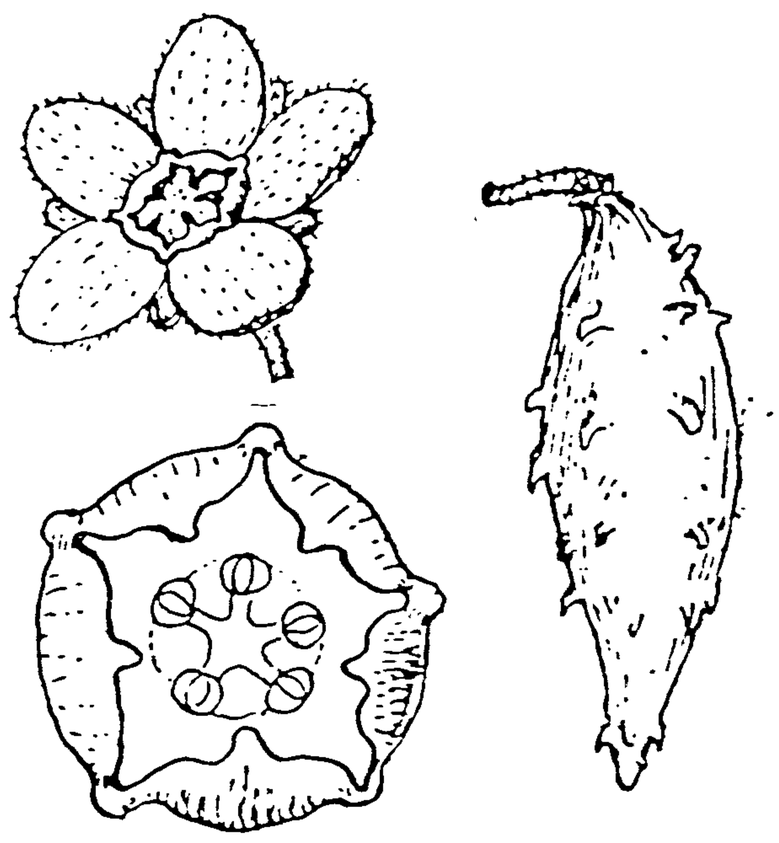
5. O. Baldwiniana (Sweet) Alexander. Leaf-blades broadly ovate, 6–14 cm. long, deeply and somewhat obliquely cordate at the base, the sinus open or the basal lobes of the larger leaves overlapping: flower-buds long-conic: calyx-lobes 2–3 mm. long: corolla white or yellowish: lobes thin, erect or barely spreading: oblong-linear, 9–11 mm. long: crown very thin, with the longer lobes divided into two very slender linear teeth fully double the length of the

rather quadrate shallowly toothed broader lobes: follicles about 8 cm. long: seeds about 9 mm. long. [*Gonolobus Baldwinianus* Sw. *Vincetoxicum Baldwinianum* Britton].—Thickets and open woods, various provinces, Ga. to Okla. and Mo.—Spr. and sum.

6. **O. flavidula** (Chapm.) Alexander. Leaf-blades broadly ovate, 9–16 cm. long, the basal lobes rarely overlapping: flower-buds ovoid: calyx-lobes about 3.5 mm. long: corolla greenish-yellow; lobes elliptic, 10–11 mm. long: crown with the longer lobes shallowly toothed: follicles 14–17 cm. long. [*Gonolobus flavidulus* Chapm. *Vincetoxicum flavidulum* Heller]—Rich soil, mostly in woods, Coastal Plain, Fla. to S. C.

7. **O. floridana** (Vail) Alexander. Leaf-blades ovate-cordate, 2–5 cm. long, the sinus open and somewhat oblique: calyx-lobes about 2 mm. long: flower-buds conic: corolla purplish or greenish-purple, about 5 mm. long, the lobes spreading, linear-lanceolate: crown with five broad lobes, each bidentate at the callous-thickened apex and with a smaller tooth on each side at about the middle: follicles not seen. [*Vincetoxicum floridanum* Vail].—Sandy soil, E Fla.—Sum.

20. **EDISONIA** Small. Slender prostrate vine-like herbs. Leaf-blades broad but small. Cymes sessile. Calyx-lobes 5, about as long as the corolla-tube. Corolla campanulate: lobes villous within, short. Crown 5-lobed, each lobe with an appendage which is decurrent on the inner side, each sinus folded as if to form another lobe. Column sunken in a cavity beneath the converging crown-lobes.—One species.



1. **E. pubiflora** (Decne.) Small. Leaf-blades broadly cordate or reniform, 2–4 cm. long, the sinus open: flower-buds oval or obovoid: calyx lobes 2–2.5 mm. long: corolla dull-purple; lobes about 2 mm. long: crown with 10 rounded undulations, each alternate one with an adnate beak or horn: follicle ovoid-fusiform, 4–5 cm. long. [*Chthamalia pubiflora* Decne. *Gonolobus pubiflorus* Engelm. *Vincetoxicum pubiflorum* Vail]—Sandhills and scrub, Coastal Plain, Fla. and Ga.—Spr.–sum.

Order **POLEMONIALES**—Polemonial Order

Herbs, sometimes parasitic, shrubs or trees. Flowers mainly perfect. Calyx of partially united sepals. Corolla, regular or irregular. Androecium of as many stamens as there are corolla-lobes, or fewer. Gynoecium 2–several carpellary. Ovary superior. Fruit a capsule, a berry or a drupe, or a group of nutlets or utricle-like.

Stamens 5, usually equal: corolla regular or nearly so.
  Gynoecium of 2 distinct carpels. — Fam. 1. Dichondraceae.
  Gynoecium of 2 or more partially or wholly united carpels.
    Fruit capsular or baccate: ovary not 4-lobed.
      Styles or stigmas distinct.
        Ovary 1–2-celled, or 4-celled: stigmas 2.
          Ovary 2-celled or 4-celled.
            Corolla unappendaged within: plants with normal leaves, at least if vines. — Fam. 2. Convolvulaceae.
            Corolla appendaged within: parasitic vines: leaves scale-like. — Fam. 3. Cuscutaceae.

- Ovary 1-celled (2-celled in *Nama*). — Fam. 4. HYDROLEACEAE.
- Ovary 3-celled: stigmas 3.
  - Calyx-lobes imbricated: corolla mostly plaited in the bud. — Fam. 2. CONVOLVULACEAE.
  - Calyx-lobes valvate: corolla merely convolute in the bud. — Fam. 5. POLEMONIACEAE.
- Styles or stigmas wholly united. — Fam. 6. SOLANACEAE.

Fruit drupaceous, or of 2 or 4 nutlets.

- Style or stigmas without a glandular ring.
  - Fruit a group of 2 or 4 nutlets: style arising from between the lobes of the ovary. — Fam. 7. BORRAGINACEAE.
  - Fruit drupaceous: style terminating the lobeless ovary. — Fam. 8. EHRETIACEAE.
- Style or stigmas with a glandular ring. — Fam. 9. HELIOTROPIACEAE.

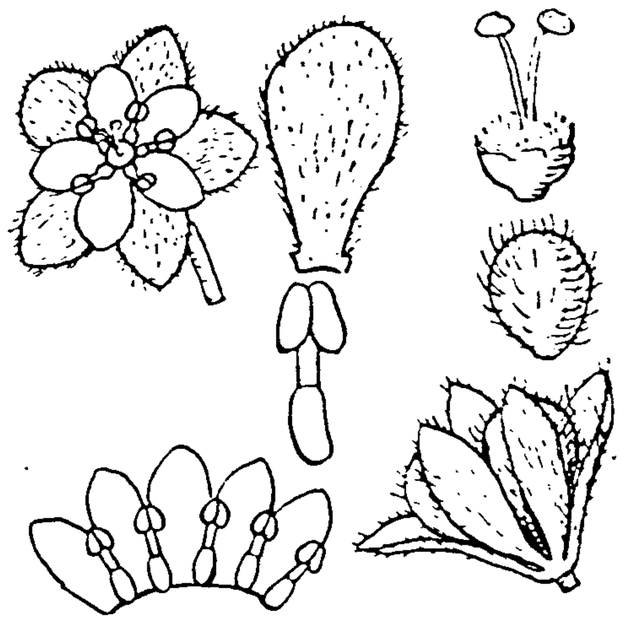
Stamens 4 and didynamous, or 1 or 2: corolla usually irregular and bilabiate.

- Carpels ripening into a group of 4 nutlets, an achene or a drupe.
  - Style apical on the lobeless ovary.
    - Ovary 2-celled.
      - Fruit dry or drupaceous, with 2 or 4 nutlets. — Fam. 10. VERBENACEAE.
      - Fruit fleshy-capsular, with a solitary seed. — Fam. 11. AVICENNIACEAE.
    - Ovary 1-celled. — Fam. 12. PHRYMACEAE.
  - Style arising between the 4 lobes of the ovary. — Fam. 13. LAMIACEAE.
- Carpels ripening into a capsule.
  - Placentae of the ovary axile.
    - Ovary 2-celled, or rarely 3–5-celled.
      - Corolla-lobes imbricated: capsule not elastically dehiscent. — Fam. 14. RHINANTHACEAE.
      - Corolla-lobes convolute: capsules elastically dehiscent. — Fam. 15. ACANTHACEAE.
    - Ovary 1-celled. — Fam. 16. PINGUICULACEAE.
  - Placentae of the ovary parietal.
    - Herbs parasitic on the roots of other plants: leaves scale-like: foliage not green. — Fam. 17. OROBANCHACEAE.
    - Trees, shrubs or woody vines, or herbs, but not parasitic: leaves not scale-like: foliage green.
      - Ovary and capsule 2-celled: trees, shrubs or woody vines: seeds winged. — Fam. 18. BIGNONIACEAE.
      - Ovary and capsule 1-celled or spuriously 2- or 4-celled: herbs, seeds wingless.
        - Anther-sacs parallel: fruit a columnar, crestless dry capsule. — Fam. 19. PEDALIACEAE.
        - Anther-sacs divergent: fruit a ventricose, fleshy coated capsule. — Fam. 20. MARTYNIACEAE.

FAMILY 1. DICHONDRACEAE — DICHONDRA FAMILY

Annual or perennial creeping herbs. Leaves alternate: blades broad, entire, long-petioled. Flowers axillary, solitary. Calyx of 5 slightly united sepals. Corolla rotate to campanulate, 5-lobed. Androecium of 5 stamens shorter than the corolla. Gynoecium of 2 distinct carpels. Styles basal. Capsules utricle-like, 2 together.—Only the following genus and 5 species, widely distributed.

1. DICHONDRA Forst. Stems much-branched, often densely matted. Flowers erect, greenish white.



1. D. carolinensis Michx. Plant inconspicuously pubescent: leaf-blades reniform to suborbicular, 5–20 mm. wide, deeply cordate: calyx-lobes 2–3 mm. long: corolla-lobes obtuse. [*D. repens* (Chapm. Fl.)]—Hammocks, pinelands, roadsides, low grounds, and moist grassy banks, Coastal Plain, and adj. provinces, Fla. to Tex., Ark., and S. Va.—(*W. I.*)—This plant has two roles in southern latitudes: it may be a persistent weed in lawns or it may be a lawn plant itself, thriving where other lawn plants refuse to grow.

Family 2. **CONVOLVULACEAE** — Morning-glory Family

Annual or perennial herbs, or vines, or rarely shrubs or trees. Leaves alternate, without stipules: blades various. Flowers perfect, regular, solitary or cymose. Calyx of 5, more or less united sepals, in one or two series. Corolla convolute in aestivation, its limb lobed or entire. Androecium of 5 stamens, partially adnate to the corolla-tube, alternate with the lobes. Gynoecium of 2 united carpels. Ovary 2–4-celled (rarely 5-celled, or 1-celled by the loss of the septum). Seeds 1 or 2 in each cavity, often pubescent.—Forty-five genera and 1,000 species, widely distributed.

Styles distinct or partly so. — I. Evolvuleae.
Styles united up to the stigmas. — II. Convolvuleae.

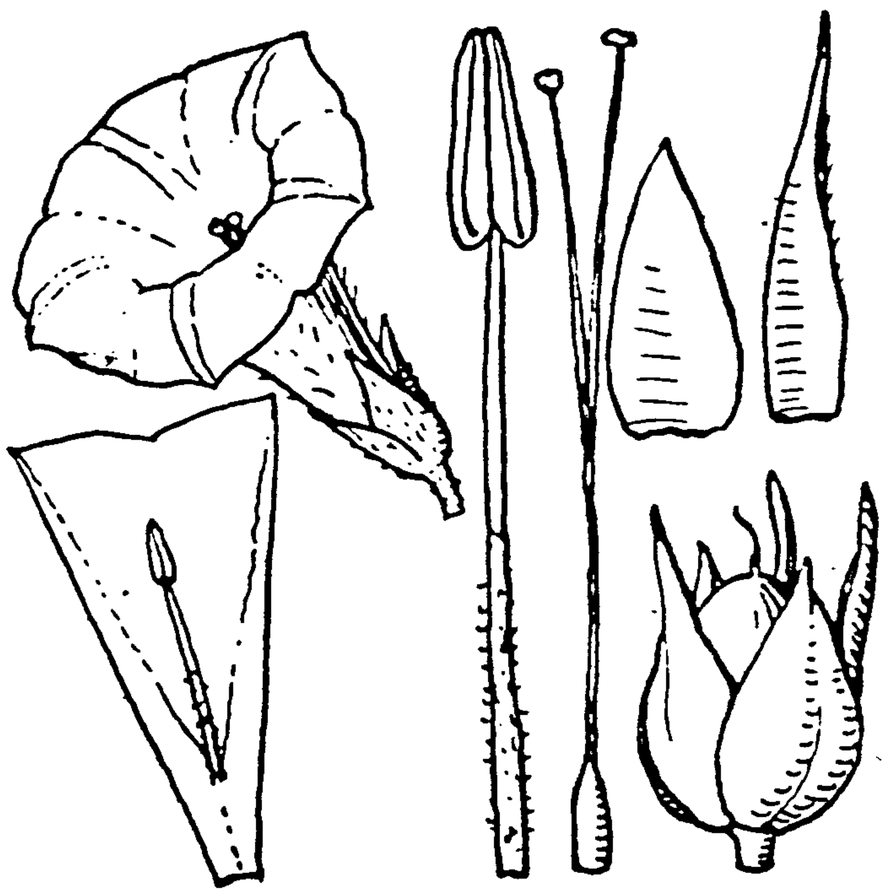
I. Evolvuleae

Styles nearly distinct or partially united, entire: stigmas 2.
  Sepals leathery, 2 cm. long or longer: stems stout. — 1. Bonamia.
  Sepals herbaceous, 1 cm. long or less: stems slender. — 2. Stylisma.
Styles distinct, each 2-cleft: stigmas 4. — 3. Evolvulus.

II. Convolvuleae

Capsules dehiscent and valvular.
  Stigmas ovoid or subglobose.
    Calyx urn-shaped: stamens spirally twisted: corolla broadly campanulate-funnelform. — 4. Operculina.
    Calyx campanulate: stamens straight.
      Stamens and style included: corolla funnelform.
        Sepals herbaceous, elongate, usually pilose: ovary usually 3-celled. — 5. Pharbitis.
        Sepals coriaceous or membranous, not elongate: ovary 2- or 4-celled. — 6. Ipomoea.
      Stamens and style exserted: corolla usually salverform.
        Corolla large, showy, 10–20 cm. long, white. — 7. Calonyction.
        Corolla smaller, 3–6 cm. long or less, rarely white.
          Herbaceous vines: seeds smooth. — 8. Quamoclit.
          Woody vines: seeds woolly. — 9. Exogonium.
  Stigmas somewhat flattened or linear.
    Stigmas flattened.
      Inflorescence densely capitate. — 10. Thyella.
      Inflorescence solitary or paniculate. — 11. Jacquemontia.
    Stigmas filiform or oblong-cylindric.
      Calyx enclosed in 2 broad bracts which subtend it: stigmas long-cylindric or broadly ellipsoid. — 12. Convolvulus.
      Calyx naked, without bracts at the base: stigmas filiform or nearly so. — 13. Strophocaulos.
Capsules or fruit indehiscent, dry or berry-like.
  Carpels turbinate, 1-celled and usually 1-seeded by abortion: foliage glabrate. — 14. Turbina.
  Fruit berry-like: leaf-blades silvery beneath. — 15. Argyreia.

1. BONAMIA Thouars. Spreading, herbaceous or woody vines. Leaf-blades rarely cordate, usually entire. Corolla funnelform, blue or white, hirsute without. Filaments glandular-villous at the base. Ovary 2-celled, 4-ovuled. Capsule chartaceous, 4-valved. Seeds smooth or pubescent. [*Breweria* R. Br.]—Four species, 2 in North America.

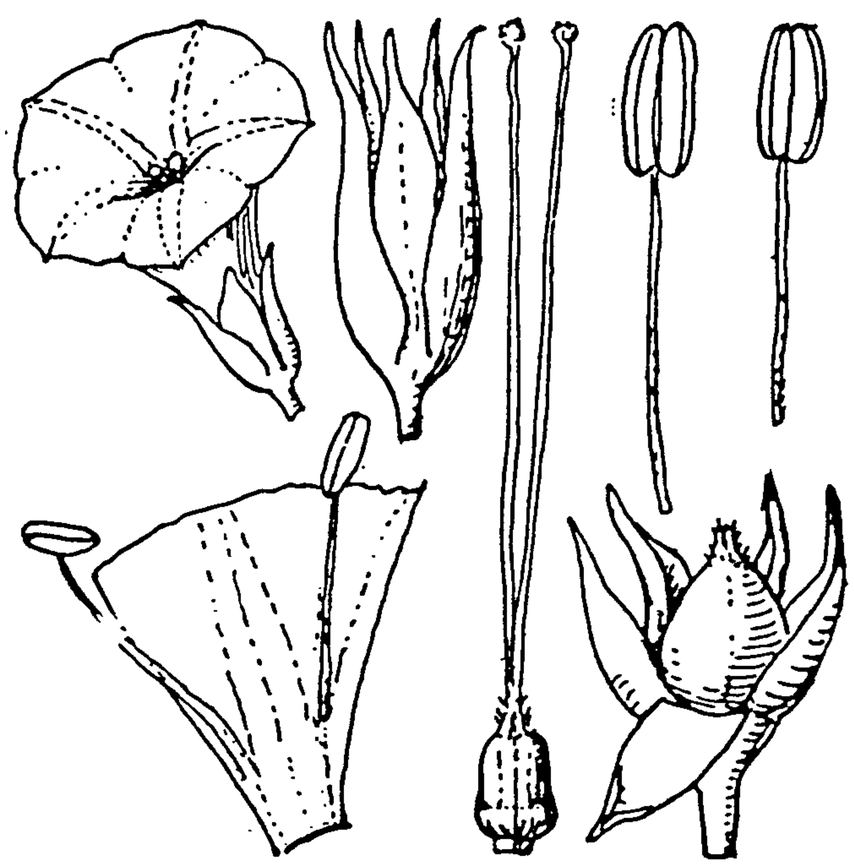


1. B. grandiflora (A. Gray) Heller. Stem 5–30 dm. long; leaf-blades leathery, broadly oval or ovate, 2.5–5 cm. long, rounded at the base; petioles 1–5 mm. long: peduncles 1-flowered: corolla blue, 7–10 cm. long: capsule ovoid or oval, about 1.5 cm. long. [*Breweria grandiflora* A. Gray]—Sandy soil, scrub pen. Fla.—Spr.–sum.

2. **STYLISMA** Raf. Herbaceous vines, often prostrate. Leaf-blades narrow or broad, not cordate. Flowers 1–3 on axillary peduncles. Sepals equal or nearly so, pointed. Corolla white or colored, rotate or subfunnelform. Capsule thin-walled. '[*Breweria* (Chapm. Fl.) (Fl. SE. U. S.)]—Seven species, in the southeastern United States and Mexico.—Spr.–fall.

Sepals glabrous or merely ciliate, elliptic, acute.
  Leaf-blades elliptic. 1. *S. humistrata.*
  Leaf-blades narrowly linear. 2. *S. angustifolia.*
Sepals distinctly pubescent.
  Filaments densely pubescent.
    Foliage sparingly villous-tomentulose: peduncles 1–3 cm. long: corolla 1.5 cm. long. 3. *S. trichosanthes.*
    Foliage densely brown-tomentose: peduncles 4–6 cm. long: corolla 2 cm. long. 4. *S. villosa.*
  Filaments glabrous or nearly so.
    Bracts shorter than the flowers: leaf-blades elliptic to narrowly lanceolate. 5. *S. aquatica.*
    Bracts exceeding the flowers: leaf-blades linear. 6. *S. Pickeringii.*

1. **S. humistrata** (Walt.) Chapm. Stem and branches decumbent; leaf-blades elliptic and subcordate to elliptic-lanceolate, 2.5–5 cm. long, mucronate, sparingly pubescent; petioles 2–10 mm. long: peduncles 1–7-flowered: sepals 6–8 mm. long: corolla white, 15–18 mm. long: styles united at the base for about one-third their length. '[*B. humistrata* A. Gray]—Pinelands, and dry sand, Coastal Plain, Fla. to La., Ark., and Va.



2. **S. angustifolia** (Nash) House. Stem and branches trailing, appressed-pubescent; leaf-blades 2.5–7 cm. long, pubescent or glabrate, acute; petioles 1–2 mm. long: peduncles 1–flowered: sepals ciliate, 7–10 mm. long: corolla white, 2 cm. long: styles distinct, nearly to the base. '[*B. angustifolia* Nash]—High pinelands, pen. Fla.

3. **S. trichosanthes** (Michx.) House. Stem and branches decumbent; pubescent; leaf-blades elliptic or linear-lanceolate, 2.5–7 cm. long, apiculate, often somewhat viscid; petioles 1–3 mm. long: sepals strigillose, glabrate, elliptic or nearly so, 6–8 mm. long, bearded at the apex: corolla white, pubescent without, about 12 mm. broad. '[*B. trichosanthes* Small]—Pinelands, Coastal Plain, Fla. to Ala. and N. C.

4. **S. villosa** (Nash) House. Stem and branches trailing, villous-pubescent; leaf-blades elliptic or elliptic-ovate, 2.5–7 cm. long, obtuse, apiculate, rounded at the base; petioles 2–8 mm. long: sepals ovate-lanceolate, 8–10 mm. long, acuminate, villous: corolla white, 15–20 mm. long: capsule 4–5 mm. in diameter, nearly as long as the calyx. '[*B. villosa* Nash]—Dry sandy soil, pen. Fla.

5. **S. aquatica** (Walt.) Chapm. Stem and branches trailing, softly pubescent: leaf-blades 2.5–3 cm. long, obtuse: peduncles longer than the leaves, 1–3-flowered: sepals elliptic-lanceolate, acute, 4–6 cm. long: corolla rose-purple, 10–15 mm. long: capsule 6–8 mm. in diameter. '[*B. aquatica* A. Gray]—Pinelands, and shallow ponds, Coastal Plain, and adj. provinces, Fla. to Tex., Mo., and S Va.

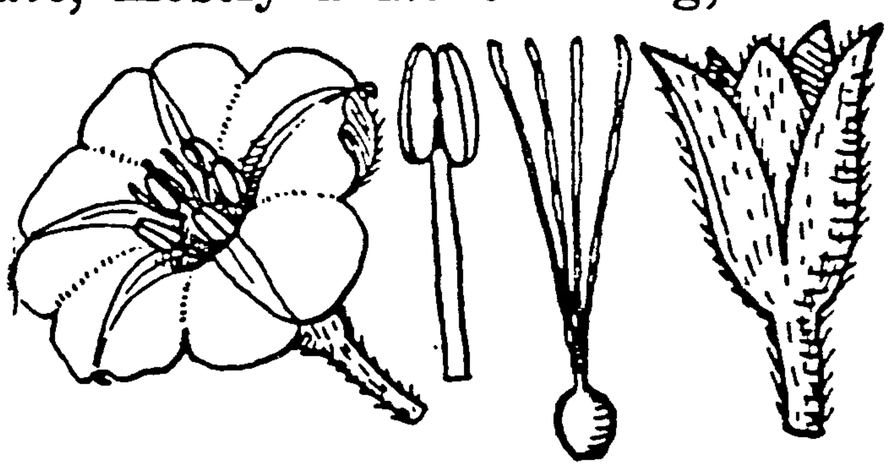
6. **S. Pickeringii** (M. A. Curtis) A. Gray. Stem and branches prostrate or trailing, minutely pubescent: leaf-blades acute at both ends, subsessile, 2–7 cm. long: peduncles rarely longer than the leaves: sepals ovate, obtuse, 4–5 mm. long, villous: corolla white, about 10 mm. long: capsule ovate-conoidal,

exceeding the calyx. [*B. Pickeringii* A. Gray]—Pinelands, in acid soil, various provinces, Fla. to Tex., Ia., and N. J.

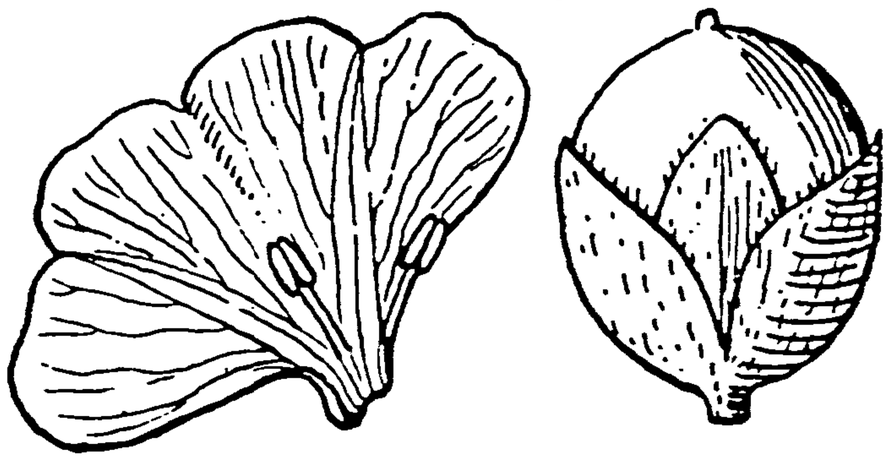
3. **EVOLVULUS** L. Erect or diffuse herbs or partially woody plants. Leaf-blades entire. Flowers solitary and axillary or in terminal racemes or panicles. Calyx small: lobes nearly equal. Corolla white, pink, or blue, rotate or rotate-funnelform: limb 5-angled or 5-lobed. Capsule subglobose, 2–4-valved.—About 85 species, in warm and tropical regions.

Peduncles as long as the leaves or longer.
  Leaf-blades glabrous or nearly so at maturity. 1. *E. glaber.*
  Leaf-blades copiously pubescent. 2. *E. alsinoides.*
Peduncles wanting or very short: pedicels shorter than the leaves.
  Plant more or less pubescent.
    Leaf-blades glabrous above. 3. *E. sericeus.*
    Leaf-blades copiously pubescent on both sides. 4. *E. Wrightii.*
  Plant glabrous. 5. *E. macilentus.*

1. E. glaber Spreng. Stem and branches diffuse, prostrate, sometimes creeping, silky: leaf-blades oblong, oval, or obovate, mostly 1–1.5 cm. long, mucronate, glabrous at maturity: calyx-lobes oblong, oblong-lanceolate, or oblong-ovate, 3–4.5 mm. long, acute or slightly acuminate: corolla blue, pink, or white, about 1 cm. broad: capsule ovoid, 2.5–3.5 mm. in diameter. [*E. mucronatus* (Chapm. Fl., Fl. SE. U. S.)]—Hammocks and open sandy places, lower Florida Keys.—(*W. I., S. A.*)



2. E. alsinoides L. Stem and branches diffuse or prostrate, 1–6 dm. long, slender: leaf-blades oblong-oval to oblong-lanceolate, 1–2.5 mm. long, acute or acutish, permanently pubescent: calyx-lobes lanceolate, 2.5–3.5 mm. long, acute: corolla blue or white, 8–12 mm. broad: capsule 3–4 mm. in diameter. [*E. argenteus* (Chapm. Fl.)]—Hammocks, lower Florida Keys; also coast of Ala., perhaps introduced.—(*W. I.*)



3. E. sericeus Sw. Plants silky, the branches ascending or decumbent, 1–3 dm. long: leaf-blades linear to oblong, 1–2.5 cm. long, acute at both ends: calyx-lobes 4–6 mm. long, acute or acuminate: corolla white or blue, 8–10 mm. wide.—Low grounds and wet woods, various provinces, Fla. to Tex., Ariz., and Ga.—(*W. I., Mex., C. A., S. A.*)

4. E. Wrightii House. Stem and branches tufted, mostly less than 1 dm. long, villous-hirsute with silvery hairs: leaf-blades suborbicular to ovate, 3–8 mm. long, acute or abruptly pointed: calyx-lobes linear-lanceolate, 4–5 mm. long, acuminate: corolla blue or white, 7–9 mm. broad.—Pinelands and open sandy places, lower Florida Keys.—(*W. I.*)

5. E. macilentus Small. Stem and branches wiry-filiform, glabrous, diffuse: leaf-blades linear to linear-subulate, 0.5–2 cm. long, acuminate, glabrous: calyx-lobes linear-lanceolate, 4–5 mm. long, acuminate: corolla pale-blue or white, nearly 1 cm. broad: capsule subglobose, 3–4 mm. in diameter.—Pinelands, lower Florida Keys.

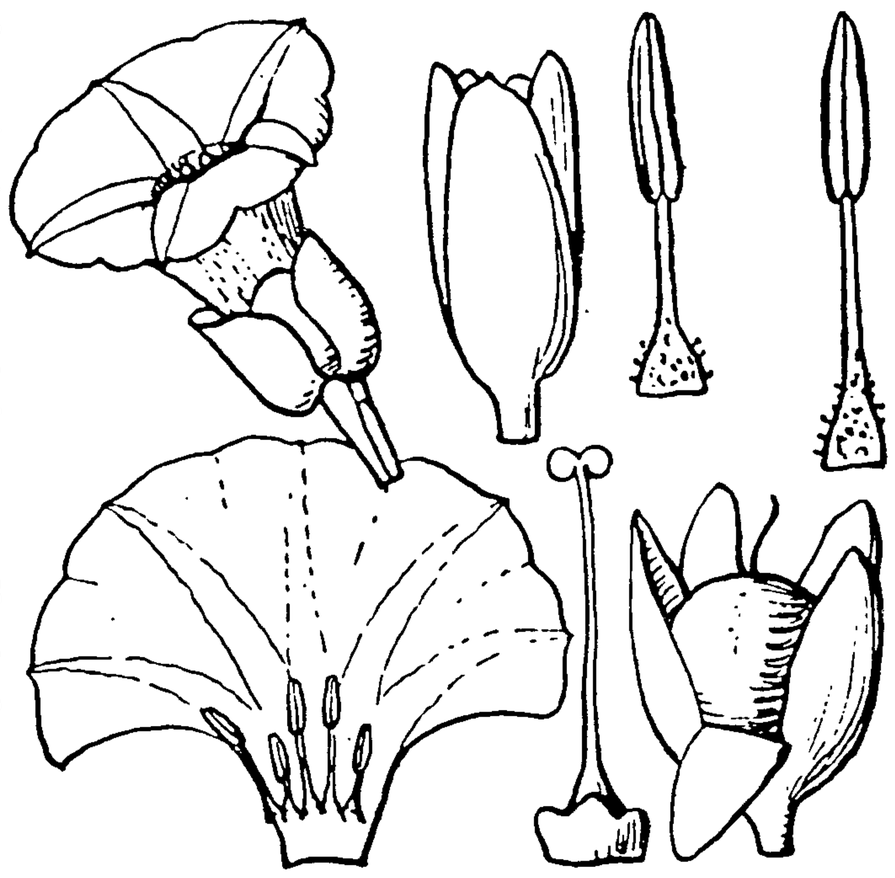
4. OPERCULINA S. Manso. Twining vines. Leaf-blades entire, palmately lobed, or divided. Calyx large, pear-shaped, constricted above in flower: lobes closely imbricate, membranaceous or chartaceous. Corolla cam-

panulate. Capsule globose, large, often operculate or irregularly dehiscent, sometimes valvate.—About 10 species, natives of tropical America and the East Indies.

Corolla yellow: sepals becoming 4–5 cm. long. 1. *O. tuberosa.*
Corolla white, purple throat: sepals becoming 1.5–2 cm. long. 2. *O. dissecta.*

1. O. tuberosa (L.) Meisn. Leaf-blades 5–7-lobed; lobes elliptic-lanceolate, acuminate, 4–6 cm. long: corolla 3.5–4 cm. long; limb 5–6 cm. wide: capsule 3–4 cm. in diameter: seeds 20 x 15 mm., black-velvety. — (YELLOW MORNING-GLORY.) Pinelands, hammocks and waste-places, Coastal Plain, Fla. and Tex. Nat. of the Tropics, and cultivated.—(*W. I.*)

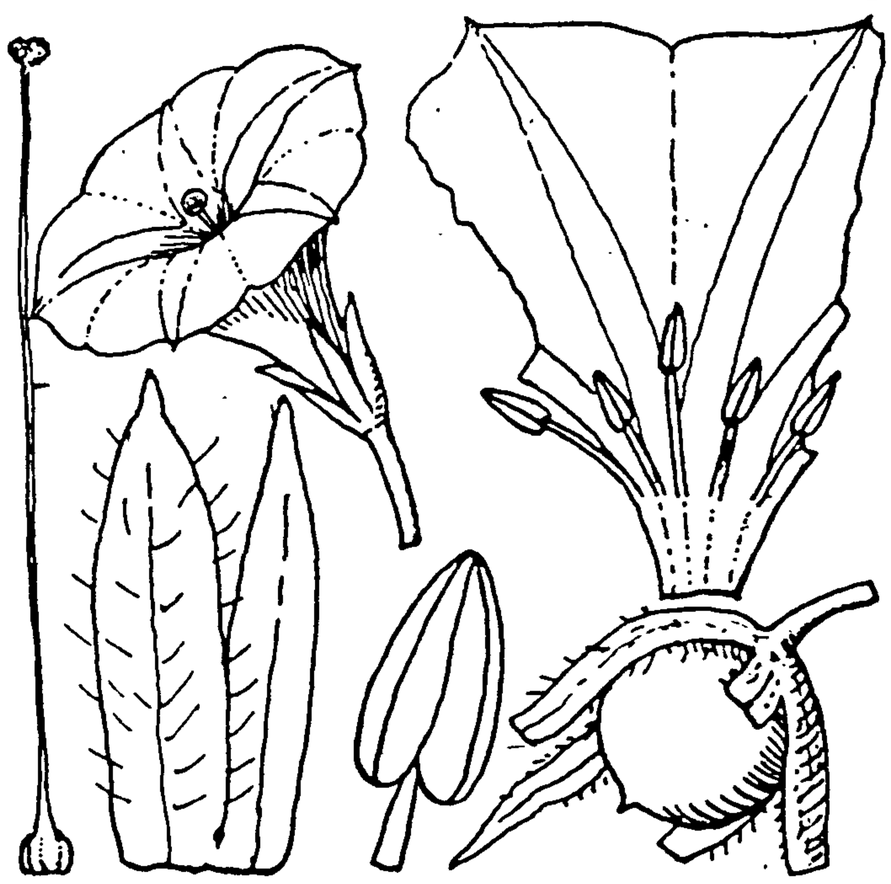
2. O. dissecta (Jacq.) House. Leaf-blades 5–7-parted; segments oval to oblong or lanceolate, 3–10 cm. long, coarsely toothed: corolla 2–3 cm. long; limb 3–5 cm. broad: capsule about 1.5 cm. in diameter: seeds glabrous. [*Ipomoea dissecta* Jacq. *I. sinuata* Ort.]—Pinelands, Coastal Plain, Fla. to Tex., and Ga.—(*W. I.*)



5. PHARBITIS Choisy. Annual (ours), or perennial, climbing or trailing vines. Leaf-blades entire, lobed, or angled. Calyx-lobes equal or unequal, herbaceous, each with a pubescent base and a narrow tip. Corolla white, blue, pink, or purple, funnelform. Ovary 3–5-celled. Seeds smooth.—About 200 species, widely distributed.—Sum.–fall. —MORNING-GLORIES.

Calyx bristly pubescent, especially near the base.
  Tips of sepals merely acute or acuminate. 1. *P. purpurea.*
  Tips of sepals conspicuously elongate.
    Leaf-blades densely appressed silky-pubescent and ciliate, often entire. 2. *P. barbigera.*
    Leaf-blades hirsute-pubescent, lobed or angled.
      Bases of sepals conspicuously broadened: lobes of blades contracted below: corolla 2.5–4 cm. long. 3. *P. hederacea.*
      Sepals linear-lanceolate, not conspicuously broadened at the base: blades 3-lobed but the lobes rarely contracted below: corolla 4–6 cm. long. 4. *P. Nil.*
Calyx glabrous or nearly so, not bristly. 5. *P. cathartica.*

1. P. purpurea (L.) Voigt. Stem twining: leaf-blades ovate to orbicular-ovate, 6–18 cm. long, short-acuminate, cordate: calyx-lobes, 10–15 mm. long: corolla 5–7 cm. long; limb purple or sometimes pink, blue, white, or variegated, 4–6 cm. broad.—(COMMON MORNING-GLORY.)—Waste-places, various provinces, Fla. to Tex., Nebr., Ont., and N. S. Nat. of trop. Am., and cult.



2. P. barbigera (Sims) G. Don. Stem twining, several m. long: leaf-blades orbicular-ovate, 5–12 cm. long: peduncles shorter than the petioles: sepals 1.5–3 cm. long: corolla 3–3.5 cm. long; limb purple or partly so, 3–4 cm. broad.—(MORNING-GLORY.)—Thickets and cult. grounds, Coastal Plain and adj. provinces, Fla. to La. and Ga.

3. **P. hederacea** (L.) Choisy. Stem twining: leaf-blades 5–12 cm. long, deeply 3-lobed; lobes acuminate: peduncles usually shorter than the petioles: calyx-lobes 2–3 cm. long, the bases ovate or oval: corolla 2.5–4 cm. long, deep-blue, or the tube white; limb about 3 cm. broad.—Waste-places and cult. grounds, various provinces, Fla. to Tex., S. Dak., and Me.—(*W. I., Mex.,*)—Nat. of trop. Am., and cult.

4. **P. Nil** (L.) Choisy. Stem hispid or hirsute: leaf-blades broadly ovate to suborbicular in outline, 6–16 cm. long, 3-angled or 3-lobed, the lobes acute: sepals 2.5–4 cm. long: corolla-limb deep-blue, 4–6 cm. wide.—Hammocks and cult. grounds, Fla. and La. Nat. of Africa, and cult.

5. **P. cathartica** (Poir.) Choisy. Stem minutely strigillose or glabrate: leaf-blades broadly ovate, 5–9 cm. long, entire or 3-lobed: sepals ovate-lanceolate, 1–2 cm. long, acuminate: corolla-limb purple to white, 6–8 cm. wide.—Hammocks and thickets, along or near the coast, pen. Fla. and the Keys. —(*W. I.*)

6. **IPOMOEA** L. Annual or perennial climbing or trailing vines, or rarely upright plants. Leaf-blades entire, angled or divided. Flowers solitary on axillary peduncles or in cymes. Calyx-lobes coriaceous or membranous, rarely fleshy. Corolla funnelform, the limb usually spreading. Capsule mostly septifragally 2- or 4-valved. Seeds often pubescent.—About 200 species, widely distributed.—Sum.–fall or all year S.—MORNING-GLORIES

Stems and branches prostrate and creeping or climbing. I. PANDURATAE.
Stems and branches erect or diffuse. II. FISTULOSAE.

I. PANDURATAE

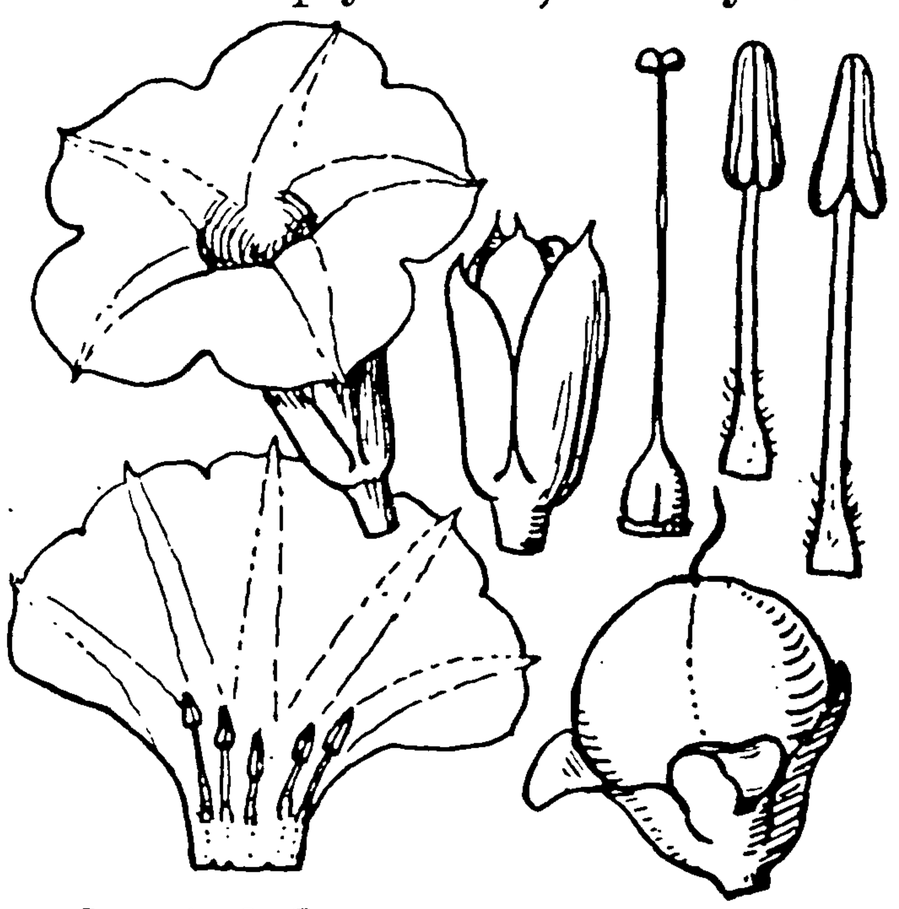
Stem creeping, perennial, glabrous, fleshy or succulent.
  Corolla-limb white: leaf-blades elliptic to ovate in outline, mainly lobed. 1. *I. stolonifera.*
  Corolla-limb purple: leaf-blades suborbicular, notched at the apex. 2. *I. Pes-Caprae.*
Stem twining or rarely trailing, never creeping.
  Leaf-blades entire or 3-lobed.
    Leaf-blades sagittate or denticulate-hastate at the base: inner sepals less than 1 cm. long.
      Leaf-blades denticulate-hastate at the base, linear or linear-lanceolate: corolla white. 3. *I. angustifolia.*
      Leaf-blades sagittate, sometimes broadly so: corolla-limb purple.
        Sepals equal, 6 mm. long: corolla 3–4 cm. long. 4. *I. tenuissima.*
        Sepals unequal, 7–9 mm. long: corolla 5–6 cm. long. 5. *I. sagittata.*
    Leaf-blades never sagittate: inner sepals often over 1 cm. long.
      Sepals obtuse or mucronate.
        Leaf-blades cordate, of an ovate type.
          Pedicels thickened and fleshy, with the petioles and sepals densely setaceous. 6. *I. setosa.*
          Pedicels not fleshy, not setaceous.
            Sepals tomentose: seeds with long wool all over. 7. *I. macrorhiza.*
            Sepals glabrous: seeds with wool on the angles. 8. *I. pandurata.*
Sepals cuspidately pointed or acuminate.
  Corolla yellow: inflorescence umbellate. 9. *I. polyanthes.*
  Corolla blue, purple, or white: inflorescence solitary or cymose.
    Perennial: calyx glabrous.
      Corolla 3 cm. long or less, pink or lilac-purple. 10. *I. trifida.*
      Corolla 4 cm. long, or longer.
        Sepals 10–14 mm. long: stem usually glabrous and trailing. 11. *I. Batatas.*

Sepals 8–10 mm. long: stem usually pubescent and twining.	12. *I. tiliacea.*
Annual: calyx pubescent, at least the sepals ciliate.	
Corolla 3 cm. long, or longer.	13. *I. trichocarpa.*
Corolla less than 3 cm. long.	
Peduncles shorter than the petioles: corolla-tube white.	14. *I. lacunosa.*
Peduncles longer than the petioles: corolla-tube purple.	15. *I. triloba.*
Leaf-blades palmately 5–7-parted.	
Peduncles stout, short, 1–9-flowered.	16. *I. cairica.*
Peduncles filiform, sometimes tendril-like, 1–2-flowered.	17. *I. heptaphylla.*

II. FISTULOSAE

Perennial plants; leaf-blades entire, ovate: corolla puberulent without: seeds shaggy-pubescent.	18. *I. fistulosa.*

1. I. stolonifera (Cyrill.) Poir. Leaf-blades 2–5 cm. long, the early ones ovate to elliptic, the later ones pandurate or more deeply lobed, mostly truncate or cordate at the base: sepals elliptic to oval, 1–1.5 cm. long, mucronate or acuminate: capsule subglobose, 1.5 cm. long. [*I. littoralis* (L.) Boiss. *I. acetosaefolia* R. & S.]—Coastal sand-dunes, Fla. to Tex., and S. C.—(*W. I., Mex., C. A., S. A.*)



2. I. Pes-Caprae (L.) Sweet. Leaf-blades 6–10 cm. long and as broad, rounded or cordate at the base: sepals oval or suborbicular, obtuse: corolla 4–5 cm. long: capsule globose-ovoid, 1.5 cm. long.—(RAILROAD-VINE.)—Coastal sand-dunes, Fla. to Tex. and Ga.—(*W. I.*)

3. I. angustifolia Jacq. Leaf-blades linear or linear-lanceolate, 3–5 cm. long, acute: peduncles 1–2-flowered, 1–3 cm. long: sepals unequal, ovate, acute, 6–8 mm. long: corolla 1–2 cm. long: capsule globose, 8 mm. in diameter: seeds smooth.—Banks, thickets, and waste-places, Coastal Plain, Brunswick, Ga., and at other southern ports. Nat. of Africa. —(*W. I.*).

4. I. tenuissima Choisy. Stems twining: leaf-blades lanceolate or linear-lanceolate, 2–5 cm. long, obtuse and mucronulate: sepals ovate-lanceolate, obtuse, ciliate: corolla purple, 3–4 cm. long: capsule globose.—Pinelands, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—All year.

5. I. sagittata Cav. Leaf-blades 3–10 cm. long, sagittate or hastate-sagittate, the segments linear or lanceolate, the basal ones about half as long as the terminal one: sepals 6–9 mm. long: corolla 5–6 cm. long. [*I. speciosa* Walt.] —Low prairies, swamps, and low hammocks, Coastal Plain and adj. provinces, Fla. to Tex. and N. C.

6. I. setosa Ker. Leaf-blades orbicular-ovate, deeply 3-lobed; petioles, pedicels, and calyces bristly with spreading purplish setae: peduncles 3–9-flowered; pedicels thickened: sepals elliptic, 10–14 mm. long, accrescent in fruit: corolla purple, 5–6 cm. long: capsule 4-celled: seeds hairy on the angles.—(BRAZILIAN MORNING-GLORY.)—Waste-places, Coastal Plain, Fla. to La. Nat. of Brazil.

7. I. macrorhiza Michx. Leaf-blades broadly ovate, 5–15 cm. long, erose-crenulate or lobed, truncate or subcordate at the base, tomentose beneath: sepals elliptic-lanceolate, obtuse, 1.5–2 cm. long: corolla white, 5–8 cm. long; limb 5–10 cm. broad: seeds with long silky-villous wool. [*I. jalapa* Pursh]—Sandy soil, on or near the coast, Fla. to Ala. and S. C.

8. I. pandurata (L.) G. F. W. Mey. Leaf-blades ovate, often fiddle-shaped, 3–10 cm. long: peduncles 5–10 cm. long, 1–5-flowered: calyx-lobes elliptic, 12–18 mm. long, obtuse, erect, imbricate and forming a tube: corolla 7–10 cm. broad; limb white, tube lavender within.—(WILD POTATO-VINE. MAN-OF-THE-EARTH.)—Dry soil, often in woods, various provinces, Fla. to Tex., Ont., and Conn.

9. I. polyanthes R. & S. Leaf-blades orbicular and cordate to oblong-lanceolate and cordate-sagittate, 5–10 cm. long; peduncles longer than the petioles, 5–many flowered in a dense umbel-like cyme: sepals oblong-lanceolate, 8–10 mm. long, glabrous, acute or acuminate: corolla bright yellow, 2–4 cm. long: seeds black, pubescent. [*I. umbellata* G. F. W. Mey. Not L.]—Florida Keys.—(*W. I.*)

10. I. trifida (H. B. K.) G. Don. Perennial, pubescent or glabrate, twining: leaf-blades 2–6 cm. long, lower ones often entire, upper 3-lobed, all cordate; peduncles 3–10-flowered; sepals glabrous, 10–12 mm. long, oblong to lanceolate or ovate-lanceolate, acuminate: corolla pink or lilac-purple, 2.5–4 cm. long; capsules more or less pubescent near the top.—Valleys and light soil, Coastal Plain, La. and Tex.—(*W. I., Mex., C. A., S. A.*) Represented in Florida by *I. trifida Torreyana* A. Gray, with glabrous stems and corolla 4 cm. long, a native of Tex.

11. I. Batatas (L.) Lam. Leaf-blades ovate, 5–11 cm. long, entire or angulately lobed, cordate: sepals unequal, ovate-lanceolate or lanceolate, acuminate: corolla 3–5 cm. long, white varying to shades of pink or purple.—(SWEET-POTATO.)—Pinelands, hammocks and waste-places, southern pen. Fla., and the Keys. Nat. of E. Indies, and cult.—(*W. I.*)

12. I. tiliacea (Willd.) Choisy. Leaf-blades ovate, cordate, acuminate, entire or 3–5-lobed: peduncles dichotomous at summit, several or many flowered: sepals elliptic-lanceolate, cuspidate-acuminate, unequal, the inner ones longest: corolla rose-purple or pink, 4–5 cm. long. [*I. fastigiata* (Roxb.) Sweet].—Sandy thickets, Florida Keys.

13. I. trichocarpa Ell. Leaf-blades ovate, entire or deeply 3-lobed, cordate: peduncles stout, 1–3-flowered: sepals hirsute, elliptic or elliptic-lanceolate, 9–12 mm. long: corolla pink or purple, 2.5–4 cm. long: capsule more or less pubescent: seeds glabrous. [*I. commutata* R. & S.]—Sandy soil, Coastal Plain, Fla. to Tex. and S. C.

14. I. lacunosa L. Leaf-blades ovate, entire or 3-lobed, 2–7 cm. long, deeply cordate: peduncles 1–3-flowered: calyx-lobes elliptic or ovate, 10–12 mm. long, acute or acuminate: corolla mainly white, 1.5–2 cm. long; limb often purple-margined.—River-banks, low grounds, and fields, various provinces, S. C. to Ala., Tex., Kans., and Pa.

15. I. triloba L. Leaf-blades ovate, 4–10 cm. long, entire or hastately 3-lobed, glabrate: sepals pubescent, oblong or suborbicular, 8–10 mm. long, acute or acuminate: corolla purple, 1.5 cm. long: capsule subglobose, 6–8 mm. in diameter, often pubescent: seeds glabrous.—Hammocks and sand-dunes, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A., O. W.*)

16. I. cairica (L.) Sweet. Segments of the leaf-blades elliptic-lanceolate, acute or acuminate, 4–9 cm. long: sepals 4–8 mm. long, obtuse: corolla purplish, 5–6 cm. long: capsule ovoid, 10–12 mm. long; seeds finely pubescent.—Roadsides and waste-places, Fla. Nat. of Africa.—(*W. I., Mex., S. A.*)

17. I. heptaphylla (Rottb. & Willd.) Voigt. Leaf-segments linear-lanceolate, 1–5 cm. long, acute or acuminate at the ends, entire or undulately toothed:

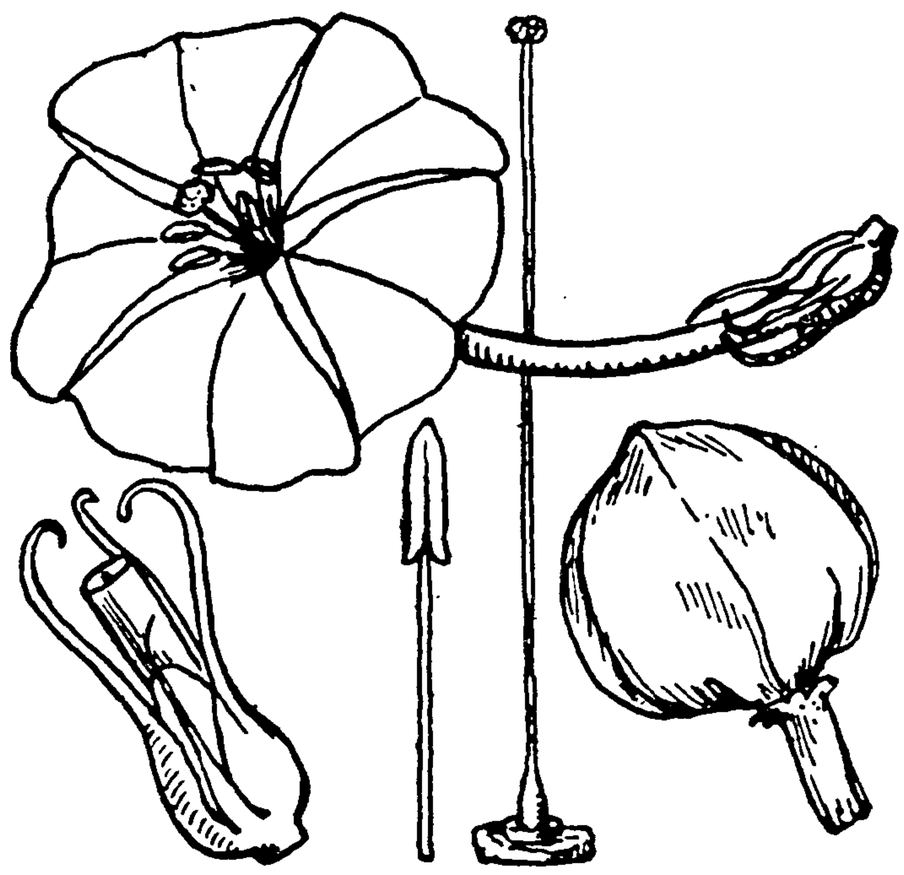
peduncles filiform, often spirally twisted and used in climbing: sepals ovate, 4–5 mm. long, becoming 6–7 mm. long: corolla pale-violet, 18–30 mm. long: capsules 10 mm. long or less.—Near New Orleans, La. Nat. of trop. regions.

18. **I. fistulosa** Mart. Leaf-blades ovate, 5–9 cm. long, acute, cordate: peduncles usually several-flowered: sepals suborbicular, 5–7.5 mm. long: corolla rose-colored, 6–8 cm. long: capsule ovoid, about 1.5 cm. long: seeds shaggy pubescent. [*I. texana* Coulter].—Waste-places, Coastal Plain, Pensacola, Fla., S Tex., and James Is., S. C. Nat. of S. A.

7. **CALONYCTION** Choisy. High-twining vines. Leaf-blades broad. Flowers showy. Calyx-lobes herbaceous, becoming leathery, the outer ones sometimes horned at the apex. Corolla white, expanding in the evening, salverform: tube elongate, not dilated at the throat. Capsule large, longer than broad.—Four species, in tropical America.—MOON-FLOWERS. MOON-VINES.

Sepals, at least the outer, long-appendaged: seeds glabrous or essentially so. 1. *C. aculeatum.*
Sepals unappendaged: seeds velvety and comose around the edges. 2. *C. Tuba.*

1. **C. aculeatum** (L.) House. Leaf-blades ovate to orbicular-ovate, 5–15 cm. long, entire or frequently hastately 3–5-lobed, thin-textured, rather slenderly acuminate, the lobes, when present acute or acuminate: appendaged calyx-lobes 2–3 cm. long: corolla very showy; tube slender, 9–14 cm. long; limb 10–14 cm. wide: capsule much-depressed, 3–3.5 cm. wide, enveloped by the accrescent inner calyx-lobes, before these become reflexed, the supporting pedicel much thickened under the calyx. [*Ipomoea Bona-Nox* L.]—Hammocks, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A., O. W.*)—All year.—This plant is a "fire-weed," *par excellence*. The growth of vines over burned areas, especially in hammocks, is prodigious.

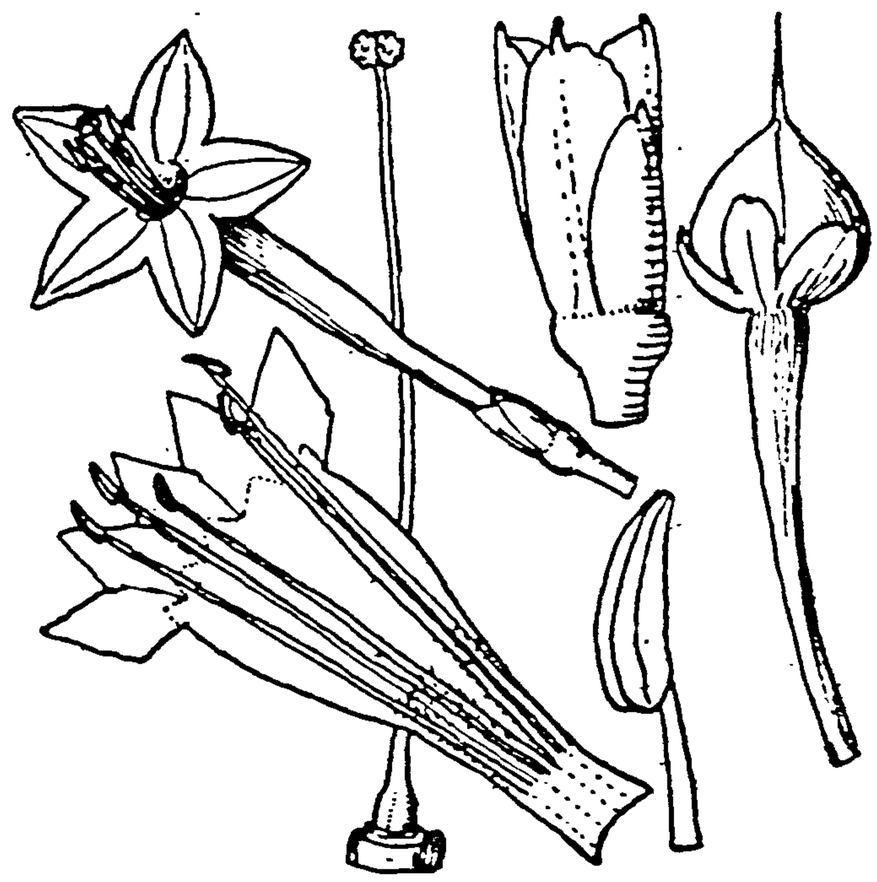


2. **C. Tuba** (Schlecht.) Colla. Leaf-blades broadly ovate to reniform-ovate, 8–15 cm. long, usually entire, thick-textured, usually broadly acuminate: calyx-lobes 1.5–2.5 cm. long: corolla showy; tube stoutish, 6–12 cm. long; limb 8–10 cm. wide: capsule ovoid or globose-ovoid, 2–2.5 cm. wide, short-pointed or somewhat acuminate, much exceeding the calyx-lobes, the supporting pedicel slightly thickened under the calyx.—Coastal hammocks, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A., O. W.*)—All year.—Unlike the preceding species, *C. Tuba* does not occur inland in Fla.; it grows only in saline and brackish situations.

8. **QUAMOCLIT** [Tourn.] Moench. Annual (ours) or perennial vines, with twining, glabrous stems. Blades entire, lobed, or divided. Flowers in axillary cymes or solitary. Calyx-lobes equal or nearly so. Corolla scarlet orange, yellow, or white, salverform: tube narrowly funnelform; limb spreading, shorter than the tube. Ovary 2- or falsely 4-celled. Capsule usually 4-celled and 4-seeded.—About 10 species, in warm and tropical regions.—Sum.–fall or all year S.

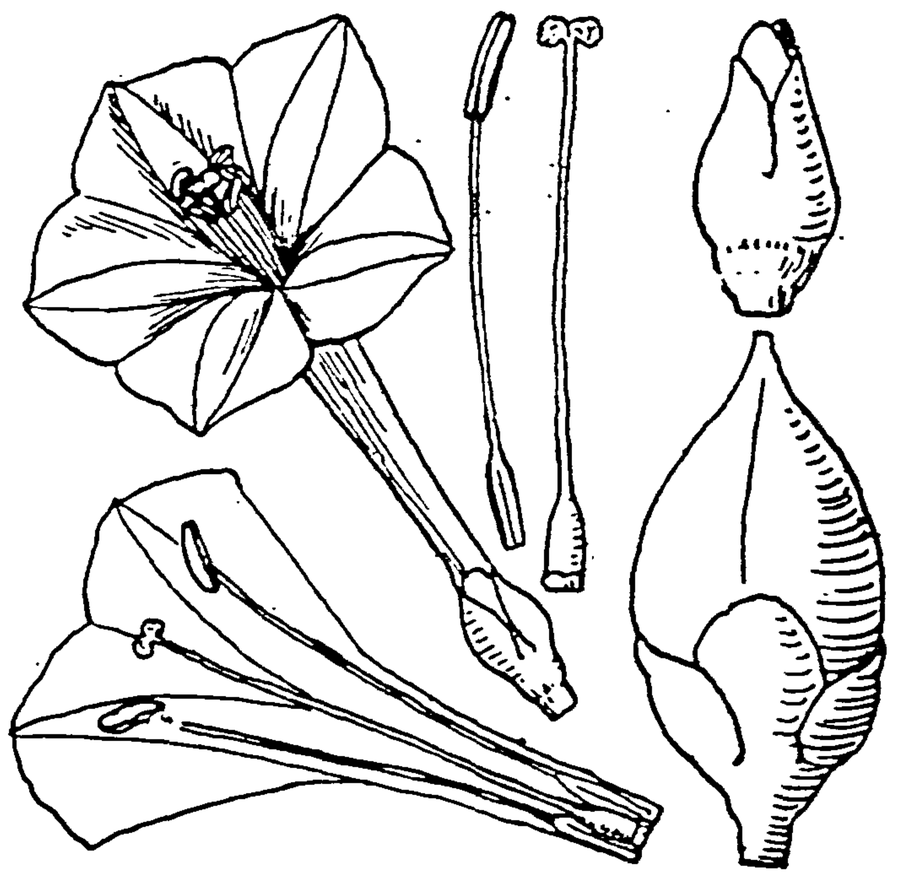
Leaf-blades pinnately parted, the segments narrow: calyx-lobes obtuse or mucronate. 1. *Q. Quamoclit.*
Leaf-blades entire: calyx-lobes acuminate. 2. *Q. coccinea.*

1. Q. Quamoclit (L.) Britton. Leaf-blades 2–10 cm. long; segments narrowly linear: pedicels clavate: calyx-lobes appressed to the corolla-tube: corolla-tube clavate, 2.5–3 cm. long; lobes ovate or triangular. [*Ipomoea Quamoclit* L.]—(CYPRESS-VINE.)—Waste-places and old fields, various provinces, Fla. to Tex., Kans., and Va. (Trop. Am.)



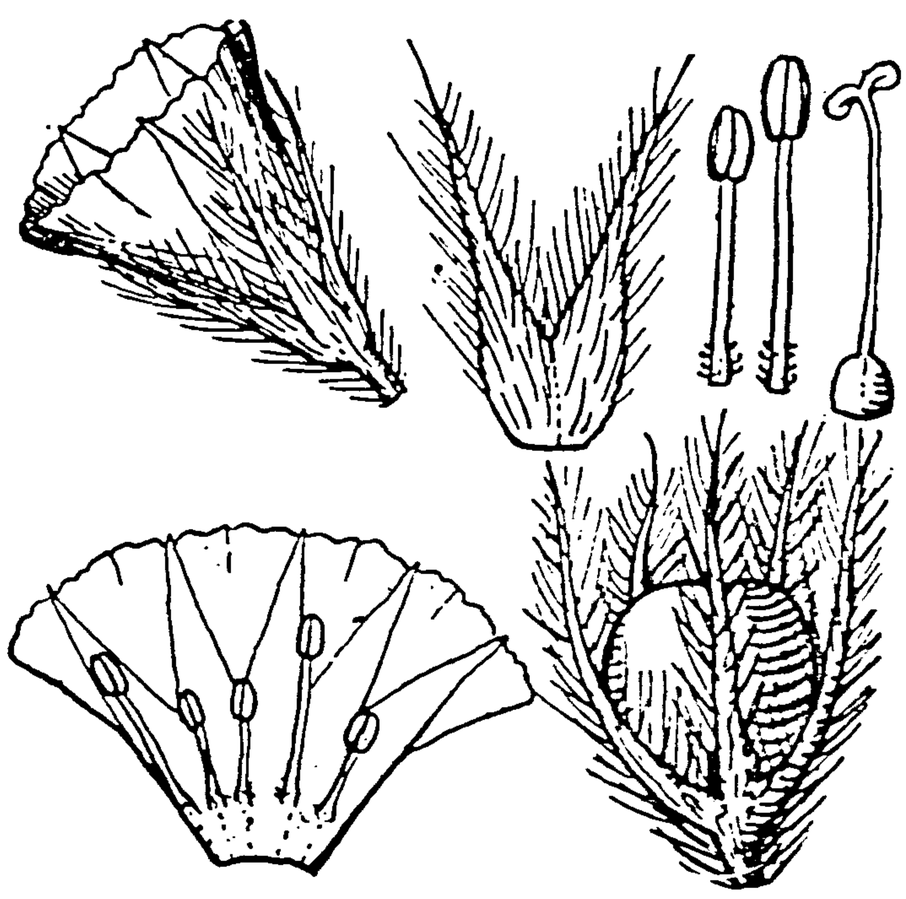
2. Q. coccinea (L.) Moench. Leaf-blades ovate, 3–10 cm. long, acuminate, angled or entire: peduncles usually stouter than the pedicels: calyx-lobes oblong: corolla scarlet or orange, rarely white; tube 2–4 cm. long; limb cup-like, 1.5–2 cm. broad. [*Ipomoea coccinea* L.]—In fields, and waste-places, various provinces, Fla. to Ariz., Mo., and Pa. Nat. of trop. Am. (Cent. Am.).

9. EXOGONIUM Choisy. Creeping, trailing or twining vines. Leaf-blades, entire, lobed, or divided, rarely cordate. Flowers in axillary cymes or solitary. Calyx-lobes leathery, unequal, obtuse. Corolla salverform, scarlet or white. Capsule thick-walled, 4-seeded.—About 25 species of tropical and subtropical America.



1. E. microdactylum (Griseb.) House. Leaf-blades elliptic, thickish, obtuse at base, entire or lobed, 3–8 cm. long: corolla crimson or scarlet; tube 4–5 cm. long; limb 4–5 cm. broad, slightly 5-lobed: capsule longer than the calyx. — (WILD-POTATO.) — Pinelands, Everglade Keys, Fla.—(*W. I.*)—This wild-potato, within our range, occurs only in the weathered surface of oölitic limestone. The roots, resembling sweet-potatoes, often fill the small erosion holes so completely that the rock must be broken in order to get them out.

10. THYELLA Raf. Annual or perennial twining vines. Leaf-blades entire or lobed. Flowers in dense capitate clusters interspersed with numerous enlarged foliaceous, pubescent or hirsute bracts. Sepals equal. Corolla blue, violet or white, funnelform. Ovary 2-celled. Styles united up to the 2 ovoid flattened stigmas. Capsule subglobose, 4-valved. Seeds minutely roughened.—About 10 species of warm and tropical America.



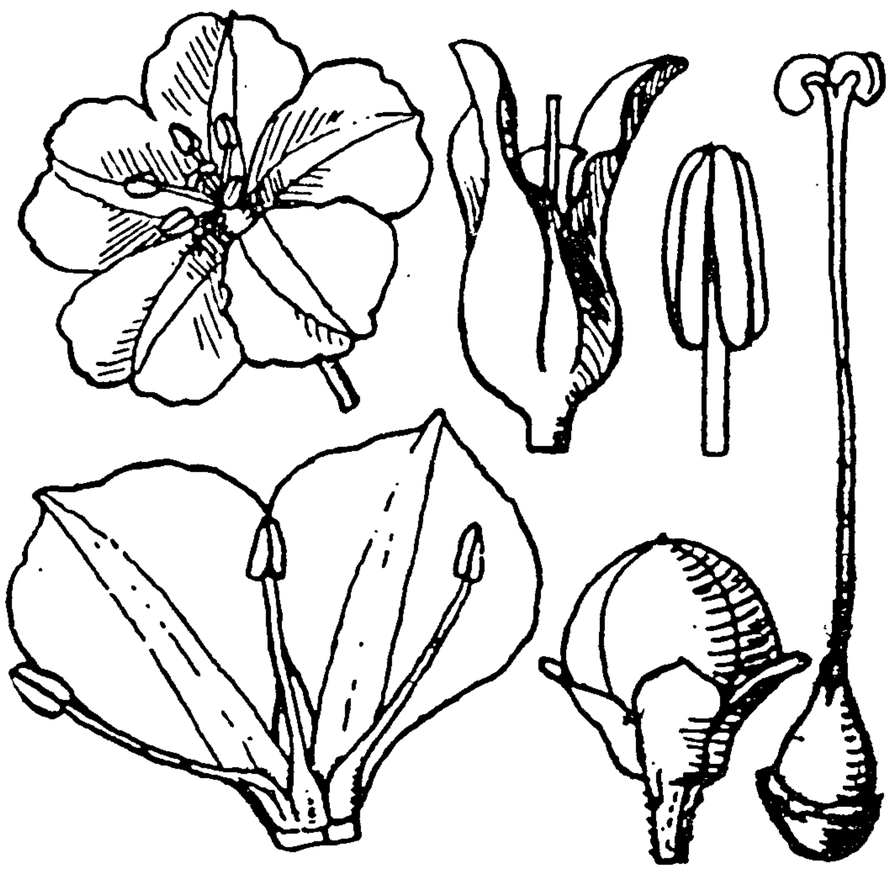
1. T. tamnifolia (L.) Raf. Annual, pubescent with tawny hairs; leaf-blades ovate or elliptic-ovate, 5–12 cm. long, undulate, rounded or cordate at the base: peduncles as long as the subtending leaves or longer: corolla violet or blue, 1.5–3 cm. broad.

[*Jacquemontia tamnifolia* (L.) Griseb.]—Fields and thickets, Coastal Plain, Fla. to Ark. and S. C.—(*W. I., Mex., C. A., S. A., O. W.*)

11. JACQUEMONTIA Choisy. Trailing or twining vines or upright shrubs or herbs. Leaf-blades entire or rarely toothed or lobed. Flowers in loose cymes without conspicuous bracts, or solitary. Calyx-lobes equal or unequal. Corolla white, or blue, limb plaited. Capsule subglobose, 4-valved or sub-8-valved.—About 30 species, in tropical and subtropical America.

Corolla white: plant perennial.
  Corolla over 2 cm. wide: capsule obtuse.
    Leaves fleshy: calyx becoming 2–3 mm. long. 1. *J. reclinata.*
    Leaves herbaceous: calyx becoming 4–5 mm. long. 2. *J. Curtissii.*
  Corolla less than 1.5 cm. wide: capsule acute. 3. *J. jamaicensis.*
Corolla blue: plant annual. 4. *J. pentantha.*

1. J. reclinata House. Stem tomentulose or glabrate, prostrate, reclining, or ascending, woody below, often 1–2.5 m. long: leaf-blades elliptic to ovate-orbicular, 1–3 cm. long, obtuse or retuse: peduncles usually shorter than the leaves: calyx-lobes ovate: corolla white, 2.5–3 cm. broad: capsule 4–5 mm. long. [*Convolvulus havanensis* (Chapm. Fl.)]—Coastal sand-dunes and coastal hammocks, eastern shores of S pen. Fla.—(*W. I.*)—All year.



2. J. Curtissii Peter. Stem woody, prostrate spreading or erect, glabrous or slightly cob-webby-pubescent, 2–9 dm. long: leaf-blades elliptic or elliptic-spatulate, 1–2 cm. long, obtuse or abruptly pointed, slightly revolute: calyx-lobes orbicular-ovate or oval: corolla white, 2.5–3 cm. broad: capsule 5–6 mm. long.—Pinelands and adj. Everglades, S pen. Fla.

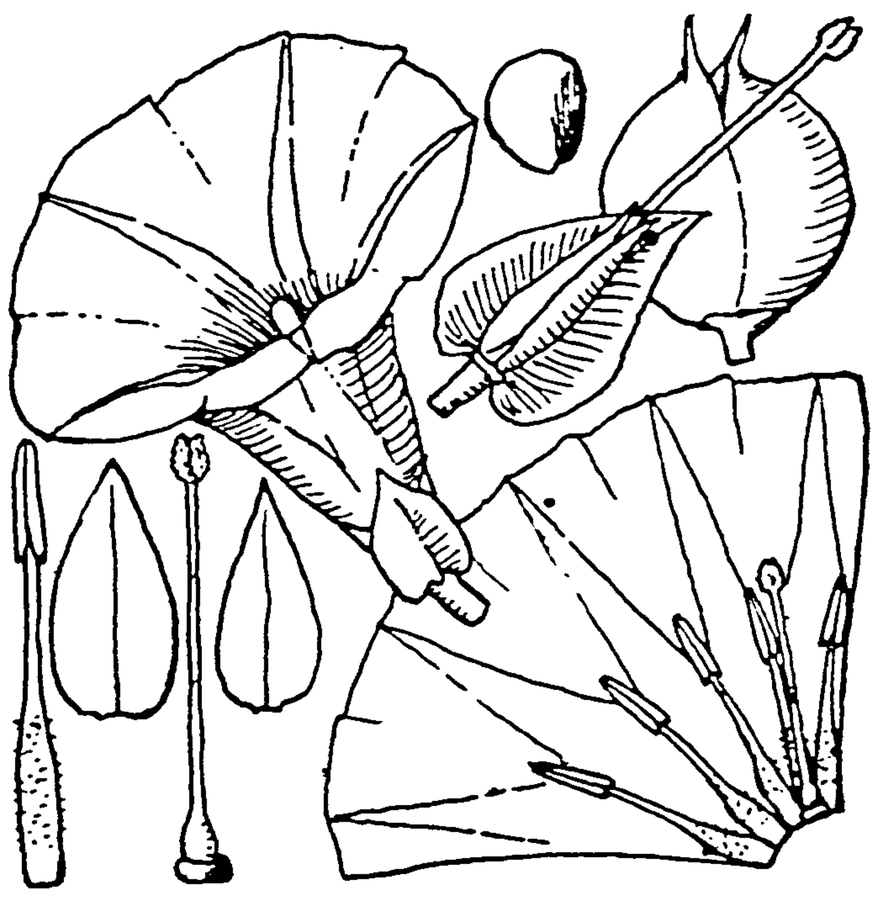
3. J. jamaicensis (Jacq.) Hall. Stem erect or ascending, finely pulverulent-pilose: leaf-blades ovate to elliptic, 5–15 mm. long, obtuse at the base, apex rounded or obtuse, rigid, revolute: peduncles 1-flowered, 6–9 mm. long; sepals obovate, 1.5–2 mm. long: corolla white. [*Convolvulus nodiflorus* (Chapm. Fl.)]—Hammocks, Bahia Honda Key, Fla.—(*W. I.*)

4. J. pentantha (Jacq.) G. Don. Stem pubescent or glabrate, 3–10 dm. long; leaf-blades ovate or ovate-lanceolate, 2–5 cm. long, truncate or subcordate at the base: corolla about 2 cm. long, the slightly angular lobes acute. [*J. violacea* Chois.]—Hammocks, Florida Keys.—(*W. I.*)

12. CONVOLVULUS [Tourn.] L. Annual or (ours) perennial, erect, reclining, trailing, or twining vines. Leaf-blades usually hastate or cordate at the base. Flowers solitary, or clustered on axillary peduncles. Calyx subtended by bracts. Calyx-lobes equal or the outer longer. Corolla funnelform or campanulate. Ovary 1- or 2-celled. Ovules 4. Capsule globose or nearly so. Seeds glabrous.—About 150 species, in temperate and tropical regions.—Spr.–sum.—BINDWEEDS.

Stem trailing or climbing.
  Mature stem and leaves glabrous or glabrate: leaf-blades ovate or hastate.
    Leaf-blades with more or less angular spreading basal lobes. 1. *C. americanus.*
    Leaf-blades with rounded or scarcely angled basal lobes which are not spreading. 2. *C. sepium.*
  Mature stem and leaves copiously and softly pubescent: leaf-blades more or less sagittate.
    Leaf-blades elliptic, basal lobes rounded.
      Leaf-blades densely white-tomentulose beneath. 3. *C. sericatus.*
      Leaf-blades green, softly pubescent. 4. *C. repens.*
    Leaf-blades lanceolate, basal lobes half as long, spreading, acute. 5. *C. Nashii.*
Stem erect or ascending. 6. *C. spithamaeus.*

1. C. americanus (Sims) Greene. Stem twining, 1–3 m. long, glabrate. Leaf-blades broadly hastate or ovate-hastate, 5–12 cm. long, acuminate or apiculate: peduncles as long as the leaves or longer: bracts 2–3 cm. long: corolla pink or rose-purple, 5–7 cm. broad.—(HEDGE-BINDWEED.)—Thickets, various provinces, N of Coastal Plain, N. C. to Utah, Mont., and N. S.—*C. japonicus* Thunb. Similar to *C. americanus* in habit, but usually smaller: leaf-blades narrowly hastate: corolla double, pink, mostly 4–5.5 cm. wide, occurs locally in cult. grounds and waste-places.



2. C. sepium L. Similar to *C. americanus* in habit: leaf-blades relatively broader and more rounded at the apex, basal lobes directed backward, not spreading: corolla white or pink.—Thickets and waste-places, locally naturalized in N. Am., except the extreme north. Nat. of O. W.

3. C. sericatus House. Stem twining, 5–10 dm. long, tomentose: leaf-blades elliptic-ovate, acuminate, slightly hastate-cordate, white beneath with a dense silky-tomentulose indument, 6–8 cm. long: peduncles longer than the leaves: bracts 2.5–3 cm. long: corolla white, 5–6 cm. long.—Thickets, Blue Ridge, Ga.

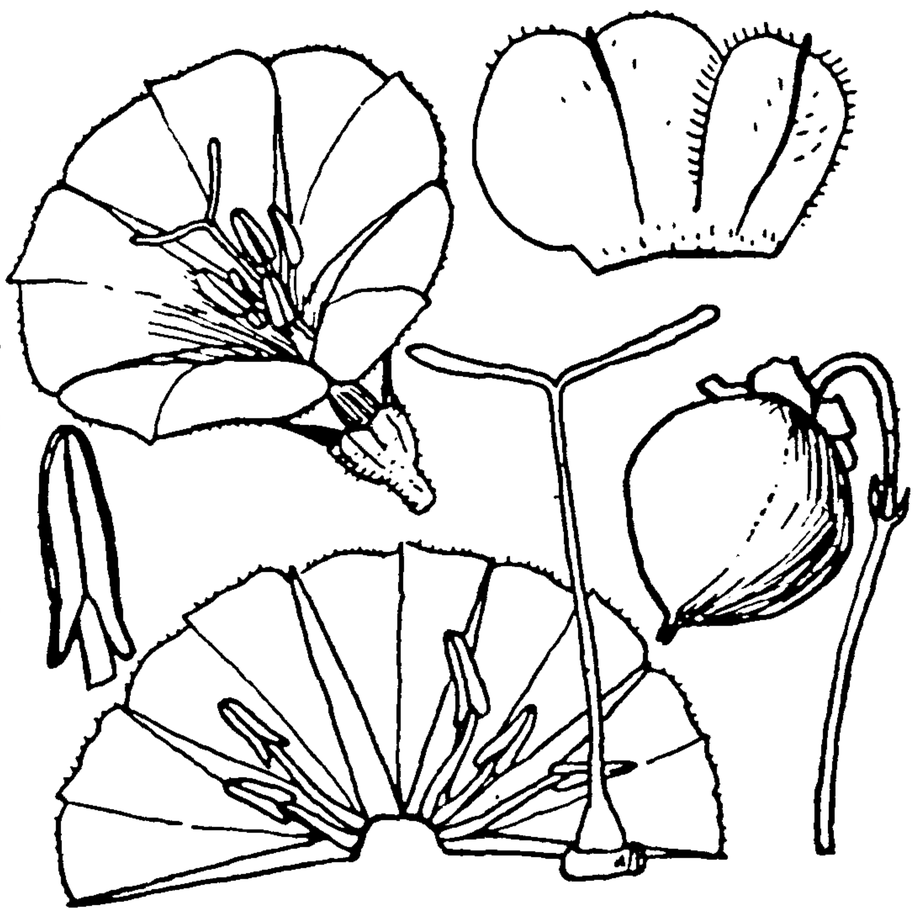
4. C. repens L. Stem twining or trailing: leaf-blades narrowly or broadly sagittate, 5–8 cm. long, cordate at the base: peduncles as long as the leaves or longer: bracts 1.5–2.5 cm. long: corolla white or pinkish, 4–5 cm. long.—Dry soil and old fields, various provinces, Fla. to Tex., S. Dak., and Va.

5. C. Nashii House. Stem softly and finely sericeous-pubescent, twining, 1–2 m. long: leaf-blades lanceolate or the lower elliptic-lanceolate, 3–4 cm. long: basal lobes 1–2 cm. long, spreading or produced: peduncles 1-flowered, shorter than the leaves: bracts ovate, subacute, 14–18 mm. long: corolla white, or the limb bordered with pink, 4–5 cm. long.—Swampy places, Fla.

6. C. spithamaeus L. Stem finely pubescent, 1–7 dm. long: leaf-blades elliptic-ovate or fiddle-shaped, 4–10 cm. long, rounded or subcordate at the base: peduncles usually from the lower axils: bracts 1.5–3 cm. long: corolla white or pink, 4–6 cm. long.—(LOW-BINDWEED.)—Fields and roadsides, often in calcareous soil, various provinces, Fla. to Tenn., NW Terr., Ont., and N. S.

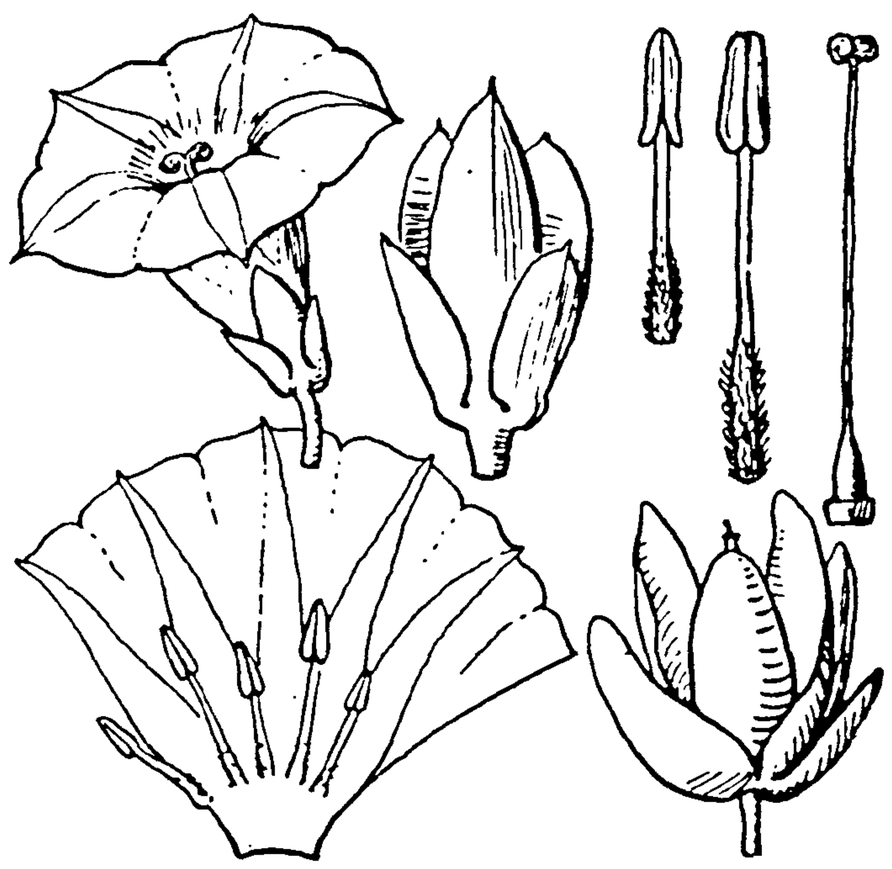
13. **STROPHOCAULOS** Small. Perennial procumbent or twining vines. Leaf-blades sagittate to hastate, petioled. Flowers solitary or few together

on peduncles. Calyx naked, not subtended by bracts. Calyx-lobes nearly equal. Corolla short-funnelform, white or pink, sometimes pubescent without. Ovary mostly 2-celled. Capsule globose or ovoid. Seeds glabrous.—About 40 species, widely distributed. One species.—BINDWEEDS.



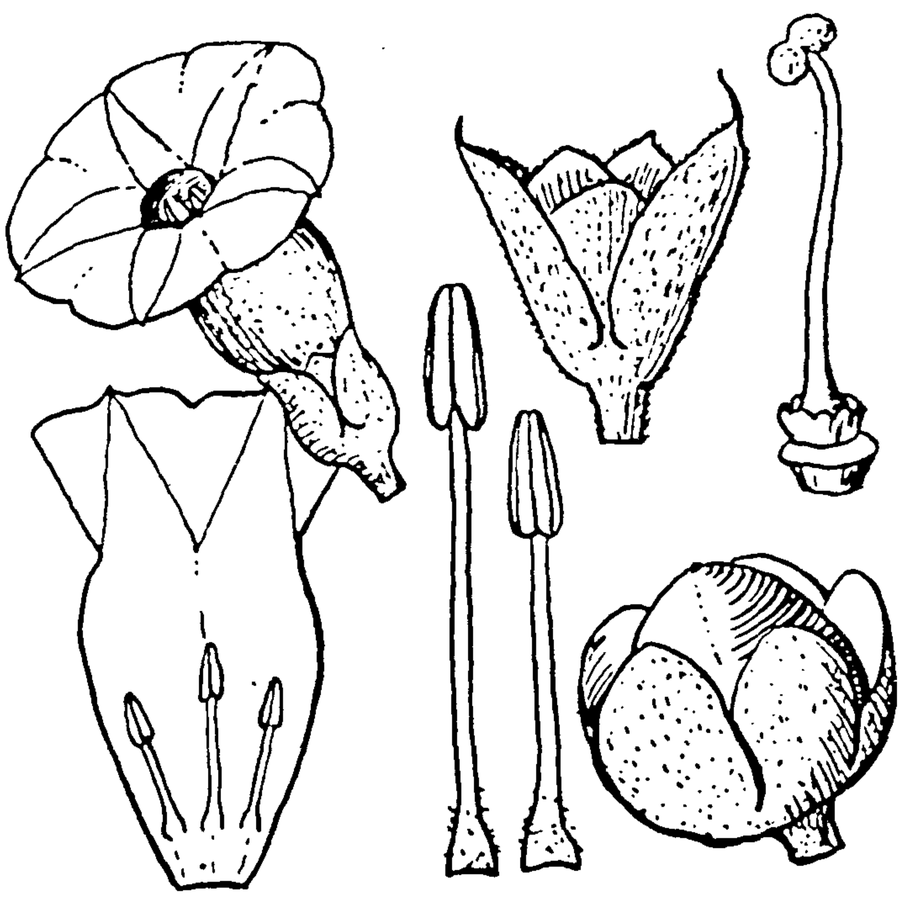
1. S. arvensis (L.) Small. Stem branched at the base, the branches prostrate or low-twining: leaf-blades elliptic, ovate-sagittate, or linear-hastate, 1–5 cm. long: peduncles shorter than the leaves: calyx-lobes oval or suborbicular, 3–3.5 mm. long: corolla white or pink, 1.5–2 cm. long.—(FIELD-BINDWEED.)—Fields, waste-places, and roadsides, various provinces, Ala. to Ark., Calif., Ont., and N. S. Nat. of Eurasia. —Spr.–sum.

14. TURBINA Raf. Perennial, high climbing or trailing vines. Leaf-blades ovate, cordate, glabrate, entire. Flowers in many-flowered, corymbose, axillary, peduncled clusters, near the ends of branches. Sepals coriaceous. Corolla funnelform from the base. Ovary 2-celled, 2-ovuled. Capsules turbinate, twice as long as broad, acute, indehiscent, 1-celled and 1-seeded by abortion. Seeds oblong, finely pubescent.—About 20 species, in tropical regions.



1. T. corymbosa (L.) Raf. Stems trailing, several m. long. Sepals narrowly ovate or elliptic, subacute, 6–8 mm. long, dark-colored with whitish scarious margins: corolla white with green bands, 3–4 cm. long; sapsule 8–10 mm. long. [*Ipomoea sidaefolia* Choisy *I. antillana* Millsp.]—Hammocks, Coastal Plain Cape Sable region, Florida and the Keys and S Tex.—Fall–wint.

15. ARGYREIA Lour. Twining vines, the pubescence commonly sericeous. Leaf-blades broad, cordate, usually entire. Flowers in axillary peduncled cymes. Calyx often colored within: lobes leathery. Corolla showy, campanulate-funnelform. Ovary 2-celled. Stigma slightly 2-lobed. Fruit baccate, indehiscent.—About 25 species, in tropical Asia and Africa.



1. A. speciosa (L.) Sweet. Stem and branches tomentose: leaf-blades broadly ovate, 12–20 cm. long, glabrate above, silvery-pubescent beneath, the veins conspicuous: bracts ovate-elliptic, unequal, glabrous within: sepals 4–5 mm. long: corolla-tube inflated-cylindric, about 5 cm. long; limb purple.—Hammocks along Everglades, Fla. Nat. of trop. Asia, and cult.—(*W. I.*)

Family 3. **CUSCUTACEAE** — Dodder Family

Herbaceous parasitic vines, with pale foliage. Leaves mere alternate scales. Flowers perfect, cymose. Calyx of 4 or 5 distinct or partly united sepals. Corolla regular, of 4 or 5 partly united petals, usually bearing fringed scales below the sinuses. Androecium of 4 or 5 stamens, the filaments partly adnate to the corolla-tube. Gynoecium of 2 partly united carpels, the styles distinct, or partly united: stigmas capitate. Capsule circumscissile or indehiscent.—Only the following genus, and about 160 species, widely distributed.

1. CUSCUTA [Tourn.] L. Annual, slender, yellow or reddish vines twining on herbs and shrubs and adhering to the bark by means of suckers. Flowers white, greenish, or yellowish. The plants arise from the ground, but later become wholly parasitic, the stems and branches often matted.—Sum.–fall or all year S.—Dodders. Love-vines. Strangle-weeds.

Styles distinct. (Subgenus Grammica.)
  Capsule remaining closed, a utricle.
    Flowers subtended by several bracts: sepals nearly or quite distinct. — I. Glomeratae.
    Flowers not subtended by bracts: sepals partly united. — II. Platycarpae.
  Capsule circumscissile, a pyxis. — III. Umbellatae.
Styles more or less united. (Subgenus Monogyna.) — IV. Exaltatae.

I. Glomeratae

Bracts subtending the calyx obtuse, with appressed tips. — 1. *C. compacta.*
Bracts subtending the calyx acute, with spreading tips. — 2. *C. glomerata.*

II. Platycarpae

Capsule subglobose, more or less depressed.
  Calyx and corolla smooth, neither fleshy nor papillate.
    Corolla persistent at the base of the capsule.
      Corolla-lobes obtuse; scales reaching the filaments: flowers pentamerous. — 3. *C. glandulosa.*
      Corolla-lobes acute.
        Corolla-lobes triangular; scales with few processes at the apex: flowers mostly tetramerous. — 4. *C. Polygonorum.*
        Corolla-lobes ovate; scales with numerous processes: flowers pentamerous. — 5. *C. pentagona.*
    Corolla persistent at the apex of the capsule: flowers mostly tetramerous. — 6. *C. Cephalanthi.*
  Calyx and corolla fleshy, papillate by the lens-like cells: corolla with inflexed tips.
    Flowers mostly tetramerous: corolla-scales rudimentary, represented by toothed wings. — 7. *C. Coryli.*
    Flowers mostly pentamerous: corolla-scales copiously fringed. — 8. *C. indecora.*
Capsule ovoid, conic, or flask-shaped.
  Corolla about 1 mm. long; lobes inflexed at the tip: flowers frequently tetramerous. — 9. *C. Harperi.*
  Corolla 2–6 mm. long; lobes not inflexed: flowers pentamerous.
    Capsule flask-shaped, with a long neck: flowers 4–6 mm. long. — 10. *C. rostrata.*
    Capsule globose-conic or globose-ovoid: flowers 2–4 mm. long. — 11. *C. Gronovii.*

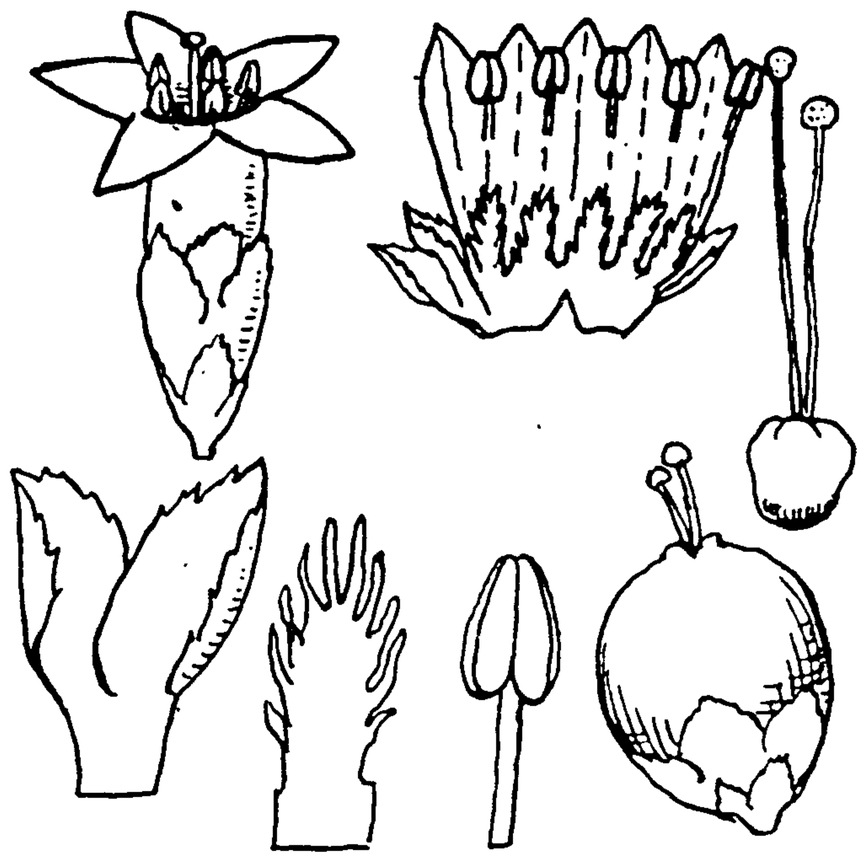
III. Umbellatae

Corolla-lobes lanceolate as long as the tube: corolla-scales long and narrow, reaching the sinuses. — 12. *C. umbellata.*
Corolla-lobes ovate, shorter than the tube: corolla-scales short and broad, not reaching the sinuses. — 13. *C. americana.*

IV. Exaltatae

Plant with very coarse tangled stems, large flowers (corolla 4–5 mm. long) and large capsules, 6–9 mm. long. — 14. *C. exaltata.*

1. C. compacta Juss. Branches stout or stoutish, often widely matted: calyx-lobes orbicular to oval, subtended by 3–5 appressed bracts: corolla-lobes elliptic, spreading or reflexed, much shorter than the tube: corolla-scales shorter than the corolla-tube or reaching the filaments, long-fringed: anthers oval: capsule globose-conic: seeds about 2.5 mm. long.—On shrubs mostly in swamps, various provinces, Fla. to Tex., Kans., Ont., and Mass.



2. C. glomerata Choisy. Branches rather slender, wound tightly around the stems of the host, and floriferous: calyx-lobes elliptic-oval, subtended by bracts with recurved tips: corolla-lobes elliptic to lanceolate, spreading or sometimes reflexed, shorter than the tube: corolla-scales shorter than the corolla-tube, most abundantly fringed at the apex: anthers elliptic: capsule globose-conic or flask-shaped: seeds about 1.7 mm. long. [*C. paradoxa* Raf. ?]—Mostly on tall herbs, various provinces, Miss. to Tex., S. Dak., Minn., and Ohio.

3. C. glandulosa (Engelm.) Small. Branches rather slender, commonly matted: flowers in globular compact clusters: calyx-lobes ovate: corolla-lobes ovate obtuse, shorter than the tube: corolla-scales as long as the corolla-tube, fimbriate: capsule depressed-globose: seeds oval. [*C. obtusiflora glandulosa* Engelm.]—On herbs, various provinces, Fla. to Tex., Calif., Tenn., and Ga.—(*W. I., Mex.*)

4. C. Polygonorum Engelm. Branches rather coarse to slender, often loosely matted: flowers in compact clusters: calyx-lobes triangular: corolla-lobes triangular, acute, longer than the tube: corolla-scales as long as the corolla-tube or nearly so, with few short processes on the upper part: capsule subglobose: seeds roundish.—On herbs in wet places, various provinces, Tenn., to Tex., Minn. and Md.

5. C. pentagona Engelm. Branches slender, loosely matted: calyx-lobes deltoid ovate to orbicular-ovate, obtuse: corolla-lobes as long as the tube or slightly longer, reflexed or spreading, the acute tips inflexed: corolla-scales longer than the corolla-tube, deeply fringed: anthers ellipsoid: capsule subglobose: seeds 1–1.2 mm. long. [*C. arvensis* Beyr.]—On herbs and low shrubs, various provinces, Fla. to Tex., Calif., Wash., and Mass.—(*W. I., Mex.*)

6. C. Cephalanthi Engelm. Branches rather coarse, seldom matted: calyx-lobes elliptic-ovate, obtuse: corolla-lobes much shorter than the tube, erect or spreading, obtuse: corolla-scales nearly or quite as long as the corolla-tube, with scattered processes: anthers oval to subglobose: capsule depressed-globose: seeds about 1.6 mm. long.—On shrubs and tall herbs, various provinces, Tenn. to Tex., Calif., Wash., Me., and Va.

7. C. Coryli Engelm. Branches slender or rather stout, sometimes loosely matted: calyx-lobes triangular, acute: corolla cylindric-campanulate in anthesis; lobes triangular-ovate: corolla-scales rudimentary, shorter than the corolla-tube, with few irregular processes on either side below the notched or truncate top: anthers oval or slightly ellipsoid: capsule depressed-globose. [*C. inflexa* Engelm.]—On shrubs or woody herbs, various provinces, N. C. to Tex., Ariz., Mont., Mich., and R. I.

8. C. indecora Choisy. Branches stout, loosely matted: calyx-lobes lanceolate to triangular-lanceolate, acute or obtusish: corolla campanulate in anthesis; lobes lanceolate or triangular-lanceolate: corolla-scales broad, as long as the corolla-tube or longer, copiously fringed: anthers broadly oval: capsule globose. [*C. decora pulcherrima* Engelm.]—On herbs and low shrubs, various provinces, Fla. to Tex., Calif., Ida., and Mich.—(*W. I., Mex.*)

9. C. Harperi Small. Branches very slender, rather loosely matted: flowers in loose clusters: calyx orbicular-ovate to reniform: corolla broadly campanulate, about 1 mm. long; lobes triangular-ovate, as long as the tube or slightly shorter, acute: corolla-scales exceeding the corolla-tube, with few short processes, especially above: anthers subglobose: capsule depressed-globose or globose-ovoid, depressed at the apex: seeds about 1 mm. long.—On low herbs, Appalachian Provinces, Ala.

10. C. rostrata Shuttlw. Branches rather coarse, sometimes loosely matted: flowers in compact clusters: calyx-lobes ovate: corolla campanulate, 4–6 mm. long; lobes ovate, much shorter than the tube, obtuse: corolla-scales shorter than the corolla-tube, with many long processes: anthers oval: capsule flask-shaped, beaked, seeds 2.5 mm. long or nearly so.—On herbs or rarely on shrubs; various provinces, Ga. to Tenn. and Md.—Very common on herbs and brambles above 5000 feet alt. in the Blue Ridge.

11. C. Gronovii Willd. Branches slender to rather coarse, more or less matted: flowers in lax or dense clusters: calyx shorter than the corolla; lobes broadly ovate, obtuse: corolla broadly campanulate; lobes ovate, shorter than the tube: corolla-scales nearly or quite as long as the tube, deeply fringed, the larger processes near the top: anthers oval: capsule globose-ovoid: seeds about 1.5 mm. long.—On herbs and low shrubs, often in wet grounds, various provinces, Fla. to Tex., Ariz., Man., and N. S.

12. C. umbellata H. B. K. Branches slender, sometimes filiform, loosely matted: flowers in unusually dense clusters: calyx fully as long as the corolla-tube; lobes triangular to ovate-triangular: corolla broadly campanulate; lobes lanceolate, as long as the tube or longer: corolla-scales as long as the corolla-tube or exceeding it, with numerous short processes: anthers oval or ellipsoid: capsule depressed-globose: seeds about 1 mm. long.—On herbs, Coastal Plain and southwestern provinces, Fla. to Ariz.—(*W. I., Mex.*)

13. C. americana L. Branches rather slender, in separate strands or sometimes matted: flowers in small (1 cm. in diameter) spaced or crowded clusters: calyx not as long as the corolla-tube; lobes somewhat reniform: corolla narrowly campanulate; lobes ovate, much shorter than the tube: corolla-scales shorter than the corolla-tube, with rather many very short processes: anthers subglobose: capsule ovoid: seeds about 1 mm. long.—Hammocks and pinelands, S Fla.—(*W. I., Mex., C. A., S. A.*)

14. C. exaltata Engelm. Branches very stout, copiously but sometimes loosely matted: flowers sessile or nearly so in spike-like panicles: calyx nearly or quite as long as the corolla-tube; lobes orbicular-ovate: corolla cylindric-campanulate: lobes ovate-orbicular, much shorter than the tube: corolla-scales 2-lobed, appearing as a wing on either side of the filament-attachment, toothed above: anthers ovoid: capsule oval-ovoid or cylindric-ovoid, 6–9 mm. long: seeds 3–5 mm. long.—On shrubs, especially scrub-oaks, coastal sand dunes, Fla.; also various provinces, Tex.

Family 4. **HYDROLEACEAE** — Water-leaf Family

Annual or perennial herbs, or shrubby plants. Leaves alternate or opposite: blades toothed, lobed, or dissected, or rarely entire. Flowers purple, blue, or white, rarely pink, in scorpioid racemes, or in cymes. Calyx of 5 partly united sepals. Corolla regular, of 5 partly united petals, the tube often appendaged within. Androecium of 5 stamens, the filaments partly adnate to the corolla. Gynoecium 2-carpellary. Fruit a capsule.—About 20 genera and 175 species, mostly natives of Western North America.

Styles wholly or partly united: ovary 1-celled: leaf-blades usually toothed or lobed.
- Corolla-lobes convolute in the bud: placentae dilated. — I. Hydrophylleae.
- Corolla-lobes imbricate in the bud: placentae narrow. — II. Phaceliae.

Styles distinct: ovary 2-celled: leaf-blades entire.
- Corolla funnelform or salverform: capsule loculicidal, the valves bearing the seeds. — III. Marilaunidieae.
- Corolla rotate or campanulate: capsule septicidal, the axils bearing the seeds. — IV. Nameae.

I. Hydrophylleae

Calyx not conspicuously enlarged at maturity.
- Calyx without reflexed appendages at the sinuses. — 1. Hydrophyllum.
- Calyx with reflexed appendages at the sinuses.
  - Styles united to near the tips: stamens exserted. — 2. Decemium.
  - Styles united to about the middle: stamens included. — 3. Nemophila.

Calyx conspicuously enlarged at maturity. — 4. Nyctelea.

II. Phacelieae

Annual or rarely perennial herbs: flowers in scorpioid raceme-like cymes: corolla showy. — 5. Phacelia.

III. Marilaunidieae

Low, often prostrate herbs: flowers axillary: corolla small. — 6. Marilaunidium.

IV. Nameae

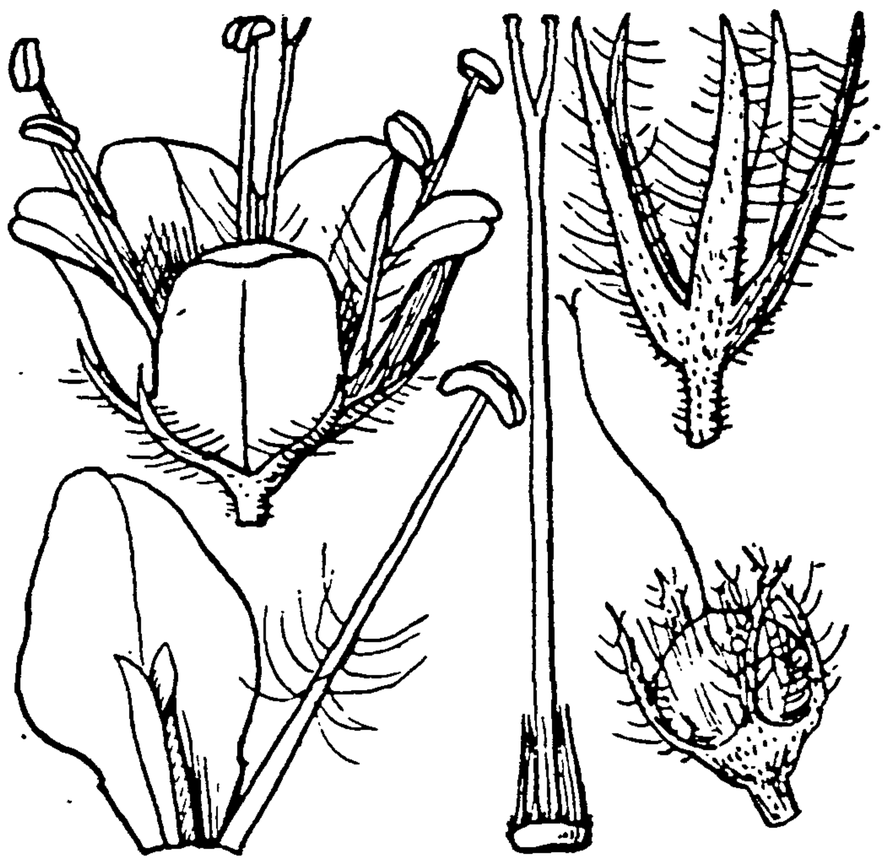
Perennial erect herbs or partly woody plants: flowers in axillary or terminal cymes: corolla showy. — 7. Nama.

1. HYDROPHYLLUM [Tourn.] L. Perennial herbs. Leaf-blades lobed, pinnatifid, or pinnately divided. Cymes long-peduncled. Calyx but little changed in fruit. Corolla white or colored. Filaments surpassing the corolla-lobes, bearded at the middle. Seeds reticulate.—About 12 species, North American.—Water-leafs.

Leaf-blades pinnate or pinnatifid: inflorescence conspicuously hirsute.
- Stems barely pubescent: calyx-lobes nearly distinct, linear. — 1. *H. virginicum.*
- Stems hispid or hirsute: calyx-lobes elliptic-lanceolate. — 2. *H. macrophyllum.*

Leaf-blades palmately 5–7-lobed. — 3. *H. canadense.*

1. H. virginicum L. Plant 2–7 dm. tall: leaf-segments coarsely toothed or incised: cymes open: calyx-lobes linear, about 5 mm. long, much longer than the tube: corolla white or purplish, 8.5–10 mm. long; lobes rounded at the apex.—Rich woods, various provinces, in Coastal Plain only northward, S. C. to Kans., Man., and Que.—Spr.–sum.

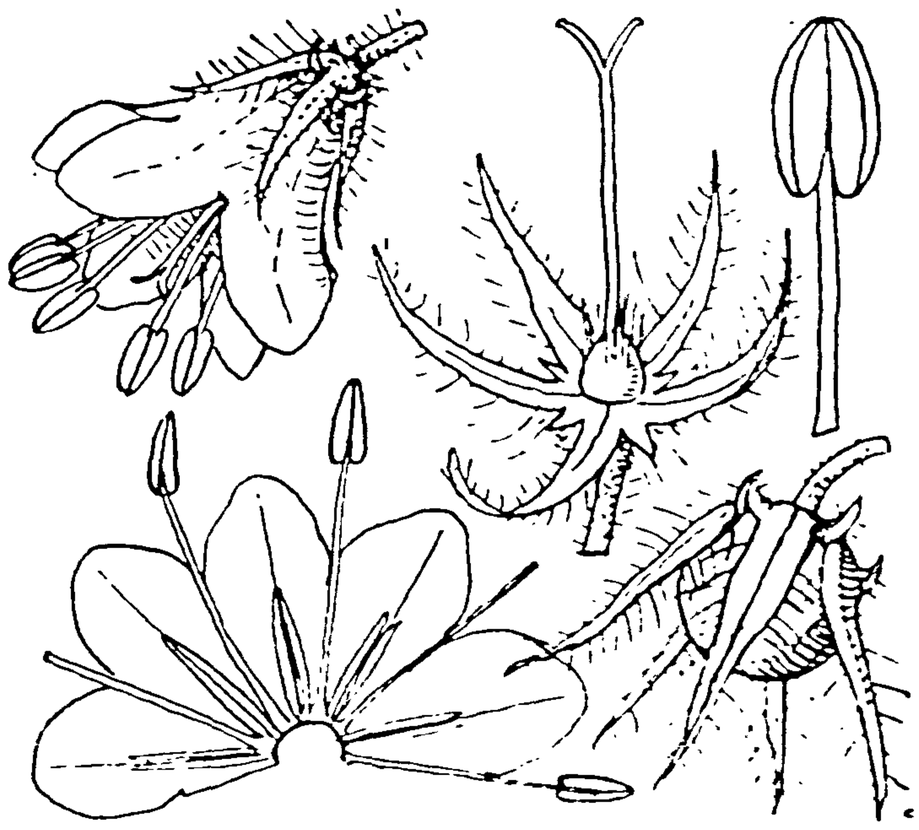


2. H. macrophyllum Nutt. Plant 2–6 dm. tall: leaf-segments coarsely serrate or incised: cymes compact: calyx-lobes lanceolate to elliptic lanceolate, somewhat longer than the tube: corolla white, 9–11 mm. long; lobes notched at the apex.—Rich woods, various provinces, N of Coastal Plain, Ga. to Ill. and Va.—Spr.

3. H. canadense L. Plant 2–7 dm. tall:

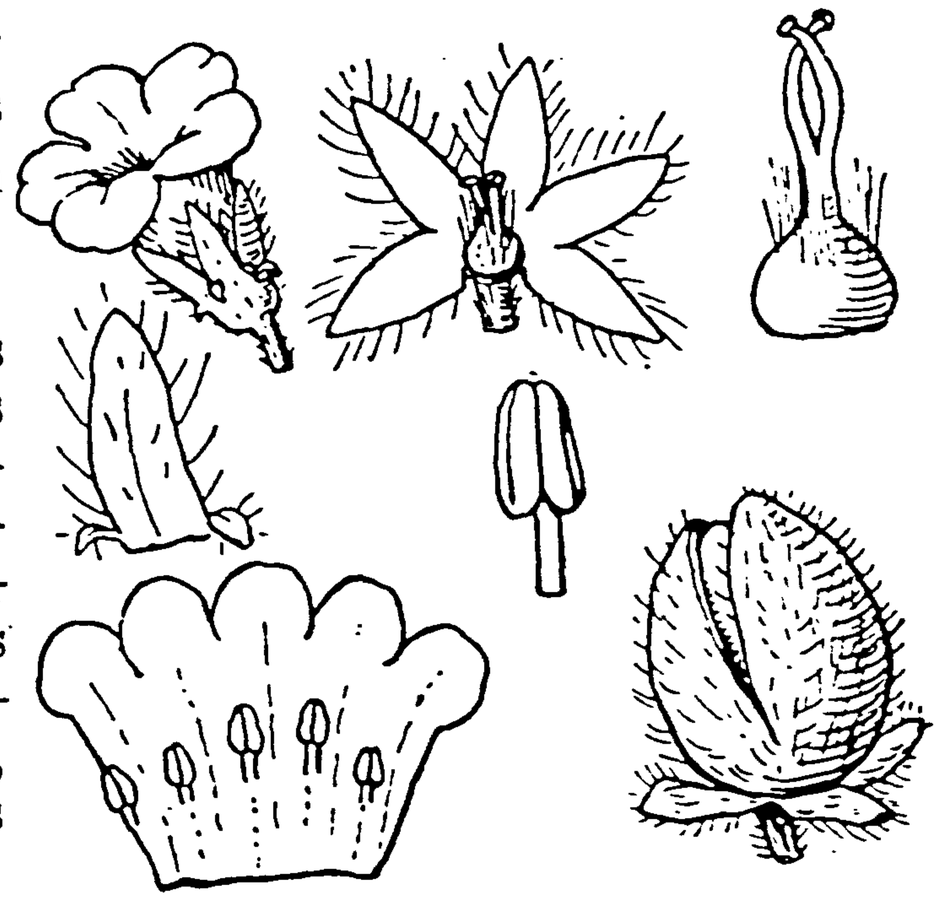
leaf-lobes coarsely toothed or again lobed: cymes open: calyx-lobes linear to linear-lanceolate, much longer than the tube: corolla white, 9–10 mm. long, the lobes notched at the apex.—Rich soil, woods and river-banks, various provinces N of Coastal Plain, N. C. to Ky., Ont., and Mass.

2. **DECEMIUM** Raf. Biennial upright herbs. Leaf-blades pinnately or palmately lobed or divided. Cymes long-peduncled. Calyx somewhat accrescent. Corolla violet or purple. Filaments surpassed by the corolla-lóbes, beardless. Seeds minutely pitted.—One species.



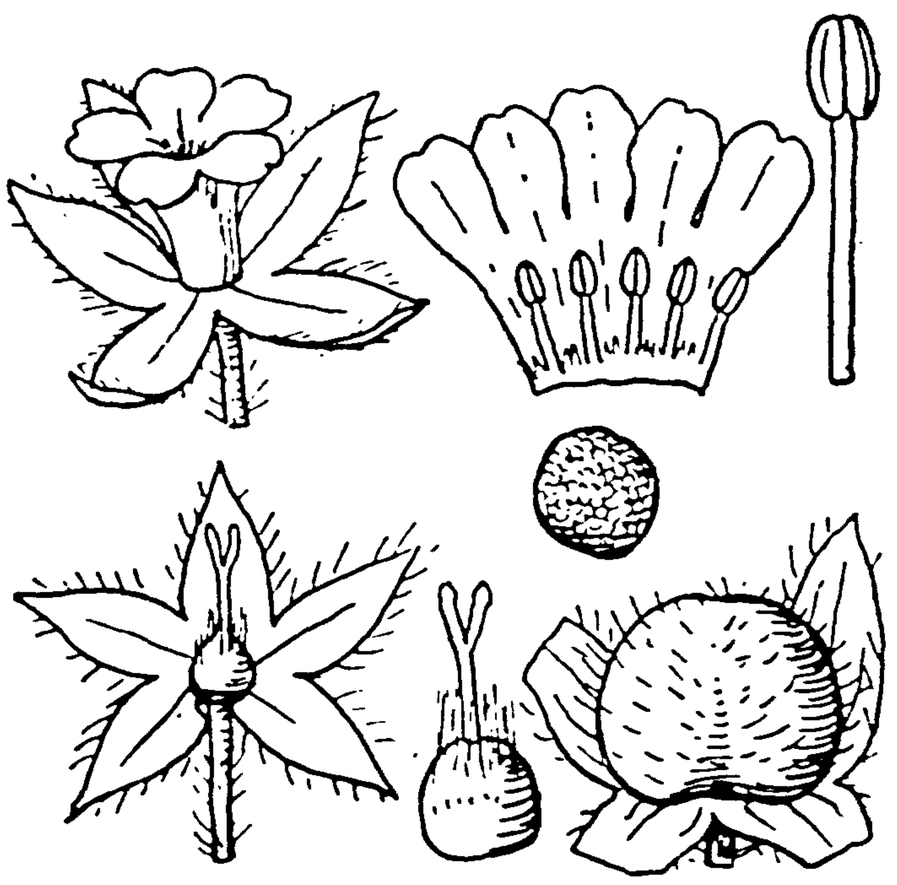
1. D. appendiculatum (Michx.) Small. Plant 3–6 dm. tall: leaf-lobes coarsely toothed, acute or acuminate: cymes open: calyx-lobes narrowly lanceolate or subulate-lanceolate, much longer than the tube: corolla 9–11 mm. long; lobes rounded at the apex. [*Hydrophyllum appendiculatum* Michx.]—Rich soil, usually in damp woods, various provinces N of Coastal Plain, N. C. to Kans., and Ont.

3. **NEMOPHILA** Nutt. Annual diffuse herbs. Leaf-blades pinnately lobed or pinnatifid. Flowers solitary on axillary peduncles. Calyx not much enlarged at maturity. Corolla white or colored. Filaments included, glabrous. Styles partially united.—About 10 species, North American.



1. N. microcalyx (Nutt.) F. & M. Branches 0.5–4 dm. long: leaf-segments 3–5: pedicels 0.5–1.5 mm. long: calyx with minute appendages: corolla white or bluish, the appendages obsolete: capsule 4–5 mm. long.—Shaded banks and moist woods, various provinces, W Fla. to Tex., Ark., and Va.—Spr.—Another species, *N. phacelioides* Nutt., occurs west of the Mississippi River. It has a large corolla 2–2.5 cm. wide.

4. **NYCTELEA** Scop. Annual herbs. Leaf-blades pinnately divived or 1–3-pinnatifid. Flowers solitary in the axils. Calyx accrescent. Corolla white or bluish, commonly smaller than the calyx. Filaments included, often unequal, not dilated. Styles united.—About three species, North American.



1. N. Nyctelea (L.) Britton. Plant 0.5–3 dm. tall, ultimately diffusely branched: leaf-blades with spreading segments: pedicels 1–2 cm. long: calyx-lobes triangular-lanceolate, becoming 7–8 mm. long: corolla 4–6 mm. long: capsule 5–6 mm. in diameter.—Rich soil, woods and stream-banks, various provinces, N of Coastal Plain, N. C. to Kans., Sask. and Ont.—Spr.–sum.

5. PHACELIA Juss. Annual, biennial, or perennial herbs. Leaf-blades toothed or dissected. Flowers in scorpioid racemes or cymes. Calyx slightly accrescent. Corolla white or variously colored: lobes entire to fimbriate. Filaments not dilated at the base. Styles partly united.—About 90 species, American—Spr.

Corolla-lobes entire or merely crenulate.
  Appendages of the corolla-tube between the stamens conspicuous. I. BIPINNATIFIDAE.
  Appendages of the corolla-tube between the stamens inconspicuous or obsolete. II. DUBIAE.
Corolla-lobes fimbriate, laciniate, or fimbriate-dentate. III. FIMBRIATAE.

I. BIPINNATIFIDAE

Stamens longer than the corolla: style over 8 mm. long. 1. *P. bipinnatifida.*
Stamens shorter than the corolla: style less than 5 mm. long. 2. *P. brevistyla.*

II. DUBIAE

Plant puberulent: corolla white or lilac, 8–10 mm. wide. 3. *P. dubia.*
Plant hirsute: corolla violet-purple, 12–15 mm. wide. 4. *P. hirsuta.*

III. FIMBRIATAE

Pedicels as long as the calyx-lobes or a little longer at maturity: style-branches longer than the united portion.
  Calyx-lobes elliptic: corolla about 8 mm. broad; lobes laciniate toothed. 5. *P. Boykinii.*
  Calyx-lobes linear: corolla about 4 mm. broad; lobes irregularly toothed. 6. *P. Bicknellii.*
Pedicels fully twice as long as the calyx-lobes at maturity: style-branches shorter than the united portion.
  Corolla blue with white eye: stem erect. 7. *P. Purshii.*
  Corolla white or pinkish: stem spreading or decumbent. 8. *P. fimbriata.*

1. P. bipinnatifida Michx. Plant 1–6 dm. tall, glandular-pubescent above: leaves 4–11 cm. long; blades pinnately divided, the segments incised or pinnatifid: calyx-lobes narrowly linear to linear-subulate, 4–6 mm. long: corolla violet-blue, 9–11 mm. long; lobes mostly longer than the tube; appendages about ⅓ as long as the corolla: capsule 5–6 mm. long.—Damp slopes, calcareous cliffs, and thickets, various provinces N of Coastal Plain, Ga. to Ala., Ill., Ohio, and Va.—Spr.–sum.

2. P. brevistyla Buckl. Plant 1–4 dm. tall, glandular-pubescent above: leaves similar to those of *P. bipinnatifida*, but often smaller: calyx-lobes linear to linear-subulate, 4–5 mm. long: corolla bluish, 4–5.5 mm. long; lobes mostly shorter than the tube; appendages about ½ as long as the corolla: capsule 4–5 mm. long.—Shaded slopes, Blue Ridge to Appalachian Plateau, Ala. to N. C.—Spr.–sum.

3. P. dubia (L.) Small. Plant 0.5–4 dm. tall, often diffuse, strigillose, as well as glandular: stem-leaves with 3–5 oval, ovate, or obovate lobes: calyx-lobes narrowly elliptic or nearly so, 3–4 mm. long: corolla mainly pale-lilac, 5–6 mm. long; appendages obsolete: stamens longer than the corolla: ovary and style-base pubescent: capsule 2.5–3 mm. long. [*P. parviflora* Pursh]—Sterile hillsides and thickets, various provinces, N of Coastal Plain, Ga. to Tex., Kans., and W N. Y.—Spr.

4. P. hirsuta Nutt. Plant 0.5–3 dm. tall, sometimes sparingly branched, hirsute: stem-leaves with 5–7 lanceolate, elliptic, or ovate lobes: calyx-lobes

elliptic to linear-spatulate, 5–6 mm. long: corolla dark-purple or purplish-blue, 8.5–11 cm. long: stamens shorter than the corolla: ovary and style-base pubescent: capsule 3.5–4 mm. long.—Dry soil, rocks, and open woods, various provinces, N of Coastal Plain, Ga. to Kans. and Va.—Spr.

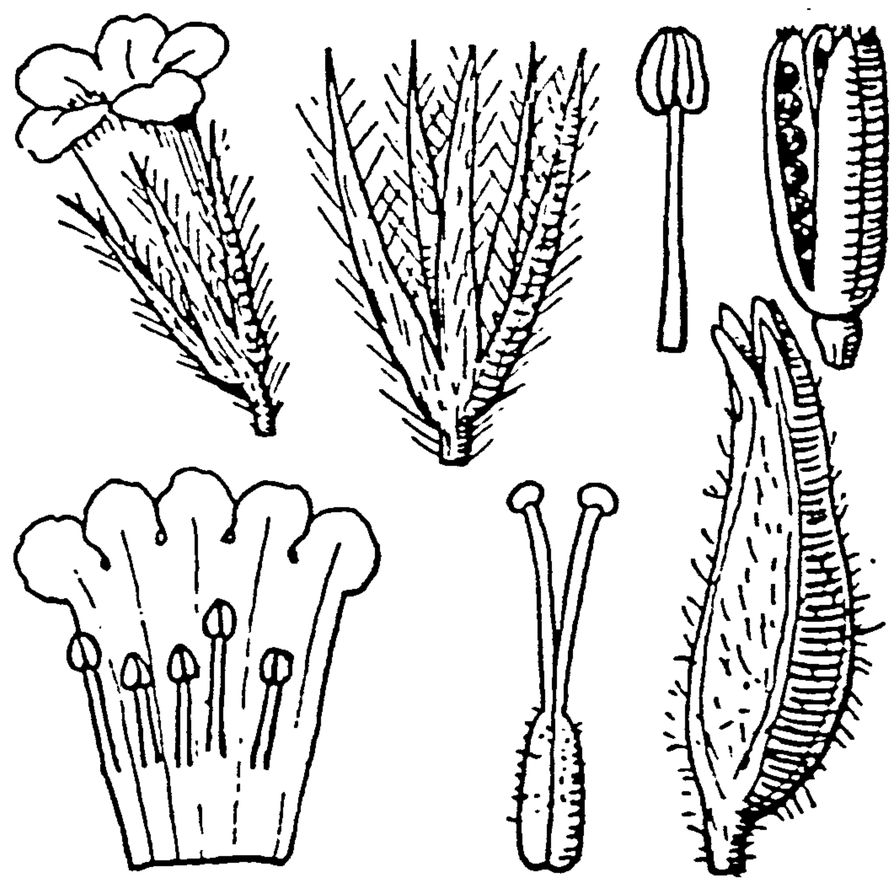
5. P. Boykinii (A. Gray) Small. Plant 1–2 dm. long, the branches becoming glabrous: stem-leaves with 5–7 broadly ovate lobes: calyx-lobes elliptic, 3–3.5 mm. long: corolla bluish, 3–4 mm. long; lobes laciniate-toothed: appendages less than ½ as long as the corolla: filaments sparingly pubescent: capsule 2.5 mm. long.—Dry soil, inner edge of Coastal Plain, Ga.—Spr.

6. P. Bicknellii Small. Plant 1–3 dm. tall, the branches strigose: stem-leaves with 5–7 mostly triangular lobes: calyx-lobes linear, 4–5 mm. long: corolla pale-blue, 3–4 mm. long; lobes irregularly toothed; appendages fully ½ as long as the corolla: filaments glabrous: capsule about 2 mm. long.—Barren soil, Interior Low Plateaus, Tenn.—Spr.

7. P. Purshii Buckl. Plant 1–3 dm. tall, with rather stiff stems; stem-leaves with 5–9 lanceolate or elliptic lobes: calyx-lobes linear to elliptic-spatulate, 4–5 mm. long: corolla light-blue with white eye, 6–7 mm. long; lobes short-fimbriate; appendages manifest: filaments about as long as the corolla: capsule about 4 mm. long.—Moist thickets and rich woods, various provinces, N of Coastal Plain, N. C. to Ala., Mo., Minn., and Pa.; locally becoming a field-weed.—Spr.

8. P. fimbriata Michx. Plant 1–4 dm. tall, with weak stem: stem-leaves with 5–7 triangular, lanceolate, or ovate, or partly elliptic lobes: calyx-lobes elliptic to elliptic-spatulate, 5–6 mm. long: corolla white or pinkish, 8–9 mm. long; appendages obsolete: filaments shorter than the corolla: capsule about 5 mm. long.—Wooded slopes, Blue Ridge to Appalachian Plateau, Ala. to Va.—Spr.

6. MARILAUNIDIUM Kuntze. Annual or perennial herbs. Leaf-blades entire. Flowers solitary in axils. Calyx slightly accrescent: lobes narrow. Corolla often blue, funnelform to nearly salverform: filaments often unequal, filiform. Styles distinct.—About 18 species, natives of warm and tropical regions.



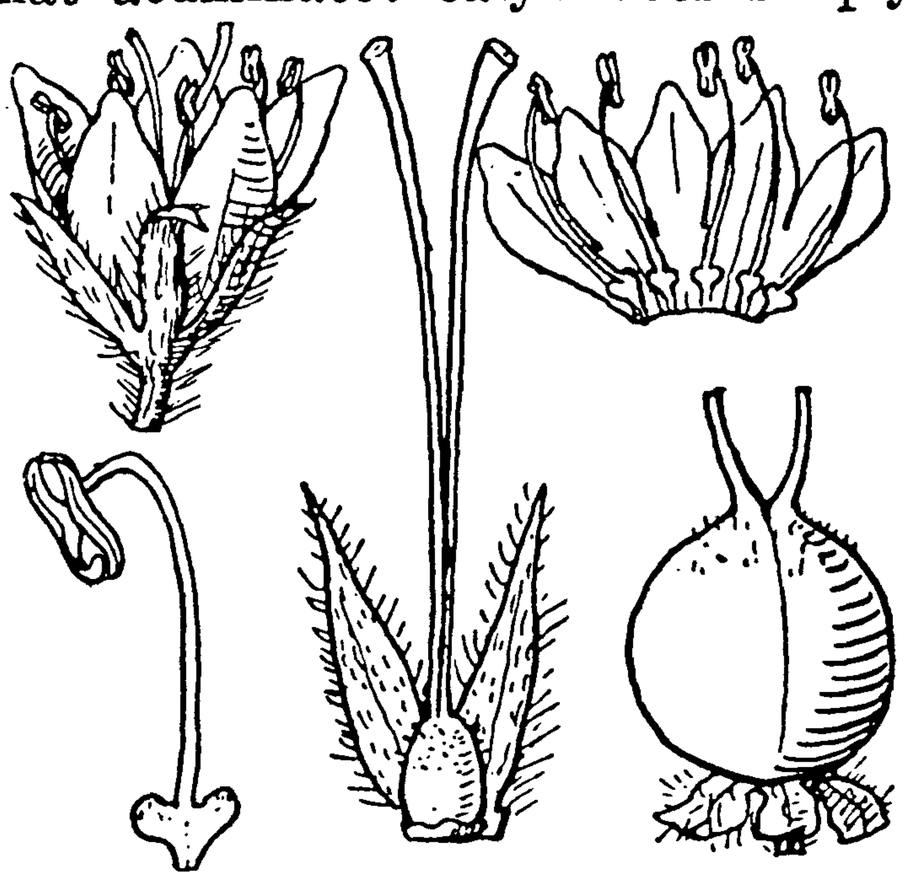
1. M. jamaicense (L.) Kuntze. Branches 1–4 dm. long, spreading or prostrate: leaf-blades spatulate, often broadly so, 1–5 cm. long: calyx-lobes narrowly linear or nearly so, 5–8 mm long, ciliate: corolla white or purple, about as long as the calyx or slightly longer: capsule 8–10 mm. long. '[*Nama jamaicensis* L.]—Hammocks and waste-places, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall.

7. NAMA L. Perennial herbs, or shrubby plants, sometimes spiny. Leaf-blades entire. Flowers in axillary or terminal cymes. Calyx slightly accrescent: lobes broad. Corolla blue or rarely white, rotate to campanulate. Filaments widely dilated at the base. Styles distinct. '[*Hydrolea* L.]—About 45 species, natives of warm and tropical regions.

Styles several times longer than the ovary: filaments nearly or quite as long as the corolla: top of the ovary and bases of the style glandular-pubescent.
- Leaf-blades ovate to elliptic: calyx-lobes mostly less than 7 mm. long. — 1. *N. ovatum.*
- Leaf-blades elliptic to elliptic-lanceolate: calyx-lobes mostly over 7 mm. long. — 2. *N. corymbosum.*

Styles slightly longer than the ovary: filaments much shorter than the corolla: ovary and styles glabrous.
- Calyx-lobes linear or linear-lanceolate, sparingly ciliate: stem villous-hirsute. — 3. *N. quadrivalve.*
- Calyx-lobes ovate to ovate-lanceolate, closely ciliate: stem glabrous or puberulent. — 4. *N. affine.*

1. N. ovatum (Nutt.) Britton. Plant 2–7 dm. tall, soft-pubescent, spine-armed, paniculate above: leaf-blades somewhat acuminate: calyx-lobes simply ciliate: corolla mainly purplish or white, 12–15 mm. long: capsule about 5 mm. long. [*H. ovata* Nutt.]—Swamps, ponds, and ditches, Coastal Plain, Ga. to Tex. and Mo.—Sum.



2. N. corymbosum (Macbride) Kuntze. Plant 2–7 dm. tall, unarmed or nearly so, corymbose above: leaf-blades elliptic to elliptic-lanceolate, acute: calyx-lobes glandular-ciliate: corolla mainly azure-blue, 11–15 mm. long: capsule 4–6 mm. long. [*H. corymbosa* Macbride]—Swamps, often calcareous, and stream-banks, Coastal Plain, Fla. to S. C.—Sum.

3. N. quadrivalve (Walt.) Kuntze. Plant 2–10 dm. long, often decumbent, spine-armed: leaf-blades narrowly elliptic or nearly so, 4–12 cm. long: calyx-lobes 6–8 mm. long: corolla blue or lilac, 7–8 mm. long: capsule 5–6 mm. long, surpassed by the calyx. [*H. quadrivalvis* Walt.]—Sandy places, swamps, ponds, and ditches, Coastal Plain, Fla. to La. and Va.—Sum.

4. N. affine (A. Gray) Kuntze. Plant 2–7 dm. long, often creeping, spine-armed: leaf-blades linear-elliptic or nearly so, 3–10 cm. long: calyx-lobes 4.5–5 mm. long: corolla violet, 9–10 mm. long: capsule 6–7 mm. long, surpassing the calyx. [*H. affinis* A. Gray]—Swampy places, Coastal Plain and adj. provinces, Miss. to Tex., Mo., and Ind.—Sum.–fall.

Family 5. POLEMONIACEAE — Phlox Family[1]

Plants of moderate size. Calyx of 5 partly united sepals, their free parts (lobes) deltoid to subulate. Corolla of 5 partly united petals, the free parts (lobes) conspicuous, convolute in bud. Androecium of 5 stamens, often unequal. Gynoecium of 3 united carpels, the styles united. Fruit a loculicidal capsule.—Comprises 20 genera and 200 species, most numerous in western North America; all but about 10 of the species are limited to the New World.

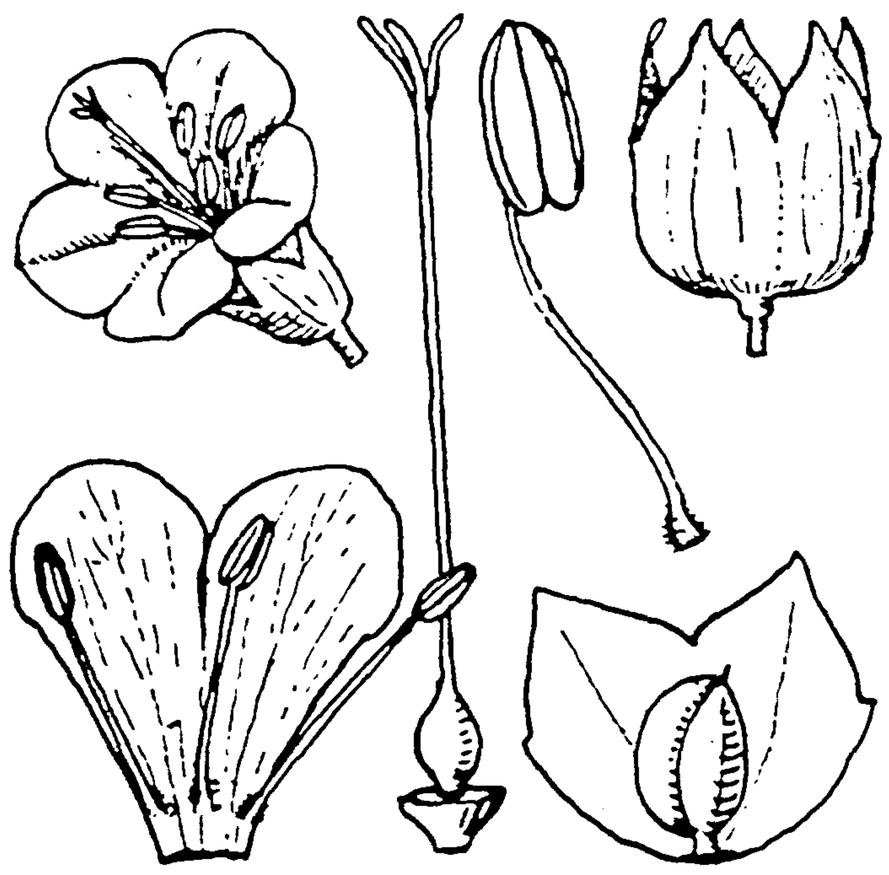
Corolla campanulate: stamens in part declined. — 1. Polemonium.

Corolla funnelform to salverform: stamens erect.
- Leaf-blades pinnately parted: corolla funnelform: filaments equally adnate up to the corolla-throat (in our species). — 2. Gilia.
- Leaf-blades entire or nearly so: corolla salverform: filaments unequally adnate to the corolla-tube. — 3. Phlox.

[1] Contributed by Edgar Theodore Wherry.

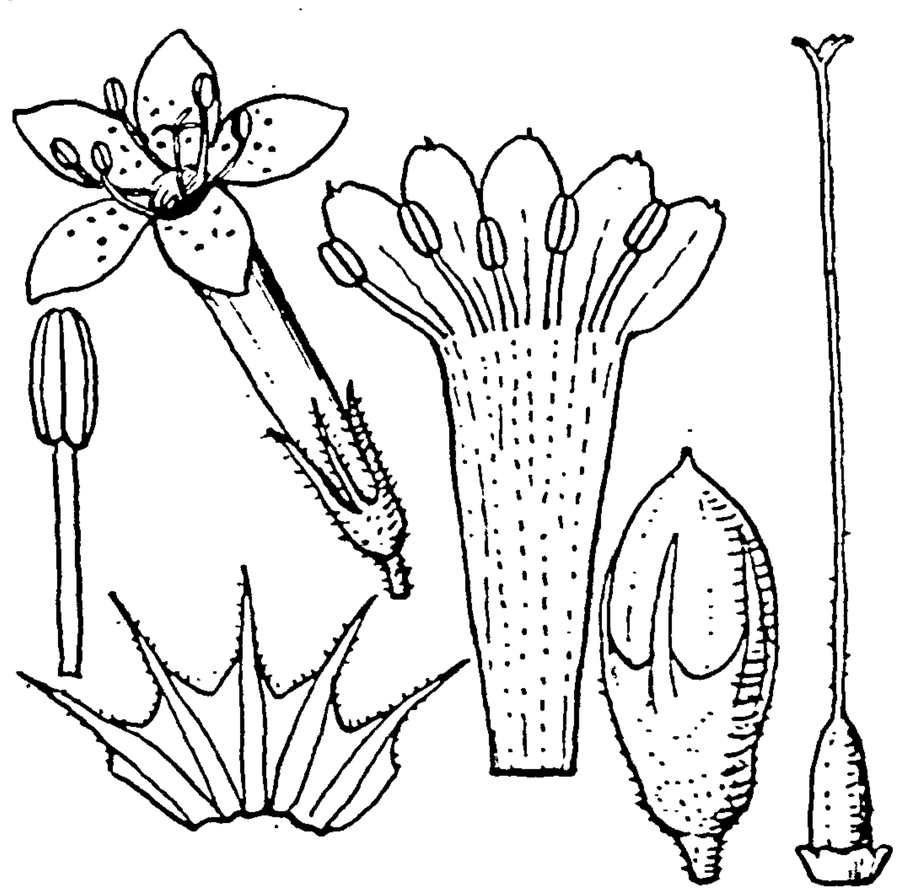
1. POLEMONIUM L. Plants perennial with well-developed rootstocks, or in a few species annual. Leaves alternate: blades pinnately divided. Inflorescence primarily cymose, the cymes corymbose or paniculate. Calyx tubular: lobes broad. Corolla violet, yellow, or white, rotate to campanulate, with spreading lobes. Filaments equally adnate to the corolla-tube, two or more declined. Capsule ovoid to ellipsoid.—About 25 species, mostly North American, but at least 7, including the type of the genus, Eurasian.

1. P. reptans L. Tufted perennial, the ascending or erect stems up to 50 (exceptionally 75) cm. tall: leaves up to 20 cm. long and 7 cm. wide; segments variable in outline, but usually elliptic: corymb lax, some of the flowers nodding: calyx-tube 3–5 mm. long; lobes 2–4 mm. long during anthesis, doubling in size as the capsule ripens: corolla pale violet, exceptionally white, campanulate, the tube 5–7 mm. long; lobes obovate, as long as the tube: stamens normally included: style exserted. — (BLUE-BELL VALERIAN. GREEK-VALERIAN. SWEAT-ROOT.)—Rich woods and thickets, often in circumneutral soil, various provinces, though rare on the Coastal Plain, Ga. to Miss., E Kans., Minn., and N. Y.—Late spr.—A delicate plant, occasionally cultivated, though blooming for but a short period. A related species, *P. Van-Bruntiae* Britton, grows in S W. Va., and may enter our range in the Blue Ridge; it is taller and has a narrow panicle of larger flowers with the stamens exserted.



2. GILIA R. & P. Perennial, biennial, or annual plants. Leaves usually alternate, with numerous narrow segments, or in some species incised or entire. Calyx tubular to campanulate; lobes narrow, acute. Corolla red, yellow, blue, or white, exceptionally purple. Filaments unequally adnate to the corolla-tube, or equally adnate but unequally exserted. Capsule ellipsoid to ovoid.—About 100 species, all American and mostly in western United States.

1. G. rubra (L.) Heller. Plant biennial, forming a large rosette the first year and producing a stout stem up to 100 (exceptionally 175) cm. tall the second year: leaves numerous, pinnately-parted into linear-filiform divisions: panicle long, slender: flowers short-pedicelled: calyx-tube 3–4 mm. long; teeth 4–6 mm. long: corolla usually brilliant scarlet-red without and yellow streaked with red within; tube 20–23 mm. long; lobes elliptic-ovate, 9–11 mm. long, terminally undulate or mucronulate: stamens unequally exserted, extending 2–6 mm. beyond the corolla-throat: capsule 8–10 mm. long. [*G. coronopifolia* Pers.]—(SPANISH-LARKSPUR. STANDING-CYPRESS.)—Fields and margins of woods, usually in sandy or sterile soil, Coastal Plain and adj. provinces, Fla. to Tex., Okla., and N. C.; escaped from cultivation in various provinces as far N as



Mich. and Mass.—Sum.—A very showy plant. The flowers are adapted to cross-pollination by humming-birds.

3. **PHLOX** L. Dwarf-shrubby, perennial, or annual plants. Leaves mostly opposite, with their bases connected by stipular lines, in some species alternate, the blades entire. Inflorescence primarily cymose, the cymes often arranged in corymbs or panicles, bracted. Calyx tubular; lobes narrow, acute or awned. Corolla typically bright-purple, but ranging to rose-red, to blue-violet, or to white, the pale eye often striate with 5 groups of deeper-colored lines: lobes cuneate to broadly obovate. Capsule subglobose to ellipsoid, 4–6 mm. long.—About 50 species, all North American except that one extends from Alaska into Siberia. Several of these, as well as hybrids between them are in cultivation and have escaped locally. Many of the species are markedly variable.

Stems woody, trailing or decumbent; axillary latent shoots prominent: leaves mostly persistent: inflorescence a few-flowered cyme; pedicels often elongate. — I. SUBULATAE.

Stems herbaceous, decumbent or erect; axillary latent shoots inconspicuous: leaves deciduous or a few persistent: inflorescence a few to many-flowered cyme, corymb, or panicle; pedicels rather short.

- Calyx-lobes mostly longer than the tube, conspicuously awn-tipped: stamens and style much shorter than the corolla-tube.
  - Plant perennial: leaf-blades obtuse to acute with short awn-tips: inflorescence bilaterally symmetrical. — II. DIVARICATAE.
  - Plant annual: leaf-blades acute, with prominent awn-tips: inflorescence asymmetrical. — III. DRUMMONDIANAE.
- Calyx-lobes mostly shorter than the tube, obscurely awn-tipped: one or more stamens and style nearly or quite equalling the corolla-tube.
  - Leaves medium-sized, their margins roughish or ciliate with soft hairs, and their lateral veins obscure. — IV. OVATAE.
  - Leaves relatively large, their margins ciliate-serrulate with stiff bristles and their lateral veins prominent, areolate. — V. PANICULATAE.

I. SUBULATAE

Corolla-lobes entire, erose, or shallowly notched; stamens all included; style 1–3 mm. long. — 1. *P. nivalis.*

Corolla-lobes conspicuously notched (exceptionally nearly entire); stamens partly exserted; style 4–12 mm. long.

- Nodes numerous, crowded; lower leaves 8–20 mm. long; sinuses in corolla-lobes averaging 1 mm. deep. — 2. *P. subulata.*
- Nodes few, more remote; lower leaves 20–60 mm. long; sinuses in the corolla-lobes averaging 3 mm. deep. — 3. *P. bifida.*

II. DIVARICATAE

Sterile shoots becoming decumbent, often rooting at nodes; leaves rather broad; inflorescence lax; corolla-tube glabrous. — 4. *P. divaricata.*

Sterile shoots erect or decumbent, not rooting at nodes; leaves mostly narrow; inflorescence more compact.

- Leaves mostly linear to lanceolate, sparingly persistent; bracts spreading; inflorescence-hairs sometimes gland-tipped.
  - Nodes few; leaves pubescent or sometimes glabrous, the upper spreading, passing rather abruptly into the bracts. — 5. *P. pilosa.*
  - Nodes numerous; leaves always glabrous, the upper ascending, passing gradually into glandular-pubescent bracts. — 6. *P. floridana.*
- Leaves oblong elliptic to lanceolate, many of them persistent; bracts ascending; inflorescence-hairs coarse, eglandular. — 7. *P. amoena.*

III. DRUMMONDIANAE

Plant a branching annual with the upper leaves alternate. 8. *P. Drummondii.*

IV. OVATAE

Prostrate stems well-developed, rooting at nodes: lower leaves spatulate, many of them persistent. 9. *P. stolonifera.*

Prostrate stems poorly developed: lower leaves never typically spatulate, sparingly if at all persistent.

Flowering shoots mostly arising from the tip of a decumbent stem: nodes few: leaves elliptic to ovate: calyx averaging 10 mm. long. 10. *P. ovata.*

Flowering shoots mostly arising from the rootstocks: nodes numerous: calyx averaging less than 10 mm. long.

Cymes in a corymb or broad corymbose panicle.

Upper leaves lanceolate to ovate: calyx 6–11 mm. long. 11. *P. carolina.*

Upper leaves linear to lanceolate: calyx 5–8 mm. long. 12. *P. glaberrima.*

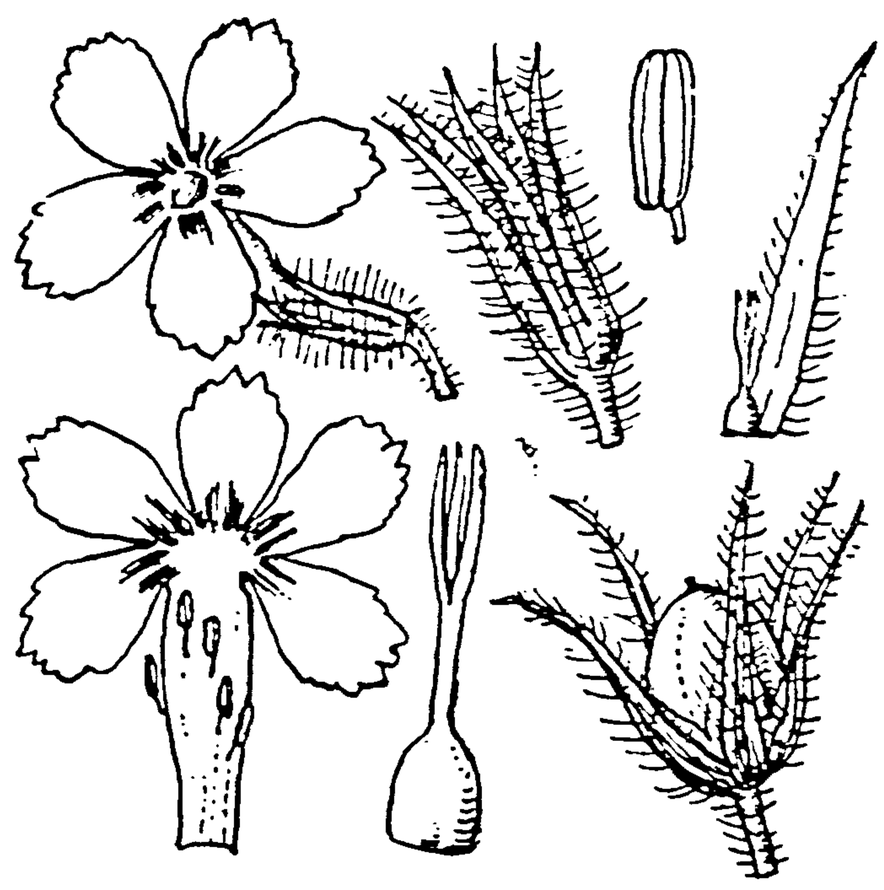
Cymes in a narrow-conical or cylindrical panicle. 13. *P. maculata.*

V. PANICULATAE

Hairs on the few opposite leaves, when present, coarse, and those on the inflorescence mostly gland-tipped: corolla-tube glabrous: stamens all included. 14. *P. amplifolia.*

Hairs on the numerous sub-opposite leaves, when present, fine, those on the inflorescence pointed or rarely gland-tipped; corolla-tube pubescent: 1 or 2 stamens exserted. 15. *P. paniculata.*

1. P. nivalis Lodd. Low evergreen shrub, with erect pubescent and often glandular flowering shoots 10–20 cm. tall: leaf-blades sessile, up to 25 mm. long and to 4 mm. wide; blades linear-subulate to lanceolate-elliptic: calyx-tube about 5 mm. and lobes 4 mm. long: corolla light-purple to white, the eye often dark-striate: tube 11–19 mm. long; lobes cuneate to obovate, 8–15 mm. long, terminally entire or erose, or with a sinus to 0.5 (rarely 1 or 2) mm. deep. [*P. Hentzii* Nutt.]—(TRAILING-PHLOX.)—Open oak woods, pine woods, or scrub, in sterile and often rather acid gravelly or sandy soil, Coastal Plain and Piedmont, Fla. to Ala. (or Miss. acc. to Chapman) and S Va.—Spr., and occasionally fall.—This species probably represents the ancestor of the next following, with which it is often confused.



2. P. subulata L. Low matted evergreen shrub with numerous erect pubescent, and in our range usually glandular, flowering shoots 5–10 cm. tall: leaves much as in the preceding, but rarely exceeding 15 mm. in length and 2 mm. in width: calyx-tube about 4 mm. long; lobes somewhat shorter: corolla of various purple hues, rarely white, the eye often deep-purple striate; tube 9–15 mm. long; lobes cuneate to obovate, 6–11 mm. long, terminally sub-entire or usually with a sinus 0.5–3 mm. deep.—(MOSS-PHLOX. MOUNTAIN PINK.)—Bare gravelly or sandy slopes, often in circumneutral soil over calcareous or magnesian rocks, various provinces, in Coastal Plain only northward, N. C. and E Tenn. to S Mich., S Ont., and N. Y.—Spr., and occasionally fall.—Presumably a descendant from *P. nivalis,* exhibiting its greater specialization in the more densely matted stems, more consistently notched corolla-lobes, and more elongate stamens and style.—*P. Brittonii* Small, differing from typical *P. subulata* in the pale-lilac or white corolla with deeper sinuses in the lobes, was included in Fl. SE. U.S., but is not now regarded as specifically distinct, nor as growing within our area.

3. P. bifida Beck. Trailing subevergreen shrub, with long ascending flowering shoots; the young foliage glabrate to glandular-pubescent: leaf-blades sessile, up to 5 cm. long and to 5 mm. wide, linear to lanceolate: calyx-tube about 4 mm. long; lobes slightly shorter: corolla lavender to white, the eye faintly striate; tube 9–12 mm. long; lobes nearly as long, cuneate, with a sinus 2–6 mm. deep.—(SAND-PHLOX.)—Exposed slopes and cliffs in rocky or sandy, sterile soil, Central Lowland and occasionally adj. provinces, Tenn. to N Okla., E Kans., Iowa, and SW Mich.—Spr.—*P. Stellaria* A. Gray, with glabrate or simply puberulent young foliage, appears not to be specifically distinct.—The plant usually cultivated under the name *P. Stellaria* is a garden form of *P. subulata.*

4. P. divaricata L. Plant in an open-mat, with the lower leaves evergreen, the erect flowering shoots up to 50 cm. tall: leaf-blades sessile or nearly so, elliptic to elliptic-lanceolate or ovate, up to 5 cm. long and to 2 cm. wide: cymes corymbose-paniculate: calyx-tube about 4 mm. long; lobes somewhat longer: corolla of mauve to blue-violet hues, ranging to white, the eye faintly violet-striate; tube 10–16 mm. long, glabrous; lobes cuneate to obovate, varying greatly in length, entire, erose, apiculate, or with a sinus as much as 2 mm. deep.—(BLUE-PHLOX.)—Rich woods, often in circumneutral soil over calcareous rocks, various provinces, rarely Coastal Plain, N Fla. to E Tex., E Nebr., Minn., W Que., and N Vt.—Spr.—The flowers of this species are more consistently of a bluish color than those of any other *Phlox.*—Several showy garden forms and hybrids with other species are in cultivation.

5. P. pilosa L. Plant tufted, the stems up to 60 cm. tall, glabrous or pubescent: leaf-blades sessile, up to 10 cm. long and to 5 (rarely 10) mm. wide, opposite or alternate, linear to broadly lanceolate or ovate, somewhat ciliate, and more or less pubescent on both surfaces, deciduous or sometimes in part persistent: cymes in a terminal corymb: calyx-tube 3–4 mm. and lobes 4–7 mm. long: corolla bright-purple, pale violet, or white, the eye sometimes purple-striate; tube 10–18 mm. long, glabrous or pubescent; lobes obovate, variable in length, entire, erose, mucronulate or apiculate.—(DOWNY-PHLOX.)—Open woods, hammocks, barrens, thickets, and prairies, often in sterile soil, various provinces, Fla. to Tex., S Man., S Ont., and W Conn.—Spr.–early sum. or all year in pen. Fla.—Variable in extent and character of pubescence, on the basis of which a number of forms have been segregated.—*P. detonsa* (A. Gray) Small, with glabrous or glabrate foliage, grades too freely into *P. pilosa* to be maintained as specifically distinct. *P. glutinosa* Buckl. is regarded as a hybrid between this species and *P. divaricata.*

6. P. floridana Benth. Plant tufted, the stems up to 80 cm. tall, glabrous below the inflorescence; leaf-blades sessile, up to 10 cm. long and 7 mm. wide, linear to lanceolate, the upper gradually shortened and conspicuously appressed: cymes in a terminal corymb, glandular-pubescent; calyx-tube 4–5 mm. and lobes 4–6 mm. long; corolla bright-purple; tube 15–20 mm. long; lobes obovate, entire, often larger than in the next preceding species.—(FLORIDA PHLOX.)—Sterile woods, thickets, and swamp-margins, NW Fla. and adj. Ala. and Ga.—Blooms about a month later than *P. pilosa,* in early summer.—One of the most restricted in area of all our Phloxes. Sometimes seems to grade toward *P. pilosa,* but usually quite distinct in aspect.

7. P. amoena Sims. Plant in an open-mat, with the lower leaves evergreen, becoming purplish beneath, the flowering shoots up to 30 cm. tall: leaf-blades sessile, up to 5 cm. long and to 8 mm. wide, the lowermost spatulate but the majority linear-elliptic to elliptic-lanceolate: bracts conspicuous, lanceolate to elliptic: calyx-tube 4–5 mm. long; lobes of the same or a slightly greater length: corolla bright-purple, pale-violet, lilac, or white, the eye faintly

striate; tube 12–16 mm. long, glabrous or puberulent; lobes obovate, 8–11 mm. long, terminally entire, undulate, or mucronulate.—(HAIRY PHLOX.)—Open woods and pine barrens, in acid sandy or rocky soil, various provinces, Fla. to Miss., Ky., and N. C.—Spr.—The plant usually cultivated under the name *P. amoena* is a hybrid between *P. subulata* and *P. stolonifera*, with gland-tipped hairs and long stamens and style.—*P. Lighthipei* Small, with flowering shoots up to 50 cm. tall and often longer leaves may not be specifically distinct.

8. P. Drummondii Hook. Stem branching, up to 40 cm. tall, pubescent with gland-tipped hairs: leaf-blades up to 9 cm. long and to 15 mm. wide, sessile, the lower opposite and oblanceolate, and the upper alternate, and lanceolate to elliptic, conspicuously awn-tipped: cymes corymbosely compound: calyx-tube 4–5 mm. and lobes 4–7 mm. long: corolla rose-red to purple, ranging to white, the eye often strongly striate; tube 14–17 mm. long, pubescent; lobes obovate, 8–15 mm. long.—(ANNUAL GARDEN-PHLOX.)—Prairies, Coastal Plain and adj. provinces, Tex.; naturalized E to Fla. and Ga.—Spr.–sum.—Cultivation has produced in this species hundreds of forms, of varying types of corolla-lobing, and numerous different colors.

9. P. stolonifera Sims. Plant in a dense mat, with decumbent evergreen sterile shoots rooting freely at the nodes, and erect deciduous glandular-pubescent flowering shoots up to 30 cm. tall: leaf-blades up to 8 cm. long and 2 cm. wide, obovate-spatulate to elliptic-lanceolate: cyme simple or somewhat compound: calyx-tube about 5 mm. long; lobes as long or somewhat shorter: corolla bright-purple, violet, or rarely white, the eye purple-striate; tube 20–25 mm. long; lobes 10–12 mm. long. [*P. reptans* Michx.]—(CREEPING-PHLOX.)—Woods, in humus-rich and slightly acid soils, Blue Ridge, Appalachian Plateau and rarely adj. provinces, Ga. to Ohio and Pa.—Spr.—Rare, though occurring locally in large colonies formed by repeated rooting of the sterile shoots; having developed the ability to propagate itself in this manner, it produces seed only sparingly.

10. P. ovata L. Plant in an open-mat, with the lower leaves somewhat persistent, and the glabrate flowering-shoots up to 50 cm. tall; leaf-blades up to 10 cm. long and to 4 cm. wide, the lower and middle petioled, the upper subsessile, elliptic to lanceolate or ovate: cyme simple or corymbosely compound: calyx-tube 6–8 mm. and lobes 3–5 mm. long: corolla bright-purple or rarely white, the eye slightly striate; tube 18–23 mm. long; lobes 10–15 mm. long.—(MOUNTAIN-PHLOX.)—Thickets and open woods, in rather acid soil, higher Piedmont to Central Lowland and to New England Upland, Ga. to E Ind. and E Pa.—Late spr.–sum.—Specimens lacking the decumbent stems tipped with petioled leaves are difficult to distinguish from the next-following species, to which this is probably ancestral.

11. P. carolina L. Plant tufted, puberulent or sometimes pubescent, the stems up to 100 (rarely 125) cm. tall, often purple-streaked: leaf-blades up to 12 cm. long and 35 mm. wide, the lower linear but the upper usually conspicuously broader, elliptic-lanceolate to ovate: cymes in a corymb or broad corymbose panicle, exceptionally conical: calyx-tube usually 4–6 mm. and lobes 2.5–4.5 mm. long: corolla deep- or sometimes pale-purple, the eye somewhat striate; tube 15–26 mm. long; lobes 7–15 mm. long.—(THICK-LEAF PHLOX.)—Open woods and occasionally meadows, in subacid soil, chiefly in the Blue Ridge and Appalachian provinces, but occasionally in Piedmont or even Coastal Plain, W Fla. to Miss., S Ind. and W Md.—Late spr.–fall.—Represents an apparent intermediate between Nos. 10, 12 and 13, and grades into them in some colonies.

12. P. glaberrima L. Plant tufted, glabrous or essentially so, the stems all erect, up to 60 (rarely 100) cm. tall: leaf-blades up to 15 cm. long and to 15

mm. wide, often numerous and crowded below, remote above, obscurely petioled, linear to lanceolate: cymes in a corymb or short, irregularly interrupted panicle: calyx-tube 3–4 mm. long, the lobes somewhat shorter: corolla purple, often pale though rarely white, the eye faintly striate: tube 18–24 mm. long: lobes variable in length.—(SMOOTH-PHLOX.)—Roadsides, prairies and open woods, various provinces, Fla. to E Tex., Wisc. and SE Va.—Late spr.–sum.

13. P. maculata L. Plant tufted, the erect stems up to 125 cm. tall, often purple-streaked: leaves numerous but scarcely crowded; blades subsessile, scabrous-ciliolate, up to 12 cm. long and to 25 (rarely 35) mm. wide, linear to ovate: cymes in a panicle 3–30 cm. long, its branches exceptionally exceeding the subtending leaves: calyx-tube 4–5 mm. and lobes 2.5–3.5 mm. long: corolla purple to white, the eye faintly striate; tube 18–24 mm. long; lobes 8–10 mm. long.—(MEADOW PHLOX.)—Damp thickets, meadows, and moist open woods, in circumneutral soil, various provinces, N. C. to E Mo., Minn., S. Que., and W Conn.—Late spr.–early fall.—The purple streaks on the stem, although often striking, are not diagnostic for this species. In some occurrences, especially those with white flowers, they are lacking while other species of the genus, and in particular *P. carolina,* of which *P. maculata* appears to be a direct descendant, may be similarly streaked. The non-recognition of this fact has led to many erroneous reports of the occurrence of this species in our region, whereas it seems to be one of the rarest.

14. P. amplifolia Britton. Plant tufted, the stems up to 125 cm. tall, often purple-streaked: leaves up to 18 cm. long and 8 cm. wide, with short broad petioles widening abruptly into the ovate blades, glabrate or usually hirsute with coarse hairs above, and hirsute-pubescent beneath: cymes in a fairly large subcorymbose panicle, the leaves subtending its elongate branches much reduced and the bractlets very small: calyx-tube 3–4 mm. and lobes about as long: corolla pale-purple or rarely white; tube about 2 cm. long; lobes 9 mm. long.—(BROAD-LEAF PHLOX.)—Open woods and thickets, various provinces N of Coastal Plain, Ga. to E Mo., S Ind., and E Ky.—Sum.–early fall.—This species has been confused with the next following, and was no doubt derived from the same ancestor, but is quite distinct in aspect.

15. P. paniculata L. Plant tufted, the stems up to 150 cm. tall: leaves numerous, rather crowded, often subopposite: blades somewhat petioled, undulate-margined, glabrous or puberulent, up to 18 cm. long and 4 (rarely 5) cm. wide, elliptic: cymes in a corymbose panicle 5–35 cm. long, the branches often exceeding their subtending leaves, the bractlets rather conspicuous: calyx-tube 4–5 mm. and lobes 3–6 mm. long: corolla purple to white, the eye often distinct; tube 2–3 cm. long; lobes 9–11 mm. long.—(PERENNIAL GARDEN-PHLOX.)—Thickets along streams and damp woods, often in circumneutral soil, various provinces, N Ga. to Miss., E Nebr., and S N. Y.—Sum.–fall.—*P. paniculata* is extensively cultivated, the majority of the garden forms of perennial phlox having arisen from it or its hybrids with other species, and frequently escapes. —*P. acuminata* Pursh., with the leaves copiously soft-pubescent beneath and decurrent on the stem as angles, may not be specifically distinct.

FAMILY 6. **SOLANACEAE** — POTATO FAMILY

Herbs, shrubs, trees, or vines. Leaves alternate: blades entire, toothed, or lobed. Calyx of 5, (4–6), more or less united sepals. Corolla of 5, (4–6), more or less united petals. Androecium of 5, (4–6), stamens, the filaments partially adnate to the corolla-tube. Gynoecium 2-carpellary or 3–5-carpellary. Fruit a berry or a capsule.—About 75 genera and 1,750 species, most abundant in the tropics.

Fruit a berry.
  Corolla plicate; lobes usually induplicate. I. SOLANEAE.
  Corolla little, if at all plicate; lobes imbricate, valvate, or valvate-induplicate.
    Stamens adnate to the lower part of the corolla-tube: corolla rotate or urceolate. II. CAPSICEAE.
    Stamens adnate up to the upper part of the corolla-tube: corolla salverform to funnelform.
      Seeds flattened: stamens exserted. III. ATROPEAE.
      Seeds turgid: stamens included. IV. CESTREAE.
Fruit a capsule.
  Capsule prickle-armed: calyx circumscissile at the base. V. DATUREAE.
  Capsule unarmed: calyx not circumscissile.
    Flowers in racemes or panicles: filaments nearly equal in length. VI. NICOTIANEAE.
    Flowers solitary in the axils or opposite the leaves: filaments unequal in length. VII. PETUNIEAE.

I. SOLANEAE

Berry enclosed in the accrescent calyx.
  Calyx inflated in fruit: anthers not connected; sacs opening lengthwise.
    Ovary 3–5-celled: sepals nearly distinct, auricled. 1. PHYSALODES.
    Ovary 2-celled: sepals united to near the tips. 2. PHYSALIS.
  Calyx not inflated, fitting close to the berry: anthers connected; sacs opening by terminal pores. 3. ANDROCERA.
Berry seated in the little changed calyx (exceptionally enclosed in species of *Solanum*): anthers connate or converging.
  Anther-sacs commonly opening by terminal pores or slits. 4. SOLANUM.
  Anther-sacs opening lengthwise and introrsely. 5. LYCOPERSICON.

II. CAPSICEAE

Anthers converging around the style: corolla urceolate. 6. PERIZOMA.
Anthers not converging: corolla rotate. 7. CAPSICUM.

III. ATROPEAE

Shrubs with herbaceous or succulent leaves. 8. LYCIUM.

IV. CESTREAE

Shrubs or trees: flowers in axillary clusters, sometimes aggregated in a terminal panicle or corymb. 9. CESTRUM.

V. DATUREAE

Herbs, shrubs, or trees, usually rank-smelling: flowers often fragrant, the corolla usually showy. 10. DATURA.

VI. NICOTIANEAE

Herbs, heavy-scented, with usually clammy-pubescent stems and leaves: flowers few or many in the panicles or racemes. 11. NICOTIANA.

VII. PETUNIEAE

Herbs with clammy-pubescent stem and leaves: corolla funnelform, showy. 12. PETUNIA.

1. PHYSALODES Boehm. Annual herbs. Leaf-blades sinuate or lobed. Flowers axillary, nodding. Calyx accrescent: lobes cordate or sagittate converging, inflated. Corolla open-campanulate, slightly 5-lobed. Ovary 3–5-celled. Berry surrounded by the calyx-lobes.—One species.

1. P. Physalodes (L.) Britton. Plant nearly glabrous, 3–9 dm. tall: leaf-blades ovate, oval, or elliptic, 5–15 cm. long, angulate-lobed or sinuate: calyx 1.5 cm. long, becoming 3.5 cm. long: lobes broadly ovate: corolla blue or violet, about 2.5 cm. wide: berry 1.5–2 cm. in diameter. [*Nicandra Physalodes* Pers.] — (APPLE-OF-PERU.)—Fence-rows, waste-grounds and roadsides, various provinces, Ala. to Miss. and S Can. Nat. of Peru.—Sum.

2. PHYSALIS L.[1] Annual or perennial branching, often diffuse herbs. Leaf-blades entire or sinuate. Flowers axillary, nodding, mostly solitary. Calyx bladder-like at maturity: lobes short and converging. Corolla campanulate, mainly yellow or whitish, often dark in the center. Ovary 2-celled. Berry globular, enclosed in the papery calyx.—About 80 species, mostly American.—Sum. or all year S.—GROUND-CHERRIES. JERUSALEM-CHERRIES.

Annual plants, with much branched roots.
  Fruiting calyx sharply 5-angled, deeply sunken at the base: calyx-lobes at flowering time fully as long as the tube. I. PUBESCENTES.
  Fruiting calyx obtusely or indistinctly 5- or 10-angled: calyx-lobes at flowering time shorter than the tube (except sometimes in *P. Carpenteri*).
    Leaf-blades acute: flowers solitary in the axils. II. ANGULATAE.
    Leaf-blades acuminate: flowers often fascicled. III. CARPENTERIANAE.
Perennial plants, with horizontal rootstocks.
  Pubescence of simple hairs.
    Pubescence sparse, seldom if at all glandular or viscid. IV. LANCEOLATAE.
    Pubescence dense, viscid or glandular, generally a mixture of fine short hairs and long flat-jointed ones. V. HETEROPHYLLAE.
  Pubescence mainly of stellate hairs. VI. VISCOSAE.

I. PUBESCENTES

Plants more or less viscid pubescent.
  Fruiting calyx not long-acuminate: leaf-blades very oblique.
    Leaf-blades ovate, subentire at the base: stem slender, diffuse, sharply angled. 1. *P. pubescens.*
    Leaf-blades cordate, strongly sinuately toothed to the base: stem obtusely angled.
      Leaves broadly rounded, cordate, 2–5 cm. long: stem weak, diffuse. 2. *P. floridana.*
      Leaves elongated, cordate, 4–10 cm. long: stem stout. 3. *P. pruinosa.*
  Fruiting calyx long-acuminate: leaf-blades scarcely oblique at the base, cordate, abruptly acuminate. 4. *P. barbadensis.*
Plants glabrous or puberulent when young. 5. *P. turbinata.*

II. ANGULATAE

Plant pubescent and more or less viscid. 6. *P. missouriensis.*
Plant glabrous. 7. *P. angulata.*

III. CARPENTERIANAE

Plant resembling that of *Solanum nigrum* in habit, the leaf-blades thin. 8. *P. Carpenteri.*

IV. LANCEOLATAE

Leaves glabrous: upper part of the stem, calyx and veins of the leaves with few, if any, short appressed hairs. 9. *P. subglabrata.*
Leaves and stem sparingly hairy with longer, flat, spreading or reflexed, often jointed, hairs (some of the species are slightly viscid).
  Fruiting calyx ovoid, scarcely angled and scarcely sunken at the base: leaf-blades thick, subentire. 10. *P. lanceolata.*
  Fruiting calyx pyramidal, more or less 5-angled and deeply sunken at the base: leaf-blades thin.
    Fruiting calyx ovoid-pyramidal: leaf-blades mostly ovate or lanceolate, tapering at the base.
      Leaf-blades more or less sinuately dentate.
        Calyx strigose or puberulent. 11. *P. virginiana.*
        Calyx villous. 12. *P. monticola.*
      Leaf-blades subentire or wavy margined.
        Leaf-blades firm: plant not at all viscid. 13. *P. rigida.*
        Leaf-blades very thin: plant more or less viscid above when young. 14. *P. intermedia.*
    Fruiting calyx oblong-pyramidal or nearly cylindrical: leaf-blades broadly ovate, truncate or cordate at the base.
      Leaf-blades rather firm, reticulate: stem and leaves puberulent. 15. *P. arenicola.*

[1] Contributed by the late Per Axel Rydberg.

Leaf-blades very thin, the veins not prominent: stem and leaves pilose. — 16. *P. ciliosa.*

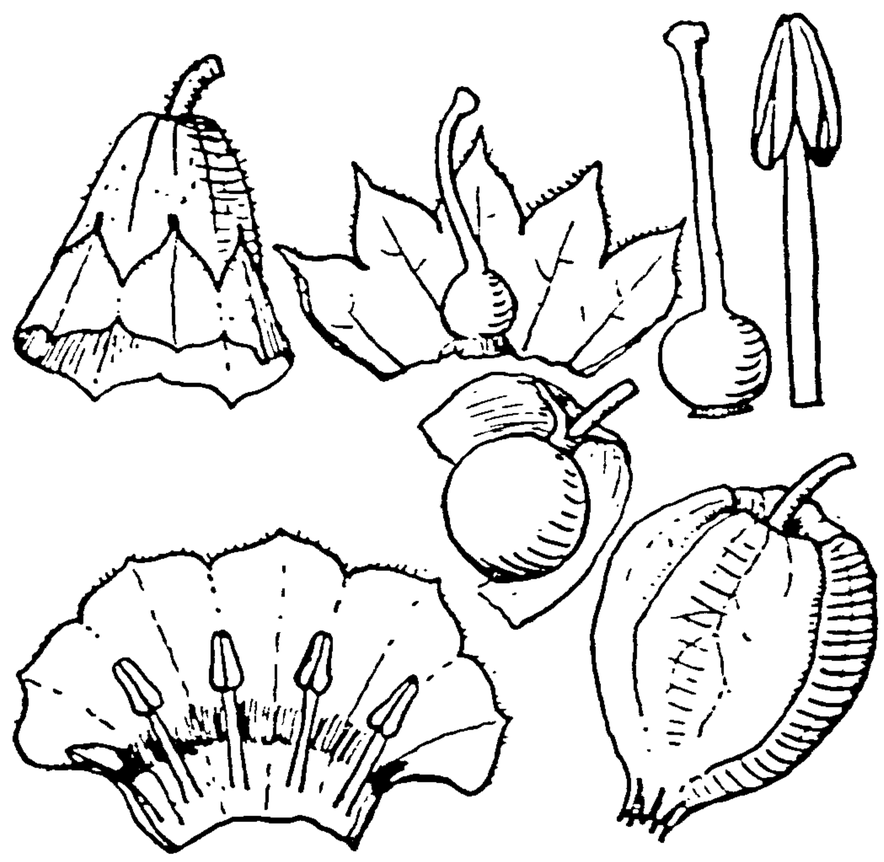
V. HETEROPHYLLAE

Leaf-blades generally over 5 cm. long, more or less cordate. Apex, and teeth of the leaves rounded. — 17. *P. sinuata.*
Apex, and teeth (if any) of the leaves acutish to acuminate.
Stem densely and leaves more sparingly pubescent with very long (2 mm. or more) white hairs.
Stem erect: anthers purple: leaf-blades rounded or subcordate at the base. — 18. *P. ambigua.*
Stem spreading: anthers yellow: leaf-blades usually cuneate or acute at the base. — 19. *P. nyctaginea.*
Stem and leaves very densely pubescent with short, very viscid hairs: anthers yellow. — 20. *P. heterophylla.*
Leaf-blades generally 5 cm. long or less: stem with long hairs. — 16. *P. ciliosa.*

VI. VISCOSAE

Plants densely white-pubescent or grayish pubescent.
Hairs all stellate.
Leaf-blades cordate, reniform or round, angulately toothed. — 21. *P. mollis.*
Leaf-blades elliptic, sometimes cordate at the base, to oblanceolate, subentire or repand. — 22. *P. viscosa.*
Hairs partly simple, partly stellate: leaf-blades elliptic, subentire. — 23. *P. fuscomaculata.*
Plants nearly glabrous, except on the margins of the calyx-lobes, rarely stellate all over when young.
Leaf-blades oblong, oblanceolate or spatulate, the lateral veins distinct. — 24. *P. Elliottii.*
Leaf-blades linear, thick; midrib prominent, the lateral veins obsolete. — 25. *P. angustifolia.*

1. **P. pubescens** L. Stem more or less villous and viscid: leaf-blades thin 2–6 cm. long, ovate, acute or acuminate, repand-denticulate or entire, pubescent, becoming nearly glabrous except along the nerves: calyx-lobes narrow, not subulate tipped: corolla 5–10 mm. broad, yellow with dark center: anthers purplish: fruiting calyx 2–3 cm. long, pyramidal-ovoid, acuminate, more or less retuse at the base.—Sandy soil, sand-dunes, fields, and pastures, various provinces, Fla. to Tex., Calif., and Pa. —(*W. I., Mex., C. A., S. A., O. W.*)



2. **P. floridana** Rydb. Stem densely villous with long white viscid hairs: leaf-blades rounded-cordate, 2–5 cm. long, coarsely sinuate-toothed, obtuse, sparingly viscid-pubescent on both sides: calyx densely viscid pubescent; lobes lanceolate, acuminate: corolla 6–8 mm. broad, yellow with purple spots: anthers purplish: fruiting calyx 2–2.5 cm. long, 5-angled, deeply retuse at the base.—Pinelands and hammocks, Fla.

3. **P. pruinosa** L. Stem more hairy and viscid than in the two preceding and the next following species, stout, generally erect or often ascending, finely villous or viscid: leaf-blades ovate-cordate 3–10 cm. long, finely pubescent, bluntly sinuate-toothed; calyx villous or viscid; lobes as long as the tube, narrow, but without subulate tips; corolla 3–8 mm. broad, yellow: anthers yellow or purplish: fruiting calyx of a little firmer texture and more pubescent than that of the two preceding species, reticulate, 2–3 cm. long, ovoid-cordate.—Rich soil and sandy woods, various provinces, Fla. to Ala., Ia., and Mass.

4. P. barbadensis Jacq. Stem generally pubescent and viscid, stouter than those of *P. pubescens*, tall and erect, or widely spreading: leaf-blades 3–6 cm. long, cordate, acute or generally abruptly acuminate, sharply repand-dentate, pubescent with short hairs: calyx generally densely viscid-hirsute; lobes lanceolate, acuminate, but not subulate-tipped: corolla 5–10 mm. broad, yellow: anthers purplish: fruiting calyx 2.5–3 cm. long, attenuate, almost conical, reticulate, retuse at the base.—Rich soil, often in open woods, and waste-places, various provinces, Fla., to Tex., Mo., and Pa. (*W. I., Mex., C. A., S. A.*)

5. P. turbinata Medic. Stem glabrous, or minutely puberulent when young rather stout: leaf-blades broadly ovate, obtuse or cordate and slightly oblique at the base, thin and dark-green, repand-dentate; short acuminate: calyx minutely ciliate on the margins and veins or glabrate: calyx-lobes lanceolate, acuminate: corolla 8–10 mm. broad, yellow with purplish spots: fruiting calyx 3–3.5 cm. long, long-attenuate, almost pyramidal, deeply retuse at the base.—Rich soil and thickets, various provinces, Fla. to Tex., Mo., and Pa.—(*W. I., Mex.*)

6. P. missouriensis Buch. Stem villous with short hairs, sometimes slightly viscid, spreading, often zigzag: leaf-blades 1–8 cm. long, ovate, acute, cuneate, obtuse or cordate at the base, repand or sinuately dentate, hairy at least on the nerves: calyx villous; lobes shorter than the tube, triangular: corolla 3–8 mm. broad, yellow, generally with a dark center: anthers generally yellow: fruiting calyx 1.5–2 cm. long, globose-ovoid, nearly filled with the berry, not sunken at the base. [*P. Lagascae* Rydb. not R. & S.]—Rich soil and open woods, Coastal Plain, Fla. and Ala.—(*W. I., Mex.*)

7. P. angulata L. Stem glabrous, often diffuse: leaf-blades ovate, 4–7 cm. long, with a more or less cuneate base, sharply sinuate, with acuminate teeth, thin: calyx glabrous; lobes triangular to lanceolate, generally shorter than the tube: corolla 5–10 cm. broad, yellow: anthers more or less purplish: fruiting calyx about 3 cm. long, ovoid, not prominently 5–10 angled, sometimes purple-nerved and at length nearly filled with the yellow berry.—Rich soil, fields, and pastures, various provinces, rarely Coastal Plain, Fla. to Tex., Minn., and Pa. (*W. I., Mex., C. A., S. A., O. W.*)—Forms occur in S Florida with linear to lanceolate sinuate leaf-blades.

8. P. Carpenteri Riddell. Stem rather closely and finely puberulent: leaf-blades very thin, oval or ovate, abruptly contracted into a long acumination, entire or slightly wavy, nearly glabrous or puberulent: corolla about 1 cm. broad, open-campanulate: fruiting calyx small, only 1 cm. in diameter, nearly globose, scarcely angled, faintly nerved, the lobes sometimes very unequal.—Sandy soil, Coastal Plain, N Fla. to La. and Ark.

9. P. subglabrata Mackenzie & Bush. Stem glabrous or sparingly hairy, especially above with short appressed hairs: leaf-blades ovate or ovate-lanceolate, 2.5–7.5 cm. long, undulate or entire, oblique and rounded or subcordate at the base, glabrous or with a few scattered hairs on the veins: calyx 6–8 mm. long, appressed-hairy on the veins and at the base; lobes triangular, about the length of the tube: corolla yellow, with a darker center, 10–15 mm. broad: fruiting calyx ovoid, slightly depressed at the base, slightly angled.—Loose soil roadsides, fields, and river-bottoms, various provinces N of Coastal Plain, Tenn. to Ark., Nebr., and Ont.

10. P. lanceolata Michx. Stem sparingly hirsute with flat hairs, at first erect, later spreading or diffuse: leaf-blades broadly oblanceolate or spatulate, tapering into the petiole, acute or obtuse, nearly always entire, rarely wavy, but not

sinuate-toothed, thickish, sparingly pubescent with short hairs: calyx strigose or villous, rarely glabrous; lobes triangular-lanceolate: corolla dullish-yellow with a brownish center, about 1.5 cm. broad: fruiting calyx round-ovoid, not sunken at the base, indistinctly 10-angled.—Prairies, bluffs, and sandy hillsides, various provinces, rarely Coastal Plain, S. C. to N. Mex., Wyo., and Ill.

11. P. virginiana Mill. Stem pubescent with appressed hairs, sometimes somewhat glandular, or in some forms nearly glabrous: leaf-blades ovate-lanceolate, tapering to both ends, 3–6 cm. long, generally more or less sinuately dentate, often yellowish-green: calyx strigose-hirsute, or at least puberulent; lobes triangular or broadly lanceolate, nearly equalling the tube in length: corolla sulphur-yellow with purplish spots, 1.5–2.5 cm. broad: anthers yellow: fruiting calyx pyramidal-ovoid, 5-angled and sunken at the base. [*P. lanceolata* Chapm. not Michx.]—Rich soil, fields, and borders of woods, various provinces, Fla. to La., Colo., Man., and Ont.

12. P. monticola C. Mohr. Stem strigose below, villous above with simple flat jointed hairs: leaf-blades ovate, oval, or elliptic, 2–6 cm. long, repand, with the teeth obtuse or rarely acutish, slender-petioled: calyx villous; lobes broadly lanceolate: corolla dingy-yellow, with a purplish center: anthers pale-yellow: fruiting calyx ovoid, acuminate, obtusely 5-angled, deeply sunken at the base.—Exposed gravelly or rocky places, Piedmont to Appalachian Plateau, Ala.

13. P. rigida Pollard & Ball. Stems strict, more or less branching, hispid-pubescent with flat hairs, especially above: leaf-blades firm, ovate-lanceolate, wavy-margined, densely pubescent when young, tapering at both ends: calyx pubescent with flat hairs, especially on the veins and at the base: lobes triangular: corolla 1–1.5 cm. wide, yellow with purple center: fruiting calyx ovoid, nearly glabrous, obscurely 10-angled, 2.5–3 cm. long, somewhat retuse at the base.—Roadsides and waste-places, Coastal Plain, Miss. to La., Ark., and Tenn.

14. P. intermedia Rydb. Stem with long hairs and somewhat viscid, especially on the upper parts: leaf-blades ovate or ovate-lanceolate, acute, 4–6 cm. long, often oblique at the base, slightly sinuate-toothed or nearly entire, very thin, light green, puberulent or glabrate: calyx puberulent or strigose; lobes broadly lanceolate, about equalling the tube: corolla sulphur-yellow with purplish spots, 1–2 cm. broad: anthers yellow: fruiting calyx ovoid, slightly 5-angled and slightly sunken at the base.—Thickets and dry hillsides, various provinces, Fla. to Tex., Ind., and Pa.

15. P. arenicola Kearney. Stem diffuse, light-green, puberulent, but sometimes a little glandular, with a few longer hairs on the nerves of the calyx: leaf-blades relatively small, 1.5–6 cm. long, but sometimes 8 cm., ovate-cordate, truncate or cuneate at the base, irregularly angulate-dentate, puberulent, mainly along the veins, which are generally prominent and conspicuous; calyx-lobes triangular-lanceolate, equalling the tube in length: corolla 1.5–2 cm. broad, light yellow: anthers yellow: fruiting calyx 3 cm. long, narrowly ovoid or rather ellipsoid pyramidal or nearly cylindric, conspicuously reticulated.—Pinelands, scrub, sandhills, and cypress-heads, Fla.

16. P. ciliosa Rydb. Stem upright, 2–3 dm. tall, together with the pedicels and calyxes ciliate with long and white jointed hairs: leaf-blades 4–7 cm. long, ovate, truncate or slightly cordate at the base, nearly entire or with a few coarse teeth, sparsely hairy on the nerves, long-petioled, thin and not conspicuously veiny: calyx turbinate, resembling that of *P. arenicola* but more pilose: corolla funnelform-campanulate, yellow without dark markings: fruiting calyx ovoid-pyramidal, sunken at the base.—Thickets, hammocks, and borders of woods, Coastal Plain and adj. provinces, Fla. to Tenn. and Ga.

17. P. sinuata Rydb. Stem decumbent, villous with long flat hairs and very viscid: leaf-blades rounded ovate, very oblique at the base and often subcordate, pubescent with long flat hairs especially on the veins, obtuse, undulate-sinuate: calyx densely villous with flat hairs and viscid; lobes triangular-lanceolate, about equalling the tube: corolla yellow with darker spots: fruiting calyx and berry unknown.—Pinelands (?), Fla.

18. P. ambigua (A. Gray) Britton. Stem 3–8 dm. tall, light green, villous with long flat hairs: leaves with the finer pubescence sparse; blades over 5 cm. long, thin, light-green, round, scarcely at all viscid, ovate or cordate, somewhat sinuately toothed or nearly entire, acute, but rarely acuminate: calyx villous; lobes triangular, generally shorter than the tube: corolla 1.5–2 cm. broad, yellow with dark spots; anthers generally purple: fruiting calyx ovoid, somewhat sunken at the base.—Rich soil, especially in thickets, various provinces N of Coastal Plain, Tenn. to Ia., Vt., and Va.

19. P. nyctaginea Dunal. Stem puberulent and villous with long flat hairs and somewhat viscid, generally zigzag: leaf-blades dark-green, ovate, often oblique, but very rarely cordate at the base, more or less acuminate, mostly entire, or occasionally sinuately dentate and rather thick, sparingly hairy, not at all puberulent, the long hairs often confined to the veins of the lower surface: calyx villous; lobes triangular, shorter than the tube: corolla 1–1.5 cm. broad, yellow with darker spots: anthers yellow: fruiting calyx ovoid, 5-angled and sunken at the base.—Dry soil, often in pinelands, various provinces, Ga. to La., Ia., and R. I.

20. P. heterophylla Nees. Stem erect, or later generally decumbent and spreading, viscid and glandular, villous with moderately long, jointed flat hairs: leaf-blades generally over 5 cm. long, generally broadly cordate, often acute but very rarely with an acumination, thick, more or less sinuately toothed, or sometimes subentire, pubescent with short and fine and longer flat jointed hairs: calyx long-villous; lobes triangular, generally shorter than the tube: corolla 1–1.5 cm. broad, yellowish: anthers yellow: fruiting calyx 2.5–5 cm. long, ovoid to conic-ovoid, somewhat sunken at the base.—Woods, sandy fields, and alluvial banks, various provinces, Fla. to Tex., Sask., and N. B.—Plants with leaves up to 10 cm. in diameter sometimes occur on the Florida prairies.

21. P. mollis Nutt. Stem 3–6 cm. high, densely whitish- or grayish-tomentose with stellate pubescence: leaf-blades rounded cordate or the upper broadly ovate, coarsely sinuately toothed: calyx densely stellate; lobes triangular, generally a little shorter than the tube: corolla 1.5–2 cm. in diameter, bright-yellow and with a purplish center, more or less stellate-pubescent without: anthers yellow or tinged with purple: fruiting calyx 3–5 cm. long, ovoid, acuminate, slightly 5-angled and a little sunken at the base.—Thickets, stream-banks, and pinelands, various provinces, Fla. to Tex., Calif., and Ark.—(*Mex.*)

22. P. viscosa L. Stem slender, creeping, cinereous with a dense stellate pubescence or in age rarely glabrate: leaf-blades elliptic, oval, or ovate, obtuse, thinnish, entire or undulate: calyx stellate-pubescent; lobes triangular, generally shorter than the tube: corolla greenish-yellow, with a darker center, 1.5–2 cm. broad: fruiting calyx 2–2.3 cm. long, rounded-ovoid, scarcely sunken at the base.—Coastal sand-dunes, sandy woods near the coast, pinelands and prairies, Fla. to Tex. and Va.—(*W. I., Mex., C. A., S. A.*)

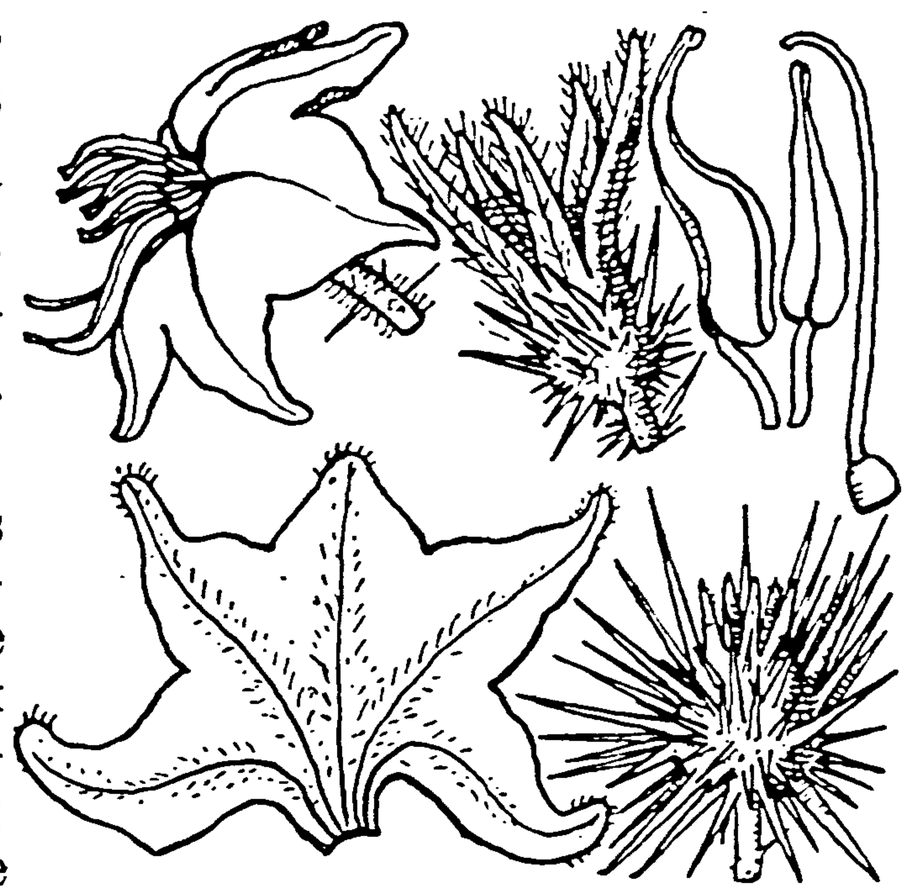
23. P. fuscomaculata De Rouv. Stem decumbent or ascending, terete, with decurrent ridges, a little pruinose-stellate: leaf-blades 2–4 cm. long, ovate, somewhat oblique at the base, entire or repand, the upper often opposite: calyx pruinose, a little stellate and stellate-ciliate; lobes triangular, shorter than the

tube: corolla yellow, with a dark eye: fruiting calyx subglobose, 10-angled, somewhat sunken at the base.—Waste-places and ballast, Mobile, Ala. Nat. of S. Am.

24. **P. Elliottii** Kunze. Stem ascending branched, slightly stellate or glabrate, 3–5 dm. tall sparingly stellate-pubescent when young: leaf-blades very thin and veiny, elliptic, spatulate, broadly oblanceolate, or in luxuriant specimens broadly oval, entire or wavy-margined, decurrent into a winged petiole: calyx generally glabrous except the margin which is stellate-ciliate; lobes triangular: corolla 1.5–2 cm. broad, yellow, with dark center: fruiting calyx generally a little shorter than in the next following species.—Coastal sand dunes and pinelands, Fla. to Tex.

25. **P. angustifolia** Nutt. Stem often glabrous, or sparsely stellate when young, diffusely branched: leaf-blades linear or linear-oblanceolate, tapering into the petiole, entire, thickish; the veins, except the midrib, generally obsolete: calyx glabrous, except the stellate-ciliate margins of the rounded triangular lobes: corolla about 2 cm. broad, yellow, with purple center: anthers yellow: fruiting calyx small, 1.5–2 cm. long, ovoid, obscurely angled and scarcely sunken at the base.—Sea-beaches and coastal sand-dunes, Fla. to La.

3. **ANDROCERA** Nutt. Annual herbs, usually prickle-armed. Leaf-blades once or twice pinnatifid. Flowers in erect cymes. Calyx spreading, accrescent, densely prickly. Corolla rotate, 5-lobed, yellow, purple, or violet. Stamens 5: anthers very unequal, the lowest one much the longest, all opening by terminal pores. Berry dry, closely invested by the calyx.—Three or 4 species, in western North America.



1. **A. rostrata** (Dunal) Rydb. Herbaceous annual, hoary-pubescent, or yellowish-pubescent, 2–7 dm. tall: leaf-blades mostly ovate or oval, 1–2-pinnatifid, 5–22 cm. long: calyx spinescent; lobes lanceolate or linear-lanceolate: corolla yellow, about 25 mm. wide; lobes ovate to lanceolate, shorter than the tube: berry enclosed. [*Solanum rostratum* Dunal.]—(BUFFALO-BUR.)—Waste-places, roadsides, and along railroads, various provinces, Miss. to N. Mex., Wyo., N. Dak., and Tenn.; Adv. eastward to Fla. and N. H.—(*Mex.*)—Spr.–fall.

4. **SOLANUM** [Tourn.] L. Annual or perennial herbs, or vines or trees. Leaf-blades entire, toothed, or lobed. Flowers variously clustered. Calyx sometimes slightly accrescent. Corolla rotate, of various colors: lobes longer than the tube. Anthers narrow, converging or united, much longer than the filaments. Berry exposed.—About 1,000 species, widely distributed, most abundant in tropical America.—NIGHTSHADES.

Woody, at least partly so, vine, with climbing often twining stem and branches. I. DULCAMARA.

Herbs or erect shrubs or trees, rarely somewhat twining in *S. bahamense.*

Annual or perennial herbs.

Annuals.

Plants not prickly. II. NIGRA.

Plants prickly.

Corolla plicate in the bud: plant annual. III. SISYMBRIIFOLIA.

Corolla not plicate: plant perennial. IV. ACULEATISSIMA.
Perennials, prickle-armed. V. CAROLINENSIA.
Shrubs or trees.
Plants glabrous. VI. GLAUCA.
Plants pubescent.
Cymes on recurving peduncles: berries nodding: anthers tapering at the apex. VII. BAHAMENSIA.
Cymes on erect peduncles or straight: berries erect: anthers blunt at the apex. VIII. VERBASCIFOLIA.
Cymes terminal: anthers short, ellipsoid.
Cymes lateral: anthers long, nearly linear. IX. TORVA.

I. DULCAMARA

Leaf-blades entire and ovate to lanceolate or with 1 or 2 basal lobes or divisions: berries in drooping clusters. 1. *S. Dulcamara.*

II. NIGRA

Foliage glabrous or nearly so: corolla 6–8 mm. broad: calyx-lobes spreading at maturity. 2. *S. nigrum.*
Foliage puberulent or finely pubescent: corolla 8–10 mm. broad: calyx-lobes appressed to the berry.
Stem and branches sparingly appressed pubescent. 3. *S. gracile.*
Stem and branches villous-tomentose. 4. *S. alatum.*

III. SISYMBRIIFOLIA

Rather coarse plant: stem, branches, leaves, and calyx armed with flat yellow or yellowish prickles. 5. *S. sisymbriifolium.*

IV. ACULEATISSIMA

Leaf-lobes acute: corolla less than 3 cm. wide, glabrous or with few long hairs without; lobes lanceolate: calyx bristly-pubescent. 6. *S. aculeatissimum.*
Leaf-lobes obtuse: corolla over 3 cm. wide, tomentulose without; lobes deltoid: calyx tomentulose. 7. *S. Melongena.*

V. CAROLINENSIA

Foliage green or brown: leaf-blades broad: prickles stout, much flattened.
Corolla 2–2.5 cm. wide: pedicels and calyx prickly: berry 1–1.5 cm. in diameter.
Leaf-blades undulate or angulately lobed. 8. *S. carolinense.*
Leaf-blades pinnatifid. 9. *S. floridanum.*
Corolla 4–5 cm. wide: pedicel and calyx not prickly: berry 2.5–4 cm. in diameter. 10. *S. perplexum.*
Foliage silvery: leaf-blades narrow: prickles slender, not flattened. 11. *S. elaeagnifolium.*

VI. GLAUCA

Corolla 11–14 mm. wide: berry mainly over 1 cm. thick: leaf-blades with pale margins. 12. *S. Pseudo-capsicum.*
Corolla 25–30 mm. wide: berry mainly less than 1 cm. thick: leaf-blades without distinct margins. 13. *S. glaucum.*

VII. BAHAMENSIA

Shrub or rarely a vine, with prickly stems and branches, and often with prickles on the more or less harshly pubescent leaves. 14. *S. bahamense.*

VIII. VERBASCIFOLIA

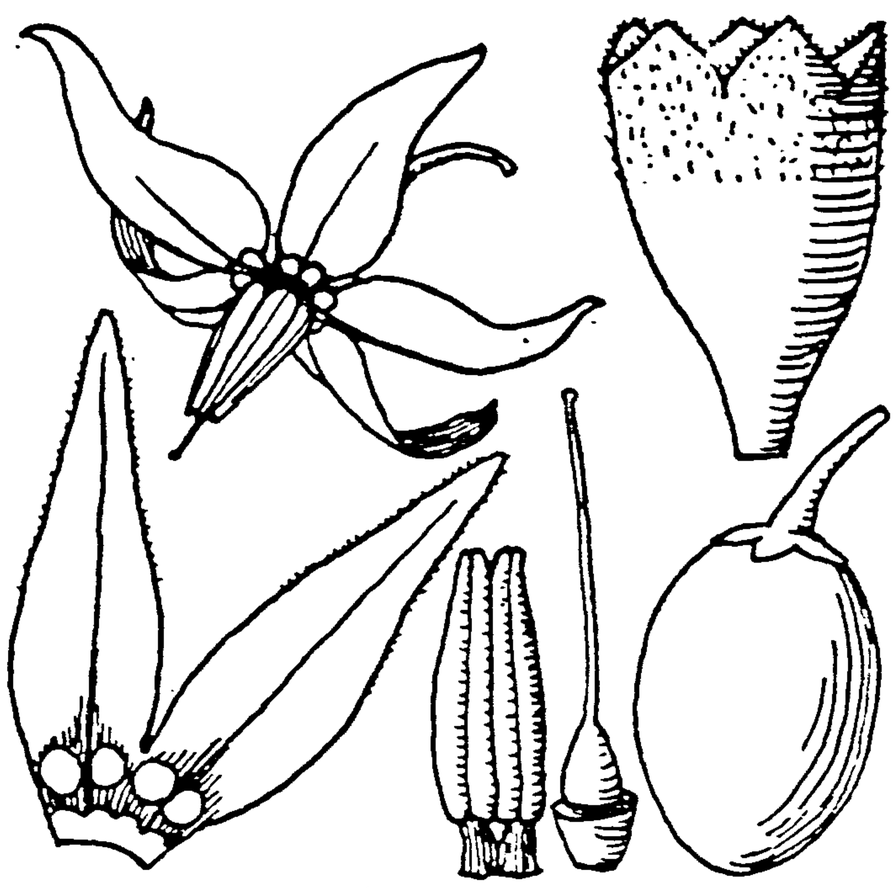
Corolla-lobes ovate to oval-ovate: ovary pubescent: berry yellow. 15. *S. verbascifolium.*
Corolla-lobes linear to linear-lanceolate or lanceolate: ovary glabrous: berry red. 16. *S. Blodgettii.*

IX. TORVA

Corolla 15–20 mm. wide: leaf-blades manifestly petioled. 17. *S. torvum.*
Corolla 8–14 mm. wide: leaf-blades nearly sessile by a cuneate base. 18. *S. jamaicense.*

1. S. Dulcamara L. Partially woody climber: leaf-blades ovate, 3–10 cm. long, entire or with 1 or 2 basal lobes, thin: corolla white or purple, 8–10 mm. long; lobes lanceolate to elliptic-lanceolate: berry oval, 9–15 mm. long.—(BITTERSWEET.)—Roadsides, thickets, and waste-places, various provinces, rarely

Coastal Plain, Ga. to Kans., Minn., and N. B. —Nat. of Eu.—Sum.–fall.



2. **S. nigrum** L. Herbaceous annual, 1–12 dm. tall: leaf-blades ovate to elliptic-ovate, 2–8 cm. long, undulate or deeply repand: calyx-lobes fully 1 mm. long: corolla white; lobes lanceolate to oblong-lanceolate: berry subglobose, 4–8 mm. in diameter, black.—(COMMON-NIGHTSHADE.) — Fields, thickets, cult. grounds, and waste-places, various provinces, U. S. and S Canada.—(*W. I., Mex., C. A., S. A., O. W.*)—Spr.–fall.

3. **S. gracile** Link. Herbaceous annual, 1–14 dm. tall: leaf-blades lanceolate to ovate or elliptic-ovate, 2.5–11 cm. long, undulate or repand: calyx-lobes fully 1.5 mm. long: corolla white or bluish; lobes lanceolate to elliptic-lanceolate: berry subglobose, 6–10 mm. in diameter, black.—Pinelands, coastal sand-dunes, and waste-places, near the coast, Fla. to La., and N. C.—Spr.–fall, or all year southward.

4. **S. alatum** Moench. Annual, erect, villous-hirsute. Stems mostly 2–8 dm. tall, branched: leaf-blades ovate to suborbicular, 1–4 cm. long, obtuse or acute, coarsely toothed, rather long-petioled: calyx copiously pubescent; lobes ovate, about as long as the tube: corolla white, about 8 mm. wide; lobes ovate, ciliate: berry scarlet, 7–9 mm. in diameter.—Roadsides, cult. grounds, and waste-places, N Fla.—Nativity uncertain.

5. **S. sisymbriifolium** Lam. Herbaceous annual 3–7 dm. tall, villous: leaf-blades elliptic to oval in outline, 1–2-pinnatifid, 8–20 cm. long: calyx spinescent; lobes lanceolate, 5–8 mm. long: corolla white or light-blue, 3–4 cm. wide; lobes ovate: gynoecium pubescent: berry 15–20 mm. in diameter, red.—Waste-places, roadsides and river-banks, Coastal Plain, Fla. to La., and contiguous regions. Nat. of S. Am.—(*W. I.*)

6. **S. aculeatissimum** Jacq. Partially woody perennial 3–8 dm. tall, often sparingly pubescent: leaf-blades ovate to suborbicular in outline, angulately toothed or sinuate-pinnatifid, 6–12 cm. long: calyx copiously spinescent: lobes lanceolate to elliptic-ovate, or ovate, about 2 mm. long: corolla white, 12–18 mm. wide; lobes lanceolate: gynoecium glabrous: berry 3–6 cm. in diameter, yellow, orange, or scarlet.—(SODA-APPLE.)—Sandy soil, fields, thickets, and roadsides, Coastal Plain, Fla. to Tex., and N. C.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall.

7. **S. Melongena** L. Partially woody annual or perennial, 3–9 dm. tall, felty-tomentose: leaf-blades oval to ovate, 8–30 cm. long, sinuate-lobed or shallowly pinnate-lobed: calyx-lobes ovate, abruptly pointed, 5.5–12 mm. long, pubescent: corolla purplish or violet, except the yellow eye, 40–50 mm. wide; lobes deltoid: berry ellipsoid or obovoid, 5–30 cm. long, purplish or whitish, edible.—(EGG-PLANT.)—Cult. grounds, Coastal Plain, Fla. to Tex. Nat. of Old World trop. —Spr.–fall.

8. **S. carolinense** L. Herbaceous perennial, 2–7 dm. tall, hirsute or rough-pubescent: leaf-blades elliptic to ovate in outline, 5–12 cm. long, sinuate or pinnately sinuate-lobed, the lobes of a triangular type: calyx spinescent; lobes lanceolate, often narrowly so, acuminate: corolla violet or rarely white, 25–30 mm. wide; lobes ovate: berry globular, 10–15 mm. in diameter, orange-yellow. —(HORSE-NETTLE.)—Thickets, fields, and roadsides, various provinces, Fla. to Tex., and Ont.—Spr.–fall.

9. S. floridanum Shuttlw. Similar to *S. carolinense* in habit: leaf-blades deeply pinnatifid, the lobes of an oblong type: calyx pubescent; lobes lanceolate, abruptly acuminate: corolla violet, 20–25 mm. wide; lobes oblong to oblong-lanceolate: gynoecium pubescent: berry globular, 15 mm. in diameter, orange.—Sandy soil, mostly in pinelands, Fla.—Spr.–fall.

10. S. perplexum Small. Herbaceous perennial, 5–8 dm. tall, villous-hirsutulous: leaf-blades ovate or oval in outline, prominently sinuate-lobed, mostly 5–20 cm. long, the lobes broadly ovate to triangular: calyx spineless; lobes ovate to triangular-lanceolate: corolla purplish or nearly white, 35–40 mm. wide; lobes ovate: berry depressed-globose, 30–40 mm. in diameter, yellow.—Pine-lands and cult. grounds, Coastal Plain, N Fla. and S Ga.—Spr.–sum.

11. S. elaeagnifolium Cav. Partially woody perennial, 3–11 dm. tall, silvery-canescent: leaf-blades broadly elliptic to linear-elliptic, 5–15 cm. long, undulate or repand: calyx-lobes linear-subulate from a broad base, 4–10 mm. long: corolla violet or white, 22–25 mm. wide; lobes undulate, each with a broad base and an ovate or triangular tip: berry globular, 10–15 mm. in diameter, yellow or black.—(WHITE HORSE-NETTLE.)—Roadsides, cult. grounds, and waste-places, various provinces, Tex. to Ariz., Kans., and Mo. Naturalized E to Fla.—Spr.–fall.

12. S. Pseudo-capsicum L. Shrub 8–19 dm. tall: leaf-blades elliptic to oblanceolate, 3–10 cm. long, undulate or repand: calyx-lobes lanceolate, about 2.5 mm. long, eciliate: corolla white, 11–14 mm. wide; lobes oval to ovate-oval, eciliate: anthers elliptic: berry globose, 10–15 mm. in diameter, scarlet, orange, or yellow.—(JERUSALEM-CHERRY.)—Roadsides, thickets, and open woods, Coastal Plain, Fla. to Tex. Nat. of Eu.

13. S. glaucum Dunal. Woody perennial, 9–25 dm. tall: leaf-blades narrowly elliptic to elliptic-lanceolate, 8–18 cm. long, glabrous, entire: calyx-lobes longer than wide, abruptly pointed, ciliate at the tip: corolla blue, 25–30 mm. wide; lobes broadly ovate, acute, ciliate at the tip: ovary glabrous: berry globose-ovoid, 6–8 mm. in diameter, glaucous.—Waste-places, Pensacola, Fla. Nat. of S. Am.

14. S. bahamense L. Shrub with much-branched stem, 5–20 dm. tall: leaf-blades elliptic to elliptic-lanceolate, 4–12 cm. long, thinly rough-pubescent, undulate: calyx-lobes ovate to elliptic-ovate, as long as the tube or shorter: corolla violet-blue, sometimes pale, 10–12 mm. wide; lobes linear or nearly so, acute or acutish: anthers linear: ovary glabrous: berry red, 6–8 mm. in diameter.—Hammocks and coastal sand-dunes, S pen. Fla. and Florida Keys.—(*W. I.*)—All year.

15. S. verbascifolium L. Shrub 4–30 dm. tall or small tree: leaf-blades elliptic to elliptic-ovate or ovate, 10–30 cm. long, velvety-tomentose, entire: calyx-lobes ovate, ciliate, obtuse: corolla white, 15–18 mm. wide; lobes ovate to oval-ovate, acutish, ciliate: anthers oblong: ovary pubescent: berry globular, 10–20 mm. in diameter, yellow.—(POTATO-TREE.)—Hammocks, pinelands, and roadsides, pen. Fla. and Florida Keys.—(*W. I., Mex., C. A., S. A.*)—All year.

16. S. Blodgettii Chapm. Shrub with simple or sparingly branched stems, 3–38 dm. tall: leaf-blades elliptic, often narrowly so, 5–15 cm. long, hoary-scurfy and tomentulose, undulate: calyx-lobes elliptic: corolla white or bluish, 14–17 mm. wide; lobes linear to linear-lanceolate or lanceolate, obtuse: anthers linear: ovary glabrous: berry red, 4–6 mm. in diameter.—Hammocks and lime-sinks in pinelands, Everglade Keys, adj. Everglades, Fla. and Florida Keys.—(*W. I.*)—All year.

17. S. torvum Sw. Shrub with widely branched stems, the prickles straight or nearly so: leaf-blades oval, varying to ovate or obovate, irregularly sinuate-lobed, 7–25 cm. long: cymes mostly 5–10 cm. wide: calyx-lobes ovate to lanceo-

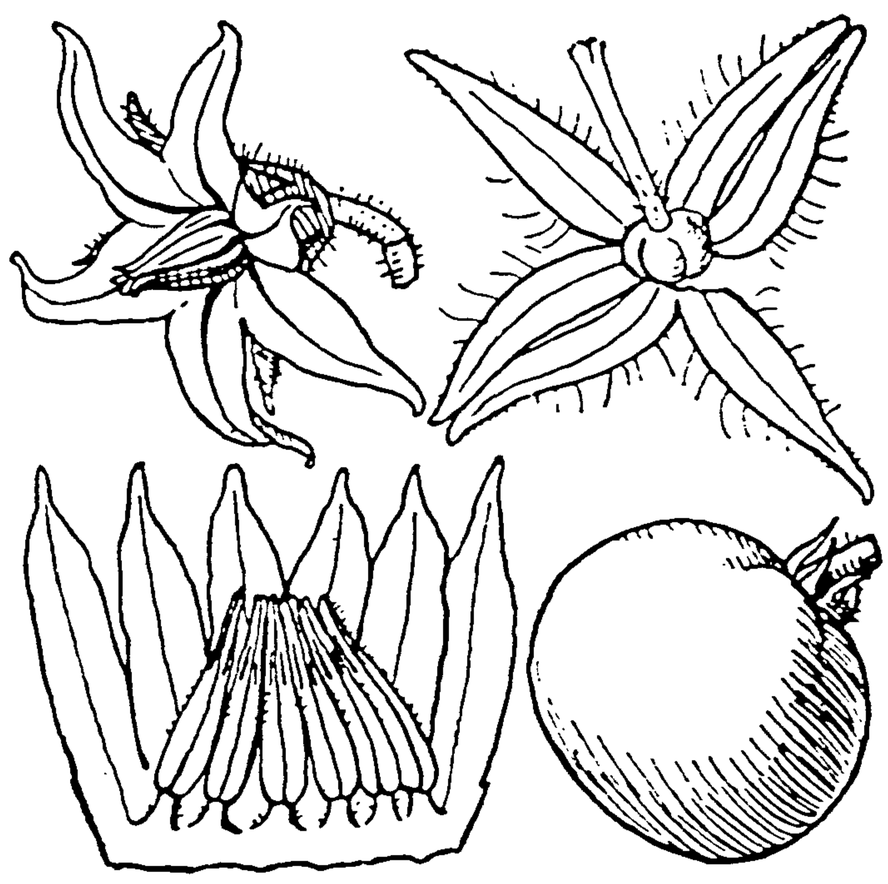
late: corolla white, 10–20 mm. wide; lobes triangular or triangular-lanceolate: anthers 5–6 mm. long: ovary glabrous: berry yellow, 9–14 mm. in diameter.—(TURKEY-BERRY.)—Roadsides, waste-places, and swamps, pen. Fla. Nat. of W. I.—(*Mex., C. A., S. A.*)—Spr.-fall.

18. S. jamaicense Mill. Shrub with a much-branched stem and diffuse branches, armed with flat somewhat curved prickles: leaf-blades ovate, oval, or obovate in outline, shallowly lobed and somewhat rhombic, mostly 8–14 cm. long: cymes 2–3.5 cm. wide: calyx-lobes lanceolate: corolla white, 8–12 mm. wide; lobes lanceolate: anthers about 4 mm. long: ovary glabrous: berry red or orange, 8–10 mm. in diameter.—Roadsides and woods, in pen. Fla. Nat. of W. I.—(*Mex., C. A., S. A.*)—Spr.-fall.

5. **LYCOPERSICON** Mill. Annual or perennial heavy-scented herbs. Leaf-blades 1–2-pinnately divided. Flowers in cymes. Calyx not accrescent. Corolla rotate, yellow: lobes longer than the tube.—Four species, tropical American.

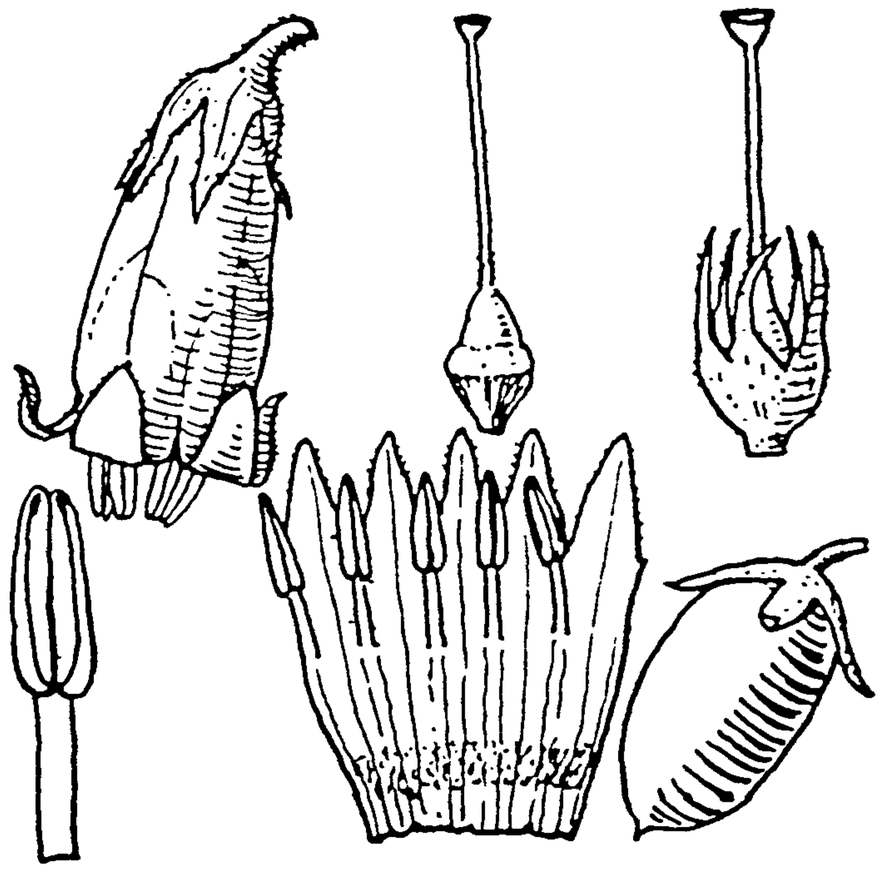
Berry more or less depressed, several-celled. 1. *L. Lycopersicon.*
Berry globular, cherry-like, 2-celled. 2. *L. cerasiforme.*

1. L. Lycopersicon (L.) Karst. Plants clammy-pubescent, 3–12 dm. tall: leaf-blades 1–4 dm. long, the divisions ovate to elliptic, coarsely toothed or incised: calyx-lobes narrow, acute: corolla mainly 1.5–2 cm. wide: berry depressed, mainly 5–15 cm. wide, red or yellow.—(TOMATO. LOVE-APPLE.)—Cult. grounds, fields, pinelands, and waste-places, Coastal Plain, Fla. to Tex. Nat. of trop. Am. and cult.—(*W. I.*)—Sum.



2. L. cerasiforme Dunal. Similar to the preceding species, but smaller and weaker: leaves with many small separated leaflets between the larger ones: berry about 1–2 cm. in diameter, bright red.—(CHERRY-TOMATO.)—Dry soil, hammocks and roadsides, Florida Keys and S Tex. Nat. of trop. Am.

6. **PERIZOMA** Miers. Herbs or shrubby plants. Leaf-blades entire. Flowers solitary in the axils. Sepals slightly united. Corolla white or yellow, urceolate or short-tubular: lobes much shorter than the tube. Filaments adnate up to near the middle of the corolla-tube: anthers much shorter than the filaments. Ovary depressed. Stigma dilated.—One species.



1. P. rhomboidea (Hook.) Small. Plants much branched: leaf-blades ovate, 1–2.5 cm. long: calyx-lobes lanceolate to subulate-lanceolate, 2.5–3 mm. long; corolla 6–8 mm. long; lobes lanceolate, spreading: filaments webby near the base: berry elliptic, 2–2.5 cm. long.—Waste-places, Fla. Nat. of S.

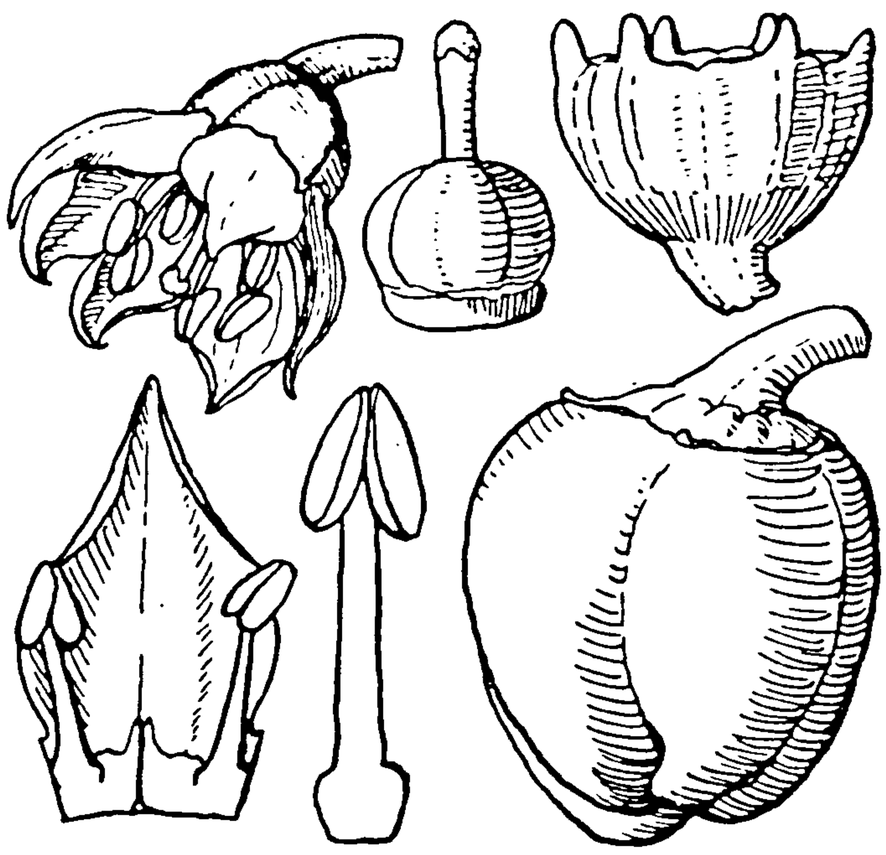
Am.—Sum.–fall.—A related plant, *Jaborosa integrifolia* Lam. with prostrate stems, long-petioled entire elliptic leaf-blades and greenish-white salverform corollas 7–10 cm. long, has been found on ballast at Mobile, Ala. It is native of S. Am.

7. CAPSICUM [Tourn.] L. Herbs or shrubs, unarmed. Leaf-blades flat, entire or repand. Flowers axillary or cymose. Calyx truncate or minutely lobed. Corolla usually white, nearly rotate: lobes nearly as long as the tube. Filaments adnate to the lower part of the corolla-tube, glabrous: anthers longer than the filaments. Ovary not depressed: stigma minute.—About 30 species, mostly in tropical America.—CAYENNE-PEPPERS.

Corolla 7–10 mm. long: anthers over 2 mm. long: annual introduced plant. 1. *C. annuum.*

Corolla 4–5 mm. long: anthers less than 2 mm. long: perennial native hammock plants.
- Calyx markedly toothed at maturity: berry subglobose. 2. *C. baccatum.*
- Calyx truncate at maturity: berry ellipsoid to conic. 3. *C. frutescens.*

1. C. annuum L. Plants mostly 1 m. tall or less, with glabrous or nearly glabrous branches: leaf-blades ovate, oval or ovate-lanceolate, mostly 7–14 cm. long, acuminate, entire: pedicels clavate: calyx 3–4 mm. long, truncate: corolla white or pinkish, 7–10 mm. long: lobes ovate, sometimes longer than the tube: berry conic or ellipsoid, 2–3 cm. long, red; or variously shaped and larger in cultivation.—(RED-PEPPER. CAYENNE-PEPPER.)—Roadsides, old-fields, and waste-places, Fla. Nat. of S. A. and cult.—All year.



2. C. baccatum L. Stem 1–3 m. tall: leaf-blades ovate, elliptic-ovate to ovate-lanceolate, 2–5 cm. long: calyx mainly 2.5–3 mm. long: corolla about 5 mm. long: berry 5–10 mm. long, red.—(BIRD-PEPPER.)—Hammocks and thickets, pen. Fla. and the Keys. Also naturalized in cult. grounds and waste-places, W to Tex.—(*W. I.*)

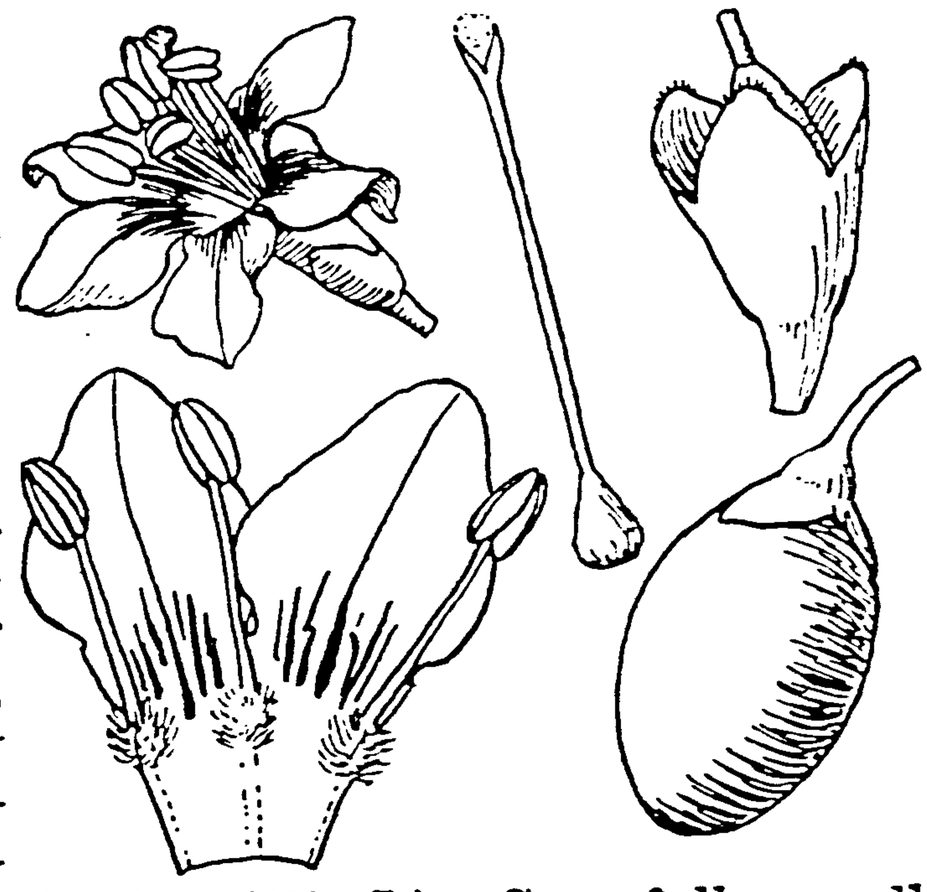
3. C. frutescens L. Stem 0.5–2 m. tall: leaf-blades ovate to ovate-lanceolate, 1–3 cm. long: calyx mainly 1.5–2 mm. long: corolla about 4 mm. long: berry 8–12 mm. long or longer, red.—(BIRD-PEPPER.)—Hammocks, pen. Fla. and the Keys.—(*W. I.*)

8. LYCIUM L. Shrubs or woody vines, commonly spiny. Leaf-blades thick, sometimes terete, entire. Flowers axillary, sometimes clustered. Calyx markedly lobed. Corolla white or colored, funnelform, salverform, or nearly campanulate: lobes longer than the usually short tube, or shorter. Anthers shorter than the pubescent filaments. Stigma dilated.—About 75 species, widely distributed.—MATRIMONY-VINES.—The purple corollas of some species have the curious habit of fading to a greenish-yellow or greenish-tan after the pollen is shed from the anthers.

Leaf-blades flat: corolla-lobes shorter than the tube and throat. 1. *L. halimifolium.*

Leaf-blades clavate: corolla-lobes longer than the tube and throat. 2. *L. carolinianum.*

1. L. halimifolium Mill. Shrub irregularly branched, sometimes vine-like: leaves herbaceous, 1.5–5 cm. long; blades elliptic, oval, ovate, lanceolate, or spatulate: calyx-lobes ovate to somewhat triangular, obtuse: corolla purplish or greenish; lobes 4–5 mm. long: berry oval or ovoid, orange or orange-red, 10–15 mm. long. — (MATRIMONY-VINE. BOX-THORN.) — Thickets, waste-places, and fence-rows, various provinces, Ga. to Kans., Minn., and Ont. Nat. of Eu.—Spr.–sum.

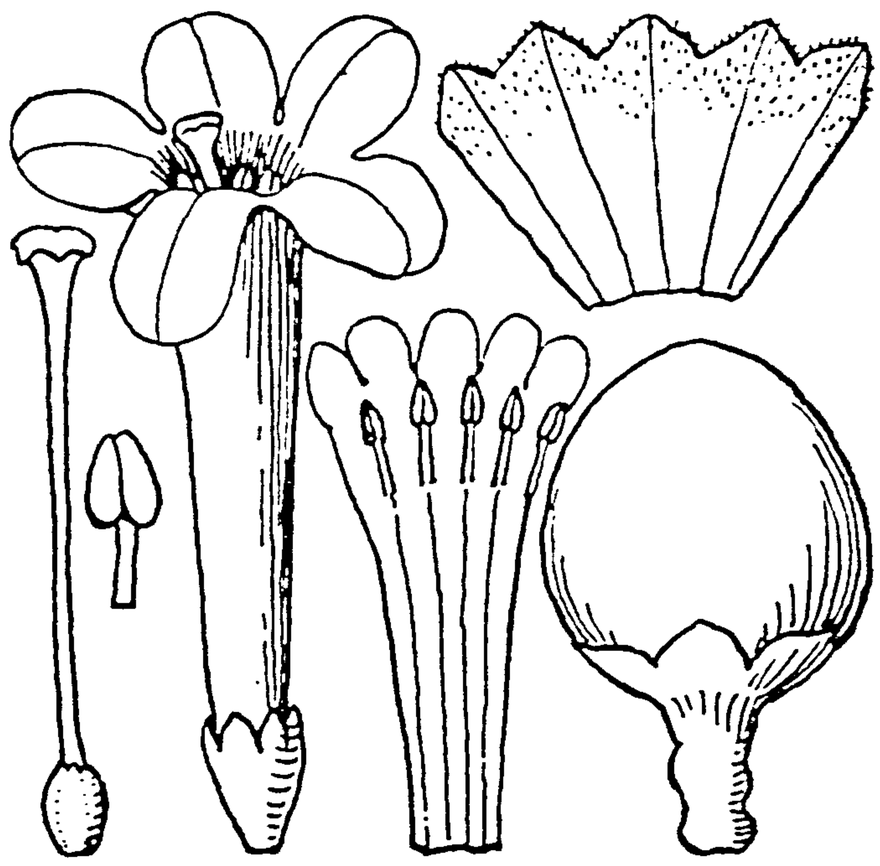


2. L. carolinianum Walt. Shrub 3–15 dm. tall, with recurving branches: leaves succulent, 0.5–2 cm. long: calyx-lobes deltoid or triangular-ovate, acute: corolla blue or lilac, or rarely white; lobes 3–6 mm. long: berry red, 8–12 mm. long.—(CHRISTMAS-BERRY.)—Coastal sand-dunes, shore-hammocks, shell-mounds, and salt-marshes, Fla. to Tex. and S. C.—(*W. I.*)—Spr.–fall, or all year S.

9. CESTRUM L. Shrubs or trees. Leaf-blades entire. Flowers in axillary clusters, sometimes aggregated in a panicle or corymb. Calyx markedly lobed. Corolla white or colored, funnelform or salverform: lobes much shorter than the tube. Filaments adnate to the middle of the corolla-tube or above it, glabrous: anthers globular. Stigma enlarged.—About 150 species, tropical American.

Corolla 15 mm. long or less: lobes as wide as long: filaments adnate to above the middle of the corolla-tube. 1. *C. diurnum.*
Corolla 20 mm. long or more; lobes longer than wide: filaments adnate to about the middle of the corolla-tube. 2. *C. Parqui.*

1. C. diurnum L. Plant minutely pubescent, 1–2.5 m. tall: leaf-blades elliptic to elliptic-lanceolate, 5–12 cm. long; petioles mostly less than 10 mm. long: calyx about 3 mm. long; tube campanulate; lobes broadly ovate: corolla white or greenish-white, 11–15 mm. long; lobes rounded.—(DAY-JESSAMINE.)—Hammocks and waste-places, Florida Keys and S. Tex.—Nat. of trop. Am.



2. C. Parqui L'Her. Plant nearly glabrous, 1–2 m. tall: leaf-blades elliptic to elliptic-lanceolate, 10–20 cm. long; petioles mostly over 10 mm. long: calyx 4–4.5 mm. long; tube nearly cylindric; lobes deltoid to triangulate-ovate: corolla greenish-white, 20–25 mm. long; lobes apiculate.—(NIGHT-BLOOMING JESSAMINE.) — Woods, thickets, waste-places, and roadsides, Coastal Plain, Fla. to Tex., and Ga. Nat. of W. I.

10. DATURA L. Herbs (ours annual), or shrubs or trees. Leaf-blades undulate or lobed. Flowers solitary in the axils. Calyx tubular, sometimes prismatic, more or less lobed. Corolla white or colored, funnelform. Filaments slightly unequal.—About 12 spccies, widely distributed.—Sum.–fall or all year S.

Capsule erect, dehiscent by 4 valves. I. STRAMONIA.
Capsule inclined or nodding, opening irregularly. II. DUTRA.

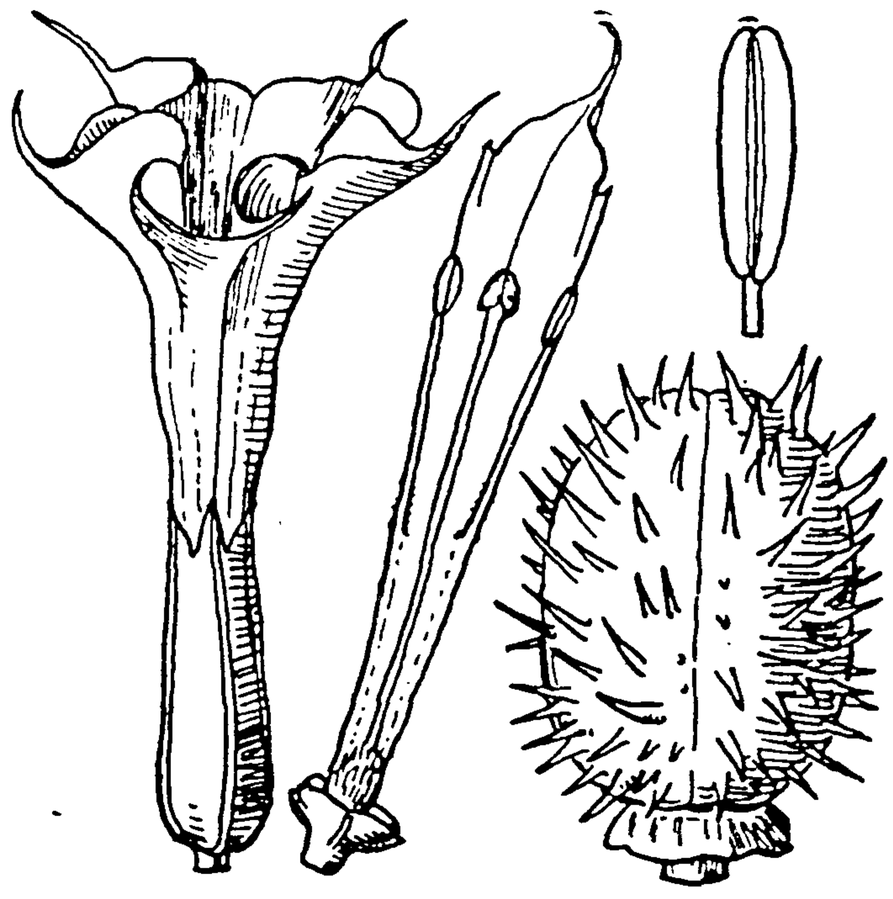
I. STRAMONIA

Herb with white or lavender corollas and capsules with nearly equal spines. 1. *D. Stramonium.*

II. DUTRA

Corolla, the outer one in double flowers, with a 5-toothed limb: fruiting pedicel curved to one side: capsule with stout-tubercle-like prickles which are often corrugated at the base. 2. *D. Metel.*
Corolla with a 10-angled limb: fruiting pedicel abruptly nodding: capsule with slender sharp prickles.
Corolla-limb 5-toothed: foliage glaucescent. 3. *D. meteloides.*
Corolla-limb 10-toothed: foliage softly-pubescent. 4. *D. innoxia.*

1. D. Stramonium L. Plant green or purple-tinged, 2–12 dm. tall: leaf-blades ovate to elliptic, 10–20 cm. long, sinuate or laciniate-toothed: calyx 3–5 cm. long; lobes 5–7 mm. long, the persistent base ultimately turned downward and frilled: corolla white, violet, or lavender, 6–10 mm. long: capsule 4–6 cm. long, the prickles equal or the lower ones rather shorter than the upper.—(THORN-APPLE. JIMSON-WEED. JAMESTOWN-WEED. STRAMONIUM.) — Cult. grounds, roadsides, and waste-places, various provinces, Fla. to Tex., Ont., and N. B.; also W U. S. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A., O. W.*)—Sum.—The lavender-flowered variety is sometimes separated as *D. Tatula* L.



2. D. Metel L. Plant 1–2 m. tall, glabrous or nearly so: leaf-blades ovate-lanceolate, elliptic or oval, 5–15 cm. long, undulate or repand-dentate: calyx 5–6.5 cm. long; lobes ovate to triangular-ovate: corolla violet without, 14–18 cm. long: capsule oval or ovoid, 4–6 cm. long. [*D. fastuosa* L.]—Hammocks and waste-places, Coastal Plain, Fla. to Tex. Nat. of trop. Asia and Africa.—(*W. I., Mex., C. A., S. A.*)

3. D. meteloides Dunal. Plant 3–11 dm. tall, glaucescent: leaf-blades ovate to oval-ovate, 10–15 cm. long, sinuate-toothed: calyx 10–12 cm. long; lobes lanceolate: corolla white, suffused with lavender or violet, 15–20 cm. long: capsule subglobose, 4–6 cm. in diameter.—River valleys, dry hills, and plains, Tex. to Calif. and Colo. Naturalized on roadsides E to Fla.—(*Mex., C. A., S. A.*)

4. D. innoxia Mill. Plant 8–15 dm. tall, softly pubescent: leaf-blades ovate to elliptic-ovate, 10–20 cm. long, undulate or slightly angled: calyx 7–12 cm. long; lobes lanceolate or triangular-lanceolate: corolla white, 10–15 cm. long: capsule oval or globose-ovoid, about 3 cm. long. [*D. Metel* (Fl. SE U. S.)]—Roadsides and waste-places, Coastal Plain and New England coast, Fla. to R. I. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A., O. W.*)

11. NICOTIANA L. Herbs, shrubs, or trees, mostly clammy-pubescent. Leaf-blades entire or repand. Flowers in racemes or panicles. Calyx markedly lobed. Corolla white or colored, tubular, funnelform, or salverform. Filaments equal or nearly so.—About 50 species, mostly American.—TOBACCOS.

Herbs.
Corolla-tube stout, 2–5 times longer than the calyx. I. RUSTICAE.
Corolla-tube very slender, many times longer than the calyx. II. LONGIFLORAE.
Shrubs or trees. III. GLAUCAE.

I. RUSTICAE

Corolla 5–8 cm. long; limb becoming purplish: capsule 15–20 mm. long. 1. *N. Tabacum.*
Corolla 1–2 cm. long: limb lurid yellow or greenish: capsule 8–10 mm. long. 2. *N. rustica.*

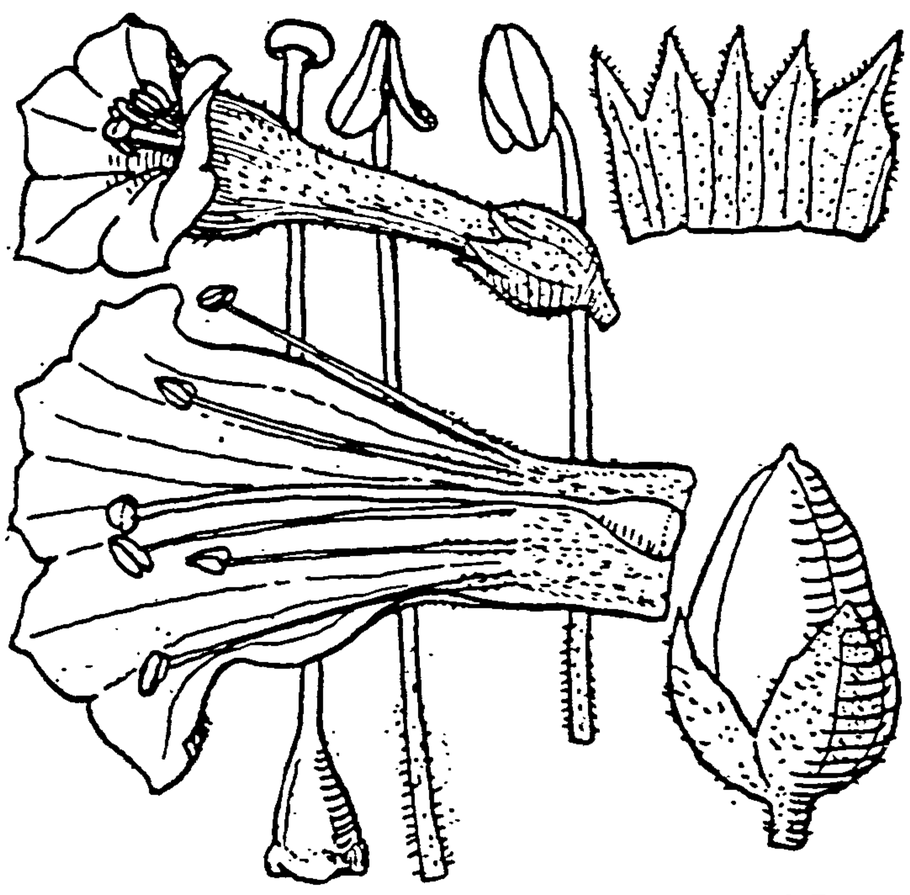
II. LONGIFLORAE

Leaf-blades sessile: calyx-lobes narrowed upward. 3. *N. longiflora.*
Leaf-blades clasping: calyx-lobes dilated upward. 4. *N. repanda.*

III. GLAUCA

Branches and leaves very glaucous: flowers on slender stalks, the corolla nearly tubular. 5. *N. glauca.*

1. N. Tabacum L. Stem 3–30 dm. tall: leaf-blades elliptic or oval, varying to broadest above the middle or below it, acute or acuminate, those of the cauline leaves 1–3 dm. long, those of the basal leaves often much longer: calyx 1.5–2 cm. long; lobes lanceolate to triangular, shorter than the tube: corolla greenish-white or greenish-yellow; limb turning purplish, 3–4 cm. wide, the lobes somewhat reniform: capsule ovoid, 15–20 mm. long.—Fields, roadsides, and waste-places, various provinces, E U. S. Nat. of trop. Am. and widely cult.—Sum.



2. N. rustica L. Stem 5–12 dm. tall: leaf-blades ovate, 5–20 cm. long, entire: calyx 5–7 cm. long, or larger in age; lobes triangular to ovate-triangular, much shorter than the tube: corolla lurid yellow or greenish, 15–20 mm. long; limb 10–15 mm. wide, the lobes rounded: capsule ovoid to globose-ovoid, 8–10 mm. long.—Fields and waste-places, various provinces, Fla. to Minn., Ont., and N. Y. Nat. of trop. Am.

3. N. longiflora Cav. Stem 3–11 dm. tall: leaf-blades spatulate to elliptic, or lanceolate to linear on the upper part of the stem, 8–25 cm. long, undulate: calyx 10–12 mm. long, enlarging in age; lobes mainly shorter than the tube: corolla white or greenish-white, turning purplish, 7–10.5 cm. long; limb 2.5–3 cm. wide, the lobes ovate to ovate-lanceolate: capsule ellipsoid-ovoid, about 15 mm. long.—Waste-places, various provinces, E U. S. Nat. of S. Am. and cult. —Sum.–fall.—A shorter-flowered species *N. plumbaginifolia* Viv., with corollas only ½ or ⅓ as long as those of *N. longiflora* and with usually broader leaf-blades on the lower parts of the stem, has been found on Key West, Fla. It is native in tropical regions.

4. N. repanda Willd. Stem 3–7 dm. tall: leaf-blades suborbicular to oval-elliptic, 5–15 cm. long, repand: calyx 8–14 mm. long; lobes longer than the tube: corolla white or tinged with pink; limb 1.5–2.5 cm. wide, the lobes ovate: capsule ovoid, 8–10 mm. long.—Sandy soil, Coastal Plain, Tex., and in waste-places E to Fla.—(*W. I., Mex.*)—Spr.

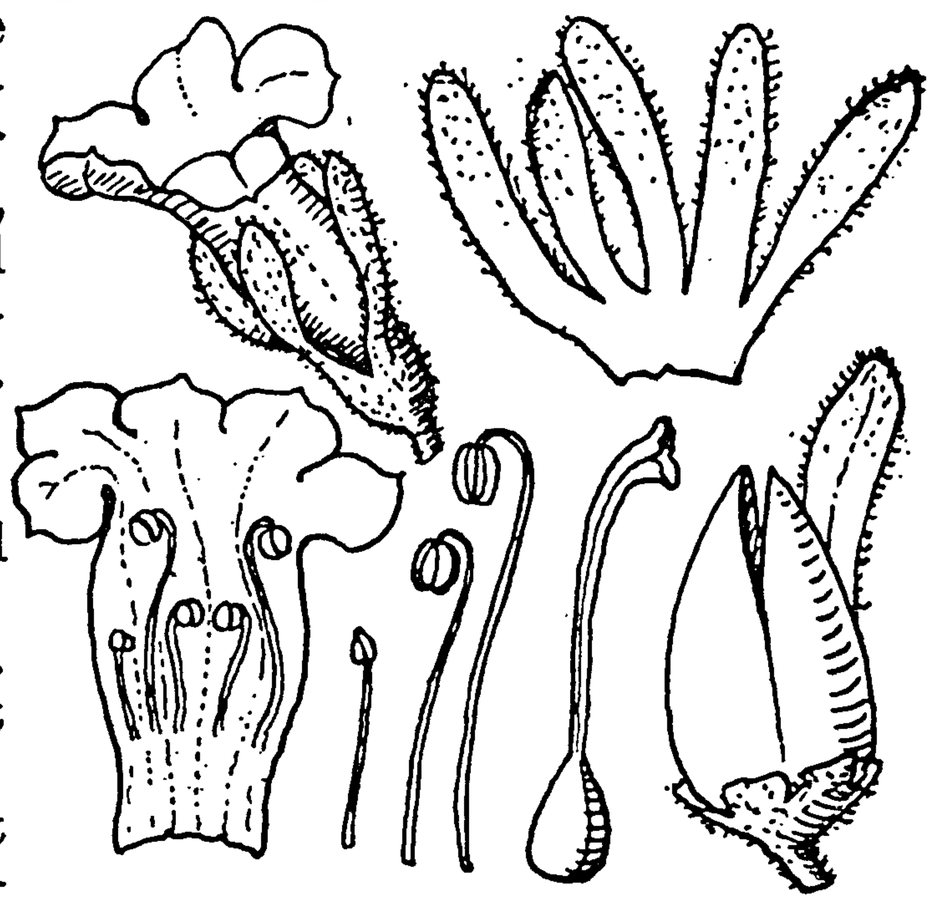
5. N. glauca Graham. Shrub or small tree: leaf-blades ovate to elliptic-ovate: 5–30 cm. long or longer, undulate: calyx 11–15 mm. long; lobes lanceolate to triangular: corolla yellow or yellowish, 35–45 mm. long; limb about 10 mm. wide, the lobes very small: capsule ovoid to elliptic-ovoid, 10–12 mm. long.—Waste-places, and roadsides, Fla. to Calif. Nat. of S. Am.—(*W. I., Mex., O. W.*)

12. PETUNIA Juss. Herbs. Leaf-blades entire. Flowers solitary in the axils. Sepals united to below the middle. Corolla white or colored, funnel-

form or salverform. Filaments unequal, 4 of them didynamous.—About 12 species, South American.

Corolla small, the limb less than 1 cm. wide.	1. *P. parviflora.*
Corolla large, the limb over 2 cm. wide.	
Corolla white; tube cylindric, 3 or 4 times as long as the calyx.	2. *P. axillaris.*
Corolla reddish-purple; tube campanulate, once or twice as long as the calyx.	3. *P. violacea.*

1. P. parviflora Juss. Annual, pubescent: stems 1–4 dm. tall: leaf-blades spatulate to elliptic, 0.5–1.5 cm. long: calyx glandular-pubescent; lobes linear to linear-spatulate, much longer than the tube: corolla about 5 mm. long; limb purple, 6–8 mm. wide, the larger lobes wider than long, abruptly pointed: capsules ovoid, 3–4 mm. long.—Dry soil, waste-places and cult. grounds, Coastal Plain, and Basin-and-range provinces, Fla. to Tex. and Calif. —(*W. I., Mex., C. A., S. A.*)—Spr.–fall.



2. P. axillaris (Lam.) B.S.P. Stem and branches rather stout, clammy-pubescent: leaf-blades elliptic to ovate-elliptic, 3–6 cm. long, those of the lower leaves with stout petiole-like bases: calyx 1.5–2 cm. long; lobes mostly elliptic: corolla white, almost salverform; limb mostly 4–6 cm. wide.—Cult. grounds and waste-places, E U. S. Nat. of Argentina.—Sum.

3. P. violacea Lindl. Stem and branches slender: leaf-blades elliptic or oval, varying to obovate or ovate, 2–5 cm. long, those of the lower ones with slender petiole-like bases: calyx about 1 cm. long; lobes linear to linear-spatulate: corolla reddish-purple, funnelform; limb 3–4 cm. wide.—Roadsides and waste-places, E U. S. Nat. of Argentina and cult.—Sum.–fall, or all year S.

Family 7. **BORAGINACEAE** — Borage Family

Herbs or shrubby plants, the foliage usually bristly pubescent. Leaves alternate: blades mostly entire. Flowers typically perfect, the spikes or racemes often scorpioid. Calyx of 4 or 5 slightly united sepals. Corolla of 4 or 5 partly united petals. Androecium of 4 or 5 stamens, the filaments partly adnate to the corolla. Gynoecium of 4 nearly distinct carpels, the style arising from between the lobes. Fruit of 4 or fewer nutlets.—About 85 genera and 1,500 species, widely distributed.

Flowers regular: corolla with equal lobes.	I. Borageae.
Flowers irregular: corolla with an oblique limb and unequal lobes.	II. Echieae.

I. Borageae

Nutlets armed with barbed prickles.	
Nutlets spreading, covered with prickles.	1. Cynoglossum.
Nutlets erect or incurved, with prickles on the back of angles.	2. Lappula.
Nutlets unarmed.	
Receptacle conic or elongate.	3. Amsinckia.
Receptacle flat or merely convex.	
Nutlets attached obliquely to the receptacles: free portions of the filaments elongate.	4. Mertensia.
Nutlets attached to the receptacle by their bases: free portions of the filaments very short.	

Nutlets each with a small flat scar where attached: scales in the throat of the corolla broad.
Corolla funnelform or salverform: lobes obtuse, spreading, broad.
Racemes without bracts: calyx-lobes about as long as the tube. 5. MYOSOTIS.
Racemes with bracts: calyx-lobes much longer than the tube.
Corolla slightly longer than the calyx: style as long as the ovary or longer. 6. LITHOSPERMUM.
Corolla much longer than the calyx: style much elongated. 7. BATSCHIA.
Corolla tubular: lobes acute or acuminate, erect, narrow. 8. ONOSMODIUM.
Nutlets each with a large hollow scar where attached: scales in the throat of the corolla narrow. 9. SYMPHYTUM.

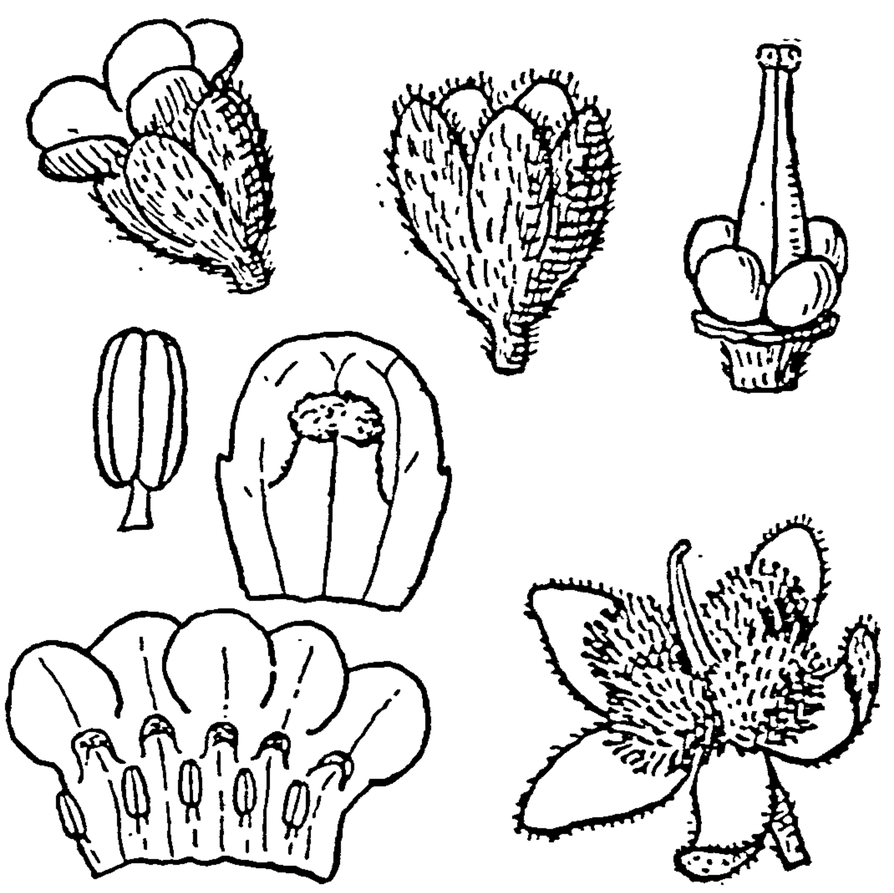
II. ECHIEAE

Stamens included: corolla-throat closed by scales. 10. LYCOPSIS.
Stamens exserted: corolla-throat dilated and open. 11. ECHIUM.

1. **CYNOGLOSSUM** [Tourn.] L. Annual, biennial, or perennial pubescent herbs. Calyx manifestly accrescent. Corolla much longer than the calyx. Style relatively long. Fruit surpassing the calyx.—About 75 species, widely distributed.—Sum.

Stem copiously leafy to the top: corolla slightly longer than the calyx: nutlets flat. 1. *C. officinale.*
Stem terminated by a long peduncle: corolla much longer than the calyx: nutlets convex. 2. *C. virginicum.*

1. C. officinale L. Stem 2–6 dm. tall: leaf-blades elliptic to linear-elliptic or linear-lanceolate, 5–15 cm. long: calyx-lobes becoming 6–8 mm. long or more: corolla reddish-purple or rarely white, mostly 8–10 mm. wide; lobes reniform: nutlets smooth between the spines.—(HOUND'S-TONGUE.)—Dry soil, roadsides, fields, waste-places, and thickets, various provinces, rarely Coastal Plain, Ga. to Ark., Kans., Minn., and Que. Nat. of Eu.

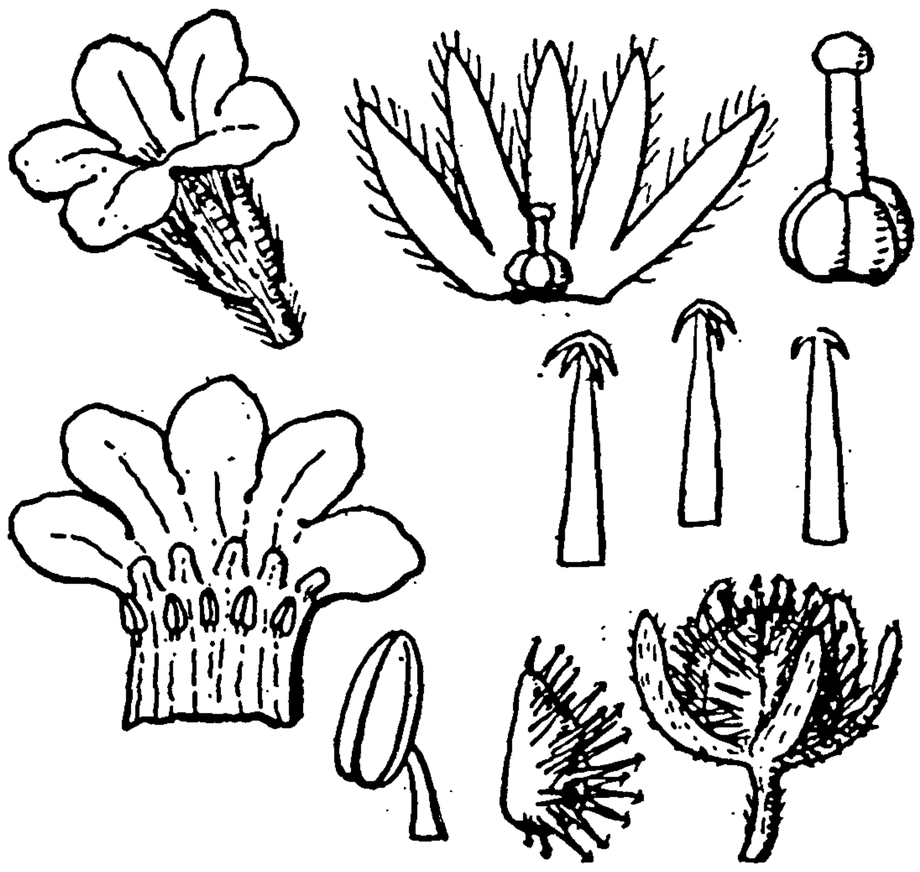


2. C. virginicum L. Stem 2–11 dm. tall: leaf-blades oval to elliptic, 8–32 cm. long: calyx-lobes becoming 3–4 mm. long: corolla blue or sometimes white, 7–8 mm. wide; lobes ovate: nutlets coarsely wrinkled between the spines.—(WILD-COMFREY.)—Dry soil, woods, roadsides, and thickets, various provinces, Ga. to La., Kans., and N. J.

2. **LAPPULA** [Rivinius] Moench. Annual, biennial, or perennial, often hirsute or hispid, herbs. Calyx scarcely accrescent: lobes spreading at maturity. Corolla pale blue, or whitish, scarcely as long as, or a little longer than the calyx. Style relatively short. Fruit somewhat longer than the calyx.—About 40 species, mostly natives of the north temperate zone.

Scales of the corolla-tube remote from the base of the lobes: fruit erect, or ascending. 1. *L. Lappula.*
Scales of the corolla-tube at the base of the lobes: fruit drooping. 2. *L. virginiana.*

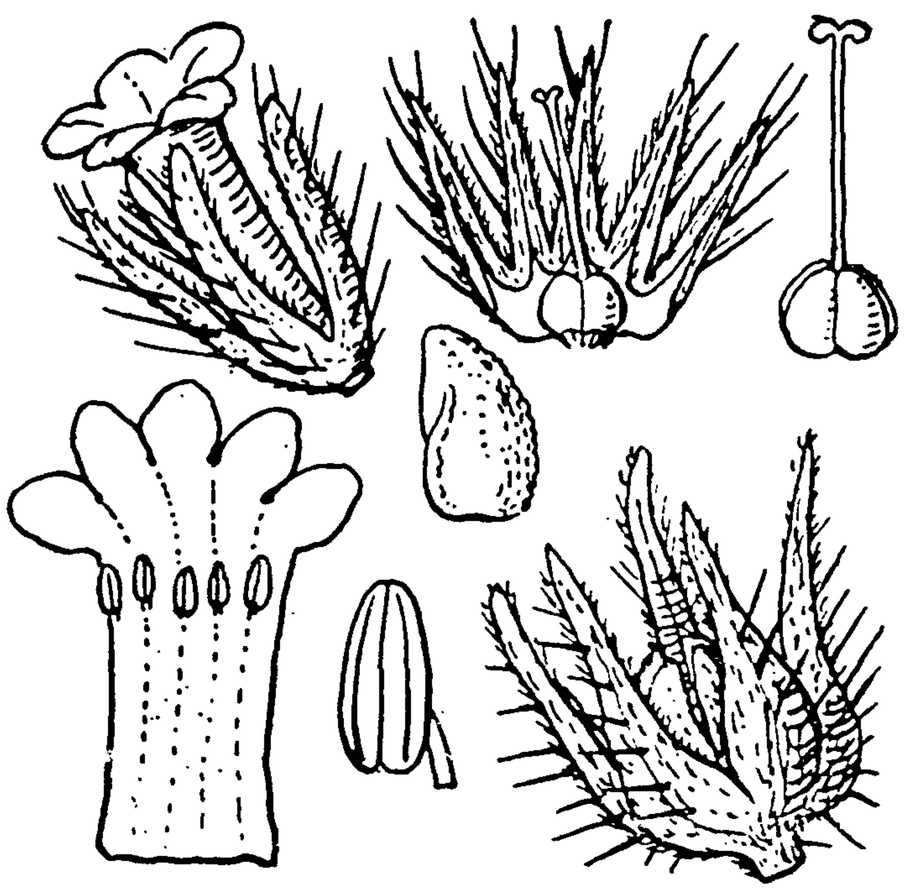
1. L. Lappula (L.) Karst. Plant 2–6 dm. tall: leaf-blades linear-spatulate to linear, 2–5 cm. long: calyx-lobes becoming 3–10 mm. long: corolla-lobes about



2 mm. long, the appendages broadly ovate: fruit about 3 mm. wide; nutlets granulose or tuberculate on the back.—(BUR-SEED.)—Dry soil and waste-places, various provinces, N of Coastal Plain, Tenn. to Tex., B. C., Ont., N. S. and N. J. Nat. of Eu.—Spr.–fall.

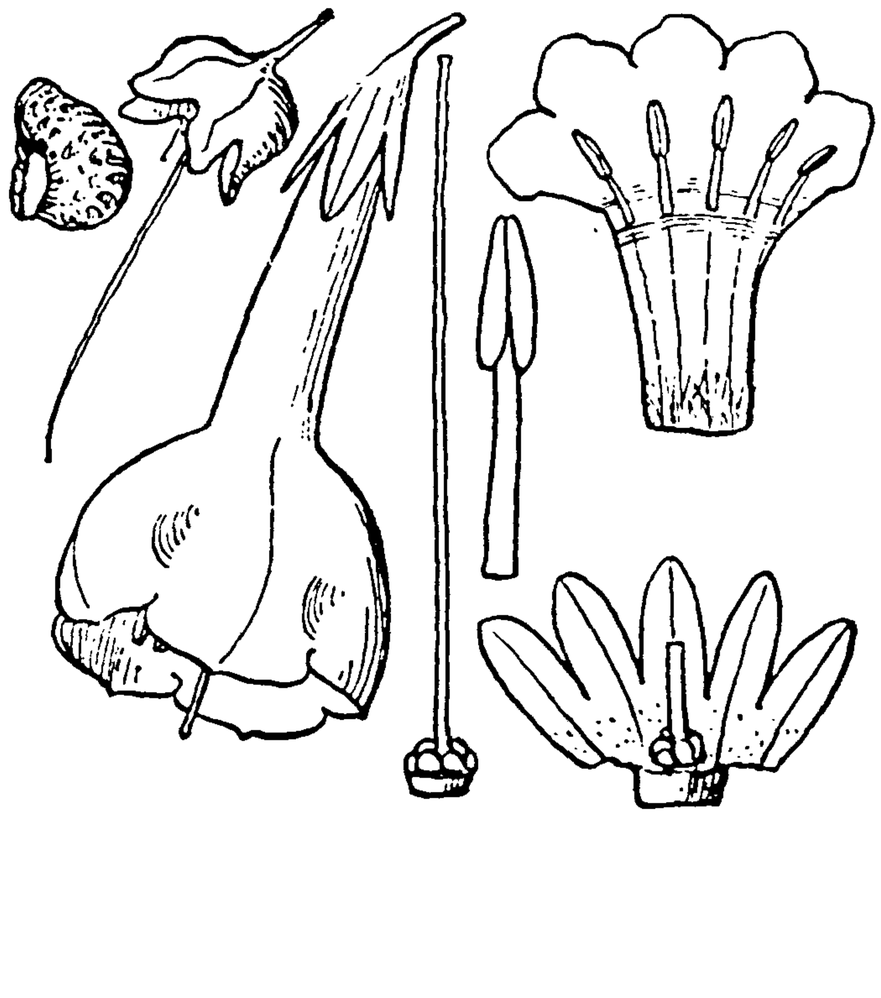
2. **L. virginiana** (L.) Greene. Plant 3–9 dm. tall: leaf-blades elliptic to elliptic-lanceolate, the lower ones 10–20 cm. long: calyx-lobes becoming 2–2.5 mm. long: corolla-tube about 1.5 mm. long, the appendages reniform: fruit about 4 mm. wide; nutlets papillose and spiny. [*Echinospermum virginicum* Lehm.]—(BEGGAR'S-LICE. STICK-WEED. BUR-SEED.)—Woods, roadsides, and thickets, various provinces, Ga. to La., Kans., Minn., and N. B.—Sum.

3. **AMSINCKIA** Lehm. Annual hispid herbs. Sepals slightly united, persistent. Corolla yellow, slightly exceeding the calyx, salverform, or the tube somewhat funnelform near the throat. Stamens adnate high up on the corolla-tube. Style elongate. Nutlets crustaceous or coriaceous, attached above the base to an ellipsoid-pyramidal receptacle.—About 15 species, of western America.



1. **A. parviflora** A. Heller. Stems 5 dm. tall or less: leaves remote; blades linear-elliptic to linear, 5–6 cm. long, or shorter on the upper part of the stem; calyx-lobes linear to linear-lanceolate, about 4 mm., becoming 6–7 mm. long, both softly pubescent and hispid: corolla pale-yellow, about 5 mm. long; limb about 2.5 mm. wide: nutlets ovoid, 2–3 mm. long, sharply keeled on the back and transversely wrinkled, also sharply tuberculate.—Fields, lawns, and waste-places, Piedmont, N. C. Nat. of Calif.—Spr.–sum.

4. **MERTENSIA** Roth. Perennial glabrous (our) herbs. Calyx scarcely, if at all, accrescent. Corolla showy, conspicuously longer than the calyx. Style and free portion of the filaments elongate. Fruit barely longer than the calyx.—About 40 species, in the Northern Hemisphere.

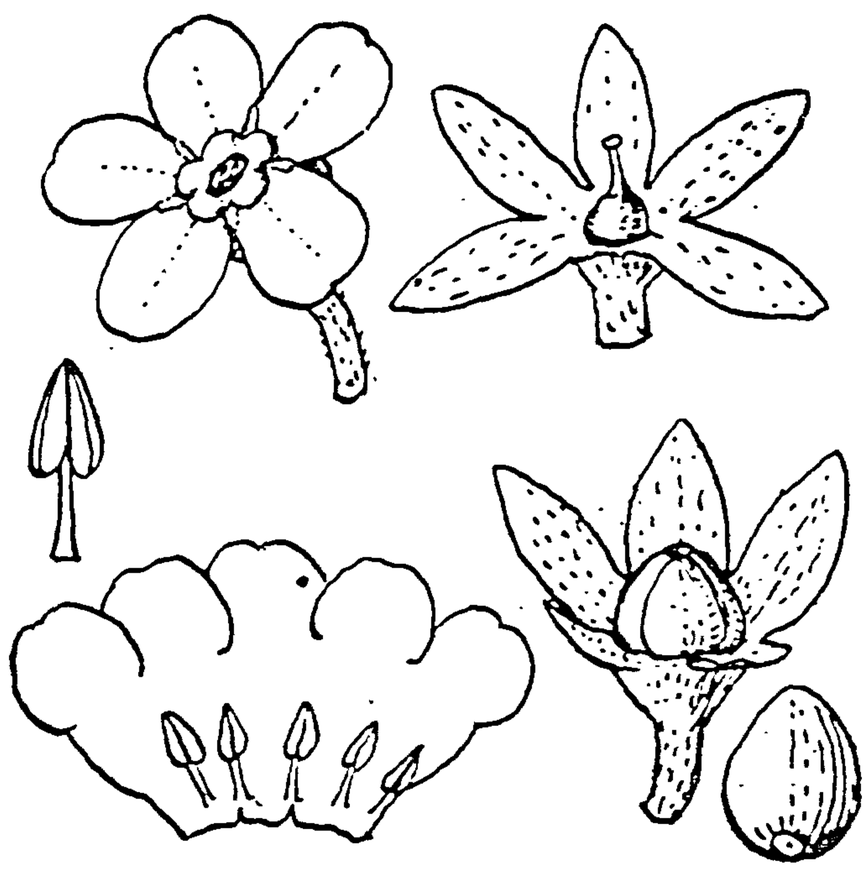


1. **M. virginica** (L.) DC. Stems often clustered 2–6 dm. tall: leaves 5–20 cm. long; blades elliptic to oval: calyx 2–3 mm. long, becoming 5–6 mm. long; lobes oblong to lanceolate or ovate: corolla blue or rarely white, 2.5–3 cm. long, the cup-like limb 10–15 mm. wide, shallowly lobed: nutlets ovoid, 2.5 mm. long.—(LUNGWORT. BLUE-BELLS. VIRGINIA-COWSLIP.)—Rich woods, low grounds, and alluvial stream-banks, various provinces, rarely Coastal Plain, Ala. to Ark., Kans., Ont., and S. C.—Spr.

5. **MYOSOTIS** [Rupp.] L. Annual, biennial, or perennial, pubescent herbs, Calyx slightly accrescent. Corolla manifestly longer than the calyx. Style and free portions of the filaments short. Fruit surpassed by the calyx.—About 35 species, of wide geographic distribution.—Spr.–sum.—FORGET-ME-NOTS. SCORPION-GRASSES.

Calyx open at maturity, pubescent with straight hairs.	
Calyx-lobes longer than the tube: corolla-limb mostly less than 6 mm. wide: style short.	1. *M. laxa.*
Calyx-lobes shorter than the tube: corolla-limb mostly over 6 mm. wide: style elongate.	2. *M. palustris.*
Calyx closed at maturity, pubescent with hooked hairs.	
Pedicel longer than the calyx at maturity: style slender, about as long as the ovary.	3. *M. arvensis.*
Pedicel shorter than the calyx: style stout, very short.	
Fruiting racemes with many approximate erect or ascending pedicels: calyx usually up to 5 mm. long at maturity: nutlets 1.5 mm. long.	4. *M. virginica.*
Fruiting racemes with few more or less recurving pedicels: calyx over 5 mm. long at maturity: nutlets 2 mm. long.	5. *M. macrosperma.*

1. **M. laxa** Lehm. Stem 1–5 dm. long: leaf-blades spatulate to elliptic-lanceolate: pedicels 5–10 mm. long: calyx-lobes triangular to triangular-lanceolate: corolla mainly pale-blue; lobes about 1 mm. long: nutlets about 1 mm. long.—Spring-runs and muddy places, various provinces, Ga. to Tenn., Ont., and N. S.



2. **M. palustris** (L.) Lam. Stem 2–6 dm. long: leaf-blades spatulate to elliptic or elliptic-lanceolate, 1–8 cm. long: pedicels 4–7 mm. long: calyx-lobes triangular: corolla sky-blue and with a yellow eye; lobes about 2 mm. long: nutlets about 1.5 mm. long.—Low grounds and brooks, various provinces, N of Coastal Plain, Ga. to W. Va., and N. S. Nat. of Eu.

3. **M. arvensis** (L.) Willd. Stem 1–3 dm. tall: leaf-blades spatulate to elliptic or elliptic-lanceolate, 1–5 cm. long: calyx becoming 3–4 mm. long; lobes equal or nearly so: corolla blue or sometimes white; lobes over ½ as long as the tube: nutlets about 1.5 mm. long.—Low grounds, various provinces N of Coastal Plain, N. C. to W. Va., Minn., and N. B.

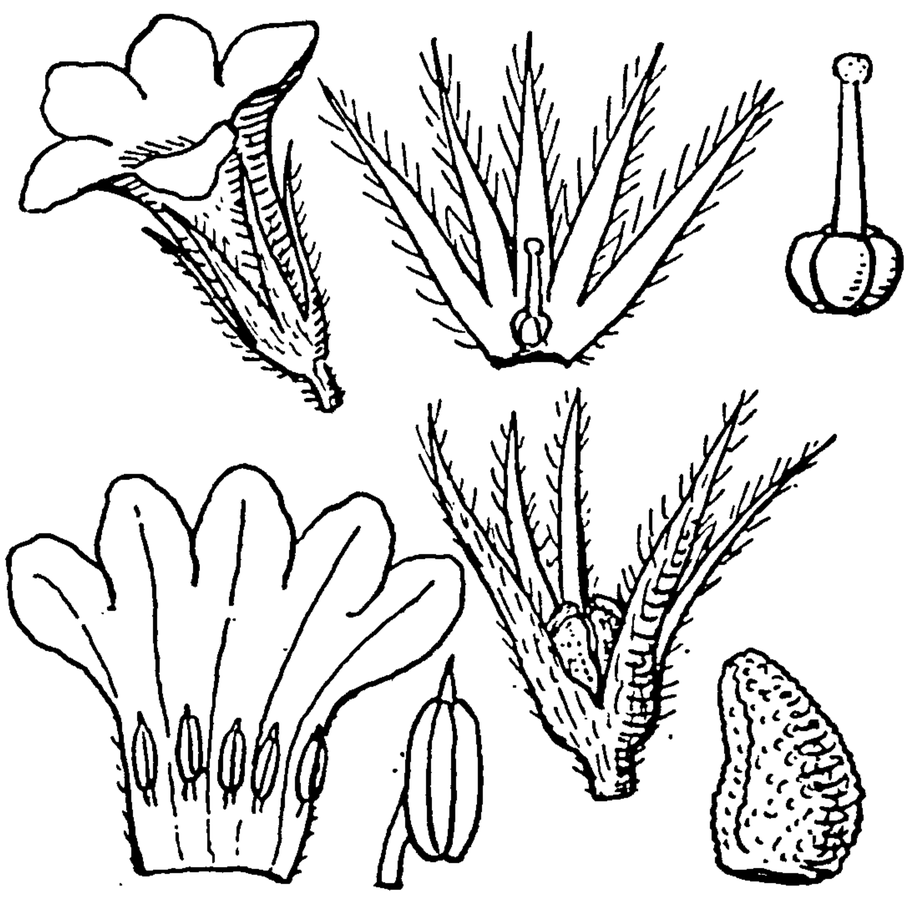
4. **M. virginica** (L.) B.S.P. Stem 1–4 dm. tall, with short, stiff, often numerous branches: leaf-blades spatulate to elliptic, 1–3 cm. long: mature raceme with numerous approximate fruiting calices: pedicels 1–3 mm. long: calyx becoming 6–7 mm. long; lobes slightly unequal: corolla white; lobes less than ⅓ as long as the tube: nutlets about 1.5 mm. long.—Dry hills and fields, various provinces, Fla. to Tex., Minn., Ont., and Me.

5. **M. macrosperma** Engelm. Stem 2–6 dm. tall, with few, elongate, virgate branches: leaf-blades similar to those of *M. arvensis* but larger: mature racemes with few widely separated fruiting calices: pedicels 3–6 mm. long: calyx becoming 6–8 mm. long; lobes very unequal: corolla white; lobes less than ⅓ as long as the tube: nutlets about 2 mm. long.—Hillsides, woods, and stream-banks, Coastal Plain and adj. provinces, Fla. to Tex., Ark., Ind., and Md.

6. **LITHOSPERMUM** [Tourn.] L. Annual, biennial, or perennial herbs. Calyx slightly enlarged at maturity. Corolla slightly longer than the calyx, white, greenish, or yellowish. Style as long as the ovary or somewhat longer. Fruit surpassed by the calyx.—About 30 species, in the Northern Hemisphere.—Spr.–sum.—GROMWELLS.

Annual plant: corolla white or whitish, slightly surpassing the calyx. 1. *L. arvense.*
Perennial plant: corolla yellow or sometimes greenish-white.
Pubescence of stem strictly appressed. 2. *L. latifolium.*
Pubescence of stem more or less spreading. 3. *L. tuberosum.*

1. **L. arvense** L. Stem and branches 1–8 dm. long: leaf-blades linear-oblanceolate to linear-lanceolate, 1.5–5 cm. long, acutish: calyx-lobes narrowly linear to linear-subulate, 8–10 mm. long, revolute: corolla white or pinkish; lobes ¼ to ⅕ as long as the tube: nutlets about 3 mm. long, pitted and wrinkled.—(CORN-GROMWELL.)—Roadsides, fields, and dry hills, various provinces, Ala. to Miss., Kans., Ont., and Me.



2. **L. latifolium** Michx. Stem and branches 3–7 dm. tall: blades of the cauline leaves elliptic to elliptic-lanceolate, 4–12 cm. long, acuminate: calyx-lobes narrowly linear, becoming 8–10 mm. long, flat: corolla yellow-white or pale-yellow; lobes over ½ as long as the tube: nutlets ovoid, 3–3.5 mm. long, smooth.—Woods, fields, and roadsides, various provinces N of Coastal Plain, Tenn. to Ark., Minn., Ont., and Va.

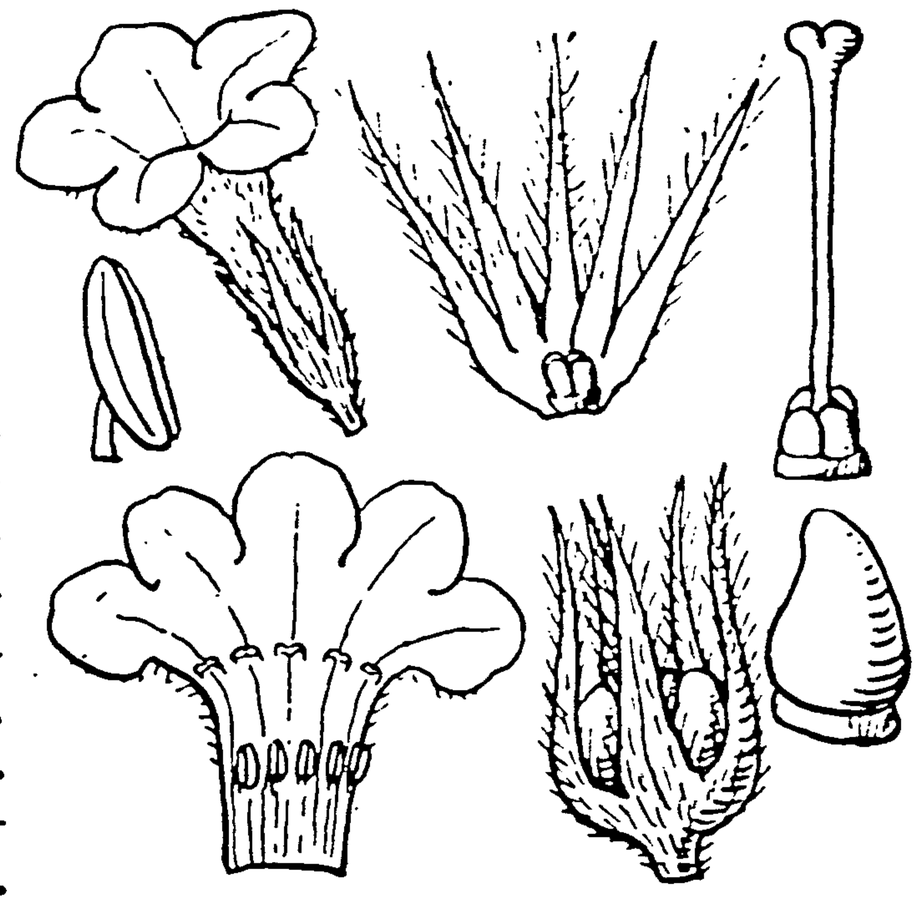
3. **L. tuberosum** Rugel. Stems and branches 3–7 dm. tall: blades of the cauline leaves oblanceolate to elliptic or ovate-elliptic, 2–10 cm. long, acute or abruptly pointed: calyx-lobes broadly linear to linear-spatulate, becoming 4–6 mm. long: corolla yellowish white; lobes less than ½ as long as the tube: nutlets oval-obovoid, about 2 mm. long.—River-bluffs and hammocks, Coastal Plain and adj. provinces, Fla. to Tex., and Tenn.

7. **BATSCHIA** G. F. Gmel. Perennial herbs, with colored roots. Calyx nearly unchanged at maturity. Corolla much longer than the calyx (except in cleistogamous flowers), yellow. Style many times longer than the ovary. Fruit surpassed by the calyx, the nutlets mainly ovoid.—About 6 species, North American.

Corolla-lobes entire, the appendages remote from them: all flowers complete: stamens below the throat of the corolla.
Stem hirsute: corolla-tube beardless at the base within. 1. *B. canescens.*
Stem hispid: corolla-tube bearded at the base within. 2. *B. carolinensis.*
Corolla-lobes erose or laciniate: the appendages close to their bases: later flowers cleistogamous: stamens in the throat of the corolla. 3. *B. linearifolia.*

1. **B. canescens** Michx. Plant 1–4 dm. tall: leaf-blades linear to elliptic or ovate-elliptic, 9–21 mm. long: calyx-lobes linear or nearly so, becoming 3–5

mm. long: corolla orange-yellow: tube 9–11 mm. long: nutlets about 2.5 mm. long. [*Lithospermum canescens* Lehm.] — (Puccoon.)—Rich woods and open hillsides, various provinces N of Coastal Plain, Ga. to Tex., Sask., and Ont.—Sum.



2. **B. carolinensis** (Walt.) G. F. Gmel. Plant 1–5 dm. tall: leaf-blades linear to elliptic or lanceolate, 1–5 cm. long: calyx-lobes lanceolate to linear-lanceolate, becoming 7–10 mm. long: corolla orange; tube 12–16 mm. long: nutlets 3–3.5 mm. long. [*Lithospermum Gmelini* (Michx.) A. Hitchc.]—Dry soil or woods, various provinces, Fla. to N. M., Minn., and N. Y.—Spr.

3. **B. linearifolia** (Goldie) Small. Plant 1–3 dm. tall: leaf-blades linear-lanceolate to linear, 3–9 cm. long: earlier flowers clustered: calyx-lobes linear-tapering, becoming 7–10 mm. long: corolla light-yellow; tube slender, 25–30 mm. long: nutlets 3–4 mm. long. [*Lithospermum linearifolium* Goldie.]—Dry soil, hills and rock ledges, various provinces, W Fla., to Ariz., B. C. and Ill.—Spr.

8. **ONOSMODIUM** Michx. Perennial herbs with hard roots. Sepals nearly distinct. Corolla narrow, longer than the calyx, without appendages in the throat, the lobes relatively long.—About 10 species, North American.

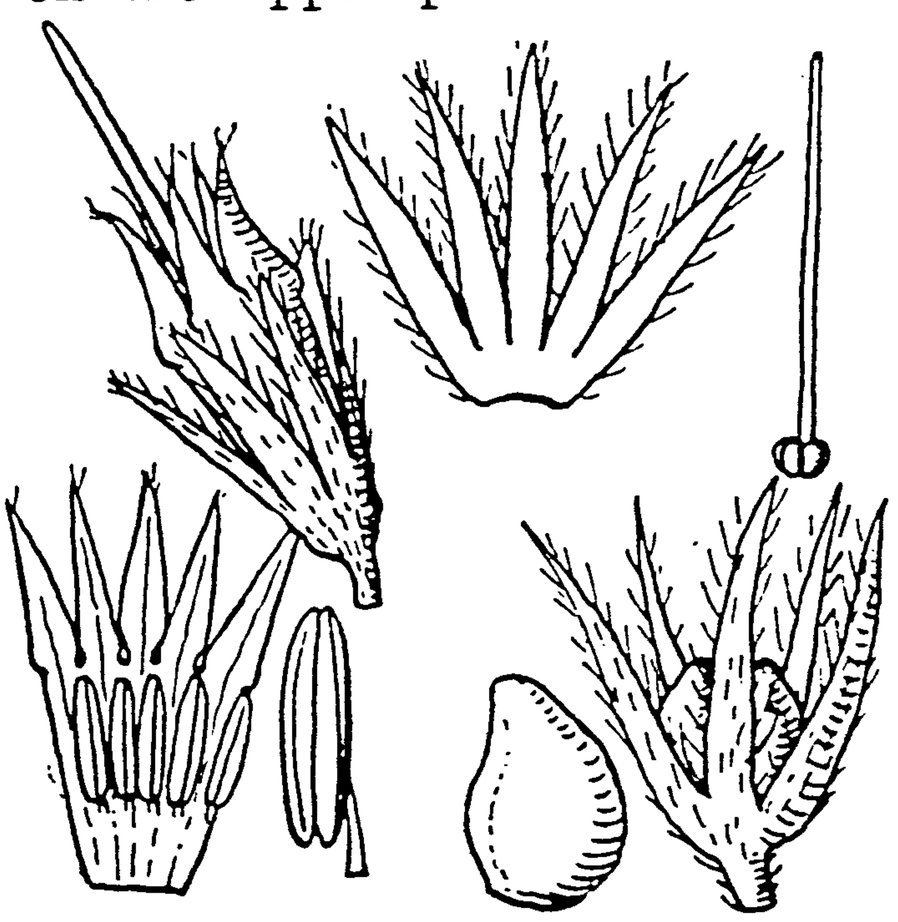
Corolla yellow; lobes lanceolate, acuminate: tips of the anthers not reaching up to the sinuses of the corolla. 1. *O. virginianum.*

Corolla whitish, often green-tinged; lobes ovate, obtuse or abruptly pointed: tips of the anthers reaching up to the sinuses of the corolla.

Leaves, bracts, and calyx-lobes not shaggy-pubescent, the hairs relatively short and more or less appressed: nutlets markedly pitted: anthers with long slender tips. 2. *O. molle.*

Leaves, bracts, and calyx-lobes shaggy-pubescent, the hairs long and loosely spreading: nutlets little, if at all, pitted: anthers with short stout tips. 3. *O. hispidissimum.*

1. **O. virginianum** (L.) DC. Stem strigose (or hirsute in *O. virginianum hirsutum*), 2–7 dm. tall or more: leaf-blades, on the upper part of the stem oblanceolate, narrowly elliptic, elliptic, elliptic-obovate to ovate, 2.5–12 cm. long, usually sparingly strigose, sometimes quite copiously so: calyx-lobes becoming 6–8 mm. long: corolla yellow, 8–10 mm. long; lobes lanceolate, more than ½ as long as the tube: nutlets ovoid, about 2.5 mm. long, not constricted at the base.—Pinelands, dry woods, thickets, and sandy hillsides, Coastal Plain and adj. provinces, Fla. to La., and Mass., and Great Lake Lowland, W N. Y.—Spr.–sum.

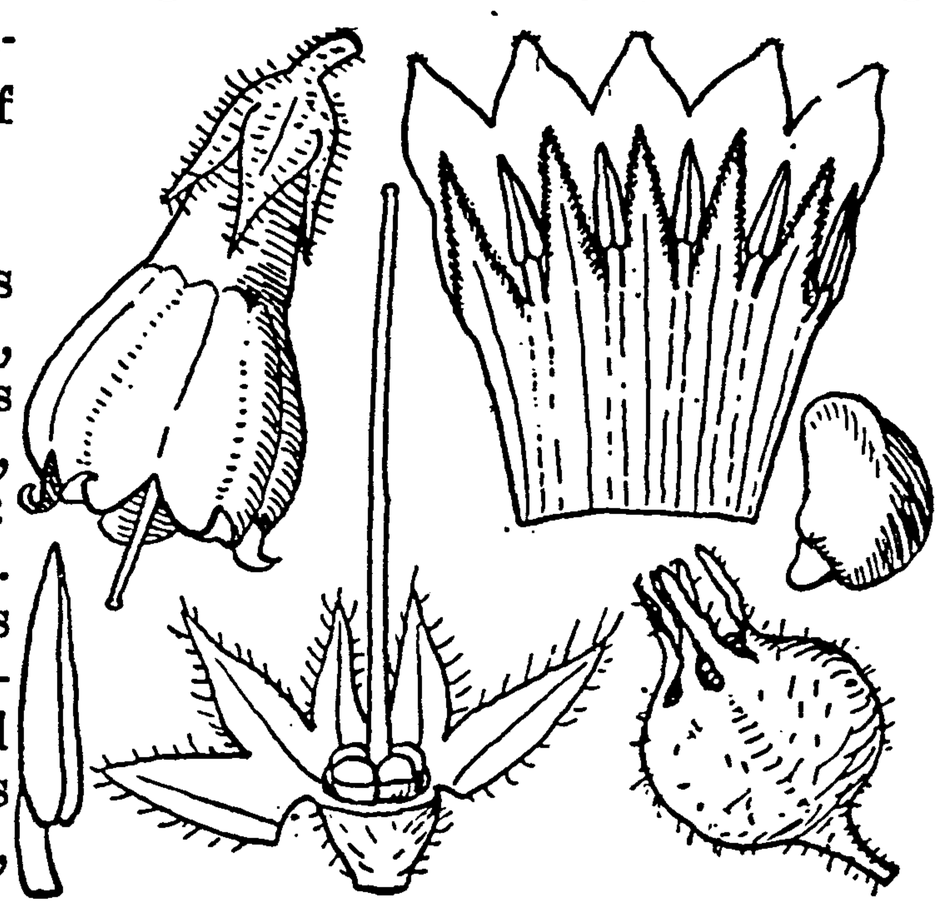


2. **O. molle** Michx. Stem short-hirsute, or partly strigose, with white or whitish hairs, 8 dm. tall or less: leaf-blades, on the upper

part of the stem, elliptic, lanceolate or ovate-lanceolate, not shaggy-pubescent, but with longer spreading hairs especially on the veins, and more numerous, at least beneath, short-appressed hairs: inflorescence softly pubescent: calyx-lobes narrowly linear, about 6 mm. long: corolla 9–12 mm. long; lobes ovate, about ½ as long as the tube: anthers about 2.5 mm. long: nutlets ovoid, about 3 mm. long, copiously pitted, slightly if at all constricted at the base.—Dry ridges and cedar-barrens, Interior Low Plateaus, Tenn., and Ky.—Spr.

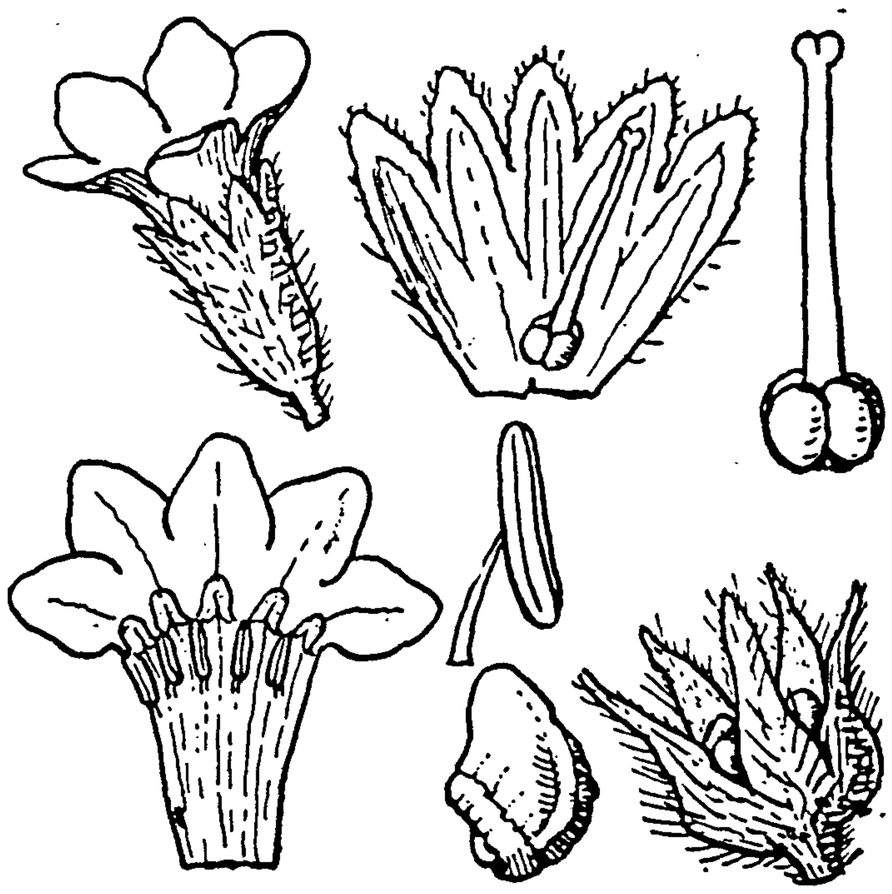
3. **O. hispidissimum** Mackenzie. Stem copiously hirsute, with whitish hairs, 12 dm. tall or less: leaf-blades, on the upper part of the stem, narrowly elliptic, elliptics, lanceolate or ovate, pubescent as in *O. molle*, but with coarser, stiffer, and longer hairs: inflorescence copiously hirsute: calyx-lobes linear, 4–6 mm. long: corolla 10–12 mm. long or longer in the earlier flowers; lobes ovate, less than ½ as long as the tube: anthers about 2 mm. long: nutlets ovoid, 3–3.5 mm. long, smooth or slightly pitted, decidedly constricted at the base. [*O. carolinianum* (Chapm. Fl.) (Fl. SE U. S.)]—Woods, bottoms, banks and dry hillsides, various provinces N of Coastal Plain, N. C. to Tex., Minn., and Ont.—Spr.–sum.

9. **SYMPHYTUM** L. Perennial herbs with mucilaginous roots. Sepals manifestly united into a tube. Corolla much longer than the calyx, with long appendages in the throat, the lobes relatively short.—About 15 species, natives of the Old World.



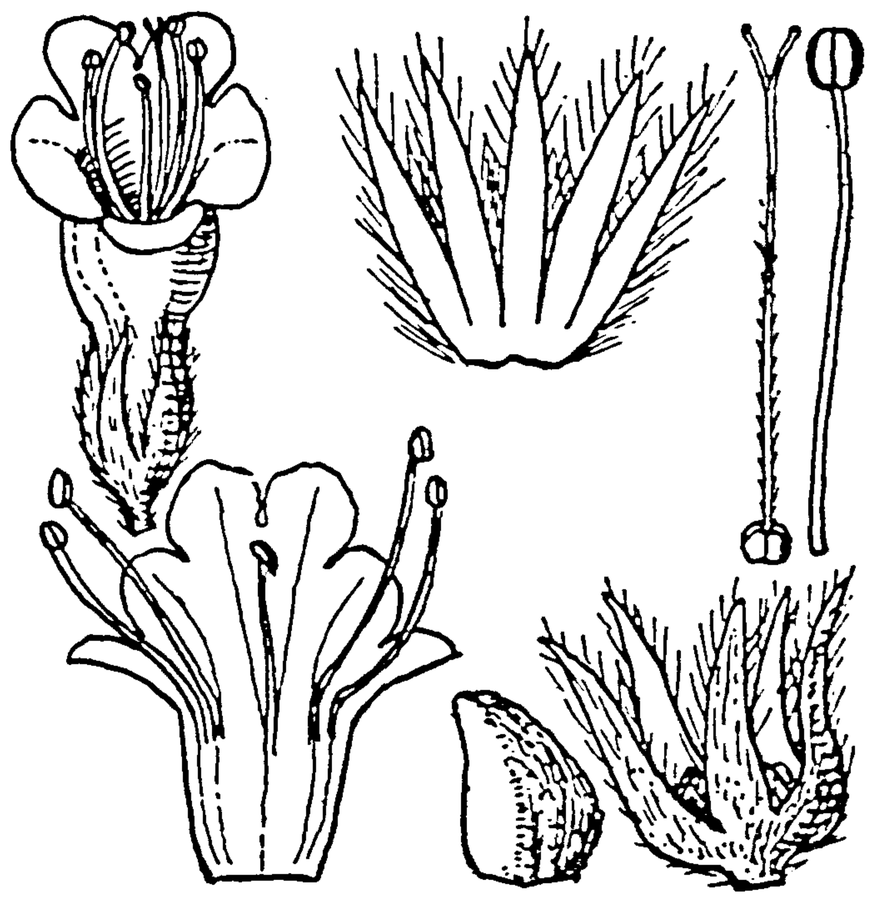
1. **S. officinale** L. Stems and branches 3–10 dm. tall, hirsute: leaf-blades oblong, lanceolate, or ovate-lanceolate, or sometimes ovate, 8–30 cm. long: calyx-lobes acuminate, each with an ovate to lanceolate body: corolla yellowish or purplish, 10–15 mm. long; lobes ovate, obtuse, the appendages lanceolate: nutlets 3–4 mm. long.—(Comfrey. Healing-herb.)—Roadsides, old fields, and about gardens, various provinces N of Coastal Plain, N. C. to Tenn., Minn., and Newf. Nat. of Eu.—Sum.

10. **LYCOPSIS** L. Annual herbs. Corolla salverform, slightly irregular, the throat appendaged. Free portion of the filaments very short.—About four species, natives of the Old World.



1. **L. arvensis** L. Plants 3–7 dm. tall, bristly hispid: stems becoming widely or diffusely branched; branches often procumbent: leaf-blades oblanceolate below, to narrowly oblong or lanceolate above, 2.5–10 cm. long, undulate or sinuate, sessile or the lower ones on long petioles: racemes often 5–10 cm. long; calyx becoming 7–8 mm. long; sepals linear or linear-lanceolate, acute: corolla blue, 5–7 mm. long; tube curved: nutlets about 3 mm. long, coarsely wrinkled. — (Bugloss.) — Waste-places, pastures, and roadsides, various provinces N of Coastal Plain, Tenn. to Ont., N. J., and Va.—Nat. of Eurasia.—Spr.–fall.

11. ECHIUM [Tourn.] L. Biennial or perennial herbs. Corolla funnelform, markedly irregular, the throat unappendaged. Free portion of the filaments elongate.—About 30 species, natives of the Old World.



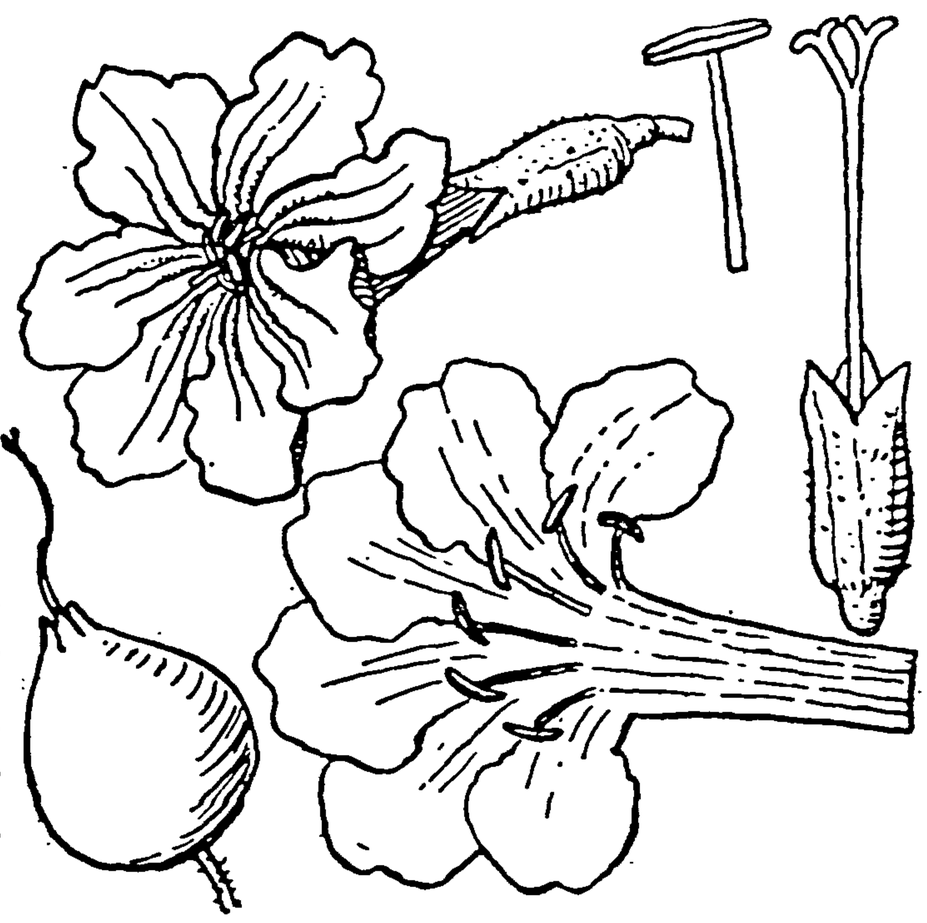
1. E. vulgare L. Plants 3–7 dm. tall, bristly-pubescent: stems 3–7 dm. tall, simple or branched throughout; branches ascending: leaf-blades linear or linear-lanceolate, or linear-oblanceolate below, acute or short-acuminate, 2–15 cm. long, undulate, sessile, bristly on both sides: spikes rather dense, becoming 2–10 cm. long: bracts obliquely lanceolate, acuminate: calyx bristly; lobes linear or linear-lanceolate, 6–12 mm. long, unequal: corolla pale blue or purplish, or rarely white, obliquely campanulate, 1.6–1.8 cm. long, narrowed into a short tube which is somewhat plaited; lobes ovate or triangular-ovate, ciliolate: filaments and style exserted, magenta: nutlets about 3 mm. long, wrinkled.—(VIPER'S-BUGLOSS. BLUE-DEVIL. BLUEWEED.)—Old fields and roadsides, often in calcareous soil, various provinces, Ga. to Nebr., Ont., and N. B. Nat. of Eu.—Sum.

FAMILY 8. EHRETIACEAE — EHRETIA FAMILY

Shrubs, trees, or sometimes herbs. Leaves mainly alternate: blades mostly entire. Flowers perfect, cymose. Calyx of 5 (4–6), partly united sepals. Corolla of 5 (4–6), partially united petals. Androecium of 5 (4–6), stamens, the filaments more or less adnate to the corolla-tube. Gynoecium 2–4-carpellary: styles 2 and distinct, or partially united, or united by pairs. Fruit drupaceous or of 4 nutlets.—About 20 genera and 350 species, in warm or tropical regions.

Styles, and stigmas, 4, unequally united by pairs: drupe with a 4-celled stone: cotyledons plaited or corrugated.
  Corolla long-funnelform; limb deeply lobed: calyx-tube cylindric. 1. SEBESTEN.
  Corolla short-funnelform; limb slightly lobed: calyx-tube campanulate. 2. VARRONIA.
Styles, and stigmas, 2: drupe with 2 or 4 stones: cotyledons flat. 3. BOURRERIA.

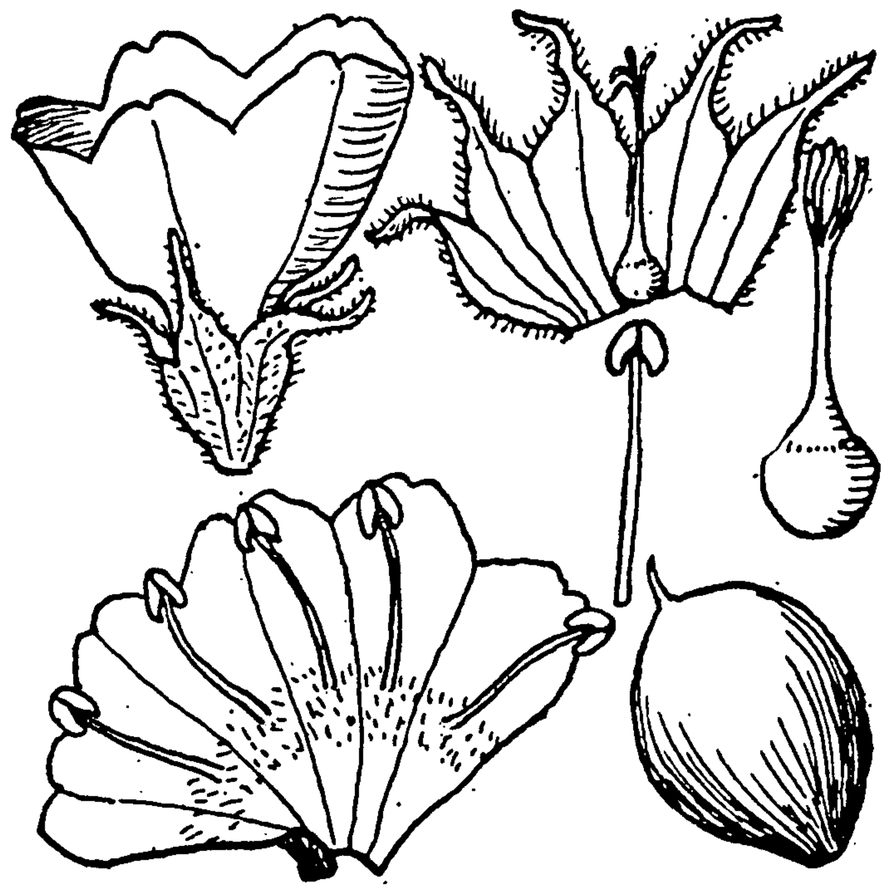
1. SEBESTEN Adans. Shrubs or trees. Flowers in open clusters. Sepals usually united to above the middle. Corolla bright-colored, shallowly or deeply lobed. Filaments adnate to above or below the middle of the corolla-tube. Fruits included, adnate to the accrescent calyx.—About 12 species, of tropical and subtropical America.



1. S. Sebestena (L.) Britton. Shrub or small tree, the twigs strigose: leaf-blades ovate or elliptic-ovate, 8–12 cm. long, undulate or repand: calyx 14–19 mm. long; tube cylindric: corolla-lobes bright-red, much shorter than the tube: fruits oval or ovoid, 2–3 cm. long. [*Cordia Sebestena* L.]—(GEIGER-TREE.)—Hammocks and sand-dunes, Everglade Keys, Fla., and Florida Keys.—(*W. I.*)

—All year.—This plant has a generic counterpart in Texas, in which the corolla is white with a yellow center.

2. **VARRONIA** Jacq. Shrubs, trees, or vines. Flowers in open clusters or in heads. Sepals usually united to above the middle. Corolla white or colored, shallowly or deeply lobed. Filaments adnate to above or below the middle of the corolla-tube.—About 70 species of tropical and subtropical America.



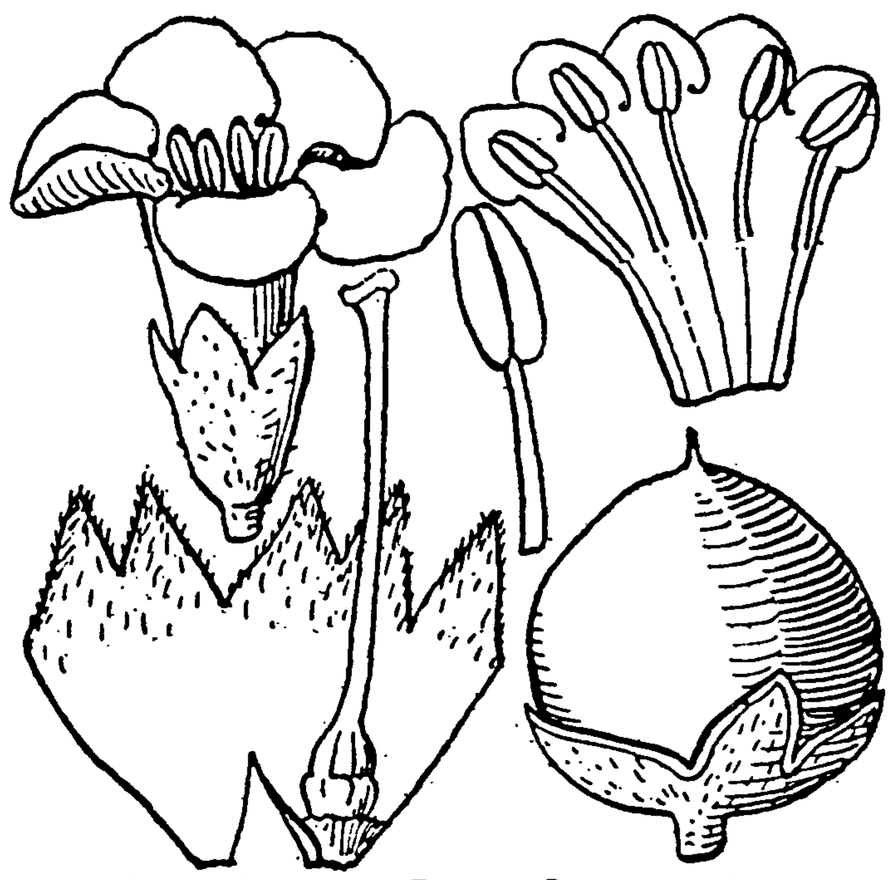
1. **V. globosa** Jacq. Branched shrub 1–3 m. tall: leaf-blades ovate to elliptic-ovate, 1–5 cm. long, serrate: calyx about 8 mm. long: corolla white, 5–7 mm. long. [*Cordia bullata* (Chapm. Fl.)]—Hammocks, Cape Sable region, Fla. and Florida Keys.—(*W. I.*)—All year.—This plant has a generic counterpart in Texas in which the calyx-lobes are shorter than the tube and its corolla is mostly 12–15 mm. long.

3. **BOURRERIA** Jacq. Shrubs or trees. Flowers in corymbose cymes. Sepals united to above the middle. Corolla white or colored, prominently lobed. Filaments adnate to above or below the middle of the corolla-tube.—About 25 species, of tropical America.

Anthers about as long as the free portion of the filaments: leaf-blades short-petioled.
- Drupe 9–11 mm. wide: corolla-tube much exceeding the calyx. 1. *B. revoluta.*
- Drupe 7–8 mm. wide: corolla-tube about equalling the calyx. 2. *B. cassinifolia.*

Anthers much shorter than the free portion of the filaments: leaf-blades slender-petioled. 3. *B. ovata.*

1. **B. revoluta** H.B.K. Small tree or shrub, with pubescent twigs: leaf-blades elliptic to obovate, mostly 2–7 cm. long, abruptly pointed, rounded or notched, permanently rough-pubescent and ciliate, or sometimes smooth: cymes several-flowered: calyx 6–7 mm. long; lobes ovate, mostly less than ⅓ as long as the tube: corolla white; tube much exceeding the calyx; larger lobes 5–6 mm. wide: anthers about 2.5 mm. long: drupe orange, slightly depressed, 9–11 mm. wide. [*B. Radula* (Chapm. Fl.) (Fl. SE U. S.)]—(ROUGH-STRONGBACK.)—Hammocks and pinelands, Everglade Keys, Fla., and Florida Keys.—(*W. I.*)—All year.



2. **B. cassinifolia** (A. Rich.) Griseb. Shrub: leaf-blades oval, elliptic, obovate, or cuneate, 1–2.5 cm. long, mostly obtuse or retuse, smooth, glabrous, and eciliate, at least at maturity, slightly veiny in age: cymes few-flowered: calyx 5–6 mm. long; lobes triangular to ovate-triangular, ⅓ as long as the tube: corolla white; tube about as long as the calyx or slightly exceeding it; larger lobes about 4 mm. wide: anthers about 2 mm. long: drupe much depressed, 7–8 mm. wide.—(SMOOTH-STRONGBACK.)—Pinelands, Everglade Keys, Fla.—(*W. I.*)—All year.

3. **B. ovata** Miers. Small tree or shrub, with glabrous twigs: leaf-blades obovate to elliptic-obovate or oval-obovate, 4–12 cm. long, smooth: calyx 6–7 cm.

long; lobes triangular, fully ⅓ as long as the tube: corolla white; tube rather short; lobes slightly shorter than the tube: stamens exserted; anthers about 2 mm. long: drupe orange, 1 cm. wide. [*B. havanensis* (Chapm. Fl.) (Fl. SE U. S.)]—(STRONGBACK.)—Hammocks, Florida Keys.—(*W. I.*)—All year.

FAMILY 9. HELIOTROPIACEAE — HELIOTROPE FAMILY

Herbs, shrubs, or woody vines. Leaves alternate: blades entire, or rarely toothed. Flowers perfect, mostly in scorpioid spikes or racemes. Calyx of 5 more or less united sepals. Corolla various, of 5 partially united petals. Androecium of 5 stamens, the filaments more or less adnate to the corolla-tube. Gynoecium 2–4-carpellary. Stigma annular, surmounted by an appendage. Fruit drupaceous, or dry and of 2–4 nutlets.—About 10 genera and 300 species, widely distributed.

Shrubs or woody twiners: fruit drupaceous. Tribe I. TOURNEFORTIEAE
Herbs, sometimes partly-woody: fruit dry, separating into nutlets. II. HELIOTROPIEAE.

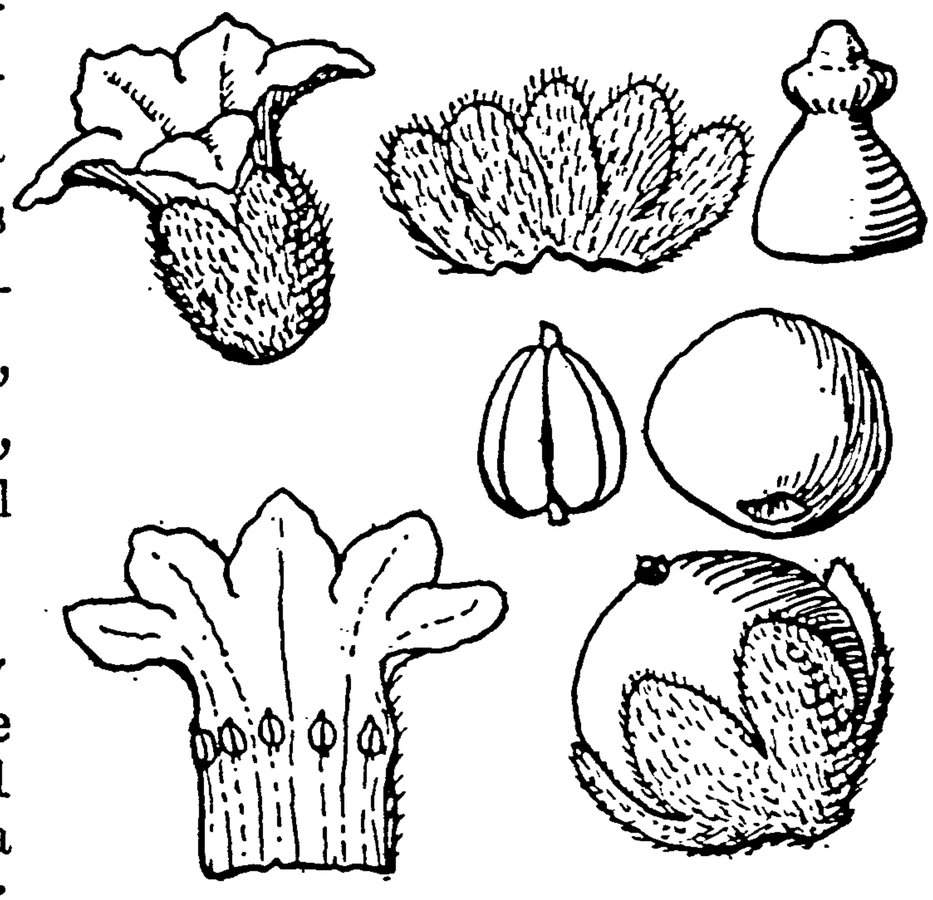
I. TOURNEFORTIEAE

Corolla-lobes broad: fruit not lobed, hollowed at the base: anthers minutely pointed.
  Plant densely and conspicuously silky-tomentose: leaves very numerous and crowded: corolla-tube about as long as the calyx or shorter. 1. MALLOTONIA.
  Plant hirsute-inconspicuously pubescent: leaves relatively few and distant: corolla-tube much exceeding the calyx. 2. TOURNEFORTIA.
Corolla-lobes narrow, often subulate: fruit lobed, usually 4-lobed, not hollowed at the base: anthers acuminate. 3. MYRIOPUS.

II. HELIOTROPIEAE

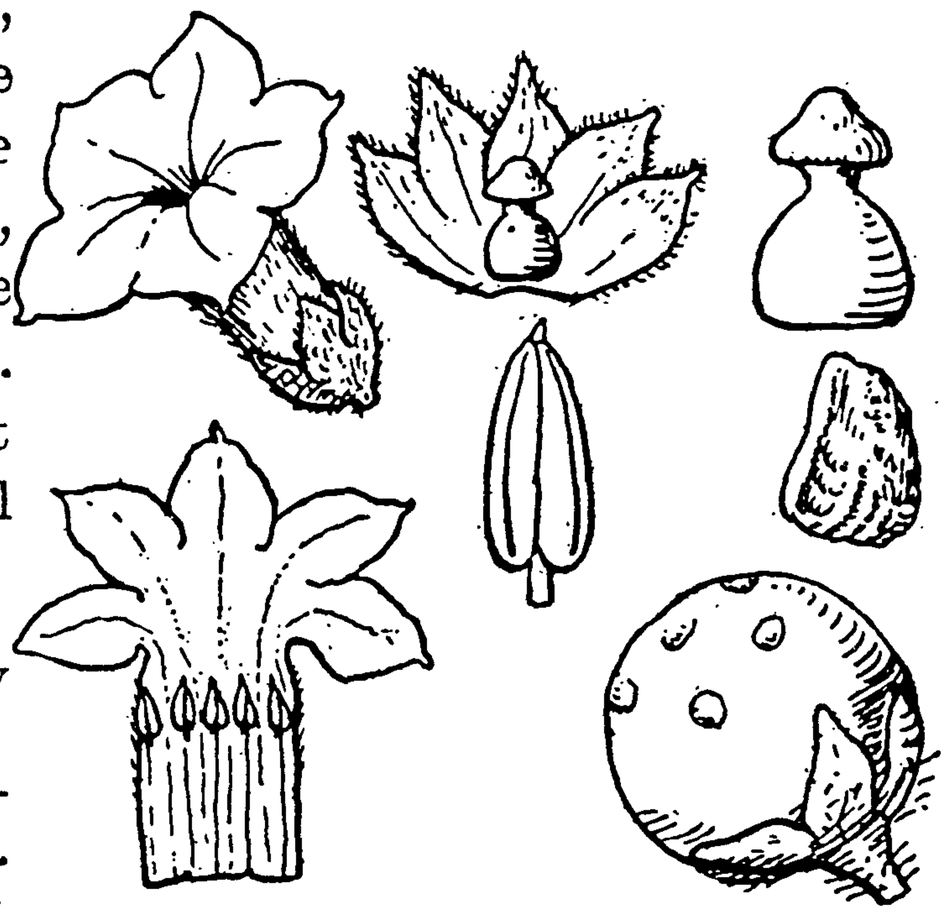
Fruit of 4 more or less readily separating nutlets.
  Fruits 4-lobed, separating into 4 one-seeded nutlets.
    Flowers in scorpioid spikes or racemes: calyx-lobes equal or nearly so. 4. HELIOTROPIUM.
    Flowers axillary to narrow bracts: calyx-lobes very unequal. 5. LITHOCOCCA.
  Fruits 2-lobed, separating into 2 two-seeded nutlets.
    Nutlets conic, ribbed: style obconic or turbinate. 6. TIARIDIUM.
    Nutlets subglobose, rugose: style very short or wanting. 7. SCHOBERA.
Fruit of 2 completely 2-celled nutlets, or sometimes 1-celled and 1-seeded. 8. COCHRANEA.

1. MALLOTONIA Britton. Maritime shrubs with conspicuously pubescent foliage. Leaves numerous, crowded on the branchlets: blades narrow, succulent, sessile. Flowers in stalked scorpioid, corymbed spikes or racemes. Calyx-lobes broad, longer than the tube. Corolla white: lobes broad, spreading. Anthers ovoid, slightly cordate at the base. Stigma-appendage low-conic. Drupe not lobed, short or depressed, hollowed at the base, abruptly pointed.—Two species, in tropical and subtropical regions.



1. M. gnaphalodes (Jacq.) Britton. Fleshy shrub 2 m. tall or less, the pubescence pale or white: leaf-blades linear-spatulate, 4–11 cm. long, obtuse: calyx-lobes ovate: corolla much exceeding the calyx; tube pubescent; lobes ovate to orbicular-ovate, 2–3 mm. long: drupe ovoid or conic-ovoid, about 5 mm. long. [*Tournefortia gnaphalodes* R. Br.]—(SEA LAVENDER.)—Coastal sand-dunes, S pen. Fla. and the Keys.—(*W. I.*)—All year.

2. TOURNEFORTIA L. Hammock vines, with stout trailing or climbing stems. Leaves neither crowded nor numerous: blades broad, often coarsely or harshly pubescent, fleshy-herbaceous, petioled. Flowers in compound corymbose spikes. Calyx-lobes broad, longer than the tube. Corolla white: lobes broad, spreading, flat or crisped. Anthers lanceolate, cordate at the base. Stigma-appendage depressed. Drupe not lobed, hollow at the base.—About 100 species, of tropical and sub-tropical regions.

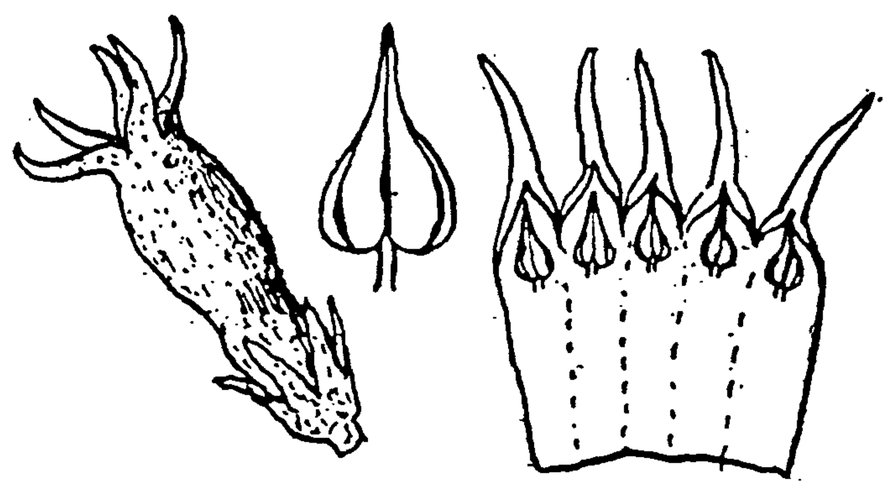


1. T. hirsutissima L. Woody or partly woody vine, the stem and branches pubescent: leaf-blades elliptic, often broadly so, varying to ovate or obovate, mostly 1–1.5 dm. long, more or less hirsute, acuminate: corymbs many-flowered: sepals ovate, acute, villous: corolla-lobes ovate to deltoid-ovate, 2–2.5 mm. long: drupes subglobose or ovoid-globose, 4–5 mm. long.—Hammocks, Everglade Keys, Fla.—(*W. I., Mex., C. A., S. A.*)—All year.

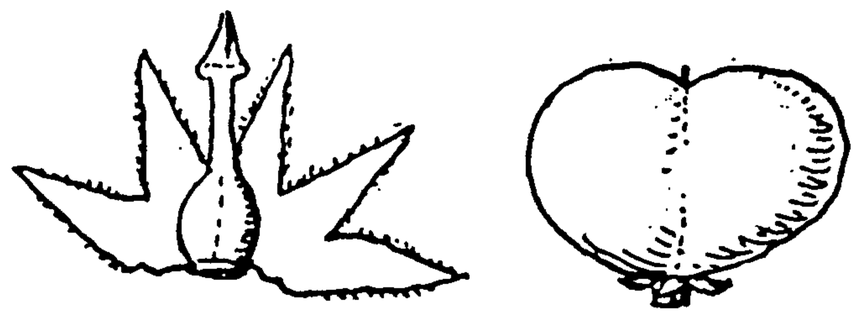
3. MYRIOPUS Small. Hammock vines with climbing, often twining stems. Leaves neither crowded nor numerous: blades broad, herbaceous, often finely pubescent, petioled. Flowers in corymbose, elongate, secund spikes or racemes. Calyx-lobes narrow or narrow-lipped. Corolla white or greenish: lobes very narrow, usually subulate. Anthers lanceolate, slightly cordate at the base. Style elongate: stigma-appendage long-conic. Drupe 2–4-lobed, with as many lobes as there are 1-seeded nutlets, usually depressed.—About 15 species, in tropical America.

Leaves glabrous or obscurely pubescent: calyx-lobes triangular or triangular-lanceolate in anthesis. 1. *M. volubilis.*
Leaves densely white-pubescent beneath: calyx-lobes subulate or triangular-subulate in anthesis. 2. *M. poliochros.*

1. M. volubilis (L.) Small. Woody vine, the fine pubescence usually rusty; leaf-blades ovate to elliptic-lanceolate, 2–8 cm. long, mostly acute or acuminate, green beneath: corymbs with sprawling branches: calyx-lobes much less than half as long as the corolla-tube: corolla-lobes much shorter than the tube: drupe 2–3 mm. wide, the lobes with black spots. [*Tournefortia volubilis* R. & S.]—Hammocks, S pen. Fla. and the Keys, and S Tex.—(*W. I., S. A.*)—All year.



2. M. poliochros (Spreng.) Small. Vine resembling *M. volubilis* in habit: leaf-blades ovate or elliptic, 3–6 cm. long, obtuse or abruptly pointed, pale or whitish beneath: corymbs usually copiously floriferous: calyx-lobes nearly or quite half as long as the corolla tube: corolla-lobes nearly or quite as long as the tube: drupe 3–4 mm. wide, the lobes with magenta spots. [*Tournefortia poliochros* Spreng.]—Hammocks on kitchenmiddens, E coast, Fla.—(*W. I.*)—All year.

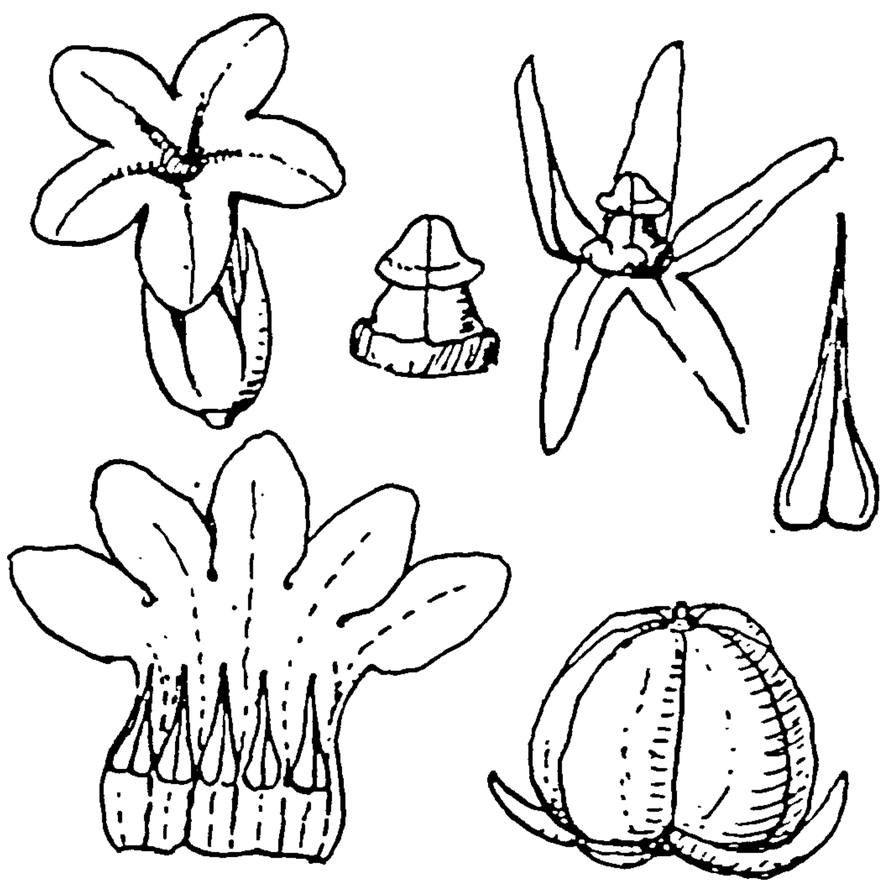


4. HELIOTROPIUM [Tourn.] L. Shrubs or erect, diffuse, or prostrate herbs. Leaves few or many: blades broad or narrow. Calyx-lobes nearly equal. Stamens adnate to the lower part of the corolla-tube. Style very short. Fruit 4-lobed, an aggregate of 4 nutlets.—About 125 species, widely distributed.—HELIOTROPES.

Inflorescence bractless.
- Calyx glabrous: nutlets finely wrinkled: leaf-blades narrow. — 1. *H. curassavicum.*
- Calyx pubescent: nutlets tuberculate: leaf-blades broad. — 2. *H. europaeum.*

Inflorescence bracted.
- Corolla white.
  - Corolla with small puberulent swellings low down in the throat. — 3. *H. phyllostachyum.*
  - Corolla with prominent deflexed appendages at the top of the throat. — 4. *H. polyphyllum.*
- Corolla yellow.
  - Plant with erect stem and branches. — 5. *H. Leavenworthii.*
  - Plant with prostrate stem and branches. — 6. *H. horizontale.*

1. H. curassavicum L. Plant perennial or mainly so, 1–4 dm. tall: leaf-blades spatulate, varying to obovate or linear, mainly 2–6 cm. long: calyx-lobes lanceolate to elliptic-lanceolate, 1.5–2 mm. long: corolla white, except the yellow eye, turning blue; tube about 2 mm. long: fruit 2–2.5 mm. wide.—(SEASIDE-HELIOTROPE.)—Hammocks, shores, and waste-places, Coastal Plain and adj. provinces, Fla. to Tex. and Del.—(*W. I., Mex., C. A., S. A.*)



2. H. europaeum L. Plant annual, 1–5 dm. tall: leaf-blades elliptic to oval, varying to ovate or obovate, 2–6 cm. long: calyx-lobes elliptic to elliptic-lanceolate or linear-lanceolate, 2–2.5 mm. long: corolla white or bluish; tube fully 2 mm. long: fruit about 3 mm. wide.—Waste-places and roadsides, various provinces, Fla. to Ala. and Mass. Nat. of Eu.

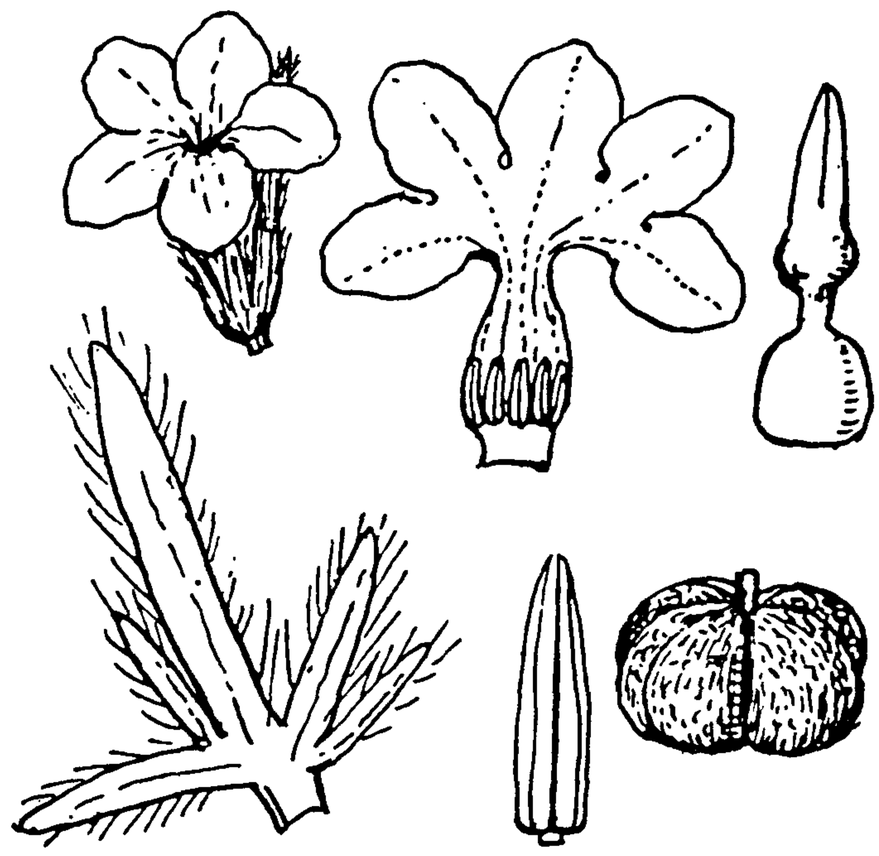
3. H. phyllostachyum Torr. Plant annual, 0.5–2 dm. tall: leaf-blades elliptic, 1–2.5 cm. long: calyx-lobes lanceolate, or the larger one ovate-lanceolate, 2–3 mm. long: corolla white; tube 2–3 mm. long; lobes about 1 mm. long: fruit about 1.5 mm. wide.—Hammocks and waste-places, Key West, Fla.

4. H. polyphyllum Lehm. Perennial, 1–2 dm. tall: leaf-blades linear-spatulate to elliptic, 0.5–2 cm. long: calyx-lobes lanceolate to ovate-lanceolate, 2–2.5 mm. long: corolla white; tube 3–4 mm. long: fruit 1.5 mm. wide.—Coastal hammocks, Everglade Keys, Fla. and Florida Keys.—(*S. A.*)—All year.

5. H. Leavenworthii Torr. Plant with pale-pubescent erect stems, 2–11 dm. tall: leaf-blades linear to linear-elliptic, 1–2 cm. long: flowers inodorous: calyx-lobes lanceolate, 3–4 mm. long: corolla bright-yellow; lobes ovate, obtuse.—Low hammocks and wet places, mostly in Everglades, S pen. Fla. and Florida Keys.—All year.

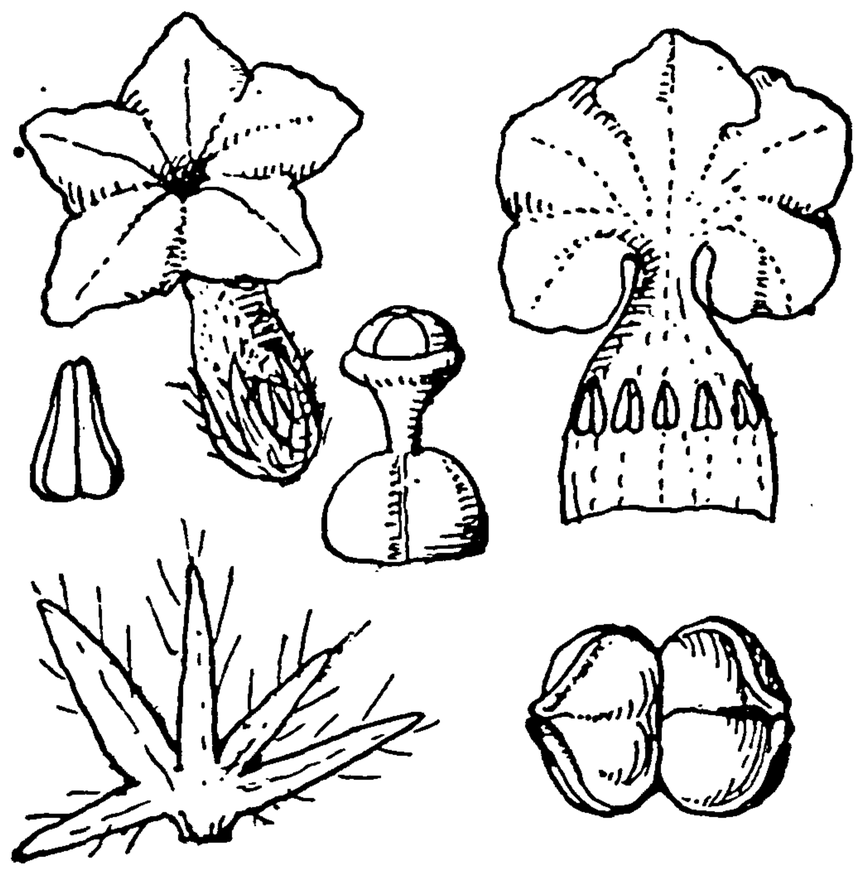
6. H. horizontale Small. Plant with radially prostrate branches, 1–5 cm. long, often matted: leaf-blades linear or nearly so, 0.8–1.6 cm. long: flowers fragrant: calyx-lobes lanceolate, 4–5 mm. long: corolla golden-yellow.—Pinelands, Everglade Keys, Fla.—All year.

5. LITHOCOCCA Small. Annual erect, wiry herbs. Leaves scattered: blades very narrow. Flowers scattered, axillary to narrow leaf-like bracts. Calyx-lobes very unequal in size and shape. Stamens adnate to the lower part of the corolla-tube. Style short. Fruit depressed, 4-lobed.—One species.



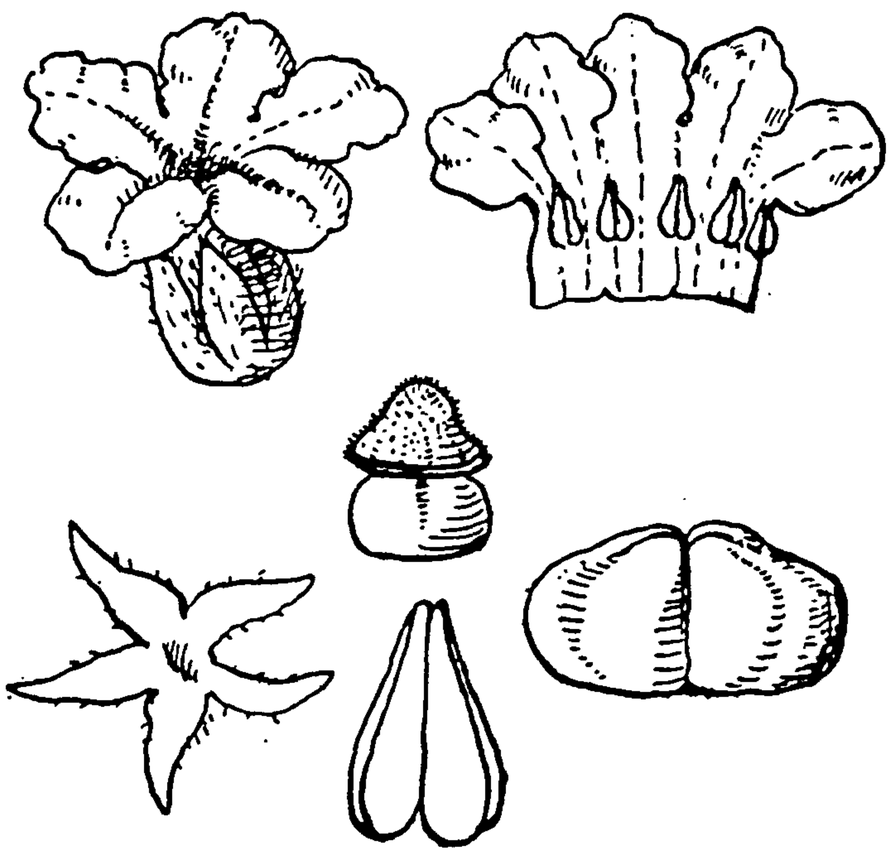
1. L. tenellum (Nutt.) Small. Stem 1–3 dm. tall, with several or many erect or ascending branches: leaf-blades linear to narrowly linear-lanceolate, 1.5–5 cm. long: calyx-lobes linear or nearly so, 2–6 mm. long; corolla white; tube about 4 mm. long: fruit 3–3.5 mm. wide, pubescent. [*Heliotropium tenellum* Torr.]—Dry soil, roadsides, and pastures, various provinces, Ala. to Tex., Kans., and Ky.—Sum.–fall.

6. TIARIDIUM Lehm. Annual erect herbs. Leaf-blades broad. Flowers in bractless scorpioid spikes. Sepals slightly united at the base. Corolla blue, with the anthers near the middle of the rather slender tube. Style obconic or turbinate. Fruit slightly depressed, the nutlets paired and mitriform.—One species.



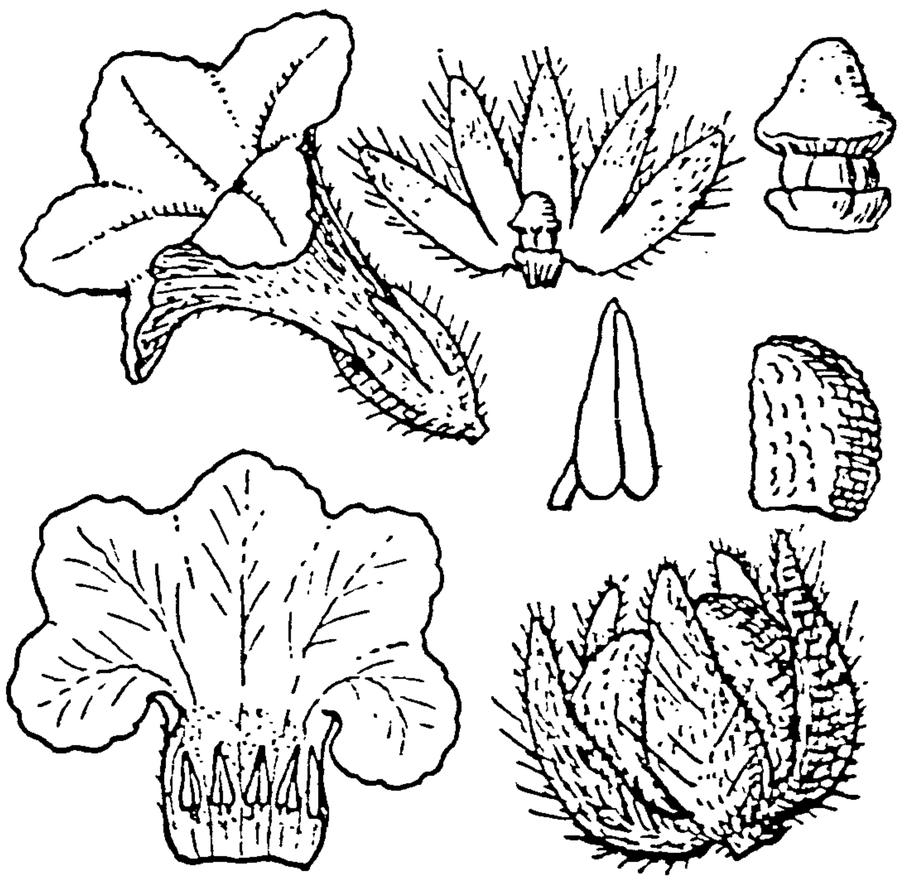
1. T. indicum (L.) Lehm. Annual, 1–7 dm. tall: leaf-blades ovate, oval, or elliptic, 2–10 cm. long: calyx-lobes linear to linear-lanceolate, 1–2 mm. long: corolla blue; tube 2.5–3 mm. long: fruit 2–2.5 mm. wide. [*Heliotropium indicum* L.]—Waste-places, fields, and roadsides, various provinces, Fla. to Tex., Ill., and Va. Nat. of E. I.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall, or all year S.

7. SCHOBERA Scop. Annual or perennial, erect herbs. Leaf-blades rather broad. Flowers in bractless scorpioid spikes. Sepals united at the base. Corolla white, with the anthers near the top of the very short tube. Style very short or wanting. Fruit much depressed, didymous by the nutlets uniting in pairs.—About 10 species, tropical American.



1. S. angiosperma (Murr.) Britton. Plant annual, 2–12 dm. tall: leaf-blades elliptic to elliptic-lanceolate, 2–7 cm. long, veiny: calyx-lobes lanceolate to linear, 1–1.5 mm. long: corolla white; tube 1–1.5 mm. long: fruit about 2 mm. wide. [*Heliotropium parviflorum* L.]—Hammocks and pinelands, S pen. Fla. and Florida Keys.—(*W. I., Mex., C. A., S. A.*)

8. **COCHRANEA** Miers. Perennial herbs, sometimes partially woody. Flowers in scorpioid cymose spikes. Sepals slightly united. Stamens adnate to the lower part of the corolla-tube. Style obsolete. Fruit 2-lobed, the typically 2-celled nutlets sometimes separating into 2 parts.—About 4 species, South American.



1. C. anchusaefolia (Poir.) Guerke. Plants often diffuse, 1–4 dm. tall: leaf-blades elliptic to linear-elliptic or oblanceolate, 2–8 cm. long, repand: calyx-lobes linear to linear-lanceolate, about 3 mm. long: corolla violet-blue or rose-purple; limb 4–6 mm. wide: fruits 2.5–3 mm. wide. [*Heliotropium anchusaefolium* Poir.]—Waste-places, roadsides, and cult. grounds, Coastal Plain, Fla. to Tex. and Ga. Nat. of S. Am.

Family 10. **VERBENACEAE** — Vervain Family

Herbs, shrubs, or trees. Stems commonly angled. Leaves alternate, opposite, or whorled: blades simple or rarely compound. Calyx of 4 or 5 partially or wholly united sepals. Corolla of 4 or 5 partially united petals, sometimes 2-lipped. Androecium of 2 or 4 stamens, the filaments more or less adnate to the corolla-tube. Gynoecium 2–4-carpellary, the style terminal. Fruit baccate or drupaceous or an aggregate of 2 or 4 nutlets.—About 75 genera and 1,300 species, of wide geographic distribution.

Inflorescence centripetal, spicate, racemose, or paniculate: ovules erect. Tribe I. Verbeneae.
Inflorescence centrifugal, cymose: ovules laterally attached. II. Viticeae.

I. Verbeneae

Flowers in heads, spikes or spike-like racemes.
  Fruit of 2 or 4 nutlets, dry.
    Stamens 4: fruit not imbedded in the rachis.
      Fruit nut-like, with a broad cap-like beak. 1. Stylodon.
      Fruit of 2 or 4 nutlets, not beaked.
        Nutlets 4, not flattened.
          Anthers unappendaged: spikes elongate at anthesis. 2. Verbena.
          Anthers of the larger stamens appendaged on the back: spikes flat-topped at anthesis, elongating in fruit. 3. Glandularia.
        Nutlets 2, more or less flattened.
          Calyx not inflated at maturity.
            Herbs with procumbent or creeping stems, sometimes partly woody below. 4. Phyla.
            Shrubs or shrubby plants, with upright stems. 5. Goniostachyum.
          Calyx inflated and inclosing the fruit. 6. Priva.
    Stamens 2: fruit imbedded in excavations of the thick rachis. 7. Valerianoides.
  Fruit drupaceous. 8. Lantana.
Flowers in open racemes.
    Drupe seated in the calyx: nutlets 2: stigma 2-lobed. 9. Citharexylum.
    Drupe enclosed in the calyx: nutlets 4: stigma 4-lobed. 10. Duranta.

II. Viticeae

Corolla regular: leaf-blades simple. 11. Callicarpa.
Corolla irregular.

Drupe with 4 stones: leaf-blades simple.
Corolla short, the tube not much longer than the limb. 12. CLERODENDRON.
Corolla elongate, the tube several times longer than the limb. 13. SIPHONANTHUS.
Drupe with a single 4-celled stone: leaf-blades compound. 14. VITEX.

1. **STYLODON** Raf. Perennial scabrous herbs. Leaf-blades serrate, sessile. Flowers in elongate, inconspicuously bracted spikes. Calyx tubular-campanulate, sharply 5-lobed. Corolla colored, rarely white, salverform: lobes 5, unequal. Anthers unappendaged. Fruit nutlike, ridged, with 4 broad plain surfaces at the top which form a cap.—One species.

1. S. carolinensis (Walt.) Small. Stem slightly decumbent, 2–8 dm. tall, rough-pubescent: leaves 2–10 cm. long; blades of the lower ones spatulate to obovate or elliptic, those of the upper narrowly elliptic to lanceolate: spikes interrupted: calyx becoming about 4 mm. long: corolla pink, purplish, or white; limb 5–6 mm. wide: fruit ovoid or oval, 3 mm. long. [*Phryma caroliniensis* Walt. *Verbena caroliniana* Michx.]—Sandy soil, often in woods and thickets, Coastal Plain and adj. provinces, Fla. to Miss. (La.?) and N. C.—Spr.–fall.

2. **VERBENA** [Tourn.] L. Annual, biennial, or perennial herbs. Leaf-blades entire, toothed or parted. Flowers in elongate, often very slender spikes, the bracts narrow. Calyx mainly tubular, 5-lobed. Corolla white or colored, salverform: lobes 5, unequal. Anthers unappendaged. Fruit an aggregate of 4, often narrow, readily separable nutlets filling the calyx.—About 75 species, American.—Sum.—VERBENAS. VERVAINS.

Spikes slender, sometimes very slender, continuous or interrupted, often greatly elongate.
Leaf-blades toothed or incised. I. HASTATAE.
Leaf-blades 1–2-pinnately cleft or parted.
Bracts shorter than the calyx: plants erect. II. OFFICINALES.
Bracts much longer than the calyx: plants prostrate or procumbent. III. BRACTEOSAE.
Spikes permanently short and stout.
Bracts shorter than the mature calyx: corolla-tube less than twice as long as the calyx. IV. BONARIENSES.
Bracts longer than the mature calyx: corolla-tube over twice as long as the calyx. V. VENOSAE.

I. HASTATAE

Spikes permanently continuous by the imbricate fruits.
Spikes sessile or nearly so: corolla-limb 8–9 mm. wide: plants densely soft-pubescent. 1. *V. stricta.*
Spikes peduncled: corolla-limb 2.5–6 mm. wide: plants sparingly pubescent or glabrous.
Leaf-blades lanceolate to ovate-lanceolate: nutlets smooth or nearly so. 2. *V. hastata.*
Leaf-blades linear-spatulate to linear: nutlets reticulate. 3. *V. angustifolia.*
Spikes becoming interrupted, the fruits at least, not imbricate.
Leaf-blades sessile, a spatulate type predominating. 4. *V. littoralis.*
Leaf-blades petioled, an ovate type predominating.
Sepals little longer than the fruit, the tips not meeting over the top. 5. *V. urticaefolia.*
Sepals much longer than the fruit, the tips converging over its top and meeting. 6. *V. scabra.*

II. OFFICINALES

Stem coarsely hirsute: flowers approximate in the spike: corolla-limb usually over 6 mm. wide: leaf-blades sessile or very short wing-petioled. 7. *V. Xutha.*

Stem glabrous or glabrate: flowers widely separated in the spike: corolla-limb usually 6 mm. wide or less: leaf-blades distinctly petioled.

Leaf-blades with blunt, rounded, or abruptly acute tips.

Corolla-limb about 5–6 mm. wide: nutlets fully thrice as long as thick. 8. *V. Halei.*

Corolla-limb 3–4 mm. wide: nutlets twice as long as thick. 9. *V. officinalis.*

Leaf-blades with long-tapering acute tips. 10. *V. riparia.*

III. BRACTEOSAE

Annual plants, often forming mats: spikes leafy-bracted. 11. *V. bracteosa.*

IV. BONARIENSES

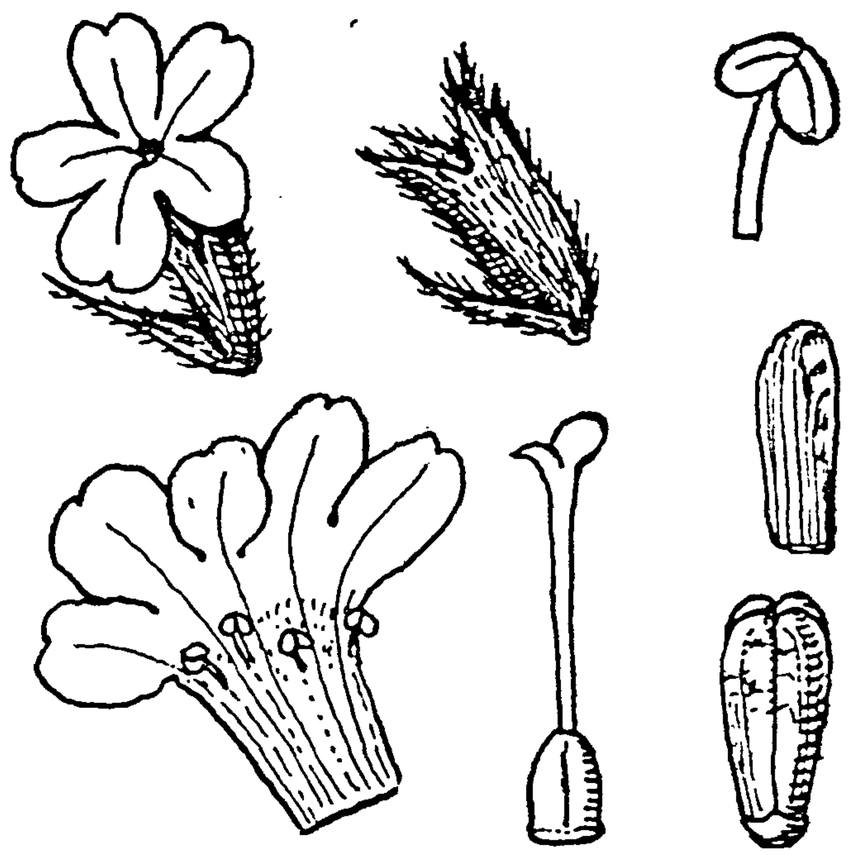
Leaf-blades sessile: nutlets reticulate at the top. 12. *V. brasiliensis.*

Leaf-blades clasping: nutlets reticulate to below the middle. 13. *V. bonariensis.*

V. VENOSAE

Stems rigid from horizontal rootstocks: leaf-blades saliently toothed, conspicuously veined. 14. *V. rigida.*

1. V. stricta Vent. Perennial, 2–12 dm. tall, densely pale-pubescent: leaves 3–10 cm. long; blades suborbicular, oval, or elliptic, serrate or incised: spikes compact and long: calyx becoming 5 mm. long: corolla deep-blue or purple; limb 8–9 mm. wide: nutlets ellipsoid, 2.5 mm. long, or sometimes longer.—(HOARY-VERBENA.)—Prairies, barrens, fields, and roadsides, various provinces, Tenn. to Tex., N. Mex., Wyo., and Ont. Introduced E.—Sum.–fall.



2. V. hastata L. Perennial, 4–15 dm. tall, roughish-pubescent: leaves 4–14 cm. long: blades lanceolate, elliptic-lanceolate, or ovate-lanceolate, sharply serrate and often incised or hastate at the base: spikes relatively slender and compact: calyx becoming 2.5 mm. long: corolla blue-violet; limb 2.5–3.5 mm. wide: nutlets linear, 1.5–2 mm. long.—(BLUE-VERBENA.)—Moist fields and meadows, various provinces, Fla. to N. M., B. C., Ont., and N. S.—Sum.

3. V. angustifolia Michx. Perennial, 1–5 dm. tall, puberulent or sparingly pubescent: leaves 2–12 cm. long; blades linear-spatulate to linear-elliptic or linear, distantly or coarsely serrate: spikes slender: calyx becoming 4 mm. long: corolla deep lavender or purple; limb 5–6 mm. wide: nutlets linear, 3 mm. long.—Woods, fields, and roadsides, various provinces, Fla. to Ark., Minn., and Mass.—Spr.–sum.

4. V. littoralis H.B.K. Perennial, 3–10 dm. tall, slightly rough-pubescent: leaves 2–8 cm. long; blades spatulate, or on shoots varying to narrowly elliptic to elliptic-lanceolate, serrate: spikes slender: calyx becoming 2 mm. long: corolla light-blue or purple; limb about 3 mm. wide: nutlets broadly linear, fully 1.5 mm. long.—Dry soil, along bayous and ditches, La. Nat. of S. A.—Spr.–sum.

5. V. urticaefolia L. Annual or perennial, 4–15 dm. tall, pubescent; leaves 8–21 cm. long; blades broadly lanceolate to ovate-lanceolate, or sometimes ovate to oval, coarsely crenate-serrate: spikes loosely-fruited: calyx becoming 2 mm.

long: corolla white: limb 3–4 mm. wide: nutlets ellipsoid, 1.5–2 mm. long.—(WHITE-VERBENA.)—Thickets, moist fields, and meadows, various provinces, Fla. to Tex., Minn., and N. B.—Sum.

6. V. scabra Vahl. Similar to *V. urticaefolia* in habit, the leaves relatively smaller, and blades thicker and commonly less gradually acute or acuminate: spikes closely fruited: calyx becoming 2 mm. long: corolla white or pinkish; limb 2–3 mm. wide: nutlets ellipsoid, about 1.5 mm. long.—Low grounds or sandy soil, Coastal Plain and Basin-and-Range Province, Fla. to Tex., and Calif. —(*W. I., Mex., C. A., S. A.*)—Spr.–fall.

7. V. xutha Lehm. Perennial, 5–15 dm. tall, coarsely hirsute: leaves 4–10 cm. long; blades incised-pinnatifid, or 3-parted on the lower part of the stem, the veins very prominent and hirsute beneath: spikes very long, not branched or but little so, proportionately slender: calyx becoming 4 mm. long; lobes converging over the nutlets: corolla purplish-lavender; limb 5–7 mm. wide: nutlets linear-cylindric, 2–2.25 mm. long.—Prairies, arroyos, stream banks, roadsides, waste-places, and bayou-banks, various provinces, Miss. to Tex. and Calif. Has been found on ballast at Mobile, Ala.—(*Mex.*)—Spr.–fall.

8. V. Halei Small. Biennial, 3–10 dm. tall, sparingly pubescent below: leaves 3–10 cm. long, pubescent, especially so beneath; blades of the lower leaves elliptic to ovate, deeply incised-pinnatifid, often 3-parted or incised-pinnate; those of the upper stem-leaves linear to linear-spatulate, sparingly toothed or entire: spikes slender, usually much-branched: calyx becoming 3–3.5 mm. long, strigillose: corolla deep-lavender; limb 4–5 mm. wide: nutlets linear-cylindric, about 2.5 mm. long.—Prairies, stream-banks, roadsides, waste-places and bayou-banks, various provinces, Miss. to Tex. and Okla.—Spr.–fall.

9. V. officinalis L. Annual, 2–6 dm. tall, glabrous or nearly so: leaves 2–6 cm. long; blades of the lower ones 1–2-pinnatifid and incised: spikes very slender: calyx 2 mm. long: corolla blue or purple; tube mostly less than 3 mm. long; lobes mainly rounded: nutlets broadly ellipsoid, about 1.5 mm. long.—(EUROPEAN-VERBENA.)—Roadsides, fields, and waste-places, various provinces, Fla. to Tex., Calif., and Tenn. Nat. of Eu.—(*W. I.*)—Spr.–fall.

10. V. riparia Raf. Annual, 6–15 dm. tall, sparingly pubescent: leaves 4–14 cm. long; blades of the lower ones 3-parted or 1–2-pinnatifid: spikes slender: calyx becoming 3 mm. long: corolla light blue; tube mostly over 3 mm. long; lobes emarginate or notched: nutlets ellipsoid, about 2 mm. long.—River banks, Piedmont, N. C. to N. J.—Spr.–sum.

11. V. bracteosa Michx. Annual, the prostrate or procumbent branches 1–5 dm. long, hirsute: leaves 1–6.5 cm. long; blades pinnatifid, 2–3 cm. long: spikes thick, sessile, continuous or mainly so: calyx becoming 3–4 mm. long: corolla purple or bluish; limb 2–2.5 mm. wide: nutlets linear, 2–2.5 mm. long. —Prairies, roadsides, fields, pastures, and waste-places, various provinces, Fla. to Tex., Calif., B. C., Minn., and Va.—Spr.–sum.—A verbena native in the Mediterranean region, *V. supina* L. with finely divided leaf-blades, short-bracts, and a calyx about equalling the very thick fruit, occurs on ballast at Mobile, Ala.

12. V. brasiliensis Vellozo. Annual, 6–25 dm. tall, finely pubescent above: leaves 3–8 cm. long; blades elliptic to linear-elliptic or lanceolate, sharply serrate at least above the middle: spikes not crowded: calyx becoming 3.5 mm. long or longer: corolla purple or lilac: limb about 2.5 mm. wide: nutlets narrowly ellipsoid, 1.5 mm. long.—Waste-places and dry sandy soil, Coastal Plain, La. Nat. of trop. Am.—Sum.

13. V. bonariensis L. Annual, 6–20 dm. tall, villous-hirsute above: leaves 4–10 cm. long; blades elliptic to elliptic-lanceolate, broadly serrate at least above

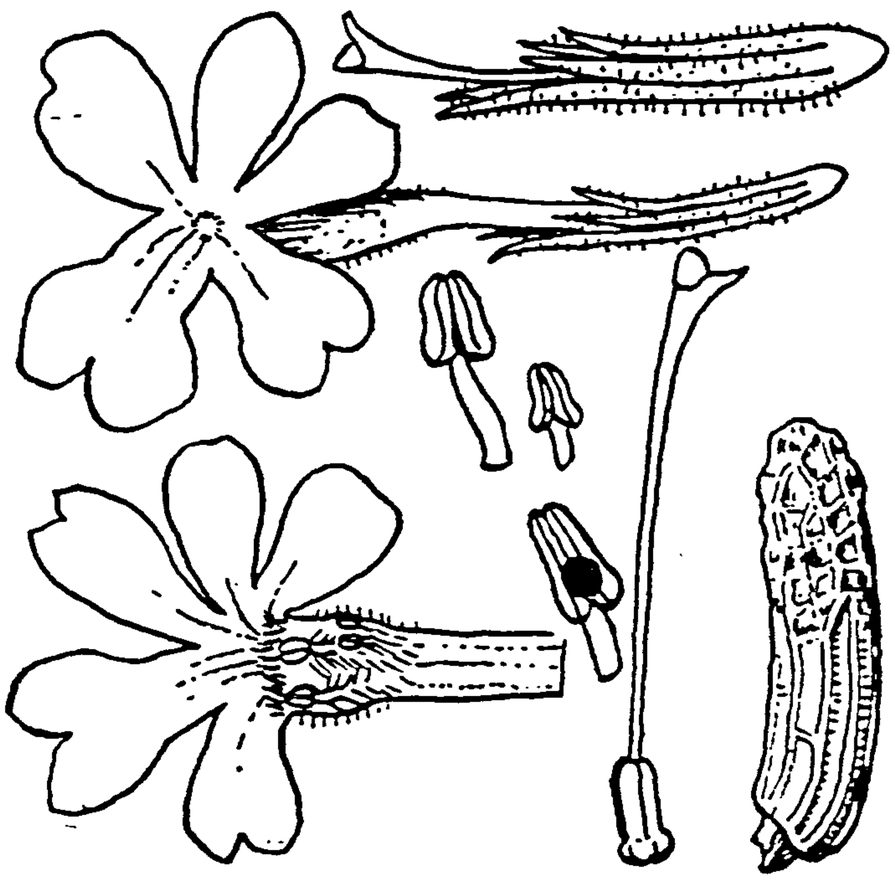
the middle: spikes crowded: calyx becoming 3.5 mm. long: corolla purplish, or rarely white: limb about 2 mm. wide: nutlets narrowly ellipsoid, 2 mm. long.—Waste-places, roadsides, and banks, Coastal Plain, Ala. to Ark. and S. C.—Nat. of S. Am.—Spr.–sum.—This and the following species are among the most conspicuous weeds of Louisiana.

14. V. rigida (L.) Spreng. Perennial, the stem and branches decumbent, 2–6 dm. tall, rough-pubescent: leaves 4–12 cm. long; blades obovate, oblanceolate, or spatulate at the base of the stem, elliptic to elliptic-lanceolate or lanceolate above, with flaring coarse teeth, prominently veined, sessile and partly clasping at the base: spikes stout, continuous: calyx becoming 4–5 mm. long: corolla deep-purple, rarely paler; tube fully twice as long as the calyx; limb 6–11 mm. wide: nutlets ellipsoid, 2 mm. long. [*V. venosa* Gillies & Hook.] —Waste-places, Coastal Plain, W Fla. to Tex. and N. C. Nat. of S. Am.—Spr.–sum.—This plant forms large, spreading patches of brilliant purple along roadsides and in waste-places in Louisiana and Texas.

3. GLANDULARIA J. F. Gmel. Annual or (ours) perennial herbs. Leaf-blades coarsely toothed to dissected. Flowers in depressed capitate spikes which elongate somewhat in age. Calyx tubular, 5-lobed. Corolla white or colored, salverform. Anthers of the longer stamens with an appendaged connective. Fruit an aggregate of 4 nutlets in the bottom of the calyx.—About 25 species, American.—VERBENAS.

Corolla rose-purple, pink, or white.
  Leaf-blades toothed, incised, lobed, or pinnatifid, the segments broad.
    Tip of the longer calyx-lobes subulate, 1 mm. long. 1. *G. maritima.*
    Tip of the longer calyx-lobes bristle-like, 2–3 mm. long.
      Leaf-blades pinnatifid or incised-pinnatifid: nutlets 2.5–3 mm. long, stout, pitted from near the base to the apex.
        Leaf-blades 1-pinnatifid: calyx 12 mm. long or more.
          Leaf-blades lanceolate to ovate-lanceolate, cuneate at the base. 2. *G. Lambertii.*
          Leaf-blades broadly ovate to deltoid, cordate or broadly truncate at the base. 3. *G. canadensis.*
        Leaf-blades 2-pinnatifid: calyx 10 mm. long or less. 4. *G. Drummondii.*
      Leaf-blades serrate or incised-serrate: nutlets about 4 mm. long, slender, pitted from about the middle to the apex. 5. *G. tampensis.*
  Leaf-blades pinnatisect, the segments narrowly linear to subulate. 6. *G. tenuisecta.*
Corolla red. 7. *G. peruviana.*

1. G. maritima Small. Stem and branches diffuse or widely creeping, 2–20 dm. long, often sparingly short-pubescent: leaf-blades cuneate to orbicular-obovate or ovate, 1–4 cm. long, incised, few-toothed, or lobed: calyx 10–12 mm. long, the larger lobes subulate-lanceolate: corolla rose-purple or bright-purple; tube 2 cm. long or nearly so: nutlets slender, about 4 mm. long. —Hammocks, pinelands, and Coastal sand-dunes, S pen. Fla.—All year.



2. G. Lambertii (Sims) Small. Stem and branches 3–6 dm. long, hirsute: leaf-blades typically lanceolate, sometimes ovate-lanceolate, 3–9 cm. long, incised-pinnatifid, acute or acuminate at the apex, cuneate at the base: calyx becoming 11–13 mm. long: corolla showy, rose-purple; tube about 1.5 cm. long; lobes rounded or slightly notched:

nutlets mostly 3 mm. long, evenly fine-pitted.—Open woods, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and S. C.—Spr.–sum.

3. **G. canadensis** (L.) Small. Stem and branches 3–6 dm. long, minutely pubescent: leaf-blades 3–8 cm. long, typically ovate or deltoid, incised-pinnatifid, rather rounded at the apex, truncate at the base: calyx becoming 13–16 mm. long: corolla showy, rose-purple; tube about 2 cm. long; lobes emarginate: nutlets about 3 mm. long, irregularly coarse-pitted. [*Verbena Aubletia* Jacq. *V. canadensis* Britton]—Prairies, roadsides, and thickets, various provinces, Fla. to Tex., Ill., and Va.—Spr.–sum.—Does not grow naturally in Canada.

4. **G. Drummondii** (Lindl.) Small. Stem and branches 2–4 dm. long, hirsute: leaf-blades 2–5 cm. long, ovate in outline, 2-pinnatifid, the segments typically narrow: calyx becoming 9–10 mm. long: corolla showy, rose-purple; tube about 1–1.5 cm. long; lobes commonly emarginate: nutlets about 3 mm. long, evenly fine-pitted. [*Verbena Drummondii* Baxt.]—Prairies, sandy bottoms, and woods, various provinces, La. to N. M., Kans., and Va.—Spr.–sum.

5. **G. tampensis** (Nash) Small. Stem and branches ascending or decumbent, 2–6 dm. long, usually minutely pubescent: leaf-blades lanceolate to elliptic or ovate, 2–8 cm. long, coarsely serrate or incised-serrate: calyx 12–15 mm. long, the longer lobes setaceous-subulate: corolla purple: tube fully 1.5 cm. long: nutlets 4 mm. long, coarsely pitted from the middle to the apex. [*Verbena tampensis* Nash]—Sandy hammocks, pen. Fla.—Spr.–fall.

6. **G. tenuisecta** (Briq.) Small. Stem and branches decumbent or procumbent, strigillose: leaf-segments narrowly linear to subulate, strigillose, diverging: calyx 9–10 mm. long; lobes short-setaceous: corolla small but showy, rose-purple, pink, or white; tube about 1 cm. long; lobes notched: nutlets 3.5 mm. long, pitted above the middle. [*Verbena tenuisecta* Briq.]—Sandy woods, clay soil and waste-places, Coastal Plain, Fla. and Ga. to La. Nat. of S. A.—Sum.–fall, or all year S.—This is the species commonly known as *Verbena erinoides* or MOSS VERBENA.

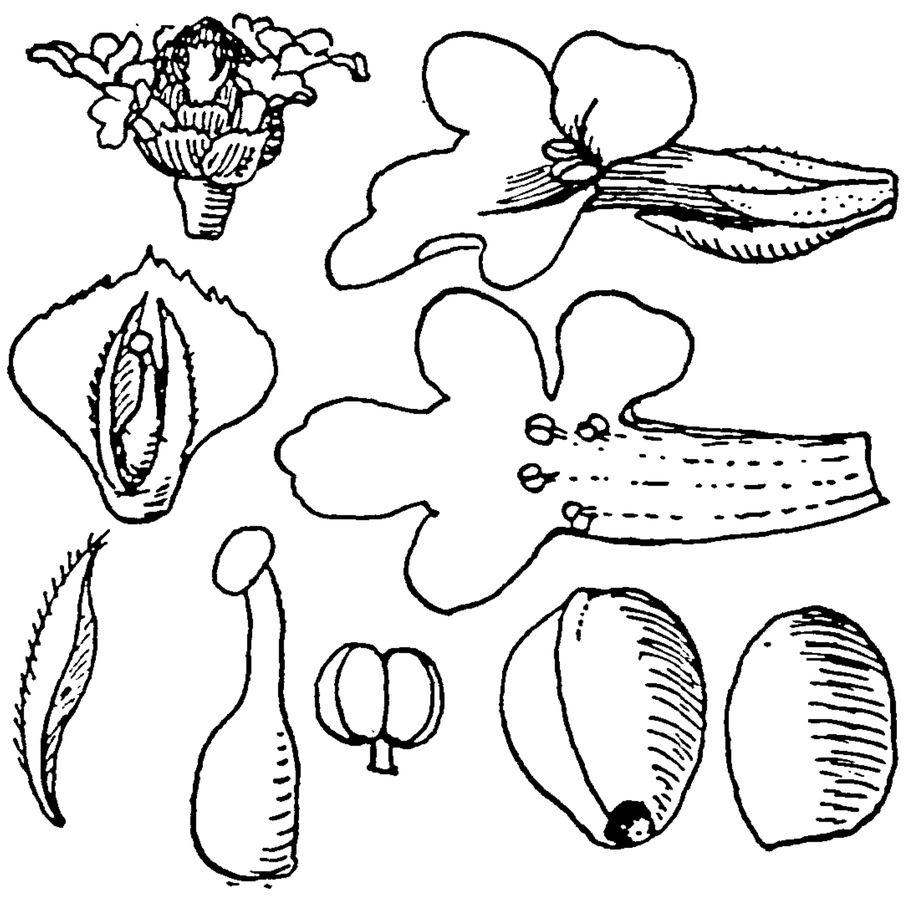
7. **G. peruviana** (L.) Small. Stem and branches decumbent and creeping, finely hirsute: leaf-blades ovate to elliptic-ovate, 1.5–5 cm. long, serrate, veiny: calyx about 1.5 cm. long, the larger lobes with short subulate tips: corolla red; tube about 2 cm. long; lobes notched: nutlets about 4 mm. long, striate-ribbed below the middle, cross-ribbed above it. [*Verbena chamaedrifolia* Juss.]—Hammocks and roadsides, pen. Fla. Nat. of S. Am.—(*W. I., Mex., C. A.*)—Spr.–fall.

4. **PHYLA** Lour. Perennial procumbent or creeping herbs. Leaf-blades toothed or lobed. Flowers in congested axillary spikes, the bracts cuneate to flabellate. Calyx short, flattened, 2-lobed. Corolla 2-lipped: tube slightly exceeding the calyx. Fruit as broad as long.—About 30 species, mostly in tropical America.—FOG-FRUITS. FROG-FRUITS.

Plant herbaceous: leaf-blades not rugose.
  Leaf-blades mostly broadest above the middle, toothed from above the middle to the apex: calyx-lobes shorter than the tube: fruit pubescent at the apex. 1. *P. nodiflora.*
  Leaf-blades mostly broadest below the middle, toothed from below the middle to the apex: calyx-lobes longer than the tube: fruit glabrous. 2. *P. lanceolata.*
Plant partly woody below: leaf-blades rugose. 3. *P. stoechadifolia.*

1. **P. nodiflora** (L.) Greene. Plants soft-strigillose, with creeping branches 2–13 dm. long: leaf-blades spatulate, 1–3 cm. long: spikes 10–30 mm. long:

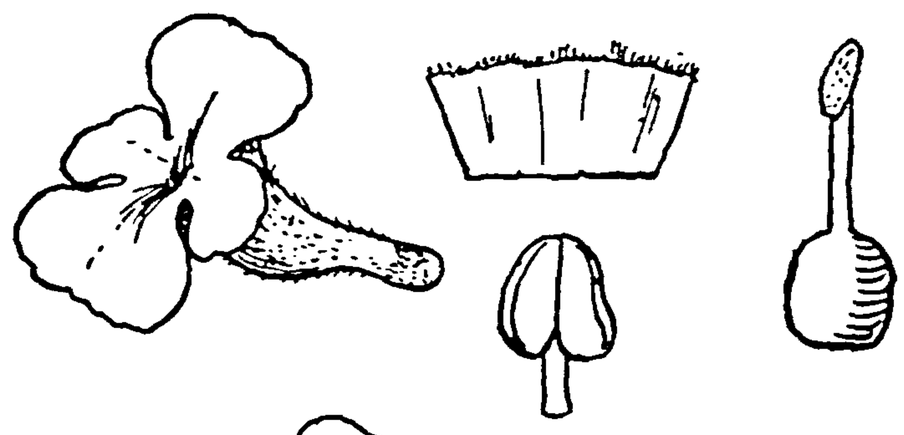
calyx about 2 mm. long: corolla purplish or nearly white, about 2 mm. long: fruits about 1 mm. long. [*Lippia nodiflora* Michx.] — (CAPE-WEED.) — Hammocks and low sandy places, Coastal Plain, Fla. to Tex., Mo., and N. C.—(*W. I., Mex., C. A., S. A.*) —All year.



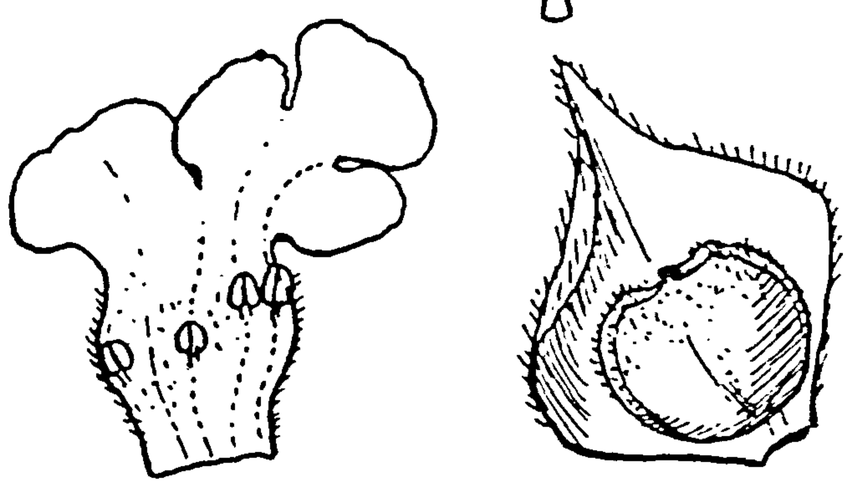
2. **P. lanceolata** (Michx.) Greene. Branches creeping, 1–4 dm. long: leaf-blades elliptic-lanceolate to lanceolate, 1.5–5 cm. long: spikes 9–15 mm. long; bracts erose-ciliolate: corolla bluish-white, about 3 mm. long. [*Lippia lanceolata* Michx.]— River-banks and shores, various provinces, Fla. to Tex., Minn., and N. J.—Spr.–sum.

3. **P. stoechadifolia** (L.) Small. Plant rough-strigillose, diffuse or with vine-like branches: leaf-blades thick, narrowly elliptic to lanceolate, 2–12 cm. long, acute, serrate, rugose, the veins impressed above, prominent beneath: heads globose or depressed, becoming cylindric, sometimes elongate: calyx 2–2.5 mm. long: corolla purplish, about 3 mm. long: fruit 1.5–2 mm. long. [*Lippia stoechadifolia* H.B.K.]—Prairies, Everglade Keys, Fla.—(*W. I.*)—All year.

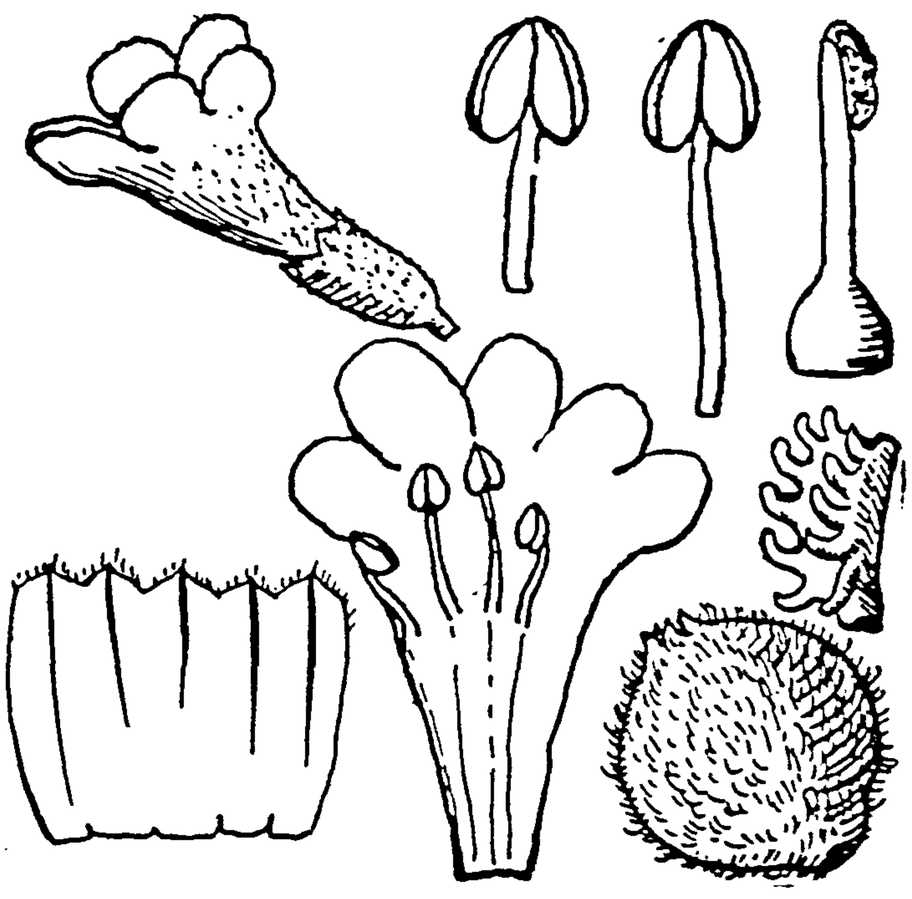
5. **GONIOSTACHYUM** Small. Shrubs or shrubby plants. Leaf-blades mostly toothed. Flowers in congested axillary spikes, the bracts 4-ranked, of an ovate type, keeled. Calyx flattened, 2-lobed. Corolla 2-lipped: tube glabrous within, much longer than the calyx.—Six or 8 species, in tropical America.



1. **G. citrosum** Small. Stems pale-gray or whitish: leaf-blades lanceolate to elliptic-lanceolate, 2.5–6 cm. long, shallowly serrate, pubescent: spikes depressed, short-peduncled, 4–6 mm. long: bracts ovate: calyx about 1 mm. long: corolla white, about 4.5 mm. long; limb about 3 mm. broad: nutlets 1.5 mm. wide.—Hammocks, Everglade Keys, Fla.—(*W. I.*)—All year.



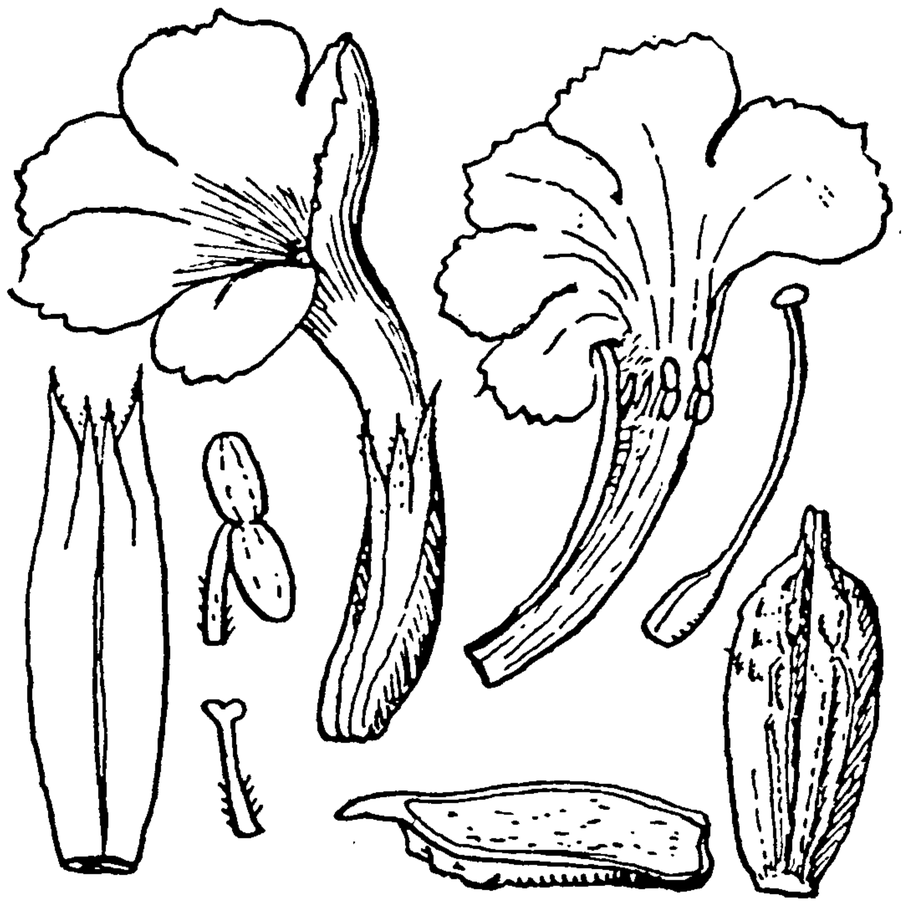
6. **PRIVA** Adans. Perennial herbs. Leaf-blades thin, toothed. Flowers in elongate slender spikes or racemes. Calyx 5-lobed. Corolla white or lavender, slightly 2-lipped. Stamens 4. Staminodia minute or obsolete. Nutlets tuberculate or spiny.—About 10 species, of tropical regions.



1. **P. lappulacea** (L.) Pers. Stems 2–6 dm. tall, pubescent: leaf-blades ovate, 2–10 cm. long, serrate: racemes loose-flowered: calyx with minute lobes: corolla-lobes rounded: fruit ovoid-pyramidal, included, the nutlets 3–4 mm. long, spiny-tuberculate. [*P. echinata* Juss.]—(VELVET-BUR.)—Hammocks and cult. grounds, Key West, Fla.—(*W. I., Mex., C. A., S. A.*).

Bonchea prismatica (Jacq.) Kuntze, an annual resembling *Valerianoides*, but with four perfect stamens, has been found on ballast at Mobile Bay.

7. **VALERIANOIDES** Boerh. Herbs, or shrubby plants. Leaf-blades toothed. Flowers sessile on a stout rachis or in excavations. Calyx often unequally 5-lobed, scarcely accrescent. Corolla white or colored, salverform, slightly 2-lipped. Stamens 2. Staminodia 2.—About 40 species, of tropic regions.



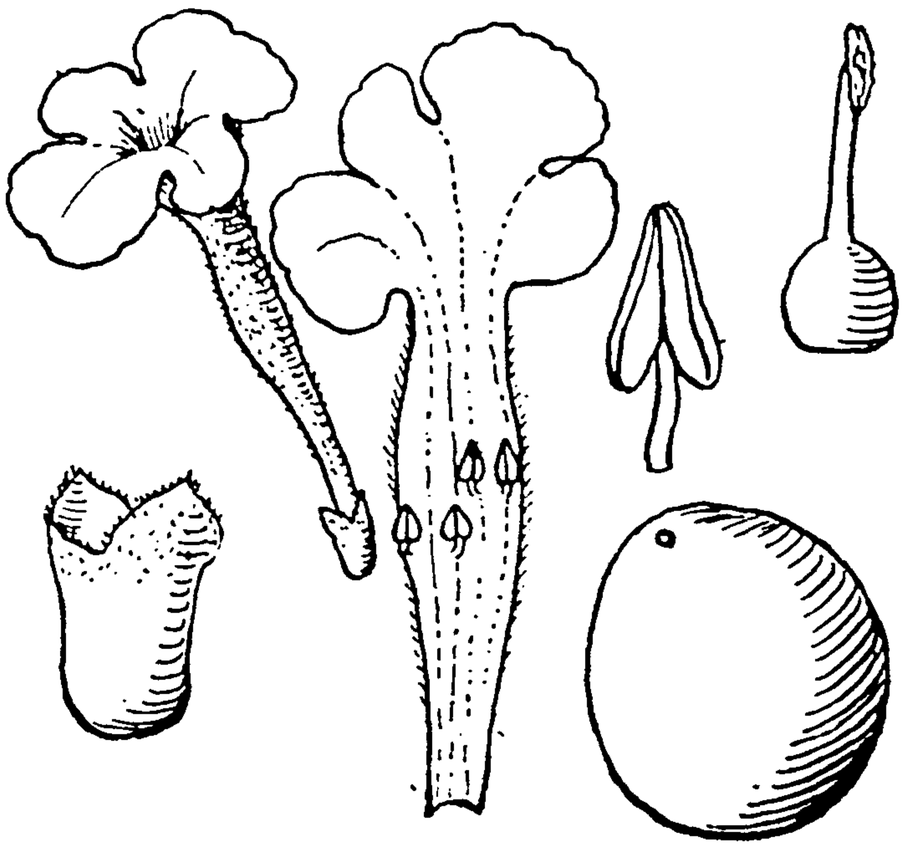
1. V. jamaicensis (L.) Kuntze. Plants with spreading or decumbent branches, 6–15 dm. long: leaf-blades elliptic, ovate, or oval, 2–8 cm. long: spikes virgate, quill-like: corolla blue-violet, 8–11 mm. long; limb 7–8.5 mm. wide. [*Stachytarpheta jamaicensis* (L.) Vahl]—Pinelands, coastal sand-dunes, and waste-places, S pen. Fla., Florida Keys, and S Ala.—(*W. I., Mex., C. A., S. A.*)

8. **LANTANA** L. Shrubs or rarely herbs, sometimes prickle-armed. Leaf-blades toothed. Flowers in congested, flat-topped spikes. Calyx shallowly 2–5-lobed or truncate. Corolla white or colored: tube slightly curved: limb irregular. Stamens 4. Drupes more or less juicy.—About 60 species, in warm and tropical regions.—Spr.–fall or all year S.—SHRUB-VERBENAS.

Flower-heads bracted, but not involucrate.
- Stem and branches prickle-armed: leaf-blades strigose: corolla-tube over 12 mm. long.
  - Stems and branches sparingly armed with weak more or less curved prickles: corollas yellow to orange. — 1. *L. Camara.*
  - Stems and branches copiously armed with stout, rigid, hooked prickles: corollas yellow to purple. — 2. *L. aculeata.*
- Stem and branches not prickle-armed: leaf-blades not strigose: corolla-tube 10 mm. long or less.
  - Plants with prostrate stems and branches: drupes 2.5–3.5 mm. long. — 3. *L. depressa.*
  - Plants with erect stems and branches: drupes 4–5 mm. long. — 4. *L. ovatifolia.*

Flower-heads decidedly involucrate.
- Leaf-blades acute or acutish, coarsely toothed: corolla-tube about 10 mm. long. — 5. *L. Sellowiana.*
- Leaf-blades rounded or retuse at the apex, crenulate: corolla-tube 2–4 mm. long. — 6. *L. involucrata.*

1. L. Camara L. Shrub with armed branches, 10–15 dm. tall: leaf-blades ovate to elliptic-ovate, 2–7 cm. long; corolla usually cream, yellow or pink, later changing to orange or scarlet; limb 6–8 mm. high.—Two forms of this species occur in Florida: one with acuminate leaf-blades, derived from plants commonly in cultivation apparently from the West Indies, the other a native plant with obtuse, relatively coarser-toothed leaf-blades.—In sandy soil, Coastal Plain, Fla. to Tex., and Ga.



2. L. aculeata L. Shrub with copiously and rigidly armed branches, 2.5 dm. tall or less: leaf-blades ovate, often broadly so, 3–6 cm. long: corolla yellow, changing to orange or purple; limb 7–9 mm. high.—Pinelands, and cult. grounds, pen. Fla. Nat. of W. I.

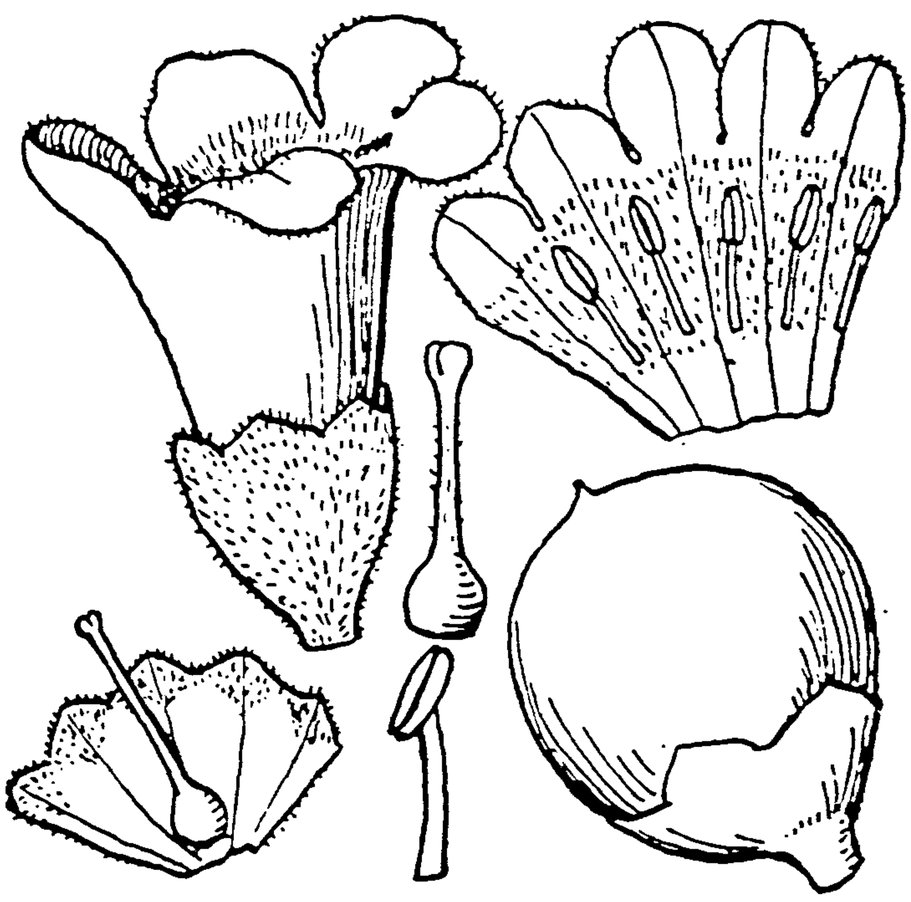
3. **L. depressa** Small. Shrub with unarmed prostrate branches, 2–11 dm. long: leaf-blades ovate to elliptic, 1–3.5 cm. long: spikes less than 2.5 cm. wide: corolla yellow; tube 5–6 mm. long; stone of the drupe globose, 2.5–3.5 mm. long, scarcely beaked.—Pinelands, Everglade Keys, Fla.

4. **L. ovatifolia** Britton. Shrub 2 m. tall or less: leaf-blades ovate, 3–7 cm. long, crenate-serrate: spikes over 2.5 cm. wide: corolla yellow; tube 9–10 mm. long: stone of the drupe ovoid, 4–5 mm. long, beaked.—Hammocks, S. pen. Fla.—(*W. I.*)

5. **L. Sellowiana** Link & Otto. Shrub 3–18 dm. tall, with tomentulose foliage: leaf-blades ovate, oval, or elliptic-ovate, 1–3 cm. long, abruptly narrowed or truncate at the base: corolla magenta or lilac; tube puberulent; limb 8–18 mm. high, the lower lobe elongate.—(POLECAT-GERANIUM. WEEPING-LANTANA.)—Roadsides, waste-places, pinelands, and woods, Fla. Nat. of S. A.—(*W. I.*)

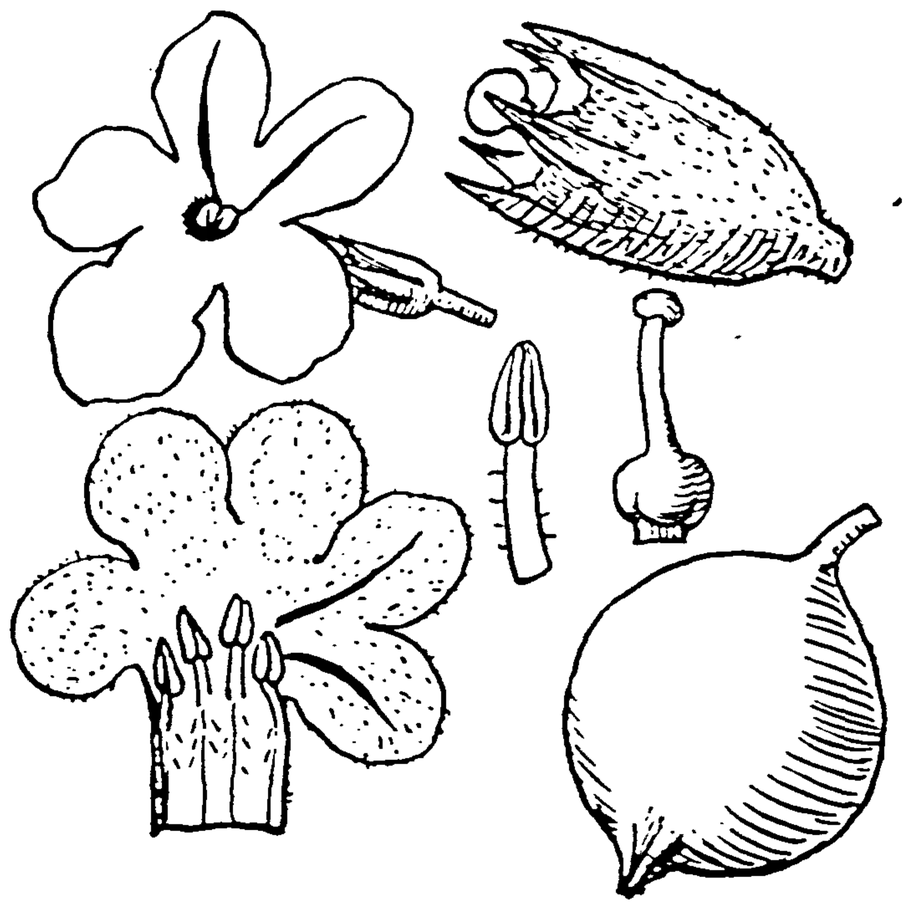
6. **L. involucrata** L. Shrub 4–17 dm. tall, with puberulent or tomentulose foliage: leaf-blades oval, obovate, to suborbicular, 1–3 cm. long, usually cuneate at the base: outer bracts of the involucre 4–7 mm. long, ciliolate: calyx becoming 1.5 mm. long: corolla white or pale-purple; tube 2–4 mm. long; limb 2–4 mm. high. [*L. odorata* L.]—(SAGE.)—Pinelands, hammocks, sand dunes, S pen. Fla. and Florida Keys; S Tex.—(*W. I., Mex., C. A., S. A.*)

9. **CITHAREXYLUM** L. Shrubs or trees, sometimes spiny. Leaf-blades mainly entire. Flowers in clusters or long spikes. Calyx obscurely 5-lobed. Corolla mainly white: tube straight or nearly so: limb slightly oblique, nearly equally 5-lobed. Staminodium present. Stigma 2-lobed. Nutlets 2.—About 20 species, tropic American.



1. **C. fruticosum** L. Shrub or small tree, with softly pubescent twigs: leaves 5–15 cm. long; blades elliptic or oblong-obovate, veiny: flowers in spikes or racemes: fruit black, 9–10 mm. in diameter. [*C. villosum* Jacq.] — (FIDDLEWOOD.) — Hammocks and pinelands, S pen. Fla. and Florida Keys.—(*W. I.*)—All year.

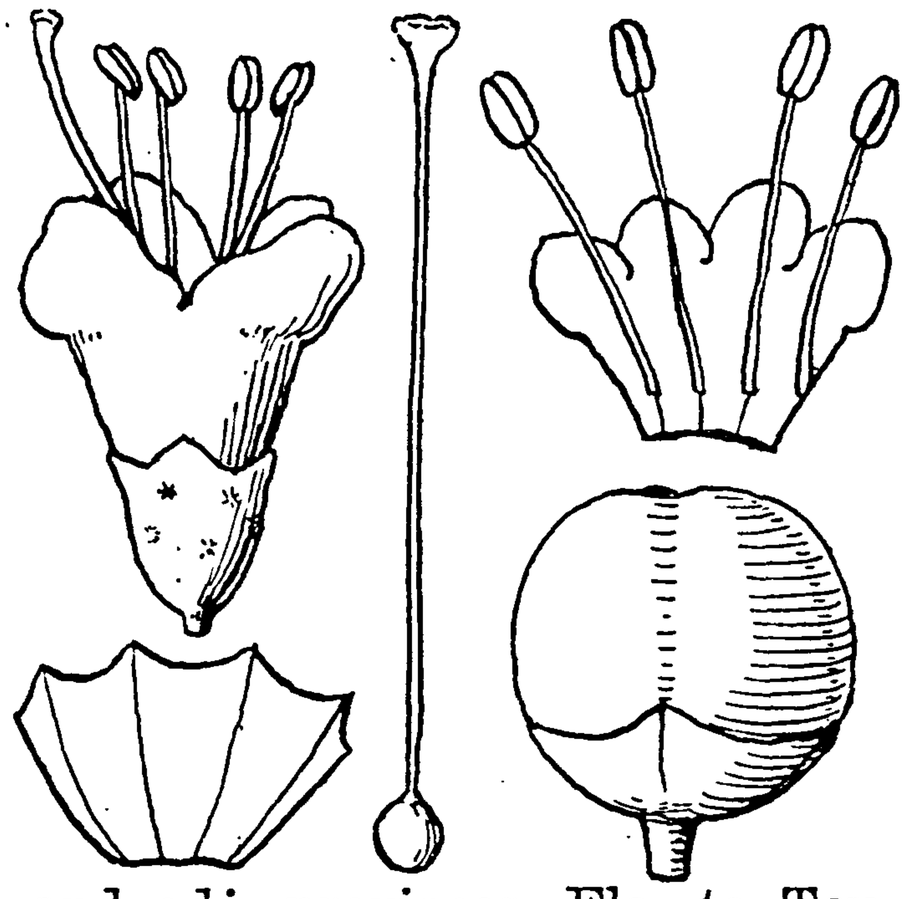
10. **DURANTA** L. Shrubs or trees, often spine-armed. Leaf-blades entire or toothed. Flowers in racemes. Calyx more or less prominently but minutely 5-lobed, the tube plicate. Corolla salverform or funnelform: tube mainly curved: limb slightly unequally 5-lobed, Staminodium mostly obsolete. Stigma 4-lobed or capitate. Nutlets 4. — About 8 species, tropic American.



1. **D. repens** L. Shrub or small tree: leaf-blades ovate-elliptic, oval or obovate, 1.5–5 cm. long: racemes 5–15 cm. long, recurving: calyx 3–4 mm. long, angled: corolla lilac or white; limb 7–9 mm. wide, the lobes ciliolate, the lower ones with magenta spots: fruit 7–11 mm. in diameter, enclosed in the

calyx. [*D. Plumieri* Jacq.]—(GOLDEN-DEWDROP.)—Hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I., Mex., C. A., S. A.*)—The accrescent calyx becomes golden-yellow.

11. CALLICARPA L. Shrubs or trees. Leaf-blades simple. Flowers in axillary cymes. Calyx shallowly 4-lobed or nearly truncate. Corolla white or colored, rotate-funnelform or funnelform, typically 4-lobed, the tube straight. Filaments adnate to the corolla-tube, glabrous. Stigmas stout. Drupe very juicy.—About 35 species, American, Asiatic, and African.—BEAUTY-BERRIES.



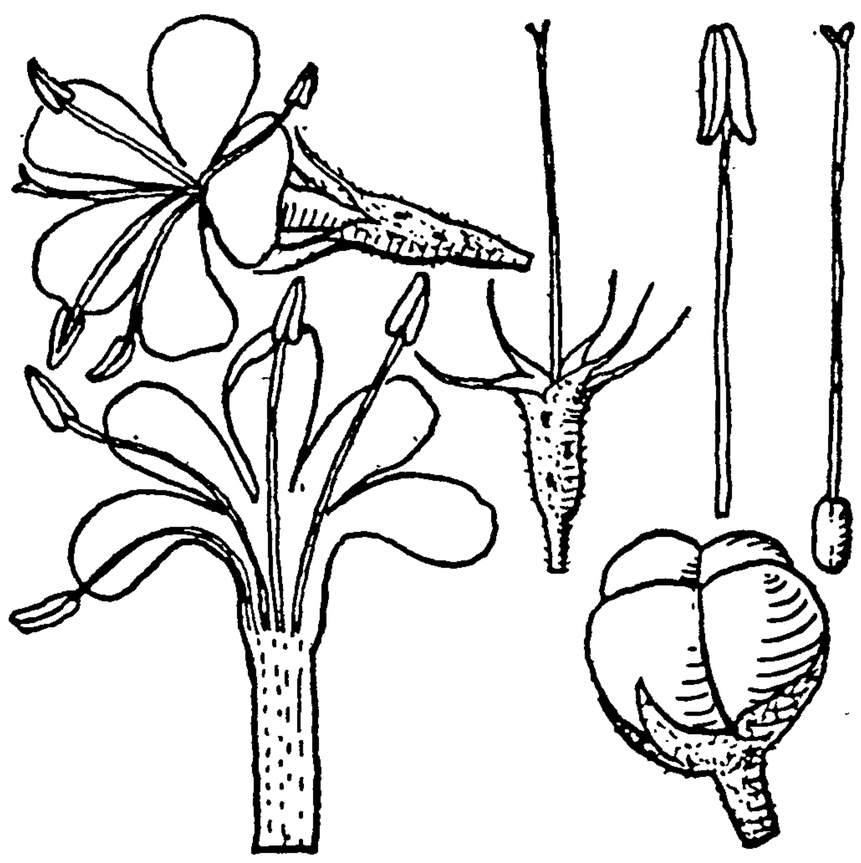
1. C. americana L. Shrub 1–2 m. tall, or a vine, stellate-pubescent: leaf-blades ovate, elliptic or oval, serrate: calyx 1–1.5 mm. long: corolla bluish or pink; limb about 5 mm. wide, the rounded lobes apiculate: fruit violet or magenta, 4–5 mm. in diameter.—(FRENCH-MULBERRY.)—Woods, thickets, hammocks and pinelands, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and S Va.—Spr.–fall, or all year northward.—There are white-flowered forms.

12. CLERODENDRON [Burm.] L. Shrubs or trees, or half-shrubs. Leaves opposite: blades simple, toothed. Flowers in dense terminal cymes. Calyx prominently 5-lobed. Corolla white or highly colored, funnelform or salverform: tube slightly curved: limb 5-lobed. Filaments adnate to above the middle of the corolla-tube. Stigmas slender. Drupe lobed or ribbed.—About 100 species, in tropical regions.—GLORYBOWERS.—Spr.–fall, or all year S.

Corolla-tube slightly exceeding the calyx: calyx-lobes as long as the tube or longer. 1. *C. fragrans.*

Corolla-tube several times longer than the calyx: calyx-lobes shorter than the tube. 2. *C. foetidum.*

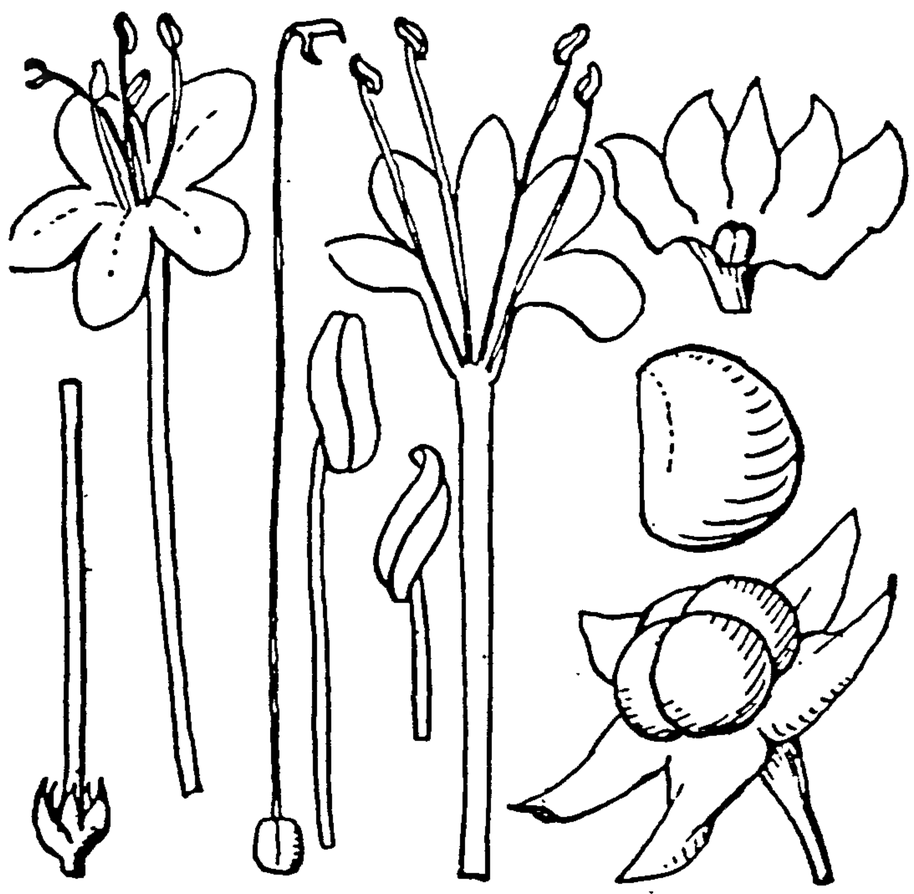
1. C. fragrans Vent. Shrub 1–3 m. tall: leaf-blades ovate to deltoid, 9–25 cm. long, mostly abruptly pointed, coarsely and irregularly toothed, finely pubescent beneath, truncate or shallowly cordate at the base, long-petioled: cymes congested: calyx 15–19 mm. long; lobes subulate or subulate-lanceolate, acuminate, ciliate: corolla 22–28 mm. long; lobes nearly as long as the tube, or shorter, white or blue-tinged.—Mostly represented by the form with double-flowers.—Thickets, roadsides, and waste-places, Fla. Nat. of eastern Asia.—(*W. I.*)



2. C. foetidum Bunge. Shrub 1–2 m. tall: leaf-blades deltoid-ovate, 6–15 cm. long, acute or slightly acuminate, serrate or serrate-dentate, mostly truncate at the base, long-petioled: cymes rather compact: calyx 5–6 mm. long; lobes triangular-lanceolate,

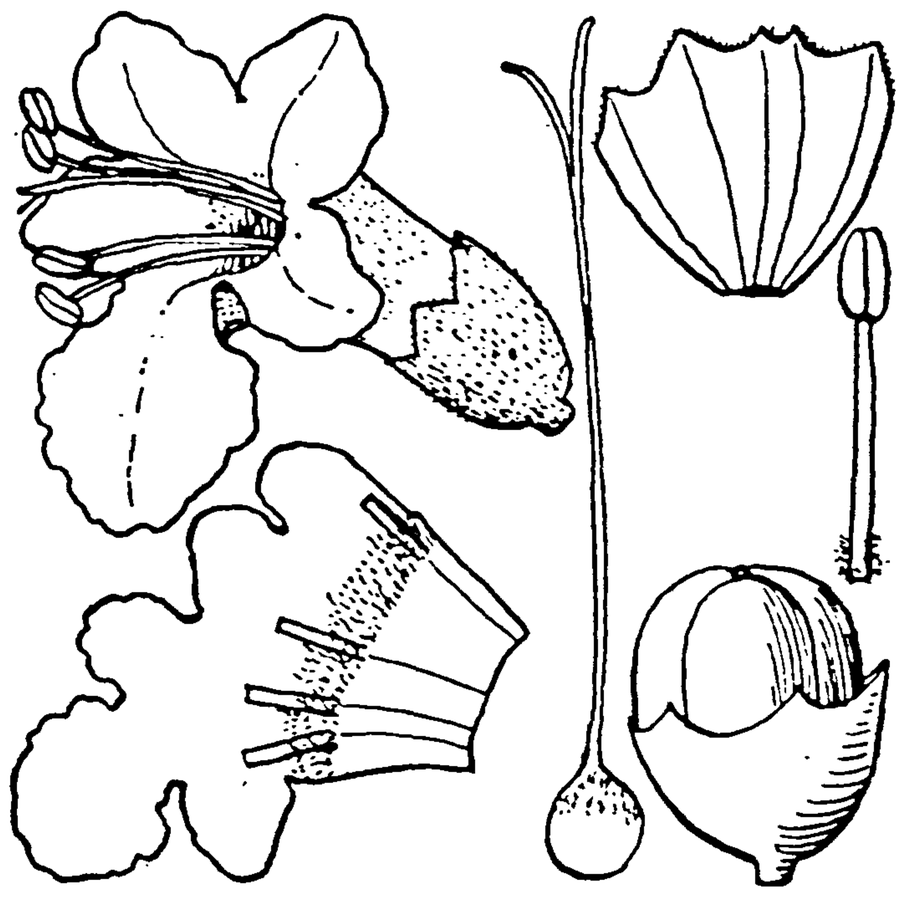
shorter than the tube: corolla 18–22 mm. long; tube very slender; lobes lilac or red-purple.—Fields and roadsides, Coastal Plain, N Fla. to La. Nat. of China.

13. SIPHONANTHUS L. Shrubs or half-shrubs. Leaf-blades simple, entire. Flowers in axillary cymes, sometimes aggregated in a panicle. Calyx loosely spreading. Corolla white or nearly so, slender-funnelform, 5-lobed, the tube curved. Filaments adnate to the middle of the corolla-tube. Stigmas slender. Drupe lobed.—About 6 species, natives of the Old World tropics.



1. S. indicus L. Plant 1–4 m. tall, the twigs glabrous: leaf-blades oblanceolate or elliptic oblanceolate to elliptic, 5–16 cm. long, entire, glabrous, short-petioled: calyx 13–16 mm. long; lobes ovate, obtuse: corolla 12–14 cm. long; lobes 12–15 mm. long: drupe 8–10 mm. long.—(TURK'S-TURBAN.)—Waste-places, roadsides, and woods, Coastal Plain, Fla. to Tex. and S. C. Nat. of E. I. and cult.—(*W. I., Mex., S. A.*)—The black fruits are conspicuous.

14. VITEX L. Shrubs or trees. Leaf-blades digitately compound or rarely 1-foliolate. Flowers in open terminal compound cymes. Calyx shallowly 3-lobed or 5-lobed. Corolla white or colored, funnelform, 2-lipped, the tube slightly curved. Filaments adnate to about the middle of the corolla-tube, pubescent at the base.—About 60 species, widely distributed in warm regions.

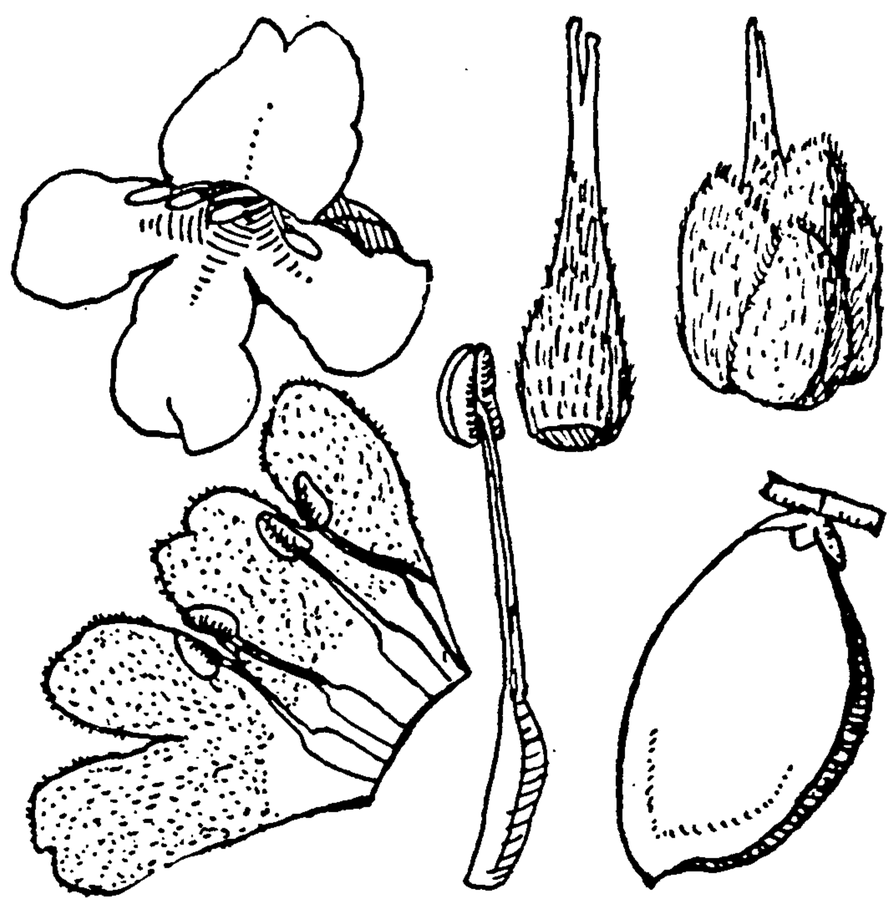


1. V. Agnus-Castus L. Shrub 1–3 m. tall, pale-pubescent: leaf-blades 7-foliolate, the leaflets with linear to linear-elliptic blades 2–10 cm. long: flowers separated: calyx 2–2.5 mm. long, campanulate: corolla blue or purplish; limb 5–6 mm. broad: fruits 3.5–4 mm. long.—(CHASTE-TREE.)—Roadsides, waste-places, and about gardens, Coastal Plain, Fla. to Tex., and N. C. Nat. of Old World, and cult.—(*W. I.*)—Spr.–fall.

FAMILY 11. AVICENNIACEAE — BLACK-MANGROVE FAMILY

Shrubs or trees of maritime regions, the branches terete, nodose. Leaves opposite, persistent: blades entire. Flowers in axillary and terminal small, long-peduncled cymes. Calyx of 5 nearly distinct sepals. Corolla of 4 partially united petals, campanulate-rotate. Androecium of 4 stamens, the filaments adnate to the lower part of the corolla-tube. Gynoecium of 2 united carpels. Fruit a compressed oblique capsule.—Only the following genus and 3 species, in tropical regions.

1. AVICENNIA L. Leaf-blades thick. Cymes peduncled. Calyx subtended by small bracts. Corolla inconspicuous, the tube and spreading lobes about equal in length. Stamens erect. Stigmas 2. Capsule thick-walled.

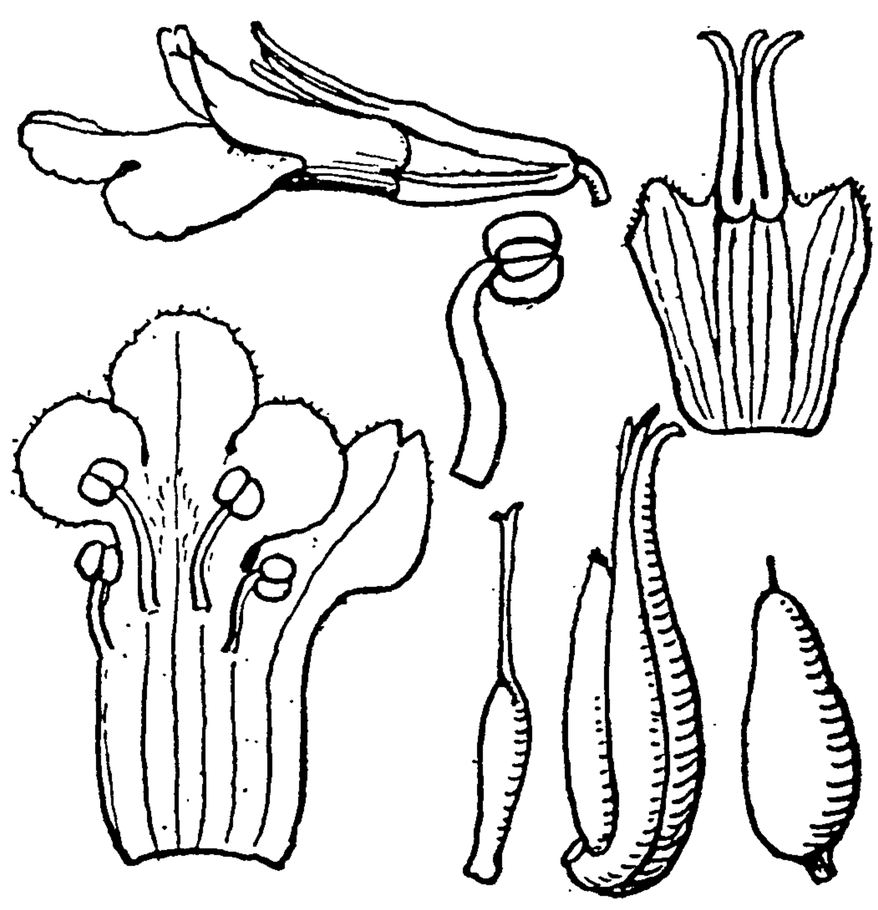


1. A. nitida Jacq. Shrub, or tree sometimes 25 m. tall: leaf-blades leathery, elliptic or nearly so, 3–8 cm. long, dark-green above, pale, minutely canescent beneath: calyx 3–4 mm. long: corolla white; lobes longer than the tube, broadly rounded or retuse: fruit ellipsoid, 3–5 cm. long, acutish. —(BLACK-MANGROVE.)—Sandy shores and coastal hammocks, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)—All year.

FAMILY 12. PHRYMACEAE — LOPSEED FAMILY

Perennial herbs, with angled stems. Leaves opposite: blades toothed. Flowers in slender spikes or spike-like racemes. Calyx of 5 partially united sepals, 2-lipped, the lower lip very short. Corolla white and magenta-tinged, of 5 partially united petals, 2-lipped, the lower lip 3-lobed. Androecium of 4 didynamous stamens. Gynoecium of 2 united carpels. Fruit an achene included in the deflexed accrescent calyx. Comprises only the following genus.

1. PHRYMA L. Caulescent herbs with spreading branches. Leaf-blades broad, coarsely toothed, petioled. Spikes or racemes elongate, the small flowers opposite. Achene in the bottom of the calyx. This genus is sometimes included in the Verbenaceae.



1. P. leptostachya L. Stems 3–10 dm. tall, sparingly branched above, reflexed-pubescent: leaf-blades ovate to elliptic-ovate or ovate-lanceolate, 3–15 cm. long: calyx 3–5 mm. long, accrescent; tube ribbed, little longer than the slender upper lobes during anthesis: corolla white and magenta-tinged, about 8 mm. long: achenes 4–5 mm. long. —(LOPSEED.)—Rich woods and thickets, various provinces, Fla., to Tex., Man., and N. B.—Sum.–fall. The same or a closely related species grows in eastern Asia.

FAMILY 13. LAMIACEAE — MINT FAMILY

Herbs or woody plants, often aromatic. Stems 4-sided. Leaves opposite or whorled: blades simple, entire, toothed, or lobed. Flowers perfect, in open or compact cymes. Calyx of 5 partially united sepals, regular or 2-lipped. Corolla of 5 partially united sepals, 2-lipped or nearly regular. Androecium of 2–4 stamens, the pairs often irregular. Gynoecium 2-carpellary. Ovary 4-celled. Fruit of 4 nutlets included

in the calyx.—About 160 genera and 3,200 species, widely distributed in tropical and temperate regions. The foliage sometimes abounds in volatile oils.

Ovary of 4 united carpels, merely 4-lobed: style not basal: nutlets laterally or obliquely attached. Tribe I. AJUGEAE.
Ovary of 4 distinct or nearly distinct carpels: style basal: nutlets basally attached.
  Calyx with a crest on the upper side or on the upper lip, the broad lips entire, closed in fruit. II. SCUTELLARIEAE.
  Calyx without a crest on the upper side, the lips more or less lobed.
    Stamens included.
      Calyx with 10 narrow spreading or recurved lobes: corolla-tube included in the calyx: *Marrubium* in III. STACHYDEAE.
      Calyx 2-lipped, the upper lip truncate or with 3 broad lobes, the lower lip with 2 narrow lobes: corolla-tube exserted from the calyx. *Dicerandra odoratissima* in V. SATUREIEAE.
    Stamens exserted.
      Corolla conspicuously 2-lipped: lips different, the upper concave.
        Anther-bearing stamens 4. III. STACHYDEAE.
        Anther-bearing stamens 2. IV. MONARDEAE.
      Corolla nearly regular, or if 2-lipped, the upper lip flat.
        Stamens 2 or 4; filaments straight and spreading, or converging under the upper lip of the corolla. V. SATUREIEAE.
        Stamens 4, didynamous; lower pair longer, lying on the lower lip of the corolla. VI. OCIMEAE.

I. AJUGEAE

Corolla markedly irregular, the middle lobe of the lower lip quite different from the other lobes: calyx 2-lipped.
  Corolla strongly bilateral, the upper lip split, very small, the lower lip large: stamens and style nearly straight. 1. TEUCRIUM.
  Corolla slightly bilateral, the middle lobe of the lower lip strongly declined: stamens and style strongly curved or coiled. 2. TRICHOSTEMA.
Corolla slightly irregular, the lobes of both lips nearly equal, spreading: calyx nearly regular. 3. ISANTHUS.

II. SCUTELLARIEAE

Perennial or rarely annual scentless herbs, with opposite leaves and more or less 1-sided racemes or panicles. 4. SCUTELLARIA.

III. STACHYDEAE

Stamens included. 5. MARRUBIUM.
Stamens exserted.
  Upper pair of filaments longer than the lower.
    Anther-sacs parallel or nearly so.
      Upper pair of stamens declined, lower pair ascending: erect herbs. 6. AGASTACHE.
      Upper and lower pair of stamens ascending: trailing herbs. 7. MEEHANIA.
    Anther-sacs diverging.
      Flowers in terminal raceme-like panicles: erect herbs. 8. NEPETA.
      Flowers in axillary clusters: creeping herbs. 9. GLECOMA.
  Upper pair of filaments shorter than the lower.
    Calyx manifestly 2-lipped.
      Upper lip of the calyx broad, with 3 lobes, the lower with 2 tooth-like lobes. 10. PRUNELLA.
      Upper lip of the calyx narrow, entire, the lower lip of 2 equal broad lobes. 11. MACBRIDEA.
    Calyx not 2-lipped, often slightly irregular, but the lobes essentially similar.
      Tube of the calyx faintly nerved, inflated at maturity.
        Calyx-lobes 5. 12. DRACOCEPHALUM.
        Calyx-lobes 4. 13. SYNANDRA.

Tube of the calyx prominently 5–10-nerved, not inflated at maturity.
Anther-sacs transversely 2-valved. 14. GALEOPSIS.
Anther-sacs not transversely 2-valved.
Nutlets 3-sided, truncate above.
Calyx-lobes not spine-tipped. 15. LAMIUM.
Calyx-lobes spine-tipped.
Calyx-lobes 5. 16. LEONURUS.
Calyx-lobes 8–10. 17. LEONOTIS.
Nutlets nearly terete, rounded above. 18. STACHYS.

IV. MONARDEAE

Connective of the anther elongate, bearing a perfect sac at one end and a rudimentary one at the other: calyx-throat glabrous or merely ciliate at the base of the lobes. 19. SALVIA.
Connective short: anther-sacs confluent.
Calyx not 2-lipped; tube 15-ribbed; teeth nearly equal. 20. MONARDA.
Calyx 2-lipped; tube 13-ribbed; teeth unequal. 21. BLEPHILIA.

V. SATUREIEAE

Flowers in axillary whorls or clusters; these sometimes forming terminal spike-like racemes or panicles.
Corolla 2-lipped.
Filaments curved, converging under the upper lip of the corolla.
Anther-bearing stamens 2.
Calyx gibbous; throat closed by hairs: corolla without folds in the throat. 22. HEDEOMA.
Calyx not gibbous; throat not closed by hairs: corolla with 2 folds in the throat. 23. STACHYDEOMA.
Anther-bearing stamens 4.
Corolla-tube strongly bent.
Anther-sacs divergent. 24. MELISSA.
Anther-sacs parallel. 25. CONRADINA.
Corolla-tube straight.
Calyx with 5 nearly equal lobes, not or scarcely 2-lipped.
Calyx-tube 10-ribbed. 26. PYCNOTHYMUS.
Calyx-tube 13-ribbed. 27. MICROMERIA.
Calyx 2-lipped.
Anther-sacs awnless. 28. CLINOPODIUM.
Anther-sacs awned. 29. DICERANDRA.
Filaments straight, often spreading.
Calyx-tube 15-nerved. 30. HYSSOPUS.
Calyx-tube 10–13-nerved.
Anther-bearing stamens 4.
Anther-sacs divergent.
Calyx equally 5-lobed: erect herbs. 31. ORIGANUM.
Calyx 2-lipped: creeping herbs. 32. THYMUS.
Anther-sacs parallel. 33. KOELLIA.
Anther-bearing stamens 2. 34. MAPPIA.
Corolla nearly regular, with 4–5 lobes.
Anther-bearing stamens 2: foliage barely aromatic. 35. LYCOPUS.
Anther-bearing stamens 4: foliage strongly aromatic. 36. MENTHA.
Flowers in loose terminal panicles.
Lower lip of the corolla fringed: native plants.
Anther-bearing stamens 4. 37. MICHELIELLA.
Anther-bearing stamens 2. 38. COLLINSONIA.
Lower lip of the corolla not fringed: naturalized plant. 39. PERILLA.

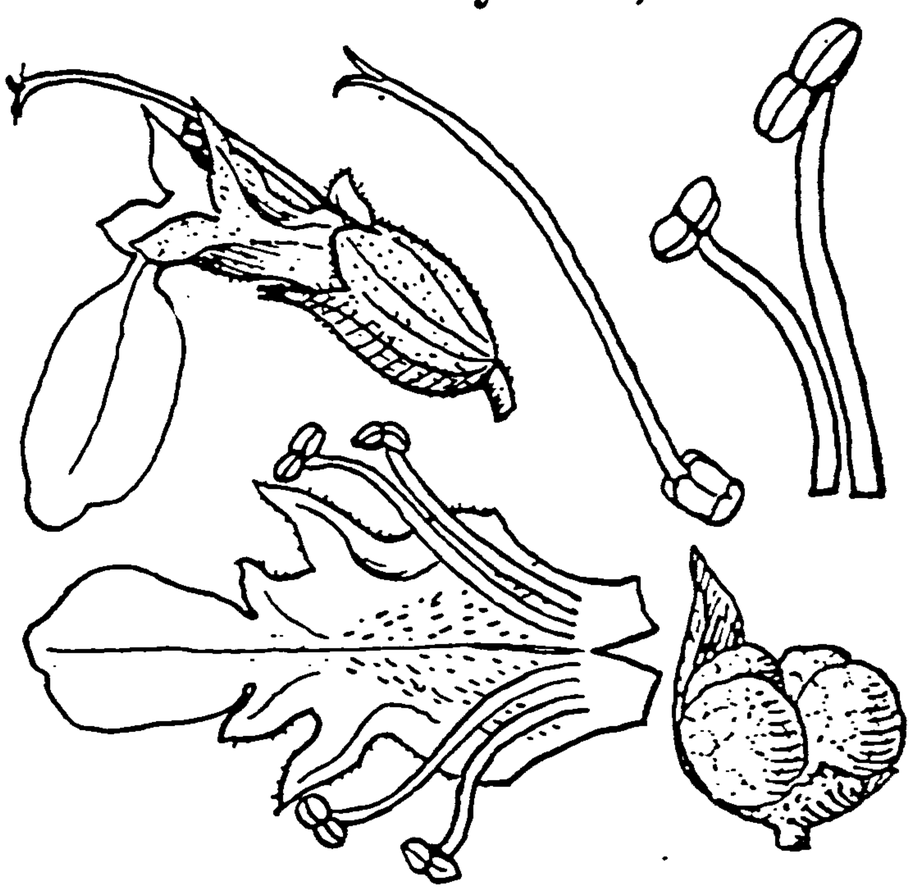
VI. OCIMEAE

Calyx with nearly equal lobes: corolla with a saccate drooping lower lip. 40. HYPTIS.
Calyx with a broad decurrent upper lobe: corolla-lips nearly equal in length. 41. OCIMUM.

1. **TEUCRIUM** [Tourn.] L. Perennial strict herbs. Leaf-blades toothed Flowers in raceme-like panicles. Calyx 2-lipped. Corolla mainly pink, very irregular: upper lip minute, split: lower lip 3-lobed, projecting beyond the upper one: tube relatively long. Stamens lying against the upper side of the corolla.—More than 100 species, widely distributed.—WOOD-SAGES. GERMANDERS.

Leaf-blades mainly rounded at the base: stem closely canescent: broader calyx-lobes acute or acutish. 1. *T. canadense.*
Leaf-blades mainly narrowed at the base: stem downy-canescent: broader calyx-lobes obtuse.
Calyx prominently ribbed at maturity: corolla glandular-puberulent. 2. *T. Nashii.*
Calyx not ribbed at maturity: corolla pubescent. 3. *T. littorale.*

1. T. canadense L. Stem 2–12 dm. tall: leaf-blades relatively thin, ovate to elliptic-ovate, 6–14 cm. long, pubescent beneath: calyx becoming 6–8 mm. long; lower lobes acuminate: corolla purplish or pink, 15–20 mm. long: nutlets about 2.5 mm. long, wrinkled.—Low grounds, fields, river-banks, and roadsides, various provinces, Ga. to Tex., Minn., and Me.—Sum.



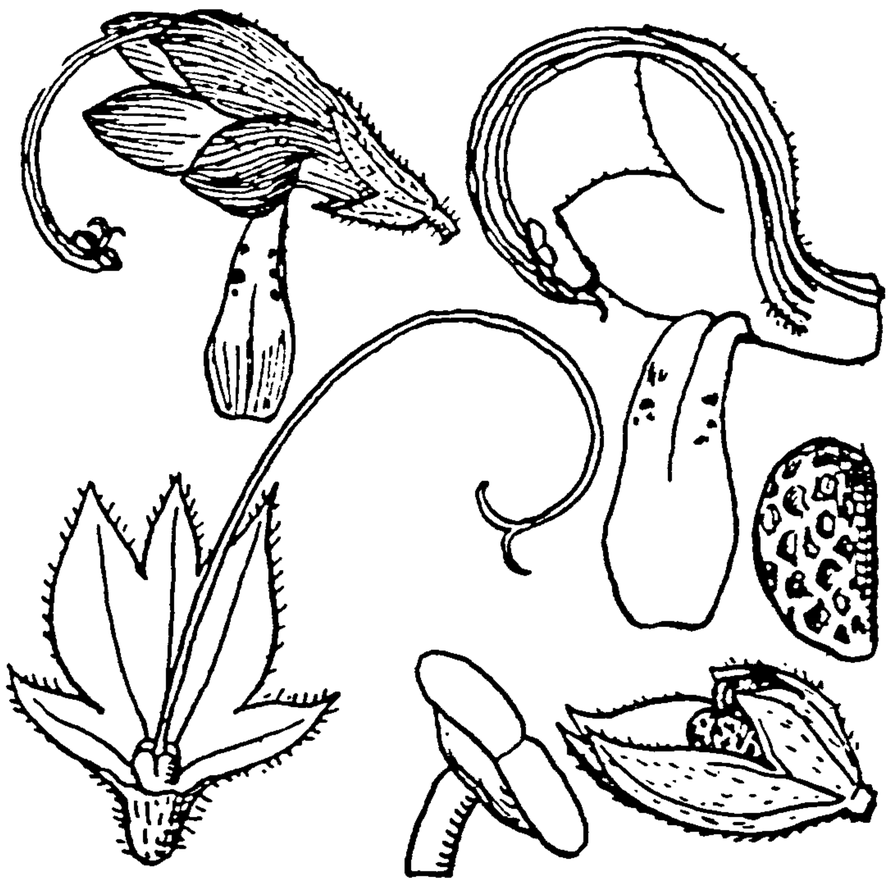
2. T. Nashii Kearney. Stem 3–14 dm. tall: leaf-blades narrowly elliptic to lanceolate, 4–14 cm. long, whitish-pubescent beneath: calyx becoming 6–7 mm. long; lower lobes blunt: corolla pink, 15–20 mm. long.—Hammocks, thickets, and wet grounds, often in calcareous soil, Coastal Plain, Fla. to Tex., and S. C.—Spr.–fall or all year S.

3. T. littorale Bicknell. Stem 3–5 dm. tall: leaf-blades narrowly elliptic to elliptic-lanceolate, 6–11 cm. long, pale or whitish-pubescent beneath: calyx becoming 5–6 mm. long; lower lobes acute: corolla pale-pink, 15–17 mm. long: nutlets 2 mm. long.—Low sandy soil, Coastal Plain and New England coast, Fla. to Me.—Sum.

2. TRICHOSTEMA L. Annual or perennial herbs or shrubby plants. Leaf-blades entire or repand. Flowers in axillary cymes. Calyx very irregular, 2-lipped. Corolla somewhat 2-lipped, the upper arching, sometimes surpassing the lower lip. Stamens lying against the lower corolla-lip.—About 10 species, North American.—The calyx becomes inverted in fruit.

Annual plant: leaf-blades of a linear or elliptic type.
Foliage viscid-pubescent: leaf-blades elliptic or lanceolate. 1. *T. dichotomum.*
Foliage glabrous or viscid-puberulent: leaf-blades linear. 2. *T. lineare.*
Perennial or biennial plant: leaf-blades of an obovate type. 3. *T. suffrutescens.*

1. T. dichotomum L. Plant 1–20 dm. tall: leaf-blades elliptic to broad-lanceolate, 2–7 cm. long: calyx becoming 5–6 mm. long; lobes acuminate: corolla blue to white, about 5 mm. long: nutlets 1.5–2 mm. long.—(BASTARD-PENNYROYAL. BLUE-CURLS.)—Dry fields, thickets, hammocks and pinelands, various provinces, Fla. to Tex., Mo., and Me.—Sum., or all year S.

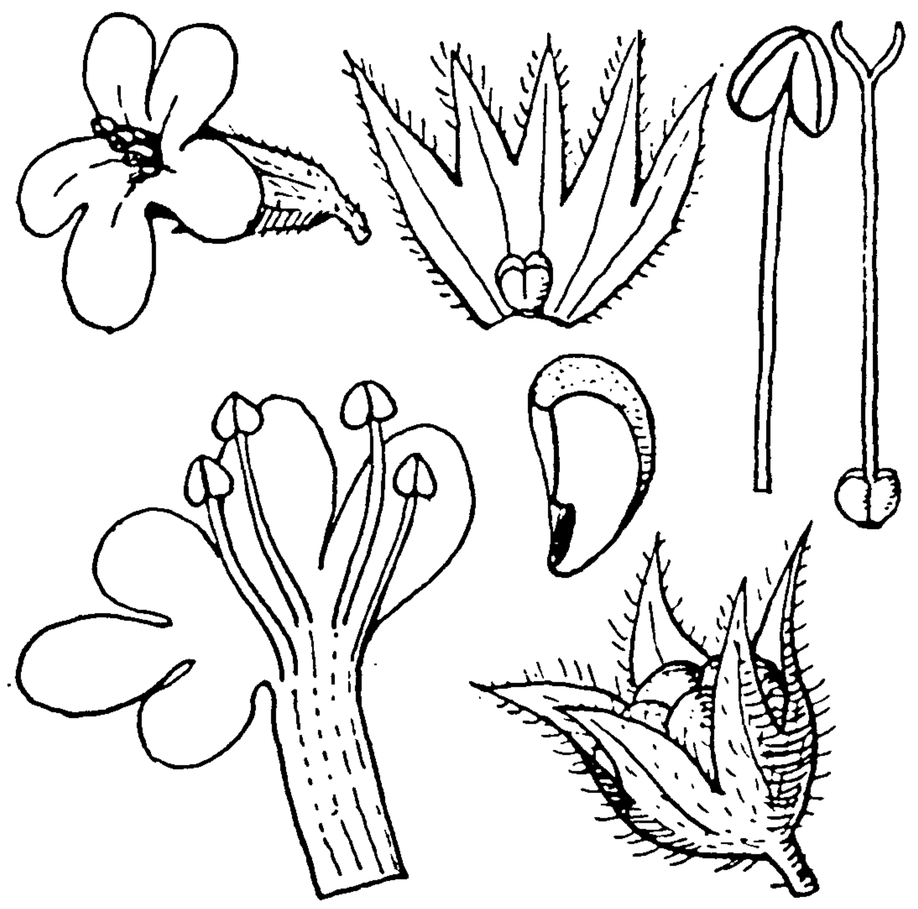


2. T. lineare Nutt. Plant 1–3 dm. tall: leaf-blades linear, 1–4 cm. long: calyx becoming 5–6 mm. long; corolla blue, sometimes pale, 6–10 mm. long: nutlets 1.5 mm. long.—Sandy soil, fields, thickets, Coastal Plain, and New England coast, Fla. to La., and Conn.—Sum.

3. T. suffrutescens Kearney. Plant 2–4 dm. tall: leaf-blades obovate to oblong-obovate,

0.5–1.5 cm. long: calyx becoming 5–6 mm. long; corolla deep-blue, 6–8 mm. long: nutlets 1.5 mm. long.—Scrub, Fla.—Spr.

3. **ISANTHUS** Michx. Annual herbs. Leaf-blades entire or sparingly toothed. Flowers in axillary cymes. Calyx nearly regular. Corolla nearly regular, the lobes spreading. Stamens slightly ascending.—One species.



1. I. brachiatus (L.) B.S.P. Plant 1–4 dm. tall, viscid-pubescent: leaf-blades elliptic to linear-elliptic, 1–4 cm. long: calyx becoming 5–6 mm. long; lobes lanceolate to triangular-lanceolate: corolla blue; lobes mainly ovate: nutlets 2–2.5 mm. long. [*I. caerulcus* Michx.] — FALSE-PENNYROYAL. — Sandy soil along streams, dry fields, and calcareous rocks, various provinces, Ga. to Tex., Minn., and Que.—Sum.—This plant often acts after the manner of a fire-weed, taking almost complete possession of recently abandoned fields, especially on stony hillsides.

4. **SCUTELLARIA** L.[1] Annual or perennial herbs or shrubby plants. Leaf-blades entire or toothed. Flowers axillary or in racemes, variously colored, blue, violet, or white in our species. Calyx 2-lipped, the upper lip crested. Corolla with a long curved tube, 2-lipped, the upper lip arching.—About 100 species, widely distributed.—SKULLCAPS. HELMET-FLOWERS.

Nutlets wingless, on a low gynobase.
  Flowers in axillary, secund racemes. — I. LATERIFLORAE.
  Flowers solitary in the axils or in terminal panicles.
    Flowers solitary in the axils of the upper leaves, appearing raceme-like, but each pedicel bearing two bractlets at its base. — II. AMBIGUAE.
    Flowers in terminal or axillary panicles.
      Leaf-blades above the middle of the stem cordate. — III. CORDATAE.
      Leaf-blades above the middle of the stem abruptly or gradually narrowed at the base.
        Leaves all with toothed blades. — IV. SERRATAE.
        Leaves all, or those above the middle of stem with entire blades. — V. INTEGRIFOLIAE.
Nutlets membranous-winged, on a slender gynobase. — VI. NERVOSAE.

I. LATERIFLORAE

Slender plant with long axillary racemes of very small flowers. — 1. *S. lateriflora.*

II. AMBIGUAE

Leaf-blades mainly toothed, lanceolate, cordate: corolla 1.5–2 cm. long. — 2. *S. epilobifolia.*
Leaf-blades mainly entire, ovate or ovate-lanceolate: corolla less than 1.5 cm. long.
  Leaf-blades all distinctly petioled: roots fibrous. — 3. *S. havanensis.*
  Leaf-blades (except basal ones) all sessile or nearly so: roots tuberous-thickened.
    Stem glabrous or puberulent: leaf-blades often revolute. — 4. *S. ambigua.*
    Stem densely and softly glandular-pubescent: leaf-blades usually flat. — 5. *S. parvula.*

III. CORDATAE

Foliage, especially the internodes of the stem and inflorescence, copiously pubescent.

[1] Contributed by Edward Johnston Alexander.

Larger leaves with petioles less than ½ as long as the blades.
Leaf-blades suborbicular to broadly ovate: inflorescence pubescent with short close-set hairs. 6. *S. Ocmulgee.*
Leaf-blades ovate to ovate-lanceolate, velvety: inflorescence pubescent with villous hairs. 7. *S. Cuthbertii.*
Larger leaves with petioles over ½ as long as the blades.
Corolla less than 15 mm. long. 8. *S. arguta.*
Corolla over 15 mm. long. 9. *S. ovata.*
Foliage glabrous, or with scattered hairs at the nodes of the stem and in the inflorescence. 10. *S. saxatilis.*

IV. Serratae

Corolla less than 2 cm. long.
Leaf-blades glabrous above.
Corolla pubescent: calyx not glandular-pubescent. 11. *S. incana.*
Corolla glabrous or nearly so: calyx glandular-pubescent. 12. *S. alabamensis.*
Leaf-blades pubescent above.
Leaf-blades usually acute, serrate. 13. *S. Altamaha.*
Leaf-blades usually obtuse, coarsely crenate. 14. *S. ovalifolia.*
Corolla over 2 cm. long.
Foliage glabrous or nearly so: inflorescence not branched, appearing raceme-like. 15. *S. serrata.*
Foliage, especially the stem, finely and closely pubescent: inflorescence branched, thus showing its paniculate character.
Corolla between 2 and 2.5 cm. long. 16. *S. Mellichampii.*
Corolla between 2.5 and 3 cm. long.
Leaf-blades acute, relatively large: corolla nearly glabrous. 17. *S. montana.*
Leaf-blades obtuse, relatively small: corolla pubescent. 18. *S. arenicola.*

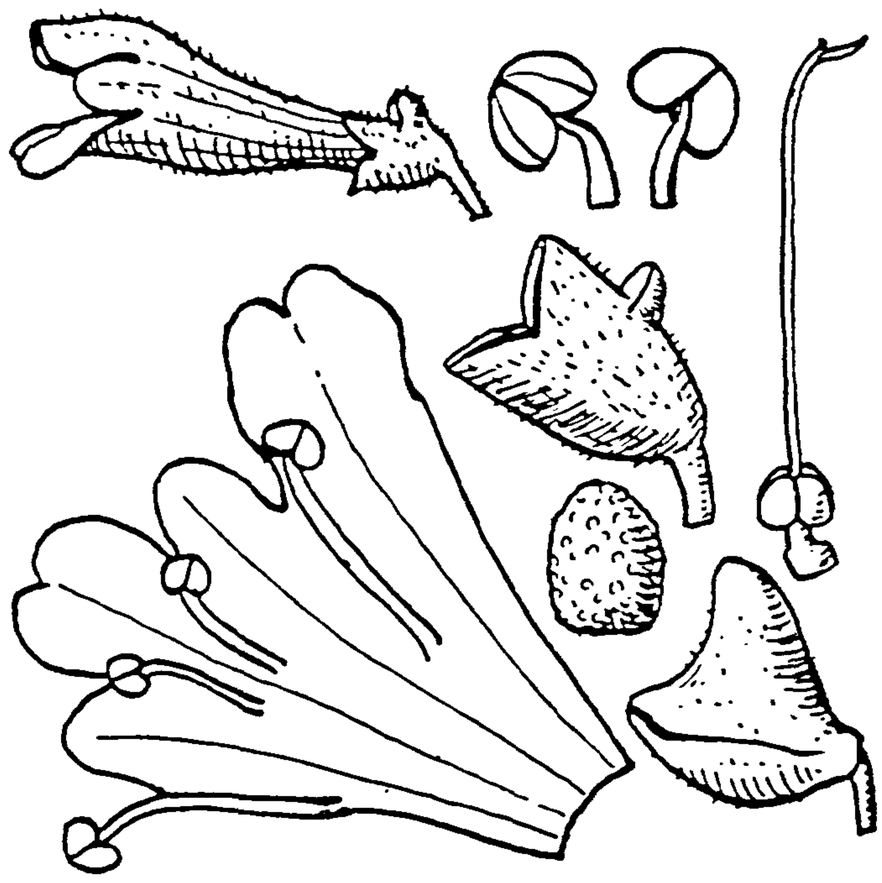
V. Integrifoliae

Upper lip of the corolla shorter than the throat.
Leaf-blades and corollas glabrous or nearly so. 19. *S. glabriuscula.*
Leaf-blades and corollas variously pubescent.
Upper lip of the corolla exceeding the lower. 20. *S. integrifolia.*
Upper lip of the corolla exceeded by the lower. 21. *S. multiglandulosa.*
Upper lip of the corolla longer than the throat. 22. *S. floridana.*

VI. Nervosae

Slender plant: blades of the lower leaves slender-petioled, those of the upper ones sessile: bracts nearly entire. 23. *S. nervosa.*

1. S. lateriflora L. Plant erect or reclining, 2–10 dm. long, glabrous or puberulent above: leaf-blades thinnish, ovate to ovate-lanceolate, 2–6 cm. long, coarsely-serrate: flowers secund and crowded in lateral racemes: calyx becoming 3–4 mm. long: corolla 6–7 mm. long: nutlets about 1 mm. long.—(Mad-Dog Skullcap.)—Low thickets, stream-banks, and swamps, various provinces, Fla. to N. M., B. C., Ont., and Newf.—Sum.–fall.



2. S. epilobifolia Hamilt. Plant 2–9 dm. tall, sometimes finely pubescent: leaf-blades lanceolate to ovate-lanceolate, 2–6 cm. long, shallowly-serrate, very short petioled or sessile: calyx becoming 6–7 mm. long: corolla 15–20 mm. long; lower lip about 5 mm. wide: nutlets about 1.5–2 mm. long. [*S. galericulata* (Chapm. Fl. Fl. SE. U. S.)]—Wet thickets and swamps, Blue Ridge and more northern provinces, N. C. to Tenn., Nebr., N. M., Ariz., Alas., Ont., and Newf.—Sum.–fall.

3. S. havanensis Jacq. Plant 1–3 dm. tall, hoary-pubescent: leaf-blades orbicular-ovate to ovate, 3–6 mm. long, those of the lower ones sometimes shal-

lowly toothed: calyx becoming 3 mm. long: corolla 13–14 mm. long; lower lip 7–8 mm. wide: nutlets fully 1 mm. long. [*S. cubensis* A. Rich. *S. longiflora* Small.]—Pinelands, Everglade Keys, Fla.—(*W. I.*)—All year.

4. **S. ambigua** Nutt. Plant 0.5–4 dm. tall, glabrous or puberulent: leaf-blades broadly ovate to lanceolate, the margins revolute, entire or sometimes the lower remotely serrate, 1–2 cm. long: calyx becoming 5–6 mm. long: corolla about 11 mm. long; lower lip 4–4.5 mm. wide: nutlets fully 1 mm. long. [*S. parvula* (Fl. SE. U. S.)]—Dry soil, various provinces, Fla. to Tex., S. D., and Que.—Spr.–sum.

5. **S. parvula** Michx. Plant 0.5–4 dm. tall, densely and softly glandular-pubescent: leaf-blades suborbicular to ovate, or ovate-lanceolate on the upper part of the stem, 1–2 cm. long: calyx becoming 5–6 mm. long: corolla 6–10 mm. long; lower lip 3.5–4 mm. wide: nutlets barely 1 mm. long. [*S. campestris* Britton]—Dry or damp soil, various provinces, Ga. to Tex., Kans., Ia., and Que.—Spr.

6. **S. Ocmulgee** Small. Plant 4–8 dm. tall, softly-pubescent: leaf-blades thickish, suborbicular to ovate, 3–8 cm. long, crenate: corolla 20–25 mm. long; lower lip 6–7 mm. wide.—River-banks, in the Piedmont of Ga.—Sum.

7. **S. Cuthbertii** Alexander. Plant 2–6 dm. tall, softly-pubescent, especially above: leaf-blades firm, ovate to ovate-lanceolate, acute, soft, velvety-pubescent above and beneath, petioles and larger veins usually purplish, 2–7 cm. long, crenate: inflorescence villous with glandular hairs, conspicuously bracted, the bracts entire, cordate: calyx becoming 5–7 mm. long: corolla 16–20 mm. long; lower lip about 6 mm. long, 8 mm. wide.—Rich, sandy or clay woods, Piedmont and Appalachian Valley, Ga. and Ala.—Spr.–sum.

8. **S. arguta** Buckl. Plant 3–5 dm. tall, pubescent: leaf-blades ovate to elliptic-ovate, 2–5 cm. long, deeply crenate-dentate; calyx becoming 5 mm. long: corolla 12–14 mm. long; lower lip 5–6 mm. wide: nutlets 1 mm. long.—Hillsides, Blue Ridge, Ga. to N. C.—Spr.–Sum.

9. **S. ovata** Hill. Plant 1–6 dm. tall, softly-pubescent: leaf-blades orbicular-ovate to lance-ovate, 3–10 cm. long, serrate: inflorescence inconspicuously bracted (conspicuously bracted and leaf-blades rugose beneath in *S. ovata bracteata*): calyx becoming 6–7 mm. long: corolla 19–21 mm. long; lower lip about 6 mm. long and 6 mm. wide, deeply notched at the apex: nutlets about 1.5 mm. long. [*S. cordifolia* Muhl. *S. versicolor* Nutt.]—Moist banks, various provinces, Fla. to Tex., Minn, and Pa.—Spr.–sum.

10. **S. saxatilis** Riddell. Plant 1–3 dm. tall, nearly glabrous, pubescent: leaf-blades suborbicular or ovate to ovate-lanceolate, 1–4 cm. long, coarsely crenate or serrate-crenate: calyx becoming 4–5 mm. long: corolla 12–18 mm. long; lower lip 5–6 mm. wide: nutlets 1 mm. long.—Sandy soil, various provinces, Ga. to Ark., Ohio, and Del.—Spr. & sum.

11. **S. incana** Muhl. Plant 5–12 dm. tall, finely-pubescent: leaf-blades 4–12 cm. long, serrate or crenate-serrate, usually pubescent beneath: calyx becoming 6–7 mm. long, canescent with white, eglandular hairs: corolla 15–20 mm. long; lower lip 6–8 mm. wide: nutlets about 1.5 mm. long. [*S. canescens* Nutt. *S. villosa* Ell.]—Woods, stream-banks, and thickets, various provinces N of Coastal Plain, Ga. to Ala., Mich., and Ont.—Sum.

12. **S. alabamensis** Alexander. Plant 4.5–7 cm. tall, finely short-pubescent below: leaf-blades ovate or ovate-lanceolate to elliptic, 4–5 cm. long, serrate-crenate, ciliate on the margin and veins beneath: inflorescence narrow and crowded, hirsute with eglandular hairs: calyx glandular pubescent: corolla glabrous or nearly so, 18–20 mm. long; upper lip as long as the throat or

slightly longer; lower lip 6–8 mm. wide.—Dry woods, Appalachian Valley, Ala.—Sum.

13. S. Altamaha Small. Plant 2–4 dm. tall, hirsute-canescent: leaf-blades ovate to elliptic, short-petioled, 1.5–5 mm. long, serrate, the terminal lobe usually acute: inflorescence very narrowly crowded: calyx becoming 4 mm. long: corolla 11–14 mm. long; lower lip 5–6 mm. wide.—Pinelands, Coastal Plain, Fla. and Ga.—Spr.–sum.

14. S. ovalifolia Pers. Plant 1–6 dm. tall, finely pubescent with long, spreading hairs: leaf-blades ovate or deltoid-ovate, 1.5–4.5 cm. long, coarsely crenate, the terminal lobe usually obtuse: calyx becoming about 5 mm. long: corolla 12–15 mm. long; lower lip 5–7 mm. wide: nutlets about 1 mm. long. [*S. pilosa* Michx.]—Dry banks, woods, and meadows, various provinces, Fla. to Tex., Mich., and N. Y.—Spr.

15. S. serrata Andr. Plant 2–7 dm. tall, sometimes puberulent: leaf-blades thin, oval, elliptic, or ovate, 4–10 cm. long, serrate or crenate-serrate: calyx becoming 6–7 mm. long: corolla 20–25 mm. long; lower lip 7–8 mm. wide: nutlets about 1.5 mm. long.—Woods, various provinces N of Coastal Plain, Ala. to Ill., N. Y., and S. C.—Spr.

16. S. Mellichampii Small. Plant 4–6 dm. tall, closely-pubescent: leaf-blades ovate to elliptic-oval, 3–6 cm. long, crenate: calyx becoming 4–5 mm. long: corolla 20–25 mm. long; lower lip 8–9 mm. wide.—Sandy soil, Coastal Plain, Ga. and S. C.—Sum.

17. S. montana Chapm. Plant 3–5 dm. tall, softly pubescent: leaf-blades ovate to ovate-lanceolate or elliptic, 2–8 cm. long, coarsely crenate-serrate, cuneate at the base: calyx becoming 7 mm. long: corolla 28–35 mm. long; lower lip 10–12 mm. wide.—Woods and thickets, Blue Ridge and Appalachian Valley, Ga. and Ala.—Sum.

18. S. arenicola Small. Plant 2–4 dm. tall, finely pubescent: leaf-blades ovate to elliptic, 1.5–3 cm. long, sharply serrate or crenate-serrate: calyx becoming 5 mm. long: corolla 20–26 mm. long; lower lip 9–10 mm. wide: nutlets 1–1.5 mm. long.—Sandy pinelands and scrub, pen. Fla.—Sum.

19. S. glabriuscula Fernald. Plant 3–6 dm. tall, puberulent: blades of the lower leaves elliptic, those of the upper linear-spatulate, entire: inflorescence short-branched: calyx becoming 5–5-5 mm. long: corolla nearly glabrous, 23–26 mm. long; lower lip 8–9 mm. wide, deeply notched.—Sandy soil, N Fla.—Spr.–fall.

20. S. integrifolia L. Plant 2–6 dm. tall, softly pubescent: blades of the lower leaves ovate to elliptic-ovate, coarsely crenate, those of the upper ones elliptic to elliptic-lanceolate or linear, entire: inflorescence branched or unbranched: calyx becoming 6–7 mm. long: corolla usually blue-violet, 21–25 mm. long; lower lip shallowly notched: nutlets fully 1 mm. long.—Woods, pastures, and thickets, various provinces, Fla. to Tex., Mo., and Mass.—Spr.–sum.

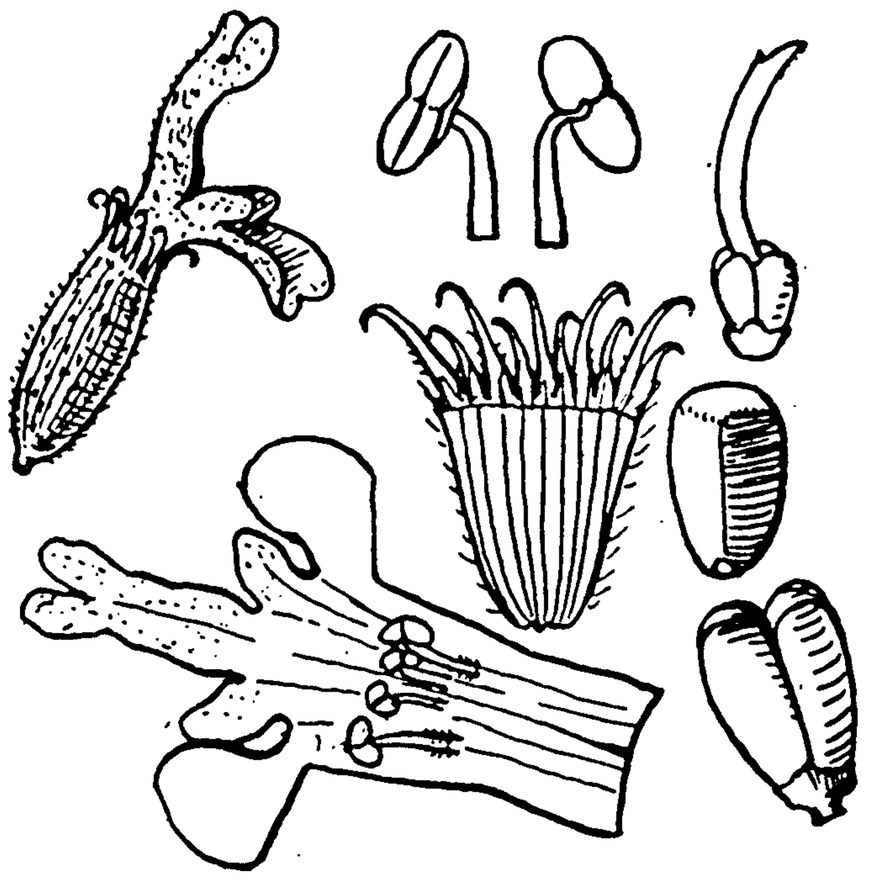
21. S. multiglandulosa (Kearney) Small. Plant 1–3.5 dm. tall, glandular-pubescent: leaf-blades various, those of the lower leaves oval to elliptic 1–2 cm. long, often coarsely crenate, those of the upper leaves elliptic to linear-spatulate, entire: inflorescence not branched; calyx becoming 5–6 mm. long: corolla pale-blue or often white, 20–25 mm. long; lower lip 4-lobed, 10–11 mm. wide: nutlets 1.5 mm. long.—Dry pinelands and sandy fields, Coastal Plain, Fla. and Ga.—Spr.

22. S. floridana Chapm. Plant 2–4 dm. tall, puberulent: leaf-blades narrowly linear, 1–2.5 cm. long, entire: inflorescence not branched; calyx becoming 7

mm. long: corolla blue-violet, 20–25 mm. long; lower lip 12–13 mm. wide, deeply notched.—Pineland swamps, Fla.—Sum.

23. S. nervosa Pursh. Plant 1–4 cm. tall, minutely pubescent: leaf-blades suborbicular to ovate or lanceolate above, 2–4 cm. long, undulate or coarsely serrate: calyx becoming about 5 mm. long: corolla 6–10 mm. long; lower lip about 5 mm. wide: nutlets 1–2 long.—Thickets and woods, various provinces N of Coastal Plain, N. C. to Mo. and Ont.—Spr.–sum.

5. **MARRUBIUM** [Tourn.] L. ´Perennial low or diffuse herbs. Leaf-blades toothed, often rugose. Flowers in dense axillary clusters. Calyx nearly regular, 10-lobed; lobes slender, spreading or recurved, sometimes unequal. Corolla 2-lipped: upper lip erect: lower lip spreading, the broad middle lobe much larger than the 2 lateral ones. Filaments somewhat longer than the anthers.—About 40 species, natives of the Old World.

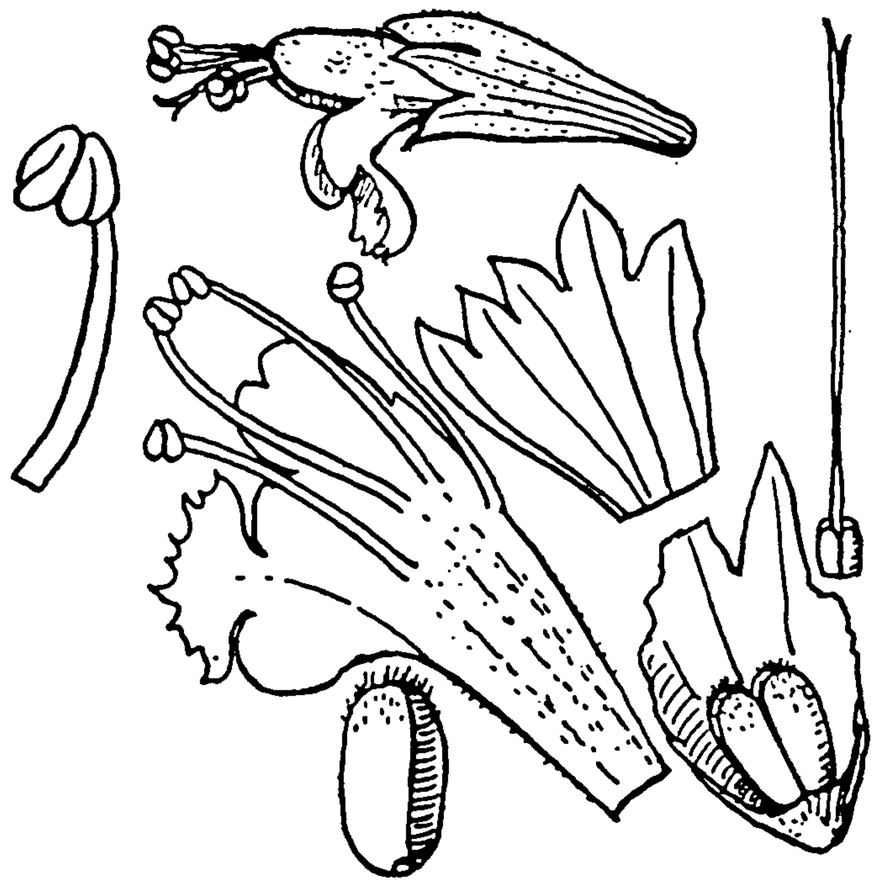


1. M. vulgare L. Plant 2–9 dm. tall, white-woolly: leaf-blades suborbicular, oval, or ovate, 1–4 cm. long, crenate, rugose: calyx 4–5 mm. long; lobes hooked: corolla white, 5–6 mm. long; upper lip deeply notched: nutlets about 2 mm. long.—(HOARHOUND.)—Pastures, waste-places, and on roadsides, various provinces, Fla. to Tex., Calif., B. C., and Me. Native of Eu.—(*Mex.*)—Spr.–sum.

6. **AGASTACHE** Clayt. Perennial tall herbs. Leaf-blades many-toothed, not rugose. Flowers many in dense panicles. Calyx nearly regular, scarcely ribbed, 5-lobed: lobes erect, the upper ones sometimes broader than the lower. Corolla 2-lipped: upper lip erect: lower lip with 2 small lateral lobes and a large spreading middle lobe. Filaments elongate. [*Lophanthus* Benth., in part.]—About 8 species, North American.—Sum.—GIANT HYSSOPS.

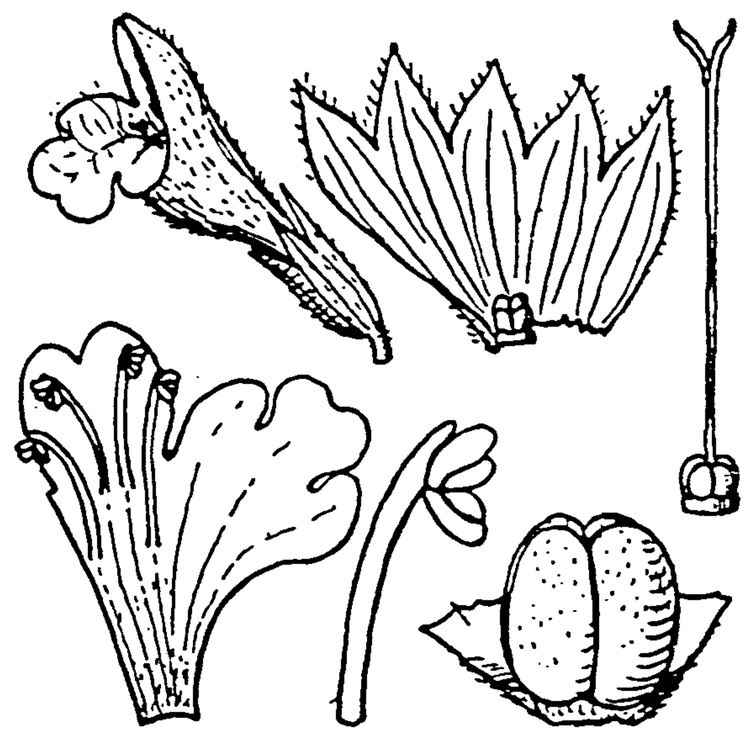
Calyx-lobes obtuse or acute: corolla greenish-yellow: bracts acute or acutish. 1. *A. nepetoides.*
Calyx-lobes acuminate: corolla purplish: bracts acuminate. 2. *A. scrophulariaefolia.*

1. A. nepetoides (L.) Kuntze. Stem glabrous or nearly so, 1–2 m. tall: leaf-blades ovate to ovate-lanceolate, 5–12 cm. long: calyx 5–6 mm. long; lobes ovate or elliptic-ovate: corolla 7–9 mm. long, slightly exceeding the calyx: nutlets minutely pubescent. [*L. nepetoides* Benth.]—Hillsides, thickets and woods, various provinces, Ga. to Ky., Minn., Que., and Mass.



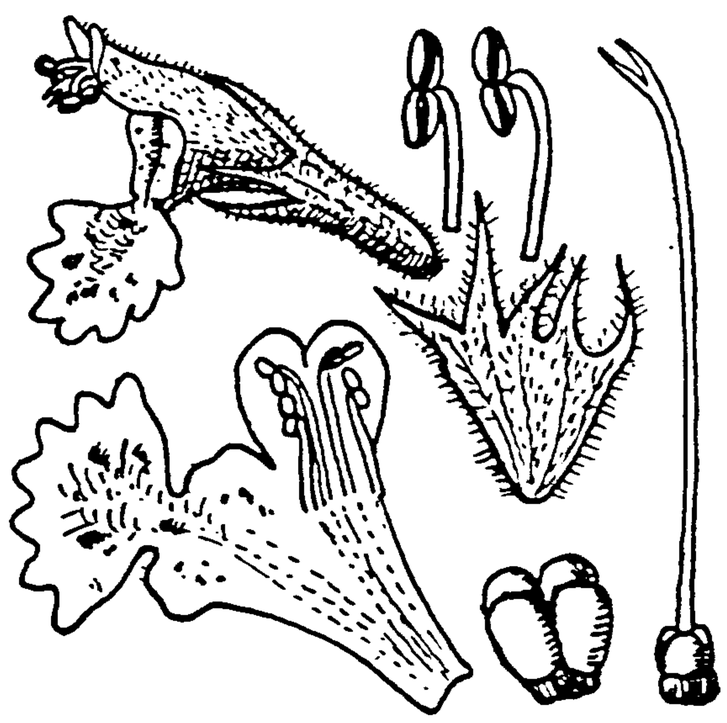
2. A. scrophulariaefolia (Willd.) Kuntze. Stem finely hirsute, 1–2 m. tall: leaf-blades ovate to ovate-lanceolate, or elliptic above: calyx 6–7 mm. long; lobes lanceolate: corolla 6–8 mm. long, much exceeding the calyx: nutlets hispidulous. [*L. scrophulariaefolius* Benth.]—Thickets, woods, and fence-rows, various provinces, rarely Coastal Plain, N. C., to Mo., Ont., and N. H.

7. MEEHANIA Britton. Perennial decumbent or creeping herbs. Leaf-blades few, crenate. Flowers few in a 1-sided raceme. Calyx nearly regular, 15-ribbed, 5-lobed; lobes erect. Corolla 2-lipped: upper lip arched: lower lip spreading, the middle lobe much broader, but scarcely longer than the 2 lateral ones. Filaments not exceeding the upper corrolla-lip.—One species.



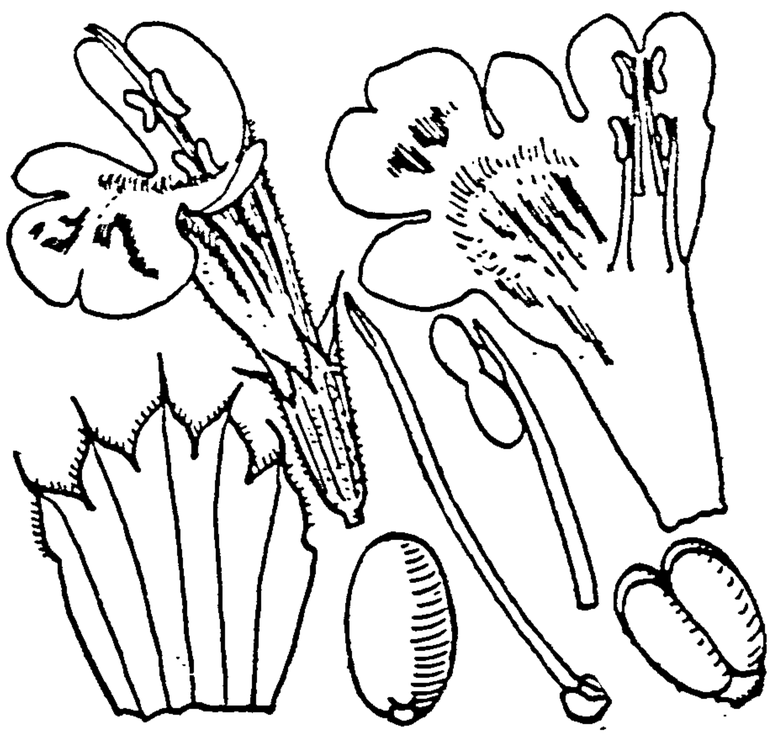
1. M. cordata (Nutt.) Britton. Stem and runners 1.5–11 dm. long, sparingly hirsute: leaf-blades ovate to orbicular-ovate, 2–7 cm. long, cordate: calyx 10–14 mm. long; lobes triangular to triangular-lanceolate: corolla blue or rarely white, 2.5–3 cm. long; nutlets about 2 mm. long. [*Cedronella cordata* Benth.]—Rich woods, various provinces N of Coastal Plain, N. C. to Tenn., Ky., and Pa.—Spr.–sum.

8. NEPETA L. Annual or perennial, erect, branching herbs. Leaf-blades toothed or incised. Flowers in axillary clusters which are sometimes borne in racemes. Calyx slightly irregular, 15-ribbed, 5-lobed: lobes relatively long, the upper lobes slightly longer than the lower. Corolla 2-lipped: upper lip erect: lower lip spreading, the larger middle lobe toothed. Filaments relatively slender, usually filiform.—Amount 150 species, Eurasian.



1. N. Cataria L. Plant pale-green, 3–11 dm. tall, closely-pubescent: leaf-blades ovate to triangular-ovate, 4–7 cm. long, crenate or serrate-crenate, mostly cordate: calyx 5–6 mm. long; lobes subulate or lanceolate-subulate: corolla pale, magenta-spotted, 6–7 mm. long: nutlets about 1 mm. long.—(CAT-MINT. CATNIP.)—Waste-places, fields, woods, and roadsides, various provinces, Ga. to La., Kans., Minn., and N. B. Nat. of Eu.—Sum.–fall.

9. GLECOMA L. Perennial creeping herbs. Leaf-blades toothed. Flowers in axillary clusters. Calyx slightly 2-lipped, 15-ribbed, 5-lobed: lobes unequal, relatively short. Corolla 2-lipped: upper lip erect: lower lip spreading, the large middle lobe notched. Filaments relatively slender.—About 6 species, Eurasian.

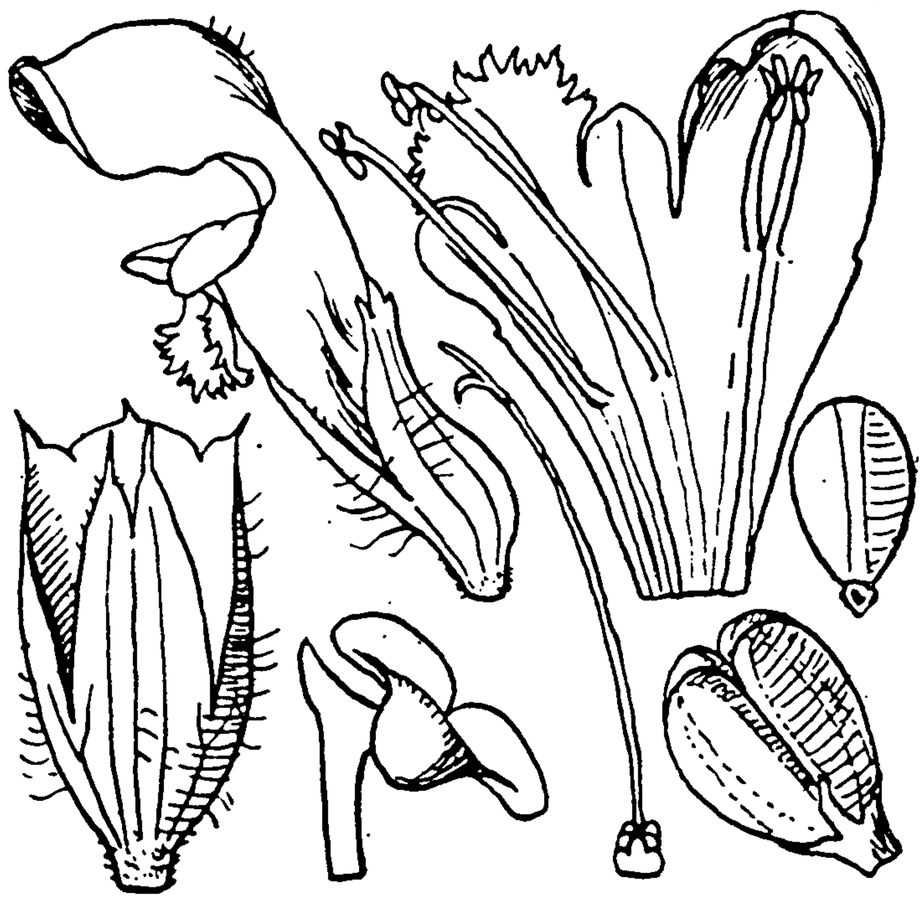


1. G. hederacea L. Plant dark-green, the branches 1–11 dm. long, hirsute: leaf-blades reniform to suborbicular, 2–4 cm. in diameter, coarsely crenate: calyx 5–7 mm. long; lobes subulate-tipped: corolla blue or white, 10–15 mm. long: nutlets about 1.5 mm. long. [*Nepeta Glechoma* Benth.] — GROUND-IVY. GILL-OVER-THE-GROUND.)—Banks and thickets, various provinces, Ga. to Kans., Ont., and Newf. Nat. of Eu.—Spr.

10. PRUNELLA L. Perennial erect or diffuse herbs. Leaf-blades toothed or laciniate. Flowers mostly in compact panicles. Calyx 2-lipped: upper lip with 3 broad lobes: lower lip with 2 narrow lobes. Corolla 2-lipped: upper lip arched: lower lip with the broad middle lobe generally toothed. Filaments relatively long, 2 of them forked at the apex. [*Brunella* L.]—About 5 species, widely distributed.—SELF-HEALS. HEALS-ALLS. BLUE-CURLS.

Leaf-blades entire or shallowly toothed: calyx 10–11 mm. long; lobes of the lower lip subulate tipped. 1. *P. vulgaris.*
Leaf-blades, at least the upper ones, pinnatifid: calyx 8–9 mm. long; lobes of the lower lip lanceolate. 2. *P. laciniata.*

1. P. vulgaris L. Stem 0.5–4 dm. long: leaf-blades ovate, elliptic, or lanceolate, 2–7.5 cm. long, undulate: bracts mostly reniform: calyx 10–11 mm. long; lobes of the upper lip mucronate: corolla purple or white, mainly 14–18 mm. long: nutlets about 2 mm. long.—(CARPENTER-WEED.)—Fields, thickets, and waste-places, U. S. and S Can., Nat. of Eu.—Spr.–fall.—Also called SNAKEWEED from the belief that a snake hole is hidden under the plant.

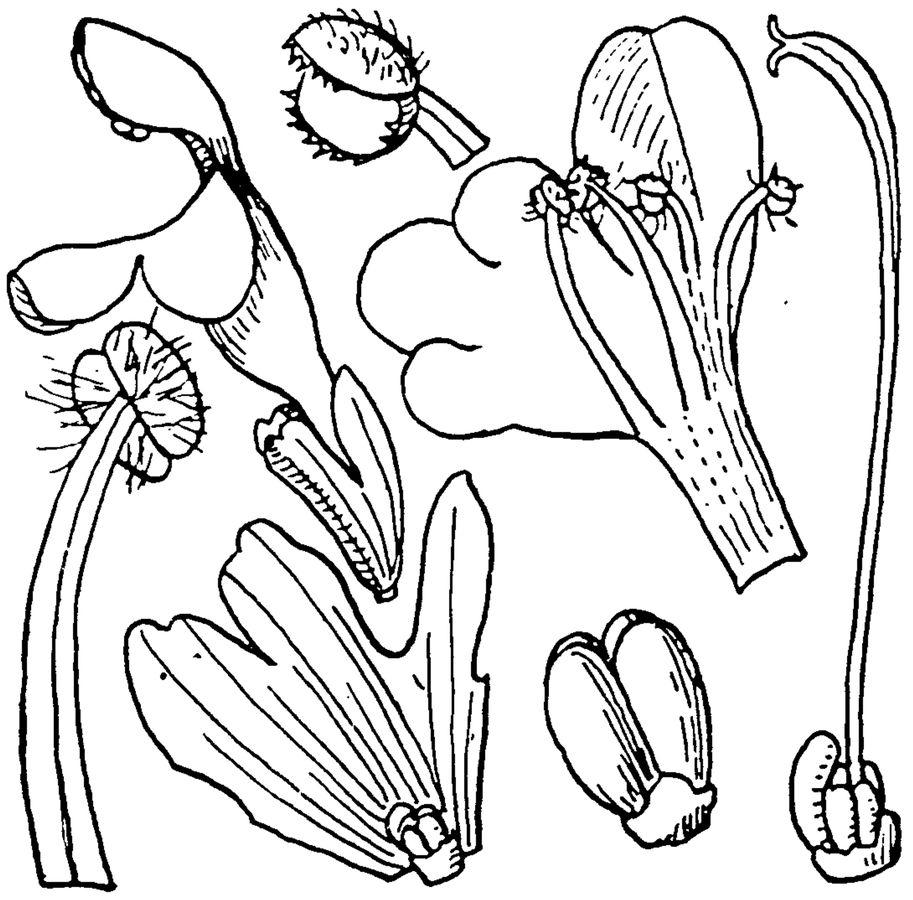


2. P. laciniata L. Plant similar to *P. vulgaris* in habit, but often hoary-pubescent: blades of the stem-leaves more or less pinnatifid: corolla white or pale.—Roadsides, fields, and lawns, various provinces, N. C. to Mass. Nat. of Eu.—Sum.—The rôle of a weed through a long period has developed many forms in the above two species.

11. MACBRIDEA Ell. Perennial erect herbs. Leaf-blades entire or repand. Flowers in axillary clustered broad-leafed cymes. Calyx strongly 2-lipped, the upper lip of a narrow lobe, the lower lip of 2 broader lobes. Corolla 2-lipped: upper lip arching: lower lip 3-lobed. Stamens 4: anthers pubescent. —Two species.

Corolla white, the upper lip notched; lateral lobes of the lower lip as wide as the middle one. 1. *M. alba.*
Corolla rose-purple, streaked, the upper lip entire: lateral lobes of the lower lip much narrower than the middle one. 2. *M. pulchra.*

1. M. alba Chapm. Stem 3–5 dm. tall, simply or rarely branched: leaf-blades cuneate-spatulate to elliptic, rather fleshy, 2–8 cm. long, obtuse, undulate or repand, the lower ones with margined petioles, the upper sessile: panicles few flowered: bracts elliptic-ovate to orbicular, obtuse: pedicels very short: calyx becoming 10–12 mm. long, glabrous or nearly so; lobes about as long as the tube, the larger ones slightly notched: corolla white, 2.5–3 cm. long the upper lip hooded, nearly erect, the lower lip spreading, the lobes emarginate or nearly truncate.—Pineland swamps and low prairies, N Fla.—Sum.



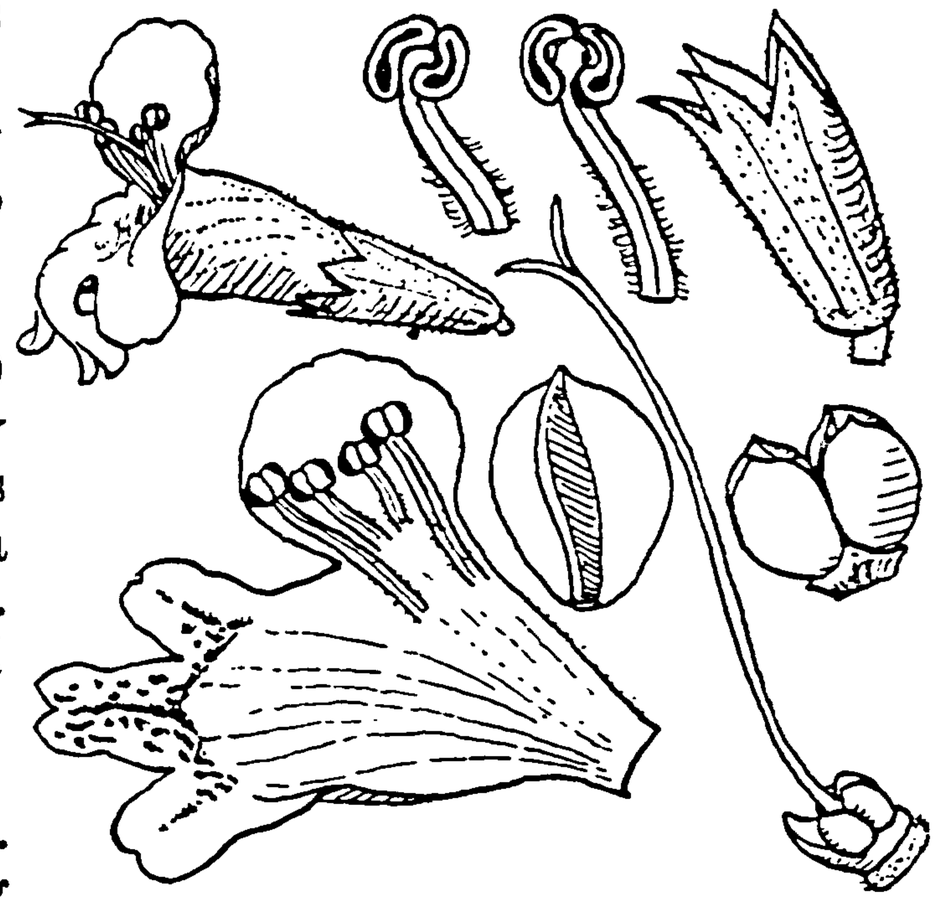
2. M. pulchra Ell. Stem 3–6 dm. tall, usually simple: leaf-blades elliptic to linear-elliptic, 4–8 cm. long, acute or acuminate at both ends, undulate or repand-serrate, the

lower ones slender-petioled, the upper sessile: panicles few-flowered: bracts ovate or elliptic, mostly obtuse: pedicels very short: calyx becoming 9–10 mm. long; lobes shorter than the tube, entire or the larger ones emarginate: corolla rose-purple striped with white and purple, 3–3.5 cm. long; tube abruptly dilated near the middle, the upper lip suborbicular, 1 cm. in diameter, the lower lip with a notched middle lobe and truncate lateral lobes.—Swamps and marshes, Coastal Plain, Fla. to Ala. and N. C.—Sum.–fall.

12. DRACOCEPHALUM [Tourn.] L. Perennial, erect or reclining herbs. Leaf-blades typically narrow, usually toothed, at least near the apex. Flowers purplish-pink to white, in spike-like racemes. Calyx essentially regular: lobes 5, shorter than the tube. Corolla 2-lipped: upper lip arched, entire: lower lip 3-lobed. Stamens 4: filaments elongate, one pair sometimes glabrous. [*Physostegia* Benth.]—About 7 species, North American.—Sum.—FALSE DRAGON-HEADS. OBEDIENT PLANTS.

Corolla over 2 cm. long.
  Leaf-blades entire or with blunt teeth.
    Mature calyx short-tubular, 9–11 mm. long: upper leaves conspicuously reduced. 1. *D. denticulatum.*
    Mature calyx campanulate, 5–6.5 mm. long: upper leaves but slightly reduced. 2. *D. leptophyllum.*
  Leaf-blades copiously toothed with very acute serrations. 3. *D. virginianum.*
Corolla less than 2 cm. long: mature calyx tubular, 8–9 mm. long: stem copiously leafy up to the inflorescence. 4. *D. veroniciformis.*

1. D. denticulatum Ait. Stems 3–9 dm. long: leaves few; blades spatulate to oblong, 2–14 cm. long, thick, repand-crenate, mostly obtuse: calyx-lobes deltoid: corolla 20–25 mm. long: nutlets about 2 mm. long. [*P. denticulata* Britton]—Swamps and river-banks, often in calcareous soil, various provinces, Fla. to Tex., Kans. and Md.—Sum.–fall.



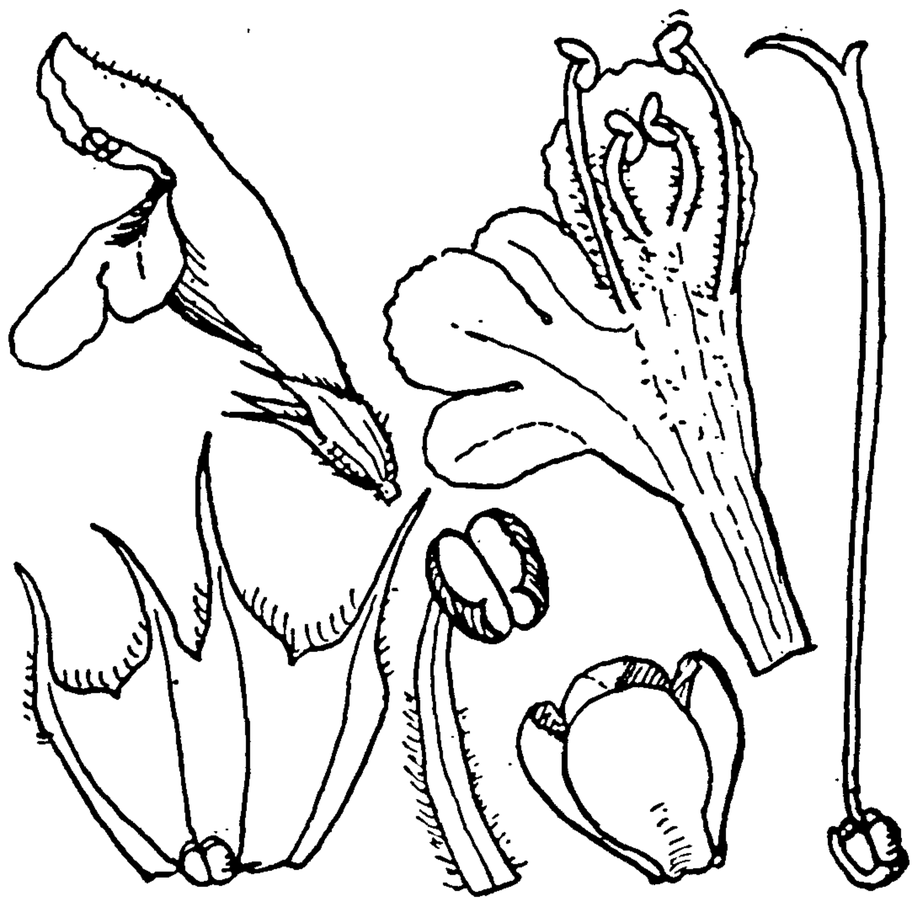
2. D. leptophyllum Small. Stems 6–10 dm. long: leaf-blades thin, oblong or nearly so, mostly 3–7 cm. long, repand: calyx-lobes lanceolate to triangular-lanceolate: corolla 20–23 mm. long: nutlets 3–3.5 mm. long. [*P. leptophylla* Small]—River-banks and swamps, pen. Fla.—Spr.–fall.

3. D. virginianum L. Stems 3–15 dm. long: leaves many; blades narrowly oblong to linear-oblong or oblong-lanceolate, 3–12 cm. long, thickish, saliently serrate or incised-serrate, mostly acuminate or acute: calyx-lobes lanceolate to ovate-lanceolate: corolla 25–30 mm. long: nutlets about 3 mm. long. [*P. virginiana* Benth.]—Swamps, low woods, and thickets, often in somewhat acid soil, various provinces, Fla. to Tex., Kans., and Que.—Sum.

4. D. veroniciformis Small. Stems 5–7 dm. long: leaf-blades lanceolate to oblong-lanceolate on the lower part of the stem, narrowly pandurate to lanceolate above, 5–10 cm. long, undulate to crenate-undulate: calyx-lobes mainly lanceolate: corolla-lobes retuse: shorter filaments pubescent. [*P. veroniciformis* Small]—Low grounds, Coastal Plain, Ga.—Sum.

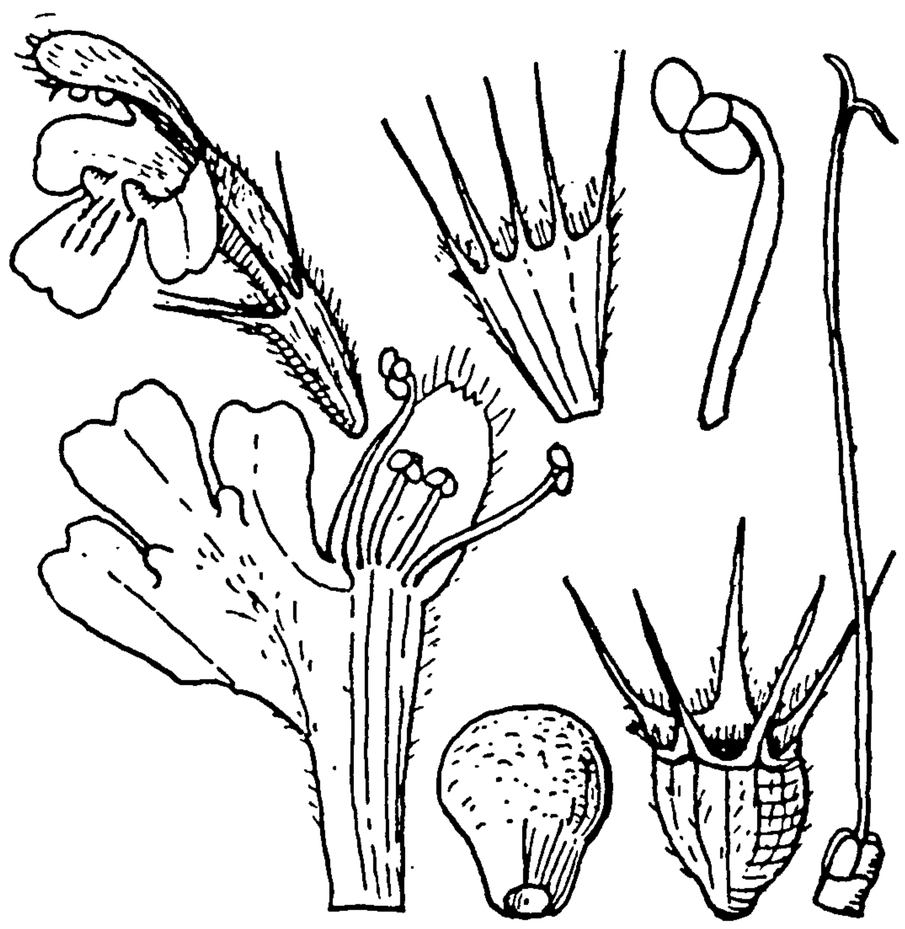
13. SYNANDRA Nutt. Annual or biennial erect herbs. Leaf-blades broad, toothed. Flowers in interrupted racemes. Calyx nearly regular: lobes

4, shorter than the tube, herbaceous. Corolla 2-lipped: upper lip arched, entire: lower lip 3-lobed. Stamens 4: filaments pubescent.—One species.



1. S. hispidula (Michx.) Britton. Stem 2–8 dm. long, hispid or somewhat villous: leaf-blades ovate to orbicular-ovate, 2–10 cm. long, crenate or serrate, cordate: calyx becoming 10 mm. long; lobes lanceolate: corolla white, 2.5–3 cm. long: nutlets about 4 mm. long. [*S. grandiflora* Nutt.]—Wet woods and stream-banks, Interior Low Plateaus and adj. provinces, Tenn. to Ill., Ohio, and Va.—Spr.

14. GALEOPSIS L. Annual often spreading herbs. Leaf-blades broad, toothed. Flowers in crowded cymes. Calyx nearly regular: lobes 5, narrow, spine-tipped. Corolla 2-lipped: upper lip notched or erose: lower lip 3-lobed, the lateral lobes often as large as the middle one, sometimes appendaged at the base. Stamens 4: filaments glabrous.—About 6 species, Eurasian.



1. G. Tetrahit L. Plant 2–5 dm. tall, hispid: stem swollen at the nodes: leaf-blades ovate to ovate-lanceolate or oblong-lanceolate, 2.5–7 cm. long, serrate: flower-clusters bristly: calyx becoming 10–13 mm. long; lobes about as long as the tube: corolla pink-purple or white, mostly 15–20 mm. long: nutlets about 3 mm. long.—(HEMP-NETTLE.)—Waste-places, fields and roadsides, various provinces, N. C. to Alas. and Newf. Nat. of Eu.—Sum.–fall.

15. LAMIUM L. Annual, biennial or perennial, diffuse herbs. Leaf-blades broad, toothed or incised. Flowers in axillary cymes. Calyx somewhat irregular: lobes 5, the upper ones usually the larger. Corolla blue, purple, or white, 2-lipped: upper lip entire or merely notched: lower lip 3-lobed, the middle lobe with a dilated blade, the lateral lobes with slender tips. Stamens 4: filaments pubescent.—About 40 species, natives of the Old World.—DEAD-NETTLES. MONKEY-FLOWERS.

Plant annual or biennial: corolla small, less than 2 cm. long: middle lobe of the lower corolla-lip less than 5 mm. wide; lateral lobes each with a short sharp tooth and a very broad one: nutlets about 2 mm. long.
- Upper leaves with sessile or clasping blades: corolla-tube slender, longer than the throat and lower lip; middle lobe of the lower lip cuneate or reniform. 1. *L. amplexicaule.*
- Upper leaves with petioled blades: corolla-tube stout, about as long as the throat and lower lip; middle lobe of the lower lip somewhat reniform. 2. *L. purpureum.*

Plant perennial: corolla mostly over 2 cm. long: middle lobe of the lower corolla-lip 1 cm. wide or nearly so; lateral lobes each with a caudate appendage and a broad lobe: nutlets about 3 mm. long. 3. *L. maculatum.*

1. L. amplexicaule L. Stem and branches decumbent, sparingly retrorse-pubescent: leaf-blades suborbicular to orbicular-reniform, 1–3.5 cm. wide, crenate-lobed: calyx becoming 5–6 mm. long: corolla purple, 13–17 mm. long; tube slender, the lower lip with mucronate lateral lobes and a cuneate or reniform middle lobe: nutlets about 2 mm. long.—(HENBIT.)—Roadsides, fields, thickets, cult. grounds, and waste-places, various provinces, Fla. to La., Ark., Calif., B. C., and N. B. Nat. of Eu.—(*W. I.*)—Wint.–spr.

2. L. purpureum L. Stem and branches decumbent, often creeping at the base, minutely retrorse-pubescent: leaf-blades orbicular-ovate to orbicular-reniform: calyx less than 9 mm. long at maturity, pubescent with short hairs: corolla purple or purplish, mostly less than 1.5 cm. long, the upper lip less than 5 mm. long: nutlets about 2 mm. long.—(DEAD-NETTLE.)—Cult. grounds, roadsides, and shaded places, various provinces, N. C. to Mo., and Newf. Nat. of Eu.—Spr.–sum.

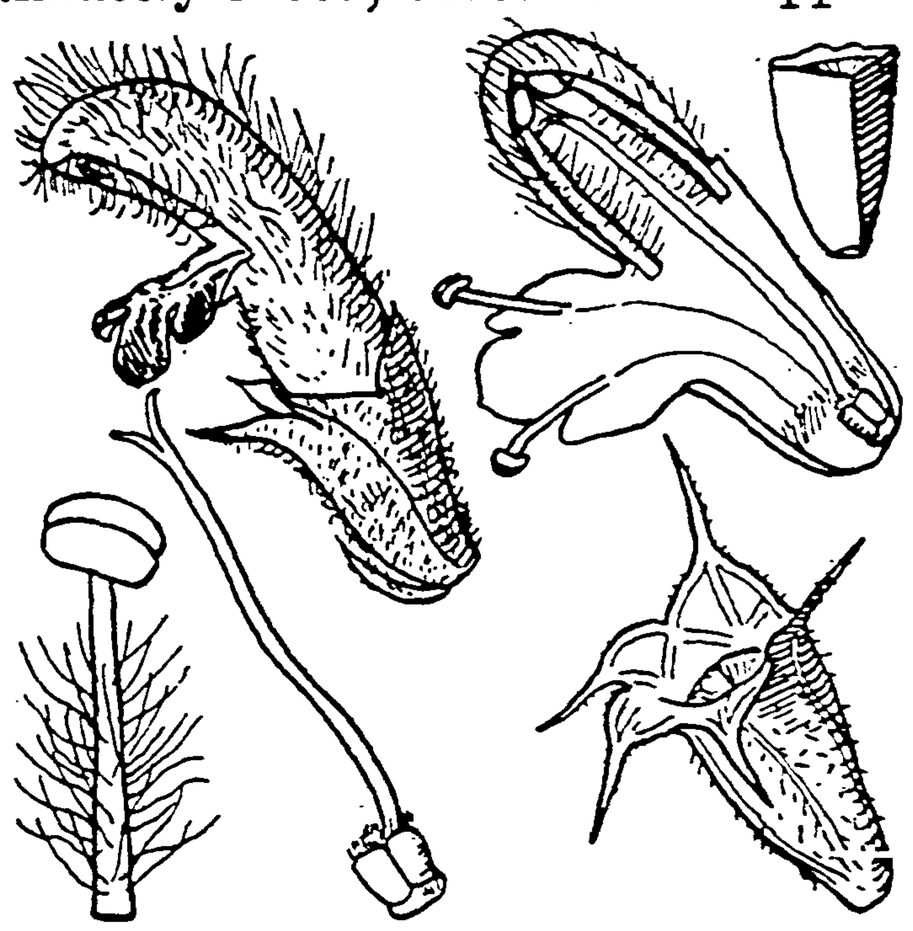
3. L. maculatum L. Stem and branches more or less creeping, rather coarsely but sparingly retrorse-pubescent: leaf-blades ovate to triangular-ovate: calyx over 10 mm. long at maturity, pubescent with long hairs: corolla purple or white, mostly over 2 cm. long, the upper lip about 1 cm. long: nutlets about 3 mm. long.—Waste-places, roadsides, and thickets, various provinces, N. C. and Tenn. to Me. Nat. of Eu.—Spr.–sum.

16. LEONURUS L. Annual, biennial, or perennial, erect herbs. Leaf-blades broad, toothed or parted. Flowers in dense axillary cymes. Calyx somewhat irregular: lobes firm, slender. Corolla 2-lipped: upper lip nearly erect: lower lip 3-lobed, the middle lobe much larger than the lateral ones. Stamens 4: filaments pubescent.—About 10 species, Eurasian.—MOTHERWORTS.

Blades of the lower leaves lobed and incised: corolla twice as long as the calyx.
- Upper corolla-lip hirsute: lower calyx-lobes spreading: blades of the lower leaves coarsely lobed. — 1. *L. Cardiaca.*
- Upper corolla-lip puberulent: lower calyx-lobes erect: blades of the lower leaves finely lobed. — 2. *L. sibiricus.*

Blades of the lower leaves coarsely toothed: corolla slightly longer than the calyx. — 3. *L. Marrubiastrum.*

1. L. Cardiaca L. Perennial, 3–12 dm. tall: leaves various; blades of the lower ones suborbicular in outline, coarsely palmately lobed, those of the upper leaves ovate to cuneate, mostly 3-lobed; calyx 6–6.5 mm. long; lobes short-subulate, half as long as the tube: corolla pale-purple, 9–10 mm. long; nutlets about 1.5 mm. long.—Roadsides, waste-places, and old fields, various provinces, N. C., to Ala., Tex., Utah, and S. Can. Nat. of Eu.—Spr.–fall.

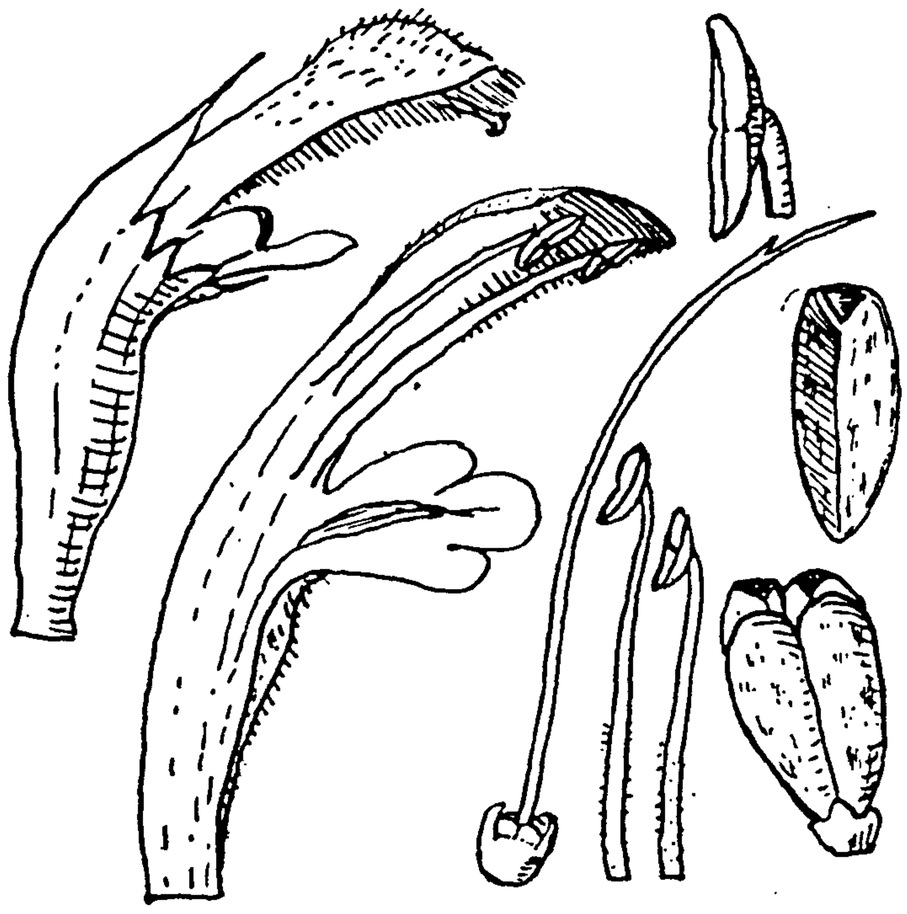


2. L. sibiricus L. Biennial, 9–12 dm. tall: leaves various; blades of the lower ones suborbicular in outline, deeply and more finely lobed than in *L. Cardiaca*, those of the upper leaves, or their lobes, finely pinnatisect; calyx 6–7 mm. long; lobes triangular-subulate, erect, about ⅓ as long as the tube: corolla purplish, 10–12 mm. long:

nutlets about 2 mm. long.—Roadsides and waste-places, various provinces, Fla. to La., Pa., and Del. Nat. of Eurasia.—(*W. I.*, *C. A.*, *S. A.*)—Spr.–fall.

3. L. Marrubiastrum L. Biennial, 8–16 dm. tall: leaf-blades ovate to elliptic-ovate, coarsely toothed: calyx about 5 mm. long; lobes subulate, about half as long as the tube: corolla whitish, about 5 mm long: nutlets about 1.5 mm. long.—Waste-places, roadsides, and stream-banks, Fla. to Pa. and Del. Nat. of Eurasia.—Sum.–fall.

17. LEONOTIS L. Annual or perennial erect herbs or woody plants. Leaf-blades broad, toothed. Flowers in dense, globular, remote cymes. Calyx curved, 2-lipped, the 8–10 lobes unequal, bristle-tipped. Corolla 2-lipped, curved: upper lip erect, long: lower lip much shorter than the upper, with 3 small lobes. Stamens 4: filaments minutely pubescent.—About 12 species, African.



1. L. nepetaefolia R. Br. Annual, 3–20 dm. tall, soft-pubescent: leaf-blades ovate to ovate-deltoid, 4–12 cm. long, crenate: calyx becoming 2 cm. long; the upper lip longer than the tube: corolla orange-yellow or scarlet, 2–2.5 cm. long: nutlets about 3 mm. long.—(LION'S-EARS.)—Cult. grounds, roadsides, and waste-places, various provinces, Fla. to La., Tenn., and N. C. Nat. of S. Africa.—Sum.–fall.

18. STACHYS [Tourn.] L. Annual or (ours) perennial, erect or spreading herbs. Leaf-blades entire or toothed. Flowers in continuous or interrupted panicles. Calyx nearly regular: lobes 5, shorter than the tube. Corolla mainly purple, 2-lipped: upper lip erect: lower lip spreading, 3-lobed, the middle lobe somewhat larger than the lateral ones. Stamens 4, all anther-bearing: anthers short.—About 160 species, mostly in the north temperate zone. HEDGE-NETTLES.

Plants native in Tex., introduced eastward: leaf-blades not rugose: pubescence coarse and spreading.
  Plant with annual or biennial roots. — I. AGRARIAE.
  Plant with perennial rootstocks.
    Leaf-blades narrowed at the base. — II. HYSSOPIFOLIAE.
    Leaf-blades, all, or some of them cordate or truncate at the base.
      Petioles less than one-fourth as long as the blades. — III. NUTTALLIANAE.
      Petioles one-third to one-half as long as the blades. — IV. CORDATAE.
Plants introduced from Old World: leaf-blades rugose: pubescence lanate-tomentose. — V. ITALICAE.

I. AGRARIAE

Slender plant: lower lip of the corolla little surpassing the calyx: mature calyx 2–4 mm. long. — 1. *S. agraria.*

II. HYSSOPIFOLIAE

Leaf-blades glabrous, entire or with shallow teeth.
  glabrous at maturity.
    Calyx-lobes subulate-tipped: leaf-blades entire or nearly so. — 2. *S. hyssopifolia.*
    Calyx-lobes not subulate-tipped: leaf-blades markedly but shallowly toothed. — 3. *S. lythroides.*
Leaf-blades pubescent, prominently serrate. — 4. *S. ambigua.*

III. NUTTALLIANAE

Lower leaves with petioles but little longer than those of the upper.
  Foliage copiously pubescent: corolla-tube slightly longer than the calyx. 5. *S. Nuttallii.*
  Foliage glabrous or nearly so: corolla-tube much longer than the calyx. 6. *S. latidens.*
Lower leaves with petioles several times longer than those of the upper.
  Calyx-lobes merely acute or acuminate, not awn-tipped.
    Foliage of the inflorescence glabrous or bristly pubescent.
      Inflorescence glabrous or nearly so. 7. *S. tenuifolia.*
      Inflorescence bristly-pubescent. 8. *S. aspera.*
    Foliage of the inflorescence puberulent or puberulent-pubescent. 9. *S. salvioides.*
  Calyx-lobes awn-tipped. 10. *S. Clingmanii.*

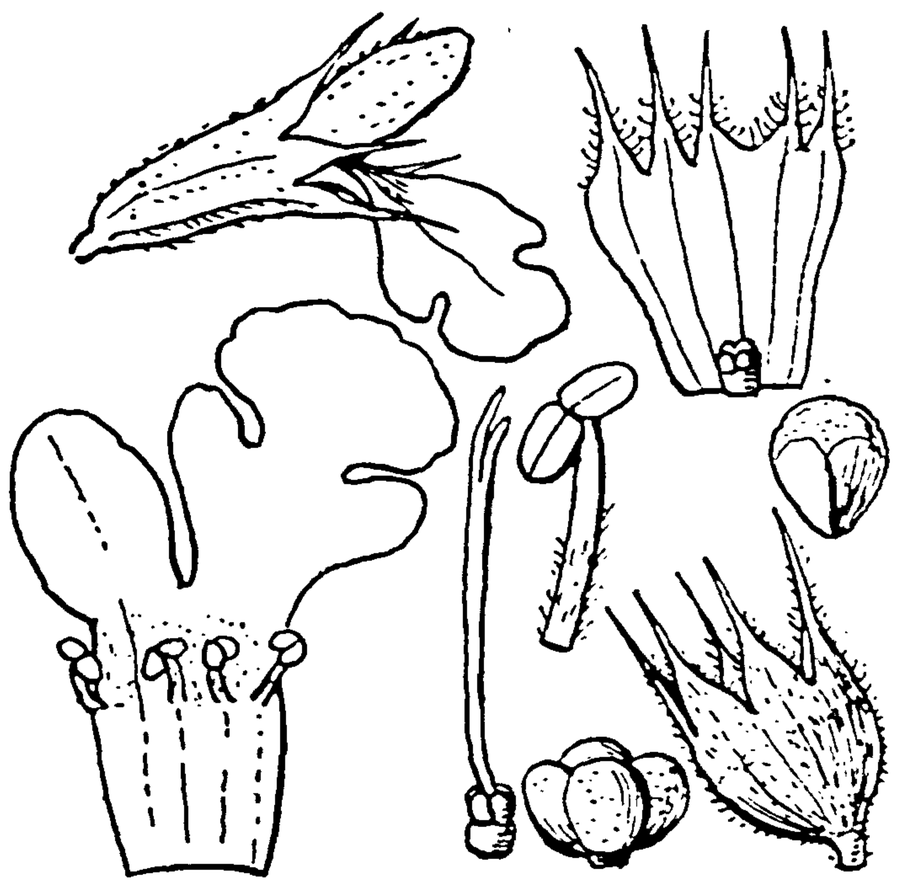
IV. CORDATAE

Leaf-blades acuminate, 6–15 cm. long: species Alleghenian. 11. *S. cordata.*
Leaf-blades obtuse or merely acute, 1–4 cm. long: species Floridian. 12. *S. floridana.*

V. ITALICAE

Hoary-pubescent plant with obtuse, crenate leaf-blades. 13. *S. italica.*

1. **S. agraria** Cham. & Schlecht. Plant 1–3 dm. tall: leaf-blades elliptic to ovate, 1–4 cm. long, crenate: calyx 2–4 mm. long; lobes shorter than the tube: corolla lavender or pinkish, 5–6 mm. long: nutlets about 1 mm. long.—Shaded ground, La. to Tex.; introduced into the Coastal Plain of Ala.—Spr.–fall.



2. **S. hyssopifolia** Michx. Stem 2–4 dm. tall, glabrous or merely hirsute at the nodes: leaf-blades linear or nearly so, 1–5 cm. long: calyx 6–7 mm. long, generally glabrous; lobes about as long as the tube: corolla 11–13 mm. long: nutlets about 2 mm. long.—Swamps, meadows, and thickets, various provinces, Fla. to Mich., and Mass.—Sum.

3. **S. lythroides** Small. Stem 4–9 dm. tall, sparingly hirsute: leaf-blades broadly linear to elliptic-linear, 1.5–6 cm. long, smooth and glabrous: calyx 6–7 mm. long, mostly pubescent; lobes shorter than the tube: corolla about 10 mm. long: nutlets not seen.—Sandy soil, near Tallahassee, Fla.—Sum.

4. **S. ambigua** (A. Gray) Britton. Stem 3–10 dm. tall, hirsute: leaf-blades narrowly elliptic to elliptic-lanceolate, 3–6 cm. long, pubescent: calyx 6–8 mm. long; lobes lanceolate, as long as the tube or nearly so: corolla 11–13 mm. long: nutlets over 2 mm. long.—Moist sandy soil, various provinces, Ga. to Wisc., and Mass.—Sum.

5. **S. Nuttallii** Shuttlw. Stem 4–11 dm. tall, copiously hirsute: leaf-blades elliptic to elliptic-lanceolate, 5–10 cm. long, serrate-dentate: calyx 5–6 mm. long; lobes triangular-lanceolate, less than ½ as long as the tube: corolla 11–13 mm. long: nutlets about 2 mm. long.—Mt. slopes, Blue Ridge, Tenn. to Va.—Spr.

6. **S. latidens** Small. Stem 3–7 dm. tall, glabrous or nearly so: leaf-blades oval, ovate, or elliptic, and 4–10 cm. long on the lower part of stem, larger and narrower above, finely crenate-serrate: calyx 5–6 mm. long; lobes triangular, very short: corolla 11–13 mm. long: nutlets fully 2 mm. long.—Slopes and summits, Blue Ridge, N. C., and Tenn. to Va.—Sum.

7. S. tenuifolia Willd. Stem 3–9 dm. tall, glabrous or nearly so: leaf-blades mainly elliptic to elliptic-lanceolate, 3–10 cm. long, serrate: calyx 6–7 mm. long, sometimes sparingly pubescent; lobes lanceolate, as long as the tube or nearly so: corolla 10–12 mm. long: nutlets about 2 mm. long.—Roadsides, fields, and moist thickets, various provinces, Fla. to La., Kans., Ia., and N. Y.—Sum.

8. S. aspera Michx. Stem 5–12 dm. tall, hirsute: leaf-blades elliptic, elliptic lanceolate, or ovate-elliptic, 3–10 cm. long, crenate-serrate: calyx 6–8 mm. long, hirsute; lobes triangular-lanceolate, shorter than the tube: corolla mainly 12–15 mm. long: nutlets about 2 mm. long.—Woods and thickets, various provinces, Fla. to La., Ont., and Mass.—Sum.

9. S. salvioides Small. Stem 3–9 dm. tall, puberulent or puberulent-pubescent: leaf-blades elliptic to elliptic-ovate or rarely ovate, 6–12 cm. long, crenate: calyx 4–5 cm. long, hirsutulous and short pubescent; lobes triangular, acute: corolla 9–10 mm. long; lower lip shorter than the tube: nutlets nearly 2.5 mm. long.—Stony soil, Appalachian Plateau, Tenn. to W. Va., and Va.—Sum.

10. S. Clingmanii Small. Stem 5–9 dm. tall, hispid, hirsute: leaf-blades elliptic to elliptic-lanceolate, 6–12 cm. long, dentate: calyx 6–7 mm. long, villous; lobes lanceolate-subulate, at least ½ as long as the tube: corolla about 15 mm. long; lower lip about as long as the tube: nutlets 2 mm. long.—Open slopes, Clingman's Dome, in the Blue Ridge of N. C. and Tenn.—Sum.

11. S. cordata Riddell. Stem 3–10 dm. tall, hirsute: leaf-blades ovate, oval or elliptic, 6–15 cm. long, crenate: calyx 4–6 mm. long, hirsute; lobes deltoid: corolla 10–14 mm. long; lower lip shorter than the tube: nutlets about 2 mm. long.—Thickets and banks, various provinces, N. Ala. and N. C. to Ohio.—Sum.

12. S. floridana Shuttlw. Stem 1–4 dm. tall, hirsute: leaf-blades elliptic to ovate, 1–4 cm. long, serrate or dentate: calyx 5–7 mm. long, puberulent; lobes lanceolate: corolla 10–13 mm. long; lower lip as long as the tube: nutlets 1.5 mm. long or rarely smaller.—Sandy soil, Fla.—Spr.–fall.—The plant spreads by means of elongate, sometimes branching tubers.

13. S. italica Mill. Plant 1 m. tall or less, the stem simple or sparingly branched: leaf-blades elliptic, elliptic-ovate or ovate, 3–15 cm. long, obtuse, crenate, rugose, pubescent: flower-whorls dense: calyx 9–12 mm. long; lobes slender-tipped, much shorter than the tube: corolla 12–16 mm. long, pubescent: nutlets about 1 mm. long.—(MOUSE-EAR.)—Waste-places, cult. grounds, and roadsides, various provinces, Fla. to Tenn., and Ont. Nat. of Eu.—Sum.–fall.

19. SALVIA [Tourn.] L. Annual or perennial, herbs, or woody plants. Leaf-blades entire, toothed, or lobed. Flowers in interrupted or continuous panicles. Calyx short, 2-lipped: upper lip 3-lobed: lower lip 1-lobed. Corolla 2-lipped: lower lip 3-lobed, the middle lobe much larger than the lateral ones. Stamens 4, but only 2 anther-bearing, or only 2: each filament surmounted by a transverse connective, one end of which bears a long anther. Stigmas very unequal.—About 500 species, widely distributed.—SAGES.

Lower anther-sac wanting.	
Anterior part of the connective linear or nearly so.	I. AZUREAE.
Anterior part of the connective abruptly dilated.	II. VERBENACEAE.
Lower anther-sac present.	III. LYRATAE.

I. AZUREAE

Corolla scarlet.	1. *S. coccinea.*
Corolla blue, purplish, or white.	
Leaf-blades narrow, usually over 4 times as long as wide.	2. *S. azurea.*

Leaf-blades broad, mostly less than twice as long as wide.
Calyx over 5 mm. long at maturity.
Leaf-blades very slightly decurrent on the petioles.
Calyx-lobes merely acute: flower-clusters approximate or contiguous. 3. *S. serotina.*
Calyx-lobes awn-tipped: flower-clusters widely separated. 4. *S. privoides.*
Leaf-blades decurrent on the petioles to their bases.
Corolla over 1 cm. long: calyx-lobes nearly erect. 5. *S. urticifolia.*
Corolla less than 1 cm. long: calyx-lobes spreading. 6. *S. Chapmanii.*
Calyx less than 5 mm. long at maturity.
Petioles filiform, wingless: stigmas subulate. 7. *S. Blodgettii.*
Petioles winged by the decurrent blades: stigmas broad. 8. *S. occidentalis.*

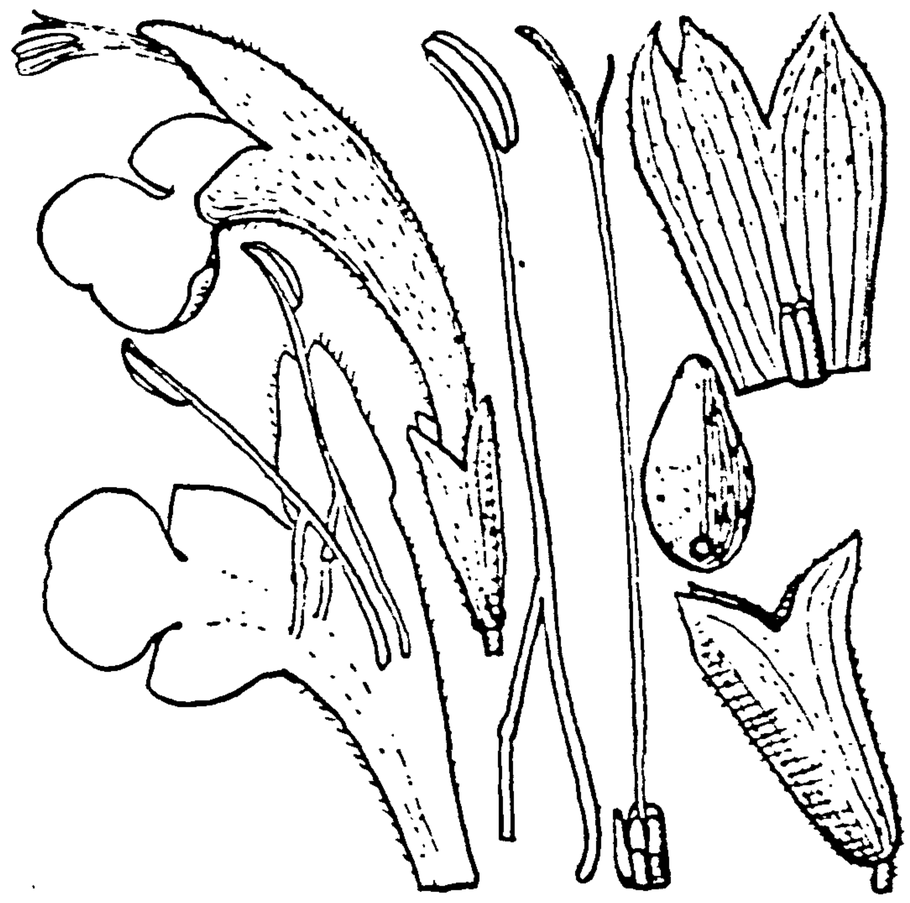
II. VERBENACEAE

Plant villous or villous-hirsute: leaf-blades incised to pinnatifid. 9. *S. verbenacea.*

III. LYRATAE

Plant with the leaves mainly basal; blades lyrate-pinnatifid. 10. *S. lyrata.*

1. S. coccinea L. Stems 3–7 dm. tall, softly pubescent: leaf-blades ovate to deltoid-ovate, 3–6 cm. long, crenate-serrate: calyx 10–12 mm. long; corolla scarlet; lower lip with a notched middle lobe 7–8 mm. wide: nutlets 2.5 mm. long.—Sandy soil, hammocks, waste-places, and roadsides, Coastal Plain, Fla. to Tex., and S. C.—(*Mex.*)—Spr.–fall.



2. S. azurea Lam. Stems 3–12 dm. tall, puberulent above: leaf-blades oblong to lanceolate or linear, or rarely broader, 3–10 cm. long, undulate or shallowly serrate: calyx 7–9 mm. long; lower lobes ovate: corolla azure-blue or white, 13–15 mm. long: style pubescent at the top: nutlets about 3 mm. long.—Dry soil, pinelands, sand-hills and woods, Coastal Plain, Fla. to Tex., and S. C.—Spr.–fall.

3. S. serotina L. Stems 1–7 dm. tall, finely pubescent: leaf-blades ovate to orbicular-ovate, 1–4 cm. long, crenate-serrate: inflorescence usually rather shortened, sometimes elongate, but always densely flowered: calyx glandular-pubescent, 6–8 mm. long: corolla 6–10 mm. long: nutlets fully 2 mm. long.—Pinelands, hammocks, and cult. grounds, Fla.—Spr.–fall.

4. S. privoides Benth. Stem 5–18 dm. tall, pubescent: leaf-blades ovate, 1–3 cm. long, sharply serrate: inflorescence elongated and slender, the flowers scattered along the rachis: calyx glandular-pubescent, 5–7 mm. long; lower lobes awn-tipped: corolla 5.5–6 mm. long: nutlets barely 2 mm. long.—Sandy places, pen. Fla., and the Keys.—(*W. I., Mex., C. A.*)—Spr.–fall.

5. S. urticifolia L. Stem 2–7 dm. tall, finely pubescent: leaf-blades ovate to deltoid, 3–8 cm. long, dentate or crenate: calyx 6–8 mm. long; lower lobes cuspidate: corolla deep-blue, 11–13 mm. long, lower lip about 8 mm. wide: nutlets about 2 mm. long.—Woods and thickets, various provinces, Fla. to La., Ky., and N. C.—Spr.–sum.

6. S. Chapmanii A. Gray. Stem 10–20 dm. tall, closely pubescent: leaf-blades ovate to ovate-lanceolate, 2.5–8 cm. long, crenate-serrate: calyx 4–6 mm. long; lower lobes acute: corolla 8–9 mm. long; lower lip about 4 mm. wide: nutlets about 1.5 mm. long.—Sandy soil, Coastal Plain, Fla. and Ala.—Spr.

7. **S. Blodgettii** Chapm. Stem 1–7 dm. tall, minutely pubescent: leaf-blades ovate to suborbicular, 1–2 cm. long, shallowly toothed: calyx about 4 mm. long; lower lobes acute: corolla about 8 mm. long.—Hammocks, Key West, Fla.—All year.

8. **S. occidentalis** Sw. Stem 5–20 dm. tall, pubescent: leaf-blades ovate, 2–5 cm. long, serrate: calyx 3–3.5 mm. long; lower lobes acute: corolla about 5 mm. long: nutlets 2 mm. long.—Sandy soil, pen. Fla.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall.

9. **S. verbenacea** L. Stem 1–6 dm. tall, hirsute or villous-hirsute; leaf-blades ovate to elliptic, 3–15 cm. long, incised or pinnatifid: calyx 6–8 mm. long, shaggy-pubescent; lower lobes lanceolate: corolla bluish, 8–10 mm. long: nutlets nearly smooth.—Sandy soil, various provinces, Ga., to Ala., Ohio, and S. C. Nat. of Eu.—Sum.—*Salvia Sclarea*—CLARY—a native of Europe, with viscid foliage, large cordate, coarsely toothed leaf-blades and white and purple corollas, has been found in N. Car.

10. **S. lyrata** L. Stem 1–6 dm tall, scape-like, pilose or hirsute: leaves mainly basal; blades spatulate, oblanceolate, elliptic, or oval, 5–20 cm. long, lyrate-pinnatifid: calyx 9–11 mm. long, hirsute; lower lobes lanceolate: corolla blue-purple, 20–25 mm. long: nutlets granular.—(LYRE-LEAVED SAGE.)—Woods, hammocks, pinelands, various provinces, Fla. to Tex., Mo., and Conn.—Early sum.

20. **MONARDA** L. Shrubs, or perennial erect herbs. Leaf-blades toothed. Flowers in remote or approximate dense cymes. Calyx elongate, nearly regular: lobes 5, slender, shorter than the tube. Corolla 2-lipped, elongate: upper lip narrow, erect or arched: lower lip 3-lobed, the middle lobe much longer than the lateral ones. Stamens 2: filaments elongate: anthers with divergent sacs. About 20 species, North American.—HORSE-MINTS.

Flower-clusters terminal and solitary: stamens exserted beyond the straight upper corolla-lip. — Subgenus I. EUMONARDA.
Flower-clusters mainly axillary, borne in spike-like interrupted panicles: stamens not exceeding the curved upper corolla-lip. — Subgenus II. CHEILYCTIS.

Subgenus I. EUMONARDA

Leaf-blades relatively long-petioled or manifestly petioled.
- Corolla scarlet. — 1. *M. didyma.*
- Corolla white, pink, or purple.
  - Leaf-blades membranous, deep-green: corolla greenish or cream-colored. — 2. *M. Clinopodia.*
  - Leaf-blades firmer, barely membranous, dull- or bright-green: corolla pink, purple, or purple-red.
    - Pubescence of spreading hairs.
      - Corolla, and often the bracts, lilac or purplish. — 3. *M. fistulosa.*
      - Corolla, and the bracts, deep-purple or purple-red. — 4. *M. media.*
    - Pubescence of very short appressed hairs.
      - Leaves on the upper part of the stem with petioles less than 5 mm. long. — 5. *M. scabra.*
      - Leaves on the upper part of the stem with petioles over 5 mm. long. — 6. *M. mollis.*

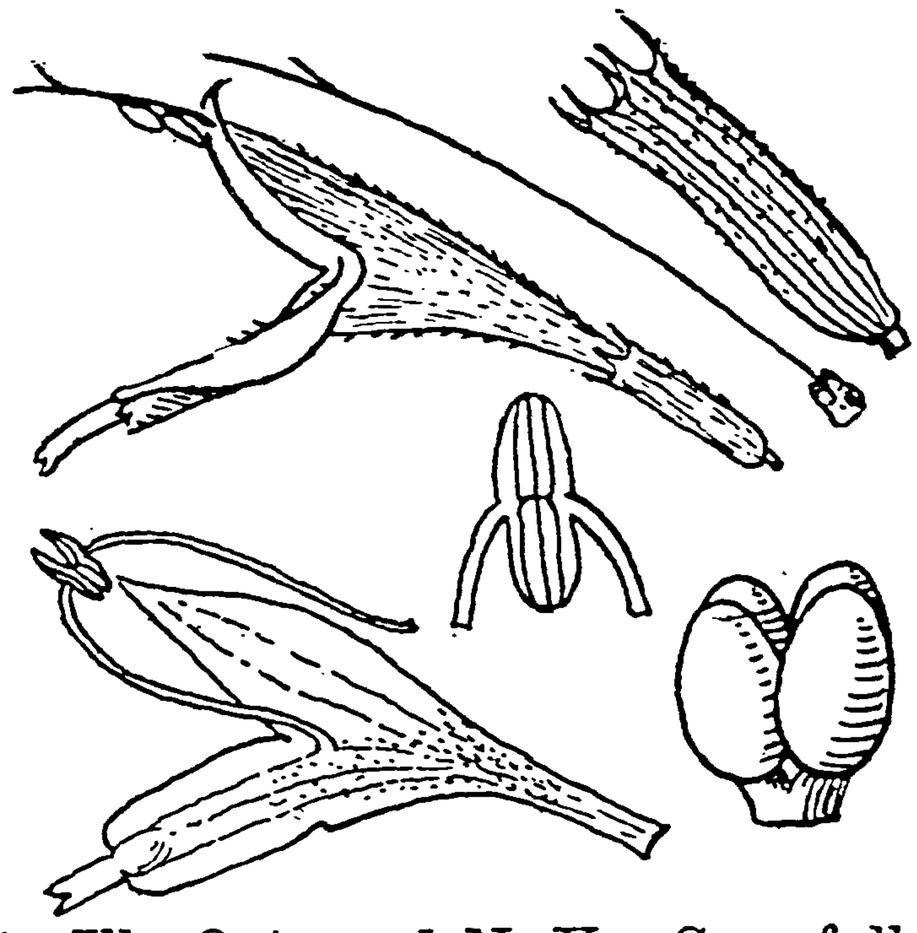
Leaf-blades sessile or nearly so: calyx pubescent at the mouth; lobes not glandular. — 7. *M. Bradburiana.*

Subgenus II. CHEILYCTIS

Plants perennial: calyx-lobes acuminate: corolla yellowish, or rarely white. — 8. *M. punctata.*
Plants annual or biennial: calyx-lobes setaceous: corolla pink or purplish. — 9. *M. dispersa.*

1. **M. didyma** L. Stem 3–12 dm. tall, sometimes sparingly pubescent: leaf-blades lanceolate or elliptic-lanceolate to ovate, 8–15 cm. long, serrate: heads

showy: calyx 7–11 mm. long; lobes subulate: corolla 35–50 mm. long; middle lobe of the lower lip acute.—(BEE-BALM. OSWEGO-TEA).—Moist woods, stream-banks, thickets, and roadsides, Blue Ridge and more northern provinces, Ga. to Ala., Ont., and N. B.—Sum.–fall.



2. M. Clinopodia L. Stem 3–8 dm. tall, glabrous or sparingly pubescent: leaf-blades ovate to lanceolate, 3–12 cm. long, serrate: bracts pale: calyx 7–9 mm. long, somewhat bearded in the throat; lobes short-subulate: corolla 24–28 mm. long; lower lip with rounded lateral lobes: nutlets fully 1 mm. long.—Hillsides, woods, and moist thickets, various provinces, rarely Coastal Plain, Ga. to Ill., Ont., and N. Y.—Spr.–fall.

3. M. fistulosa L. Stem 5–12 dm. tall, villous or villous-hirsute: leaf-blades ovate to lanceolate, 2–12 cm. long, remotely sharp-serrate: bracts usually colored: calyx 8–12 mm. long, copiously bearded in the throat; lobes long-subulate: corolla 30–34 mm. long; lower lip with acute lateral lobes: nutlets fully 1.5 mm. long.—(HORSE-MINT. WILD-BERGAMOT).—Dry hillsides, fence-rows, rocky woods, and thickets, often in calcareous soil, various provinces, Fla. to La., Ont., and Me.—Sum.–fall.

4. M. media Willd. Stem 6–12 dm. tall, hirsute or glabrate: leaf-blades ovate, lanceolate, or elliptic, 8–12 cm. long, serrate: calyx 9–10 mm. long; lobes subulate: corolla 15–22 mm. long; lower lip with rounded lateral lobes.—Thickets and stream-banks, Blue Ridge, and more northern provinces, N. C. to Tenn., Pa., and Me.—Sum.

5. M. scabra Beck. Stem 2–10 dm. tall, velvety-pubescent: leaf-blades ovate to lanceolate, 2–8 cm. long, sharply, often remotely, serrate: calyx 7–9 mm. long; lobes subulate: corolla 20–25 mm. long, pale-purple; lower lip with rounded lateral lobes.—Dry soil, various provinces, rarely Coastal Plain, Ala. to Tex., Ariz., B. C., and Man.—Sum.

6. M. mollis L. Similar to *M. fistulosa* in habit and to *M. scabra* in pubescence: leaf-blades ovate to lanceolate, 5–11.5 cm. long, coarsely serrate: calyx 8–10 mm. long; lobes subulate: corolla 24–27 mm. long, pink to lilac.—Dry soil, Blue Ridge and more northern provinces, Ga. to Tenn., S. Dak., and Me.—Sum.

7. M. Bradburiana Beck. Stem 3–6 dm. tall, more or less villous-hirsute above: leaf-blades ovate to lanceolate, 3–10 cm. long, serrate or nearly entire: calyx 9–10 mm. long; lobes subulate: corolla pink or whitish, 20–27 mm. long.—Thickets and hillsides, various provinces N of Coastal Plain, Ala. to Kans. and Ill.—Spr.–sum.

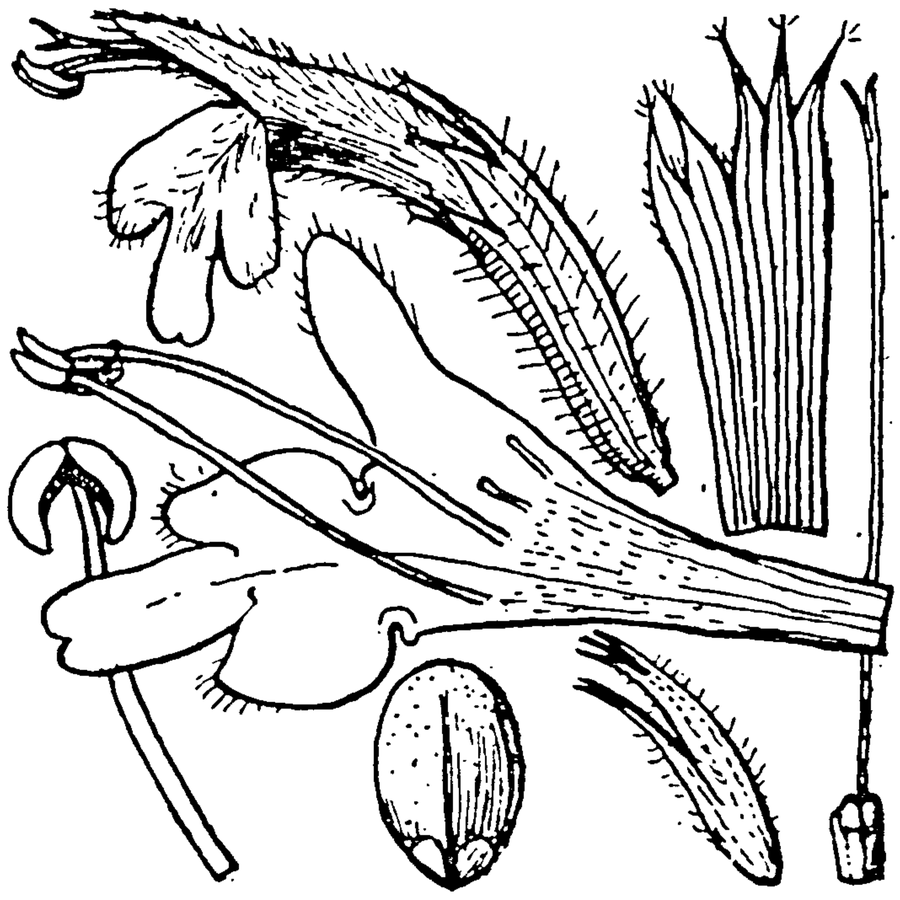
8. M. punctata L. Stem 3–10 dm. tall, finely pubescent: leaf-blades linear-elliptic to lanceolate, 2–8 cm. long, serrate: calyx 8–10 mm. long; lobes short-acuminate, spreading: corolla yellowish and purple-spotted (white in *M. punctata leucantha*), 20–25 mm. long; upper lip mainly elliptic-ovate.—Sandy fields, pastures, woods and roadsides, in rather acid soil, various provinces, Fla. to Tex., Minn., and N. Y.—Sum.–fall.

9. **M. dispersa** Small. Stem 2–8 dm. tall, puberulent: leaf-blades elliptic to elliptic-spatulate or oblanceolate on the lower part of the stem, narrowly elliptic or linear above, 2–11 cm. long, shallowly serrate: calyx-tube 8–9 mm. long; lobes spreading: corolla pink or purplish, 20–25 mm. long; lower lip with an elliptic middle lobe.—Low grounds, various provinces, Fla. to Tex., N. M., Mo., and Ga.—(*Mex.*)—Native westward.—Spr.-sum.

21. BLEPHILIA Raf. Perennial erect herbs. Leaf-blades shallowly toothed. Flowers in dense axillary cymes. Calyx 2-lipped: upper lip 3-lobed: lower lip 2-lobed. Corolla 2-lipped: upper lip erect, entire: lower lip 3-lobed, the narrow middle lobe much longer than the others. Stamens 2, long-exserted. —Only the following species.—Sum.

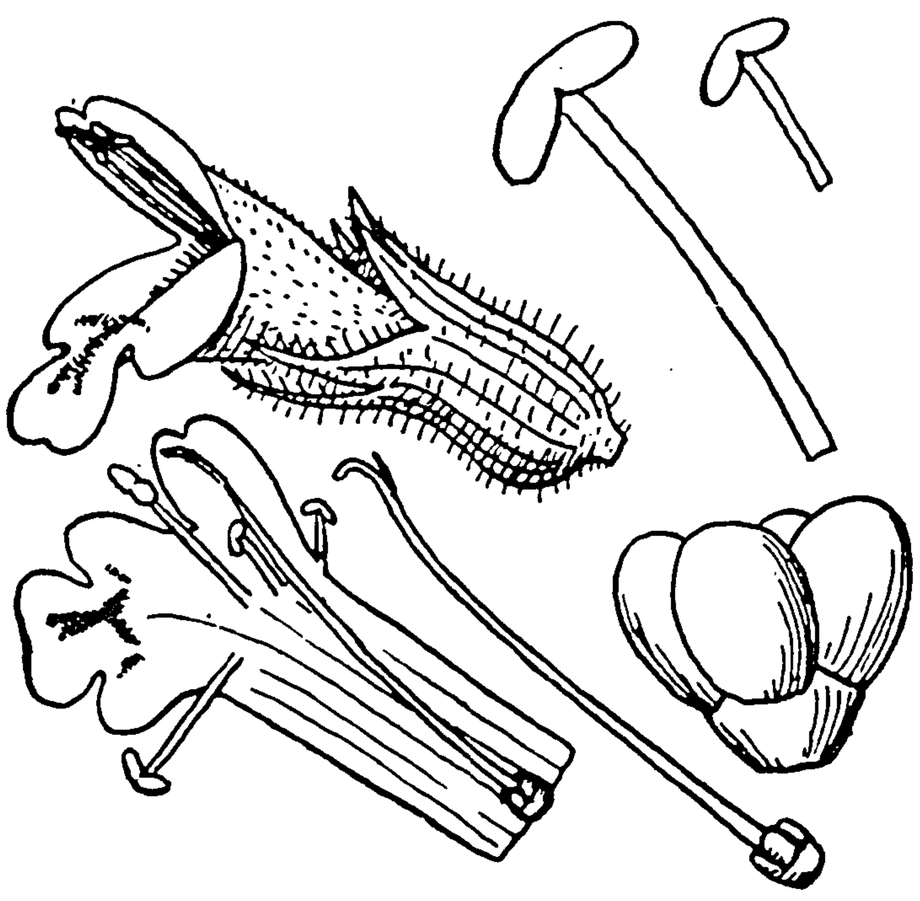
Cauline and floral leaves with short-petioled or nearly sessile blades: bractlets acute or short-acuminate. 1. *B. ciliata.*
Cauline and floral leaves with rather long-petioled blades: bractlets long-acuminate. 2. *B. hirsuta.*

1. **B. ciliata** (L.) Raf. Stem 3–6 dm. tall, softly villous-pubescent: leaf-blades lanceolate, 5–10 cm. long, shallowly toothed, short-petioled or nearly sessile: outer bractlets usually broadly ovate; all with acute or short acuminate tips; calyx 8–11 mm. long: corolla pink or purplish, 10–12 mm. long; middle lobe of the lower lip truncate or notched.—Thickets and dry woods, various provinces, Ga. to Tex., Wis., and Mass.



2. **B. hirsuta** (Pursh) Torr. Stem 3–10 dm. tall, hirsute or villous-hirsute: leaf-blades ovate to lanceolate, 5–12 cm. long serrate, rather long-petioled: outer bractlets usually ovate-lanceolate; all with long acuminate tips; calyx 6–8 mm. long: corolla pale or almost white, 10–11 mm. long; middle lobe of the lower lip rounded or slightly notched.—Shaded grounds, various provinces, Ga. to Tex., Wis., and Vt.

22. HEDEOMA Pers. Annual or perennial often diffuse herbs. Leaf-blades entire or sparingly toothed. Flowers in remote or contiguous axillary cymes. Calyx 2-lipped, sometimes obscurely so: lobes of the upper lip broader and shorter than those of the lower lip. Corolla 2-lipped: upper lip sometimes notched: lower lip 3-lobed, commonly broader than the lateral one. Stamens 2, accompanied by more or less reduced ones. One stigma obsolete.—About 15 species, American.



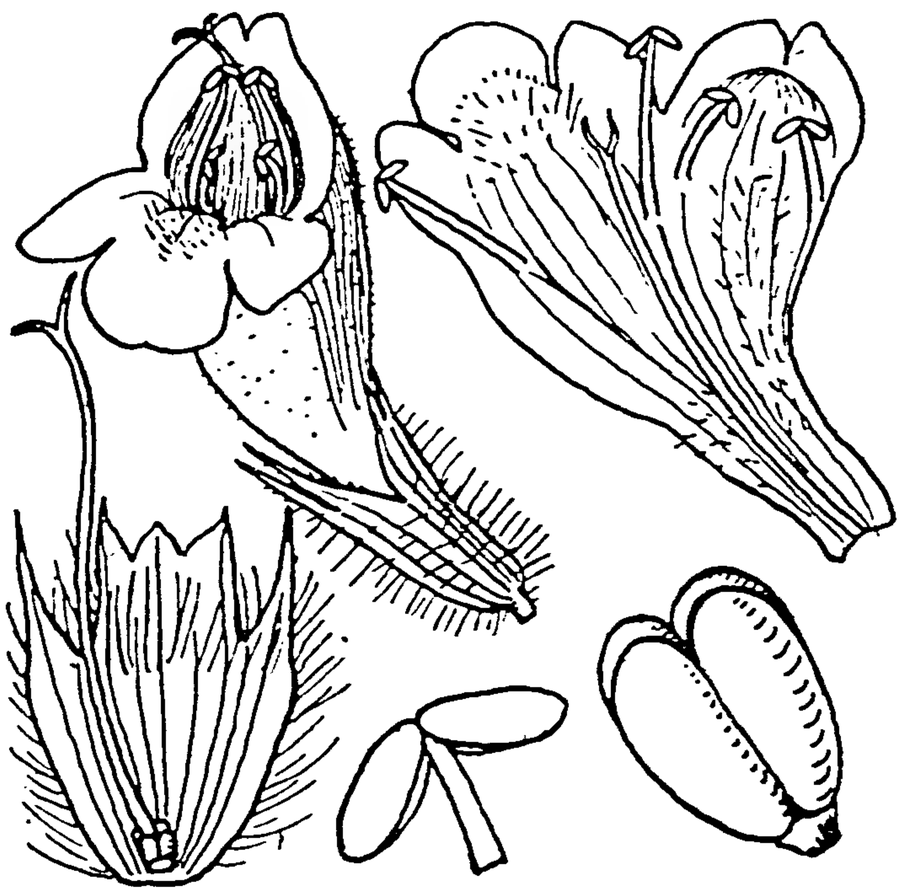
1. **H. pulegioides** (L.) Pers. Plant very fragrant: stem 1–4 dm. tall, finely pubescent: leaf-blades oval-elliptic to elliptic, 9–20 mm. long, sparingly serrate, mostly purple beneath: calyx becoming 4–5 mm. long; tubes strongly ribbed: corolla 4–5 mm. long, pale lilac, with a deep purple blotch on the lower lip.—(PENNYROYAL. MOCK-PENNYROYAL. AMERICAN-PENNY-

ROYAL.)—Dry fields and open woods, various provinces, Fla. to Nebr., Minn., and N. S.—Sum.

23. **STACHYDEOMA** Small. Perennial erect herbs. Leaf-blades toothed. Flowers pale-lilac, in long leafy-bracted spike-like panicles. Calyx strongly 2-lipped; lobes of the upper lip broad, those of the lower lip subulate. Corolla 2-lipped: upper lip entire: lower lip drooping, 3-lobed, the lateral lobes about equalling the terminal one. Stamens 2, exserted: anthers shorter than the filaments. Staminodia present. Style glabrous.—One species.

1. S. graveolens (Chapm.) Small. Stem 2–6 dm. tall, hirsute: leaf-blades suborbicular to ovate, 10–15 mm. long: calyx becoming 7–9 mm. long; upper lip ovate: nutlets 0.5 mm. long. [*Hedeoma graveolens* Chapm.] —Low pinelands, N Fla.—Sum.

24. **MELISSA** [Tourn.] L. Perennial, erect herbs. Leaf-blades broad, toothed. Flowers in axillary clusters. Calyx 2-lipped, the broad upper lip with 3 minute lobes, the 2 lobes of the lower lip slender. Corolla 2-lipped: upper lip mostly notched: lower lip 3-lobed, the middle lobe very broad. Stamens 4, exserted.—About 4 species, Eurasian.



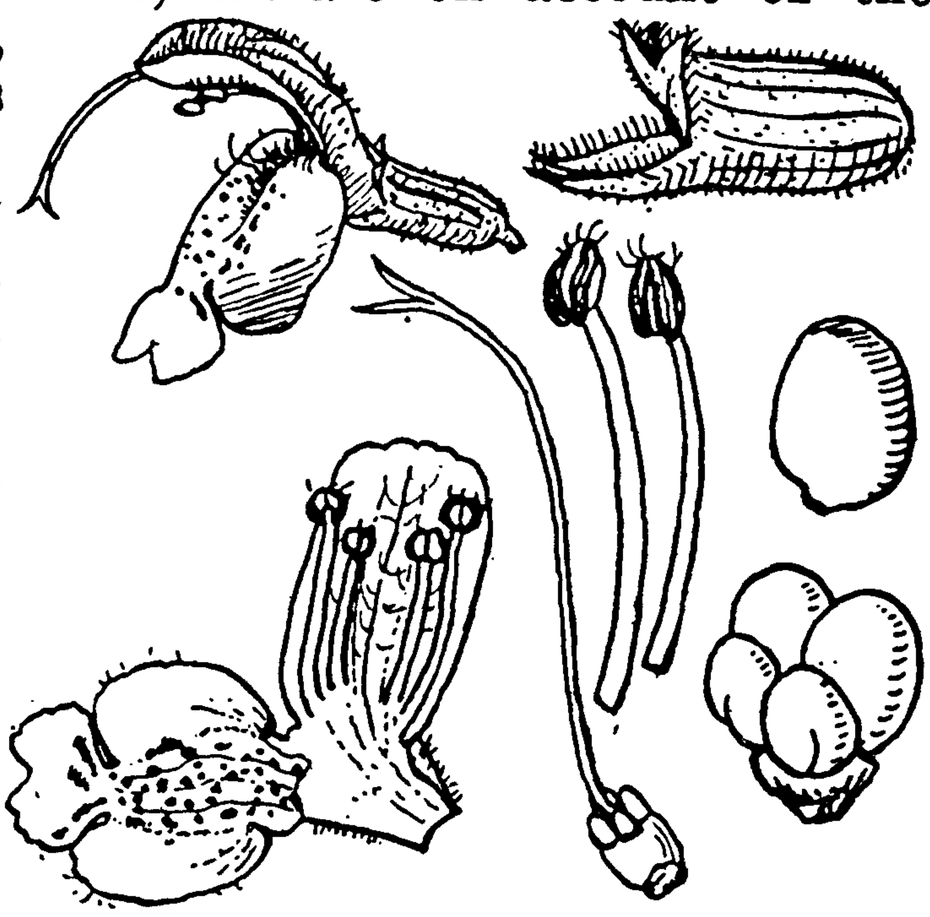
1. M. officinalis L. Plant lemon-scented, 3–9 dm. tall: leaf-blades ovate to ovate-oblong, 2–8 cm. long, crenate-serrate: calyx ringent, 7–8 mm. long; upper lip curved upward: corolla white or cream-colored, about 10 mm. long: nutlets 1.5 mm. long.—(BEE-BALM. LEMON-BALM.)—Roadsides and waste-places, various provinces, Fla. to Ark., Mo., and Me. Nat. of Eu.—Sum.

25. **CONRADINA** A. Gray. Shrubs with virgate branches. Leaf-blades narrow, entire, revolute, fasciculate. Flowers 1–few together in axillary cymes which are sometimes approximate. Calyx 2-lipped; upper lip with 3 short and broad lobes; lower lip with 2 long and narrow lobes: corolla bluish or purplish, 2-lipped; upper lip erect, slightly concave; lower lip divergent, 3-lobed, usually dotted, the terminal lobe about the same size as the lateral ones or smaller. Stamens 4, exserted or lying under the upper corolla lip.—Four species, the following:

Lower corolla-lip 12–15 mm. long; lateral lobes wider than long. — 1. *C. grandiflora.*

Lower corolla-lip 8–10 mm. long; lateral lobes longer than wide.
- Calyx-tube hirsute, villous-hirsute, or hirsutulous.
  - Leaf-blades pubescent on both sides: calyx-tube hirsute or villous-hirsute. — 2. *C. canescens.*
  - Leaf-blades glabrous above: calyx-tube hirsutulous. — 3. *C. montana.*
- Calyx-tube minutely canescent. — 4. *C. puberula.*

1. C. grandiflora Small. Shrub 1 m. tall or less with few, virgate, often curved branches: leaf-blades narrowly spatulate, clavate on account of the revolute margins, mostly 10–25 mm. long, white-canescent beneath, otherwise glabrous or nearly so, at least at maturity, punctate: calyx becoming 6.5–7.5 mm. long, finely pubescent: upper lip of corolla 7–9 mm. long: nutlets nearly 1.5 mm. long.—Scrub, lower E coast region, Fla.—All year.



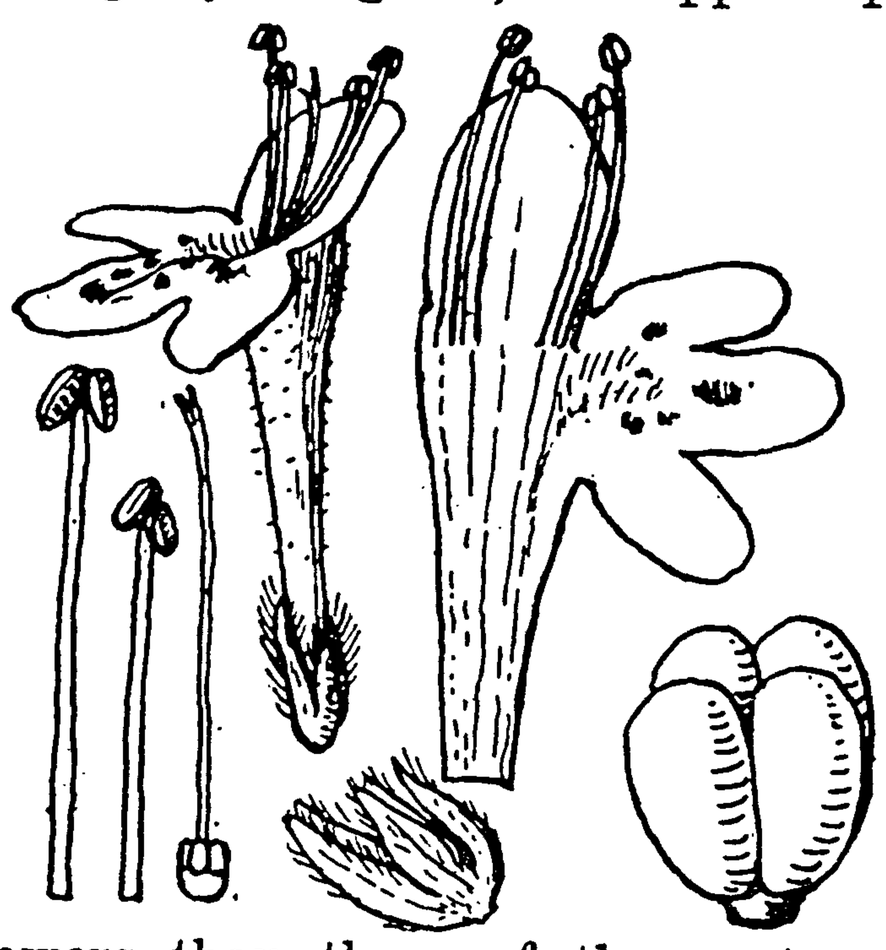
2. C. canescens (T. & G.) A. Gray. Shrub less than 0.5 m. tall, with numerous stiff branches: leaf-blades broadly spatulate, but tightly revolute and thus clavate, 5–9 mm. long, finely canescent: calyx becoming 4.5–5.5 mm. long: upper lip of corolla 4–5 mm. long: nutlets fully 1 mm. long.—Pinelands, upper Gulf coast region, Fla. and Ala.—Spr.

3. C. montana Small. Shrub less than 0.5 m. tall, with diffuse often decumbent branches: leaf-blades narrowly linear, tightly revolute, 5–16 mm. long, minutely canescent beneath: calyx becoming 6–7 mm. long; lobes hirsutulous: upper lip of corolla 3.5–4 mm. long: nutlets barely 1 mm. long.—Sandy woods and ravines, Appalachian Plateau, near Rugby, Tenn.—Late Spr.

4. C. puberula Small. Shrub about 0.5 m. tall, with rather numerous slender branches: leaf-blades narrowly spatulate, but revolute and slenderly clavate, mostly 12–20 mm. long, puberulent: calyx becoming 5–7 mm. long; lobes hirsute: upper lip of corolla 4–5 mm. long: nutlets fully 1 mm. long.—Pinelands, N Gulf coast region, Fla.—Spr.

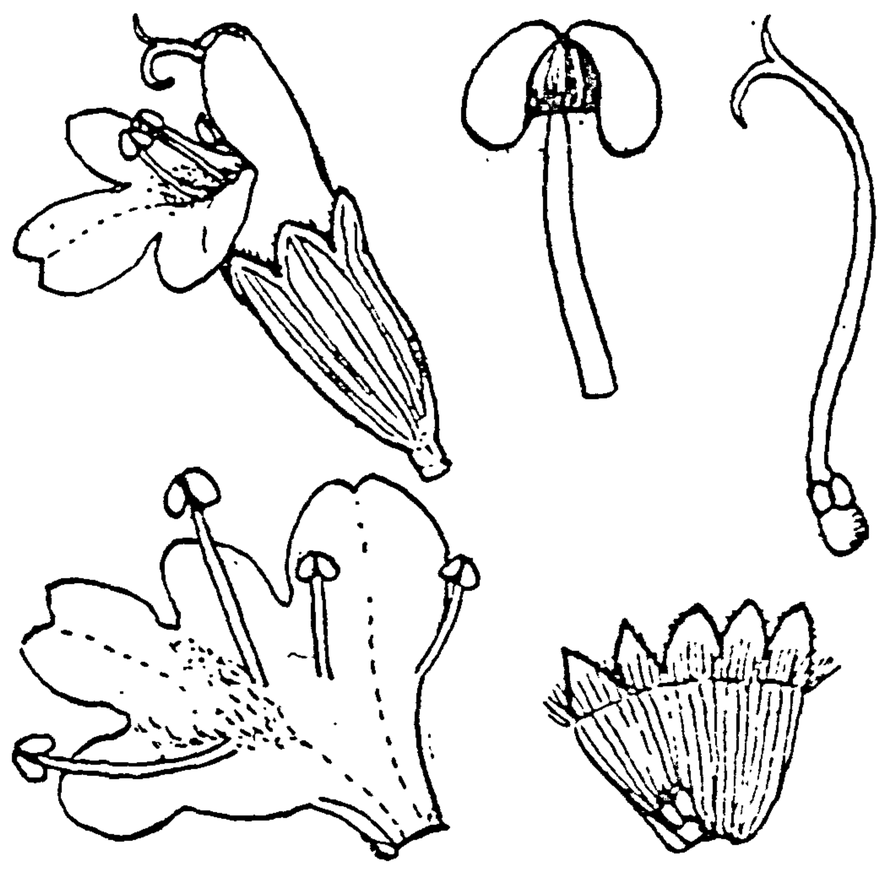
A plant of this genus collected near Bristol, Fla., has the small flowers of *C. canescens* and *C. puberula*, but differs in the foliage and inflorescence being glabrous or nearly so, except the ciliate calyx-lobes, and in the abortive anthers.

26. **PYCNOTHYMUS** Small. Shrubs. Leaf-blades narrow, entire. Flowers in dense raceme-like panicles. Calyx slightly irregular, the upper lip with 3 narrow lobes, the lower lip with 2 longer lobes. Corolla 2-lipped: lower lip 3-lobed, the middle lobe slightly larger than the lateral ones.—One species.



1. P. rigidus (Bart.) Small. Plant 1–7 dm. tall or low and diffuse, hirsute: leaf-blades lanceolate, 5–12 mm. long: calyx 2.5–3 mm. long; lobes lanceolate to elliptic-lanceolate: corolla light-purple, 7–8 mm. long; lobes rounded. — (PENNYROYAL.) — Pinelands, pen. Fla.—All year.—This plant is rather wide-spread in southern pen. Florida. It is commonly used for making a tea. The plants of the eastern coastal region grow more erect and have lighter colored flowers than those of the western coastal region.

27. **MICROMERIA** Benth. Perennial, diffuse or creeping herbs. Leaf-blades entire or sparingly toothed. Flowers in axillary cymes, the cymes in ours one-flowered. Calyx with a fringe of hairs in the throat; almost equally 5-lobed, the lobes short. Corolla 2-lipped, pink, lavender-pink, or whitish: upper lip erect: lower lip 3-lobed, the middle lobe very broad. Stamens 4, more or less exserted.—About 60 species, widely distributed.



1. M. pilosiuscula (A. Gray) Small. Stem and branches sparingly pubescent or glabrate, the branches ascending or spreading, 1–4 dm. long: leaf-blades suborbicular to broadly ovate, 5–25 mm. long, sparingly pubescent: calyx glabrate or sparingly pilose, 4–5 mm. long, shorter than the pedicel or sometimes equalling it in length; lobes 1–1.5 mm. long, ovate-deltoid, those of the upper lip abruptly acute, acutish, or even acuminate; corolla 7–8 mm. long, pink, lavender-pink, or whitish; tube much dilated; middle lobe of the lower lip about as wide as long, notched.—Swamps, marshes, stream-banks, woods, and ditches. Coastal Plain, Fla. to Tex.—(*Mex.*)—Spr.–sum.

M. Brownei (Sw.) Benth., a West Indian species with which the above species has been confused, but which differs in the size of the calyx and the shape of the calyx-lobes, as well as in size of plant, leaf, and flower, is not known to occur in the continental U. S.

28. **CLINOPODIUM** L. Shrubs or annual or perennial herbs. Leaf-blades entire or toothed. Flowers in sessile or peduncled axillary cymes. Calyx 2-lipped, the upper lip with 3 short lobes, the lower lip with 2 long, narrow lobes. Corolla 2-lipped: upper lip sometimes notched: lower lip 3-lobed. Stamens 4: anthers awnless.—Spr.–fall, or all year southward.—About 60 species, natives of the north temperate zone.—BASILS.

Flowers in dense axillary clusters, thus forming head-like whorls, accompanied by linear-filiform bractlets. I. VULGARIA.
Flowers few together or solitary in the axils of the leaves, with minute bractlets.
  Plants herbaceous. II. HERBACEA.
  Plants woody. III. FRUTICOSA.

I. VULGARIA

Stem hirsute: calyx-lobes hirsute: corolla slightly exceeding the calyx. 1. *C. vulgare.*

II. HERBACEA

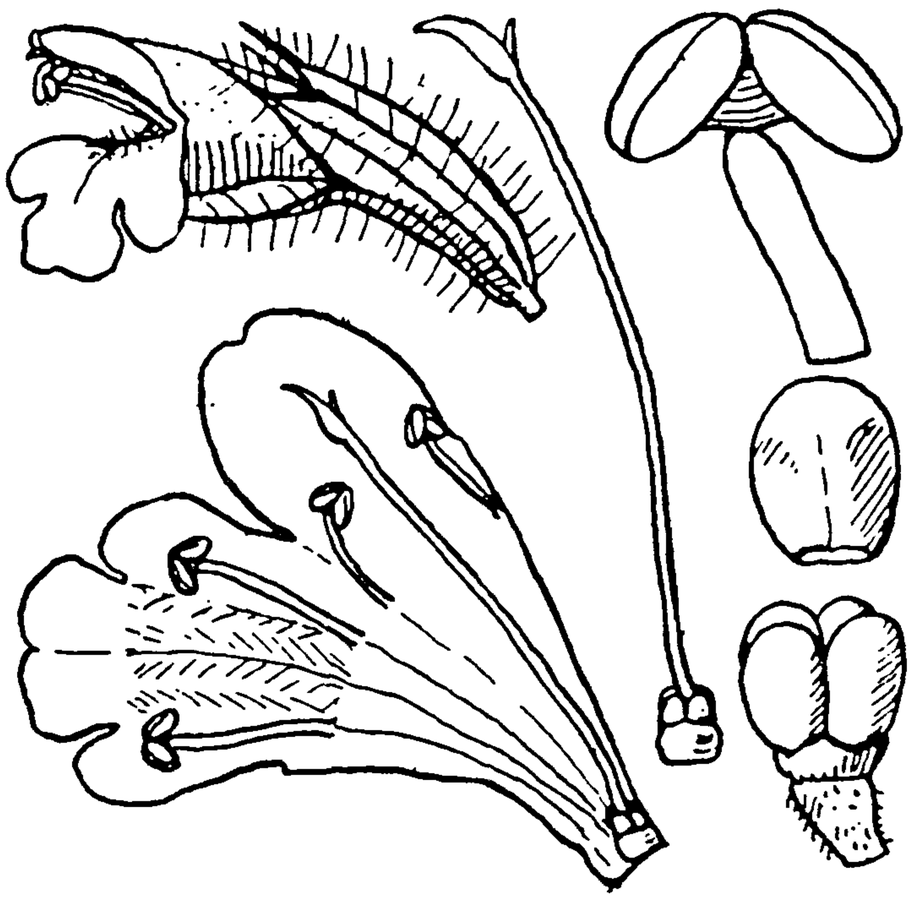
Stem and leaves pubescent: leaf-blades ovate, often broadly so. 2. *C. Nepeta.*
Stem and leaves glabrous or nearly so: leaf-blades linear to elliptic. 3. *C. glabellum.*

III. FRUTICOSA

Corolla over 2.5 cm. long, scarlet.
  Calyx less than 1.5 cm. long: corolla 3–4 cm. long. 4. *C. coccineum.*
  Calyx over 1.5 cm. long: corolla 4–5 cm. long. 5. *C. macrocalyx.*
Corolla less than 2 cm. long, white or purplish.
  Leaf-blades toothed, broad and flat.
    Clusters 5–6-flowered: leaf-blades sessile or nearly so. 6. *C. georgianum.*
    Clusters 1–3-flowered: leaf-blades petioled. 7. *C. dentatum.*
  Leaf-blades entire, narrow and strongly revolute. 8. *C. Ashei.*

1. C. vulgare L. Stem 1–5 dm. tall, hirsute: blades of the upper leaves ovate to ovate-lanceolate, 1–4 cm. long, undulate or crenate: calyx becoming 8–9

mm. long, villous-hirsute: corolla white or pink, 11–13 mm. long; middle lobe of the lower lip broadened upward: nutlets about 1 mm. long.—(WILD-BASIL. BASIL-WEED. DOG-MINT.) — Roadsides, old fields, and woods, various provinces, N. C. to Okla., Ariz., Man., and Newf. — (*Eurasia.*) — Sum.–fall.



2. C. Nepeta (L.) Kuntze. Plant 2–9′ dm. tall, copiously pubescent: leaf-blades ovate to orbicular-ovate, 10–20 mm. long, slightly toothed: calyx becoming 5–6 mm. long: corolla light-purple or nearly white, 8–9 mm. long.—(FIELD-BALM. BASIL-THYME.)—Fields and waste-places, various provinces, Ga. to Ark., and Md. Nat. of Eu.—Sum.–fall.

3. C. glabellum (Michx.) Kuntze. Stem 1–4 dm. tall, glabrous or nearly so: blades of the upper leaves linear-elliptic or elliptic, sparingly serrate: calyx becoming 5–6 mm. long: corolla purplish, 8–12 mm. long.—Wet or damp banks, Interior Low Plateaus, Tenn. and Ky.—Spr.–sum.

4. C. coccineum (Nutt.) Kuntze. Shrub 3–9 dm. tall: leaf-blades obovate to spatulate, linear-spatulate or linear-elliptic, 0.5–2 cm. long, entire: calyx 8–11 mm. long; lateral lobes of the upper lip triangular: corolla scarlet, 3–4 cm. long; lobes of the upper lip shorter than those of the lower.—Sandy shores, sandhills, and hammocks, Coastal Plain, Fla. to Ala. and Ga.—All year.

5. C. macrocalyx Small. Similar to *C. coccineum* in habit: leaf-blades broadly spatulate, 1–1.5 mm. long: calyx 16–18 mm. long; lateral lobes of the upper lip lanceolate-subulate: corolla scarlet, 4–5 cm. long; lobes of the upper lip longer than those of the lower.—Pinelands, E pen. Fla.—All year.

6. C. georgianum Harper. Shrub 2–6 dm. tall: leaf-blades ovate, oval or elliptic, 10–30 mm. long, shallowly serrate: calyx 5–6 mm. long: corolla white or pink-purple, and purple-spotted, 11–13 mm. long; middle lobe of the lower lip quite similar to the lateral ones and scarcely longer. [*C. carolinianum* (Michx.) Heller.]—River-banks, dry woods, and hammocks, Coastal Plain, and rarely adj. provinces, Fla. to Miss. and N. C.—Sum.–fall.

7. C. dentatum (Chapm.) Kuntze. Shrub 3–7 dm. tall: leaf-blades obovate to elliptic-cuneate, 5–12 mm. long, mainly toothed at the apex: calyx 7–8 mm. long: corolla white or purplish, 11–13 mm. long; middle lobe of the lower lip broader than the lateral ones and extending beyond them.—Sand-ridges, middle Fla.—Spr.–fall.

8. C. Ashei (Weatherby) Small. Shrub 1–5 dm. tall: leaf-blades linear to narrowly linear-elliptic, 0.5–1 cm. long, entire, strongly revolute: calyx 6–8 mm. long; lobes of the upper lip completely fused, the tip merely shallowly tridentate: corolla pinkish-purple with darker spots, 12–15 mm. long; middle lobe of the lower lip broader and longer than the lateral lobes.—Scrub, Lake Region, Fla.—Spr.

29. **DICERANDRA** Benth. Annual erect herbs. Leaf-blades narrow, entire. Flowers in axillary cymes. Calyx 2-lipped, the upper lip entire or with 3 minute lobes, the lower lip with 2 broad lobes. Corolla 2-lipped: upper lip broad: lower lip 3-lobed, the middle lobe sometimes scarcely as wide as the lateral ones. Stamens 4: anthers awned.—Three species, as follows:

Corolla pink-purple: anthers exserted: calyx purple-tinged; lobes of the lower lip deltoid or triangular: style pubescent to below the middle.

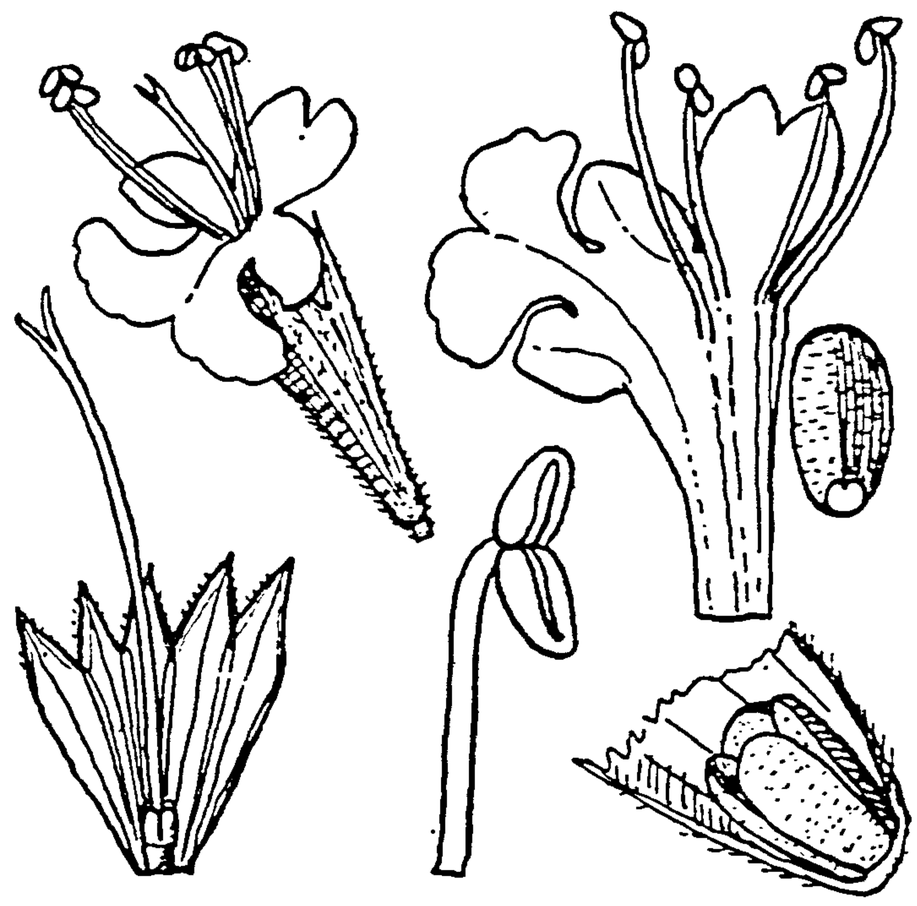
Cymes nearly sessile: anther-horns blunt or acute. 1. *D. densiflora.*
Cymes markedly peduncled: anther-horns acuminate. 2. *D. linearifolia.*
Corolla white: anthers included: calyx white above; lobes of the lower lip subulate: style pubescent near the tip. 3. *D. odoratissima.*

1. **D. densiflora** Benth. Stem 1–4 dm. tall: leaf-blades narrowly elliptic to linear-elliptic, 2–4 cm. long: calyx becoming 6–8 mm. long: corolla 11–14 mm. long. [*Ceranthera densiflora* A. Gray.]—Pinelands, Coastal Plain, E Fla. and Ga.—Sum.–fall.

2. **D. linearifolia** (Ell.) Benth. Stem 2–4 dm. tall: leaf-blades linear or lanceolate, 1–3 cm. long: calyx becoming 6–7 mm. long: corolla 14–16 mm. long. [*Ceranthera linearifolia* Ell.]—Pinelands and sandhills, Coastal Plain, Fla. to Ala. and Ga.—Fall.

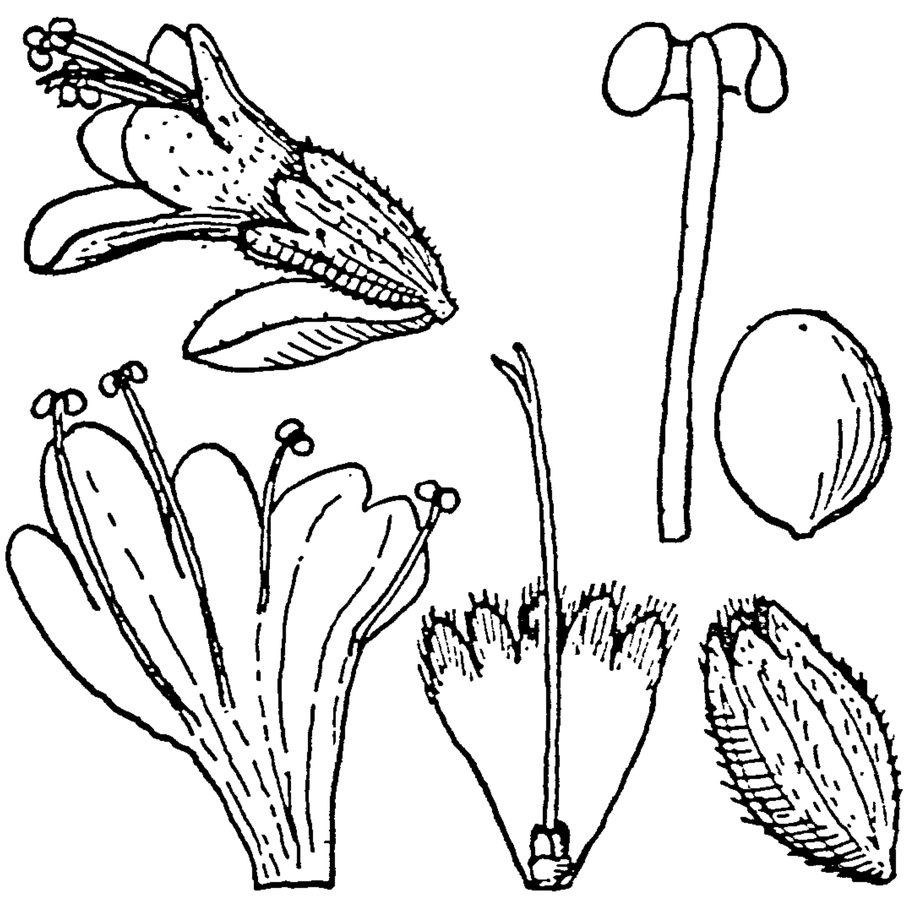
3. **D. odoratissima** Harper. Stem 2–4 dm. tall: leaf-blades linear, 2–4 cm. long: calyx becoming 8–11 mm. long: corolla 14–17 mm. long.—Sandhills, Coastal Plain, S E Ga.—Fall.

30. **HYSSOPUS** L. Perennial erect herbs. Leaf-blades narrow, entire: flowers in axillary cymes or spike-like panicles. Calyx nearly regular, the lobes nearly equal, shorter than the tube. Corolla 2-lipped: upper lip notched: lower lip 3-lobed, the middle lobe very broad. Stamens 4. Stigmas very short.—One species.



1. **H. officinalis** L. Stem 2–9 dm. tall, puberulent: leaf-blades elliptic to elliptic-lanceolate or linear, 1–3 cm. long: calyx becoming about 7 mm. long; lobes ovate to lanceolate, ribbed: corolla blue or purplish, 8–10 mm. long.—(Hyssop.)—Roadsides and waste-places, various provinces, N. C. to Ont. and Me., also on Pacific slope. Nat. of Eu.—Sum.

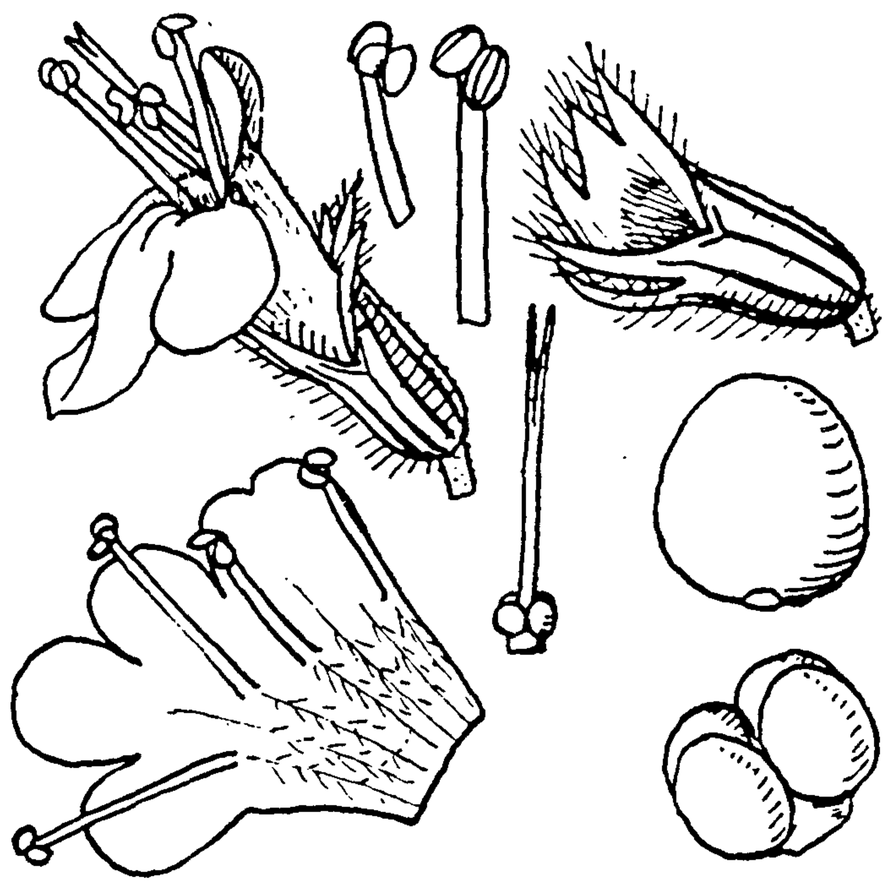
31. **ORIGANUM** [Tourn.] L. Perennial herbs, or partially woody plants. Leaf-blades broad, often notched. Cymes mostly borne in corymbs. Calyx stout, nearly equally 5-lobed. Corolla 2-lipped: upper lip broad, slightly lobed: lower lip with 3 rather broad lobes. Stamens 4. Stigmas short.—About 30 species, natives of the Old World.



1. **O. vulgare** L. Stem mostly simple below, sparingly branched above, villous-hirsute: leaf-blades ovate, mostly 1.5–2.5 cm. long, shallowly toothed or entire: calyx 2–2.5 mm. long; lobes ovate, shorter than the tube: corolla pale-magenta or rarely white, 6–7 mm. long; lobes of the upper lip rounded, the lateral lobes of the lower lip

rounded, the lateral lobes of the lower lip broadly ovate: nutlets less than 1 mm. long.—(WILD-MARJORAM.)—Thickets, roadsides, and fields, various provinces, N. C. to Ont., and Mass. Nat. of Eu.—Sum.—A related Old World plant and similar in habit, *Majorana Majorana*—the SWEET-MARJORAM of the gardens.—with a 2-lipped calyx, sometimes escapes from cultivation.

32. **THYMUS** [Tourn.] L. Perennial depressed or creeping herbs. Leaf-blades short, mostly entire. Flowers in axillary cymes or raceme-like panicles. Calyx 2-lipped, the upper lip with 3 short lobes, the lower lip with 2 longer lobes. Corolla 2-lipped: upper lip erect: lower lip 3-lobed, the middle lobe scarcely larger than the lateral ones. Stamens 4. Stigmas long. —About 50 species, mostly European.



1. T. Serpyllum L. Plant fragrant, forming depressed mats: leaf-blades elliptic to oval or ovate, 3–10 mm. long: calyx becoming 3.5–4 mm. long; lobes of the lower lip about as long as the tube: corolla purplish, about as long as the calyx: nutlets less than 1 mm. long.—(CREEPING-THYME. THYME.) Meadows, roadsides, and fields, various provinces N of Coastal Plain, N. C. to W. Va. and N. S. Nat of Eu.—Sum.

33. **KOELLIA** Moench. Perennial erect herbs. Leaf-blades entire or shallowly toothed, those of the upper leaves, like the bracts, often more or less whitened. Flowers in dense axillary and terminal cymes, pale with purplish spots. Calyx nearly regular or somewhat 2-lipped, the lobes short or elongate. Corolla 2-lipped: upper lip erect: lower lip 3-lobed, the middle lobe larger than the lateral ones. Stamens 4.—[*Pycnanthemum* Michx.]—Sum.—MOUNTAIN-MINTS. HORSE-MINTS. BASILS.—About 20 species, North American.

Flower-clusters apparently naked, the bracts small and inconspicuous. — I. NUDAE.
Flower-clusters conspicuously bracted.
  Calyx not 2-lipped, lobes equal or nearly so.
    Corolla much exceeding the calyx: calyx-lobes not aristate. — II. LANCEOLATAE.
    Corolla about as long as the calyx: calyx-lobes aristate. — III. ARISTATAE.
  Calyx somewhat 2-lipped, the three upper lobes partly united. — IV. INCANAE.

I. NUDAE

Stem strict, topped by a corymb-like cyme: flower-clusters permanently small. — 1. *K. nuda.*

II. LANCEOLATAE

Bractlets ciliolate.
  Calyx-lobes triangular or ovate-triangular. — 2. *K. virginiana.*
  Calyx-lobes subulate to lanceolate, triangular-lanceolate, or deltoid.
    Leaf-blades or most of them over 3 times as long as broad.
      Leaves with strictly entire blades. — 3. *K. flexuosa.*
      Leaves, or the larger ones, with toothed blades.
        Flower-clusters 1–2 cm. broad at maturity, compact.
          Flower-clusters conspicuously woolly at maturity: stems copiously pubescent.
            Calyx-lobes acute: leaf-blades firm; species campestrian. — 4. *K. pilosa.*

Calyx-lobes acuminate: leaf-blades thin: species Alleghenian. — 5. *K. leptodon.*
Flower-clusters not woolly at maturity: stems minutely pubescent. — 6. *K. verticillata.*
Flower-clusters 2–3 cm. broad at maturity, not crowded. — 7. *K. clinopodioides.*
Leaf-blades or most of them less than 3 times as long as broad. — 8. *K. mutica.*
Bractlets copiously villous-ciliate. — 9. *K. montana.*

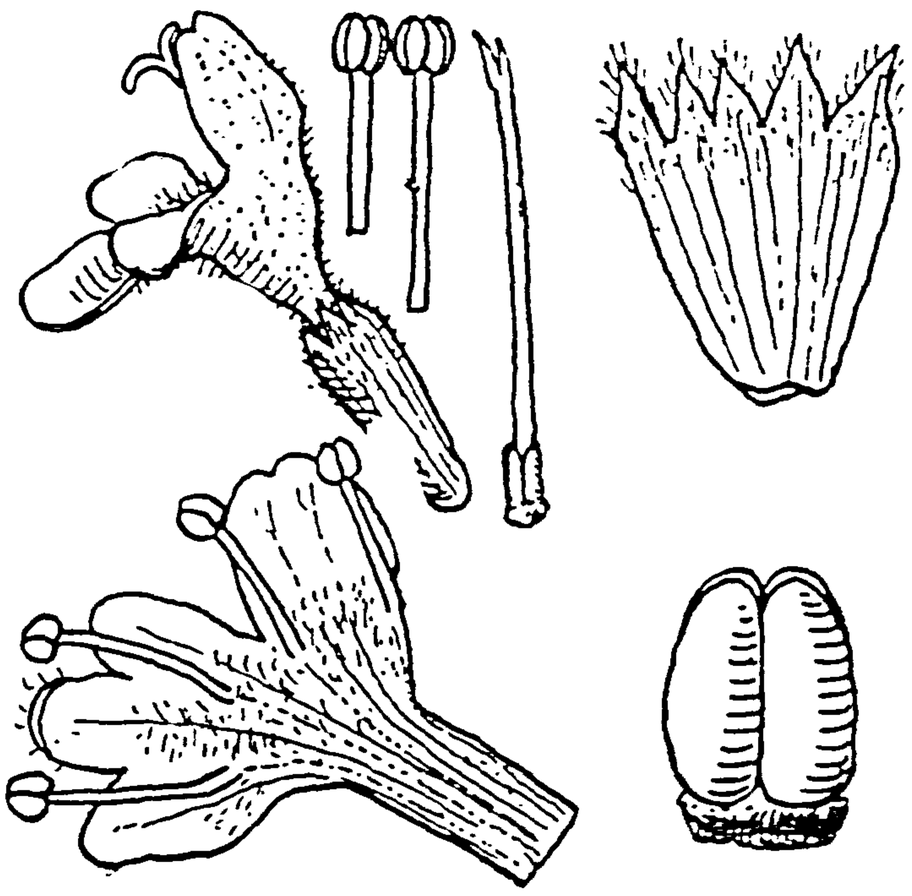
III. Aristatae

Calyx-lobes, at least the lower ones, shorter than the tube: bracts with tips mostly shorter than the body: coastal species.
Calyx-lobes lanceolate to lanceolate-subulate, less than ½ as long as the tube: leaf-blades broad. — 10. *K. aristata.*
Calyx-lobes subulate-filiform, over ½ as long as the tube: leaf-blades narrow. — 11. *K. hyssopifolia.*
Calyx-lobes, at least the lower ones, longer than the tube: bracts with tips mostly longer than the body: Alleghenian species. — 12. *K. Hugeri.*

IV. Incanae

Calyx-lobes minutely pubescent, without long hairs (except a rare form of 13): bractlets pubescent like the calyx and usually without long hairs.
Calyx-lobes ovate or lanceolate.
Calyx-lobes ovate, obtuse or acutish: mature calyx about 4 mm. long. — 13. *K. albescens.*
Calyx-lobes lanceolate, acuminate: mature calyx about 5 mm. long. — 14. *K. pauciflora.*
Calyx-lobes deltoid.
Corolla much exceeding the calyx: calyx-lobes mostly slightly longer than wide. — 15. *K. multiflora.*
Corolla slightly exceeding the calyx: calyx-lobes mostly slightly wider than long. — 16. *K. curvipes.*
Calyx with long hairs in addition to the minute ones, at least when young: bractlets finely bristly pubescent or plumose.
Leaf-blades mostly whitened, at least, beneath.
Calyx-lobes conspicuously long-hairy; the upper ones subulate. — 17. *K. pycnanthemoides.*
Calyx-lobes inconspicuously long-hairy; the upper ones lanceolate. — 18. *K. incana.*
Leaf-blades not whitened, glabrous or nearly so, or hirsutulous beneath.
Calyx-lobes copiously long-hairy, often plumose: leaf-blades hirsutulous beneath, usually cuneate at the base. — 19. *K. dubia.*
Calyx-lobes sparingly long-hairy, not plumose: leaf-blades glabrous or nearly so, rounded or subcordate at the base. — 20. *K. Beadlei.*

1. K. nuda (Nutt.) Kuntz. Stem 3–7 dm. tall, glabrous or nearly so: leaf-blades oval or elliptic, 1–2 cm. long, entire or nearly so: calyx 3–4 mm. long; lobes deltoid: corolla about 5 mm. long; upper lip obtuse.—Pinelands, Coastal Plain, Fla. to Ala. and N. C.—Sum.–fall.



2. K. virginiana (L.) Britton. Stem 4–9 dm. tall, minutely pubescent: leaf-blades lanceolate to linear-lanceolate, 2–5 cm. long, mostly entire: calyx 3.5–4 mm. long; lobes triangular to ovate-triangular: corolla 6–7 mm. long; upper lip notched; middle lobe of the lower lip slightly narrower than the lateral ones.—Woods, fields, and thickets, various provinces, rarely Coastal Plain, Ga. to Ala., Kans., N. D., and Que.—Sum.–fall.

3. K. flexuosa (Walt.) MacM. Stem 3–8

dm. tall, glabrous: leaf-blades narrowly linear to linear-filiform, 1–4 cm. long, entire: calyx about 3.5 mm. long; lobes lanceolate to triangular-lanceolate: corolla 6–7 mm. long; upper lip minutely notched; middle lobe of the lower lip much narrower than the lateral ones.—Meadows, fields, and thickets, various provinces, Fla. to Tex., Minn., and Me.—Sum.–fall.

4. K. pilosa (Nutt.) Britton. Stem 4–13 dm. tall, cinereous-pubescent: leaf-blades lanceolate to linear-lanceolate, 2–6 cm. long, entire or sparingly denticulate: calyx 4–5 mm. long, minutely pubescent; lobes broad-lanceolate: corolla 7–8 mm. long.—Prairies and dry woods, various provinces, rarely Coastal Plain, Ga. to Ark., Mo., and Pa.—Sum.–fall.

5. K. leptodon (A. Gray) Small. Stem 5–11 dm. tall, soft-pubescent. at least above: leaf-blades lanceolate to elliptic-lanceolate, 2–5 cm. long, serrate or entire: calyx 4.5–5.5 mm. long, rather villous; lobes narrow-lanceolate: corolla 6–7 mm. long.—Mt. woods, Blue Ridge, N. C.—Sum.

6. K. verticillata (Michx.) Kuntze. Stem 4–12 dm. tall, minutely pubescent: leaf-blades lanceolate to almost linear, 2–6 cm. long, remotely or shallowly serrate: calyx 4–5 mm. long; lobes subulate-lanceolate: corolla 6–7 mm. long, or rarely longer.—Fields, thickets, and woods, various provinces, Ga. to Mass. and Que.—Sum.–fall.

7. K. clinopodioides (T. & G.) Kuntze. Stem 4–12 dm. tall, softly-pubescent: leaf-blades lanceolate, narrowly elliptic, 2–8 cm. long, more or less serrate: calyx 4–4.5 mm. long; lobes lanceolate-subulate, nearly ½ as long as the tube: corolla about 6 mm. long.—Open woods and dry thickets, various provinces N of Coastal Plain, Tenn. to Pa., Conn., and Va.—Sum.

8. K. mutica (Michx.) Britton. Stem 6–10 dm. tall, finely pubescent: leaf-blades thick, ovate to lanceolate, 2–6 cm. long, serrate: calyx 3.5–4 mm. long; lobes deltoid to triangular-lanceolate, very short: corolla 6–8 mm. long: filaments short.—Sandy banks, open woods, and thickets, various provinces, Fla. to Mo. and Me.—Sum.–fall.

9. K. montana (Michx.) Kuntze. Stem 3–9 dm. tall, glabrous or nearly so: leaf-blades thin, lanceolate to elliptic-lanceolate or ovate-lanceolate, 7.5–12 cm. long, sharply serrate: calyx 4–5 mm. long, often villous above; lobes lanceolate: corolla 7–8 mm. long: filaments elongate.—Mt. woods, Blue Ridge to Appalachian Plateau, Ga. to Ala., W. Va., and Va.—Sum.

10. K. aristata (Michx.) Kuntze. Stem 4–9 dm. tall, puberulent: leaf-blades elliptic-lanceolate to ovate-lanceolate, 1.5–5 cm. long, sometimes shallowly serrate: calyx 5–6 mm. long; tube faintly ribbed; lobes lanceolate to subulate-lanceolate: corolla 6–7 mm. long.—Pinelands and sandy fields, Coastal Plain, Fla. to La. and N. J.—Sum.–fall.

11. K. hyssopifolia (Benth.) Britton. Stem 4–10 dm. tall, puberulent: leaf-blades narrowly elliptic to linear 1–3.5 cm. long, usually entire: calyx 5–6 mm. long; tube prominently ribbed: corolla much surpassing the calyx.—Low pinelands, Coastal Plain, Fla. to La. and Va.—Sum.

12. K. Hugeri Small. Stem 5–9 dm. tall, cinereous-tomentulose: leaf-blades elliptic, 1.5–4 cm. long, entire or sparingly serrate: calyx 7–8 mm. long; tube prominently ribbed: corolla scarcely, if at all, longer than the calyx.—Mt. woods, Blue Ridge, N. C.—Sum.

13. K. albescens (T. & G.) Kuntze. Stem 4–10 dm. tall, more or less finely, often minutely, pubescent: leaf-blades ovate to elliptic or lanceolate, 2–7 cm.

long, serrate, usually greenish above, whitish beneath: calyx 3–4 mm. long; lobes ovate, obtuse or acutish, beardless: corolla 5–6 mm. long: nutlets ovoid, fully 1 mm. long.—Pinelands and woods, Coastal Plain, Fla. to Tex., Mo., and N. C.—Sum.–fall.

14. **K. pauciflora** Small. Stem mostly 12 dm. tall or less, minutely close-pubescent, at least above: leaf-blades lanceolate to elliptic-lanceolate, 2–5 cm. long, distantly serrate, acute or slightly acuminate, whitish or pale-green above, whitish beneath: calyx 4–5 mm. long; lobes lanceolate, acuminate, beardless: corolla about 6 mm. long: nutlets narrowly ovoid, fully 1 mm. long.—Pinelands and edges of hammocks, Albany, in the Coastal Plain of Ga.—Sum.

15. **K. multiflora** Small. Stem 15 dm. tall or less, closely and minutely soft-pubescent, at least above: leaf-blades ovate or elliptic-ovate, 2–8 cm. long, rather remotely serrate, acute or acutish, pale-green above, white or whitish beneath: flower-clusters becoming open at maturity, the branches somewhat elongate, each with many secund calyces: calyx 4–4.5 mm. long; lobes deltoid, mostly slightly longer than wide, beardless: corolla about 6 mm. long: nutlets ovoid, fully 1 mm. long.—Dry woods and open sunny slopes, various provinces, Ga. to Ala., N. C., and Pa.—Sum.

16. **K. curvipes** Greene. Stem mostly less than 10 dm. tall, closely and minutely pale-pubescent throughout: leaf-blades ovate, 1.5–3.5 cm. long, mostly obtuse, shallowly serrate, closely and densely fine-pubescent, greenish-white above, white and prominently veined beneath: flower-clusters permanently glomerate: calyx 3.5–4 mm. long; lobes deltoid, mostly wider than long: corolla about 4 mm. long: nutlets oval, about 1 mm. long.—Open woods, Stone Mt. in the Piedmont of Ga.—Sum.

17. **K. pycnanthemoides** (Leavenw.) Kuntze. Stem 6–16 dm. tall, minutely pale-pubescent, at least above, and sometimes finely hirsute: leaf-blades ovate, elliptic or elliptic-lanceolate, 2–10 cm. long, thin, shallowly and usually remotely serrate: flowerclusters rather dense and somewhat plumose when young, looser in age, the branches somewhat elongate and bearing the secund calyces: bractlets conspicuously long and narrow: calyx 5–6 mm. long; lobes slender, the upper ones subulate, the lower ones often lanceolate-subulate: corolla 7–8 mm. long: nutlets ovoid, fully 1 mm. long.—Mt. woods and thickets, Blue Ridge to Appalachian Plateau, Ga. to Ala., Ky., and Va.—Sum.

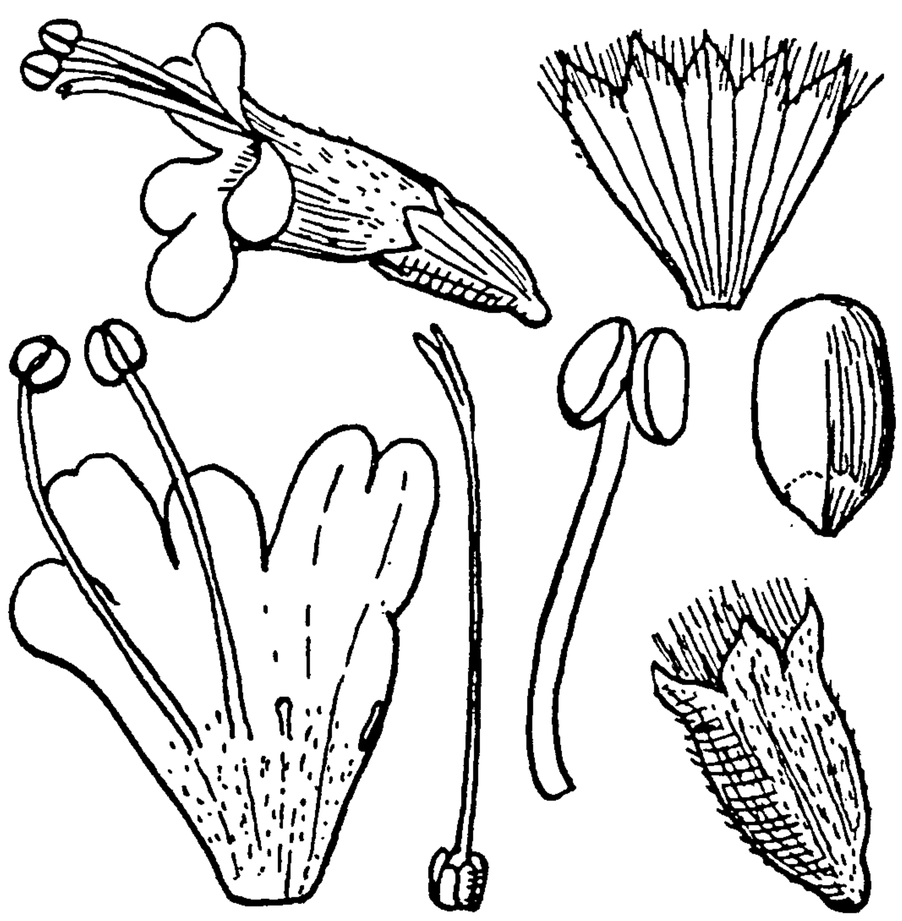
18. **K. incana** (L.) Kuntze. Stem 5–12 dm. tall, softly and closely pubescent at least above, and often finely hirsute: leaf-blades ovate, elliptic, or lanceolate, 3–10 cm. long, thickish, shallowly, but rather prominently and remotely serrate: flower-clusters permanently compact, not conspicuously plumose: calyx 3.5–4 mm. long; lobes stout, the upper ones lanceolate, the lower ones triangular-lanceolate: corolla 6–7 mm. long: nutlets broadly ovoid, about 1 mm. long.—Hillsides, dry thickets, and open woods, various provinces, Fla. to Mo., Ont., and Me.—Sum.–fall.

19. **K. dubia** (A. Gray) Small. Stem 4–11 dm. tall, finely hirsute: leaf-blades lanceolate to linear-elliptic or linear-lanceolate, 2–9.5 cm. long, remotely serrate or nearly entire, green, except some of the upper ones, hirsutulous, especially beneath: calyx 4.5–5 mm. long, pubescent; lobes each with a triangular or lanceolate body and a subulate bearded tip: corolla 6–7 mm. long: tube pubescent within: nutlets broadly ellipsoid, 1.5 mm. long.—Mt. slopes, Blue Ridge, N. C.—Sum.

20. **K. Beadlei** Small. Stem 5–9 dm. tall, minutely pubescent with short hairs: leaf-blades elliptic-lanceolate to ovate-lanceolate, or those of the branches

lanceolate to ovate, 3–8 cm. long, shallowly serrate, glabrous or nearly so, and often prominently veined beneath: calyx 4–5 mm. long, puberulent; lobes triangular-lanceolate and subulate-tipped: corolla 6–7 mm. long; tube glabrous within: nutlets narrowly ovoid, about 1.5 mm. long.—Woods in the Blue Ridge, N. C. and Tenn.—Sum.–fall.

34. MAPPIA House. Perennial erect herbs, or woody plants. Leaf-blades broad, entire or toothed. Flowers in axillary cymes. Calyx nearly regular, the lobes shorter than the tube. Corolla 2-lipped: upper lip erect: lower lip 3-lobed. Stamens 2, long-exserted.—About 15 species, American.



1. M. origanoides (L.) House. Stem 2–4 dm. tall, wiry: leaf-blades ovate to ovate-lanceolate, 1.5–2.5 cm. long, serrate: calyx 2–2.5 mm. long; lobes ovate to deltoid: corolla purplish, 4–5 mm. long. [*Cunila mariana* L. *C. origanoides* (L.) Britton]—(DITTANY. STONE-MINT.)—Woods, thickets, and open hillsides, often in somewhat acid soil, N Fla. to Tex., Mo., and N. Y.—Sum.–fall.—This aromatic plant found its way into the materia medica of both the American aborigines and of the early settlers from Europe. It was used in cases of "colds" and of fevers, and also for making a tea!

35. LYCOPUS [Tourn.] L. Perennial, erect or creeping, often stoloniferous herbs. Leaf-blades entire, toothed, or pinnatifid. Flowers whitish to lavender in dense axillary cymes. Calyx regular or nearly so: lobes longer than the tube or shorter. Corolla slightly 2-lipped: upper lip notched: lower lip nearly equally 3-lobed. Stamens 2.—About 15 species, natives of the north temperate zone.—Sum.—BUGLE-WEEDS. WATER-HOARHOUNDS.

Calyx-lobes ovate to elliptic or elliptic-lanceolate, 4 or 5: nutlets exceeding the calyx. — I. VIRGINICI.
Calyx-lobes subulate to lanceolate (ovate, acuminate in No. 8), mostly 5: nutlets not exceeding the calyx.
  Corolla twice as long as the calyx: bracts minute: blades of the lower leaves merely toothed. — II. RUBELLI.
  Corolla but little longer than the calyx; blades of the lower leaves pinnatifid. — III. PINNATIFIDI.

I. VIRGINICI

Corolla 1.5–2 mm. long: style included. — 1. *L. virginicus.*
Corolla 2–3 mm. long: style exserted. — 2. *L. uniflorus.*

II. RUBELLI

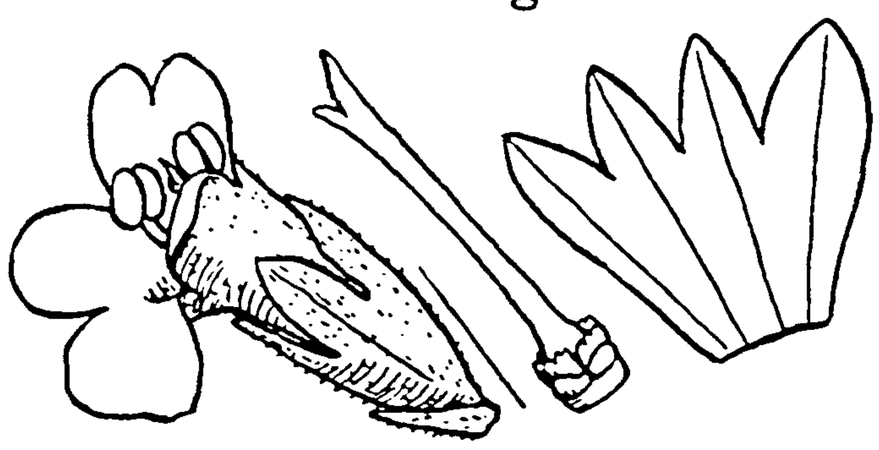
Leaf-blades manifestly petioled, or with petiole-like bases.
  Stem glabrous or merely puberulent: calyx glabrous or nearly so; lobes straight. — 3. *L. rubellus.*
  Stem copiously pubescent: calyx closely pubescent; lobes, at least the upper ones, recurved. — 4. *L. velutinus.*
Leaf-blades sessile or nearly so, sometimes partly clasping.
  Stem glabrous, at least below: bracts subtending the cymes gradually narrowed at the base. — 5. *L. sessilifolius.*
  Stem densely puberulent or finely pubescent: bracts subtending the cymes truncate at the base. — 6. *L. pubens.*

III. PINNATIFIDI

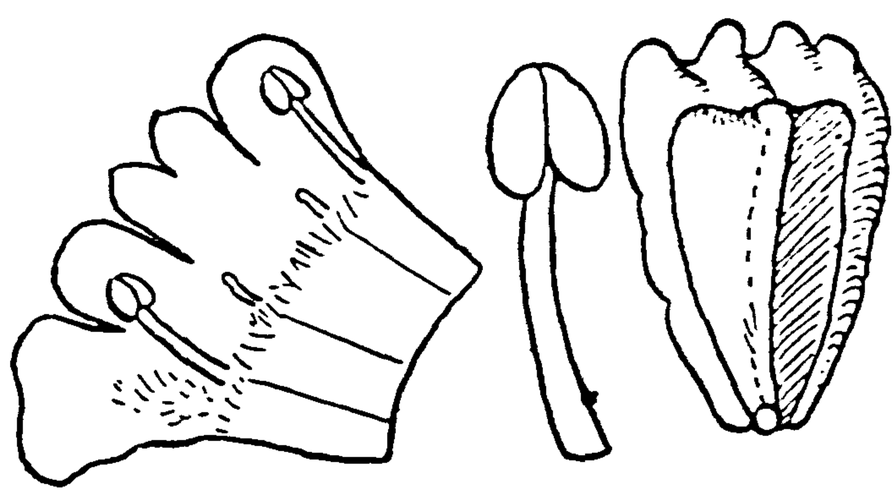
Stem and leaves usually glabrous or glabrate: calyx-lobes acute, short awn-tipped: leaf-blades with acute serrations. — 7. *L. americanus.*

Stem and leaves usually pubescent, sometimes slightly so: calyx-lobes acuminate, long awn-tipped: leaf-blades with obtuse serrations. 8. *L. europaeus.*

1. L. virginicus L. Stem 1–8 dm. tall, purplish or greenish-purple, obtuse-angled, not usually tuberous at the base, but with tuber-bearing stolons: leaf-blades ovate to elliptic-ovate or elliptic, 2–14 cm. long, coarsely toothed, manifestly petioled: calyx about 2 mm. long; lobes narrow. —Common, in meadows and rather moist soil, various provinces, Ga. to Ark., Nebr., and N. H.—Sum.–fall.



2. L. uniflorus Michx. Stem 1–8 dm. tall, green or sometimes purplish, sharp-angled, tuberous at the base, the stolons rarely tuber-bearing: leaf-blades elliptic to elliptic-lanceolate, 2–8 cm. long, serrate, calyx about 1.5 mm. long; lobes wide. [*L. communis* Bicknell]—Low grounds, and thickets, various provinces, N. C. to Nebr., Ore., B. C., Ont., and Newf.—Sum.–fall.



3. L. rubellus Moench. Stem 5–10 dm. tall: leaf-blades elliptic, lanceolate, or ovate-elliptic, 3–15 cm. long, sharply serrate or dentate-serrate: calyx becoming fully 2.5 mm. long; lobes straight, about as long as the tube: corolla 3.5–4 mm. long.—Low grounds, borders of swamps and ditches, Coastal Plain and adj. provinces, Fla. to La., Mo., and N. Y.—Sum.–fall.

4. L. velutinus Rydb. Similar to *L. rubellus* in habit, but copiously pubescent, the branches often densely so: leaf-blades elliptic, sometimes broadly so, or elliptic-lanceolate, coarsely toothed: calyx becoming 2.5 mm. long; lobes curved, much longer than the tube: corolla 3–3.5 mm. long.—Low grounds, various provinces, Miss. to Tex. and Colo.—Sum.–fall.

5. L. sessilifolius A. Gray. Stem 2–6 dm. tall: leaf-blades ovate to elliptic or lanceolate, 1.5–6 cm. long, shallowly serrate: calyx 2–2.5 mm. long; lobes as long as the tube: lower corolla-lip with a reniform notched middle lobe: filaments pubescent at the base.—Wet soil and low grounds, Coastal Plain and New England Coast, Fla. to Miss. and Mass.—Sum.–fall.

6. L. pubens Britton. Stem 6–12 dm. tall: leaf-blades elliptic, elliptic-lanceolate or linear-elliptic, 4.5–10 cm. long, sharply serrate: calyx mainly 2.5–3 mm. long; lobes longer than the tube: lower corolla-lip with an ovate obtuse middle lobe: filaments glabrous—Low pinelands, Coastal Plain, Fla. to Miss. and S. C. —Sum.–fall.

7. L. americanus Muhl. Stem 1–9 dm. tall, often much-branched: leaf-blades lanceolate to ovate-lanceolate, 2–10 cm. long, those on the lower part of the stem pinnatifid, those near the top merely toothed: calyx 2.5–3 mm. long: corolla about as long as the calyx: staminodia thickened at the tip. [*L. sinuatus* Ell.]—Moist thickets and pastures, wet banks and meadows, various provinces, Fla. to Tex., Calif., B. C., Ont., and Newf.—Sum.–fall.

8. L. europaeus L. Stem 1 m. tall or less: leaf-blades ovate or elliptic-ovate, 2–8 cm. long, obtuse or acutish, coarsely toothed, and the lower ones, at least, incised or pinnatifid near the base: calyx 2.5–3 mm. long: corolla only slightly exceeding the calyx: nutlets scarcely exceeding the calyx-tube.—Waste-

places and roadsides, various provinces, Ala. to La. and Mass. Nat. of Eu.—Sum.–fall.

36. **MENTHA** [Tourn.] L. Perennial erect or diffuse herbs. Leaf-blades toothed or incised. Flowers in dense axillary cymes, these sometimes disposed in spike-like panicles. Calyx nearly regular, the lobes shorter than the tube. Corolla obscurely 2-lipped: upper lip mostly notched: lower lip of 3 nearly equal lobes. Stamens 4.—About 30 species, natives of the north temperate zone.—Sum.—MINTS.

Flower-clusters all axillary, not in terminal spikes. I. ARVENSES.
Flower-clusters, at least most of them, aggregated in terminal spike-like panicles. II. SPICATAE.

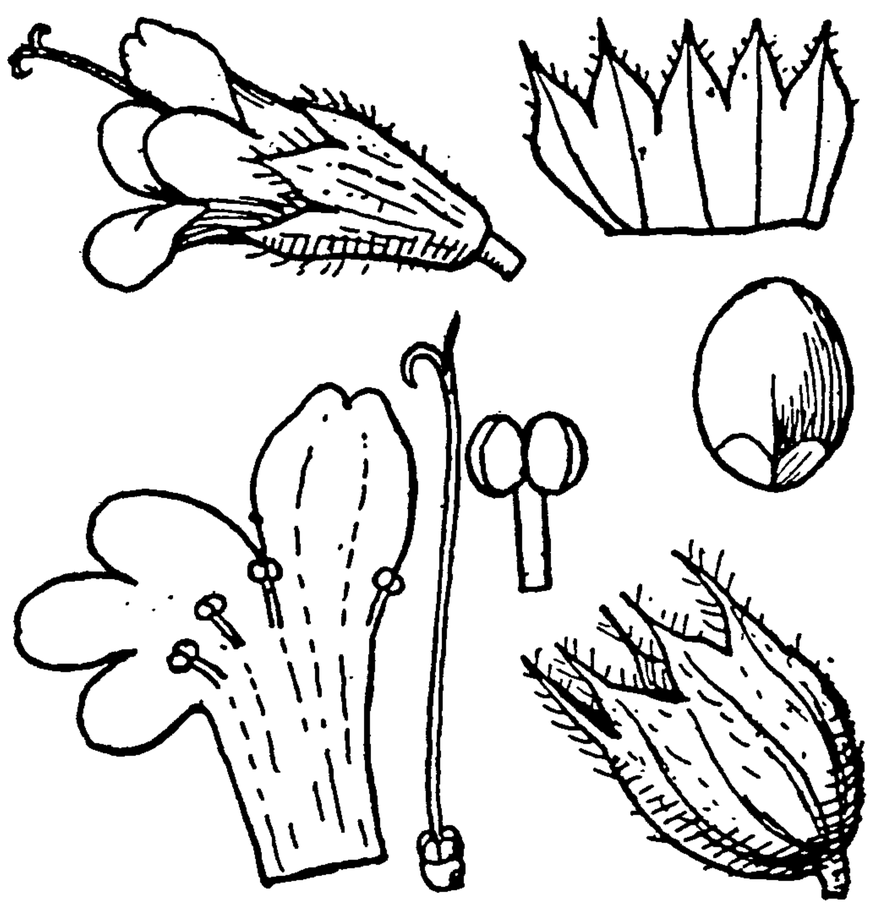
I. ARVENSES

Stem and branches glabrous or with short scattered hairs: calyx glabrous or nearly so, except for the ciliate lobes. 1. *M. gentilis.*
Stem and branches with retrorse or spreading hairs: calyx pubescent all over.
  Stem and branches with short retrorse or retrorse-appressed hairs: larger calyx-lobes deltoid: calyx-tube closely pubescent with short hairs. 2. *M. arvensis.*
  Stem and branches with long lax or spreading hairs: larger calyx-lobes typically lanceolate: calyx-tube loosely pubescent with long hairs. 3. *M. canadensis.*

II. SPICATAE

Flowers in short and stout raceme-like panicles, or clustered in the upper leaf-axils: longer calyx-lobes decidedly shorter than the tube: leaf-blades petioled.
  Calyx, at least the lobes, pubescent.
    Stem and leaves copiously pubescent: leaf-blades ovate or orbicular-ovate: calyx pubescent all over. 4. *M. aquatica.*
    Stem and leaves glabrous: leaf-blades elliptic, or lanceolate: calyx with pubescent lobes. 5. *M. piperita.*
  Calyx glabrous. 6. *M. citrata.*
Flowers in slender or relatively slender, often elongate spike-like panicles: longer calyx-lobes as long as the tube or nearly so: leaf-blades sessile.
  Stem and inflorescence not canescent: calyx-tube glabrous or nearly so: corolla-tube not exceeding the calyx. 7. *M. spicata.*
  Stem and inflorescence canescent or villous-canescent: calyx-tube copiously pubescent: corolla-tube much exceeding the calyx. 8. *M. rotundifolia.*

1. M. gentilis L. Stem 2–7 dm. tall, glabrous or nearly so: leaf-blades oval, ovate, obovate, or elliptic, 1.5–5 cm. long, serrate, the floral ones not conspicuously reduced, with petioles often longer than the flower-clusters: calyx 1.5–2 mm. long; tube glabrous or nearly so: corolla lavender or lilac; upper lip notched.—Stream-banks, waste-places, and roadsides, various provinces N of Coastal Plain, Ga. to Ia. and N. S. Nat. of Eu.—Sum.–fall.



2. M. arvensis L. Stem 4 dm. tall or less, often diffuse, copiously, often closely pale-pubescent: leaf-blades ovate, elliptic, or oval, 1.5–5 cm. long, coarsely serrate above the middle, copiously pubescent with short hairs, broad at the base: calyx 1.5–2 mm. long, minutely pubescent; lobes short-tipped: corolla usually lavender, mostly 3 mm. long, the upper lip mostly notched.—Stream-banks, waste-places, and about swamps,

various provinces, Fla. to Tex., Calif., Nebr., and Newf. Nat. of Eu.—(*Mex.*) —Sum.–fall.

3. **M. canadensis** L. Stem 2–6 dm. tall, loosely pubescent: leaf-blades lanceolate, elliptic, or elliptic-lanceolate, 2–7 cm. long, serrate, narrow-based, the floral ones with petioles as long as the flower-clusters: calyx about 2.5–3 mm. long; tube loosely pubescent: corolla lavender or white; upper lip mostly obtuse.—Thickets and low sandy places, various provinces, rarely Coastal Plain, N. C. to N. M., B. C., Man., and N. B.—Sum.–fall.

4. **M. aquatica** L. Stem 2–6 dm. long or more, pubescent with recurved hairs: leaf-blades broadly ovate, or orbicular-ovate, 1–4 cm. long, or rarely more, rather sharply serrate, those of the floral leaves reduced: calyx 3–3.5 mm. long: tube pubescent with short spreading hairs; lobes lanceolate, about ⅓ as long as the tube: corolla lavender, about 5 mm. long.—(WATER-MINT.)—Roadside ditches and wet places, various provinces, Ga. to N. S. Nat. of Eu.—Sum.–fall.

5. **M. piperita** L. Stem 2–7 dm. tall, glabrous: leaf-blades elliptic, elliptic-ovate, elliptic-lanceolate, or lanceolate, 1.5–5 cm. long, sharply serrate: calyx 2.5–3 mm. long; lobes subulate, much shorter than the cylindric-campanulate tube: corolla light-violet, 3.5–4 mm. long.—(PEPPERMINT.)—Waste-places, roadsides, and stream-banks, various provinces, Fla. to Ark., Calif., Ont., and N. S. Nat. of Eu.—(*W. I.*)—Sum.–fall.

6. **M. citrata** Ehrh. Stem 3–11 dm. long, glabrous or nearly so: leaf-blades ovate to orbicular-ovate, 1.5–4 cm. long, sharply serrate: calyx 3.5–4 mm. long; lobes subulate, shorter than the cylindric-turbinate tube: corolla lavender or whitish, about 4.5 mm. long.—Wet places, various provinces, Ga. to Mo. and Conn. Nat. of Eu.—(*W. I.*)—Sum.–fall.

7. **M. spicata** L. Stem 2–5 dm. tall, glabrous or nearly so: leaf-blades elliptic or elliptic-lanceolate, 3–6 cm. long, sharply serrate: calyx 1–1.5 mm. long; lobes about as long as the campanulate tube: corolla lavender, 2–2.5 mm. long. [*M. viridis* L.]—(SPEAR-MINT.)—Waste-places, fields, and roadsides, various provinces, Fla. to Kans., Ont., and N. B. Nat. of Eu.—(*W. I.*)—Sum.–fall.

8. **M. rotundifolia** (L.) Huds. Stem 3–9 dm. tall, canescent-tomentulose: leaf-blades elliptic, oval, or ovate, 2–9 cm. long, finely serrate, often partly clasping: calyx becoming about 1.5 mm. long; lobes slightly shorter than the campanulate tube: corolla lavender or pale-lilac, 2.5–3 mm. long.—Open grounds and thickets, various provinces, Fla. to Tex., Ark., and Me. Nat. of Eu.—(*W. I., Mex., S. A.*)—Sum.–fall.

37. **MICHELIELLA** Briq. Perennial erect herbs. Leaf-blades rather coarsely toothed. Flowers in panicles. Calyx 2-lipped: upper lip with 3 short lobes: lower lip with 2 narrow lobes. Corolla 2-lipped, middle lobe of the lower lip fringed. Stamens 4.—Two species.—STONE-ROOTS.

Leaves 4, or rarely 6, approximate, sometimes almost whorled at the top of the stem. 1. *M. verticillata.*
Leaves several, in pairs along the stem. 2. *M. anisata.*

1. **M. verticillata** (Baldw.) Briq. Stem 1–5 dm. tall, finely pubescent: leaf-blades thin, ovate to obovate or cuneate-obovate, 8–16 cm. long: calyx becoming

8 mm. long: corolla tawny, 11–13 mm. long. [*Collinsonia verticillata* Baldw.] — Rich woods, Blue Ridge and Piedmont, Ga. to Miss., Tenn., and N. C.—Spr.–sum.

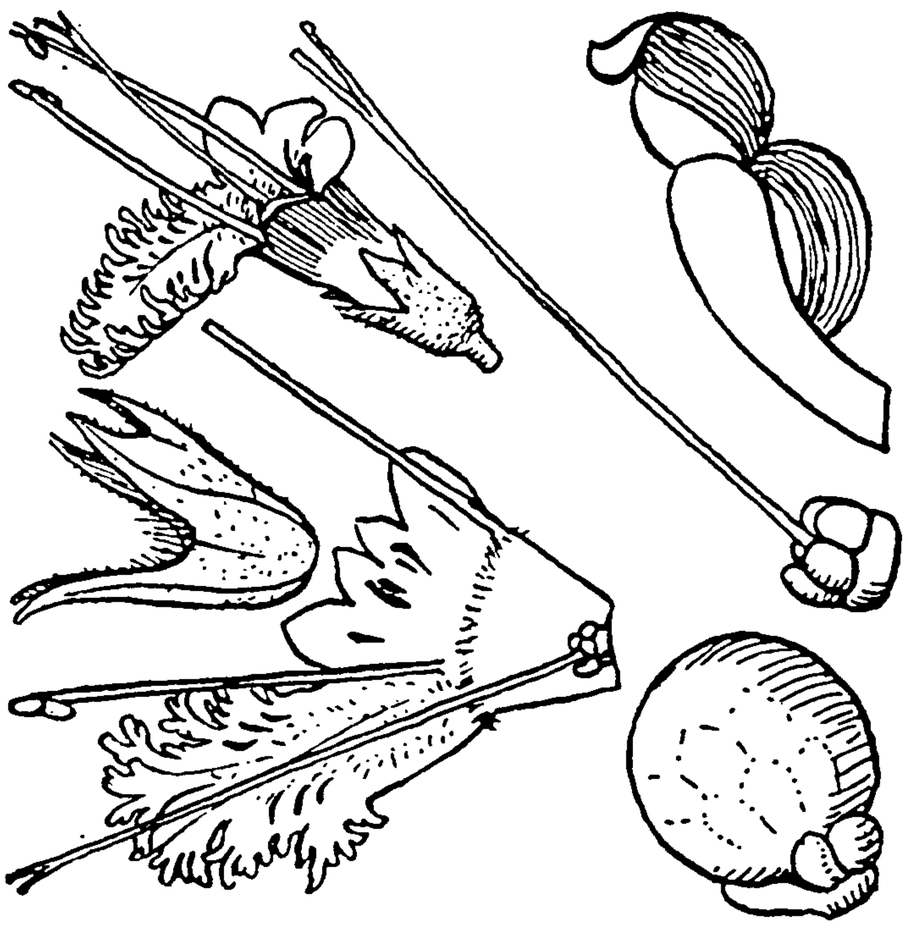
2. M. anisata (Sims) Briq. Stem 3–6 dm. tall, glandular-pubescent: leaf-blades thickish, elliptic or broadly oval, 8–15 cm. long: calyx becoming 10 mm. long: corolla cream-colored, 8–12 mm. long. [*Collinsonia anisata* Sims]—Dry woods, Blue Ridge and Piedmont, Fla. to Ala. and S. C.—Sum.—The plants of this genus and of the following have long been used medicinally. The woody root and the leaves contain a number of principles, viz. starch, tannin, resin, wax, mucilage, and volatile oil. The plants are lemon-scented.

38. **COLLINSONIA** L. Perennial erect or reclining herbs. Leaf-blades toothed. Flowers in panicles. Calyx 2-lipped: upper lip with 3 short lobes: lower lip with 2 longer lobes. Corolla 2-lipped, elongate, middle lobe of the lower lip lacerate or fringed.—Three species as follows.—HORSE-BALMS.

Branches of the inflorescence puberulent.
- Stem rigid: leaf-blades mostly over 10 cm. long, many-toothed: pedicels becoming 6–9 mm. long. — 1. *C. canadensis.*
- Stem reclining: leaf-blades mostly less than 8 cm. long, coarsely few-toothed: pedicels becoming 2–4 mm. long. — 2. *C. tuberosa.*

Branches of the inflorescence glandular-pubescent. — 3. *C. punctata.*

1. C. canadensis L. Stem erect, 3–9 dm. tall, from a thick hard root: leaf-blades thickish, elliptic or oval, 9–16 cm. long, rather coarsely dentate-serrate: calyx becoming 5–7 mm. long: corolla about 1.5 cm. long, yellowish: nutlets obscurely reticulate, nearly 2 mm. in diameter.—(HORSE-BALM. RICH-WEED. STONE-ROOT.)—Rich, moist woods and thickets, various provinces, Fla. to Ark., Kans., Ont., and Me.—Sum.–fall.

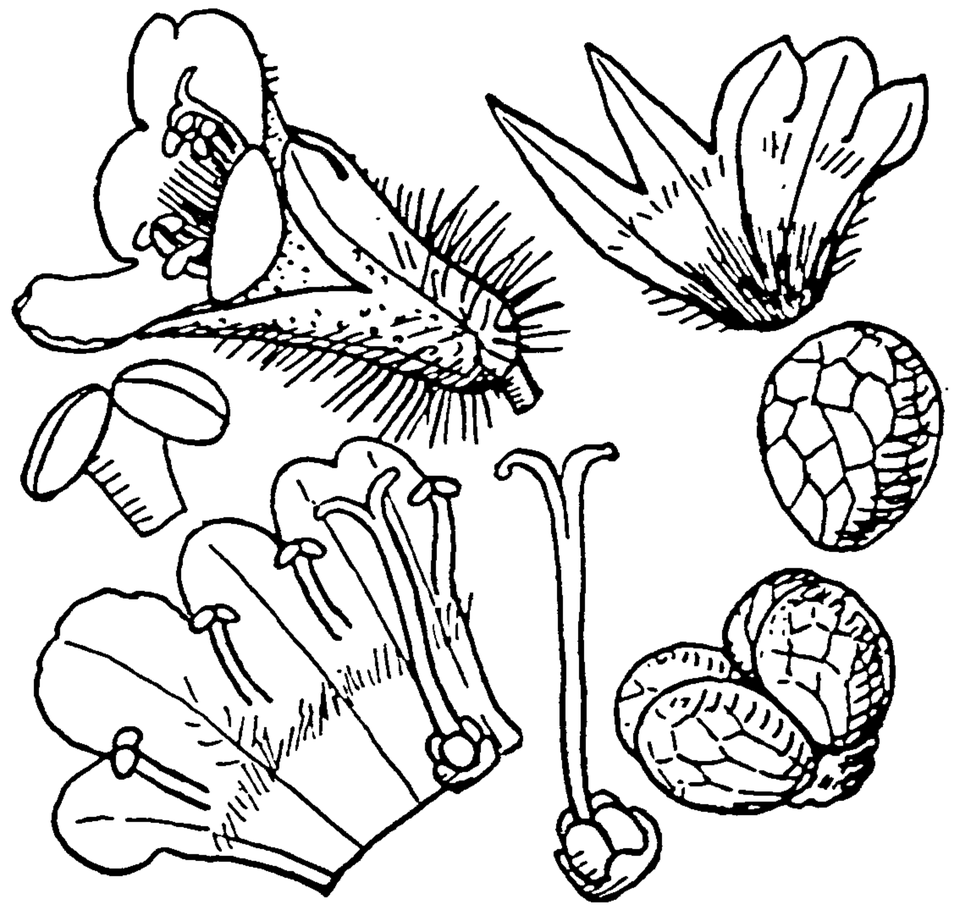


2. C. tuberosa Michx. Stem spreading or reclining, 3–10 dm. long: leaf-blades thin, ovate, 5–8 cm. long, coarsely serrate.—Rich woods, various provinces, Ga. to La. and N. C.—The corolla of this species and that of the following are yellowish, either dark or pale.

3. C. punctata Ell. Stem 4–9 dm. tall: leaf-blades rhombic-ovate or ovate, or elliptic or ovate on the upper part of the stem, 2–8 cm. long, serrate: calyx becoming 6 mm. long.—Rich woods, various provinces, Ga. to Miss. (La.?) and N. C.

39. **PERILLA** L. Annual erect herbs. Leaf-blades often coarsely toothed. Flowers in spike-like panicles. Calyx 2-lipped: upper lip with 3 broad lobes: lower lip with 2 longer lobes. Corolla 2-lipped: upper lip broad: lower lip 3-lobed, the middle lobe largest. Stamens 4.—Two species, Asiatic.

1. P. frutescens (L.) Britton. Stem 2–6 dm. tall, minutely pubescent: leaves usually red or red-tinged; blades ovate or oval, 4–10 cm. long, serrate or crenate-serrate: calyx 2–2.5 mm., becoming 6 mm. long; lower lobes lanceolate: corolla 3–3.5 mm. long, white, with a ring of hairs within; lobes obtuse: nutlets prominently reticulate, nearly 1.5 mm. in diameter.—(BEEFSTEAK-PLANT.)—Waste-places, and roadsides, various provinces, Fla. to Tex., Mo., and Conn. Nat. of Asia.—Sum.—The plants, especially when bruised, give off a strong odor.



40. HYPTIS Jacq. Herbs or woody plants. Leaf-blades commonly toothed. Flowers in often dense axillary cymes. Calyx nearly regular, sometimes oblique, accrescent and ribbed or veiny at maturity. Corolla 2-lipped, white to purple: lower lip 3-lobed, the middle lobe saccate. [*Mesosphaerum* P. Br.]—About 300 species, mostly tropical American.

Flowers borne in few remote peduncled involucrate heads: bracts foliaceous. I. RADIATAE.

Flowers borne in numerous axillary separated clusters or in contiguous or approximate glomerules which thus form terminal thyrsoid panicles: bracts minute.
- Flowers in unilateral cymules which are aggregated into a thyrsus: mature calyx persistent. II. SPICATAE.
- Flowers in small separated axillary clusters: mature calyx deciduous. III. VERTICILLATAE.

I. RADIATAE

Stem typically simple or branched at the base, leafy to the top. 1. *H. radiata.*

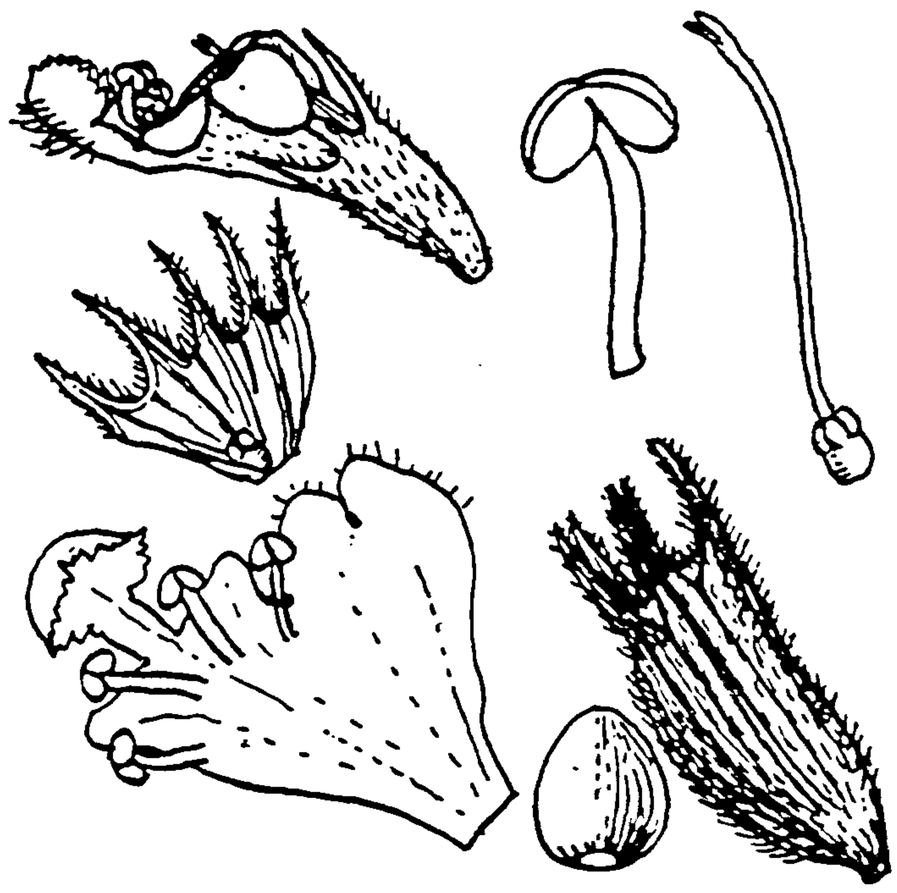
II. SPICATAE

- Calyx-lobes short-subulate, at maturity less than ½ as long as the tube: terminal portion of the inflorescence composed of elongate slender interrupted thyrsi, open. 2. *H. mutabilis.*
- Calyx-lobes setaceous-subulate, at maturity much more than ½ as long as the tube: terminal portion of the inflorescence composed of short continuous thyrsi, compact. 3. *H. pectinata.*

III. VERTICILLATAE

Tall plant with virgate stems and very slender branches, the flower-clusters inconspicuously bracted. 4. *H. verticillata.*

1. H. radiata Willd. Stem 2 m. tall or less, finely pubescent, simple or rarely branched: leaf-blades ovate to lanceolate or linear-lanceolate, 2–8 cm. long or more, coarsely and often irregularly serrate, cuneately narrowed into petiole-like bases: calyx becoming 6–8 mm. long: tube strongly cross-ribbed at maturity; lobes subulate-lanceolate, short-hairy: corolla 8–10 mm. long: nutlets oval, nearly 1.5 mm. long.—Low pinelands, hammocks, swamps, and marshes, Coastal Plain, Fla. to Tex. and N. C.—(*W. I.*)—Spr.–fall or all year S.



2. H. mutabilis (A. Rich.) Briq. Stem 2 m. tall or less, pubescent with short crisped hairs and more or less muricate: leaf-blades rhombic-ovate to deltoid, or orbicular-reniform, 2–7 cm. long or rarely more, crenate-serrate, broadly cuneate to truncate

at the base, slender-petioled: calyx becoming 6–7 mm. long; tube prominently cross-ribbed; lobes short-subulate, about 1 mm. long: corolla 3.5–4 mm. long; tube stout: nutlets oval, about 1.5 mm. long.—Woods, waste-places, cult.-grounds, and roadsides, Fla. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A.*)

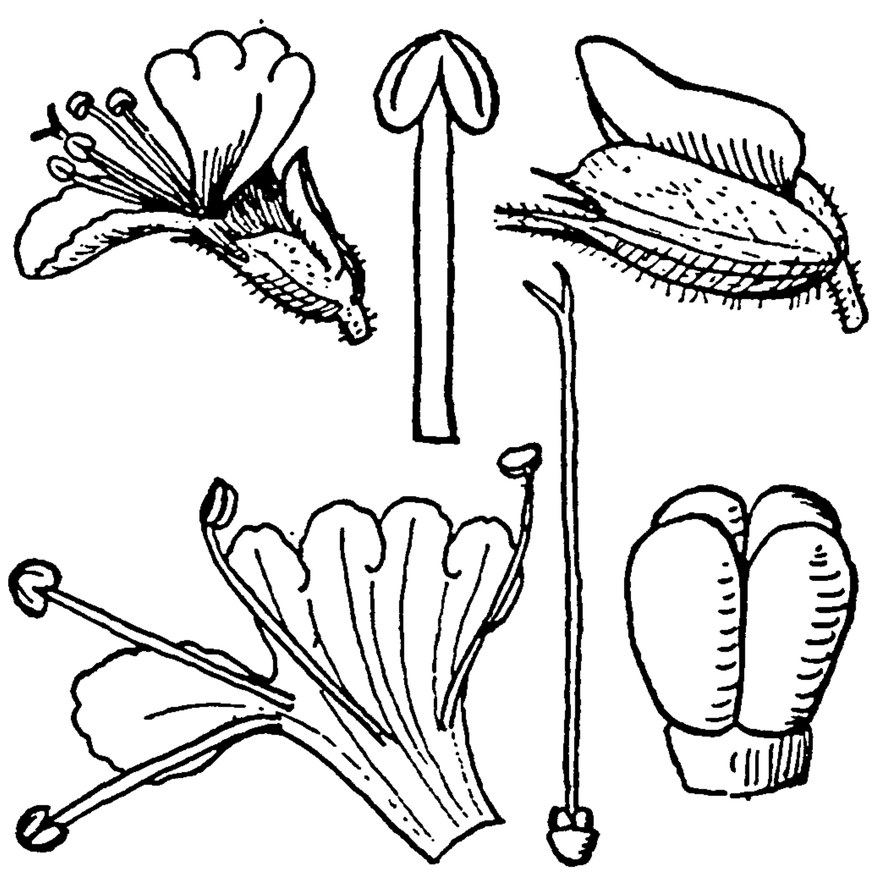
3. **H. pectinata** (L.) Poir. Stem 1.5 m. tall or less, sparingly pubescent with short crisped hairs and more or less muricate: leaf-blades ovate, 2–8 cm. long, irregularly serrate, cuneate to rounded at the base: calyx becoming 4–5 mm. long; tube faintly cross-ribbed; lobes setaceous-subulate, 1.5–2 mm. long: corolla about 4 mm. long; tube slender: nutlets ellipsoid, about 1 mm. long.—Hammocks, cult.-grounds, and roadsides, S pen. Fla. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A.*)—All year.—Two related species included in Fl. SE. U. S., *H. spicata* Poir. and *H. spicigera* Lam., are not now definitely known from our range.

4. **H. verticillata** Jacq. Stem 1–2 m. tall, sparingly pubescent, leaf-blades lanceolate to linear-lanceolate, mostly 5–12 cm. long, rather sharply serrate, acuminate: calyx becoming 2–2.5 mm. long; tube slightly ribbed; lobes deltoid to triangular-lanceolate, shorter than the tube: corolla white, about twice as long as the calyx: nutlets ellipsoid, about 1.5 mm. long.—Hammocks and roadsides, pen. Fla. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.

41. **OCIMUM** [Tourn.] L. Herbs or woody plants. Leaf-blades often of an ovate type and toothed. Flowers in raceme-like panicles. Calyx strongly 2-lipped, accrescent: upper lip a broad lobe decurrent as wings on the sides of the tube: lower lip of 2 broad lobes and 2 narrow lobes. Corolla 2-lipped: lower lip of 3 broad lobes.—About 40 species, widely distributed in warm and tropical regions.

Corolla slightly exceeding the calyx; lips obscurely fine-pubescent without, the lower lobe entire: nutlets about 1 mm. long. 1. *O. micranthum.*
Corolla much exceeding the calyx; lips hirsutulous without, the lower lobe sharply toothed: nutlets about 1.5 mm. long. 2. *O. basilicum.*

1. **O. micranthum** Willd. Stem 2–5 dm. tall, minutely and obscurely pubescent: leaf-blades ovate, often narrowly so, evidently but shallowly toothed: panicles rather loosely flowered: calyx purple, 2–3 mm. long at anthesis: crest-like upper lobe oval-orbicular in fruit: corolla purple or paler, about 4 mm. long: posterior stamens without spurs: fruiting calyx narrowly campanulate, the lateral lobes with slender tips as long as the body.—(WILD-BASIL. MOSQUITO-PLANT.)—Hammocks, pinelands, and waste-places, S Fla.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall or all year.



2. **O. basilicum** L. Stem 2–5 dm. tall, finely pubescent: leaf-blades ovate, usually broadly so, obscurely toothed: panicles densely flowered: calyx green, about 5 mm. long at anthesis; crest-like upper lobe orbicular-reniform in fruit: corolla white, about 7 mm. long: posterior stamens with hairy spurs at the base of the filaments: fruiting calyx campanulate, the lateral lobes with stout tips much shorter than the body.—(BASIL.)—Hammocks, shell-mounds, and pinelands, pen. Fla. Nat. of Asia.—(*W. I.*)—Sum.–fall.

Coleus pumilus Blanco, with small, obtuse, deeply toothed leaf-blades, red along midrib and lateral veins, the stem somewhat prostrate and rooting along the lower portion, has been found as an escape in pen. Fla. Native of the Philippine Islands.

Family 14. RHINANTHACEAE[1] — Figwort Family

Herbs or rarely shrubs or trees. Stems commonly terete. Leaves opposite, whorled or alternate: blades entire, toothed, or divided. Flowers perfect, axillary, racemose, or paniculate, the peduncles sometimes bearing a pair of bractlets. Calyx regular or irregular, of 4 or 5 distinct or united sepals. Corolla irregular, of 5 partly or wholly united petals. Androecium usually of 4 didynamous stamens, sometimes 2 or 5 or the fifth one represented by a staminodium. Gynoecium 2-carpellary. Ovary 2-celled, rarely becoming 1-celled. Fruit capsular or rarely baccate.—About 200 genera and 3000 species, of wide geographic distribution.

Corolla with the posterior lobes external—overlapping in the bud.—**(Antirrhinoideae)**
- Tree: calyx coriaceous: corolla large, about 5 cm. long: capsule woody. — Tribe I. Paulownieae.
- Herbs: calyx membranous or herbaceous: corolla smaller: capsule membranous to coriaceous.
  - Stigmas distinct, flattened (scarcely so in *Capraria, Bramia,* and *Scoparia*): seeds reticulate or finely lined, wingless (except in *Ilysanthes grandiflora*): capsule-walls membranous: inflorescence simply racemose, with the bracts foliaceous, except in *Mazus,* and the flowers axillary: leaves opposite (except in *Capraria*).
    - Sepals distinct or nearly so (except in *Hemianthus*): corolla small (3–18 mm. long): leaves and capsule usually glandular-punctate. — II. Gratioleae.
    - Sepals united over half their length: corolla large (25–35 mm. long): leaves and capsule not glandular-punctate. — III. Mimuleae.
  - Stigmas wholly united, punctiform or capitate: seeds not simply reticulate, either smooth, tuberculate, ridged, alveolate, or winged: capsule-walls firm, chartaceous or coriaceous: inflorescence racemose or paniculate, the bracts usually much smaller than the leaves.
    - Filaments 5: capsule septicidal.
      - Corolla rotate, slightly zygomorphic, its lobes longer than the tube: filaments all antheriferous: leaves alternate. — IV. Verbasceae.
      - Corolla tubular-campanulate, strongly zygomorphic, its lobes shorter than the tube: posterior filament without an anther: leaves opposite. — V. Cheloneae.
    - Filaments 4 (the posterior one present as a minute knob only in *Collinsia*): capsule loculicidal.
      - Corolla red, tubular: capsule filled with tortuous hairs between which are scattered roughened seeds: leaves mostly scale-like. — VI. Russelieae.
      - Corolla yellow, blue, violet, or white, saccate or spurred: capsule lacking hairs within: leaves with expanded blades.
        - Capsule loculicidal by a simple median slit: seed alveolate or smooth: corolla violet or blue, not pouched or spurred anteriorly: leaves opposite.
          - Corolla broadly saucer-shaped or dipper-shaped, with a fine horn-like appendage at the base of the anterior lobes: posterior stamen lacking: capsule globose: sepals distinct. — VII. Angelonieae.

[1] Contributed by Francis Whittier Pennell.

Corolla seemingly papilionaceous, the tube gibbous at the base posteriorly: posterior stamen represented by a callose knob: capsule slightly flattened: sepals partly united. VIII. COLLINSIEAE.

Capsule opening by transverse loculicidal ruptures: seed angled, ridged, or winged: corolla yellow or violet-blue, bilabiate, with a narrow pouch or spur at the base anteriorly: leaves alternate. IX. ANTIRRHINEAE.

Corolla with the anterior lobes external—overlapping in the bud: herbs.—(**Rhinanthoideae**)

Stamens 2, the postero-laterals alone present: corolla small (2–5 mm. long), the antero-lateral lobes external: plants not parasitic. X. VERONICEAE.

Stamens 4, the antero-lateral usually the longer: corolla larger, the mid-anterior lobes usually external: plants usually root-parasites.

Sepals 5, alike: corolla-lobes nearly equally distinct. XI. BUCHNEREAE.

Sepals unequal, the posterior one very short or lacking: corolla strongly bilabiate, the 2 posterior lobes united nearly to the apex. XII. RHINANTHEAE.

I. PAULOWNIEAE

Tree, with cordate leaf-blades, large panicles of horizontal flowers, and erect pointed capsules. 1. PAULOWNIA.

II. GRATIOLEAE

Leaves alternate: stamens 5: corolla nearly regular, white. 2. CAPRARIA.

Leaves opposite: stamens 4 or 2 (the posterior one obsolete).

Leaf-blades entire or toothed: seeds brown or yellow.

Corolla with the ridges to the antero-lateral sinuses low and not projecting beyond those points (anterior filaments simple): posterior lobes of the corolla, little if at all, shorter than the anterior.

Leaves uniform: capsule turgid, longer than wide, acute or obtuse: stem elongate.

Sepals 4: corolla rotate, with recurved lobes much longer than the tube. 3. SCOPARIA.

Sepals 5: corolla campanulate, tubular, or salverform, the lobes equalling or shorter than the tube.

Corolla campanulate, nearly regular; lobes equalling, or little shorter than the tube, the posterior united, little if at all higher than the others.

Pedicels not bracteolate: capsule obtuse.

Stamens 4: capsule globose or ovoid, nearly equalling the sepals: outer sepal oval. 4. MACUILLAMIA.

Stamens 2: capsule ellipsoid-ovoid, much shorter than the sepals: outer sepal of an orbicular-cordate type. 5. HERPESTIS.

Pedicels bibracteolate: capsule acute.

Corolla pubescent in the throat: ovary surrounded by a circle of bristles: outer sepal cordate: leaf-blades clasping: plant lemon-scented. 6. HYDROTRIDA.

Corolla glabrous within: ovary not surrounded by bristles: outer sepal ovate: leaf-blades cuneate at the base: plant odorless. 7. BRAMIA.

Corolla narrower, decidedly zygomorphic, the lobes shorter than the tube, the posterior united over half their length or throughout.

Corolla tubular or tubular-campanulate, relatively broad at the throat, pubescent within at the base of the posterior lobes: capsule septicidal, or secondarily (in *Gratiola*) also loculicidal: leaf-blades toothed.

Pedicels bibracteolate at the base: outer sepals much wider than the inner: polleniferous stamens 4. — 8. MECARDONIA.

Pedicels bibracteolate at the apex (or in *Gratiola* bractlets occasionally one or lacking): sepals nearly even in width: polleniferous stamens 2.

Anther-sacs transverse across the tip of the filament, often somewhat separated on the expanded connective: corolla mostly over twice as long as the calyx: capsule broadly acute to globose, only slightly furrowed: sepals nearly or quite equal in length. — 9. GRATIOLA.

Anther-sacs vertical, contiguous: corolla slightly exceeding the calyx: capsule narrowly pyramidal, deeply furrowed: sepals very unequal in length. — 10. TRAGIOLA.

Corolla salverform, very narrow at the throat and short-pubescent within on all sides: capsule loculicidal: leaf-blades entire. — 11. SOPHRONANTHE.

Leaves dimorphic, several narrow submerged ones on the short caudex-like stem and a pair of broad ones (bracts), which serve as floats at the tip of the elongate scape: capsule wider than long, deeply notched. — 12. AMPHIANTHUS.

Corolla with 2 raised ridges (each formed by the adherence of a filament) to the antero-lateral sinuses, and which project as knob-like processes beyond this point: posterior lobes of the corolla less than two-thirds the length of the anterior.

Corolla violet-blue, 6 mm. long or more: only the postero-lateral filaments with anthers: style with enlarged callose semi-persistent base: capsule 2 mm. long or more, ellipsoid to ovoid, permanently 2-celled, septicidal: sepals 5. — 13. ILYSANTHES.

Corolla white, 2 mm. long or less: only the antero-lateral stamens present: style not enlarged at the base, wholly deciduous: capsule 1 mm. long or less, globose, 1-celled (by lack of septum distally), rupturing irregularly: sepals 4.

Sepals united only at the base: corolla with posterior lobes wholly united, about half the length of the anterior: styles united fully three-fourths their length: leaf-blades orbicular or nearly so. — 14. GLOBIFERA.

Sepals united at least half their length, except on the anterior side: corolla open nearly to the base on the posterior side, the posterior lobe lacking: styles united half to two-thirds their length: leaf-blades obovate-elliptic. — 15. HEMIANTHUS.

Leaf-blades bipinnatifid: seeds pale greenish-yellow, or nearly colorless: corolla lavender. — 16. LEUCOSPORA.

III. MIMULEAE

Tall glabrous perennial herbs: corolla personate, violet. — 17. MIMULUS.

IV. VERBASCEAE

Tall perennial or biennial herbs, with sessile or decurrent leaf-blades and yellow or white corollas. — 18. VERBASCUM.

V. CHELONEAE

Flower-stalk bibracteolate, the simple inflorescence nearly spicate, the flowers crowded: bracts and bractlets broad: corolla with orifice closed by the lower lip: anthers lanose: seed flattened, winged. — 19. CHELONE.

Flower-stalk not bracteolate: inflorescence compound, paniculate or thyrsoid, of axillary cymose flower-clusters:

bracts attenuate: corolla with orifice open: anthers barbate or glabrous: seeds turgid, wingless.
Corolla purple, violet-blue, or white: posterior filament slender, as long as the others: cauline leaves with clasping blades: stem terete. — 20. PENSTEMON.
Corolla greenish-purple or brownish: posterior filament scale-like. 2-lobed: cauline leaves with petioled blades: stem 4-angled. — 21. SCROPHULARIA.

VI. RUSSELIEAE

Tall diffuse perennial herb, with rush-like stems and scale-like leaves (except on shoots). — 22. RUSSELIA.

VII. ANGELONIEAE

Erect perennial herb with leafy stems: corolla violet. — 23. ANGELONIA.

VIII. COLLINSIEAE

Low annual herb with broad leaf-blades and axillary flowers, the corollas partly blue and partly white. — 24. COLLINSIA.

IX. ANTIRRHINEAE

Capsule dehiscing by irregular distal ruptures: corolla with the posterior lobes arched and distally spreading: filaments and anthers glabrous: flowers in terminal racemes: leaf-blades narrow, sessile: plants erect. — 25. LINARIA.
Capsule dehiscing by a lid: corolla with the posterior lobes projecting: filaments and anthers pubescent: flowers axillary: leaf-blades broad, petioled: plant prostrate. — 26. KICKXIA.

X. VERONICEAE

Corolla with lobes much shorter than the tube: capsule ovoid, turgid, acute: sepals 5: leaves whorled. — 27. VERONICASTRUM.
Corolla with lobes longer than the tube: capsule as wide as long or wider, flat: acutish to deeply notched: sepals 4: leaves opposite or alternate. — 28. VERONICA.

XI. BUCHNEREAE

Stamens with both anther-sacs equally developed: corolla not salverform, the throat open: capsule partly exserted from the calyx: pedicel not bracteolate.
Corolla tubular, orange, fleshy, semi-persistent: anthers much exserted. — 29. MACRANTHERA.
Corolla campanulate or rotate, yellow or rose-purple, membranous, early falling: anthers little or not at all exserted.
Anther-sacs glabrous (or in *Afzelia cassioides* with few bristle-like hairs at apex): corolla rotate: stigma punctiform or capitate.
Corolla densely pubescent within on all sides: filaments didynamous: anther-sacs somewhat cuspidate at the base, opening lengthwise: style persistent on the capsule. — 30. DASISTOMA.
Corolla finely pubescent in a ring about the base of the filaments: filaments nearly or quite equal: anther-sacs obtuse at the base, opening by apical slits: style deciduous. — 31. AFZELIA.
Anther-sacs lanose: corolla semi-campanulate: stigma somewhat elongate.
Corolla yellow: anther-sacs with rigid awns at the base: stigma ovoid-capitate. — 32. AUREOLARIA.
Corolla purple or pink, nearly always with red-purple spots within: anther-sacs rounded or mucronate-setaceous at the base: stigma linguliform.
Leaf-blades of a filiform, linear, or spatulate type, entire: calyx-lobes shorter than the tube or about equalling it: anther-sacs of both pairs of stamens equal. — 33. AGALINIS.
Leaf-blades of a lanceolate type, some, at least, auriculate-lobed at the base: calyx-lobes longer than the tube: anther-sacs of the posterior stamens smaller. — 34. TOMANTHERA.
Stamens with only one anther-sac developed, the other wholly abortive: corolla salverform, the throat nearly closed: capsule nearly or quite included in the calyx-tube: pedicel bibracteolate. — 35. BUCHNERA.

XII. RHINANTHEAE

Pedicel bibracteolate: calyx-lobes 5: capsule turgid, septicidal, and tardily also slightly loculicidal: seeds narrow, winged. — 36. SCHWALBEA.

Pedicel not bracted: calyx-lobes 4: capsule loculicidal: seeds broad, wingless.

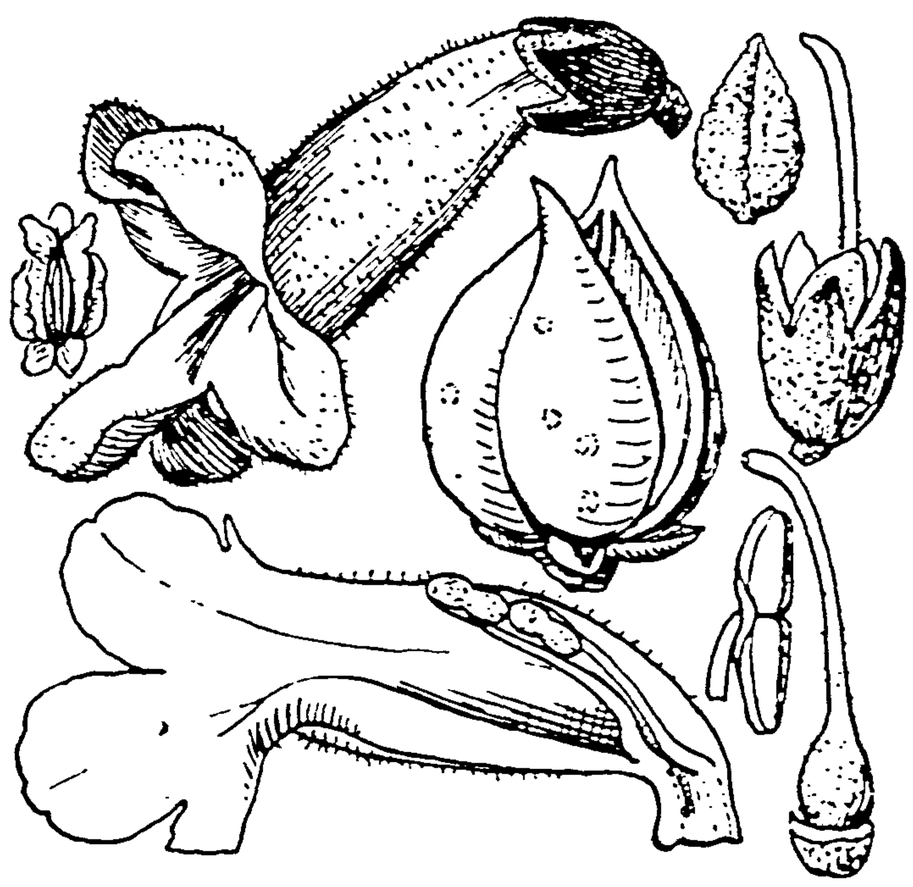
Corolla yellowish-green, its posterior lobes long-projecting, not hooded at the apex, its anterior lobes very short: capsule cylindric-ovoid, equally 2-celled: calyx and foliaceous bracts distally scarlet. — 37. CASTILLEJA.

Corolla yellow, purplish, or white, its posterior lobes arched and hooded, its anterior lobes developed on a flat or ridged plane: capsule flattened, ensiform, unequally 2-celled: calyx and bracts green.

Anterior lip not raised into a palate: anthers glabrous: seeds flat: sepals of each side united to the apex: plant perennial. — 38. PEDICULARIS.

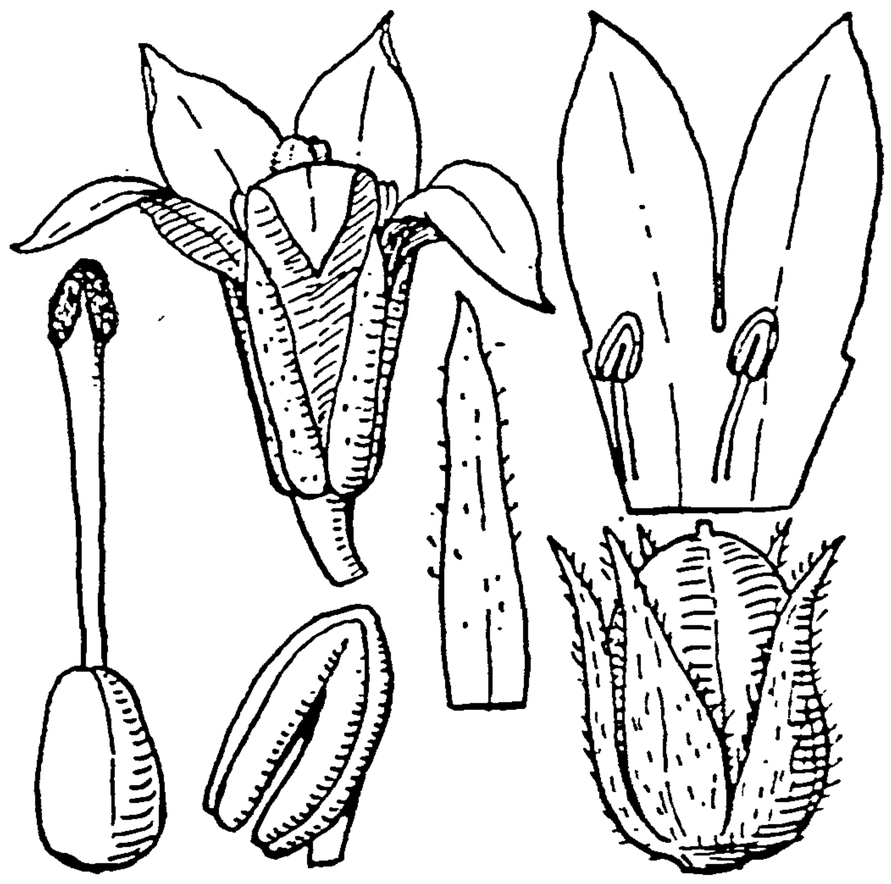
Anterior lip raised into a yellow densely pubescent palate: anthers pubescent: seeds turgid: sepals of each side united at the base: plant annual. — 39. MELAMPYRUM.

1. PAULOWNIA Sieb. & Zucc. Trees resembling *Catalpa*. Leaves opposite; blades ample, long-petioled. Flowers in a large panicle. Sepals 5, united half their length. Corolla violet-blue, zygomorphic, the throat broad and two-ridged within, the lips slightly spreading. Stamens 4, didynamous. Stigmas distinct, plate-like. Capsule ovoid, acute, loculicidal. Seeds flat, broadly winged.—Eight species, Asiatic.



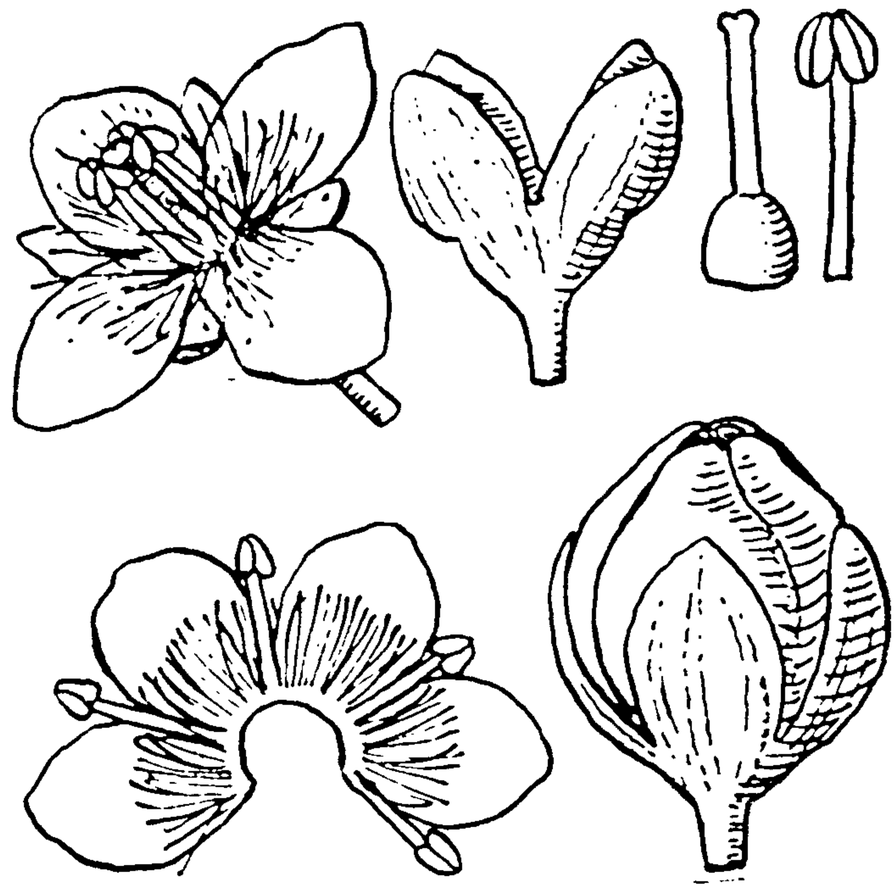
1. P. tomentosa (Thunb.) Baill. Large tree with flaky bark: leaf-blades 15–40 cm. long, ovate, to suborbicular, cordate, entire or somewhat three-lobed, densely pubescent beneath with stellate hairs: calyx 10–15 mm. long; lobes triangular-ovate: corolla 45–55 mm. long; capsule 30–40 mm. long.—(PRINCESS-TREE. KARRI-TREE.)—Roadsides and open woods, occasional throughout E U. S. Nat. of China.—Late Spr.

2. CAPRARIA L. Erect branched herb, the root perennial. Leaves alternate: blades sessile, serrate, not glandular-punctate. Flowers axillary to leaf-like bracts. Sepals 5, distinct, equal. Corolla white: tube campanulate, slightly pubescent anteriorly: lobes 5, nearly equal, spreading, longer than the tube. Stamens 5. Stigmas scarcely distinct, short. Capsule ovoid, acute, glandular-dotted, septicidal, the valves only slightly splitting loculicidally at apex. Seeds numerous, reticulate, wingless.—Two or three species, tropical American.



1. C. biflora L. Stem 3–15 dm. tall, glabrous or pubescent: leaf-blades 2–7 cm. long, oblanceolate, cuneate, or elliptic: pedicels 5–20 mm. long, slender, usually two to an axil: sepals 5–7 mm. long, linear: corolla about 10 mm. long, white or violet-tinged: capsule 4–6 mm. long: seeds ellipsoid, brown.—Sandy soil, on or near beaches, S Fla.—(*W. I., Mex., C. A., S. A.*)—All year.

3. **SCOPARIA** L. Erect, much-branched herb, the root perennial. Leaves opposite: blades petioled, serrate, glandular-punctate. Flowers axillary to leaf-like bracts. Sepals 4, equal. Corolla white, rotate, lanose-pubescent on all sides: lobes much longer than the tube, the posterior united throughout (so that lobes appear to be only four). Stamens 4. Stigmas minute, mainly united. Capsule ovoid, acute, septicidal, and only slightly loculicidal at apex. Seeds numerous, cylindric-ellipsoid, reticulate, wingless.—About 20 species, tropical and South American.

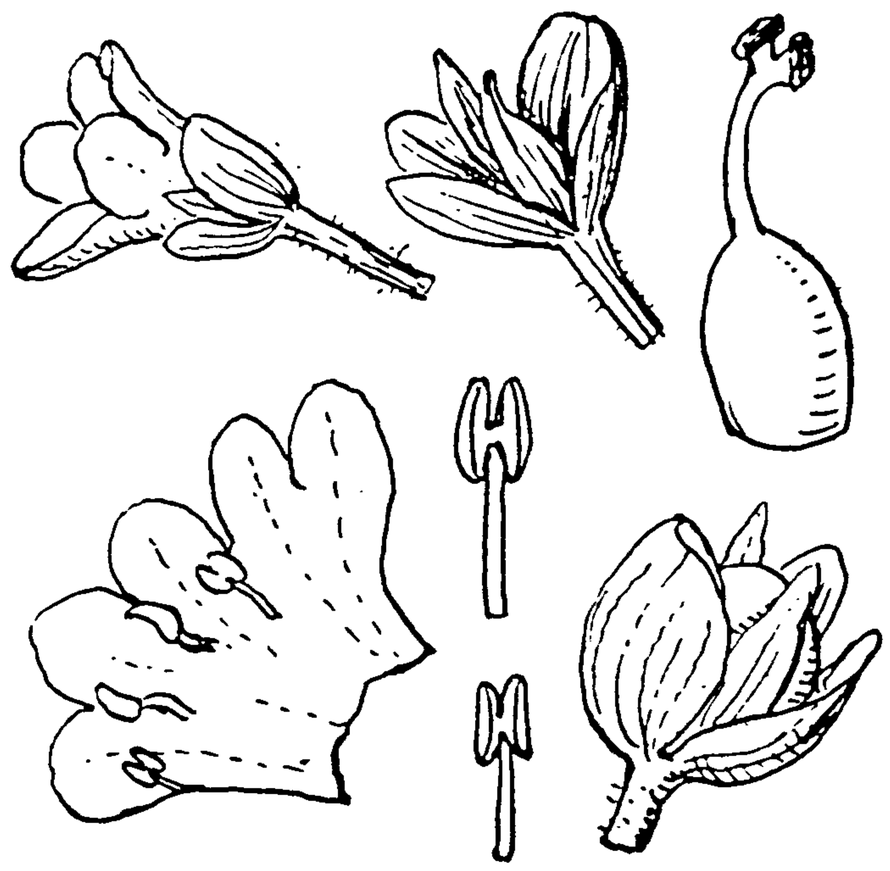


1. S. dulcis L. Stem 3–8 dm. tall, glabrous or slightly pubescent: leaf-blades 1–3 cm. long, ovate to lanceolate, cuneately narrowed to the short petiole: pedicels 3–9 mm. long, slender, one or two to an axil: sepals about 1.5 mm. long, elliptic to elliptic-ovate, three-nerved: corolla white, 4–10 mm. wide; lobes ovate: capsule 1.5–2.5 mm. long: seeds yellowish-brown. [*S. grandiflora* Nash]—(GOAT-WEED.)—Waste-places and cult. ground, Coastal Plain, S Fla. to La. and S Ga.—(*W. I., Mex., C. A., S. A.*)—All year.

4. **MACUILLAMIA** Raf. Creeping and floating succulent, odorless herbs. Leaves opposite: blades entire, palmately 7–9-veined, obscurely glandular-punctate, narrowed to a clasping base. Flowers axillary to leaf-like bracts. Sepals 5, unequal, the posterior one orbicular-oval to oval; the two lateral ovate; the two innermost lanceolate, as long as the others. Corolla white, nearly regular, campanulate: lobes slightly shorter than the tube, equally distinct or the posterior slightly united. Stamens 4. Stigmas peltately flattened. Capsule globose or ovoid, obtuse, nearly equalling the persistent calyx, septicidal or also loculicidal. Seeds numerous, cylindric, finely reticulate, wingless.—About 10 species, natives of tropical and temperate America.

Pedicels 10–15 mm. long, pubescent: corolla 6–8 mm. long: capsule 4-5 mm. long, both septicidal and loculicidal. 1. *M. rotundifolia.*
Pedicels 5–7 mm. long, nearly glabrous: corolla 3–4 mm. long: capsule 3 mm. long, apparently only loculicidal. 2. *M. repens.*

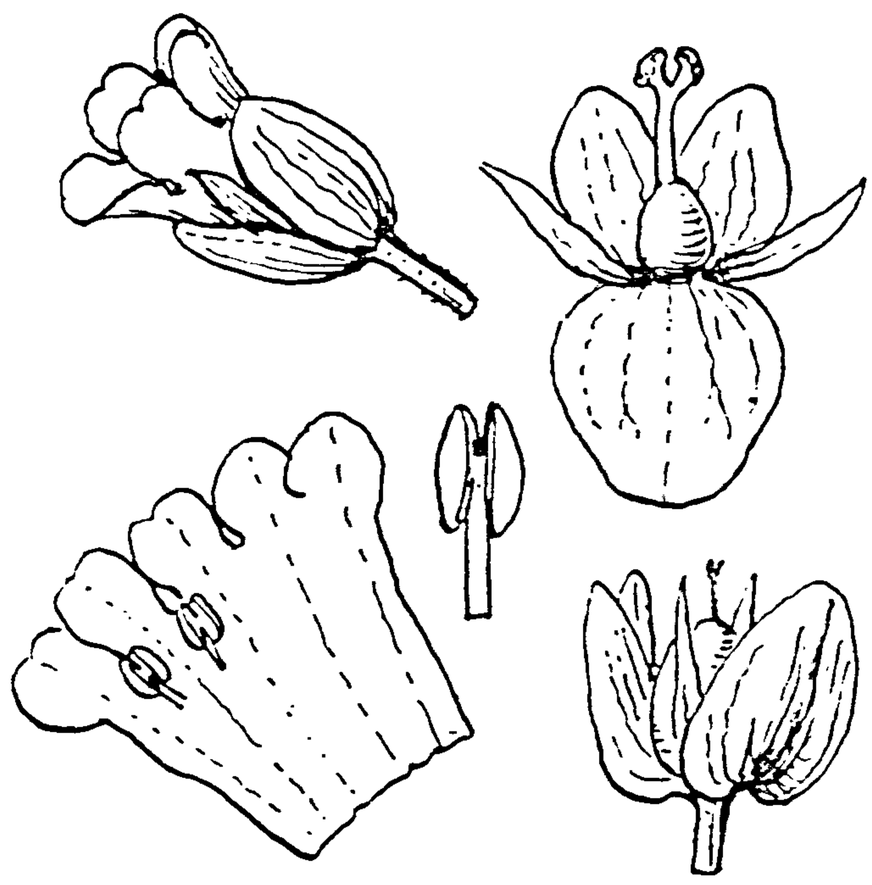
1. M. rotundifolia (Michx.) Raf. Stem and branches 2–6 dm. long, pubescent, especially above, forming dense mats in water: leaf-blades 1.5–3.5 cm. long, obovate to obovate-orbicular: pedicels 10–15 mm. long, shorter than the bracts: sepals becoming 4–6 mm. long: corolla 6–8 mm. long, with yellow throat: seeds 0.5 mm. long, yellowish-brown. [*Herpestis rotundifolia* (Michx.) Pursh *Monniera rotundifolia* Michx.]—Ponds, Interior Low Plateaus, Tenn., and more western provinces, Tex. to Colo., N. D., and Ind.—Sum.



2. M. repens (Sw.) Pennell. Stem and branches 2–4 dm. long, pubescent, especially above, forming mats in water: leaf-blades 1–2 cm. long, obovate: pedicels 5–7 mm. long, nearly glabrous, much shorter than the bracts: sepals becoming 3–4 mm. long:

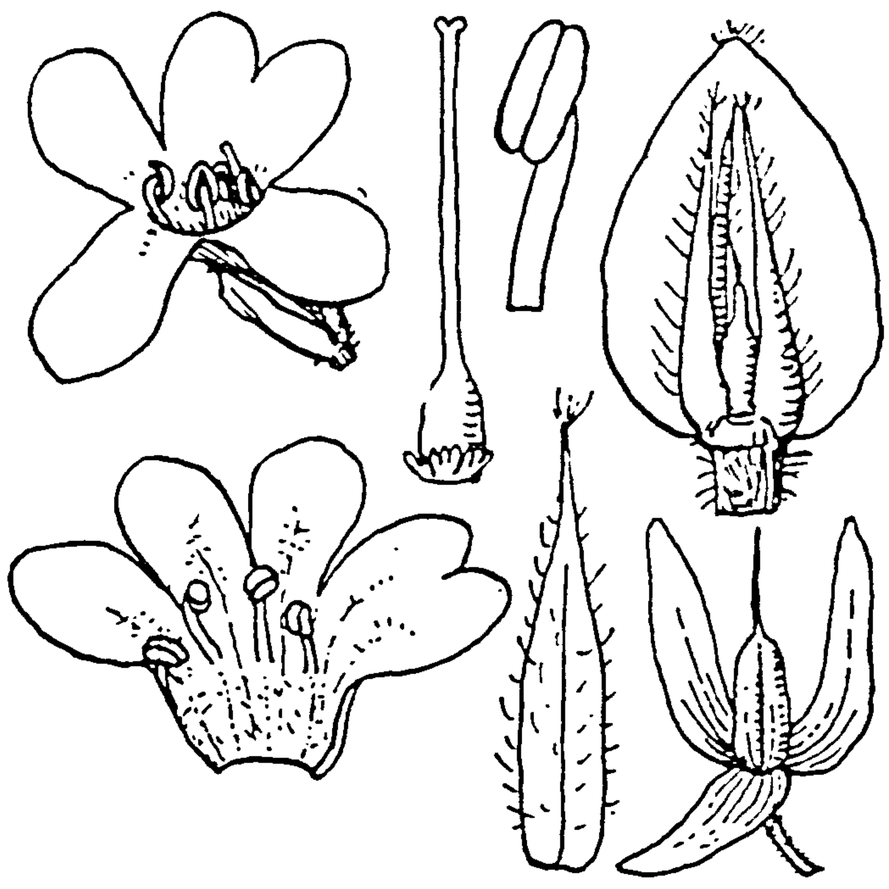
corolla 3–4 mm. long. [*Gratiola repens* Sw.]—Pools, near the coast, Georgetown, S. C.—(*W. I.*)—Sum.

5. **HERPESTIS** Gaertn. f. Creeping succulent, odorless herbs. Leaves opposite: blades entire, palmately 3–5-veined, obscurely glandular-punctate, cordate-clasping. Flowers axillary to leaf-like bracts. Sepals 5, very dissimilar, the posterior one orbicular-cordate, the two lateral half-cordate; the two innermost linear-lanceolate, attenuate, slightly shorter than the others. Corolla white, nearly regular, campanulate: lobes shorter than the tube, the posterior united about half their length. Stamens 2. Stigmas distinct, peltately flattened and semi-capitate. Capsule ellipsoid-ovoid, obtuse, enclosed within and much shorter than the persistent calyx, both septicidal and loculicidal. Seeds numerous, ellipsoid-cylindric, finely ridged, wingless.—One species.



1. **H. rotundifolia** Gaertn. f. Stem much-branched, 0.5–2 dm. long, finely pubescent, especially above: leaf-blades 0.5–1.3 cm. long, oval or rounded-ovate: flower-stalks 2–8 mm. long, finely pubescent, shorter than the bracts: outer sepals becoming 3–5 mm. long: corolla 3–4 mm. long: capsule 2–2.5 mm. long: seeds dark-brown. [*H. repens* (Chapm. Fl.) *Septilia repens* (Fl. SE U. S.)].—Muddy and sandy shores, probably tidal, Coastal Plain, Fla. to Md.—(*W. I.*)—Sum.

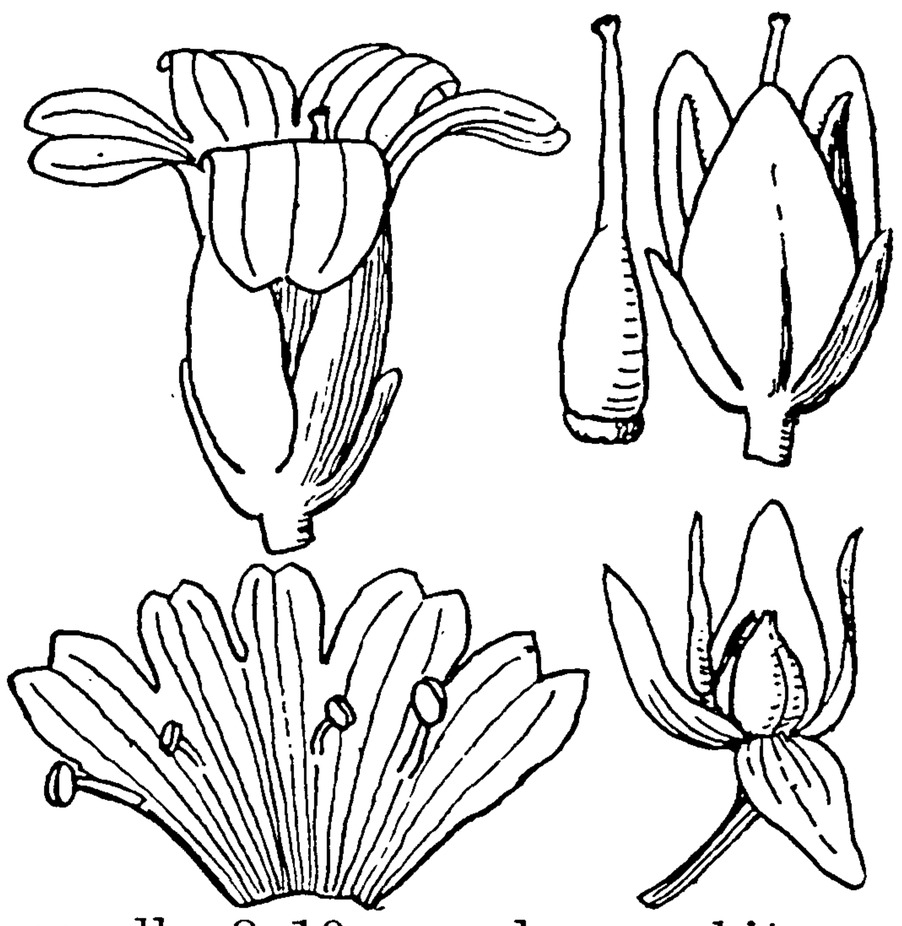
6. **HYDROTRIDA** Small. Aromatic, succulent, creeping or floating herbs, the roots perennial. Stems distally erect. Leaves opposite: blades entire or obscurely crenate, with 5–7 longitudinal veins, punctate with resinous dots, rounded, clasping at base. Flowers axillary to leaf-like bracts. Bractlets two, borne just beneath the calyx. Sepals 5, very dissimilar, the posterior one cordate, the two lateral half-cordate; the two innermost lanceolate-attenuate, much shorter than the others. Corolla blue, nearly regular, campanulate: lobes slightly shorter than the tube and all pubescent within at base, the posterior lobes somewhat united. Stamens 4. Ovary surrounded by a circle of bristles. Stigmas distinct, lip-like. Capsule narrowly ovoid, acute, glabrous, included in the persistent calyx, septicidal and loculicidal. Seeds numerous, ellipsoid or oval, reticulate, wingless.—About 5 species, American.



1. **H. caroliniana** (Walt.) Small. Stem and branches 2–6 dm. long, distally lanose: leaf-blades 1–2.5 cm. long, ovate to suborbicular or nearly elliptic: pedicels 3–15 mm. long, shorter than the bracts: sepals all exceeding the minute, subulate bractlets, the outer becoming 6–11 mm. long: corolla 9–11 mm. long: capsule

4–5 mm. long: seeds grayish-brown. [*Herpestis amplexicaulis* Pursh *Septilia caroliniana* (Walt.) Small]—Ponds and ditches in pineland, Coastal Plain, S Fla. to E Tex. and Va.—Spr.–fall, or all year S.

7. **BRAMIA** Lam. Creeping, glabrous, succulent, odorless herbs, the root perennial. Stems distally ascending. Leaves opposite, blades entire or obscurely toothed, obscurely glandular-punctate, narrowed to a sessile base. Flowers axillary to leaf-like bracts. Bractlets two, just beneath the calyx. Sepals 5, dissimilar; the posterior one ovate; the two lateral narrower; the two innermost lanceolate, attenuate, slightly shorter than the others. Corolla nearly regular, campanulate, glabrous: lobes equalling the tube, all equally distinct. Stigmas flat, mainly united and semi-capitate. Capsule ovoid, acute, glabrous, more deeply loculicidal than septicidal. Seeds numerous, cylindric or ovoid, finely-ridged, wingless.—About 5 species, tropical.



1. **B. Monnieri** (L.) Pennell. Stem and branches 1–6 dm. long, often forming mats: leaf-blades 0.5–1.7 cm. long, cuneate to elliptic-cuneate: pedicels 5–25 mm. long, usually as long as or longer than the bracts: sepals becoming 5–7 mm. long, much exceeding the linear-attenuate, spreading bractlets: corolla 8–10 mm. long, white or pinkish-white: capsule 4–5 mm. long: seeds grayish-brown. [*Herpestis Monnieria* (L.) H.B.K. *Monniera Monniera* (L.) Britton]—Sandy shores of rivers and ponds, most frequently within reach of tides, near the coast, Fla. to Tex., and Va.—(*W. I., Mex., C. A., S. A., O. W.*)—Spr.–fall, or all year S.

8. **MECARDONIA** R. & P. Erect or diffuse, much-branched, glabrous herbs, the roots perennial, the plant blackening in drying. Stems angled. Leaves opposite: blades toothed, glandular-punctate, narrowed to a sessile base. Flowers axillary to leaf-like bracts. Bractlets two, at the base of the slender pedicel and much shorter than the bracts. Sepals 5, unequal; the outer much wider than the inner. Corolla personate: lobes shorter than the tube, the posterior more or less united and pubescent within at base. Stigmas lip-like. Capsule cylindric or ovoid, acute, glabrous, septicidal, the valves only slightly loculicidal at apex. Seeds numerous, cylindric, reticulate, wingless.—About 20 species, of tropical and temperate America.

Corolla white, the posterior lobes united half to two-thirds their length: sepals unequal, the outer lanceolate, rarely more than twice the width of the inner: plant erect or diffuse. 1. *M. acuminata.*

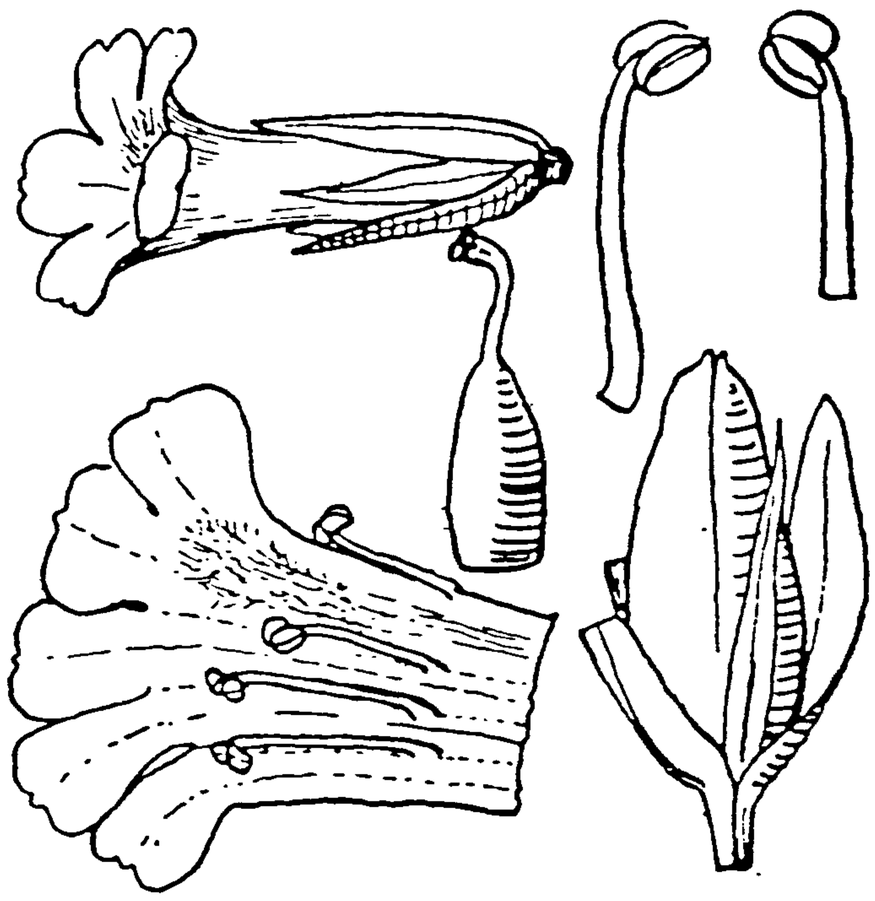
Corolla yellow, the posterior lobes united nearly to apex: sepals nearly equal in length, the outer ovate, more than thrice the width of the inner: plant procumbent or ascending.

Outer sepals narrowly ovate to ovate, narrowed or slightly rounded at base: pedicels 2–4 times the length of the bracts. 2. *M. tenuis.*

Outer sepals ovate to widely ovate, broadly rounded or cordate at the base: pedicels 1–2 times the length of the bracts. 3. *M. procumbens.*

1. **M. acuminata** (Walt.) Small. Plant erect or nearly so, 1–6 dm. tall: (lower, diffuse, with leaf-blades 1.3–2 cm. long, outer sepals 5–6 mm. long, and

corolla usually 7–8 mm. long, in *M. acuminata peninsularis* of S Fla.; laxly ascending, with ovate leaf-blades only 1–1.7 cm. long and pedicels only 8–12 mm. long, in *M. acuminata microphylla* of longleaf pinelands from N Fla. to Tex. and S Ga.) leaf-blades 3–5 cm. long, spatulate-elliptic or nearly elliptic, serrate-dentate: pedicels 12–30 mm. long, usually exceeding the bracts: sepals 6.8 mm. long: corolla about 10 mm. long, white, with longitudinal purple veins on the posterior side: capsule 5–6 mm. long: seeds dark-gray. [*Herpestis nigrescens* Benth.]—Moist sand or loam, especially near streams, in partial shade, various provinces, Fla. to Tex., Mo., Ky., and Md.—Spr.–fall.



2. M. tenuis Small. Plant 0.5–4 dm. long, diffusely ascending or prostrate: leaf-blades 1–2 cm. long, oval, serrate: pedicels 15–35 mm. long, sepals 5–6 mm. long: corolla 7–8 mm. long, deep lemon-yellow, with longitudinal dark veins on the posterior side: capsule 5–6 mm. long.—Light loam or humus over limestone, hammocks and thickets, Everglade Keys, Fla., and lower Florida Keys.—(*W. I.*).—All year, but mostly in spr.

3. M. procumbens (Mill.) Small. Plant 0.5–4 dm. long, procumbent and somewhat ascending: leaf-blades 1–2 cm. long, oval or ovate, serrate: pedicels 7–25 mm. long, sepals 6–9 mm. long: corolla 6 mm. long, lemon-yellow, with longitudinal dark veins on the posterior side: capsule 4–6 mm. long.—Moist loam or sand, meadows and edges of hammocks, S Florida.—(*W. I., Mex., C. A., S. A.*)—All year.

9. **GRATIOLA** L. Erect or ascending, branching herbs, the roots perennial or annual. Leaves opposite: blades toothed to rarely entire, more or less glandular-punctate, sessile, or on young shoots petioled. Flowers axillary to leaf-like bracts. Bractlets usually present, borne just beneath the calyx. Sepals 5, nearly equal. Corolla yellow or white, personate: lobes shorter than the tube, the posterior united nearly or quite to apex and pubescent within at base. Two postero-lateral stamens perfect, the antero-lateral represented by rudimentary filaments or wholly lacking, the connective expanded to a pale membrane spreading beyond the anther-sacs, which are turned transversely to axis of flower. Stigmas lip-like. Capsule ovoid-pyramidal to globose, acute or rounded, glabrous, both septicidal and loculicidal nearly or quite to base. Seeds numerous, irregularly tetrahedral, reticulate, wingless.—About 30 species, widely distributed.—HEDGE-HYSSOPS.

Capsule 3–6 mm. long, equalling or slightly exceeding the sepals: stem-leaves narrowed to a sessile or scarcely clasping base: plant annual.
  Pedicel slender, 10–45 mm. long: corolla within throat on posterior side pubescent with clavate hairs: capsule ovoid, equalled or exceeded by the sepals.
    Corolla 8–10 mm. long; tube greenish-yellow, unlined: leaf-blades elliptic-lanceolate, acute to acuminate. 1. *G. neglecta.*
    Corolla (at least of earlier flowers) 15–18 mm. long, the tube white and lined with purple: leaf-blades obovate to oval, obtuse or rounded. 2. *G. floridana.*
  Pedicel stout, 1–12 mm. long: corolla within throat on posterior side pubescent with filiform hairs: capsule globose, usually slightly exceeding the sepals. 3. *G. virginiana.*
Capsule 1–3 mm. long, much exceeded by the sepals: stem-leaves clasping by a wide base: plant perennial.

Corolla golden-yellow: capsule 3 mm. long: leaf-blades entire or slightly toothed. — 4. *G. aurea.*

Corolla at least with white lobes; tube delicately lined with purple-brown: capsule 1–2 mm. long: leaf-blades with sharp salient teeth.

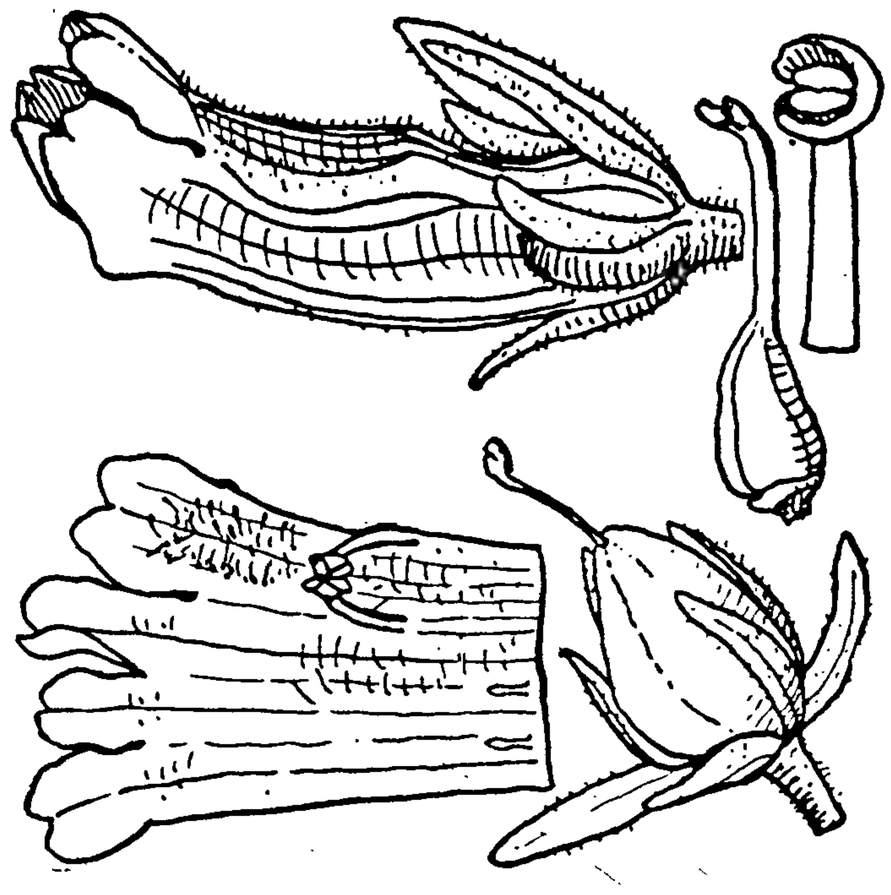
Leaf-blades linear-lanceolate to lanceolate, coarsely toothed towards the tip: sepals linear to linear-subulate: corolla-tube dull-yellow.

Capsule usually wider than long: sepals 5–7 mm. long, usually subtended by one or two sepal-like bractlets. — 5. *G. brevifolia.*

Capsule as long as wide or longer: sepals 3–5 mm. long, subtended by one small bractlet or none. — 6. *G. ramosa.*

Leaf-blades elliptic-ovate to ovate, finely serrate throughout: sepals lanceolate to elliptic-lanceolate: corolla-tube white. — 7. *G. viscidula.*

1. G. neglecta Torr. Stem 1–3 dm. tall, usually much-branched, glandular-pubescent especially above: leaf-blades 1–6 cm. long, elliptic-lanceolate, serrate-dentate, acute or acuminate: pedicels 10–30 mm. long, slender, glandular-pubescent: bractlets equaling or usually longer than the calyx: sepals 3–6 mm. long, linear to linear-lanceolate: corolla 8–10 mm. long; lobes white or pinkish-tinged; throat greenish-yellow: capsule 3–5 mm. long, pyramidal-ovoid, acute: seeds yellow, with longitudinal much more pronounced than transverse reticulations. [*G. virginiana* (Chapm. Fl. Fl. SE U. S.)].—Wet loam, usually in deciduous woodland, Piedmont and more northern provinces, Ga. to Tex., Calif., B. C., Ont., and Me.; north of our area more common. —Spr.–sum., then until fall fruiting cleistogamously.



2. G. floridana Nutt. Stem 1–4 dm. tall, simple or somewhat branched, finely glandular-pubescent above or glabrate throughout: leaf-blades 2–4 cm. long, obovate or oval, dentate to nearly entire, obtuse or rounded, obscurely glandular-punctate: pedicels mostly 20–45 mm. long, slender, finely glandular-pubescent to glabrate: bractlets equalling or usually longer than the calyx: sepals 3–6 mm. long, linear: corolla 15–18 mm. long, white; throat lined with purple, yellow posteriorly: capsule 3–5 mm. long, ovoid, acute: seeds cylindric, yellow, with longitudinal much more pronounced than transverse reticulations. [*G. macrantha* Chapm.]—Muddy banks and wet woods, Coastal Plain and adj. provinces, N Fla. to Ala. and Ga.—Spr.

3. G. virginiana L. Stem 1–4 dm. tall, stout, often much branched, glabrous or nearly so throughout: leaf-blades 2–5 cm. long, elliptic-lanceolate to oval, repand to dentate-serrate, acute or obtuse, obscurely glandular-punctate: pedicels 1–12 mm. long, stout, puberulent or glabrate: bractlets shorter or slightly longer than the calyx: sepals 4–6 mm. long, linear: corolla 9–14 mm. long, white; throat lined with purple on the upper side: capsule 4–7 mm. long, globose: seeds linear-cylindric, yellow, with longitudinal and transverse reticulations equally pronounced. [*G. sphaerocarpa* Ell.]—Wet shaded places, along streams and ponds, Coastal Plain from C pen. Fla. to E Tex., and N. J.; inland through the Blue Ridge and Appalachian Valley, and in the Mississippi Valley to Ia. and Ohio.—Spr., then until fall fruiting cleistogamously.

4. G. aurea Pursh. Stem 1–4 dm. long, erect or weakly ascending, usually branched, glandular-puberulent above: leaf-blades 1–2.5 cm. long, linear-lanceolate to lanceolate-ovate, conspicuously glandular-punctate, clasping at base: pedicels becoming 10–25 mm. long, slender, glandular-puberulent: bractlets

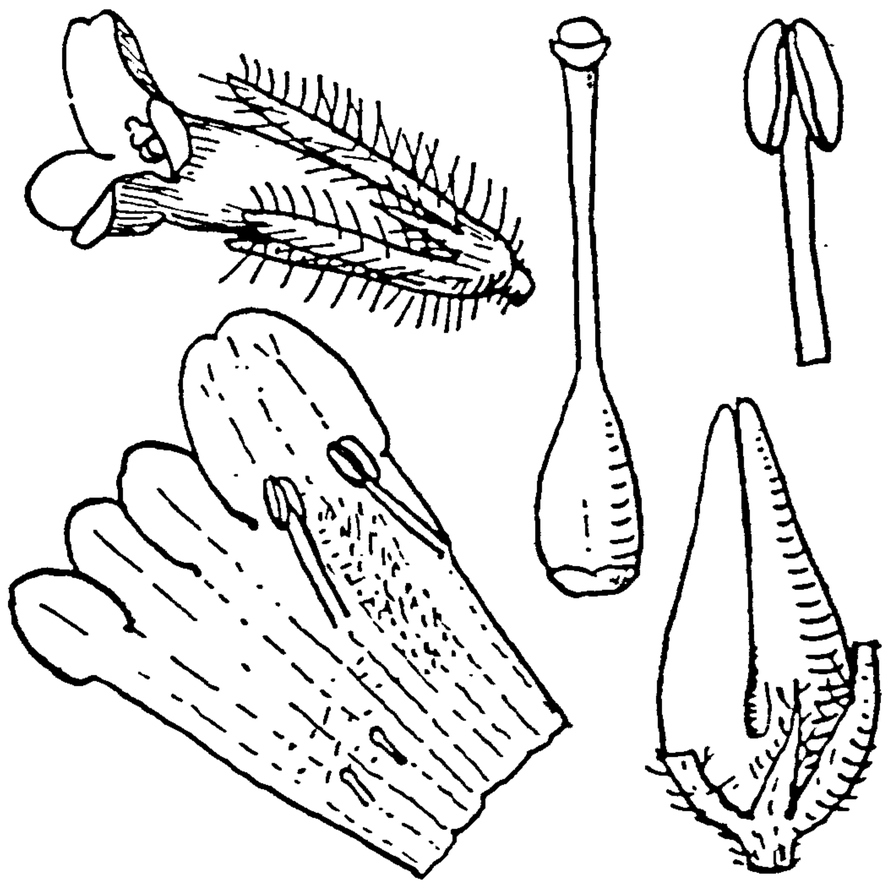
shorter than the calyx: sepals 4–7 mm. long, linear-lanceolate to lanceolate: corolla 10–15 mm. long, golden-yellow, unlined; capsule 3 mm. long: seeds strongly reticulate, brown. [*G. georgiana* Pennell]—Wet pine-barrens, occasional or rare, Coastal Plain, N Fla. to Ala. and N. C.; more abundant northward, to Que. and Newf.—Spr.–fall.

5. G. brevifolia Raf. Stem 2–4 dm. long, laxly ascending, simple or little branched, glandular-puberulent above: leaf-blades 1–2.5 mm. long, linear-lanceolate, clasping at base: pedicels becoming 12–20 mm. long, slender, glandular-puberulent: bractlets equalling the calyx: sepals 5–7 mm. long, linear: corolla 10–12 mm. long; lobes white, the throat yellow, lined with brown; capsule 1–2 mm. long, wider than long: seeds strongly reticulate, brown. [*G. Drummondii* Benth.]—Moist or wet sandy soil in pinelands, Coastal Plain from N Florida to E Texas and S Ga.; inland on sandstone ridges to northwestern Georgia and the Cumberland Plateau of E Tenn.—Spr.–fall.

6. G. ramosa Walt. Rootstock much branched: stem 1–3 dm. tall, simple or little branched, densely glandular-puberulent above: leaf-blades 0.7–1.5 cm. long, linear to lanceolate, clasping at base: pedicels becoming 6–17 mm. long, glandular-puberulent: bractlets vestigial or wholly lacking: sepals 3–5 mm. long, linear-subulate: corolla 10–14 mm. long; lobes white; throat yellow, lined with brown: capsule 1–2 mm. long, as long as or longer than wide: seeds finely reticulate, brown.—Moist or wet sandy soil in pinelands, Coastal Plain, S Fla. to La. and Md.—Spr.

7. G. viscidula Pennell. Rootstock short and nearly simple: stem 2–6 dm. tall, simple or little branched, viscid-puberulent or pubescent: leaf-blades 1–2 cm. long, oblong-ovate to ovate, widely clasping at base: pedicels 10–15 mm. long, glandular-pubescent: bractlets nearly equalling the calyx: sepals 5–7 mm. long, lanceolate to elliptic-lanceolate: corolla 8–11 mm. long, white; throat lined with purple: capsule 2 mm. long, globose-ovoid: seeds strongly reticulate, brown. [*G. viscosa* Schwein. not Hornem.]—Swales and along streams, Blue Ridge and Piedmont, C Ga. to E Tenn. and N Del.—Sum.

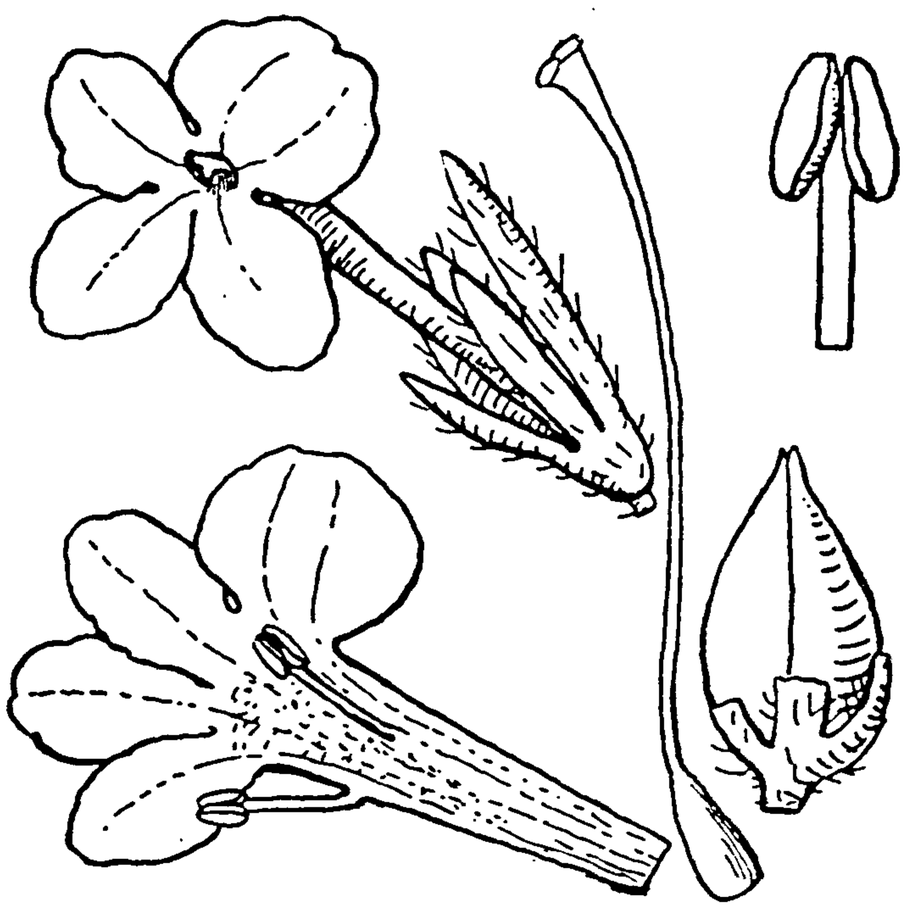
10. TRAGIOLA Small & Pennell. Erect herbs, from a short rootstock. Leaves opposite: blades serrate, glandular-punctate, the cauline rounded to a clasping base, the basal short-petioled, forming a winter-rosette. Flowers axillary to bracts. Bractlets two, just beneath the calyx. Sepals 5, unequal. Corolla white, personate, nearly tubular: lobes short, the posterior united nearly to apex and pubescent within at base. Two postero-lateral stamens polleniferous, the antero-laterals represented by rudimentary filaments. Connective not dilated. Stigmas lip-like. Capsule narrowly pyramidal, acuminate, deeply-sulcate, glabrous, septicidal, the valves only slightly loculicidal at apex. Seeds numerous, irregularly tetrahedral, obscurely lined, wingless.—One species.



1. T. pilosa (Michx.) Small & Pennell. Stem 2–6 dm. tall, hirsute (or nearly or quite glabrous and with shorter leaves and bracts in *T. pilosa epilis*, which occurs in S Fla.); leaf-blades 1–2 cm. long, ovate or oval, slightly serrate to nearly entire: pedicels less than 1 mm. long: sepals 5–7 mm. long, linear to linear-subulate, somewhat exceeded by the bractlets: corolla 5–9 mm. long, the throat with

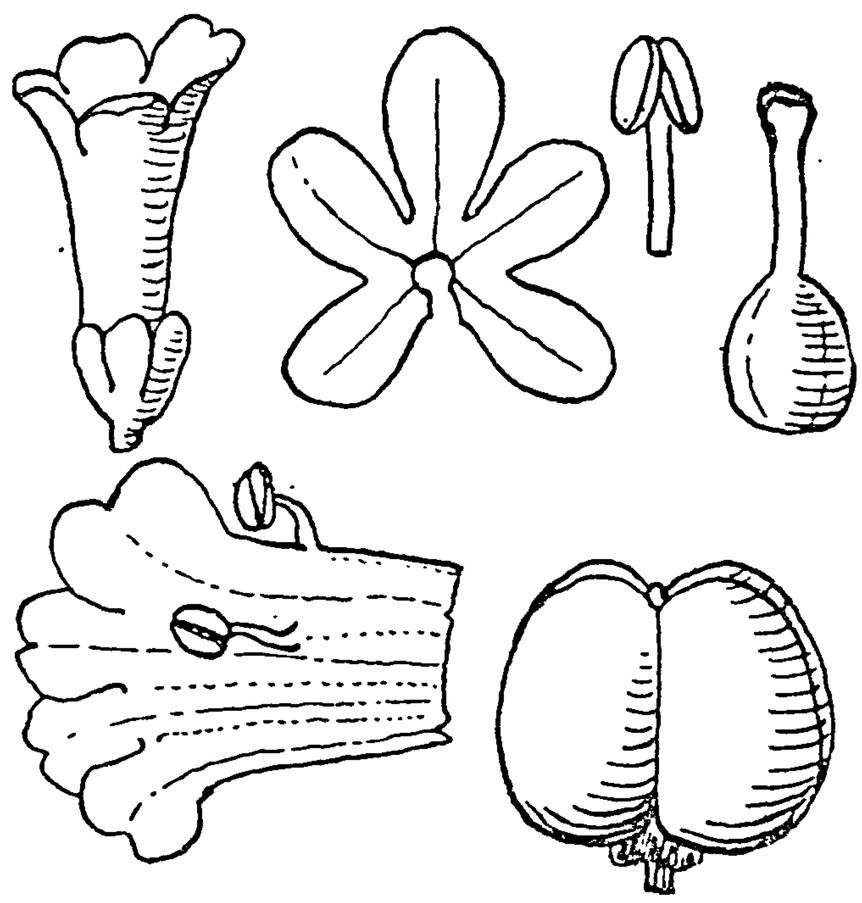
faint bluish-purple lines: capsule 4–5 mm. long: seeds yellowish. [*Gratiola pilosa* Michx. *Sophronanthe pilosa* (Michx.) Small]—Pinelands, Coastal Plain, C pen. Fla. to E Tex. and N. J.; inland through northern Ala. and northern Ga., reaching the mountain-valleys of E Tenn. and W N. C.—Sum.–fall.

11. SOPHRONANTHE Benth. Erect much branched herbs, with perennial roots, the plant covered nearly throughout with stiff white bristle-like hairs. Leaves opposite; blades entire, strongly revolute, obscurely glandular-punctate, sessile. Flowers sessile, axillary to leaf-like bracts. Bractlets two. Sepals 5, very unequal, the outer three longer than the inner two. Corolla white, salverform, slightly personate: tube very narrow, short-pubescent within on all sides; lobes shorter than the tube, the posterior united to apex. Two postero-lateral stamens polleniferous, the antero-laterals represented by rudimentary filaments or lacking. Connective not dilated. Stigmas lip-like. Capsule narrowly pyramidal, acuminate, deeply-sulcate, glabrous, loculicidal. Seeds numerous, nearly rectagonal, finely lined, wingless. —One species.



1. S. hispida Benth. Stem 0.5–2 dm. tall, hispid: leaf-blades 0.8–1.5 cm. long, firm, linear, glabrous and whitened as by an incrustation above, with hispid midrib beneath: sepals 3–6 mm. long, linear to linear-lanceolate, all exceeded by the bractlets: corolla 10–13 mm. long: capsule 4–5 mm. long: seeds nearly black. [*Gratiola subulata* Baldw.]—Dry pinelands, Coastal Plain, S Fla. to Miss. and S Ga.—Spr.–fall.

12. AMPHIANTHUS Torr. Delicate glabrous annual herb, from a caudex sending up several lax stems each buoyed to the surface of the water by the pair of leaves that act as floats. Leaves opposite; blades obscurely glandular-punctate, dimorphic; the basal immersed ones lanceolate, acute, widely sessile; the distal floating ones oval, rounded at apex, narrowed to a semi-petiolar base. Flowers axillary to both types of leaves, although from the two floating leaves there is usually only one, seemingly terminal, the basal flowers probably cleistogamic. Bractlets none. Sepals 5, slightly united, somewhat unequal. Corolla of emersed flowers white or whitish, campanulate, slightly personate; lobes shorter than the tube: while not seen, the corollas of the basal flowers probably do not open. Stamens 2. Stigmas plate-like. Capsule wider than long, flattened contrary to septum, of two rounded cavities, loculicidal to base, even splitting the septum. Seeds numerous, cylindric, reticulate, wingless.—One species.



1. A. pusillus Torr. Stem filiform, 0.1–0.5 dm. long branched only at base: leaf-blades about 0.5 cm. long: pedicels 0.5–2 mm. long,

shorter than the bracts: sepals 1 mm. long: corolla (of emersed flowers) 6–8 mm. long: capsule 2 mm. long, 3 mm. wide: seeds 1–1.2 mm. long, those of the basal capsules smaller.—Aquatic in shallow depressions in granite rocks, Piedmont, Ga. —Spr.—The seeds of this plant apparently lie dormant during dry seasons, and germinate in years of heavy winter precipitation. It is accordingly to be found only at long or irregular intervals.

13. ILYSANTHES Raf. Erect, diffuse or creeping herbs, usually much-branched, with biennial or annual roots. Leaves opposite: blades toothed to entire, glandular-punctate, sessile or somewhat petioled. Flowers axillary to leaf-like bracts. Bractlets none. Sepals 5, distinct or united, linear, slightly unequal in length. Corolla blue-violet or paler, zygomorphic: lobes shorter than the tube, the two posterior arched and united over half their length, the three anterior projecting and with two conspicuous yellow pubescent ridges formed by the adnate proximal portions of the anterior filaments. Filaments four, didynamous, the two posterior shorter, anther-bearing; the two anterior projecting distally as two short yellow pubescent processes, at or near the apex of which a reflexed glabrous upcurving prolongation may be evident. Stigmas plate-like. Capsule narrowly ellipsoid to ovoid, somewhat oblique by the greater development of the anterior carpel and with the callose white style-base attached posteriorly; glabrous, septicidal throughout. Seeds numerous, yellowish, nearly ellipsoid, prismatic-angled or winged, with fine transverse lines. —About 70 species, widely distributed, especially in warm regions.—FALSE-PIMPERNELS.

Stem prostrate and extensively creeping: leaf-blades orbicular to ovate-orbicular, rounded at base, all closely sessile: seeds winged. I. BAZINA.
Stem erect or ascending: leaf-blades more or less elongate, at least the lowermost narrowed at the base: seeds not winged. II. EUILYSANTHES.

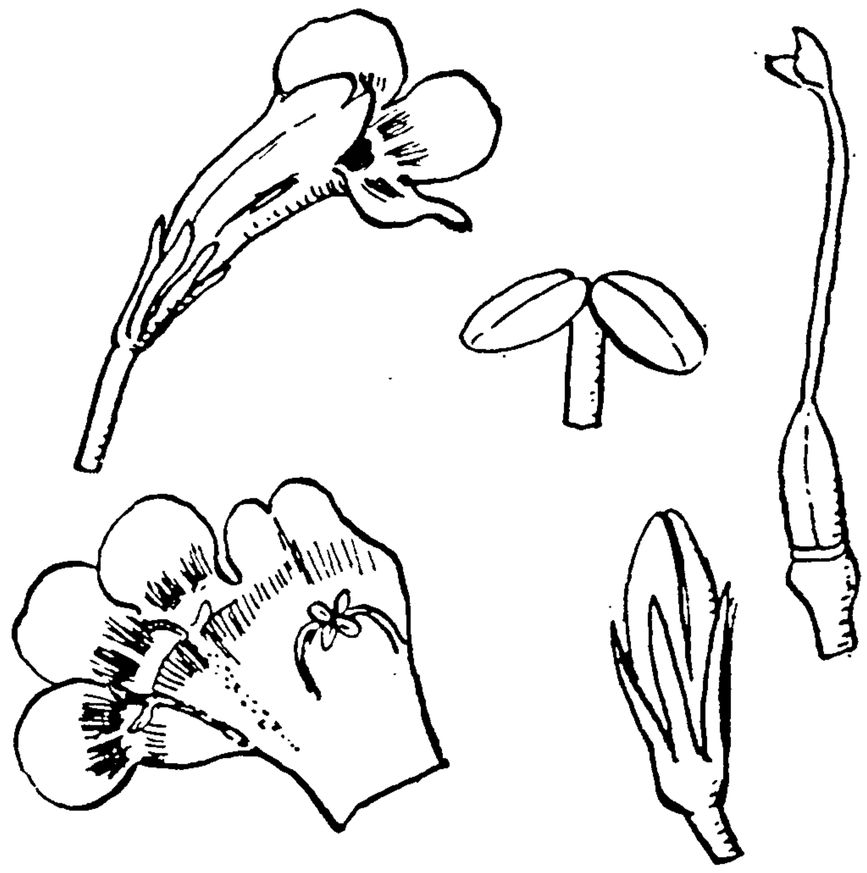
I. BAZINA

Matted plant, conspicuous when in flower by the numerous mottled corollas. 1. *I. grandiflora.*

II. EUILYSANTHES

Seeds much longer than wide, truncate: basal leaves small or lacking, not tending to form a rosette: stem and pedicels slightly ridge-angled.
  Seeds pale-yellow, mostly twice or thrice as long as wide: leaf-blades 1–3 cm. long, the lower obviously narrowed at base: pedicels shorter or longer than the bracts: later flowers cleistogamous. 2. *I. dubia.*
  Seeds brownish-yellow, mostly less than twice as long as wide: leaf-blades 0.5–1.5 cm. long, nearly all widest near base and rounded-clasping: pedicels much exceeding the bracts: corollas throughout the season all open. 3. *I. inaequalis.*
Seeds as wide as long, apiculate: basal leaves usually larger, present most of the season and forming a winter-rosette: stem and pedicels prominently ridge-angled.
  Stem 0.3–1 dm. tall, uniformly leafy, the cauline leaves being little smaller than the basal: pedicels 7–15 mm. long: capsule 1–2 mm. long. 4. *I. saxicola.*
  Stem 1–3 dm. tall, nearly bare above, the upper leaves being reduced to subulate bracts: pedicels 15–50 mm. long: capsule 3–5 mm. long. 5. *I. monticola.*

1. I. grandiflora (Nutt.) Benth. Stems 0.2–4 dm. long, much-branched, extensively creeping: leaf-blades 0.5–1 cm. long, orbicular or ovate-orbicular,



crenate-serrate to entire, finely glandular-punctate: pedicels 15–40 mm. long, erect, obscurely puberulent: sepals 2–4 mm. long, glabrate: corolla 8–10 mm. long, violet-blue, within paler, the posterior lobes pale and with violet-blue median streaks, the anterior lobes white, but with two violet-blue blotches near the bases of the lobes: capsule 4–6 mm. long: seeds brownish-yellow, cylindric, scarcely longer than wide, slightly curved, with 5 to 7 thin wings. [*Bazina nudiflora* Raf.]—Moist sandy soil, Coastal Plain, S Fla. to S Ga.—Spr.–fall or all year S.

2. I. dubia (L.) Barnhart. Stems 0.5–2.5 dm. tall, often much branched and diffusely spreading: leaf-blades dentate, serrate, or nearly entire: those of the lower leaves obovate or elliptic narrowed at base, 1–3 cm. long; the upper smaller and frequently ovate, with rounded clasping base: pedicels 3–20 mm. long: sepals 3–5 mm. long, usually finely pubescent: corolla 7–10 mm. long, pale-lavender, deeper in color near margin of lobes: capsule 3–5 mm. long: seeds nearly cylindric, pale-yellow. [*I. gratioloides* (L.) Benth. *I. attenuata* (Muhl.) Small.]—Swamps and stream-margins, usually loami, open or shaded, various provinces, N Fla. to Tex., Nebr., Wis., and N. B.—Sum.; in fall fruiting cleistogamously.

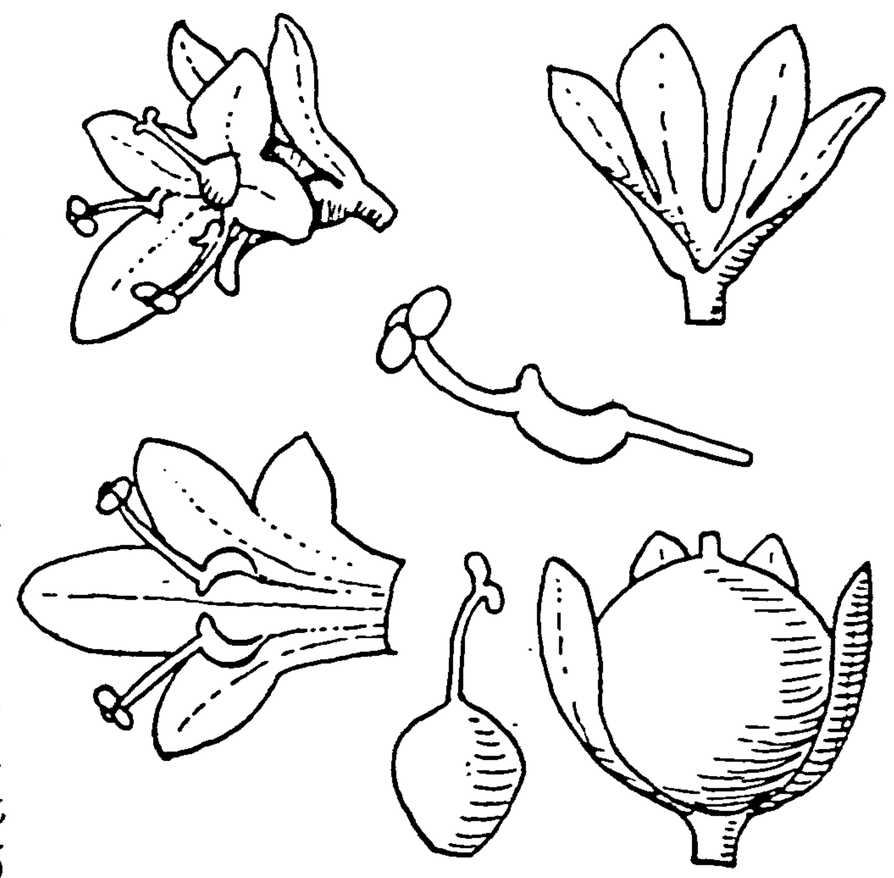
3. I. inequalis (Walt.) Pennell. Stems 0.3–2 dm. tall, much-branched and diffusely spreading: leaf-blades 0.5–1.5 cm. long, remotely toothed or usually entire, mostly ovate and rounded-clasping, only the lowermost sometimes narrowed at base: pedicels 10–20 mm. long: sepals 2–3 mm. long, glabrate or glabrous: corolla 6–8 mm. long, white or faintly tinged with lavender: capsule 2–4 mm. long: seeds cylindric-angled, brownish-yellow. [*I. gratioloides* (Fl. SE. U. S.)]—Wet sandy places, usually open, Coastal Plain and more northern provinces, Fla. to Tex., N. Dak., and N. H.—Sum.–fall.

4. I. saxicola (Curtis) Chapm. Stems 0.3–1 dm. tall, somewhat tufted, simple or sparingly branched: blades of the cauline leaves 0.3–0.7 mm. long, narrowly elliptic or somewhat spatulate, entire, obviously glandular-dotted, narrowed at base: pedicels 7–15 mm. long, obscurely glandular-puberulent: sepals 1–2 mm. long, glabrous: corolla 9–12 mm. long (not seen fresh): capsule 1–2 mm. long: seeds ovoid, brownish-yellow.—On rocks in rapid streams, Blue Ridge, Ga. to N. C.—Sum.–fall.

5. I. monticola (Nutt.) Raf. Stems 1–3 dm. tall, rising from out a rosette of leaves that persists most of the year, simple or laxly branched: basal leaf-blades elliptic-oval to oval, undulate-dentate to entire, obviously glandular-punctate, 15–23 mm. long, narrowed to short petiolar bases; blades of the cauline leaves smaller, rapidly diminishing above, the upper being slender subulate-linear scales only 2–3 mm. long: pedicels obscurely glandular-puberulent to glabrous: sepals 1.5–3 mm. long, glabrous: corolla 9–11 mm. long, violet-purple, within paler, streaked and blotched: capsule 3–5 mm. long: seeds globose-ovoid, brownish-yellow. [*I. refracta* (Ell.) Raf.]—Moist sandy open soil, various provinces, N Fla. to Ala., and N. C.—Spr.–fall.

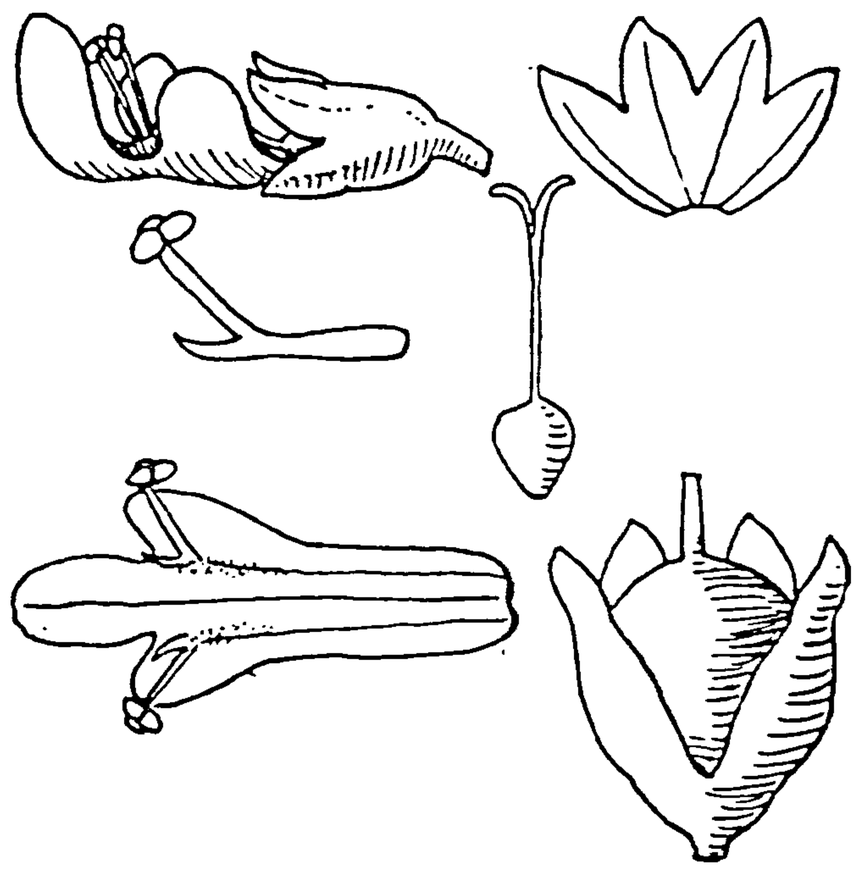
14. GLOBIFERA J. F. Gmel. Creeping glabrous annual herbs, extensively branching and forming soft mats. Leaves opposite: blades entire, obscurely or not glandular-punctate, sessile or nearly so. Flowers axillary to leaf-like bracts. Bractlets none. Sepals 4, slightly united, elliptic, uniform.

Corolla white, glabrous, rotate, lobes longer than the tube, the 2 posterior united to apex, so appearing as one lobe which is smaller than the other 3. Filaments two (only the antero-lateral present), exserted, arising from swollen, but scarcely projecting bases. Stigmas lip-like, borne on the distinct style-tips. Capsule globose, glabrous, at maturity one-celled, rupturing irregularly by the break-down of the thin wall. Seeds numerous, yellowish, cylindric, prismatic-angled, with fine transverse lines.—Two or 3 species, American.



1. G. umbrosa (Walt.) J. F. Gmel. Stem 0.5–3 dm. long, slender: leaf-blades 0.3–1.1 cm. long, somewhat cuneately narrowed at base: pedicels 0.5–1 mm. long: sepals 1.5 mm. long: corolla 1.5 mm long: capsule 1 mm. long. [*Micranthemum orbiculatum* Michx.]—Wet shaded loam, often in shallow pools, Coastal Plain, C pen. Fla. to Tex., and N. C.—(*W. I., S. A.*)—Spr.–fall.—The suborbicular leaf-blades are usually much less than 1 cm. long.

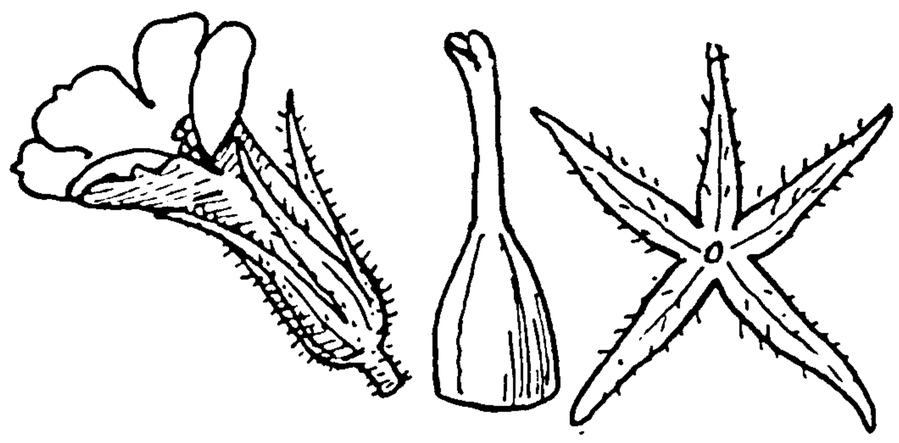
15. HEMIANTHUS Nutt. Creeping glabrous annual herbs, extensively branching and forming small mats. Leaves opposite or in threes: blades entire, not glandular-punctate, sessile. Flowers axillary to leaf-like bracts. Bractlets none. Sepals 4, united at least half their length, but on the anterior side distinct nearly to base. Corolla 1-lipped, open nearly to base on the posterior side (the posterior lobes wholly lacking), the lip deflexed-spreading, 3-lobed, pubescent with short yellow hairs on the two ridges to the sinuses. Filaments two (only the antero-lateral present), projecting distally as two yellow-pubescent processes just below the bases of which upcurve the glabrous anther-bearing portion of the filament. Stigmas narrowly flattened, widely divaricate on the free style-tips. Capsule globose, glabrous, at maturity 1-celled, rupturing irregularly by the break-down of the thin wall. Seeds numerous, yellow, cylindric, prismatic-angled, with fine transverse lines.—About 7 species, mostly West Indian.



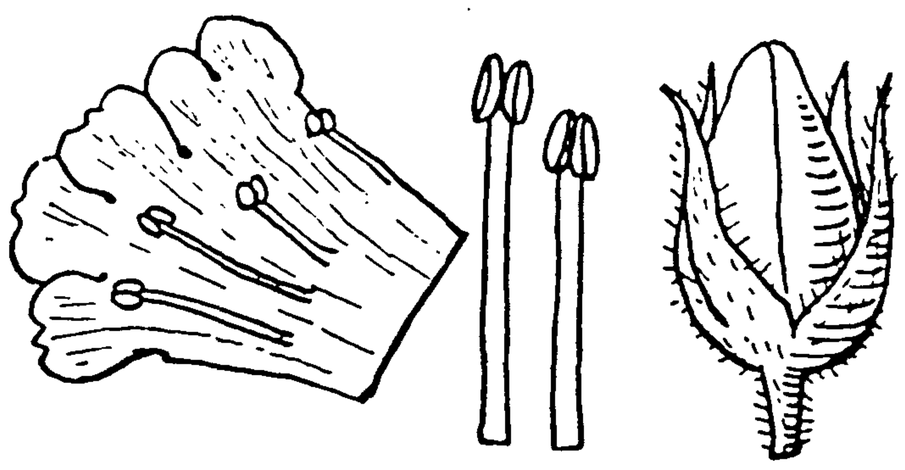
1. H. glomeratus (Chapm.) Pennell. Stem 0.2–0.5 dm. long (or, when submersed, occasionally 2 dm. long), slender: leaf-blades 0.2–0.3 cm. long (or, when submersed, reaching 0.7–0.8 cm. long), cuneately narrowed at base: pedicels very short, usually about 0.5 mm. long: calyx 1 mm. long; lobes acute, about ½ the length of the tube: corolla 1.5–2 mm. long, white, the anterior lobes short: capsule 0.7 mm. long. [*Micranthemum Nuttallii glomeratum* Chapm. *Hemianthus micranthemoides* (Fl. SE. U. S.)]—Sandy shores of lakes and rivers, Coastal Plain, pen. Fla.—Spr.–fall, or all year S.

16. LEUCOSPORA Nutt. Erect, hairy, annual, much branched herbs. Leaves opposite: blades deeply-pinnatifid, not punctate, petioled. Bractlets none. Sepals 5, distinct, linear-attenuate, uniform. Corolla personate: lobes shorter than the tube, the two posterior united nearly to apex, the anterior

spreading-projecting and slightly pubescent at base. Filaments four, didynamous. Stigmas plate-like. Capsule ovoid, glabrous, septicidal nearly to base, the valves only slightly loculicidal near apex. Seeds numerous, pale greenish-yellow or nearly colorless, ellipsoid-cylindric, ridged and with fine transverse lines.—One species.



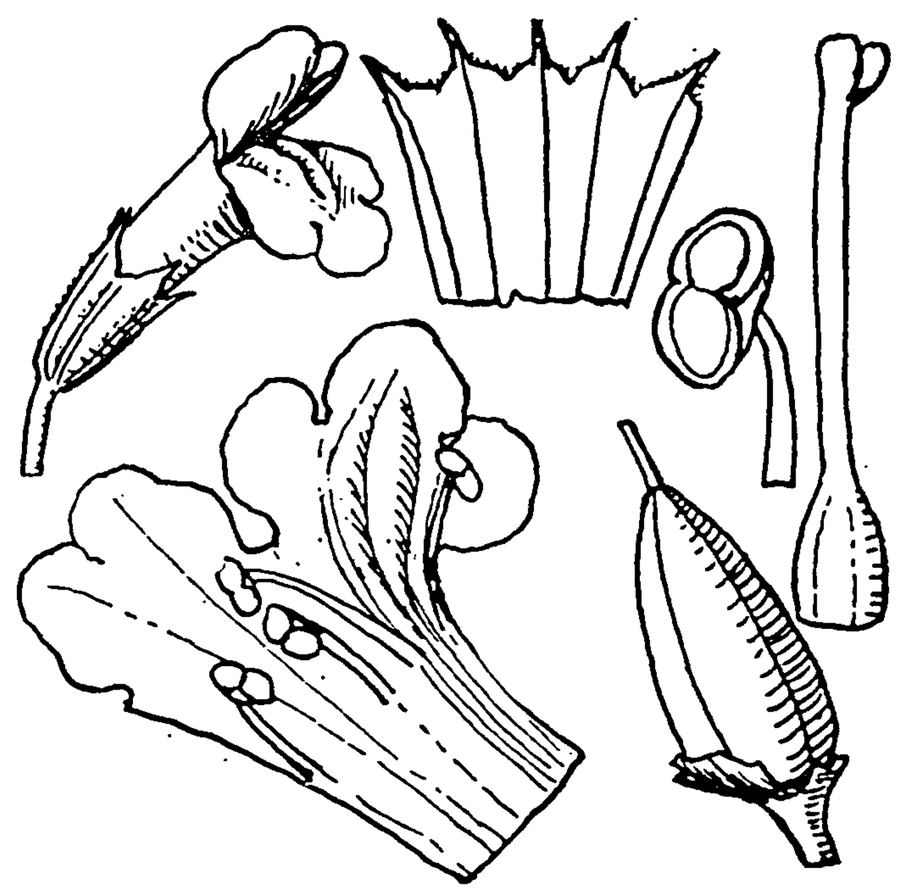
1. L. multifida (Michx.) Nutt. Stem 1–3 dm. tall, glandular-pubescent: leaf-blades with two pairs of divaricately spreading segments that, like the terminal segment, are slightly dentate to sharply lobed, the larger leaf-blades 1–2 cm. long on ill-defined petioles 0.5–1 cm. long: pedicels 3–7 mm. long, pubescent: sepals 3–5 mm. long, finely pubescent: corolla 3–4 mm. long; lobes with violet-purple lines; tube within yellow and purplish: capsule 3–4 mm. long. [*Conobea multifida* (Michx.) Benth.] —Sandy river-bars and stream-banks, various provinces, Ga. to Tex., Kans., and Ohio.—Sum.–fall.



17. **MIMULUS** L. Erect, glabrous, much branched herbs, with rootstocks. Leaves opposite: blades serrate, not punctate, petioled or sessile. Flowers axillary to leaf-like bracts. Bractlets none. Calyx-lobes 5, shorter than the tube, nearly uniform. Corolla violet or violet-purple, personate: lobes shorter than the tube, the two posterior united over half their length with their free portions sagitally erect, the anterior spreading; the throat with two ridges running to the antero-lateral sinuses, these ridges pubescent, mottled with yellow and also spotted with purple. Stamens 4, didynamous, glabrous. Stigmas plate-like, sensitive. Capsule cylindric, glabrous, enclosed within the persistent calyx, loculicidal. Seeds numerous, yellow, cylindric, minutely or obsoletely reticulate, wingless.—About 70 species, mostly American.—MONKEY-FLOWERS.

Leaf-blades petioled: angles of stem usually slightly winged: calyx-lobes setaceous-tipped, 0.5–2 mm. long. 1. *M. alatus.*
Leaf-blades clasping (or rarely only sessile): angles of stem not winged: calyx-lobes lanceolate, 3–5 mm. long. 2. *M. ringens.*

1. M. alatus Ait. Stem 4–12 dm. tall, simple or somewhat branched: leaf-blades 5–15 cm. long, elliptic-oval, oval, or ovate: pedicels 0.5–1.5 (–3) cm. long: calyx-lobes setaceous-tipped: corolla 25–35 mm. long, as in *M. ringens*, but frequently more purplish, with smaller spots and fainter brownish patches: capsule 10–12 mm. long.—Shaded swamps, Piedmont and more northern provinces, and along river-bottoms in the Coastal Plain, N Fla. to E Tex., Nebr., Mich., and Conn.—Sum.



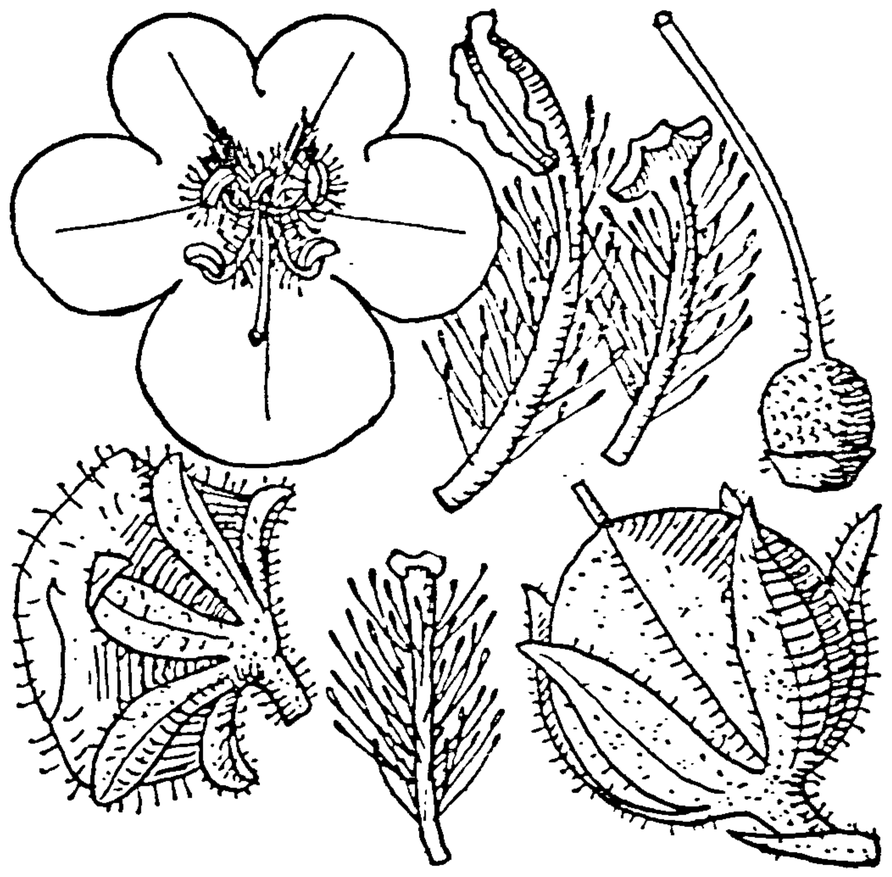
2. M. ringens L. Stem 5–12 dm. tall, usually much branched: leaf-blades 5–12 cm. long, narrowly lanceolate to ovate-lanceolate: pedicels 3–6 cm. long: calyx-lobes lanceolate-attenuate: corolla 25–30 mm. long, pale hortense-violet, throat anteriorly with purple-red spots and proximally two yellow areas

mottled with faint brownish patches: capsule 10–12 mm. long. [*M. menthoides* Greene]—Swamps and swales, Piedmont and more northern provinces, C Ala. to Colo., Minn., and N. S.; descending along rivers into Coastal Plain as reported from Quincy, Fla.—Sum.

18. **VERBASCUM** L. Erect, simple or virgately branched herbs, with a perennial or biennial tap-root. Leaves alternate: blades toothed or entire, those of the cauline sessile, clasping, or sometimes decurrent. Flowers in spikes, racemes, or panicles, the bracts much smaller than the leaves. Bractlets none. Sepals 5, uniform. Corolla rotate, slightly zygomorphic: lobes longer than the tube, all equally distinct, the anterior larger than the posterior. Stamens 5, exserted, the filaments more or less lanose-pubescent. Stigma capitate. Capsule ellipsoid to subglobose, septicidal. Seeds numerous, gray, minutely tuberculate-lined, wingless.—About 250 species, natives of the Old World.—MULLENS.

Stem glabrous or with simple gland-tipped hairs above: leaves glabrous: filaments all densely lanose with knobbed purple hairs: capsule subglobose, glandular-puberulent. ..... 1. *V. Blattaria.*
Stem pubescent with stellate, glandless hairs: leaves pubescent, at least beneath: filaments lanose with filiform yellow hairs, the two anterior sparingly so or glabrous: capsule ovoid to ellipsoid, stellate-pubescent.
  Leaf-blades crenate, glabrate above, the cauline sessile: pedicels usually several in an axil: sepals about half length of capsule: inflorescence not densely crowded.
    Inflorescence a simple raceme, the pedicels one to five to an axil: capsule globose, 7–8 mm. long: leaves green and slightly pubescent beneath. ..... 2. *V. virgatum.*
    Inflorescence a panicle of racemes, the pedicels three to twelve to an axil: capsule oblong or oblong-ovoid, 4–5 mm. long: leaves white and densely stellate-tomentose beneath. ..... 3. *V. Lychnitis.*
  Leaf-blades entire or only obscurely crenate, densely pubescent above, the cauline decurrent: pedicels one to an axil: sepals as long as the capsule: inflorescence densely crowded. ..... 4. *V. Thapsus.*

1. V. Blattaria L. Stem 4–12 dm. tall, simple or slightly branched, glandular-pubescent above: cauline leaf-blades 2–12 cm. long, elliptic to ovate, doubly serrate-crenate, bright-green above and scarcely paler beneath: pedicels 10–15 mm. long, glandular-pubescent: sepals 5–8 mm. long, linear-lanceolate: corolla 25–30 mm. wide, yellow or white: capsule 6–8 mm. long, glandular-puberulent. — (MOTH-MULLEN.)—Old fields and roadsides, various provinces, C Fla. to Calif., B. C., and Que. Nat. of Eurasia.—Sum.–fall.



2. V. virgatum With. Stem 6–12 dm. tall, simple or slightly branched, stellate-pubescent: cauline leaf-blades 7–15 cm. long, lanceolate, crenate, deep-green above and scarcely paler beneath: pedicels 2–5 mm. long, pubescent: sepals 5–6 mm. long, lanceolate: corolla about 25 mm. wide, yellow: capsule 7–8 mm. long, stellate-pubescent.—Waste-places, Coastal Plain, S. C.; Calif.—Nat. of Eu.—Sum.

3. V. Lychnitis L. Stem 8–10 dm. tall, usually much branched especially above, floccose-tomentose with short stellate hairs: cauline leaf-blades 10–20 cm. long, elliptic-lanceolate to ovate-lanceolate, crenate, dark-green above, whitened beneath: pedicels 2–10 mm. long, stellate-tomentose: sepals 2–3 mm. long, lanceo-

late: corolla 10–15 mm. wide, yellow: capsule 3–4 mm. long, ovoid.—(WHITE-MULLEN.)—Old fields and roadsides, various provinces, N. C. to Ont., and N. J.—Nat. of Eurasia.—Sum.

4. **V. Thapsus** L. Stem 3–12 dm. tall, usually simple, densely tomentose with floccose stellate hairs: leaf-blades 5–30 cm. long, elliptic to elliptic-ovate, finely crenate to entire, densely stellate-tomentose: pedicels less than 2 mm. long, woolly: sepals 7–9 mm. long, lanceolate or ovate with caudate tip: corolla 15–20 mm. long, yellow: capsule 8 mm. long.—(GREAT-MULLEN. WOOLLY-MULLEN. VELVET-PLANT.)—Old fields, roadsides and thickets, various provinces, Fla. to Calif., S. Dak., and N. S.—Nat. of Eurasia.—Sum.–fall.

19. **CHELONE** L. Odorless glabrous herbs, the erect stems arising from a rootstock. Leaves all cauline, opposite: blades toothed, acuminate, not punctate. Flowers in spike-like racemes, the bracts, excepting the lower ones, sepal-like, broad, entire. Bractlets 2, similar to the bracts but smaller. Sepals 5, uniform, rounded. Corolla purple, greenish, or white, 2-lipped, externally glabrous, internally lanose on the margins of the palate: tube abruptly expanded into an inflated throat: lips shorter than the throat, the posterior lip arched, slightly lobed, the anterior lip projecting, slightly lobed. Polleniferous stamens 4, didynamous, included: anther-sacs divaricate, lanose. Sterile posterior filament (staminodium) shorter than the stamens, usually glabrous. Stigma capitate, capsule pyramidal-globose or pyramidal-cylindric, glabrous, distally septicidal. Seeds numerous, winged.—About 8 species, eastern North American.—SNAKE-HEADS. TURTLE-HEADS.

Leaf-blades widest at or near the middle, above the cuneately narrowed base: corolla purple to white, not or only faintly lined within throat on the anterior side, the beard of the anterior lip pale-yellow to white: sterile filament less than half the length of the polleniferous ones: blooming chiefly in September. I. EUCHELONE.

Leaf-blades widest near the rounded, truncate, or rarely slightly narrowed base: corolla purple to violet, with well-defined lines of deeper color within the throat on the anterior side, the beard of the anterior lip yellow: sterile filament over half the length of the polleniferous ones: blooming chiefly in August.

Petioles very short or lacking: flowers conspicuously 4-ranked, in nearly leafless, usually elongate spikes: bracts, bractlets, and sepals finely ciliolate: corolla tending toward violet, the color-lines wide, the beard light-yellow: sterile filament purple. II. SESSILES.

Petioles mostly 1.5–3 cm. long: flowers obscurely ranked, in short spikes subtended by scarcely reduced leaves: bracts, bractlets, and sepals strongly ciliolate: corolla tending toward purple, the color lines narrow, the beard deep-yellow: sterile filament white or pinkish-tipped. III. PETIOLATAE.

I. EUCHELONE

Corolla white throughout, or distally purple or green: sterile filament green or greenish: sepals obscurely ciliolate: leaf-blades rather thick and usually duller green.

Distal portion of corolla white or green, externally only faintly if at all purplish.

Leaf-blades 2–4 cm. wide, with ascending teeth, decidedly paler beneath, on petioles 0.2–0.6 cm. long: corolla rounded or slightly keeled posteriorly, distally often purplish, and with purple tinge internally. 1. *C. glabra.*

Leaf-blades 3–6 cm. wide, with spreading teeth, only slightly paler beneath, on petioles 0.6–1.2 cm. long: corolla strongly keeled posteriorly, distally yellowish-green, without purple tinge even internally. 2. *C. chlorantha.*

Distal portion of corolla purple: petioles 0.5–1.5 cm. long, and leaf-blades lanceolate to elliptic-oval, the larger 2–6 cm. wide. 3. *C. montana.*

Corolla purple throughout: sterile filament white or rarely greenish-tipped: sepals manifestly ciliolate: leaf-blades rather thin and deep-green. 4. *C. obliqua.*

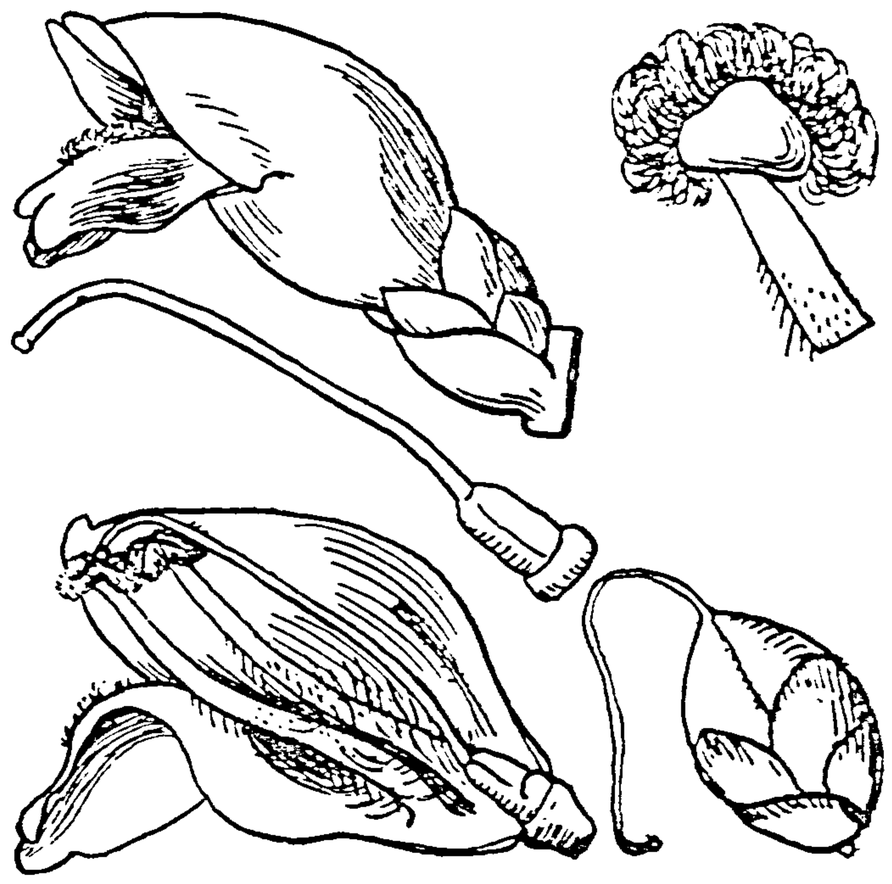
II. SESSILES

Tall plant with leaf-blades rounded to the stem. 5. *C. Cuthbertii.*

III. PETIOLATAE

Low plant with wide-spreading ample leaf-blades. 6. *C. Lyoni.*

1. C. glabra L. Stem 8–16 dm. tall: leaf-blades 7–15 cm. long, lanceolate to elliptic-lanceolate (or linear-lanceolate and the spikes usually much elongate in *C. glabra elongata* of W Tenn. and S Ind.), slightly to moderately serrate, glaucous and glabrous or pubescent beneath, acuminate, at base cuneately narrowed: spike slightly or considerably elongate, the flowers obscurely ranked: bractlets 4–7 mm. long, oval or elliptic-oval, rounded: sepals 7–10 mm. long, elliptic or widely elliptic, rounded: bracts, bractlets, and sepals minutely ciliolate and scarious, the sepals somewhat erose: corolla 25–33 mm. long, rounded or slightly keeled posteriorly, white, sometimes distally faintly purplish and normally dull-purple within the lips (or with greenish-yellow corolla-tips that are only slightly or not at all purple within and a tendency to more elongate and laxer spikes, in *C. glabra ochroleuca,* of the Coastal Plain from N. C. to Md.), the anterior lip with white or faintly yellowish beard and with the lateral margins somewhat deflexed: sterile filament ⅓ to ½ the length of the polleniferous ones: capsule 10–12 mm. long.—Swamps and along streams, Piedmont and more northern provinces, Ga. to Minn. and Newf.—Fall.



2. C. chlorantha Pennell & Wherry. Stem 9–15 dm. tall: leaf-blades 9–18 cm. long, elliptic-lanceolate to elliptic-ovate, sharply dentate-serrate, glabrous and slightly glaucous beneath, long-acuminate, at base cuneately narrowed to the petiole: spike becoming elongate, the flowers obscurely ranked: bractlets 4–6 mm. long, oval or elliptic, obtuse or rounded: sepals 6–9 mm. long, elliptic, obtuse or rounded: bracts, bractlets, and sepals minutely ciliolate, the sepals with narrow scarious margin: corolla 23–28 mm. long, proximally white, the anterior lip with pale-yellow beard and with the lateral margins much deflexed: sterile filament ⅓ to ½ the length of the polleniferous ones: capsule not seen.—Swamps and along streams, Blue Ridge and adj. Piedmont, N. C.—Fall.

3. C. montana (Raf.) Pennell & Wherry. Stem 6–12 dm. tall: leaf-blades 9–18 cm. long, lanceolate (or elliptic or elliptic-oval and dentate-serrate borne on a larger plant; corolla usually 30–36 mm. long, and capsule 10–12 mm. long, in *C. montana elatior,* a plant of lower elevations and occurring as far south as N Ga.), sharply serrate, glabrous and slightly glaucous beneath, long-acuminate, at base cuneately narrowed: spike only slightly elongate, the flowers obscurely ranked: bracts acute to acuminate: bractlets 3–5 mm. long, broadly oval, rounded: sepals 8–10 mm. long, elliptic, rounded: bracts, bractlets, and sepals minutely ciliolate and somewhat erose, the margin somewhat scarious and purplish: corolla usually 25–30 mm. long, slightly keeled posteriorly, proximally white, the anterior lip with slightly yellowish beard and usually with spreading lateral margins: sterile filament ⅓ the length of the polleniferous

ones: capsule not seen.—Sphagnous bogs and stream-margins, at high elevations, Blue Ridge to Appalachian Plateau, N. C. to Ky. and Pa.—Sum.–fall.

4. **C. obliqua** L. Stem 8–15 dm. tall: leaf-blades 8–18 cm. long, elliptic to ovate-elliptic, irregularly serrate, slightly pubescent or glabrous, slightly paler beneath, acute to usually acuminate, at base cuneately narrowed to the petiole which is 0.5–1.5 cm. long: spike usually somewhat elongate, the flowers obscurely ranked: bracts 6–10 mm. long, broadly ovate, acute to acuminate: bractlets 5–7 mm. long, obtuse: sepals 6–10 mm. long, widely elliptic, rounded: bracts, bractlets, and sepals ciliolate, and the sepals with pale or purplish scarious margins: corolla 25–32 mm. long, rounded and faintly keeled posteriorly, purple (paler and duller, with the sterile filament usually green-tipped, and leaf-blades decidedly paler beneath, in *C. obliqua Erwiniae* of the Blue Ridge, N. C.), the anterior lip with faintly yellowish or dull-yellow beard and with the lateral margins somewhat deflexed: sterile filament ⅓ to ½ the length of the polleniferous ones: capsule not seen.—Alluvial swamps, Coastal Plain and Mississippi Valley, Fla. to Ark., Iowa, and Md.—Fall.

5. **C. Cuthbertii** Small. Stem 4–15 dm. tall: leaf-blades 5–10 cm. long, lanceolate to ovate, finely to rather coarsely serrate, glabrous, pale and slightly lustrous beneath, attenuate-acuminate, rounded at base, nearly sessile to somewhat clasping: spike usually elongate, the flowers conspicuously 4-ranked: bractlets 3–5 mm. long, broadly oval, rounded: sepals 7–9 mm. long, elliptic or widely elliptic, rounded: bracts, bractlets, and sepals finely ciliolate, with purple scarious margins: corolla 20–25 mm. long, slightly keeled posteriorly, violet-purple, broadly striped on the anterior side, the anterior lip with light yellow beard and with the lateral margins strongly deflexed: sterile filament purple, ½ to ¾ the length of the polleniferous ones: capsule 10–12 mm. long: seeds 3 mm. long. [*C. Grimesii* Weatherby]—Boggy meadows and thickets, Piedmont and Blue Ridge, N. C.; and in the Coastal Plain of Va.—Sum.

6. **C. Lyoni** Pursh. Stem 6–10 dm. tall: leaf-blades 10–20 cm. long, ovate, evenly serrate, finely pubescent to glabrous, somewhat glaucous beneath, conspicuously acuminate, at base broadly rounded or somewhat narrowed to the slender petiole: spike short, the flowers obscurely ranked: bractlets 3–4 mm. long, broadly oval, rounded: sepals 7–9 mm. long, elliptic or widely elliptic, rounded: bracts, bractlets, and sepals strongly ciliolate, sometimes with pale or purplish scarious margins: corolla 25–30 mm. long, sharply keeled posteriorly, purple, narrowly striped on the anterior side, the anterior lip with dark-yellow beard and with the lateral margins strongly deflexed: sterile filament white or pinkish-tipped, nearly as long as the polleniferous ones: capsule 10–12 mm. long, not seen mature. [*C. latifolia* Muhl.]—Moist mountain slopes in forest, Blue Ridge, N. C. and Tenn.—Sum.

20. **PENSTEMON** [Mitch.] Schmidel. Strong-scented herbs with erect solitary or several nearly terete stems arising from a short rootstock or caudex, the inflorescence usually glandular. Leaves dimorphic: those of the winter rosettes narrowed into petiole-like bases: cauline-leaves opposite, the blades entire or toothed, or rarely pinnatifid, the upper ones sessile and usually clasping. Flowers paniculate, often thyrsoid. Bractlets none. Sepals 5, uniform. Corolla often somewhat nodding, colored and mostly blue or purple or white, 2-lipped: tube rather abruptly expanded into a more or less inflated throat, whose orifice may remain open or be partly or wholly closed by the uparching of the anterior lip: lobes shorter than the tube. Polleniferous stamens 4, didynamous, included: anther-sacs usually divaricate. Sterile posterior fila-

ment (staminodium) equalling the fertile stamens or longer, with yellow hairs. Stigma capitate. Capsule conic-ovoid, glabrous, septicidal and secondarily slightly loculicidal. Seeds numerous, angled, wingless.—About 300 species, North American.—BEARD-TONGUES.

Leaf-blades of 2 types, the cauline bipinnatifid, those of the basal rosettes entire or few-toothed: staminodium conspicuously exserted. I. DISSECTI.
Leaf-blades all entire or toothed; those of the basal rosettes petioled: staminodium included or slightly exserted.
Anther-sacs dehiscent their entire length, not pouch-like: inflorescence-branches less elongate.
Corolla pubescent with glandless hairs within over the bases of the anterior lobes, the throat well inflated: leaf-blades more or less serrate. II. GRACILES.
Corolla glandular-puberulent within on all sides, the throat slightly inflated: leaf-blades entire or nearly so. III. TUBIFLORI.
Anther-sacs dehiscent by short proximal slits, the distal part of each sac pouch-like: inflorescence-branches elongate. IV. MULTIFLORI.

I. DISSECTI

Plant puberulent: corolla purple and lined. 1. *P. dissectus.*

II. GRACILES

Corolla with throat much inflated, only slightly 2-ridged within: anterior lobes little exceeding the posterior: staminodium slightly or moderately bearded.
Anthers normally somewhat bearded: corolla-throat amply inflated, white or slightly tinged or lined with purple: sepals ovate and acuminate-tipped.
Corolla 23–30 mm. long: sepals evidently scarious-margined: inflorescence of 3–5 fascicles, markedly glandular-pubescent. 2. *P. Digitalis.*
Corolla 17–23 mm. long: sepals scarcely scarious-margined: inflorescence of 5–7 fascicles, glabrous or sparsely glandular. 3. *P. alluviorum.*
Anthers glabrous: corolla-throat less strongly inflated, more or less violet-purple: sepals ovate-lanceolate to linear-attenuate.
Sepals ovate-lanceolate, 3–6 mm. long: corolla 15–20 mm. long: blades of the cauline leaves lanceolate, sometimes narrowly so. 4. *P. Pentstemon.*
Sepals linear-lanceolate, long-attenuate, 5–12 mm. long: corolla 20–35 mm. long: blades of the cauline leaves broadly lanceolate to ovate. 5. *P. calycosus.*
Corolla with throat narrower, strongly 2-ridged within: anterior corolla-lobes projecting considerably beyond the posterior: staminodium densely bearded.
Corolla lined with deeper color: orifice to the throat open: anther-sacs longer than wide.
Lower bracts of inflorescence foliose, scarcely smaller than the leaves: cauline leaf-blades usually tapering from a wide base, evenly and sharply serrate: radical leaf-blades truncate to cordate at base: corolla 28–35 mm. long: capsule 8–10 mm. long. 6. *P. Smallii.*
Lower bracts of inflorescence much smaller than the leaves: cauline leaf-blades lanceolate or elliptic-lanceolate, more irregularly or less sharply serrate: radical leaf-blades narrowed to petiole: corolla usually smaller.
Throat of corolla moderately inflated, nearly cylindric: corolla 20–32 mm. long.
Leaf-blades essentially glabrous, deep green above, the cauline rather sharply serrate: stem 2–5 dm. tall: corolla strongly purple. 7. *P. Brittonorum.*
Leaf-blades somewhat pubescent, dull green above, usually less sharply serrate: stem 3–8 dm. tall: corolla pale-purple or nearly white. 8. *P. canescens.*
Throat of corolla slightly inflated, nearly tubular: corolla 15–25 mm. long.
Corolla white, merely lined with purple: leaves densely and softly pubescent, velvety to the touch. 9. *P. pallidus.*
Corolla purple or purplish: leaves finely pubescent or puberulent.

Sepals less than half the length of the capsule: corolla pale violet-purple, anteriorly with nearly or quite distinct fine lines: primary peduncles ascending-spreading.
Capsule 5–7 mm. long: sepals 2–3 mm. long, obtusish to acute: blades of the cauline leaves elliptic-lanceolate to narrowly ovate, obtuse to acute. 10. *P. brevisepalus.*
Capsule 8–9 mm. long: sepals 3–6 mm. long, acute to acuminate: blades of the cauline leaves lanceolate, acute to acuminate. 11. *P. pauciflorus.*
Sepals half the length of the capsule or more: corolla reddish-purple, on all sides with lines that anastomose distally: primary peduncles strongly ascending or erect. 12. *P. australis.*
Corolla unlined; orifice to the throat closed by the up-arching lower lip: anther-sacs as wide as long.
Corolla-throat purplish to violet, the lobes white: sepals usually over half the length of the capsule: leaf-blades soon glabrous, except for coarse hairs beneath on midrib. 13. *P. hirsutus.*
Corolla-throat and lobes white: sepals less than half the length of the capsule: leaf-blades pubescent on both surfaces, only in age becoming glabrate. 14. *P. tenuiflorus.*

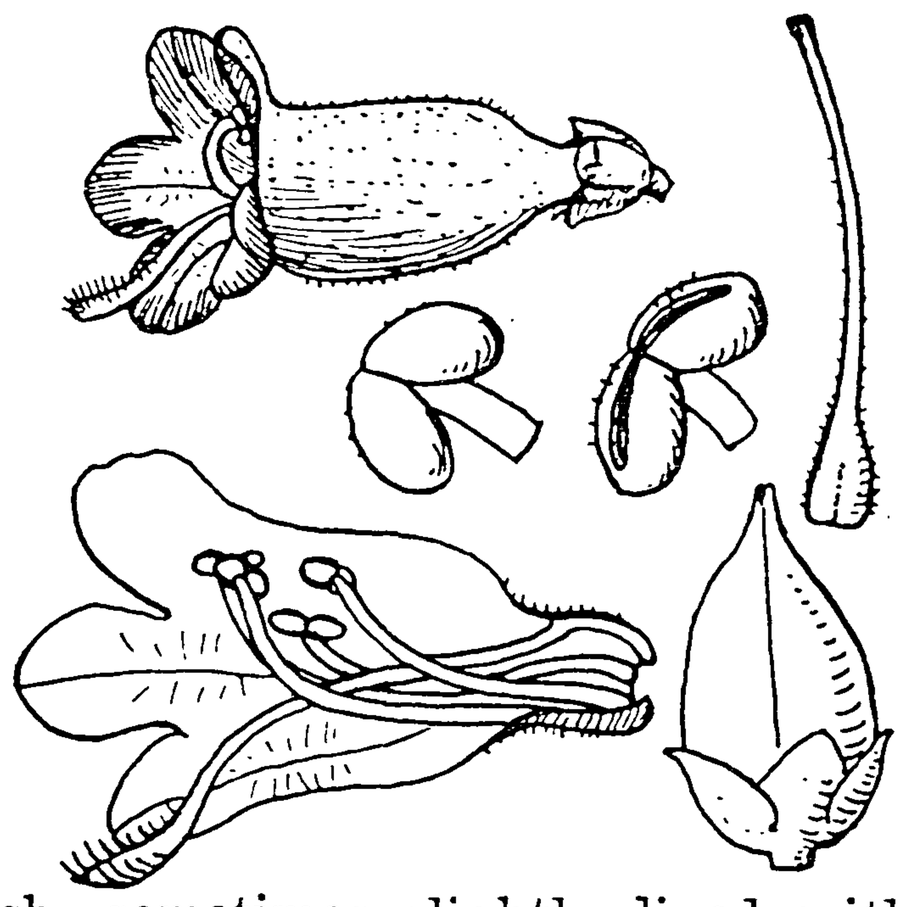
III. TUBIFLORI

Plant glabrous: corolla white, unlined; lobes wide spreading. 15. *P. tubiflorus.*

IV. MULTIFLORI

Plant glabrous: corolla white, unlined; throat campanulate; lobes slightly spreading. 16. *P. multiflorus.*

1. P. dissectus Ell. Stem 3–4 dm. tall, puberulent: blades of the cauline leaves bipinnatifid, the segments linear: panicle lax, of 1–3 fascicles: sepals 3–4 mm. long, broadly ovate, acute or abruptly acuminate, the scarious margins erose: corolla 20–25 mm. long, externally violet-purple and paler within, and lined with violet-purple, the throat much inflated; lobes of both lips widely spreading: capsule not seen.—Gravelly soil and rock-ledges, Altamaha Grit, Coastal Plain, Ga.—Sum.



2. P. Digitalis Nutt. Stem 7–15 dm. tall, glabrous, frequently purple, slightly shining: blades of the cauline leaves lanceolate, sharply serrate, acuminate: panicle lax, of 3–5 fascicles: sepals 5–8 mm. long, oval or ovate, caudate-acuminate, glandular-pubescent, the margins scarious and erose: corolla 23–30 mm. long, white or externally purplish, sometimes slightly lined with amparo-purple within: capsule 8–9 mm. long.—Fields and roadsides, various provinces, N Ala. to Kans. and Me. Adv. E.—Spr.

3. P. alluviorum Pennell. Stem 6–12 dm. tall, dull, finely pubescent or glabrous: blades of the cauline leaves lanceolate, slightly serrate, acuminate, clasping: panicle lax, of 5–7 fascicles: sepals 3–9 mm. long, ovate, caudate-acuminate, the margin slightly scarious: corolla 17–23 mm. long, externally white or slightly purplish, somewhat lined with purple within: capsule not seen mature.—Meadows, especially alluvial, Mississippi embayment of the Coastal Plain, and adj. provinces, Miss. to Ark., Mo., and S Ind.—Spr.

4. P. Pentstemon (L.) MacM. Stem 4–10 dm. tall, dull, puberulent to nearly glabrous, sometimes slightly purple: blades of the cauline leaves lanceolate, finely or obscurely serrate, acuminate: panicle lax, of 3–5 fascicles: sepals 3–6

mm. long, ovate-lanceolate, acute or short-attenuate, proximally with erose somewhat scarious margin: corolla 15–20 mm. long, externally violet-purple, within usually white, and faintly lined with purple: capsule 6–7 mm. long. [*P. laevigatus* (L.) Ait.]—Meadows and river-banks, various provinces, N Fla. to S Ala., E Tenn., and Pa.—Spr.

5. **P. calycosus** Small. Stem 6–12 dm. tall, finely pubescent to nearly glabrous, dull or slightly purple: blades of the cauline leaves broadly lanceolate to ovate, finely serrate, acute to acuminate: panicle lax, of 3–5 fascicles: sepals 5–12 mm. long, linear-lanceolate, long-attenuate, the margin sometimes slightly scarious: corolla 20–35 mm. long, externally more or less violet-purple, within paler and with more or less evident purple lines: capsule 7–8 mm. long. —Woods and meadows, limestone ledges and river-banks, Interior Low Plateaus and adj. provinces, N Ala. to Ill. and Ohio.—Spr.

6. **P. Smallii** Heller. Stem 4–8 dm. tall, finely puberulent: blades of the cauline leaves broadly lanceolate to triangular-ovate, sharply serrate: panicle lax, of 3–5 fascicles: sepals 5–7 mm. long, ovate-acuminate, the margins sometimes slightly scarious: corolla 28–35 mm. long, externally amparo-purple, within paler and with many sharply defined purple lines: capsule 8–10 mm. long.—Woods, Blue Ridge and Appalachian Valley, N. C. and Tenn.—Spr.

7. **P. Brittonorum** Pennell. Stem 2–5 dm. tall, finely pubescent or hirsute below, green or purplish: blades of the cauline leaves elliptic-lanceolate, sharply serrate, acute to acuminate: panicle lax, of 3–5 fascicles: sepals 4–5 mm. long, lanceolate or ovate-lanceolate, acuminate, the margin scarious proximally: corolla 25–30 mm. long, purple, paler than *P. Smallii*, and with the color-lines narrower: capsule 7–8 mm. long.—Woods, Blue Ridge, S. C. to Va.—Spr.

8. **P. canescens** Britton. Stem 3–8 dm. tall, pubescent: blades of the cauline leaves elliptic-lanceolate, irregularly serrate: panicle lax, of 3–6 fascicles: sepals 4–7 mm. long, ovate-lanceolate, acuminate to attenuate, the margin obscurely scarious: corolla 22–32 mm. long, externally pale amparo-purple, within white and with many sharply defined purple lines: capsule 6–8 mm. long.—Rocky or sandy woods, Blue Ridge and Appalachian provinces, Ala. to Ky., Pa., and N. C.; rarely in the Piedmont in S Va.—Spr.

9. **P. pallidus** Small. Stem 4–8 dm. tall, pubescent, hirsute below: blades of the cauline leaves lanceolate, serrate or serrate-dentate, acuminate: panicle of 4–7 fascicles: sepals 3–7 mm. long, ovate, acuminate, the margin slightly scarious: corolla 17–22 mm. long, white, within with violet-purple lines: capsule 6–7 mm. long.—Rocky or sandy woods and old fields, N. C. to Ark., Ia., and Vt. Adv. E.

10. **P. brevisepalus** Pennell. Stem 6–8 dm. tall, finely pubescent: blades of the cauline leaves elliptic-lanceolate to ovate-lanceolate, crenate-serrate or serrate, obtuse to somewhat acuminate: panicle lax, of 4–7 fascicles: sepals 2–3 mm. long, ovate, obtusish to acute, the margin slightly scarious: corolla 15–23 (–25) mm. long, externally pale lavender-violet or amparo-purple, within paler and with violet-purple lines: capsule 5–7 mm. long.—Sandy or rocky woods, Appalachian Plateau, Tenn. and Ky.—Spr.

11. **P. pauciflorus** Buckl. Stem 4–8 dm. tall, puberulent: blades of the cauline leaves narrowly lanceolate, sharply serrate, acute to attenuate-acuminate: panicle lax, of 3–6 fascicles: sepals 3–5 mm. long, ovate, acute to acuminate, the margin slightly scarious: corolla 20–25 mm. long, pale-purple, within with fine violet-purple lines: capsule 7–9 mm. long.—Sandy soil, open woodland and prairies, Coastal Plain and adj. provinces, N Fla. to Tex., Okla., and Ark.—Spr.

12. **P. australis** Small. Stem 3–8 dm. tall, finely pubescent, or at the base coarsely pubescent: blades of the cauline leaves lanceolate, usually narrowly

so, slightly serrate, attenuate-acuminate: panicle strict, of 3–7 fascicles: sepals 4–8 mm. long, ovate, acute to acuminate, the margin slightly scarious: corolla 20–25 mm. long, externally reddish-purple, within paler and with conspicuous red-purple lines which are most pronounced on the anterior side: capsule 8–9 mm. long.—Pinelands, granite hills and sandy fields, Coastal Plain and Piedmont, C Fla. to Miss. and S Va.—Spr.

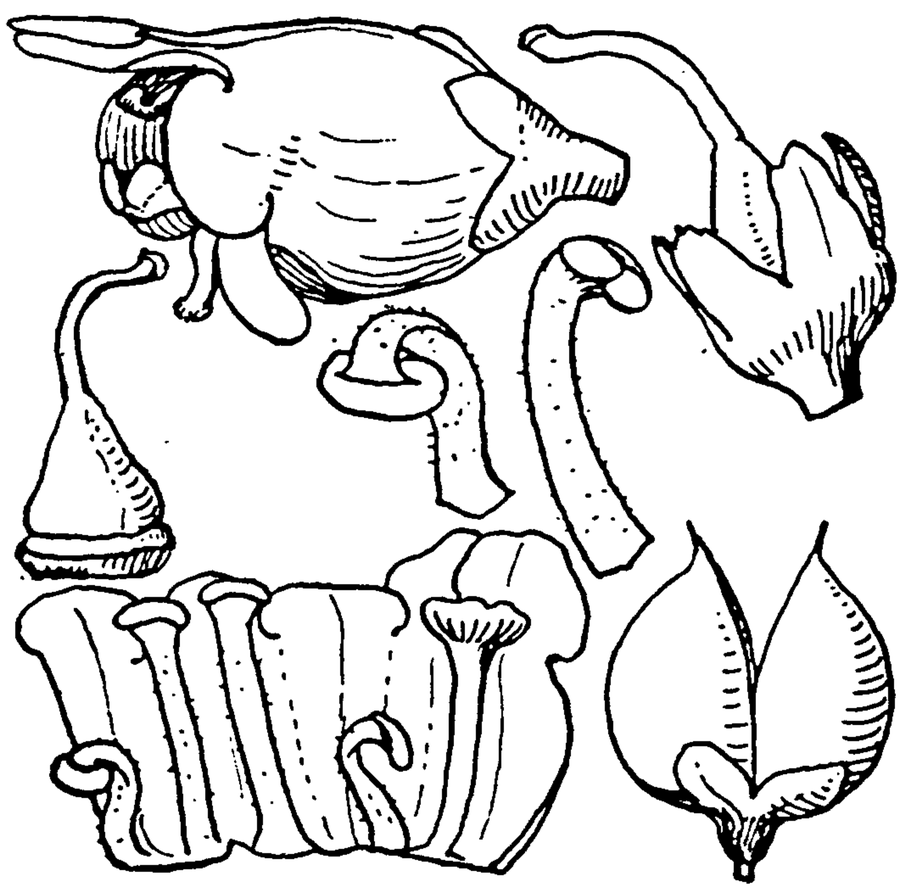
13. P. hirsutus (L.) Willd. Stem 4–8 dm. tall, hirsute: blades of the cauline leaves lanceolate, serrate-dentate or sinuately serrate, acuminate, clasping: panicle lax, of 3–6 fascicles: sepals 3–8 mm. long, ovate, acuminate, the margin sometimes slightly scarious: corolla 23–28 mm. long, the tube externally amparo-purple to light-violet, the lobes white: capsule 8–9 mm. long. [*P. pubescens* Ait.]—Rocky bluffs and woods, various provinces, N of Coastal Plain, Tenn. to Wis., Que., and Me.—Spr.

14. P. tenuiflorus Pennell. Stem 4–8 dm. tall, hirsute: blades of the cauline leaves lanceolate to ovate, slightly serrate or undulate, acuminate: panicle lax, of 4–7 fascicles: sepals 2–5 mm. long, ovate, acute or short-acuminate, the margin sometimes scarious: corolla 25–30 mm. long, externally glandular-pubescent and white: capsule 8–9 mm. long.—Stony or rocky soil, especially in cedar-glades, Interior Low Plateaus, Ala. to Ky.—Spr.

15. P. tubiflorus Nutt. Stem 5–10 dm. tall, glabrous: blades of the cauline leaves elliptic-lanceolate to lanceolate, entire or the upper occasionally finely serrate, acuminate: panicle (thyrsus) strict, of 4–7 fascicles: sepals 3–4 mm. long, triangular-ovate, acuminate, the margin scarious: corolla 20–25 mm. long, white, within glandular-pubescent; lobes of both lips spreading: capsule 7–8 mm. long.—Gravelly banks, mostly along the Mississippi River and tributaries and Ozark Plateau, Tenn. to Tex., Kans., and Ind.—Sum.

16. P. multiflorus Chapm. Stem 8–15 dm. tall, glabrous: blades of the cauline leaves oblanceolate, entire or slightly undulate-crenate, acute: panicle diffuse, of 5–8 fascicles: sepals 3–5 mm. long, ovate, obtuse or acutish, the margin slightly scarious: corolla 20–22 mm. long, white or faintly purplish, the throat much inflated; lobes of both lips projecting-spreading: capsule 7–9 mm. long.—Sandy soil, pinelands and scrub, S Fla. to S Ga.—Spr.–sum, or all year S.

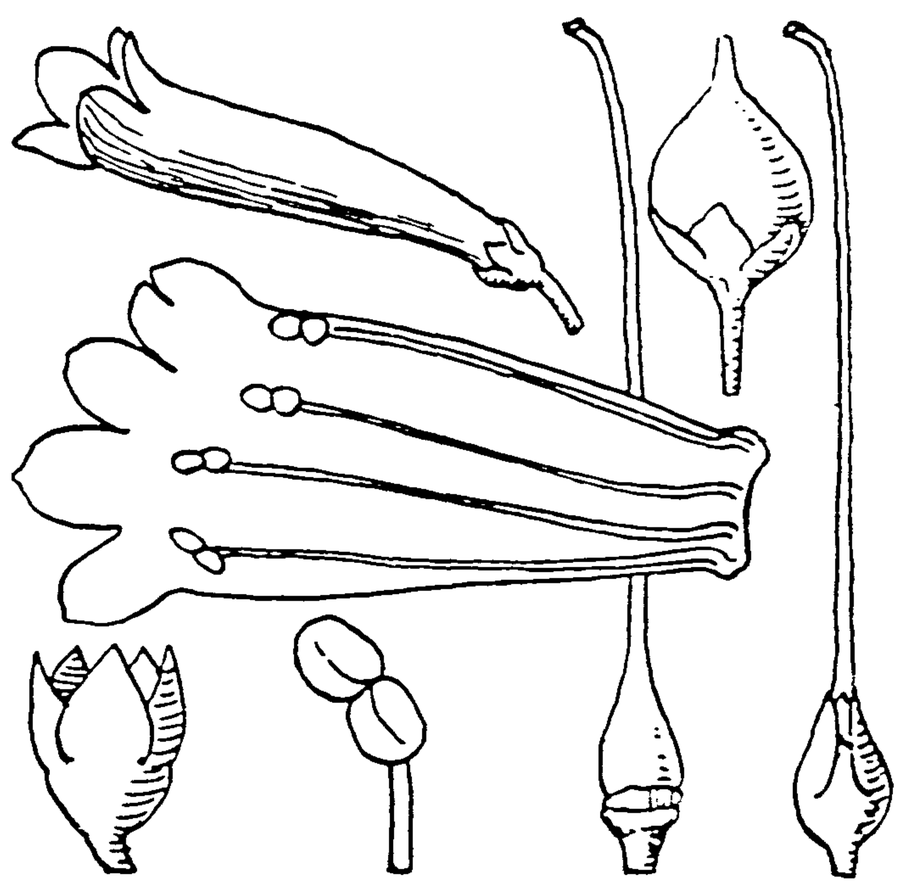
21. SCROPHULARIA L. Erect strong-scented herbs. Stem arising from a stout rootstock, 4-angled. Leaves opposite: blades relatively broad, toothed, petioled. Flowers in panicles. Bractlets none. Calyx-lobes 5, much longer than the tube. Corolla greenish-purple or purplish-brown, two-lipped: tube cylindric; posterior lip as long as the tube, projecting and flattened, the lobes well united; anterior lip with the lateral lobes vertical, the middle lobe reflexed. Stamens 4, slightly didynamous, barely exserted: anther-sacs divergent. Sterile posterior filament (staminodium) scale-like. Stigma semi-capitate. Capsule conic-ovoid, septicidal. Seeds numerous, plump, furrowed.—Over 100 species, native of the Northern Hemisphere.



1. S. marilandica L. Stem 8–15 dm. tall: leaf-blades 10–17 cm. long, ovate, often broadly so, serrate or rather finely dentate, rounded or cordate at the base, on nearly

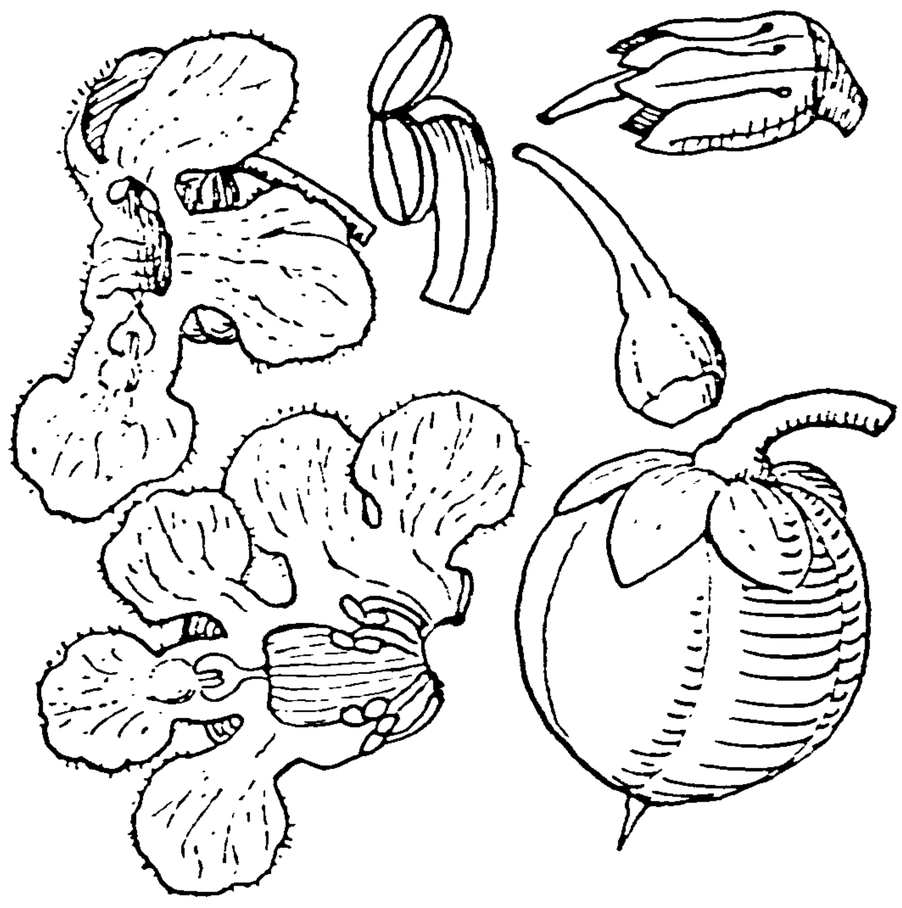
wingless petioles: panicle usually ample and lax, of 4–10 fascicles, often with several pairs of the lower bracts foliaceous: calyx-lobes triangular-rounded, 2–3 mm. long: corolla 5–8 mm. long: staminodium purple: capsule 4–7 mm. long, globose-ovoid, acute.—(FIGWORT. HEAL-ALL.)—Rich woods, Blue Ridge and more northern provinces, Fla. and Ala. to Nebr., Ont., and Mass.—Sum.

22. RUSSELIA Jacq. Erect-arching herbs or shrubby plants, with several or many striate-angled stems in a clump on the perennial root, and whorled branches. Leaves all cauline, whorled, with small or scale-like blades. Flowers in lateral cymes, the bracts minute. Bractlets none. Sepals 5, only slightly if at all united. Corolla red, 2-lipped: tube nearly cylindric: lips short, the posterior with partly united arched lobes, the anterior spreading. Stamens 4, slightly didynamous: anther-sacs explanate. Stigma punctiform-capitate. Capsule globose, mucronate, loculicidal, filled with slender or tortuous hairs among which are embedded the seeds. Seeds numerous, cylindric, reticulate-roughened, long-funicled.—About 30 species, tropical American.



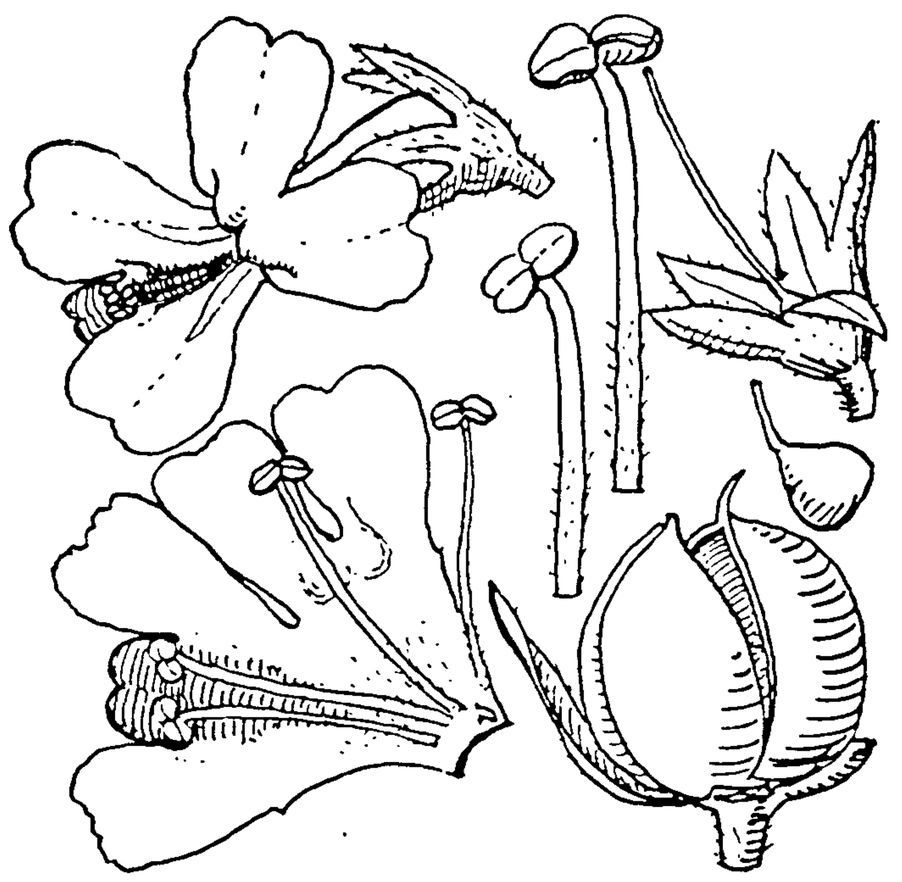
1. R. juncea Zucc. Stem 8–25 dm. long, with many striations and 4–6 ridges, virgately branched: leaves scale-like or if developed the blades oval or elliptic, less than 1 cm. long, short-petioled: cymes lax or diffuse, 1–2-flowered: sepals ovate, 2 mm. long, acuminate: corolla 20–25 mm. long: capsule 5–6 mm. long, prominently caudate-mucronate.— (FOUNTAIN-PLANT. CORAL-PLANT.) —Waste-places and roadsides, pen. Fla. and cult. Nat. of Mex.—Spr.–sum. or all year S.

23. ANGELONIA H. & B. Herbs with erect stems arising from a rootstock. Leaves opposite: blades often toothed. Flowers in racemes, the bracts much smaller than the leaves. Bractlets none. Sepals 5, uniform. Corolla violet-blue, zygomorphic: anterior lip like a shallow cup or saucer: lobes spreading, the anterior the longer, with a yellow palate at the base and a projecting horn on the mid-anterior lobe. Stamens 4, scarcely didynamous: filaments pubescent: anthers glabrous; the sacs explanate. Stigma punctiform-capitate. Capsule globose, loculicidal. Seeds numerous, with raised wing-like reticulations.—About 30 species, tropical American.



1. A. angustifolia Benth. Plant 1–14 dm. tall, the stem and branches glabrous or sparsely pubescent; leaf-blades linear-lanceolate, 3–11 cm. long, rather remotely serrate: flowers slender-pedicelled: sepals ovate: corolla about 2 cm. long and wide, spotted within: capsule 6–7 mm. in diameter, nodding.—(ANGELON.)—Waste-places, cult. grounds, and rarely pinelands, S Fla. Nat. of Mex.—Spr.–fall.

24. COLLINSIA Nutt. Delicate annual herbs, the stem erect, much-branched. Leaves opposite: blades toothed, the upper ones sessile or clasping. Flowers in loose racemes, long-pedicelled, axillary to foliaceous bracts, sometimes in whorls of 3–6. Bractlets none. Calyx-lobes 5, uniform, half as long as the tube or more, acute. Corolla two-lipped: tube gibbous on the posterior side: posterior lip pale or white, shorter than the anterior, proximally with a concave-arched portion which abruptly terminates in a transverse-rounded, puberulent, palate-like ridge, beyond which the lip becomes upcurved-erect with free fan-like lobes; anterior lobes projecting, blue, the median one with margins upcurved, so that the petal is boat-like, slightly exceeded by the flat lateral lobes. Stamens 4, slightly didynamous: filaments slender: anthers scarcely exserted; sacs divaricate, glabrous. Posterior stamen represented by a callose knob. Stigma capitate. Capsule subglobose, somewhat flattened laterally, loculicidal and also slightly septicidal. Seeds few, smooth, wingless.—About 30 species, North American.



1. C. verna Nutt. Stem 1–5 dm. tall, pubescent chiefly in 2 lines: leaf-blades elliptic-ovate to ovate, crenately serrate-dentate, the upper rounded to a clasping base, the lower narrowed to a petiole-like base: pedicels slender, in fruit 10–45 mm. long: calyx 6–10 mm. long; lobes lanceolate, nearly twice as long as the tube: corolla 10–15 mm. long; lobes emarginate or shallowly notched: capsule 5–6 mm. long: seeds 2.5–3 mm. long, brown.—(INNOCENCE. BLUE-EYED MARY.)—Moist woods, especially in alluvial soil, Interior Low Plateaus and adj. provinces, Tenn. to Mo., Mich., and W. N. Y.—Spr.

25. LINARIA Mill. Erect annual or perennial herbs, the stem branched, sometimes with basal shoots. Leaves alternate, or opposite on the basal shoots: blades narrow, entire, sessile. Flowers in racemes, the bracts foliaceous, or much reduced. Bractlets none. Sepals 5, uniform. Corolla 2-lipped, yellow or violet: tube spurred at the base anteriorly: posterior lobes more or less united and arched: anterior lobes united and spreading, at times with a definite palate. Stamens 4, didynamous, included: filaments glabrous: anther-sacs divaricate. Stigma capitate. Capsule globose to cylindric, loculicidal by irregular ruptures. Seeds numerous, prismatic-angled and wingless, or flattened and broadly winged.—About 120 species, widely distributed, but most abundant in the old World.—SPURRED-SNAPDRAGON. TOADFLAXES.

Corolla violet or violet-purple; anterior lip with 2 rounded ridges, but no palate: capsule globose or nearly so: seeds less than 0.5 mm. long, wingless: plant annual, or perhaps biennial, with prostrate basal shoots. I. LEPTOPLECTRON.

Corolla yellow; anterior lip with a prominent orange-colored palate: capsule ovoid: seeds about 1.5 mm. long, winged: plant perennial, all stems erect. II. EULINARIA.

I. LEPTOPLECTRON

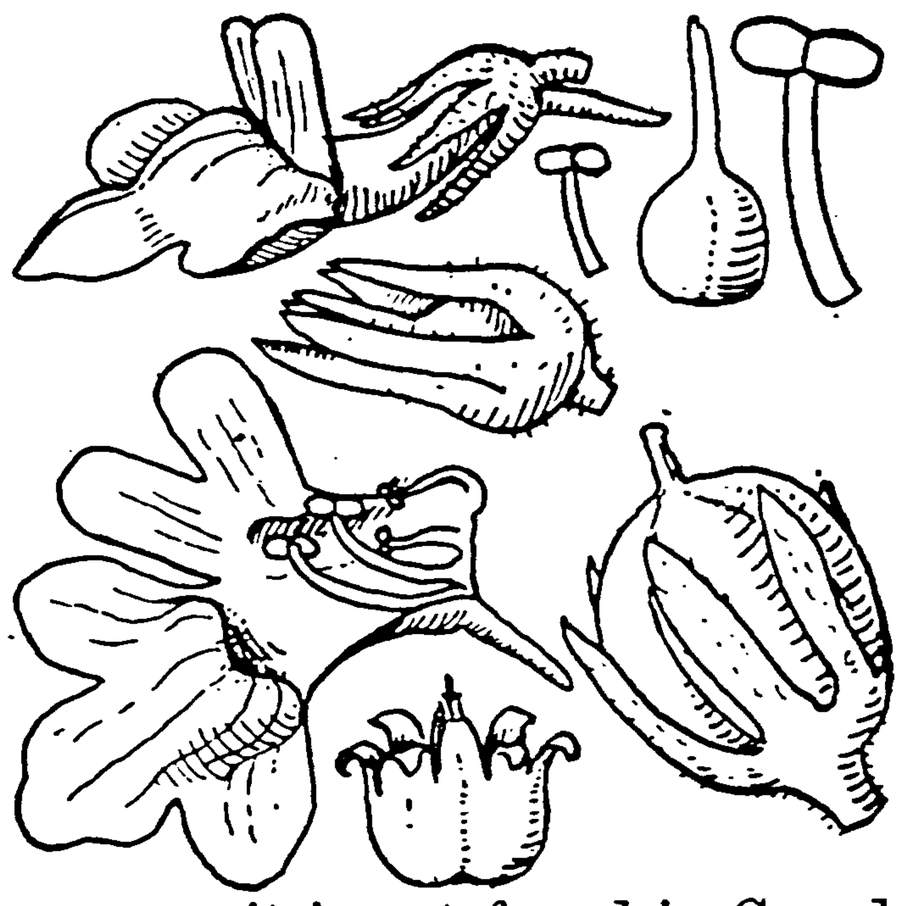
Pedicels nearly glabrous, shorter than the corolla: corolla 7–12 mm. long, the spur slender, decurved: capsule 2–3.5 mm. long. 1. *L. canadensis.*

Pedicels glandular-pubescent, longer than the corolla: corolla 5–6 mm. long, the spur very short: capsule 1.5–2 mm. long. 2. *L. floridana.*

II. EULINARIA

Flowers in stiffly erect dense racemes: corolla strongly 2-lipped; the stout spur tapering. 3. *L. Linaria.*

1. L. canadensis (L.) Dum. Stems slender, 2–6 dm. tall: leaves scattered but usually numerous on the flowering stems, linear, 1.5–2.5 cm. long, those on the basal shoots opposite or in 3's and shorter and wider: raceme elongate, nearly glabrous: pedicels 1–5 mm. long: sepals 2–3 mm. long, lanceolate: corolla 7–10 mm. long, the spur decurved 2–6 mm. long, (corolla 10–12 mm. long with a slender spur 5–9 mm. long, and densely tuberculate seeds, in *L. canadensis texana* which predominates westward); posterior lip with erect lobes about as long as the body; anterior lip with a ridged body and 3 spreading lobes: capsule 2–3 mm. long.—(BLUE-TOADFLAX.)—Open sandy soil, often a weed in fields and on roadsides, various provinces, chiefly Coastal Plain, Fla. to Tex. and Mass.—(*Mex., C. A., S. A.*)—Spr.; in sum. ripening its fruit cleistogamously.—The species name is a misnomer, as it is not found in Canada.



2. L. floridana Chapm. Stems slender, 1–3 dm. tall: leaf-blades filiform, 1–2.5 cm. long, those on the basal shoots whorled in 3's: raceme zigzag, glandular-pubescent: pedicels 5–10 mm. long: sepals 1–2 mm. long, lanceolate: corolla 5–6 mm. long, the subulate spur about 0.5 mm. long; posterior lip with erect lobes about twice as long as the body; anterior lip with spreading lobes: capsule 1.5–2 mm. long.—Dry sandy soil, often in scrub or on sandhills, Coastal Plain, Fla. to Miss. and Ga.—Spr.

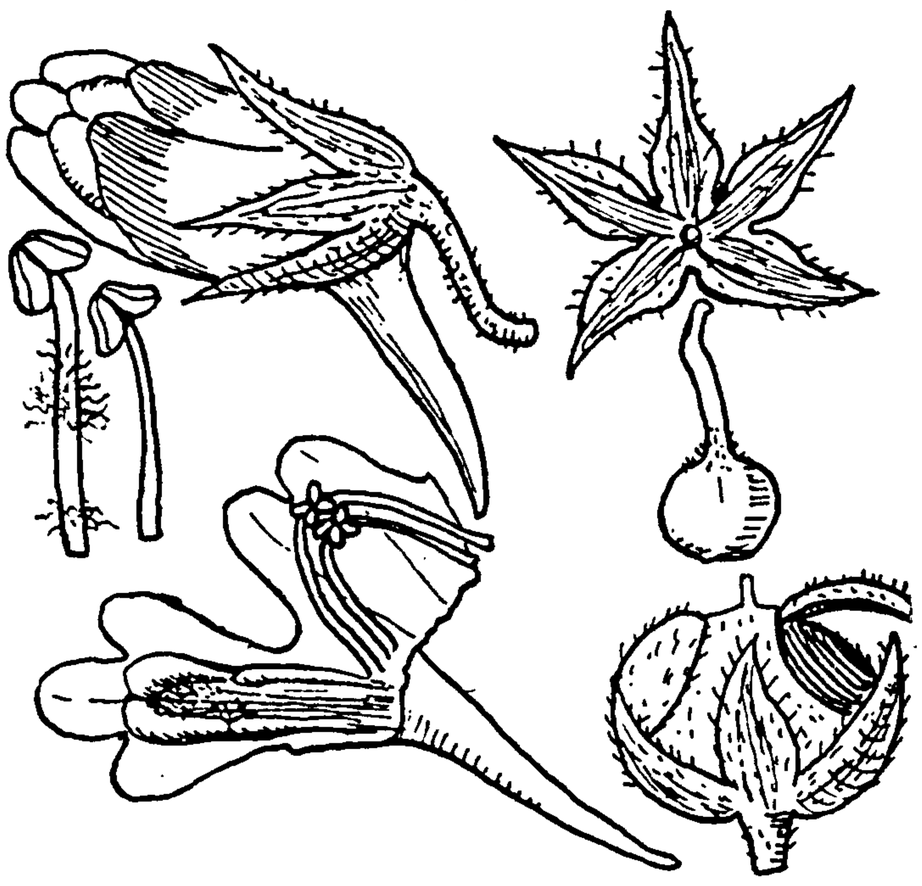
3. L. Linaria (L.) Karst. Stems 4–8 dm. tall, usually several together; leaf-blades 3–6 cm. long, linear to linear-lanceolate: raceme stout: pedicels 3–8 mm. long: sepals 3–4 mm. long, lanceolate-ovate: corolla 15–20 mm. long, the spur 10–15 mm. long; posterior lip with recurved lobes shorter than the body; lobes of the anterior lip deflexed-spreading: capsule 9–12 mm. long. [*L. vulgaris* Mill.]—(BUTTER-AND-EGGS. WILD-SNAPDRAGON. YELLOW-TOADFLAX.)—Fields, roadsides, and waste-places, various provinces, Ala. to Ark., N. Dak., Ont., and N. S. Nat. of Eurasia.—Sum.

26. KICKXIA Dumort. Pubescent perennial herbs, the stems prostrate, often matted. Leaves alternate: blades broad, entire, sometimes hastate at the base. Flowers axillary to leaf-like bracts, slender-pedicelled. Bractlets none. Sepals 5, uniform. Corolla 2-lipped, proximally yellow: tube with a deflexed spur: posterior lip with lobes shorter than the body, distally purple; anterior lip raised anteriorly into a prominent russet palate, the lobes mostly yellow. Stamens 4, didynamous, included: filaments pubescent: anthers horseshoe-shaped, the sacs opening proximally, densely white-hairy. Stigmas somewhat united. Capsule globose, glandular-pubescent, loculicidal by the falling away as a lid of most of the wall of each carpel. Seeds few, with reticulations or convolutions.—About 25 species, natives of the Old World.—FLUELLINS.

Leaf-blades hastate-lobed at the base: sepals lanceolate: corolla 5 mm. long, with straight spur: anthers wholly cohering. 1. *K. Elatine.*

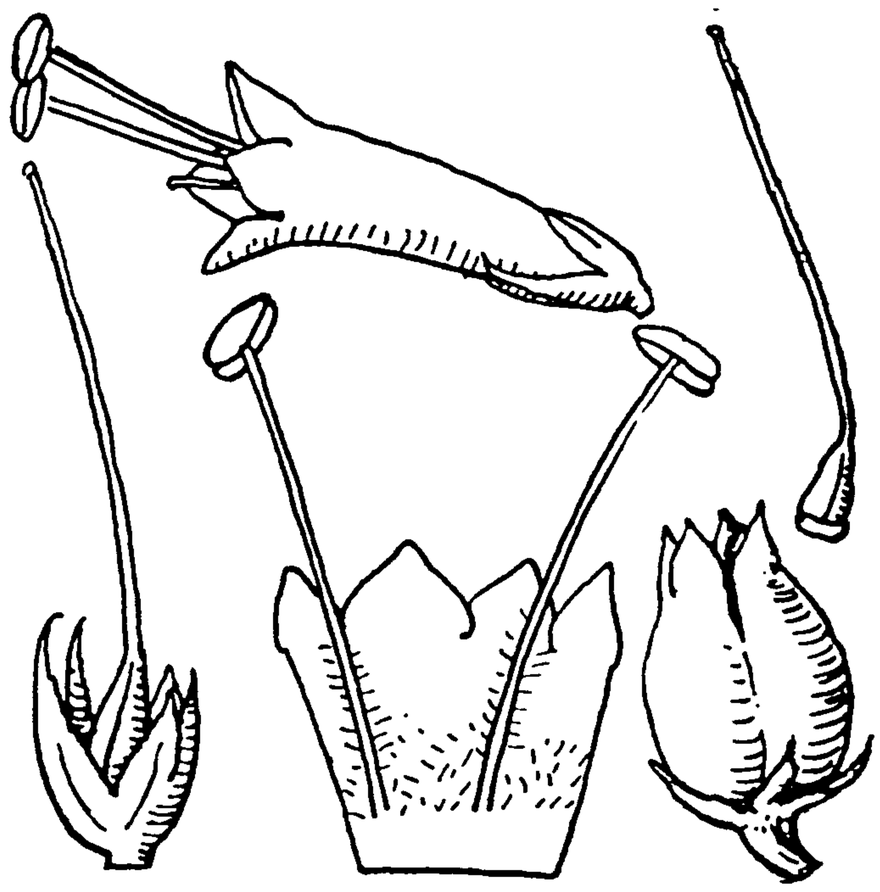
Leaf-blades rounded or cordate at base: sepals ovate: corolla 6–8 mm. long, with curved spur: anthers usually more or less cohering. 2. *K. spuria.*

1. K. Elatine (L.) Dumort. Stem 2–8 dm. long: leaf-blades 1–2 cm. long, ovate, hastate at the truncate or slightly cordate base, the petioles 2–4 mm. long: sepals 3–5 mm. long, triangular-lanceolate: corolla-spur 3–5 mm. long: capsule 3 mm. long, equalling or exceeding the calyx: seeds with strongly raised and wing-like convolutions. — (CANKER-ROOT.) — Waste-places, sandy fields, and roadsides, various provinces, Ga. to La., Mo., Mass., and Del. Nat. of Eurasia.—Sum.



2. K. spuria (L.) Dumort. Stem 2–8 dm. long or more: leaf-blades 1–4 cm. long, broadly oval, the petioles 1–4 mm. long: sepals 4–6 mm. long, ovate: corolla-spur 5 mm. long: capsule 3.5–4 mm. long, nearly concealed in the calyx: seeds with slightly raised reticulations and convolutions.—(FEMALE FLUELLIN.)—Waste-places and ballast, various provinces, Ala. to Mo., N. Y., and N. C. Nat. of Eu.—Sum.

27. VERONICASTRUM Fabr. Tall virgate herbs, the solitary stem erect from an elongate rootstock. Leaves whorled: blades narrow or relatively so, toothed, short-petioled. Flowers in a terminal spike-like raceme which is usually accompanied by several smaller racemes axillary to the upper leaf-whorl. Bracts very small. Bractlets none. Sepals 5, uniform. Corolla tubular, white or pinkish-white: lobes broad, less than half the length of the tube, the posterior ones wholly united. Stamens 2 (only the 2 postero-laterals present): filaments slender: anthers exserted, glabrous, the sacs parallel. Stigma capitate. Capsule ovoid, glabrous, septicidal and slightly loculicidal. Seeds numerous, obscurely reticulate.—Two species, the following and one Asiatic.



1. V. virginicum (L.) Farwell. Stem 10–20 dm. tall: leaves whorled in 3's–6's, usually in 5's: blades lanceolate to elliptic-ovate, 3–15 cm. long, finely serrate: racemes 20–30 cm. long, dense, the bracts setaceous-subulate, 2–3 mm. long: pedicels less than 1 mm. long: sepals ovate-attenuate, about 2 mm. long: corolla 5 mm. long, glabrous without, pubescent within: filaments nearly twice as long as the corolla: capsule 3 mm. long. [*Veronica virginica* L. *Leptandra virginica* (L.) Nutt.]—(BOWMAN'S-ROOT. CULVER'S-PHYSIC. BLACK-ROOT.)—Meadows and moist woods, various provinces, Ga. to Tex., Minn., and Ont.—Sum.

28. VERONICA L. Low creeping or spreading perennial or annual herbs. Leaves opposite or alternate above: blades linear to cordate, toothed or nearly entire. Flowers in terminal or axillary racemes or spikes. Bractlets

none. Sepals 4 (the posterior one lacking), uniform or the anterior longer. Corolla rotate, blue, violet, or white: lobes spreading, longer than the tube, the posterior ones wholly united to form one rounded lobe. Stamens 2 (only the 2 postero-laterals present): anthers slightly exserted, glabrous, the sacs parallel. Stigma capitate. Capsule flattened contrary to the septum, as wide as long or wider, deeply loculicidal. Seeds numerous or few, smooth.—About 250 species, widely distributed.—SPEEDWELLS.

Main stem terminating in an inflorescence, whose flowers are densely crowded or remote and axillary: bract-leaves alternate. I. VERONICELLA.
Main stem not terminating in an inflorescence, leaves opposite throughout and flowers all in axillary racemes. II. EUVERONICA.

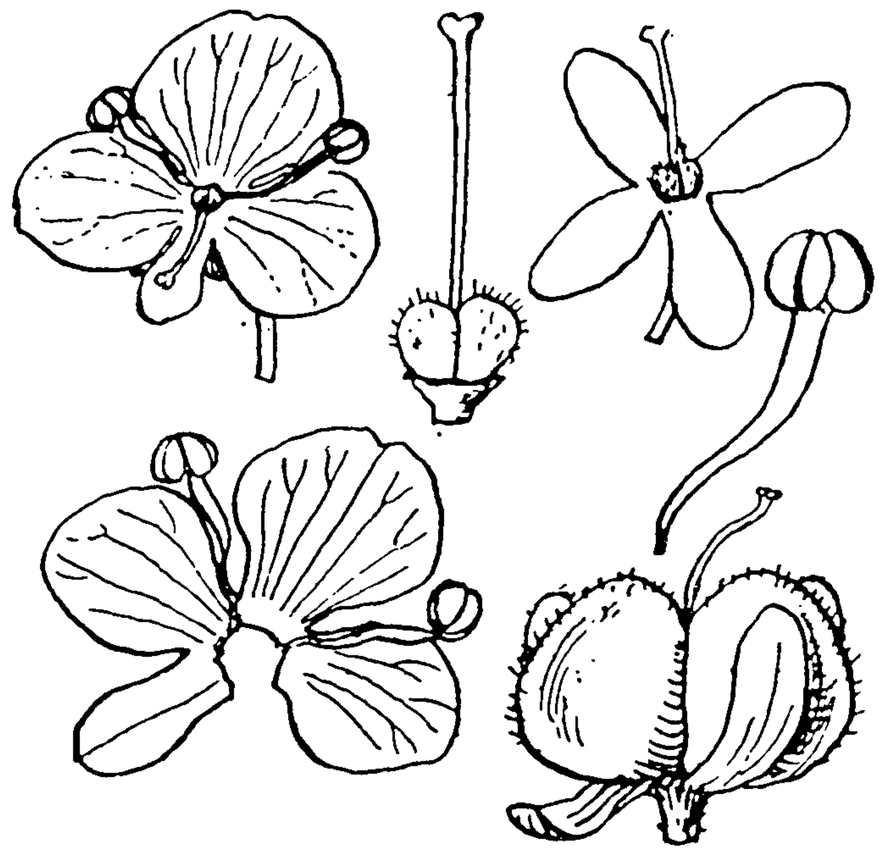
I. VERONICELLA

Plant perennial: flowers in terminal racemes: corolla pale, with deep-blue lines only on the posterior side. 1. *V. serpyllifolia.*
Plant annual: flowers axillary to most of the leaf-axils: corolla more uniformly colored.
  Pedicels shorter than the linear to lanceolate sepals: capsule strongly flattened: seeds many, less than 1 mm. long, flat, smooth: stem erect.
    Leaf-blades, except the lowermost, sessile; those of the lower stem-leaves oblanceolate, nearly entire to dentate: corolla whitish throughout: capsule greenish, notched, the minute style hidden between the capsule-lobes: plant glabrous or with gland-tipped hairs. 2. *V. peregrina.*
    Leaf-blades petioled or the upper ones sessile, those of the lower stem-leaves ovate, crenate-serrate: corolla deep violet-blue: capsule yellowish-brown, notched one-third its length or nearly so, the style reaching to about the capsule-lobes: plant pubescent with white glandless or obscurely gland-tipped hairs. 3. *V. arvensis.*
  Pedicels longer than the ovate sepals: capsule relatively turgid: seeds few, 1.5–3 mm. long, turgid, rough: stem creeping.
    Leaf-blades ovate: sepals short-ciliate, not accrescent: capsule slightly flattened, deeply notched, pubescent: seeds 1.5–2 mm. long, brown.
      Corolla-lobes not exceeding the ovate sepals: capsule-lobes rounded, the distal point of each about midway between the style and the lateral margin: style shorter than the capsule. 4. *V. polita.*
      Corolla-lobes much exceeding the sepals: capsule-lobes acutish in profile, the most distal point of each near the lateral margin: style as long as the capsule. 5. *V. persica.*
    Leaf-blades broadly and shallowly cordate, 3–5-lobed: sepals conspicuously ciliate, accrescent: capsule turgid, scarcely notched, glabrous: seeds 2.5–3 mm. long, blackish. 6. *V. hederaefolia.*

II. EUVERONICA

Capsule pubescent, wider than long, the most distal point of each lobe near the lateral margin: pedicel shorter than the calyx: stem, leaves, pedicels, and calyx with glandless hairs: leaf-blades oval, with petiole-like bases: herbage pubescent: plant of dry soil. 7. *V. officinalis.*
Capsule glabrous or sparingly glandular-pubescent, as wide as long or narrower, the most distal point of each lobe about midway between the style and the lateral margin: pedicel longer than the calyx: leaf-blades rounded at the base, lanceolate or narrowly ovate: herbage glabrous or glandular: plant aquatic.
  Leaf-blades all petioled: racemes usually 10–25-flowered: corolla 2.5–3 mm. long, violet-blue: style 2–3 mm. long: plant glabrous. 8. *V. americana.*
  Leaf-blades of the flowering stem sessile and clasping; those of the autumnal shoots petioled: racemes usually 30–60-flowered: corolla 2 mm. long, pale-violet: style 1–1.5 mm. long: inflorescence with gland-tipped hairs. 9. *V. glandifera.*

1. V. serpyllifolia L. Stem 0.3–2 dm. long, finely pubescent with incurved hairs, creeping, distally erect and floriferous: leaf-blades elliptic-ovate or oval,



0.9–1.6 cm. long, obscurely crenate, obtuse: pedicels 2–3 mm. long, ascending: sepals 3 mm. long, elliptic-oval, glabrous: corolla about 2 mm. long: style 2 mm. long: capsule 3 mm. long, shallowly notched, slightly glandular-pubescent.—Fields, roadsides, and cult. grounds, Blue Ridge and more northern provinces, N. C. to Mo., Minn., Ont., and Newf.; also introduced on the Pacific slope.—Nat. of Eu.—Spr.–sum.

2. V. peregrina L. Stem 1–3 dm. tall, glabrous (glandular-pubescent throughout, even to the capsules, in *V. peregrina xalapensis*), much-branched, floriferous nearly throughout: leaf-blades oblanceolate to elliptic, 1.5–3.5 cm. long, obtuse, entire or the larger crenate-dentate: pedicels 0.5–1 mm. long: sepals 3–5 mm. long, linear-elliptic: corolla about 2 mm. long: style 0.1–0.2 mm. long: capsule about 3 mm. long, shallowly notched, glabrous. —(NECKWEED.)—Cult. grounds and moist fields, various provinces, Fla. to Tex., Ia., Mich., and N. B.—Spr.

3. V. arvensis L. Stem 1–3 dm. tall, pubescent with glandless or obscurely gland-tipped hairs, usually much-branched, floriferous nearly throughout: leaf-blades ovate, 0.5–1.5 cm. long, obtuse, crenate-serrate: pedicels 0.5–1 mm. long: sepals 3–4 mm. long, broadly linear: corolla about 2 mm. long, deep-blue, the lobes with deeper-blue lines: style 0.5 mm. long: capsule 2.5–3 mm. long, deeply notched, pubescent. — (WALL-SPEEDWELL.) — Fields, dry woods, and cult. grounds, various provinces, C Ga. to Okla., Kans., Ont., and Newf.; also introduced on the Pacific slope. Nat. of Eurasia.—Spr.

4. V. polita Fries. Stem 1–2 dm. long, finely pubescent, much branched: leaf-blades ovate, 0.5–1.2 cm. long, acutish, with rounded teeth: pedicels 5–10 mm. long, recurving: sepals ovate, 3–4 mm. long, reticulate, obscurely ciliate: corolla 3 mm. long, violet-blue: style 1 mm. long: capsule 3–3.5 mm. long, deeply notched, minutely pubescent.—Fields and cult. grounds, various provinces, Fla. to Tex. and N. Y. Nat. of Eu.—Spr.

5. V. persica Poir. Stem 1–3 dm. long, pubescent, distally ascending: leaf-blades ovate, 1–2 cm. long, dentate: sepals ovate, 4–6 mm. long, finely ciliate: corolla 5 mm. long, blue, anteriorly paler, the lobes with deep-blue lines: style 3 mm. long: capsule 3–4 mm. long, broadly notched, pubescent.—Fields, roadsides, and waste-places, various provinces, Fla. to Calif., Alas., and Newf. Nat. of Eu.—(*W. I.*)—Spr.

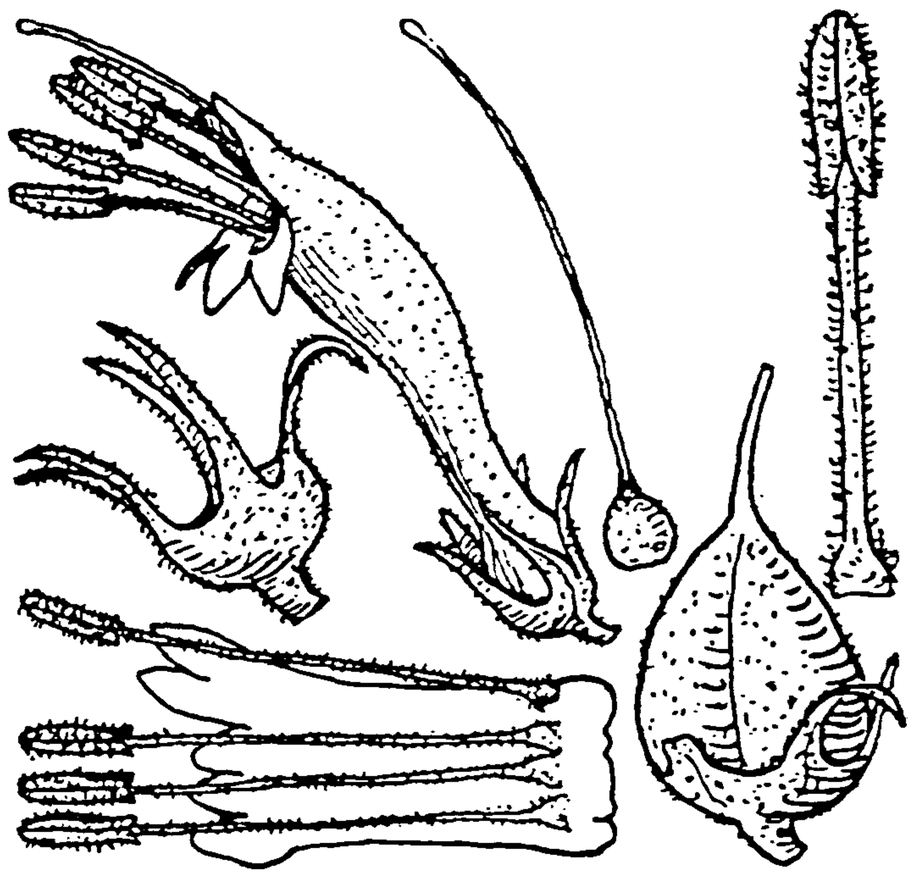
6. V. hederaefolia L. Stem 0.5–3 dm. long, white-hirsute, much branched, distally ascending: leaf-blades broadly ovate, 0.5–1.5 cm. long, 3–5-lobed, the lobes rounded, entire: pedicels 7–18 mm. long: sepals broadly ovate, at anthesis 2–3 mm. long, becoming 5–7 mm. long, densely ciliate: corolla 2 mm. long, purplish: style 0.5 mm. long: capsule 3 mm. long, scarcely notched, glabrous. —(IVY-SPEEDWELL.)—Roadsides, orchards, and waste-places, various provinces, S. C. to N. Y. Nat. of Eu.—Spr.

7. V. officinalis L. Stem 1–4 dm. long, pubescent, much-branched: leaf-blades oval, 2–5 cm. long, crenate-serrate: racemes mostly 5–10 cm. long: pedicels 1–2 mm. long: sepals elliptic-lanceolate, 2 mm. long: corolla 3–4 mm. long, pale-lavender, on the posterior side with lavender-blue lines: style 2.5–3.5 mm. long: capsule 3–4 mm. long.—(GIPSY-WEED.)—Fields and open woods, various provinces, in Coastal Plain only N, N. C. to Tenn., S. Dak., Ont., and N. S. Nat. of Eu.—Sum.

8. V. americana Schwein. Stem 2–8 dm. long, creeping at the base, glabrous: leaf-blades lanceolate to narrowly ovate, 2–8 cm. long, serrate with low teeth, acute or acutish: racemes mostly 5–10 cm. long: pedicels 5–8 mm. long: sepals elliptic-lanceolate, 2–3 mm. long, acuminate: corolla 2.5–3 mm. long, violet-blue, with deeper-blue lines: capsule 2.5–3 mm. long, slightly notched.—(BROOKLIME.)—Woodland streams and spring-heads, Blue Ridge and more N provinces, N. C. to Calif., Alas., Ont., and Newf.—(*Mex.*)—Sum.

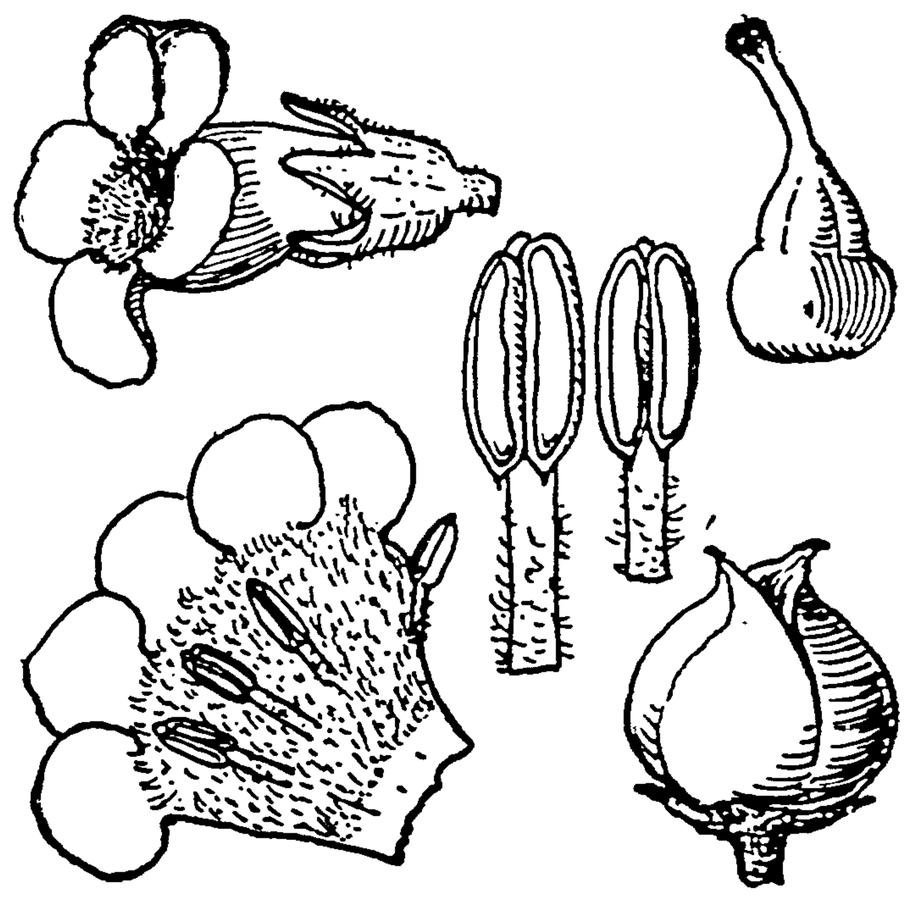
9. V. glandifera Pennell. Stem 3–6 dm. long, creeping at the base, distally finely and sparsely glandular-pubescent: leaf-blades lanceolate, sometimes broadly so, 4–9 cm. long, sharply crenate-serrate, acuminate: racemes mostly 10–15 cm. long: pedicels 3–5 mm. long: sepals lanceolate to narrowly ovate, 2–3 mm. long, acuminate: corolla 2 mm. long, pale violet-blue, with few deeper-blue lines: style 1–1.5 mm. long: capsule 2.5–3 mm. long, rounded.—Shallow streams and stream-margins, various provinces, N. C. to Ind. and Pa.—Sum.

29. MACRANTHERA Torr. Tall annual or biennial herb, the stem retrorse-pubescent. Leaves opposite: blades pinnatifid. Flowers in terminal racemes, the pedicels reflexed in fruit, the bracts entire. Bractlets none. Calyx-lobes 5, uniform. Corolla tubular, orange, fleshy, semi-persistent: lobes shorter than the tube, the 2 posterior erect, the 3 anterior spreading. Stamens 4, equal: anthers conspicuously exserted on the elongate filaments, the sacs parallel. Stigma linear-clavate. Capsule ovoid, pubescent, loculicidal. Seeds angular-lunate, reticulate, winged.—One species.



1. M. flammea (Bartr.) Pennell. Stem 15–30 dm. tall, obtusely 4-angled: leaf-blades lanceolate to ovate in outline, the larger 8–10 cm. long, with 5–7 pairs of lateral lobes: pedicels 10–20 mm. long, upcurved at the apex: calyx-lobes, at anthesis, linear, becoming 10–15 mm. long and toothed: corolla 20–25 mm. long, rusty-tomentulose without, glabrous within above; lobes obtuse: filaments lanose: capsule broadly ovoid, 15–18 mm. long: seeds 3–4 mm. long, thick-winged. [*M. fuchsioides* (Nutt.) Benth. *M. LeContei* Torr.]—Borders of wet sandy thickets, Coastal Plain, N Fla. to E La. and Ga.—Sum.–fall.

30. DASISTOMA Raf. Tall annual herbs, the stem retrorse-pubescent. Leaves opposite: blades bipinnatifid-lobed. Flowers axillary to foliaceous narrow entire bracts, spicate. Bractlets none. Calyx-lobes 5, about as long as the tube. Corolla yellow, evanescent: tube pubescent all over within: lobes spreading, equally distinct, slightly shorter than the tube. Staments 4, didynamous, included; anther-sacs slightly divaricate, glabrous. Stigmas 2, semi-capitate. Capsule globose-ovoid, loculicidal. Seeds winged.—One species.



1. D. macrophylla (Nutt.) Raf. Stem 15–20 dm. tall, obtusely 4-angled, much-branched: leaf-blades ovate to ovate-lanceo-

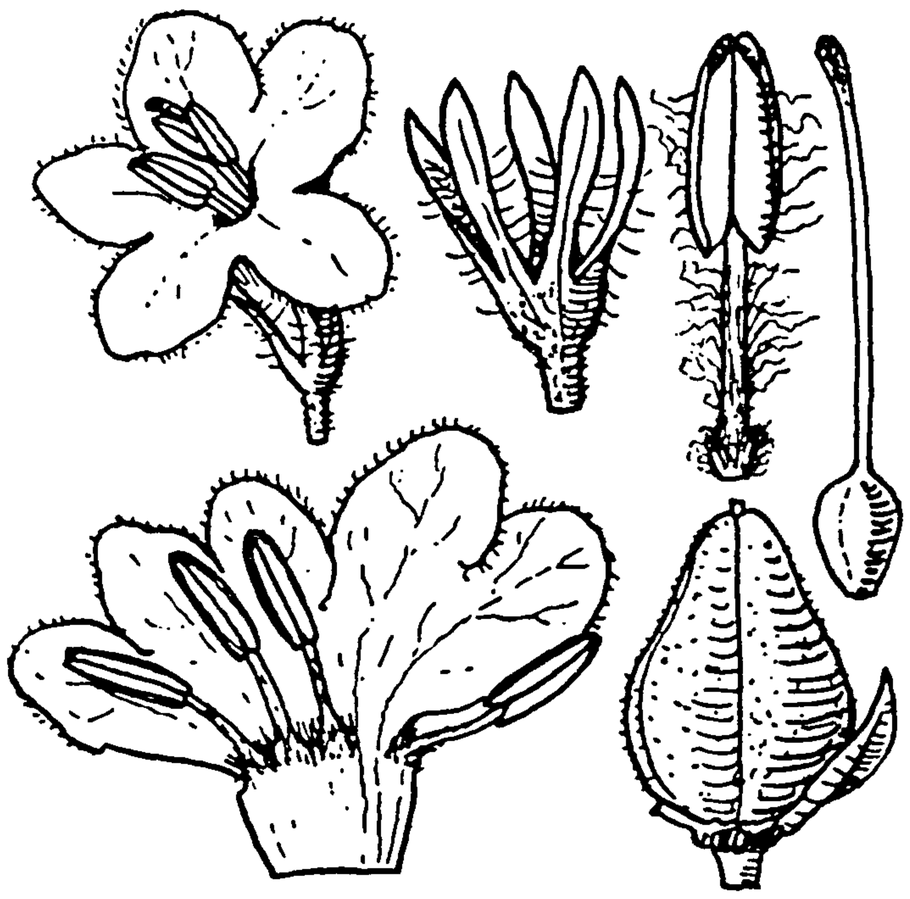
late, the larger 10–30 cm. long, with 7–12 pairs of lateral lobes: calyx-lobes triangular-ovate, ultimately longer than the tube: corolla 15–16 mm. long, externally glabrous; lobes ovate-reniform, about 7 mm. long: capsule 9–10 mm. long, glabrous, black: seeds 2 mm. long, short-winged. [*Seymeria macrophylla* Nutt. *Brachygyne macrophylla* (Nutt.) Small.]—(MULLEN-FOXGLOVE.)—Moist woodlands, Appalachian Valley and more N & W provinces, Ga. to NE Tex., Nebr., and Ohio.—Sum.—A root-parasite.

31. AFZELIA J. F. Gmel. Relatively low annual herbs, the stem more or less glandular-pubescent. Leaves opposite: blades pinnatifid or bipinnatifid. Flowers axillary to foliaceous pinnatifid or bipinnatifid bracts, loosely racemose. Bractlets none. Calyx-lobes 5, longer than the tube. Corolla rotate, yellow, evanescent, glabrous or nearly so within above the bases of the filaments; lobes longer than the tube, the 2 posterior partly united. Stamens 4, nearly equal, slightly exserted: anther-sacs parallel, glabrous or nearly so, dehiscing by short apical slits. Stigma punctiform or capitate. Capsule ovoid or urceolate. Seeds numerous, winged or wingless.—About 22 species, North American, mostly Mexican.

Capsule ovoid, brown-tomentose: seeds winged: corolla deep-yellow, externally pubescent: leaf-segments lanceolate or wider: stem viscid-pubescent. 1. *A. pectinata.*

Capsule urceolate-acuminate, glabrous: seeds wingless: corolla pale-yellow, externally glabrous: leaf-segments filiform: stem sparsely pubescent, obscurely glandular. 2. *A. cassioides.*

1. A. pectinata (Pursh) Kuntze. Stem 2–6 dm. tall, widely and stiffly branched, retrorsely pubescent (with ascending hairs and glandular-pubescent capsules, in *A. pectinata peninsularis* of S Fla.): leaf-blades mostly pinnatifid, the longer ones 1.5–3 cm. long, with 3 or 4 pairs of lateral segments: calyx glandular-pubescent; lobes 3–4.5 mm. long, lanceolate: corolla 10 mm. long; lobes ovate: filaments lanose at the apex: capsule 5–7 mm. long, rounded or acute: seeds with 3 or 4 wings.—Dry pinelands, Coastal Plain, Fla. to Miss. and S. C.—Sum.–fall.



2. A. cassioides (Walt.) J. F. Gmel. Stem 5–10 dm. tall, virgately branched, sparsely pubescent with ascending incurved hairs: leaf-blades pinnatifid, the larger ones 1–1.5 cm. long, with 4–7 pairs of lateral segments: calyx glabrous or nearly so: lobes 2–2.5 mm. long, linear: corolla 9 mm. long; lobes lanceolate: filaments glabrous: capsule 4–4.5 mm. long, acuminate: seeds furrowed. [*Seymeria tenuifolia* Pursh.]—Pinelands, Coastal Plain and adj. provinces, C pen. Fla. to La., Tenn., and N. C.—(*W. I.*)—Fall.

32. AUREOLARIA Raf. Perennial or annual herbs parasitic on the roots of oaks, the stem simple or branched. Leaves opposite: blades narrow or broad, entire, toothed, or pinnatifid. Flowers axillary to more or less foliaceous bracts, in spikes or racemes. Bractlets none. Calyx-lobes 5, uniform or nearly so, longer than the tube. Corolla yellow, the throat nearly campanulate, somewhat inflated anteriorly; lobes spreading. Stamens 4, didynamous: filaments flattened, lanose: anthers lanose on the valvular surfaces, the

sacs parallel. Stigma slightly elongate or semi-capitate. Capsule cylindric-ellipsoid to globose-ovoid, acute to acuminate, loculicidal. Seeds irregularly tetrahedral, reticulate, wingless or winged. [*Dasystoma* Benth. not Raf.]—About 11 species, in eastern North America.—YELLOW-FOXGLOVES. FALSE-FOXGLOVES.

Seeds wingless: capsule glandular-pubescent: corolla externally glandular-pubescent: calyx-lobes toothed or pectinate: leaf-blades bipinnatifid, more or less pectinately cut: plant annual. I. PANCTENIS.
Seeds winged: capsule glandless: corolla externally glabrous: calyx-lobes entire; leaf-blades entire to coarsely bipinnatifid: plant perennial. II. EUAUREOLARIA.

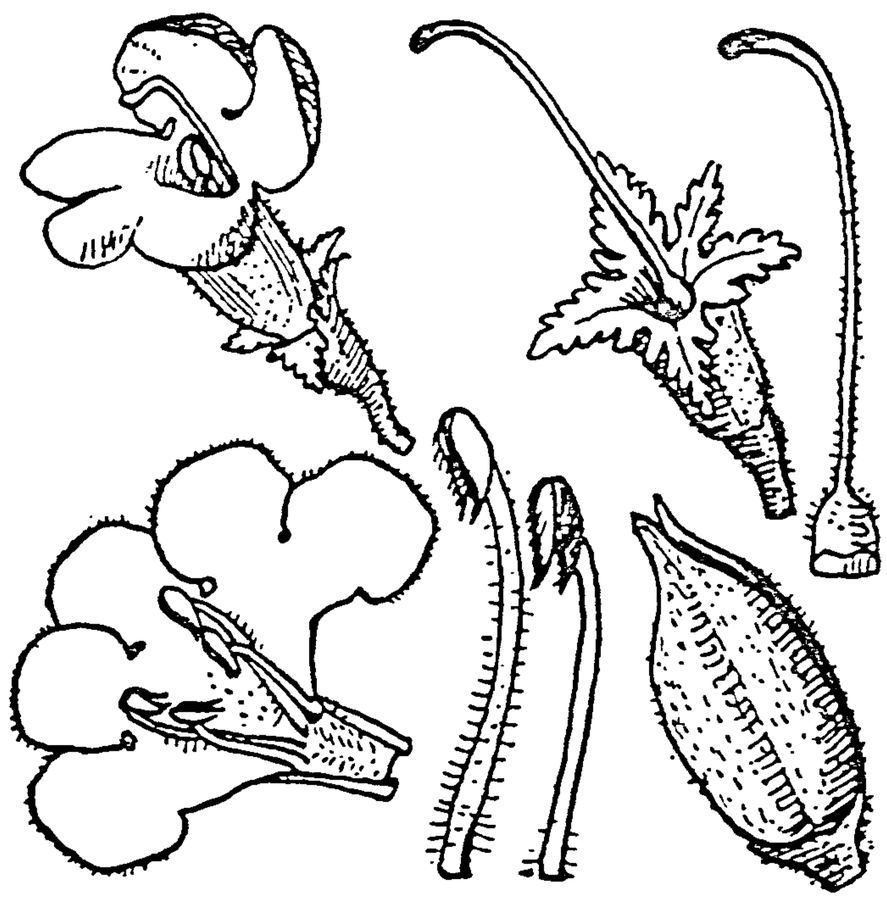
I. PANCTENIS

Calyx-tube turbinate, glandular-puberulent: capsule ellipsoid, half enclosed in the calyx-tube: pedicels 1–3 cm. long: leaf-blades with mostly rounded teeth. 1. *A. pedicularia.*
Calyx-tube hemispheric, glandular-hirsute or -lanose: capsule ovoid, only the base enclosed in the calyx-tube: pedicels 0.4–2 cm. long: leaf-blades with acute or acutish teeth. 2. *A. pectinata.*

II. EUAUREOLARIA

Capsule pubescent: pedicels 1.5–3 mm. long: stem pubescent or puberulent, at least above.
  Stem pubescent or puberulent throughout: leaf-blades permanently pubescent: capsule 12–15 mm. long. 3. *A. virginica.*
  Stem glabrous below: leaf-blades becoming glabrous: capsule 9–12 mm. long. 4. *A. microcarpa.*
Capsule glabrous: pedicels 3–25 mm. long: stem glabrous or minutely puberulent.
  Leaf-blades lanceolate to ovate-lanceolate, widest below the middle, long-acuminate: corolla 30–35 mm. long: capsule 10–12 mm. long. 5. *A. laevigata.*
  Leaf-blades elliptic-ovate in outline, widest about the middle, less acuminate: corolla 35–60 mm. long: capsule 12–24 mm. long.
    Stem glabrous, glaucous: pedicels and calyx externally glabrous. 6. *A. flava.*
    Stem puberulent, not glaucous: pedicels and calyx externally puberulent.
      Pedicels 4–10 mm. long: calyx-lobes 5–7 mm. long, triangular-lanceolate: corolla 40–50 mm. long. 7. *A. dispersa.*
      Pedicels 10–25 mm. long: calyx-lobes 10–12 mm. long, linear: corolla 35–45 mm. long. 8. *A. patula.*

1. A. pedicularia (L.) Raf. Stem 4–12 dm. tall, glandular-hirsute below, but nearly or quite glandless above (glandular-pubescent throughout, calyx-lobes 10–16 mm. long, and capsule broadly ellipsoid, in *A. pedicularia austromontana,* Blue Ridge, Ga. to Va.): leaf-blades lanceolate to ovate-lanceolate, deeply bipinnatifid (⅔ to the midrib), (less deeply cut and rather copiously glandular, but stem and pedicels less glandular or nearly glabrous, in *A. pedicularia carolinensis,* Piedmont and Coastal Plain, N. C.), the larger 3–6 cm. long, with 6–8 pairs of lateral lobes (or only 1.5–2.5 cm. long, stem less hirsute, and pedicels longer than bracts, in *A. pedicularia caesariensis,* Coastal Plain and Piedmont, N. C. to Mass.): calyx-lobes 8–10 mm. long, pinnately cut: corolla 30–40 mm. long; lobes depressed-orbicular: capsule 10–11 mm. long. [*D. pedicularia* (L.) Benth.]—Sandy and rocky woods, various provinces, Va. to Ont. and Me.; to be expected in N. C.—Sum.—Represented in our range by the subspecies as indicated above.



2. A. pectinata (Nutt.) Pennell. Stem 4–11 dm. tall, glandular-hirsute, diffusely branched (virgately branched, with the small upper leaves appressed to the branches, short pedicels and large corollas 38–45 mm. long, in *A. pectinata floridana*, Coastal Plain, C Fla. and S Ga.): leaf-blades lanceolate to lanceolate-ovate, deeply bipinnatifid, glandular-pubescent, the larger 2–4 cm. long (larger, 3–6 cm. long, with the capsule 13–16 mm. long on pedicels 8–16 mm. long, in *A. pectinata eurycarpa*, various provinces, Ga. to Ala., Tenn., and N. C.): pedicels 4–11 mm. long: calyx glandular-lanose (merely glandular-hirsute and with pedicels 10–20 mm. long in *A. pectinata transcedens*, sandhills, Coastal Plain, Ga. to N. C.); lobes 8–15 mm. long, pinnately cut: corolla 30–40 mm. long; lobes orbicular: capsule 11–13 mm. long. [*D. pectinata* (Nutt.) Benth.] Sandy oak woods, Coastal Plain, NW Fla. to La., Tenn., and N. C.; also adj. provinces, Ala. to C. Tenn.—Sum.—The stem is pubescent or puberulent.

3. A. virginica (L.) Pennell. Stem 8–12 dm. tall: leaf-blades lanceolate-ovate, rather coarsely sinuate with 2–4 rounded lobes, downy on both sides, the longer 9–15 cm. long: pedicels 1–3 mm. long: calyx-lobes 4–12 mm. long, lanceolate to ovate: corolla 30–45 mm. long; lobes 6–12 mm. long, ovate-orbicular: capsule 12–15 mm. long, ovoid to globose-ovoid. [*D. pubescens* Benth. *Gerardia flava* (Chapm. Fl.)]—Open, usually sandy oak woods, various provinces, N Fla. to La., Mich., and N. H.—Spr.–sum.—The stem is puberulent above.

4. A. microcarpa Pennell. Stem 6–10 dm. tall: leaf-blades lanceolate-ovate, rather coarsely sinuate-lobed, puberulent on both sides, the larger 6–11 cm. long: pedicels 1–3 mm. long: calyx-lobes 3.5–7 mm. long, lanceolate to spatulate-ovate: corolla 30–40 mm. long; lobes 5–10 mm. long, ovate-orbicular: capsule 9–12 mm. long, ovoid to globose-ovoid.—Dry oak woods, Appalachian provinces and rarely Coastal Plain, N Fla. to E Tenn.—Sum.

5. A. laevigata Raf. Stem 5–12 dm. tall, glabrous, green: leaf-blades lanceolate to ovate-lanceolate, entire or the lower ones somewhat pinnately lobed, glabrous or nearly so, the larger 5–12 cm. long: pedicels 1–4 mm. long, or in fruit 3–8 mm. long: calyx glabrous; tube 3–5 mm. long; lobes 4–6 mm. long, lanceolate: corolla 30–35 mm. long; lobes 9–11 mm. long, depressed-orbicular: capsule 10–12 mm. long, ovoid. [*D. laevigata* (Raf.) Chapm.]—Rocky woods, Blue Ridge and Appalachian provinces, Ga. to Ky., Ohio, and Pa.; rarely Piedmont, N. C. and Va.—Sum.

6. A. flava (L.) Farwell. Stem 15–25 dm. tall, glabrous, glaucous: leaf-blades ovate-lanceolate to ovate, rather deeply and coarsely lobed or incised (shallowly lobed in *A. flava reticulata*, Coastal Plain, C Fla. to Md.), glabrate or glabrous, the larger 10–14 cm. long, with 5–7 pairs of lateral lobes: pedicels 4–10 mm. long: calyx glabrous; tube 4–7 mm. long; lobes 2–5 mm. long (5–14 mm. long, corolla 35–60 mm. long, and capsule 15–20 mm. long, in *A. flava macrantha*, various provinces, Ala. to Ark., Ill., and Ont.), lanceolate: corolla 35–40 mm. long; lobes 11–13 mm. long, depressed-orbicular: capsule 12–16 mm. long, ovoid. [*D. quercifolia* (Pursh) Benth. *Gerardia virginica* Auth. not L.]—Rocky and sandy oak woods, Piedmont, and more northern provinces, Ala. to Mich. and Me.—Sum.–fall.

7. A. dispersa (Small) Pennell. Stem 10–12 dm. tall, sparsely puberulent: leaf-blades lanceolate-ovate to ovate, nearly entire or rather deeply and coarsely lobed, finely puberulent, the larger 7–12 cm. long, with 1–4 pairs of lateral lobes: pedicels 4–10 mm. long: calyx-lobes 5–7 mm. long, triangular-lanceolate: corolla 40–50 mm. long; lobes 10–13 mm. long, depressed orbicular: capsule 14–18 mm. long, ovoid. [*D. dispersa* Small]—Sandy oak-woods, Coastal Plain, Ala. to La.—Sum.

8. **A. patula** (Chapm.) Pennell. Stems 10–12 dm. tall, sparsely puberulent: leaf-blades ovate-lanceolate to narrowly ovate, deeply and coarsely lobed or incised, puberulent or glabrate, the larger 13–16 cm. long, with 4–8 pairs of lateral lobes: pedicels 10–16 mm. long, or in fruit 15–25 mm. long: calyx-lobes 10–12 mm. long, linear: corolla 35–45 mm. long; lobes 7–10 mm. long, depressed-orbicular: capsule 13–17 mm. long, ovoid. [*D. patula* Chapm.]—Wooded river bluffs, Appalachian Valley and Interior Low Plateaus, Ga. to Tenn.—Sum.–fall.

33. **AGALINIS** Raf. Annual or perennial root-parasitic herbs, the stem usually branched. Leaves usually opposite, often with leaf-clusters in their axils: blades linear or filiform, or rarely subulate or broadened upward, entire, sessile. Flowers in racemes, axillary to foliaceous bracts. Calyx-lobes 5, uniform, shorter than the tube. Corolla rose-purple or pink-purple, more or less purple-spotted and usually with 2 yellow lines on the anterior side: throat campanulate or horizontally flattened, somewhat inflated anteriorly: lobes much shorter than the tube, about equal in length, spreading or the posterior arched or flattened. Stamens 4, didynamous, included: filaments more or less lanose: anthers lanose. Stigma elongate. Capsule globose to globose-ellipsoid, mucronate, loculicidal. Seeds numerous, reticulate, wingless. [*Gerardia* L. in part.] —About 50 species, American.—FALSE-FOXGLOVES. GERARDIAS. FALSE PURPLE-FOXGLOVES.

Plant annual: pedicels ascending or spreading: corolla membranous, rose-purple or lavender-purple, or rarely pink, nearly always with spots and yellow lines within: parasitic on many plants.
  Corolla with the posterior lobes spreading, pubescent within at their base.
    Calyx-tube not strongly reticulate-veined: seeds dark-brown: plant tending to blacken in drying. I. PURPUREAE.
    Calyx-tube evidently reticulate-veined: seeds yellowish-brown: plant not tending to blacken in drying. II. ERECTAE.
  Corolla with the posterior lobes arched or flattened over stamens and style, glabrous within at their base. III. TENUIFOLIAE.
Plant with an elongate rootstock: pedicels erect: corolla pink, slightly fleshy, spotted, but without yellow lines in the throat: parasitic on pine roots. IV. LINIFOLIAE.

I. PURPUREAE

Leaf-blades all linear or filiform, not obviously dimorphic.
  Racemes elongate, the pedicels less than 12 mm. long.
    Leaf-blades and calyx-lobes acute to acuminate: anther-sacs mucronate to caudate at the base: plant not fleshy.
      Corolla purple, the two yellow lines and dark spots within evident: plant dull-green or purplish.
        Stem smooth or minutely scabrellous: leaves without axillary fascicles or these small and shorter than the leaves.
          Fruiting pedicels 3–6 mm. long: the areas between the reticulations of the seed relatively pale.
            Plant relatively stiffly branched: stem sparingly scabrellous: calyx-lobes triangular-lanceolate to triangular-subulate: corolla 20–38 mm. long. 1. *A. purpurea.*
            Plant virgately branched: stem smooth: calyx-lobes subulate or nearly so: corolla 20–25 mm. long. 2. *A. virgata.*
          Fruiting pedicels 1.5–3 mm. long: the areas between the reticulations of the seed nearly black.
            Corolla 20–25 mm. long: stigmas 2–3 mm. long: stem usually much branched. 3. *A. pinetorum.*
            Corolla 15–18 mm. long: stigmas 1–1.5 mm. long: stem simple or slightly branched. 4. *A. Harperi.*
        Stem more or less scabrous: leaves with usually conspicuously developed axillary fascicles. 5. *A. fasciculata.*

Corolla lavender-pink, destitute of spots and yellow lines: plant bright-green. 6. *A. georgiana.*
Leaf-blades and calyx-lobes obtuse or acutish: anther-sacs obtuse or acutish at the base: plant fleshy. 7. *A. maritima.*
Racemes short, much broken or lax, or if somewhat elongate the pedicels over 10 mm. long.
Stem scabrous: corolla pubescent within in a narrow line below the posterior sinus: anthers densely lanose with pink hairs on the sides. 8. *A. pulchella.*
Stem smooth or nearly so: corolla pubescent within over the entire width of the basal portions of the posterior lobes: anthers glabrous over much of the dorsal surface.
Cauline leaves alternate: blades broadened distally slightly fleshy: axillary leaf-fascicles abundantly developed. 9. *A. filifolia.*
Cauline leaves opposite: blades neither broadened distally nor fleshy: axillary leaf-fascicles scarcely or not at all developed.
Branches very widely and laxly ascending: fruiting pedicels 25–50 mm. long, 4–5 times as long as the bracts: corolla 15–18 mm. long. 10. *A. laxa.*
Branches more closely and stiffly ascending: fruiting pedicels less than twice as long as the bracts.
Leaf-blades 2–3.5 cm. long, equalling or exceeding the internodes, slightly scabrous to smooth on the upper surface.
Pedicels 15–40 mm. long, longer than the bracts: corolla 17–25 mm. long: capsule 3–4 mm. long.
Racemes somewhat developed so that only a few flowers appear as if terminal: pedicels 15–40 mm. long: corolla 18–25 mm. long: leaf-blades narrowly linear to filiform. 11. *A. setacea.*
Racemes scarcely evident, most flowers appearing as if terminal to the branches: pedicels 15–20 mm. long: corolla 17–20 mm. long: leaf-blades filiform-setaceous. 12. *A. stenophylla.*
Pedicels 5–10 (–15) mm. long, shorter than the bracts or equalling them: corolla 25–30 mm. long: capsule 4–5 mm. long: most flowers appearing as if terminal to the branches. 13. *A. Plukenetii.*
Leaf-blades 0.5–1.2 cm. long, shorter than the internodes, scabrous on the upper surface: corolla 15–22 mm. long.
Pedicels 4–6 mm. long, about equalling the bracts: calyx-lobes not becoming callose: leaf-blades filiform: stem smooth or slightly scabrellous. 14. *A. keyensis.*
Pedicels thrice to ten times the length of the bracts: calyx-lobes becoming callose: leaf-blades linear-subulate: stem ridged, minutely hispidulous-roughened. 15. *A. oligophylla.*
Leaf-blades mostly minute, scale-like, appressed, those near the base of the stem oval or ovate and spreading, but frequently early deciduous: pedicels 1–3 mm. long. 16. *A. aphylla.*

II. Erectae

Racemes well-developed, and flowers not appearing as if terminal: stigma 1–2 mm. long: leaf-blades linear to nearly filiform: stem evidently striate-angled.
Leaf-blades linear to nearly filiform, not widening distally, acutish to acuminate: corolla with yellow lines and dark spots within strongly defined: capsule globose to globose-ovoid, somewhat flattened at the base.
Corolla 10–15 mm. long: pedicels mostly twice to thrice the length of the bracts. 17. *A. decemloba.*
Corolla 15–20 mm. long: pedicels mostly thrice to eight times the length of the bracts. 18. *A. tenella.*
Leaf-blades widening distally, acutish to obtuse: corolla with yellow lines and dark spots faint or obsolete: capsule globose-ovoid to ellipsoid, rounded at the base. 19. *A. erecta.*

Racemes scarcely developed, many flowers appearing as if terminal to the branches: stigma 2–3 mm. long: leaf-blades narrowly linear: stem nearly terete. 20. *A. Gattingeri.*

III. TENUIFOLIAE

Corolla pubescent externally; its posterior lobes about two-thirds the length of the anterior, concave-arched: pedicels, if exceeding the bracts, less than twice their length. 21. *A. tenuifolia.*

Corolla glabrous externally, its posterior lobes less than half the length of the anterior, flattened: pedicels at least thrice the length of the bracts.

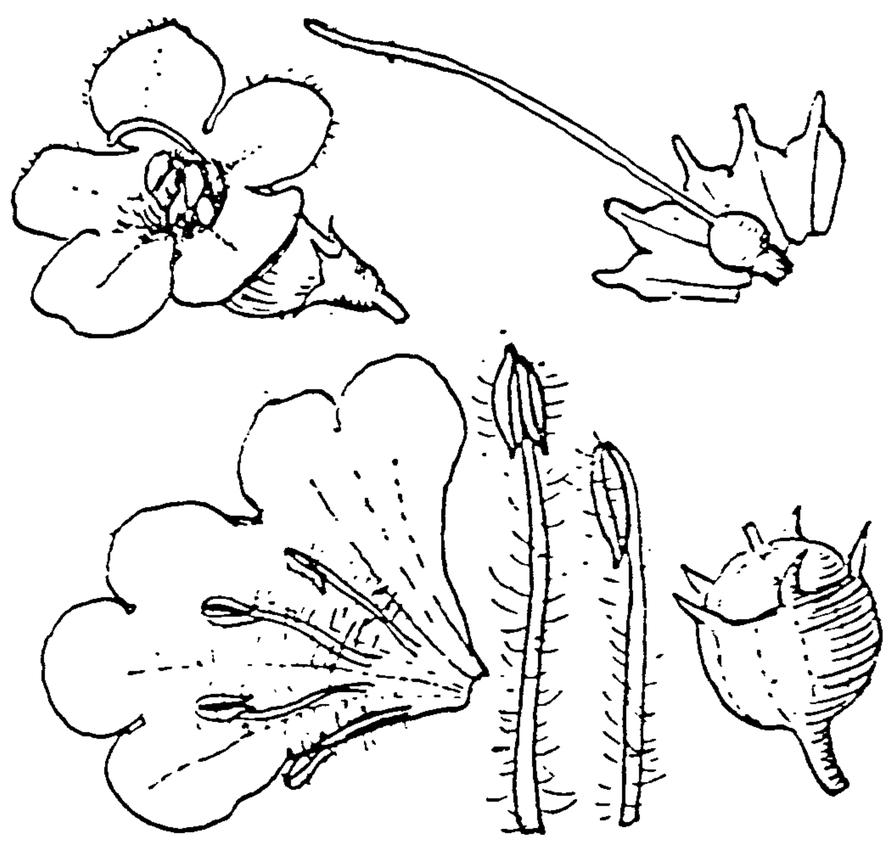
Leaf-blades filiform, 1.5–2 cm. long: stem evenly and stiffly much-branched: racemes well developed, no flowers appearing as if terminal: pedicels 15–32 mm. long: corolla 15–18 mm. long. 22. *A. divaricata.*

Leaf-blades minute, triangular-subulate, 0.1–0.2 cm. long: stem sparingly very laxly branched: racemes scarcely developed, the flowers scattered and mostly appearing as if terminal to the branches: pedicels 5–10 mm. long: corolla 10–13 mm. long. 23. *A. filicaulis.*

IV. LINIFOLIAE

Plant with a virgate, little branched stem, corollas 30–40 mm. long. 24. *A. linifolia.*

1. A. purpurea (L.) Pennell. Stem 4–12 dm. tall, striate-angled, sparingly scabrellous, much branched: leaf-blades 2.5–4 cm. long, linear, scabrous above: racemes elongate, 6–14-flowered: pedicels 2–5 mm. long: calyx-lobes triangular-lanceolate to subulate, 0.5–2 mm. long, much shorter than the tube: corolla 20–38 mm. long, purple; lobes spreading, the posterior ones pubescent at the base: capsule 4.5–7 mm. long, globose or nearly so. [*G. purpurea* L.]—Moist sandy soil, meadows and stream-banks, various provinces, Fla. to Tex., Minn., and Mass.—Sum.–fall.



2. A. virgata Raf. Stem 3–10 dm. tall, striate-angled, glabrous, virgately branched: leaf-blades 1.5–4 cm. long, narrowly linear to almost filiform, scabrous above: racemes elongate, 8–26-flowered: pedicels 2–6 mm. long: calyx-lobes triangular-subulate to subulate, 0.8–2 mm. long: corolla 20–25 mm. long, purple; lobes spreading, the posterior pubescent at the base: capsule 4.5–5 mm. long, globose.—Moist pinebarrens, Coastal Plain, S. C. to SE N. Y.—Fall.

3. A. pinetorum Pennell. Stem 6–8 dm. tall, slightly angled, nearly glabrous, much branched: leaf-blades 2–2.5 cm. long, narrowly linear (a more slender plant, *A. pinetorum delicatula,* with filiform curled leaf-blades, calyx-lobes 1.5–2 mm. long, and an unspotted corolla, occurs on the pinehills of W Fla.) somewhat scabrous above: racemes slightly elongate, 8–14-flowered: pedicels 1–3 mm. long: calyx-lobes triangular-subulate, 1–1.5 mm. long, shorter than the tube: corolla 20–25 mm. long, purple; lobes spreading, the posterior ones pubescent at the base: capsule 4.5–5 mm. long, globose.—Moist pinelands, Coastal Plain, N Fla. to La. and Ga.—Fall.

4. A. Harperi Pennell. Stem 4–8 dm. tall, striate-angled, nearly glabrous, simple or slightly branched: leaf-blades 2–3.5 cm. long, narrowly linear, scabrous above: racemes elongate, 8–20-flowered: pedicels 1–2 mm. long: calyx-lobes triangular-lanceolate to triangular-subulate, 0.7–1.5 mm. long, shorter than the tube: corolla 15–18 mm. long, pink; lobes spreading, the posterior lobes pubescent at the base: capsule 4–5 mm. long, globose.—Moist pinelands and marsh-borders, Coastal Plain, S Fla. to Ga.—(*W. I.*)—Fall or all year S.

5. A. fasciculata (Ell.) Raf. Stem 6–12 dm. tall, striate-angled, usually very scabrous, much branched: leaf-blades 1.5–4 cm. long, linear, scabrous above (or with the fascicles only slightly or moderately developed on a slender plant with merely scabrellous stems in *A. fasciculata peninsularis*, of the Everglades, Fla.): racemes elongate, 12–30-flowered: pedicels 2–6 mm. long: calyx-lobes triangular-lanceolate to subulate, 0.5–2 mm. long, much shorter than the tube: corolla mostly 25–35 mm. long; lobes spreading, the posterior lobes pubescent at the base: capsule 5–6 mm. long, ovoid-globose.—Sandy soil, near beaches and in cult. fields and prairies, Coastal Plain, Fla. to Tex. and S. C.; also in adj. provinces, Okla. to Mo.—(*W. I.*)—Sum.–fall, or all year S.

6. A. georgiana (Boynton) Pennell. Stem 3–8 dm. tall, striate-angled, nearly or quite glabrous, simple or branched: leaf-blades 1–1.5 cm. long, linear, somewhat scabrous above: racemes elongate, 12–20-flowered: pedicels 1–4 mm. long: calyx-lobes triangular-lanceolate, 0.5–1 mm. long: corolla 15–18 mm. long; lobes spreading, the posterior pubescent at the base: capsule 3.5–5 mm. long, ovoid-globose.—Dry pinelands, Coastal Plain, N Fla. to Ala. and Ga.—Fall.

7. A. maritima Raf. Stem 0.5–4 dm. tall, nearly terete, glabrous, often bushy-branched: leaf-blades 1.5–3 cm. long, broadly linear, somewhat scabrous above: racemes elongate, 4–10-flowered: pedicels 2–10 mm. long: calyx-lobes triangular, 0.5–1.5 mm. long, obtuse, shorter than the tube: corolla 12–17 mm. long, pink-purple; lobes spreading, somewhat pubescent below and adjacent to the posterior sinus: capsule 5–6 mm. long, globose to globose-ovoid. [*G. maritima* Raf.]—Saltmarshes, Va. to Me.—The species is represented in our range by *A. maritima grandiflora* (Benth.) Pennell (*G. spiciflora* Engelm.), larger plant up to 6 dm. tall, with leaves 2–4 cm. long and corolla 15–20 mm. long, ranging in salt marshes from S Fla. to Tex. and N. C.—(*W. I., Mex.*)

8. A. pulchella Pennell. Stem 6–10 dm. tall, striate-angled, scabrous, much branched: leaf-blades 2–3 cm. long, narrowly linear, very scabrous above: racemes slightly elongate, 4–6-flowered: pedicels 15–30 mm. long, much longer in fruit: calyx-lobes subulate, 0.1–0.5 mm. long: corolla 25–30 mm. long; lobes spreading: capsule 5–6 mm. long, globose.—Pinelands, Coastal Plain, N Fla. to La. and Ga.—Fall.

9. A. filifolia (Nutt.) Raf. Stem 3–8 dm. tall, terete, glabrous, much branched: leaf-blades 1–2 cm. long, narrowly linear to filiform, slightly scabrous above: racemes slightly elongate, 3–12-flowered: pedicels 10–30 mm. long or in fruit nearly twice this length: calyx-lobes linear-subulate, 0.5–1 mm. long: corolla 22–28 mm. long, purple; lobes spreading: capsule 4–5 mm. long, ovoid-globose. [*G. filifolia* Nutt.]—Pinelands, Coastal Plain, S Fla. to Ga.—Fall.

10. A. laxa Pennell. Stem 6–10 dm. tall, nearly terete, glabrous, widely and laxly branched: leaf-blades 2–3 cm. long, narrowly linear to nearly filiform, nearly or quite glabrous above: racemes slightly elongate, 3–8-flowered: pedicels 15–30 mm. long, or in fruit nearly twice as long: calyx-lobes subulate, 0.2–0.5 mm. long: corolla 15–18 mm. long; lobes spreading: capsule 4–5 mm. long, ovoid-globose.—River handhills and old dunes, Coastal Plain, C Fla. to S. C.—Fall.

11. A. setacea (Walt.) Raf. Stem 3–7 dm. tall, somewhat striate-angled, glabrous, much branched: leaf-blades 2.5–3.5 mm. long, narrowly linear to filiform, scabrellous to nearly glabrous above: racemes slightly elongate, 6–10-flowered: pedicels 15–40 mm. long: calyx-lobes triangular-subulate, 0.2–0.5 mm. long: corolla mostly 18–25 mm. long; lobes spreading: capsule 3–4 mm. long, globose-ovoid. [*G. Holmiana* Greene]—Dry pinelands, Coastal Plain and rarely adj. provinces, Ga. to SE N. Y.—Sum.–fall.

12. A. stenophylla Pennell. Stem 6–7 dm. tall, slightly striate-angled, glabrous, much-branched: leaf-blades 2–3 cm. long, filiform-setaceous, nearly or quite glabrous: racemes scarcely elongate, 1–6-flowered: pedicels 8–12 mm. long or in fruit nearly twice this length: calyx-lobes triangular-subulate, 0.1–0.3 mm. long: corolla 17–20 mm. long, not seen fresh; lobes spreading; capsule 3–4 mm. long, globose-ovoid.—Pinelands, C Fla.—Fall.

13. A. Plukenetii (Ell.) Raf. Stem 5–8 dm. tall, striate-angled, glabrous or nearly so, much-branched: leaf-blades 2–3.5 cm. long, setaceous-filiform, scabrellous above: racemes scarcely developed, 1–6-flowered: pedicels mostly 5–10 mm. long: calyx-lobes triangular-subulate to subulate, 0.3–0.5 mm. long; corolla mostly 25–30 mm. long, purple; lobes spreading: capsule 4–5 mm. long, globose. [*G. Plukenetii* Ell.]—Dry pinelands, Coastal Plain, N Fla. to E Miss. and Ga.; also adj. provinces, Ga. to Ala. and SE Tenn.—Fall.

14. A. keyensis Pennell. Stem at least 7 dm. tall, slightly striate-angled, glabrous or nearly so, much branched: leaf-blades (lowest not seen) 0.8–1.2 cm. long, filiform, scabrous above: racemes scarcely developed, only 1–4-flowered: pedicels in flower 3–4 mm. long, in fruit 4–6 mm. long: calyx-lobes triangular-subulate, 0.4–0.6 mm. long: corolla 18–20 mm. long, not seen fresh; lobes spreading: capsule 3–3.5 mm. long, globose.—Pinelands, Big Pine Key, Fla.

15. A. oligophylla Pennell. Stem 3–8 dm. tall, striate-angled, hispidulous, simple or branched: leaf-blades 0.5–1 cm. long, linear-filiform to subulate, scabrous above: racemes scarcely developed: pedicels in flower 5–15 mm. long (2–8 mm. long and calyx-lobes very callose, 0.2 mm. long, in *A. oligophylla pseudaphylla* of long-leaf pineland of S Miss.), in fruit not seen: calyx-lobes triangular-subulate, 0.4–0.6 mm. long; corolla 15–22 mm. long; lobes spreading: capsule not seen. [*G. microphylla* (A. Gray) Small, not *A. microphylla* Raf.]—Long-leaf pineland, Coastal Plain, S La. to E Tex.—Doubtfully E of the Mississippi River, except in above subspecies.

16. A. aphylla (Nutt.) Raf. Stem 5–12 dm. tall, striate-ridged and minutely hispidulous, or sometimes terete and hirsute at the base, simple or branched: leaf-blades appressed, 0.1–0.3 (–0.6) mm. long, triangular-subulate, glabrous above; those near the base with oval more or less pubescent blades: racemes somewhat elongate, 8–20-flowered: pedicels 1–3 mm. long: calyx-lobes subulate tips 0.05–0.2 mm. long; corolla 15–20 mm. long, pink; lobes spreading, the posterior ones pubescent at the base: capsule 3–4 mm. long, globose.—Moist pinelands, Coastal Plain, N Fla. to La. and N. C.—Fall.

17. A. decemloba (Greene) Pennell. Stem 2–5 dm. tall, striate-angled, glabrous, simple or somewhat branched: leaf-blades mostly 2–2.5 cm. long, filiform-linear, scabrous above: racemes somewhat elongate, 3–10-flowered: pedicels in flower 5–15 mm. long, in fruit 12–25 mm. long: calyx-lobes minute, 0.05–0.2 (–0.3) mm. long: corolla 10–15 mm. long, pink; lobes spreading, the posterior pubescent at the base: capsule 3.5–4 mm. long, globose-ovoid. [*G. decemloba* Greene]—Open sterile soil, Piedmont, Blue Ridge, and Appalachian Valley, Ala. to Pa.—Fall.

18. A. tenella Pennell. Stem 5–8 dm. tall, striate-angled, glabrous, branched: leaf-blades mostly 1–1.5 cm. long, linear-filiform to filiform, scabrellous above: racemes somewhat elongate, 8–12-flowered: pedicels 8–25 mm. long, calyx-lobes minute, 0.05–0.2 mm. long; corolla 15–20 mm. long, pink; lobes spreading, the posterior ones pubescent at the base: capsule 3–4 mm. long, globose-ovoid.—Dry pinelands, Coastal Plain, N Fla. to E Ala. and S. C.—Fall.

19. A. erecta (Walt.) Pennell. Stem 3–8 dm. tall, striate-angled, nearly glabrous, simple or branched: leaf-blades mostly 1–1.5 cm. long, linear-cuneate,

scabrous above: racemes slightly elongate, 6–14-flowered: pedicels 3–25 mm. long: calyx-lobes minute, subulate, 0.05–0.15 mm. long: corolla 12–16 mm. long; lobes spreading, the posterior ones pubescent at the base: capsule 3–4 mm. long, globose-ovoid to globose-ellipsoid. [*G. parvifolia* (Benth.) Chapm.]—Pinelands, Coastal Plain, Fla. to La. and Del.—Fall.

20. **A. Gattingeri** Small. Stem 2–5 dm. tall, nearly terete, nearly glabrous, much-branched: leaf-blades 2–3 cm. long, narrowly linear, scabrellous above: racemes scarcely developed, 1–5-flowered: pedicels in flower 2–25 mm. long, in fruit 8–30 mm. long; calyx-lobes triangular-lanceolate, 0.5–1.8 mm. long, much shorter than the tube: corolla 12–18 mm. long, pink; lobes spreading, the posterior ones pubescent at the base: capsule 4–5 mm. long, globose to globose-ovoid. [*G. Gattingeri* Small]—Open woods, in sterile soil, barrens, and bluffs, Appalachian Valley and more N and W provinces, Ala. to Tex., Minn., and Ont.—Sum.–fall.

21. **A. tenuifolia** (Vahl) Raf. Stem 1–8 dm. tall, striate-angled, nearly glabrous, much branched: leaf-blades 2–5 cm. long, narrowly linear (linear-filiform to filiform and corollas 9–12 mm. long, in *A. tenuifolia polyphylla* of the granite regions of Ga.; widely linear and 3–7 cm. long, calyx-lobes 1–2 mm. long, and capsules 5–7 mm. long, in *A. tenuifolia macrophylla* of the Miss. Valley), scabrous above: racemes much elongate, 6–34-flowered: pedicels in flower 7–20 mm. long, in fruit 12–27 mm. long: calyx-lobes triangular-subulate to subulate, 0.2–1 mm. long: corolla 10–15 mm. long (15–23 mm. long and capsule 5–7 mm. long, in *A. tenuifolia leucanthera* of the Coastal Plain, N Fla. to Tex. and Ga.), purple, the posterior lobes concave-arched, glabrous: capsule 3–4 (–7) mm. long, globose. [*G. tenuifolia* Vahl.]—Woodlands, various provinces, Ga. to La., Mo., Mich., and Me.—Sum.–fall.

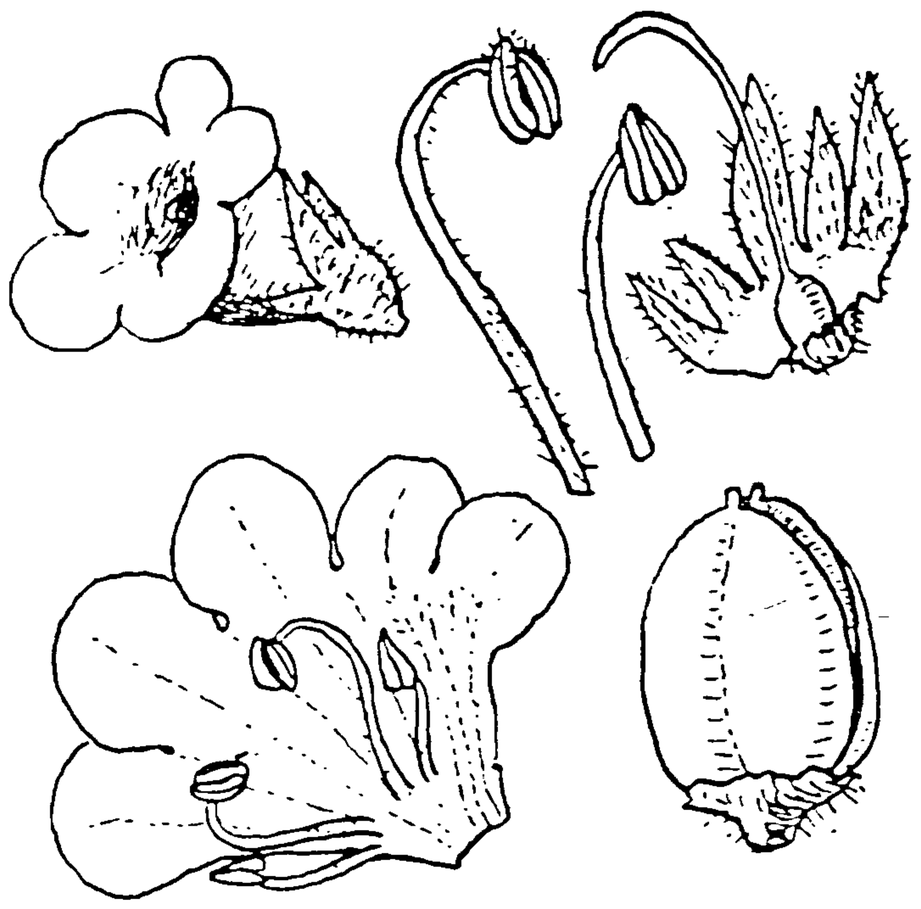
22. **A. divaricata** (Chapm.) Pennell. Stem 3–8 dm. tall, striate-angled, glabrous, much-branched: leaf-blades 1.5–2 cm. long, filiform, scabrellous above: racemes elongate, 6–12-flowered: pedicels 15–32 mm. long: calyx-lobes subulate, 0.1–0.3 mm. long, much shorter than the tube: corolla 15–18 mm. long, the posterior lobes flattened-projecting and glabrous at the base: capsule 3–4 mm. long, globose to ovoid-globose, not seen mature. [*G. divaricata* Chapm.]—Dry pineland, NW Fla. and SE Ala.—Fall.

23. **A. filicaulis** (Benth.) Pennell. Stem 1–5 dm. tall, obscurely striate, glabrous, with a few lax branches: leaf-blades 0.1–0.2 cm. long, triangular-subulate, appressed, scabrellous above: racemes not developed, the flowers nearly always solitary: pedicels in flower 5–8 mm. long, in fruit 6–10 mm. long: calyx-lobes triangular-subulate, 0.1–0.3 mm. long: corolla 10–13 mm. long, the posterior lobes flattened-projecting and glabrous at the base: capsule about 3 mm. long, globose. [*G. filicaulis* Benth.]—Moist grassy pinelands, Coastal Plain, N Fla. to E La. and Ga.—Fall.

24. **A. linifolia** (Nutt.) Britton. Stem 8–15 dm. tall, terete, glabrous, simple or virgately branched: leaf-blades 3–5 cm. long, linear, glabrous: racemes elongate, 8–20-flowered: pedicels 5–25 mm. long: calyx-lobes minute, subulate: corolla 30–40 mm. long; lobes spreading, lanose on the basal portions of the posterior: capsule 6–7 mm. long, globose to globose-ovoid. [*G. linifolia* Nutt.]—Wet pinelands, Coastal Plain, S Fla. to La. and Del.—Sum.–fall.

34. **TOMANTHERA** Raf. Annual root-parasitic herbs, the stems simple or branched, pubescent. Leaves opposite, cauline: blades entire, lobed at the base, or pinnately parted, sessile. Flowers in spikes with foliaceous bracts. Calyx-lobes 5, unequal, longer than the tube. Corolla purple: throat campanulate, somewhat inflated anteriorly: lobes much shorter than the tube, the 2

posterior arched, the 3 anterior spreading. Stamens 4, didynamous, included: anthers lanose. Stigma elongate. Capsule short, glabrous, loculicidal. Seeds numerous, reticulate, wingless. [*Otophylla* Benth.]—Two species, eastern North American.

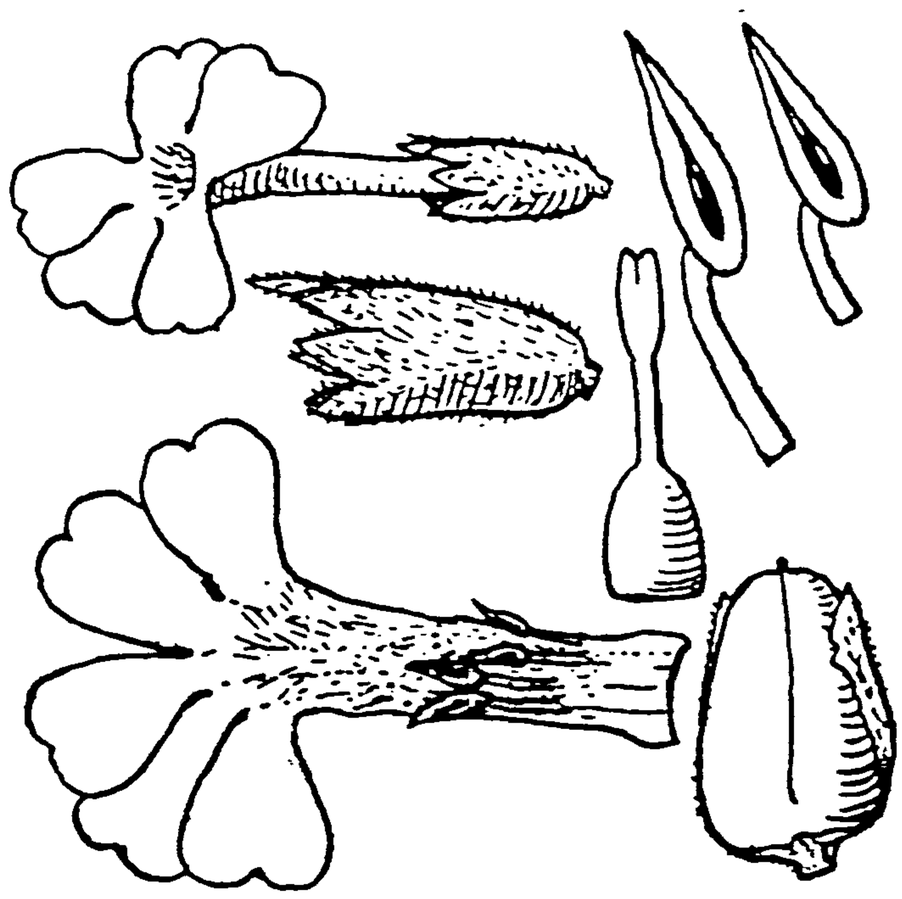


1. T. auriculata (Michx.) Raf. Stem 1.5–8 dm. tall, 4-angled, hispid: leaf-blades 2.5–5.5 cm. long, lanceolate to lanceolate-ovate, rough-pubescent above: calyx-tube 5–8 mm. long, retrorse-pubescent; lobes 9–12 mm. long, ovate-lanceolate; corolla 20–23 mm. long, externally pubescent; the throat spotted with deep-purple anteriorly: capsule broadly ovoid, 10–13 mm. long, mucronate. [*O. Michauxii* Benth. *O. auriculata* (Michx.) Small]—Prairies and old fields, various provinces; introduced, Ala. to Tenn. and Pa.; native from Ill. to Tex., Kans., and Minn.—Sum.

35. **BUCHNERA** L. Perennial mostly pubescent herbs with short rootstocks, the stem simple. Leaves opposite, the lower sessile or nearly so, the upper clasping, toothed, all rough-pubescent. Flowers in a slender terminal spike, each axillary to a bract and with 2 narrower bractlets. Calyx-lobes 5, short. Corolla violet or white, salverform: tube very slender, pubescent: lobes nearly uniform. Stamens 4, included, slightly didynamous: anthers 1-celled. Stigma linear-cylindric. Capsule ovoid, included, loculicidal. Seeds numerous, reticulate, wingless.—About 100 species, in warm regions.—BLUEHEARTS.

Leaf-blades obscurely, if at all, 3-veined, repand-dentate or entire: capsule usually about 5 mm. long: stem finely rough-pubescent or nearly glabrous.
  Corolla-tube about twice as long as the calyx: calyx-lobes triangular-acute, the anterior sinus only slightly deeper than the others: bracts 1.5–3 mm. long.
    Blades of the lower leaves lanceolate to linear-lanceolate, acute or acuminate: corolla-lobes usually 6–9 mm. long. 1. *B. elongata.*
    Blades of the lower leaves elliptic-lanceolate, obtuse: corolla-lobes 3–5 mm. long. 2. *B. floridana.*
  Corolla-tube little longer than the calyx: calyx-lobes lanceolate-acuminate, the anterior sinus much deeper than the others: bracts 3–4 mm. long. 3. *B. breviflora.*
Leaf-blades clearly 3-veined, sinuate-toothed or lacerate: capsule usually 6–7 mm. long: stem hirsute. 4. *B. americana.*

1. B. elongata Sw. Stem 3–7 dm. tall, sparsely pilose or glabrate: leaf-blades rough-pubescent, the larger lanceolate to linear-lanceolate, 3–8 cm. long: bracts 1.5–3 mm. long, spreading or ascending-appressed: calyx-lobes triangular-acute to triangular-acuminate, 0.5–1 mm. long, the anterior sinus scarcely deeper than the others: corolla violet or white; tube 7–10 mm. long; lobes 6–9 mm. long, oblanceolate to narrowly obovate: capsule 5 mm. long.—Prairies and pinelands, S Fla.—[*W. I.*]—All year.



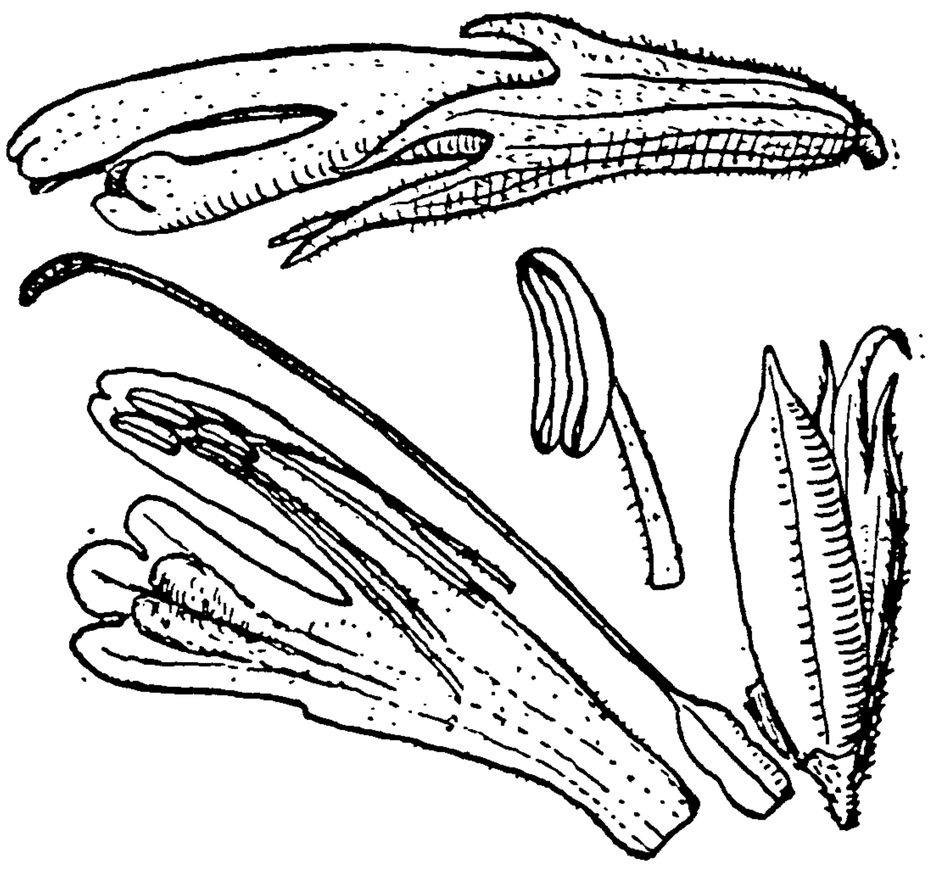
2. B. floridana Gandoger. Stem 3–6 dm. tall, slightly pilose, or glabrate above: leaf-blades rough-pubescent, the larger elliptic-lanceolate, 2.5–5.5 cm. long: bracts 2–3 mm. long, spreading: calyx-lobes triangular-acute, 0.5–1 mm. long, the anterior

sinus the deeper: corolla violet or white; tube 7–8 mm. long; lobes 3–5 mm. long, triangular-obovate: capsule about 5 mm. long.—Pinelands, Coastal Plain, pen. Fla. to Tex. and N. C.—Spr.–fall.

3. **B. breviflora** Pennell. Stem 3–6 dm. tall, pilose below: leaf-blades rough-pubescent, the larger lanceolate to elliptic, 4–8 cm. long: bracts 3–4 mm. long, ascending-appressed: calyx-lobes lanceolate-acuminate, 1–2 mm. long: corolla violet; tube 6–7 mm. long, very densely pilose at the mouth; lobes 2–4 mm. long, triangular-obovate, rounded or slightly emarginate: capsule not seen mature.—Prairies and pinelands, Coastal Plain, C pen. Fla. to Tex. and S. C.—Spr.

4. **B. americana** L. Stem 3–8 dm. tall, most copiously hirsute below: leaf-blades hispid, the larger ovate-lanceolate or elliptic-lanceolate, 3–7 cm. long: bracts 2–4 mm. long, ascending or spreading: calyx-lobes acuminate-cuspidate, mostly 1–1.5 mm. long: corolla violet; tube 9–11 mm. long, strongly pilose at the mouth; lobes 5–8 mm. long, oblanceolate, rounded or emarginate: capsule usually 6–7 mm. long: seeds about 0.5 mm. long.—Sandy or sterile open soil, often in meadows, various provinces N of Coastal Plain, Ga. to Tex., Ill., Ont., and Pa.—Spr.–early sum.

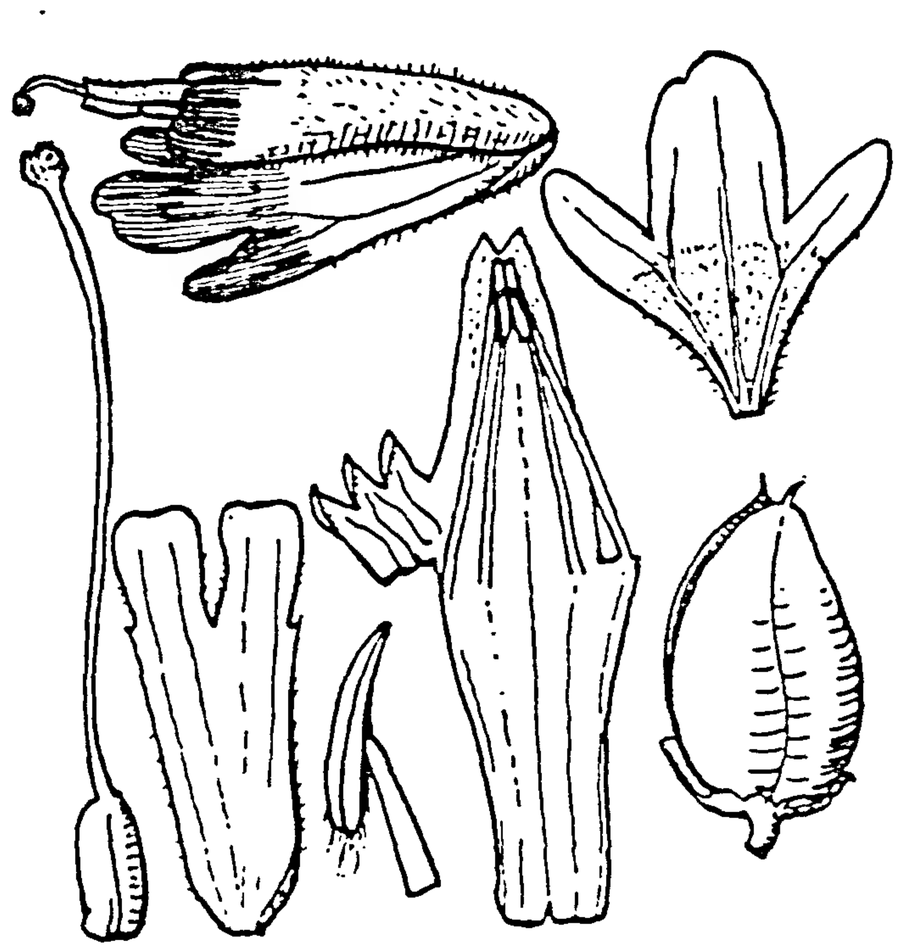
36. **SCHWALBEA** L. Perennial pubescent herbs, the stem simple. Leaves alternate, all cauline: blades entire, rather broad, 3-veined, sessile. Flowers in a raceme, each pedicel subtended by 2 bractlets, the short stalks axillary to bracts which are shorter than the calyx. Calyx-lobes 5, unequal, the posterior one short, narrow, the anterior pair well united, broad. Corolla 2-lipped: posterior lip nearly entire: anterior lip 3-lobed, the throat with 2 slightly pubescent ridges. Stamens 4, included, didynamous: anthers nearly glabrous. Stigma capitate. Capsule stout, included in the calyx, septicidal and secondarily slightly loculicidal. Seeds narrow, flat, winged.—Two species, eastern North American.



1. **S. australis** Pennell. Stem 4–8 dm. tall, finely pubescent with ascending hairs: leaf-blades 3–4 cm. long, elliptic-oval, obscurely reticulate, strigillose; pedicels 3–5 mm. long: bractlets 5–8 mm. long: calyx-lobes acute or acuminate; posterior one 7–10 mm. long; anterior lip 20–22 mm. long: corolla about 30 mm. long, yellow, and distally purplish: capsule cylindric-ovoid or ellipsoid, 10–12 mm. long: seeds 2.5 mm. long, slightly curved.—(CHAFF-SEED.)—Sandy oak woods and pinelands, Coastal Plain, C Fla. to La. and S. C.; and adj. provinces, Ala. to E Tenn.—Spr.–sum.

37. **CASTILLEJA** Mutis. Annual pubescent herbs, the stem simple or branched. Leaves alternate, the basal ones forming a semi-persistent rosette: blades entire or pinnately cleft, sessile or nearly so. Flowers spicate. Bracts foliaceous, shorter and broader than the leaves, red or yellowish towards the ends. Bractlets none. Calyx-lobes 4 (the posterior sepal lacking), united sagitally about half their length, those of each side completely fused; distally

red or yellowish. Corolla 2-lipped, yellowish-green: posterior lip long and narrowly arched: anterior lip very short, of 3 thickened lobes. Stamens 4, included, didynamous: anthers coherent, glabrous. Stigma capitate. Capsule stout, the carpels equal, loculicidal. Seeds turgid, reticulate, wingless.—About 200 species, mostly American; 2 or 3 Asiatic.

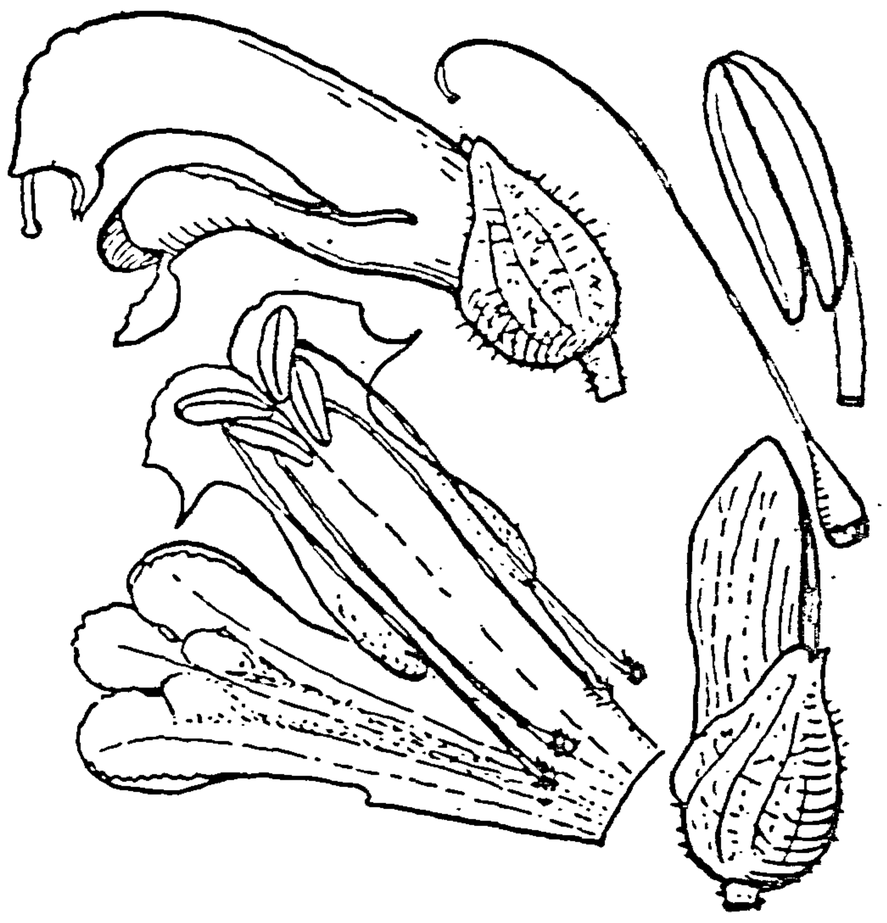


1. C. coccinea (L.) Spreng. Stem 2–6 dm. tall, arising from a rosette of elliptic to ovate, nearly or quite entire leaf-blades: cauline leaves few; blades linear-lanceolate, with 1 or 2 pairs of divaricate lobes: bracts overlapping, ovate, 3-lobed, distally scarlet, or exceptionally yellow: calyx 18–23 mm. long: corolla 18–25 mm. long: capsule narrowly-ovoid, 11–13 mm. long.—(PAINTED-CUP. INDIAN PAINTBRUSH.)—Grassy meadows and moist woods, various provinces, in Coastal Plain only northward, Ga. to Ark., Kans., Man., and Me.—Spr.

38. **PEDICULARIS** L. Perennial herbs, the stems often gregarious, glabrous or pubescent. Leaves opposite or alternate, all cauline or tufted on basal shoots: blades pinnately lobed, often thickish. Flowers closely spicate, usually leafy-bracted. Bractlets none. Calyx-lobes 4 (the posterior sepal lacking), shorter than the tube, those of each side completely fused. Corolla 2-lipped, yellow or purple: posterior lip arched and decurved: anterior lip 3-lobed, obliquely spreading. Stamens 4, included, slightly didynamous. Stigma capitate. Capsule ensiform-lanceolate, the carpels unequal, the posterior loculicidal. Seeds few, flat, wingless.—About 350 species, of the Northern Hemisphere, mainly in the Old World.—LOUSEWORTS. FERNLEAFS.

Stem hirsute: leaves alternate; blades deeply pinnatifid: calyx-lobes broadly acute, entire: capsule twice as long as the calyx. 1. *P. canadensis.*
Stem glabrous: leaves opposite; blades shallowly pinnatifid: calyx-lobes with a slightly enlarged crenate tip: capsule scarcely exceeding the calyx. 2. *P. lanceolata.*

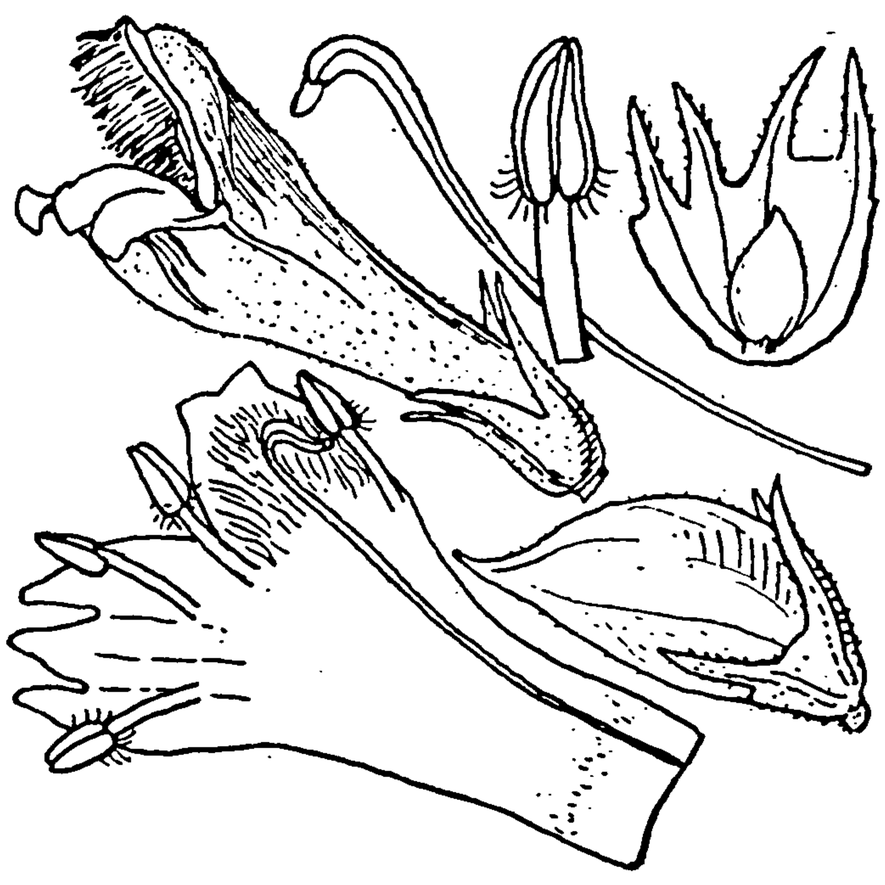
1. P. canadensis L. Stem 1–3 dm. tall: leaf-blades petioled, elliptic-oval, with long crenate lobes separated by deep broad sinuses: flower-rachis lanate: calyx 7–9 mm. long, hirsute, on each side entire: corolla 18–23 mm. long, yellow, or with the posterior lip purple, or purplish throughout, the anterior lip not close to the posterior one: capsule 13–16 mm. long, nearly beakless: seeds 1.5 mm. long, finely lined.—(WOOD-BETONY.)—Sandy or sterile soil, woods and knolls in meadows, various provinces, N Fla. to Tex., Man., and N. S.—Spr.



2. P. lanceolata Michx. Stem 4–8 dm. tall: leaf-blades sessile or nearly so, elliptic-lanceolate, with short crenulate lobes separated by shallow narrow sinuses: flower-rachis glabrous: calyx 9–11 mm. long, glabrous or nearly so, on each side terminating in a crenate leaf-like tip: corolla 18–23 mm.

long, yellow, the anterior lip appressed to or partly investing the posterior one: capsule 10–12 mm. long, obliquely pointed: seeds 2.5 mm. long.—(SWAMP-LOUSEWORT.)—Wet meadows and swales, Blue Ridge and more N provinces, N. C. to Nebr., Man., and Mass.—Sum.–fall.

39. **MELAMPYRUM** L. Annual herbs, the stem minutely pubescent. Leaves opposite, all cauline: blades usually entire, thin. Flowers loosely racemose, axillary to foliaceous, entire or basally fimbriate bracts. Bractlets none. Calyx-lobes 4 (the posterior sepal lacking), as long as the tube or longer, nearly equal, the posterior and anterior pairs divaricate. Corolla 2-lipped, mainly white: posterior lip arched and hooded: anterior lip slightly 3-lobed with a densely puberulent palate. Stamens 4, included, didynamous: filaments glabrous: anthers cohering, pubescent, mucronate at base. Stigma capitate. Capsule somewhat decurved, the carpels unequal, the posterior cavity loculicidal. Seeds 2 in each cavity, plump, smooth, wingless.—About 50 species, of the Northern Hemisphere.



1. M. lineare Desr. Stem 1–4 dm. tall: leaf-blades linear to lanceolate-linear: 2–6 cm. long: bracts conspicuously fimbriate: calyx-lobes ovate-caudate, 2–4 mm. long: corolla 7–10 mm. long: posterior lip yellowish-tipped, ciliolate; anterior lip flat, the palate egg-yellow: capsule ensiform-ovate, 5–7 mm. long: seeds ovoid, 2–3 mm. long, mostly brown. [*M. americanum* (Chapm. Fl.)]—(COW-WHEAT.)—Open woods, old fields, and pastures, Coastal Plain and adj. provinces, N. C. to N. Y.—*M. latifolium* Muhl. perhaps not specifically distinct, with larger leaf-blades varying from ovate to linear-lanceolate, shortly fimbriate or entire bracts, a broader capsule, and seeds 3–4 mm. long, ranges, in the Blue Ridge and adj. provinces, from Ga. to Wis., Que., and N. S.

FAMILY 15. **ACANTHACEAE** — ACANTHUS FAMILY

Herbs or shrubs. Leaves alternate, opposite, or whorled: blades simple. Flowers perfect, irregular. Calyx of usually 5 partly united sepals. Corolla of 5 partly united petals, 2-lipped or sometimes essentially regular. Androecium of 4 didynamous, or of 2 equal stamens, one pair being abortive or obsolete. Gynoecium of 2 united carpels. Ovary 2-celled. Ovules commonly 2 in each cavity. Fruit a capsule, often with a stipe-like base, the valves opening elastically.—About 175 genera and 2,000 species, widely distributed in temperate and tropical regions.

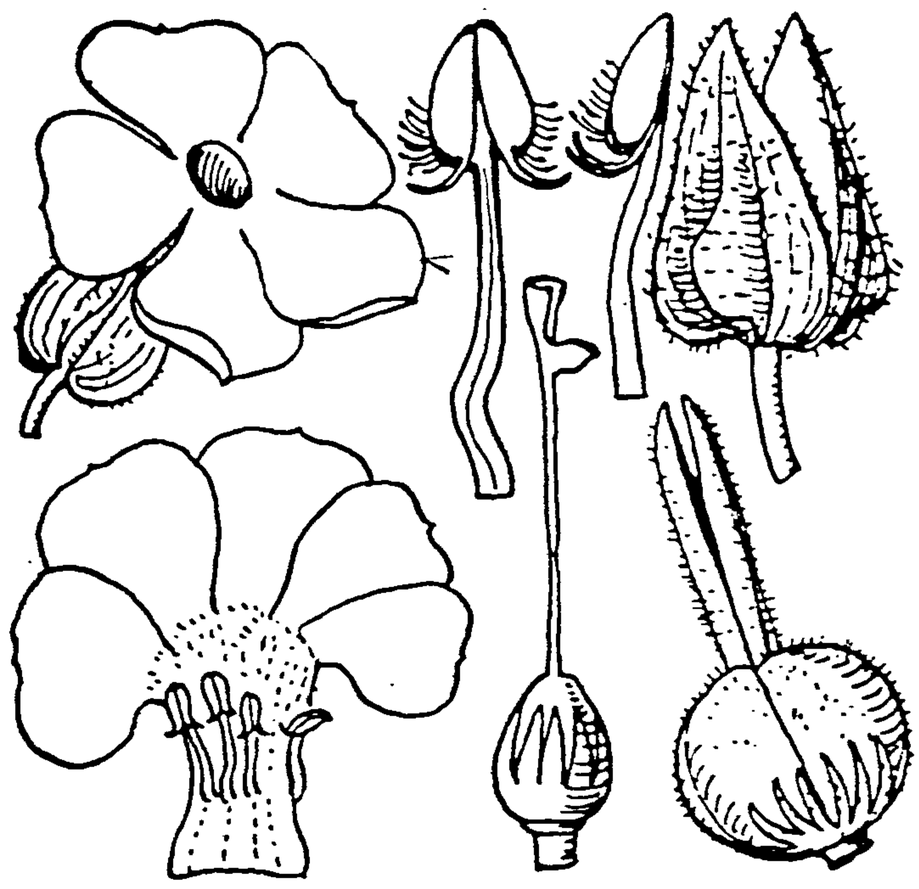
Vines: seeds globular. — 1. THUNBERGIA.
Erect or diffuse herbs: seeds flat.
  Leaves normal only at the base of the stem, those on the stem reduced to firm sheathing imbricate scales and passing into the inflorescence. — 2. TUBIFLORA.
  Leaves normal on the stem.
    Corolla convolute in the bud.
      Corolla conspicuously 2-lipped: capsule terete, not constricted at the base. — 3. HYGROPHILA.
      Corolla barely if at all 2-lipped: capsule constricted into a stipe-like base.

Anther-sacs mucronate or aristulate at the base: corolla with a short tube and a campanulate throat. 4. DYSCHORISTE.
Anther-sacs rounded at the base: corolla with a long tube and a funnelform or campanulate throat. 5. RUELLIA.
Corolla imbricated in the bud.
Stamens 4: anthers 1-celled. 6. GERARDIA.
Stamens 2: anthers 2-celled.
Anther-sacs parallel, closely contiguous.
Corolla strongly 2-lipped. 7. DIAPEDIUM.
Corolla slightly 2-lipped. 8. YEATESIA.
Anther-sacs separated on a dilated connective.
Anther-sacs nearly similar in size and shape, the lower sac short-stalked. 9. DIANTHERA.
Anther-sacs dissimilar, more or less unequal, and the lateral one, at least, pointed at the base, sessile. 10. JUSTICIA.

1. **THUNBERGIA** L. f. Climbing vines (ours). Leaf-blades more or less hastate or sagittate and toothed. Flowers on axillary peduncles, subtended by a pair of foliaceous bracts. Calyx persistent: lobes 10–16, narrow. Corolla salverform, with a short tube, a long throat, and a limb with 5 broad lobes. Stamens 4, didynamous. Capsule subtended by the persistent bracts, with a roundish body and a flat beak.—About 40 species, in the Old World tropics.—Sum. or all year S.

Petioles wing-margined: corolla yellow or ochroleucous, with a purple eye: capsule-beak somewhat longer than the body. 1. *T. alata.*
Petioles not wing-margined: corolla white: capsule-beak much longer than the body. 2. *T. fragrans.*

1. T. alata Bojer. Leaf-blades triangular-ovate to hastate, 3–11 cm. long, undulate or sinuate-toothed, cordate at the base: calyx-lobes subulate, mostly 10–12, longer than the tube: corolla-limb 2.5–3.5 cm. wide, the lobes rounded or undulate: capsule-beak somewhat longer than the diameter of the body.—(BLACK-EYED SUSAN.)—Prairies, roadsides, and waste-places, Fla. Nat. of Africa.

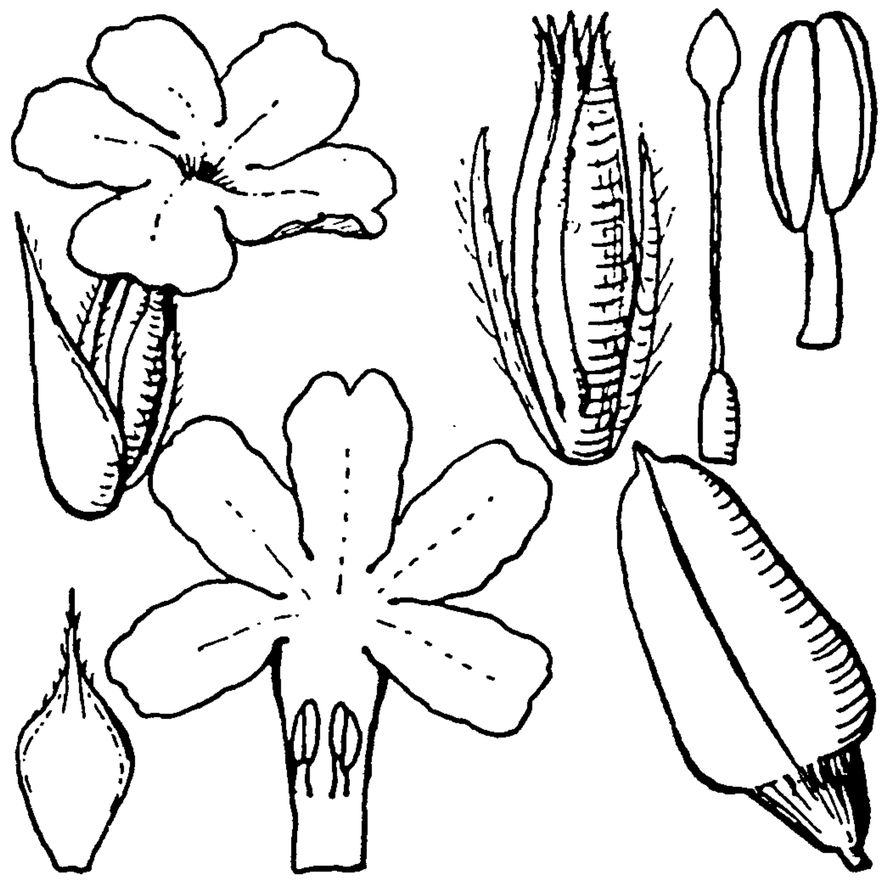


2. T. fragrans Roxb. Leaf-blades lanceolate to ovate, coarsely toothed near the base and more or less hastate, 4–11 cm. long, truncate to cordate at the base: calyx-lobes lanceolate, 12–16, unequal, about half as long as the tube or longer: corolla-limb 3.5–4.5 cm. wide, the lobes truncate: capsule-beak nearly twice as long as the body. — (WHITE-THUNBERGIA.) — Fence-rows, roadsides, waste-places, and hammocks, Fla. Nat. of Asia.

2. **TUBIFLORA** J. F. Gmel. Rigid herbs with several basal leaves and flower stems with many rigid sheathing scales. Flowers in terminal spikes, subtended by bractlets somewhat shorter than the calyx. Calyx-lobes glumaceous, 4 or 5, the lateral ones the narrower. Corolla white or blue, slightly 2-lipped. [*Elytraria* Vahl.]—About 10 species, American.

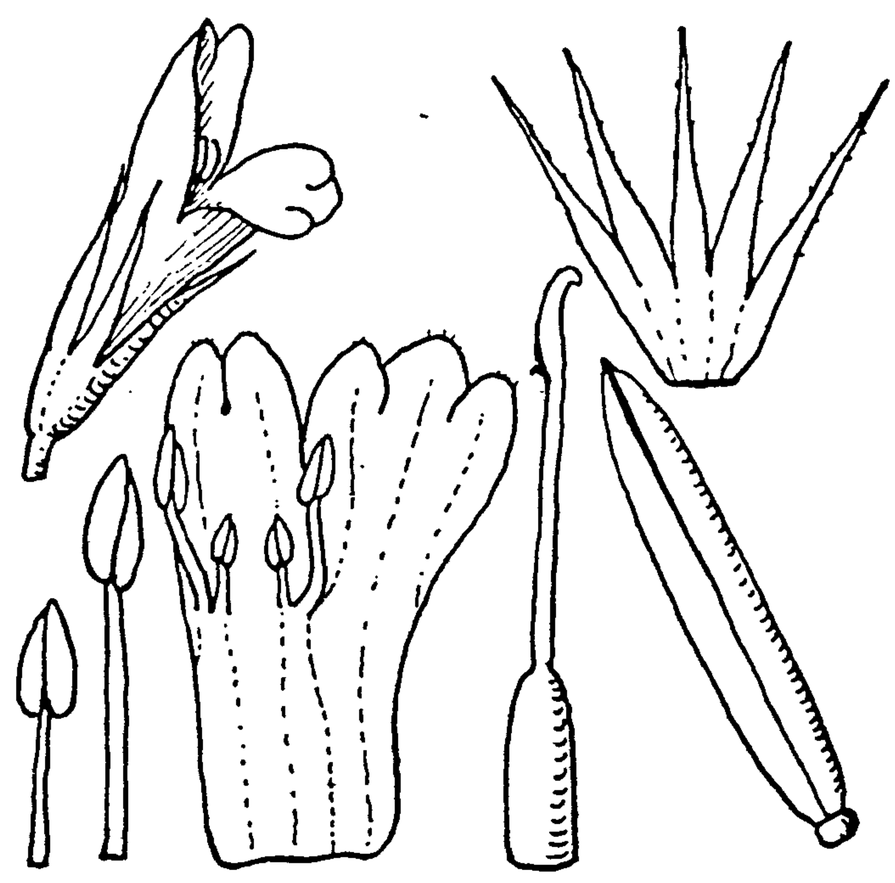
Basal leaves more or less spreading: blades narrow and elongate. 1. *T. angustifolia.*
Basal leaves erect; blades broad and relatively short. 2. *T. carolinensis.*

1. T. angustifolia (Fernald) Small. Stem 2–6 dm. tall: basal leaves 4–30 cm. long; blades linear, elongate linear-spatulate or narrowly oblanceolate: bracts ciliate: bractlets very narrow: calyx-lobes 6–7.5 mm. long, short-ciliate at the tip: corolla-lobes much shorter than the tube: capsule about equalling the calyx, the body 4–5 mm. long. Everglades, S Fla.—Spr.–fall.



2. T. carolinensis (Walt.) J. F. Gmel. Stem 2–5 dm. tall: basal leaves 5–20 cm. long; blades elliptic to spatulate: bracts ciliate: bractlets rather broad: calyx-lobes 8–9.5 mm. long, long-ciliate at the tip: corolla-lobes nearly as long as the tube: capsule often exserted at the tip, the body 5–7 mm. long. [*E. virgata* Michx.]—Low grounds, especially calcareous, Coastal Plain, Fla. to S. C.—Sum.

3. HYGROPHILA R. Br. Annual or perennial weak herbs. Flowers solitary or clustered in the axils. Calyx 5-lobed, the lobes nearly equal. Corolla mainly white, strongly 2-lipped. Stamens 4, didynamous. Capsule cylindric.—About 30 species, tropical.



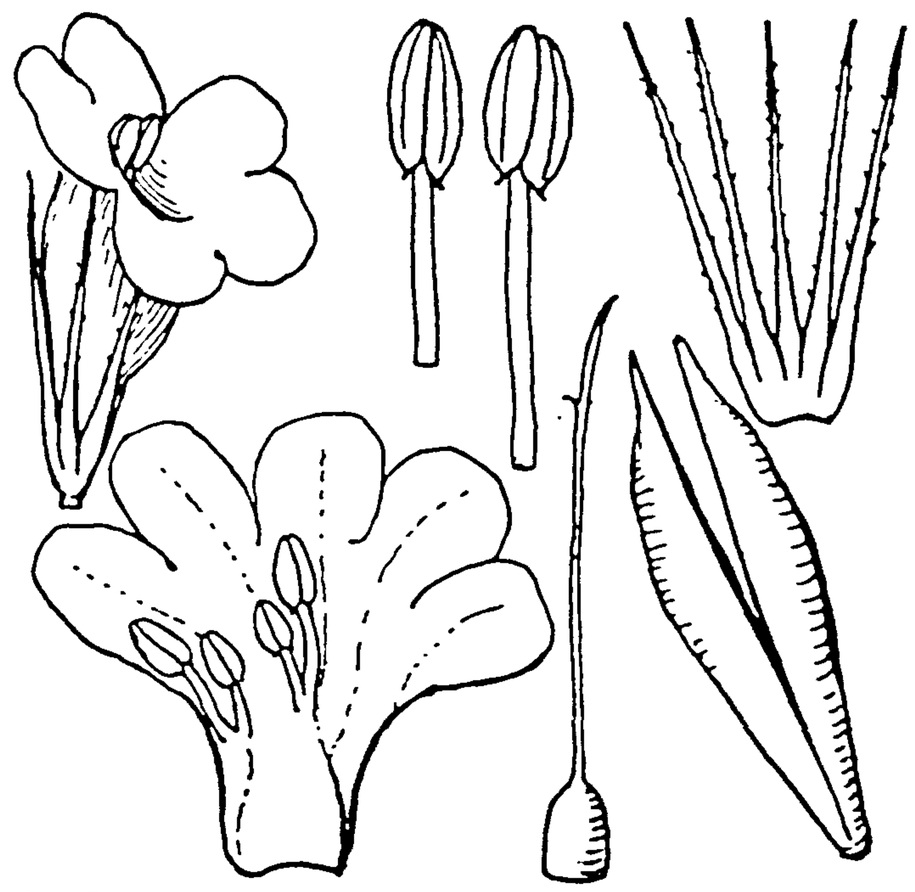
1. H. lacustris (Schlecht.) Nees. Stem 3–9 dm. long: leaf-blades nearly linear or narrowly linear-lanceolate, 5–12 cm. long: calyx-lobes narrowly linear-subulate, 5–7 mm. long: corolla 7 mm. long; lobes of the lower lip ovate: capsule 7–8 mm. long.—Swamps and muddy banks, Coastal Plain, Fla. to Tex.—(*Mex.*)—Sum.–fall.—The score and a half species of this genus are all swamp or marsh inhabitants. The sole species in the continental United States inhabits the river-bottoms from western Florida to Texas. It reaches its greatest development in the lower Mississippi Delta.

4. DYSCHORISTE Nees. Herbs or woody plants: leaf-blades entire. Flowers solitary or clustered in the axils. Calyx-lobes 5, very slender. Corolla blue, purple, or rarely white, somewhat 2-lipped. Capsule 2–4-seeded. [*Calophanes* D. Don.]—About 30 species widely distributed in warm and tropical regions.

Calyx-lobes nearly as long as the corolla; corollas and the bractlets about equal in length. 1. *D. humistrata.*
Calyx-lobes less than ½ as long as the corolla; which is fully twice as long as the bractlets.
  Corolla 1 cm. long or shorter: leaf-blades of a linear type. 2. *D. angusta.*
  Corolla fully 2 cm. long: leaf-blades mainly of an elliptic type. 3. *D. oblongifolia.*

1. D. humistrata (Michx.) Kuntze. Stem 1–4 dm. long: leaves few; blades 2–3 cm. long, elliptic to elliptic-ovate: calyx puberulent; lobes subulate-seta-

ceous from a lanceolate base, 6–8 mm. long: corolla about 1 cm. long; limb about 10 mm. wide: capsule 8–10 mm. long.—River-swamps, Coastal Plain, Fla. and Ga.—Spr.



2. D. angusta (A. Gray) Small. Stem 1–2 dm. tall: leaves numerous; blades 1–2.5 cm. long, spatulate below to linear-elliptic or linear above: calyx-lobes linear-subulate, 9–11 mm. long: corolla limb about 10 mm. wide: capsule 7–8 mm. long.—Pinelands and open sandy hammocks, S Fla.—All year.

3. D. oblongifolia (Michx.) Kuntze. Stem 1–3 dm. tall: leaves few; blades 1–3 cm. long, obovate to cuneate below, elliptic above: calyx-lobes 12–15 mm. long: corolla-limb 15 mm. wide: capsule 10–13 mm. long.—Sandhills and pinelands, Coastal Plain, Fla. to Va.—Spr.–fall.

5. RUELLIA [Plum.] L. Caulescent herbs. Leaf-blades entire or toothed. Flowers axillary or sometimes in terminal clusters. Calyx 5-lobed, the lobes narrow. Corolla nearly regular. Capsule 6–20 seeded.—About 200 species, mostly tropical American.

Flowers or flower-clusters sessile or essentially so. — I. PARVIFLORAE.
Flowers or flower-clusters peduncled. — II. PEDUNCULATAE.

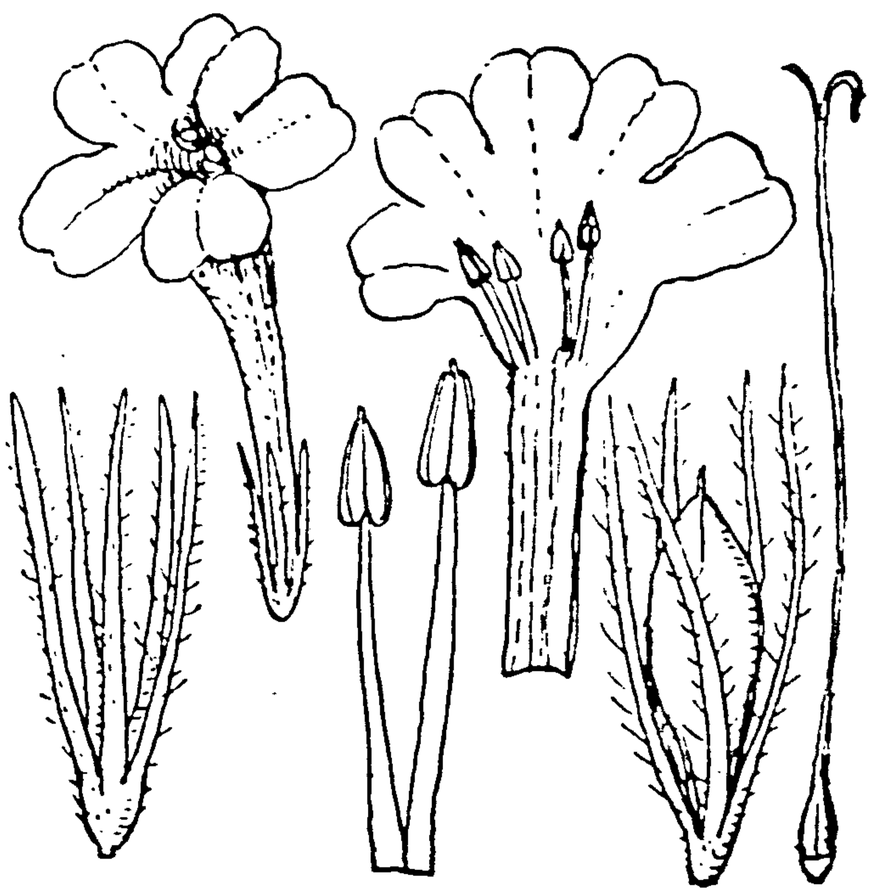
I. PARVIFLORAE

Calyx-lobes linear-filiform or with filiform tips, longer than the capsule.
  Corolla 4–6 cm. long.
    Stem less than 1 dm. tall. — 1. *R. humilis.*
    Stem over 2 dm. tall.
      Leaf-blades sessile or essentially so. — 2. *R. ciliosa.*
      Leaf-blades manifestly petioled.
        Plant green or purple-tinged: leaf-blades not conspicuously veined beneath.
          Leaf-blades thick: stem succulent, fistulose. — 3. *R. succulenta.*
          Leaf-blades thin: stem woody, not fistulose. — 4. *R. parviflora.*
        Plant grayish-pubescent: leaf-blades prominently veined beneath. — 5. *R. hybrida.*
  Corolla 7–10 cm. long. — 6. *R. noctiflora.*
Calyx-lobes linear-lanceolate or broadly linear, scarcely longer than the capsule. — 7. *R. strepens.*

II. PEDUNCULATAE

Erect gregarious plant with narrow leaf-blades. — 8. *R. malacosperma.*

1. R. humilis Nutt. Stem 1–3 cm. tall, hirsute or villous-hirsute, or almost wanting: leaf-blades spatulate to elliptic or oval, 3–10 cm. long: calyx hirsute; lobes linear-subulate, 15–20 mm. long: corolla blue or nearly white, 4–5 cm. long; tube 1–2 mm. thick: capsule 15–17 mm. long.—Sandy soil, Coastal Plain, Fla. to Miss. and Ga.—Spr.–fall.



2. R. ciliosa Pursh. Stem 2–6 dm. tall, hirsute: leaf-blades oval, ovate, or elliptic, 2–5 cm. long: calyx hirsute; lobes filiform-subulate, 15–20 mm. long: corolla blue, 5–7 cm. long: tube 1–2 mm. thick: capsule 10–15 mm. long.—Dry soil, various provinces, Fla. to Tex., Kans., Mich., and N. J.—Spr.–fall.

3. R. succulenta Small. Stem 1.5–5 dm. tall, inconspicuously puberulent: leaf-blades

narrowly elliptic to spatulate, 2.5–4.5 cm. long; calyx sparingly ciliate or glabrous; lobes linear-filiform, 13–16 mm. long: corolla deep purplish-blue, about 4 cm. long.—Everglades, Fla.—All year.

4. **R. parviflora** (Nees) Britton. Stem 2–6 dm. tall, sparingly pubescent but green: leaf-blades elliptic to elliptic-lanceolate, 3–10 cm. long: calyx hirsute; lobes linear-filiform, 15–20 mm. long: corolla blue, 4–5 cm. long; tube 1.5–2 mm. thick: capsule barely 15 mm. long.—Sandy soil, Coastal Plain and adj. provinces, Fla. to Tex., Ind., and N. J.—Spr.–fall.

5. **R. hybrida** Pursh. Stem 2–6 dm. long, often diffusely spreading, grayish pubescent: leaf-blades elliptic to elliptic-lanceolate, 3–10 cm. long: calyx hirsute; lobes linear-filiform, 15–20 mm. long: corolla light-blue, 4–5 cm. long: capsule 10–16 mm. long.—Pinelands, Fla.—Spr.–sum.

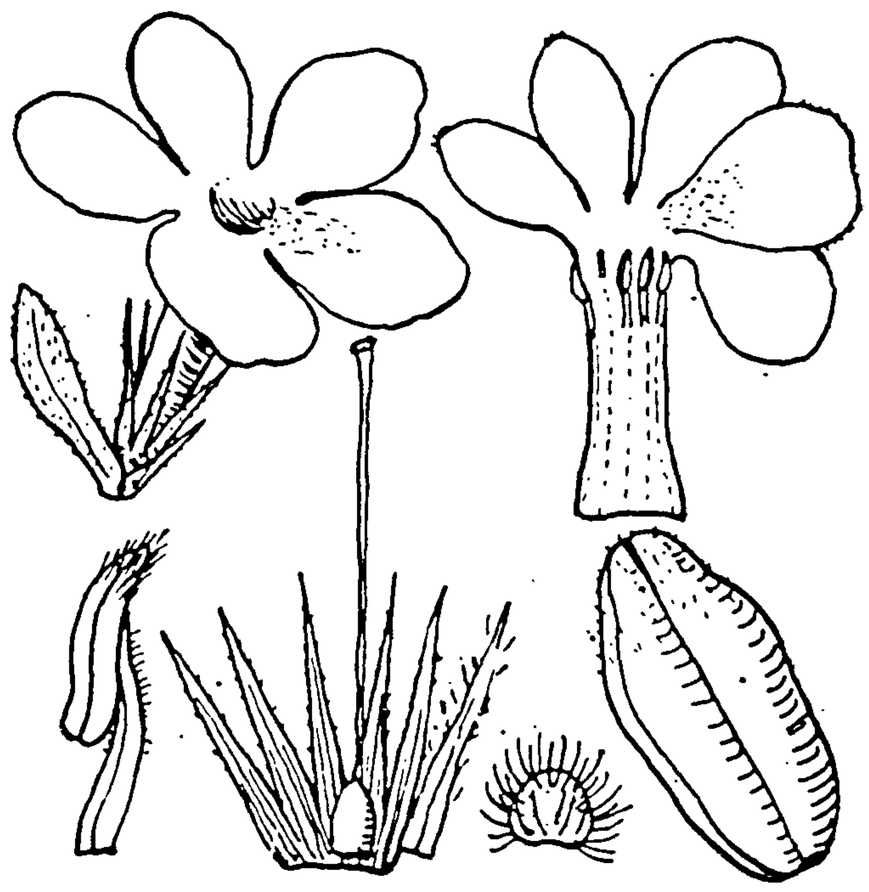
6. **R. noctiflora** (Nees) A. Gray. Stem 1–3 dm. tall, minutely pubescent: leaf-blades elliptic, sometimes narrowly so or elliptic-lanceolate, 4–7 cm. long: calyx softly pubescent; lobes linear-filiform, 25–35 mm. long: corolla blue or nearly white, about 9 cm. long; tube about 2 mm. thick: capsule about 25 mm. long.—Pinelands, Coastal Plain, Fla. to Miss. and Ga.—Spr.–sum.

7. **R. strepens** L. Stem 2–12 dm. tall, glabrous or finely pubescent; leaf-blades ovate to elliptic, 5–15 cm. long: corolla blue or nearly white, 5–6 cm. long: capsule 10–15 mm. long.—Dry soil, often calcareous, various provinces, Fla. to Tex., Wisc., and Pa.—Spr.–sum.

8. **R. malacosperma** Greenm. Stem up to 1 m. tall, glabrous in age: leaf-blades linear-elliptic or linear-spatulate on the lower part of the stem, elongate-linear and attenuate above, mostly 1–2 dm. long: flowers in open cymes: calyx sparingly pubescent; lobes linear-subulate, about 1 cm. long: corolla bluish-purple, 3.5–4 cm. long; tube about 1 cm. long, shorter than the throat: capsule about 2.5 cm. long.—Roadsides, cult. grounds, and ditch-banks, Coastal Plain, Fla. to La. Nat. of C. A. and cult.—Spr.–fall.

Blechnum Blechnum (L.) Millsp., with conspicuously bracted epike-like panicles, has been found in Fla.; it is a native of S. A.

6. **GERARDIA** L. Mostly scapose herbs. Leaves mainly basal. Flowers in terminal spikes. Calyx-lobes 5, nearly equal. Corolla with slightly unequal broad spreading lobes. [*Stenandrium* Nees.]—About 25 species, of tropical America.

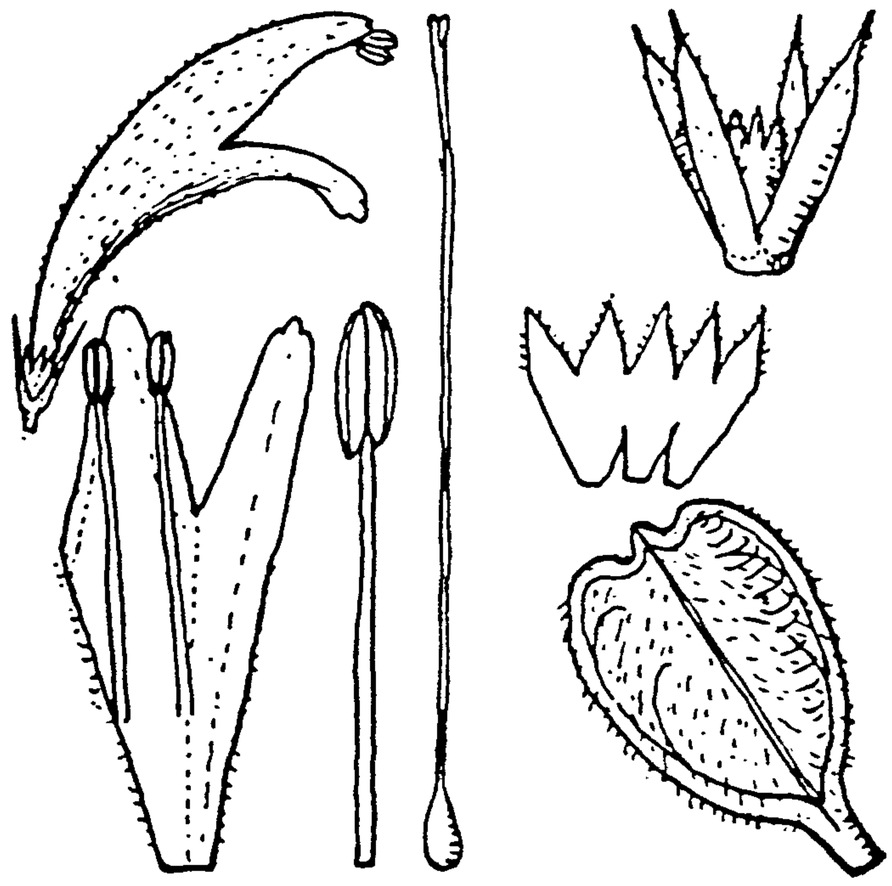


1. **G. floridana** (A. Gray) Small. Plant 2–6 cm. tall: leaf-blades ovate to elliptic or oval, 2–3 cm. long: calyx-lobes linear-subulate, becoming 9–11 mm. long: corolla rose-purple, 16–20 mm. long: capsule 9–12 mm. long. [*S. floridanum* (A. Gray) Small.]—Pinelands, S pen. Fla.—All year.—The genus-name *Gerardia* has long been mistakenly applied to certain groups of the Figwort Family.

7. **DIAPEDIUM** Konig. Annual or usually perennial herbs. Leaf-blades entire. Flowers in conspicuously bracted spikes. Calyx 5-lobed, the lobes narrow, nearly equal. Corolla 2-lipped, the upper lip erect. Filaments elongate. Capsule with an ovoid or suborbicular body. [*Dicliptera* Juss.]—About 60 species of tropical and warm regions.

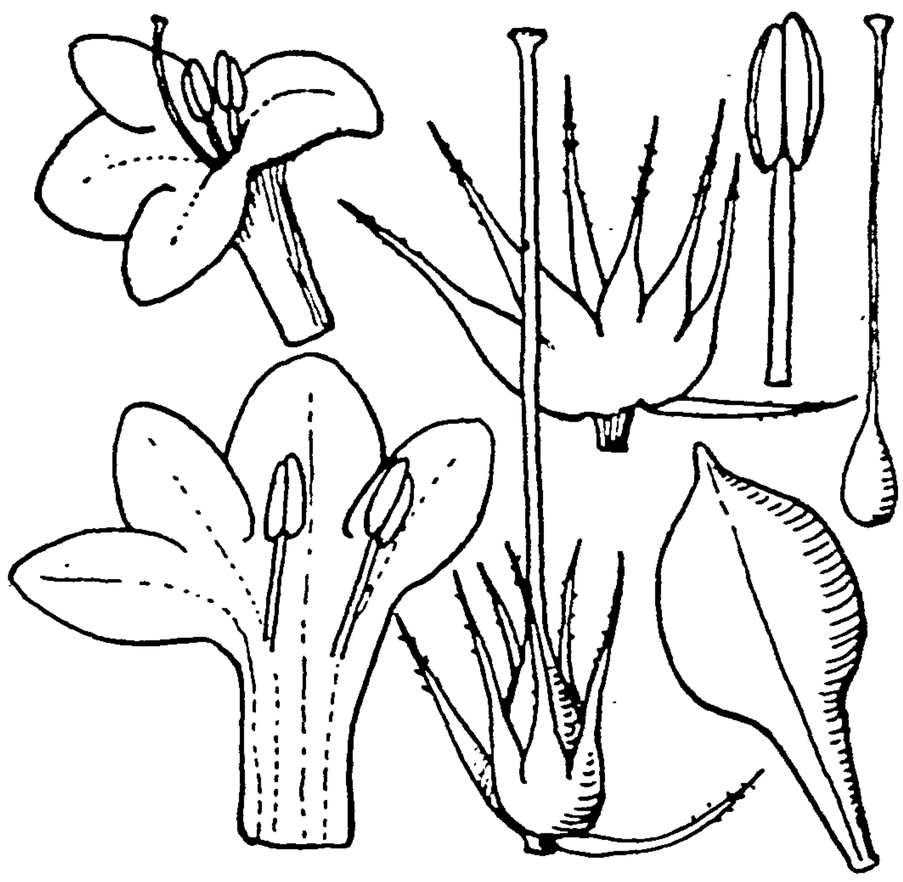
Corolla red or crimson, curved: tube longer than the lips. 1. *D. assurgens.*
Corolla purple or pink, nearly straight: tube and lips about equal in length. 2. *D. brachiatum.*

1. D. assurgens (L.) Kuntze. Plant 3–11 dm. tall, often diffuse: leaf-blades ovate to elliptic or elliptic-lanceolate, 2–10 cm. long: calyx 3–4 mm. long; lobes lanceolate: corolla crimson or red, 2–2.5 cm. long: capsule 7–8 mm. long.—Hammocks, S pen. Fla. and the Keys.—(*W. I., Mex., C. A.*)—All year.



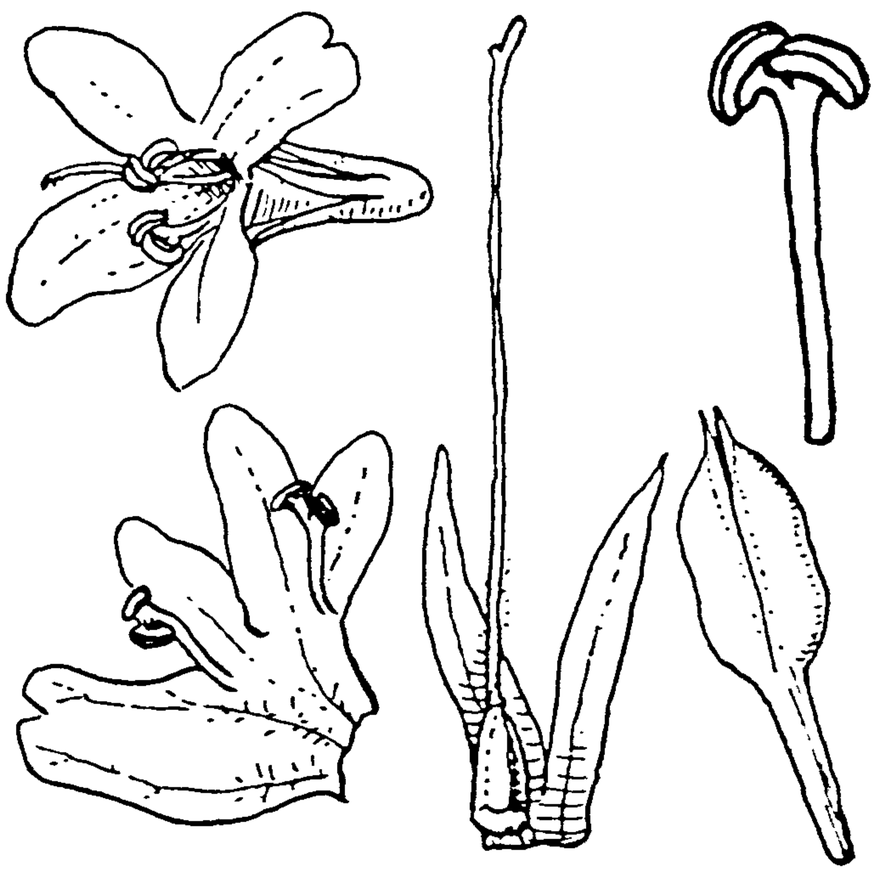
2. D. brachiatum (Pursh) Kuntze. Plant 3–8 dm. tall: leaf-blades ovate to elliptic-ovate, 2–10 cm. long, acute or somewhat acuminate: calyx 4–5 mm. long; lobes linear-subulate: corolla 15–20 mm. long: capsule about 5 mm. long.—River-banks and swamps, Coastal Plain, Fla. to Tex., Kans, Mo., and N. C.—Sum.–fall.—The two species in our range are as distinct in their habitats as in the color of their corollas. The first cited species thrives in saline habitats, while the second one inhabits fresh swamps and river-banks.

8. YEATESIA Small. Perennial herbs. Leaf-blades entire. Flowers in conspicuously bracted spikes. Calyx 5-lobed, the lobes slender. Corolla slightly 2-lipped: upper lip entire or nearly so: lower lip 3-lobed. Capsule with an ovoid body.—One species.



1. Y. viridiflora (Nees) Small. Plant 2–6 dm. tall: leaf-blades elliptic or elliptic-lanceolate, 5–15 cm. long: calyx 4–5 mm. long; lobes slender: corolla white, pale-purple, or pink, 12–15 mm. long: capsule about 1 cm. long, the body longer than the stipe-like base. [*Dicliptera Halei* Ridd.]—Shaded stream-banks, woods, and thickets, Coastal Plain and adj. provinces, Fla. to Tex., Tenn., and Ga.—Sum.

9. DIANTHERA [Gronov.] L. Perennial herbs. Leaf-blades entire or rarely toothed. Flowers in dense spikes on axillary peduncles. Calyx 4–5 lobed, the lobes narrow or slender. Corolla 2-lipped: upper lip slightly notched: lower lip 3-lobed. Anther-sacs borne obliquely, each at the tip of a fork of the connective. Capsule mostly 4-seeded.—One species.

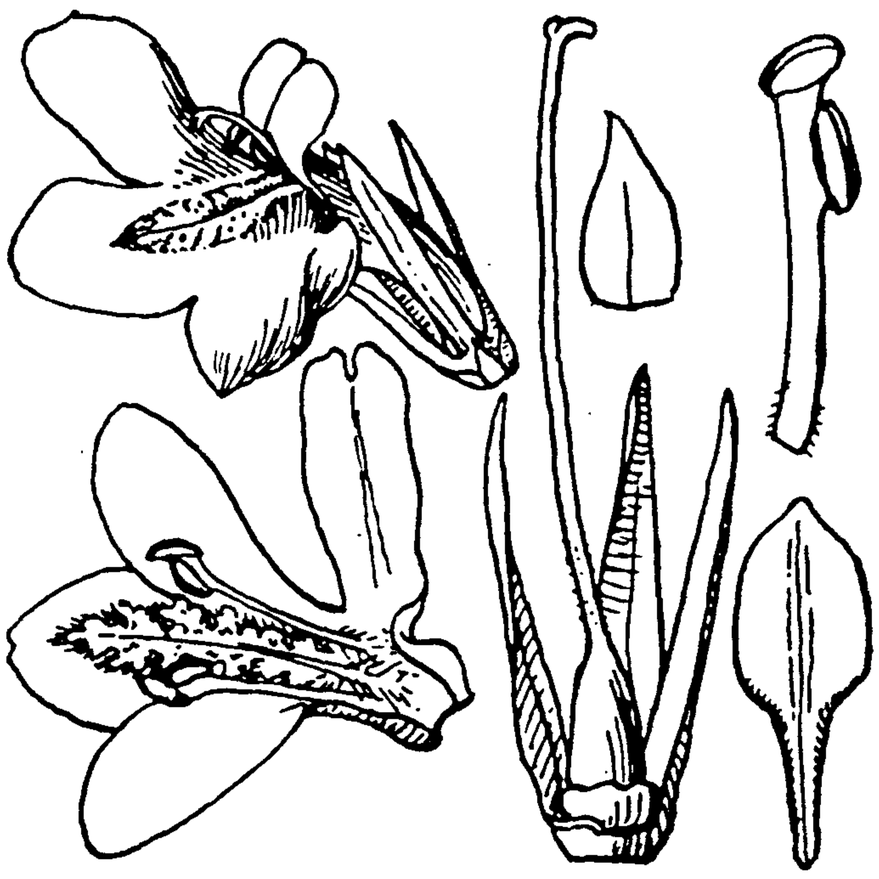


1. D. americana L. Stem 3–10 dm. tall: leaf-blades linear to linear-lanceolate or narrowly elliptic, 5–15 cm. long: peduncles ascending, about as long as the leaves or longer: spikes 1–3 cm. long, continuous: calyx-lobes linear, 4–5 mm. long: corolla white, pink, or purplish: capsule 1.5–2 cm. long.—(WATER-WILLOW.)—Beds, shores, and banks of streams, various provinces, Ga. to Tex., Mich., and Que.—Spr.–sum.

10. **JUSTICIA** L. Perennial herbs. Leaf-blades entire. Flowers in more or less interrupted spikes on axillary peduncles. Calyx 5-lobed, the lobes narrow. Corolla 2-lipped: upper lip notched: lower lip 3-lobed. Anther-sacs unequal, one borne oblique or horizontal at the top of the connective, the other perpendicular or nearly so below it. Capsule 4-seeded.—About 100 species, mostly tropical American.

Corolla 2–2.5 cm. long. 1. *J. crassifolia.*
Corolla 1 cm. long or shorter.
  Flowers scattered along one side of the upper part of the peduncle.
    Leaves remote, reflexed: corolla-tube 5–6 mm. long. 2. *J. angusta.*
    Leaves approximate, spreading or ascending: corolla-tube 8–10 mm. long. 3. *J. lanceolata.*
  Flowers in head-like spikes terminating the peduncles, or approximate at the end. 4. *J. ovata.*

1. J. crassifolia Chapm. Stem 2–4 dm. tall: leaf-blades linear, usually narrowly so, or spatulate near the base of the stem, 3–15 cm. long, fleshy: calyx-lobes linear, 11–15 mm. long, acuminate: corolla bright-purple, 2–2.5 cm. long: capsule 2–2.5 cm. long.—Swamps, wet woods, and low pinelands, Fla.—Spr. or all year S.



2. J. angusta (Chapm.) Small. Stem 2–5 dm. tall: leaf-blades linear or narrowly linear-lanceolate, 2–7 cm. long, or elliptic-spatulate at the base of the stem, more or less reflexed: peduncles bearing 2–few flowers near the end: calyx-lobes linear, 5–7 mm. long: corolla pale-purple about 10 mm. long: capsule about 1.2 cm. long.—Pineland ponds, Fla.—Spr.

3. J. lanceolata (Chapm.) Small. Stem 1–3 dm. tall: leaf-blades linear to linear-elliptic or elliptic-lanceolate, 3–10 cm. long, more or less acuminate, undulate, sessile or nearly so: spikes slender, 3–10 cm. long, interrupted along the peduncle: calyx-lobes narrowly linear, 5–7 mm. long: corolla purple, about 10 mm. long: capsule 1.5 cm. long.—Swampy ground and wet hammocks, Coastal Plain, Fla. to Tex. and Va.—Spr.–sum.

4. J. ovata Walt. Stem 1–3 dm. tall: leaf-blades elliptic, 3–11 cm. long; spike long-peduncled, 1–2 cm. long, continuous: calyx-lobes narrowly linear-acuminate, 6–12 mm. long: corolla pale-purple to violet, about 10 mm. long: capsule about 1 cm. long.—About pineland ponds, Coastal Plain, Fla. to Tex. and Va.—Spr.–sum.

FAMILY 16. PINGUICULACEAE[1] — BLADDERWORT FAMILY

Herbs, growing in water or in wet places. Leaves submersed and dissected, sometimes resembling rootlets and often bladder-bearing, or aerial and entire, or rarely wanting. Scapes naked or minutely scaly, 1–many-flowered. Flowers irregular, perfect. Calyx 2–5-lobed, the lobes often nearly distinct. Corolla 2-lipped: tube spurred or saccate. Androecium of 2 stamens, adnate to the base of the corolla-tube on its upper side. Filaments flattened, twisted. Anthers 1-celled. Gynoecium a single 1-celled pistil, with a free-central, usually globose placenta. Style thick, very short. Ovules usually numerous but sometimes only two. Fruit a

[1] Contributed by John Hendley Barnhart.

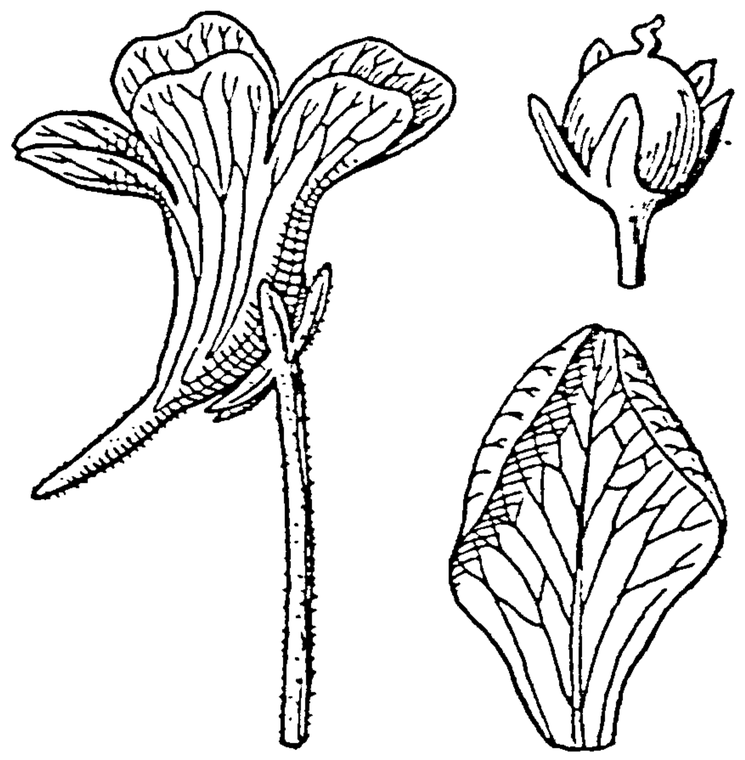
capsule, 2-valved or irregularly dehiscent. Seeds numerous (in *Biovularia* only one).

Calyx-lobes 5: scape without bracts, always 1-flowered. 1. PINGUICULA.
Calyx-lobes 2: scape with 1 or more bracts, 1–many-flowered.
  Calyx with a pair of bractlets resembling exterior lobes: scales, bracts, bractlets, and calyx-lobes fimbriate. 2. ARANELLA.
  Calyx without bractlets; lobes not fimbriate.
    Pedicels each with a bract and 2 bractlets at base.
      Racemes spike-like, the pedicels rarely exceeding the bracts: bractlets free. 3. STOMOISIA.
      Racemes not spike-like, the pedicels longer, commonly many times longer than the bracts: bractlets more or less adnate to the bracts. 4. CALPIDISCA.
    Pedicels each with a bract at base, but no bractlets.
      Branches, if any, alternate: lateral lobes (if any) of lower corolla-lip not saccate.
        Bracts peltate. 5. SETISCAPELLA.
        Bracts not peltate, attached by the base.
          Bracts tubular, solitary: corollas purple. 6. LECTICULA.
          Bracts not tubular, 1 or more: corollas yellow.
            Scape below lowest bract well developed, with several scales; ovules and seeds numerous. 7. UTRICULARIA.
            Scape below lowest bract obsolete; ovules 2; seed 1. 8. BIOVULARIA.
      Branches and branchlets whorled: lateral lobes of lower corolla-lip saccate. 9. VESICULINA.

1. PINGUICULA [Tourn.] L. Terrestrial scapose herbs. Leaves in a basal rosette: blades flat. Scapes usually several, 1–flowered, without scales or bracts. Calyx-lobes 5, more or less united. Corolla spurred at the base, the palate (in ours) subulate or clavate, included in the tube.—About 35 species, widely distributed.—BUTTERWORTS.

Corolla, including spur, less than 2 cm. long. 1. *P. pumila.*
Corolla, including spur, 2 cm. long, or longer.
  Spur slender: plant glandular-pubescent.
    Corolla golden-yellow: scape not villous. 2. *P. lutea.*
    Corolla violet: scape villous toward the base. 3. *P. caerulea.*
  Spur short and sac-like: plant almost wholly glabrous. 4. *P. planifolia.*

1. P. pumila Michx. Leaves 1–2.5 cm. long, clammy-pubescent: scapes very slender, 5–20 cm. tall: corolla white, pale violet, or pale rose, very rarely yellow, 1–2 cm. broad; spur subulate, about 3 mm. long, longer than the sac-like base of the corolla.—Low pinelands, Coastal Plain, Fla. to Tex. and S. C.—(*W. I.*)—Spr. or all year S.



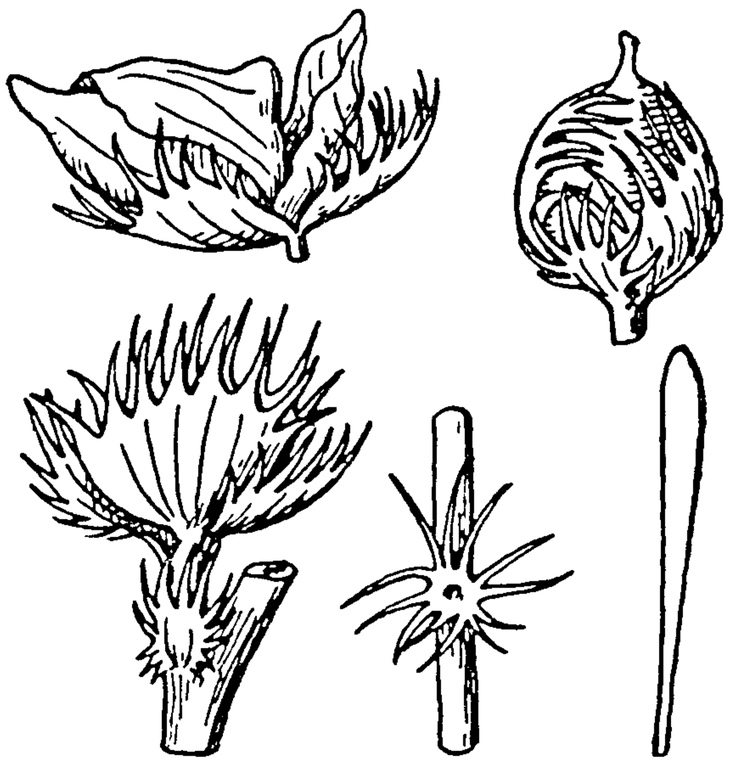
2. P. lutea Walt. Leaves 1.5–6 cm. long, clammy-pubescent; scapes 1–3 dm. tall, pubescent: corolla golden-yellow, 2–3.5 cm. broad; lobes longer than the tube, usually obtusely 2–4-lobed; spur subulate or subcylindric, 5–10 mm. long.—Low pinelands, Coastal Plain, Fla. to La. and N. C.—Spr.

3. P. caerulea Walt. Leaves 1.5–6 cm. long, clammy-pubescent; scapes 1–3 dm. tall, pubescent, villous at the base; corolla violet, 2–2.5 cm. broad, the lobes obtusely 2-cleft; spur slender, subcylindric, 4–8 mm. long, obtuse. [*P. elatior* Michx.] —Low pinelands, Coastal Plain, Fla. to N. C.—Spr.

4. P. planifolia Chapm. Leaves 1.5–8 cm. long, glabrous or nearly so: scapes 1–3.5 dm. tall, nearly glabrous, not villous at the base: corolla violet, 1–2 cm.

broad, the lobes usually acutely 2-cleft; spur rather sac-like, only 1–3 mm. long, obtuse.—Shallow water, near the Gulf coast, Fla. to Miss.—Spr.

2. **ARANELLA** Barnh. Terrestrial herbs. Leaves in a basal rosette, often fugacious. Scapes 1–several-flowered: scales below the lowest pedicel numerous, peltate, fimbriate: bracts fimbriate: bractlets above the base of the very short pedicels, mimicking exterior calyx-lobes, fimbriate. Calyx-lobes 2, nearly distinct, fimbriate. Corolla 2-lipped. [*Cosmiza* Small, not Raf.]—Three or 4 species, tropical American.

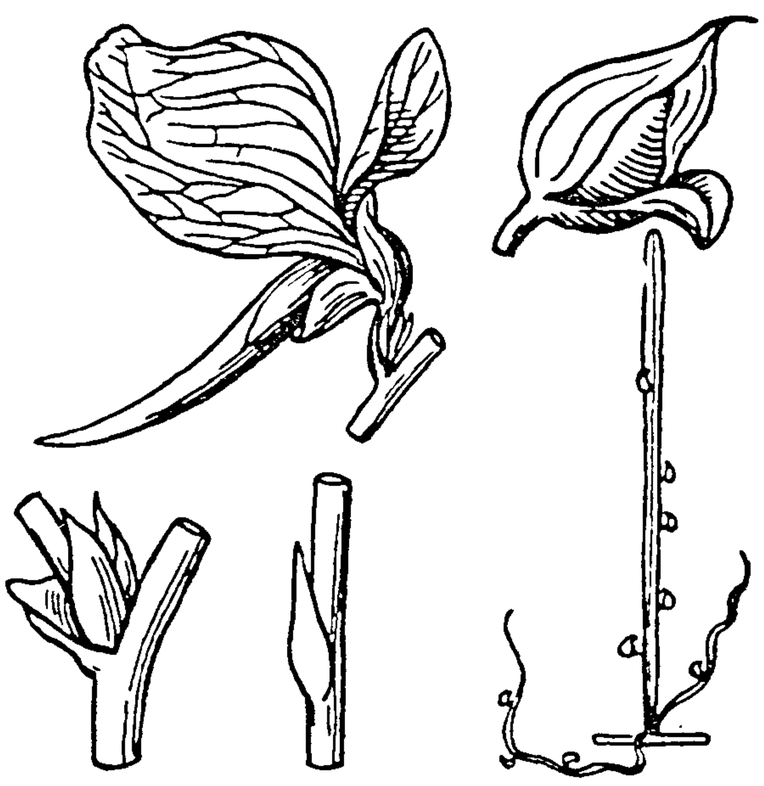


1. **A. fimbriata** (H.B.K.) Barnh. Leaves linear, 5–6 mm. long: scapes 5–15 cm. tall: racemes 1–7-flowered, spike-like or subcapitate: corolla yellow, 6–8 mm. broad; spur subconic, about as long as the lower lip. [*Cosmiza longeciliata* Small.]—Low pinelands, especially along the Everglades, pen. Fla.—(*W. I., S. A.*)—All year.

3. **STOMOISIA** Raf. Terrestrial herbs. Stems delicate, root-like. Leaves delicate, rarely seen: blades linear. Bladders minute, beaked but without bristles. Scapes 1–many-flowered: scales below the lowest pedicel several, attached by the base: bracts each accompanied by a pair of bractlets. Calyx-lobes 2, nearly distinct. Corolla 2-lipped, the lips nearly distinct, the upper one clawed, the lower consisting chiefly of the helmet-shaped, laterally compressed palate.—About 50 species, widely distributed.

Corolla much exceeding the calyx.
  Lower lip of corolla 1.2 cm. long or more; spur about 12 mm. long. 1. *S. cornuta.*
  Lower lip of corolla 1 cm. long or less; spur about 6 mm. long. 2. *S. juncea.*
Corolla about as long as the calyx, or shorter. 3. *S. virgatula.*

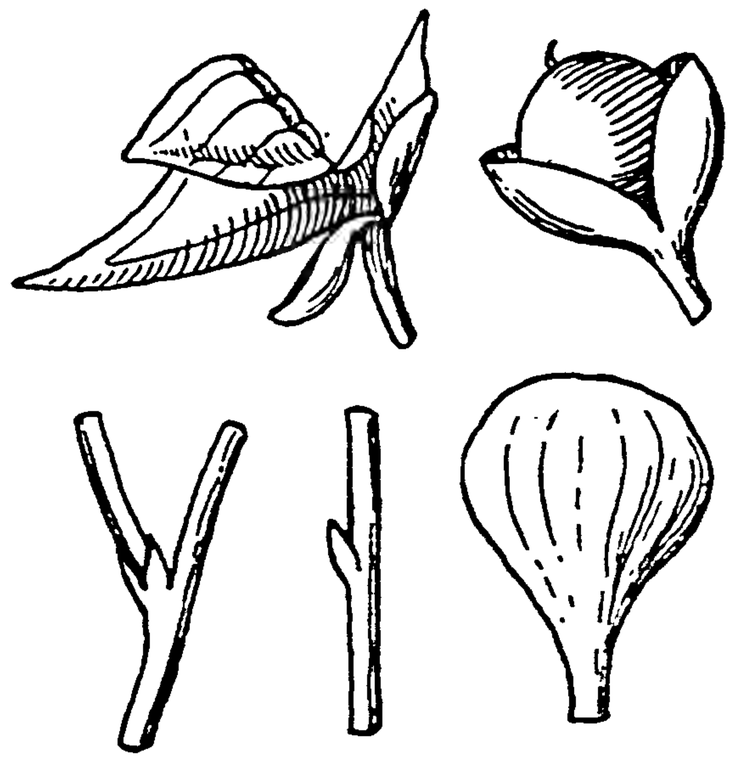
1. **S. cornuta** (Michx.) Raf. Scape rooting in mud, erect, 1–3 dm. tall: racemes spike-like, 2–5-flowered, the flowers approximate: corolla yellow, 1.2–1.6 cm. broad: lower lip much larger than the upper, abruptly pointed; spur horn-shaped, acute, slightly curved, pendent, 7–12 mm. long. [*Utricularia cornuta* Michx.]—Margins of ponds, various provinces, Fla. to Tex., Minn., and Newf.—(*W. I.*)—Sum.–fall.



2. **S. juncea** (Vahl.) Barnh. Scape rooting in mud, erect, 1–4 dm. tall: racemes spike-like, 3–12-flowered: corolla yellow, 0.8–1 cm. broad; lower lip larger than the upper, rather pointed; spur horn-shaped, acute, slightly curved, pendent, 5–7 mm. long. [*Utricularia juncea* Vahl.]—Margins of ponds, Coastal Plain and rarely adj. provinces, Fla. to Miss. and N. Y.—(*W. I., S. A.*)—Sum.–fall.

3. S. virgatula Barnh. Scape rooting in mud, erect, 0.3–2 dm. tall: racemes spike-like, 1–6-flowered: corolla yellow, 4 mm. broad, little if at all surpassing the calyx; spur conic, pendent, 2–3 mm. long. [*Utricularia simplex* Wright.] —Margins of ponds, Coastal Plain, Fla. to Miss. and N. Y.—(*W. I.*)—Fall.

4. **CALPIDISCA** Barnh. Terrestrial herbs. Leaves in a basal rosette, often fugacious. Scapes 1–several-flowered: scales below the lowest pedicel several, acute: bracts each accompanied by a pair of bractlets more or less adnate to it, making an apparently 3-lobed bract. Calyx-lobes 2, nearly distinct. Corolla 2-lipped, the lower lip abruptly reflexed from the aperture of the spur.—About 60 species, mostly tropical.

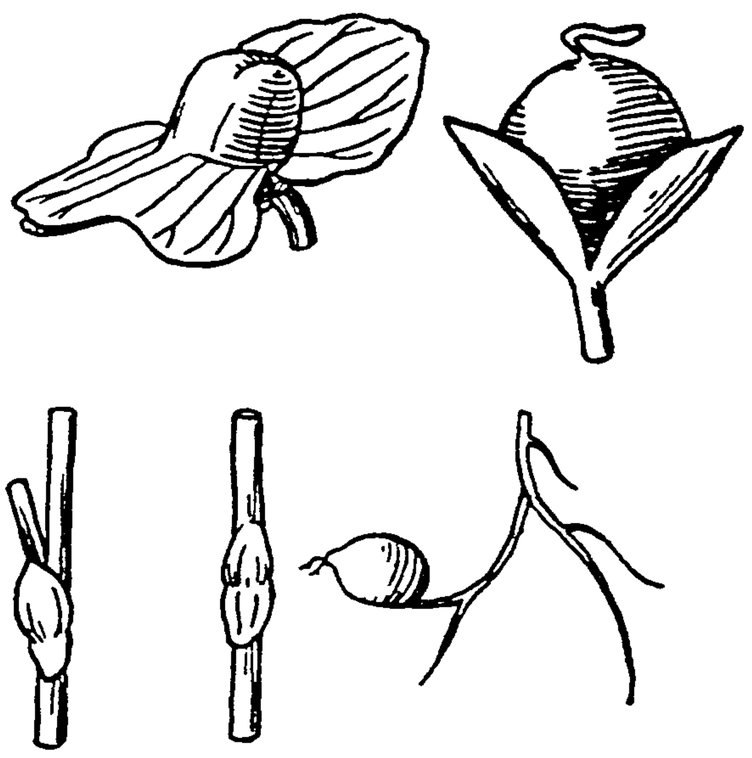


1. C. Standleyae Barnh. Leaves 1–6, subspatulate, 3–5 mm. long: scapes filiform, 1.5–15 cm. tall: racemes 1–6-flowered: pedicels filiform, ascending, 1.5–11 mm. long: corolla probably pale-purple; upper lip entire, 3 mm. long; spur compressed-conic, 4–5 mm. long, longer than the lower lip.—Low pinelands, pen. Fla.—Fall.

5. **SETISCAPELLA** Barnh. Terrestrial herbs, with short root-like branches from the base of the scape. Leaves delicate, evanescent and rarely seen: blades linear. Bladders minute, 2-horned. Scapes 1–many-flowered: scales below the lowest pedicel scarious, peltate: bracts scarious, peltate: bractlets none. Calyx-lobes 2, nearly distinct, scarious, ribbed. Corolla 2-lipped, the lower lip commonly stiff, divergently 3-lobed, with a 2-lobed palate.—About 12 species, mostly American.—Spr.–sum. or all year S.

Corolla yellow, 6–12 mm. long: capsule 2 mm. in diameter. 1. *S. subulata.*
Corolla white or purplish, subglobose, about 1 mm. in diameter: capsule 1 mm. in diameter. 2. *S. cleistogama.*

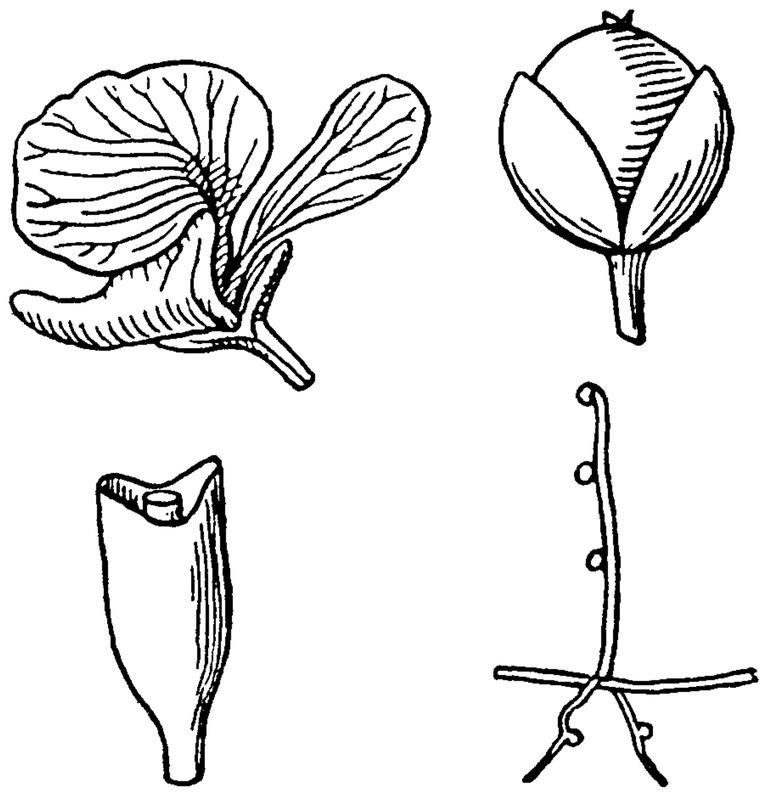
1. S. subulata (L.) Barnh. Scape rooting in mud, filiform, 3–20 cm. tall: racemes 1–12-flowered: rachis becoming zigzag when well-developed: pedicels ascending, 2–10 mm. long, surpassing the bracts: calyx becoming 2 mm. long: corolla yellow, 6–12 mm. long, 4–8 mm. broad, the lower lip much larger than the upper one, equally 3-lobed; spur flattened-conic, obtuse, appressed, nearly as long as the lower lip: capsule 2 mm. in diameter. [*Utricularia subulata* L.]—Wet sandy soil, Coastal Plain and New England coast, Fla. to Tex. and Mass.—Sum.



2. S. cleistogama (A. Gray) Barnh. Scape rooting in mud, filiform, stiff, 1–6 cm. tall: racemes 1–3-flowered: pedicels ascending 2–6 mm. long, surpassing the bracts: corolla dirty-white or purplish, not more than 1 mm. in diameter, consisting chiefly of

the large saccate spur, the tips minute: capsule 1 mm. in diameter.—Wet sandy soil, Coastal Plain and New England coast, Fla. to Miss. and Mass.—(*Cuba.*)

6. **LECTICULA** Barnh. Herbs. Stems radiating from the base of the scape, usually submerged. Leaves alternate, usually 3-parted, the segments linear. Scapes 1-flowered, the pedicel continuous with the scape: bract tubular, the free margin truncate, notched: bractlets none. Calyx-lobes 2, nearly distinct. Corolla transverse at the summit of the scape, 2-lipped, the palate a mere convexity.—Two species, the following and one in South America.



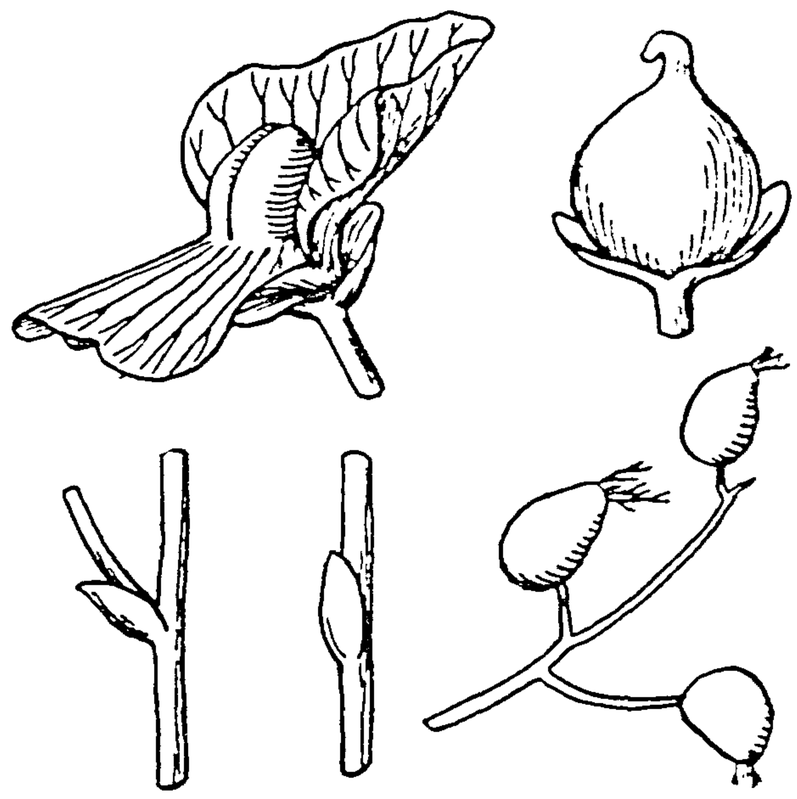
1. L. resupinata (B. D. Greene) Barnh. Stem short, root-like: leaves scattered; blades simple or forked near the base, the segments slender, capillary, often bladder-bearing: scape erect, 2–10 cm. tall: calyx 1.5–2 mm. long: corolla violet-purple, 8–12 mm. long; spur conic, obtuse, distant from the lower lip. [*Utricularia resupinata* B. D. Greene.]—Shallow water, various provinces, Fla. to Ont. and N. B.—Fall.

7. **UTRICULARIA** L. Aquatic herbs. Stems submersed, the branches alternate or from the base of the scapes. Leaves alternate, dissected. Bladders borne on the leaf-segments, the mouth with a pair of bristles. Scapes 1–many-flowered: scales below the lowest pedicel several: bractlets none. Calyx-lobes 2, nearly distinct. Corolla 2-lipped: lower lip flat, spreading, with a prominent 2-lobed palate.—About 75 species, very widely distributed.—BLADDERWORTS.

Scape without floats.
- Stem creeping on the bottom in shallow water: some or all of the leaves root-like.
  - Spur slender, equalling or exceeding the lower lip.
    - Spur conic at base, linear above: leaves not all bladder-bearing: scapes 10–40 cm. tall. 1. *U. fibrosa.*
    - Spur tapering from base to apex: leaves all alike, bladder-bearing: scapes 5–12 cm. tall. 2. *U. pumila.*
  - Spur stout, conic, shorter than the lower lip. 3. *U. gibba.*
- Stem free-floating, except for the single point of attachment.
  - Corolla 12–15 mm. broad: leaves forked, each fork twice or thrice dissected.
    - Scapes erect: pedicels recurving at maturity: capsule 3–4 mm. in diameter. 4. *U. macrorhiza.*
    - Scapes flexuous: pedicels straight at maturity: capsule 5 mm. in diameter. 5. *U. floridana.*
  - Corolla 15–20 mm. broad: leaves forked, each fork 4–5 times dissected: pedicels recurving at maturity: capsule 5 mm. in diameter. 6. *U. foliosa.*

Scape with a whorl of conspicuous, inflated, more or less united floats.
- Scape from floats to lowest pedicel 5 cm. long or less. 7. *U. radiata.*
- Scape from floats to lowest pedicel 7.5 cm. long or more. 8. *U. inflata.*

1. U. fibrosa Walt. Stems radiating from the base of the scape or scapes, often 1–2 dm. long and free-swimming at the tip: leaves numerous; blades 2–3-



dichotomously dissected, or the bladder-bearing ones much reduced: scapes 1–4 dm. tall: raceme 2–6-flowered, usually 3-flowered: pedicels ascending, 5–20 mm. long: corolla yellow, about 15 mm. broad; spur conic at base, linear above, appressed, about as long as the lower lip, obtuse or emarginate at the apex.—Ponds, chiefly in pinelands, Coastal Plain, Fla. to Miss., (La.?) and N. Y.—Spr.–fall.

2. **U. pumila** Walt. Stems radiating from the base of the scape or scapes, short, root-like: leaves few; blades mostly bladder-bearing and much reduced: scapes 5–12 cm. tall: raceme 1–4-flowered, usually 2-flowered: pedicels ascending, 5–16 cm. long: corolla yellow, about 12 mm. broad; spur slenderly conic, appressed, usually longer than the lower lip, obtuse or emarginate at the apex. [*U. biflora* Lam. *U. macrorhyncha* Barnh.]—Shallow water, mostly Coastal Plain, and New England coast, Fla. to La. and Mass.—Spr.–fall.

3. **U. gibba** L. Stems radiating from the base of the scape or scapes, several cm. long, delicate, root-like: leaves scattered, sparingly divided; segments capillary, with few minute bladders: scapes 2–10 cm. tall: raceme 1–3-flowered, usually 2-flowered: pedicels very slender, erect or ascending, 2–10 mm. long: corolla yellow, 5–8 mm. broad; spur conic, very obtuse, shorter than the lower lip.—Shallow water, various provinces, Fla. to Tex., Mich., and Me.—Spr.–fall or all year S.

4. **U. macrorhiza** Le Conte. Stems submersed, leafy, 3–10 dm. long: leaves numerous, alternate, 1.5–5 cm. long: blades forked, each fork 2–3-pinnately dissected into filiform segments, usually bearing numerous bladders; bladders when fully developed 3–5 mm. long: scapes erect, 1–3 dm. tall: raceme 5–20-flowered: pedicels 0.5–2 cm. long, recurving at maturity: corolla yellow, 12–15 mm. broad, the lower lip slightly 3-lobed; spur not appressed, subulate, slightly curved, shorter than the lower lip: capsule 3–4 mm. in diameter, many-seeded. [*U. vulgaris americana* A. Gray.]—In water, various provinces, (N. C.?), Va. to Tex., Mo., Yukon, and Newf.—Sum.

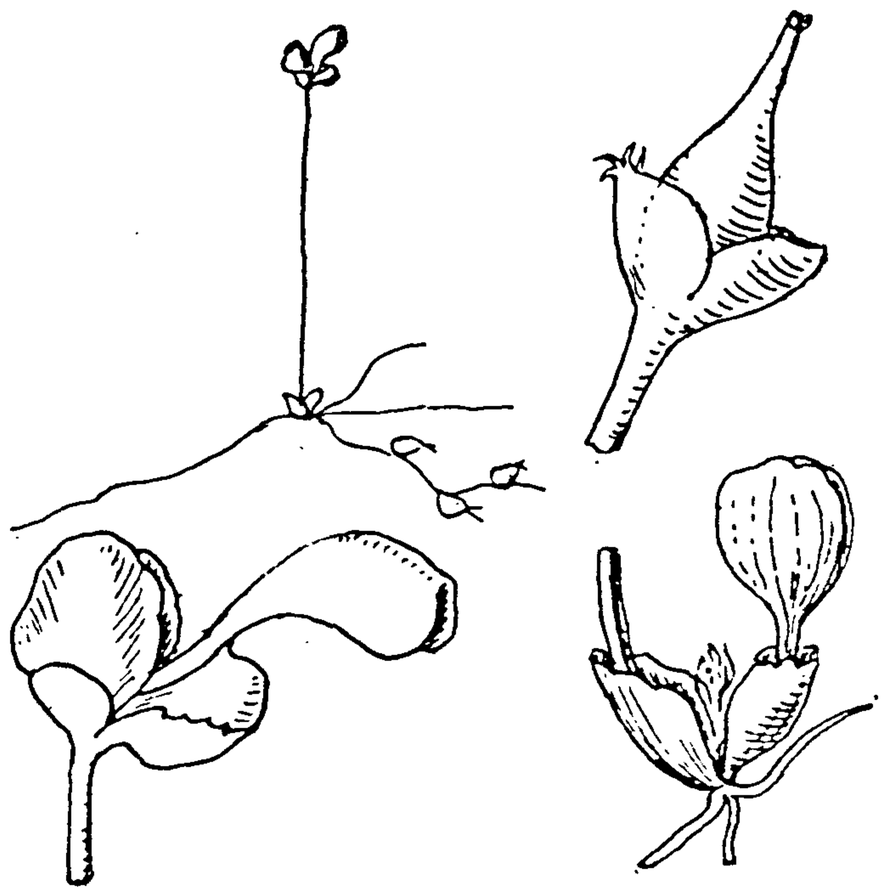
5. **U. floridana** Nash. Stems submersed, leafy, 6–15 dm. long: leaves numerous, alternate, 3–5 cm. long; blades forked, each fork 2–3-pinnately dissected into very delicate capillary segments, the segments fewer, shorter, and stiffer when bladder-bearing; bladders 2 mm. long or less: scapes more or less flexuous, 1.5 dm. tall when the first flower expands, becoming 3–6 dm. tall: raceme very laxly 8–25-flowered: pedicels 0.5–1.5 cm. long, ascending or spreading at maturity: corolla yellow, 12–15 mm. broad, both lips nearly entire: spur not appressed, subulate, slightly curved, shorter than the lower lip: capsule about 5 mm. in diameter.—Ponds, Coastal Plain, Fla. and Ga.—Spr.–sum.

6. **U. foliosa** L. Stems submersed, leafy, 9–30 dm. long: leaves numerous, alternate, 3–10 cm. long; blades forked, each fork 4–5-pinnately dissected into very fine or capillary segments, the segments fewer when the bladders are more numerous: bladders 2 mm. long or less: scapes erect, 1–3 dm. tall: raceme rather closely 10–20-flowered: pedicels 1–2 cm. long, recurving at maturity: calyx becoming 4–5 mm. long: corolla yellow, 15–20 mm. broad, the upper lip erect, nearly entire, the lower lip spreading, slightly 3-lobed; spur not appressed, slenderly conic, slightly curved, shorter than the lower lip: capsule about 5 mm. in diameter, few-seeded. [*U. oligosperma* St. Hil.]—Ponds and brackish water, Coastal Plain, Fla. to La.—(*W. I.*)—Spr.–fall or all year S.

7. U. radiata Small. Stems elongate: leaves 6–10-dichotomously dissected, copiously bladder-bearing: scapes erect, 6–12 cm. tall, bearing near the middle a single whorl of 4–7 conspicuous inflated floats, which are more or less confluent at the base, less than 4 cm. long, and pinnately dissected near the tip: raceme 1–3-flowered: pedicels 8–20 mm. long, spreading or recurved in fruit: corolla yellow, about 1.5 cm. broad, the lower lip 3-lobed, about twice as long as the appressed conic emarginate spur.—Ponds, Coastal Plain and New England coast, Fla. to Tex. and Me.—Spr.–fall.

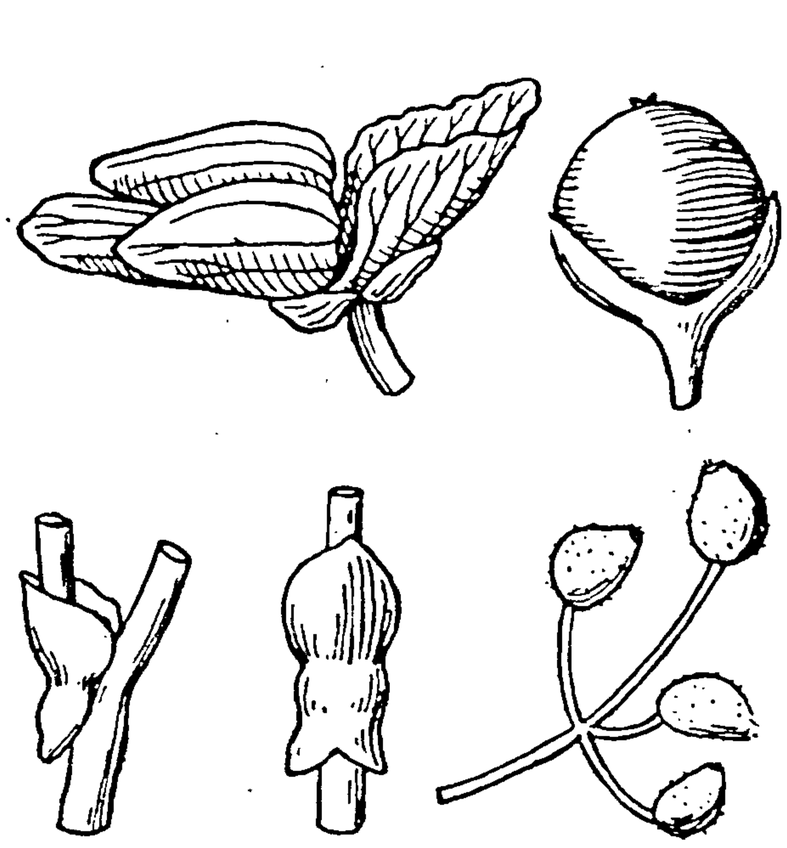
8. U. inflata Walt. Stems submersed, often stout, elongate: leaves 10–12-dichotomously dissected, copiously bladder-bearing: scapes erect, 2–6 dm. tall, bearing a whorl of 4–9 conspicuous inflated bracts, which are more or less confluent at the base, 5–7 cm. long, and pinnately dissected from near the middle: raceme 4–12-flowered: pedicels 16–32 mm. long, spreading or recurved in fruit: corolla yellow, about 2 cm. broad, the lower lip 3-lobed, about twice as long as the appressed conic emarginate spur.—Ponds and ditches, Coastal Plain, Fla. to Del.—Spr.–fall.

8. **BIOVULARIA** Kam. Minute aquatic herbs. Stems submerged. Leaves alternate, dissected. Bladders borne on the leaf-segments, the mouth 2-beaked. Scapes 1–3-flowered, the part below lowest bract obsolete, the lowest bract hence sessile on the main stem; bractlets none. Calyx-lobes 2, nearly distinct. Corolla 2-lipped, the lips entire, the palate not prominent. Ovules only 2. Fruit indehiscent, with a single seed.—One species, in tropical and subtropical America.



1. B. olivacea (Wright) Kam. Stems delicate, capillary, forming mats on or a little beneath the surface of the water: leaves mostly of a single segment, bearing one bladder; scape scarcely any, the bracts and pedicels, if more than one, approximate at its base; longest pedicel less than 1 cm. long; calyx about 0.5 mm. long; corolla yellowish, less than 2 mm. long: spur saccate. [*Utricularia olivacea* Wright.]—Shallow water, near Sanford, Seminole Co., Fla.—(*W. I., S. A.*) One of the smallest (perhaps the smallest by weight) of all flowering plants.

9. **VESICULINA** Raf. Aquatic herbs. Stems submersed, the branches whorled, decompound. Leaves none. Bladders terminal, the mouth (in ours) naked. Scapes 1–4-flowered: scales below the lowest pedicel none: bractlets none. Calyx-lobes 2, nearly distinct. Corolla 2-lipped: lower lip 3-lobed, the lateral lobes saccate, forming together a prominent divergently 2-lobed palate, the middle lobe short.—About 6 species, American.



1. V. purpurea (Walt.) Raf. Stems elongate, the branches numerous, whorled, verticillately decompound: bladders solitary, terminating many of the ultimate branchlets, the orifices without projecting processes: scapes erect, slender, spongy-

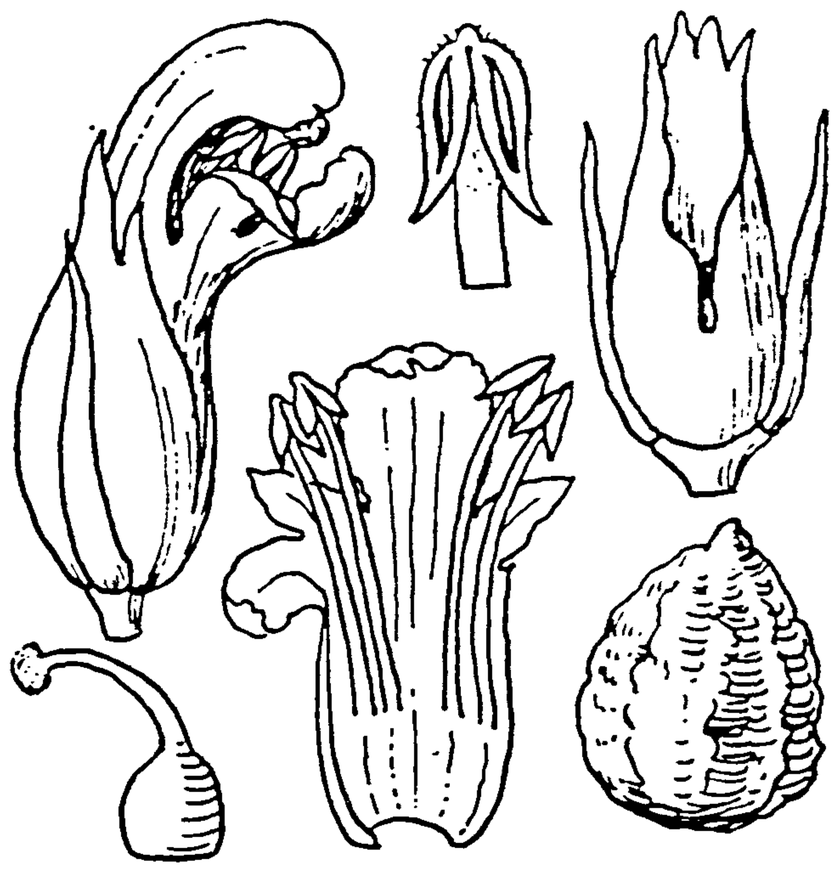
thickened below, 0.5–1.5 dm. tall: pedicels erect or ascending: calyx becoming 2.5–3 mm. long: corolla violet-purple, 12 mm. broad; spur conic, somewhat flattened, about ½ as long as the lower lip. [*Utricularia purpurea* Walt.]—Ponds, various provinces, Fla. to La., Minn., Ont., and Me.—(*W. I.*)—Sum.–fall.

Family 17. **OROBANCHACEAE** — Broom-rape Family

Parasitic, commonly perennial herbs, without green coloring matter. Leaves alternate, scale-like. Flowers perfect, or rarely dioecious, sometimes cleistogamous and complete on the same plant. Calyx of 4 or 5 partly united sepals, sometimes spathe-like. Corolla of 4 or 5 partially united petals, the limb irregular or 2-lipped. Androecium of 4 didynamous stamens partially adnate to the corolla. Gynoecium of 2, or rarely of 3, united carpels. Ovary 1-celled. Ovules mostly numerous. Fruit a capsule. Seeds wingless.—About 11 genera and more than 200 species, most abundant in the Northern Hemisphere.

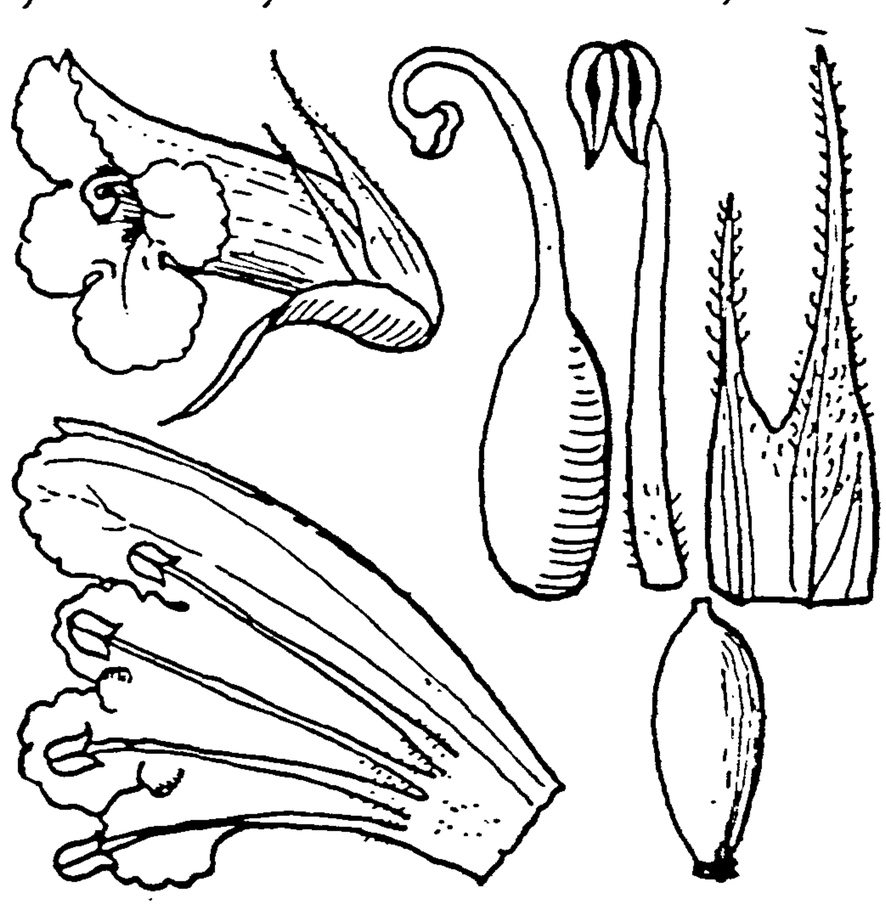
Flowers perfect and complete throughout.
  Calyx irregular, spathe-like, the lower side split, the upper with 3 or 4 tooth-like lobes: stamens exserted. 1. Conopholis.
  Calyx regular or nearly so, with 2–5 equal or unequal lobes: stamens included.
    Calyx with a deep sinus above and below. 2. Orobanche.
    Calyx nearly equally 5-lobed. 3. Thalesia.
Flowers various, cleistogamous on lower part of spike, complete but mostly sterile above. 4. Leptamnium.

1. CONOPHOLIS Wallr. Yellow or brownish herbs, with very stout stems and inflorescence. Leaves numerous. Flowers sessile, yellowish, crowded in the spike.—Three species, North American.



1. C. americana (L. f.) Wallr. Plant clustered, 1–2 dm. tall: leaves (scales) ovate to lanceolate, 10–12 mm. long: calyx 7–9 mm. long, erose-toothed: corolla yellowish or pale-yellow, 10–12 mm. long: capsule ovoid, 10–15 mm. long.— (Squaw-root. Cancer-roots.)—Rich woods, various provinces, Fla. to Mich. and Me.—Spr.—The squaw-root frequently grows in oak-woods. The young plant resembles a fir or spruce cone. It is pale, often creamy when young, but soon becomes brown.

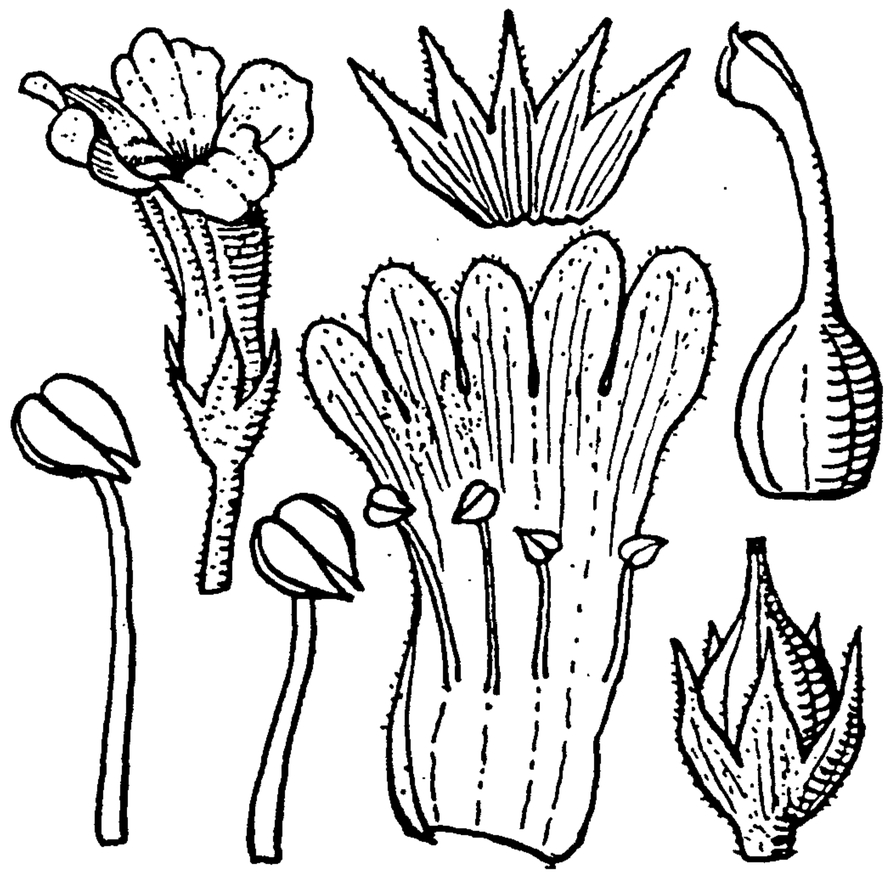
2. OROBANCHE L. Whitish, yellowish, reddish, or violet herbs, with relatively slender stems. Leaves few. Flowers sessile, in a spike.—About 85 species, natives of the Old World.



1. O. minor J. E. Smith. Plant 1–5 dm. tall: leaves (scales) ovate to lanceolate, 6–20 mm. long: calyx about 10 mm. long; lobes lanceolate-subulate: corolla 11–15 mm. long; lips bluish, the lobes erose: filaments pubescent: capsule about 8 mm. long.—(Broom-rape.)—Fields, various provinces N. C. to N. J. Nat. of Eu.—Spr.–sum.—Usually parasitic on clover roots. *Orobanche* is the most wide-spread genus of this family. The plants of some species are restricted to a

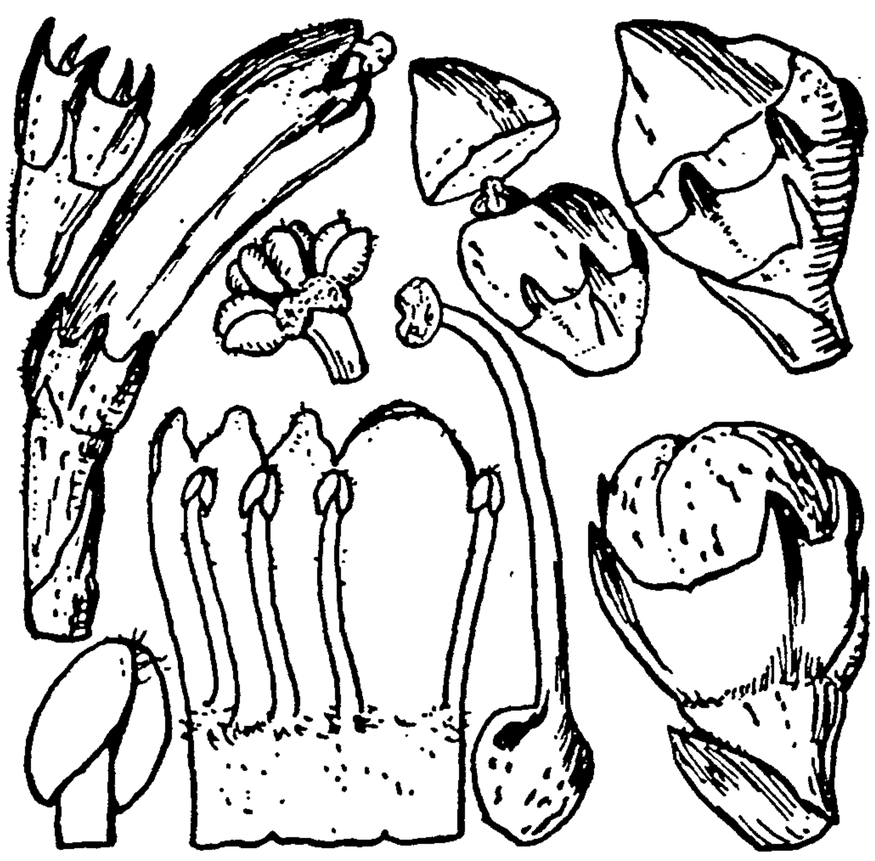
single host, while others are not particularly selective. Different hosts seem to influence variations in the parasite, a fact that may have led to too much multiplication of species.

3. **THALESIA** Raf. Pale, often pink herbs, with short, mostly subterranean stems. Leaves few. Flowers solitary on long pedicels, often more deeply colored than the foliage.—About 5 species, North American.



1. T. uniflora (L.) Britton. Plant 5–16 cm. tall: leaves (scales) ovate to obovate, 5–10 mm. long: calyx 4–11 mm. long; lobes lanceolate, about as long as the tube: corolla cream-colored and purple-tinged, 14–18 mm. long; lobes elliptic to obovate: capsule conic-ovoid, about 10 mm. long. [*Aphyllon uniflorum* T. & G.]—(BROOM-RAPE. CANCER-ROOT.)—Rich woods, various provinces, rarely Coastal Plain, Ga. to Tex., Calif., B. C., Ont., and Newf.—Spr.

4. **LEPTAMNIUM** Raf. Dark-purplish or yellowish-brown herbs, with branching stems. Leaves very few. Flowers racemose or paniculate, paler than the stem, separated.—One species.



1. L. virginianum (L.) Raf. Plant 1–4 dm. tall: leaves (scales) few at the base of the plant: complete flowers larger than the cleistogamous ones: calyx 2.5–3 mm. long; lobes triangular to ovate-triangular, shorter than the tube: corolla 10–13 mm. long; upper lip notched; lobes of the lower lip acute: capsule 3–5 mm. long. [*Epiphegus virginiana* Bart.]—(BEECH-DROPS. CANCER-ROOT.)—Under beech trees, various provinces, Fla. to La., Mich., and N. B.—Spr.

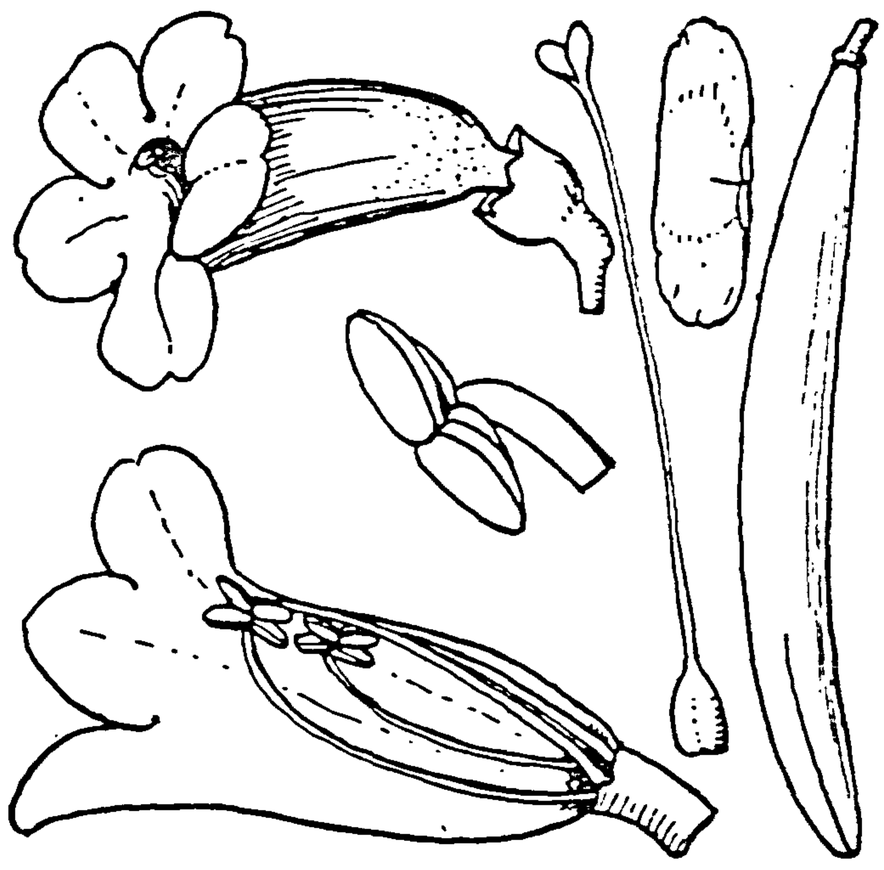
FAMILY 18. **BIGNONIACEAE** — TRUMPET-CREEPER FAMILY

Shrubs, trees, woody vines, or rarely herbs. Leaves opposite, or rarely alternate or whorled, often tendril-bearing: blades simple or pinnately compound. Flowers perfect, usually showy. Calyx of usually 2–5 more or less united sepals. Corolla 5-lobed, irregular, or 2-lipped. Androecium of 5 stamens with 1 or 3 of them reduced to staminodia, or of 4 didynamous stamens. Anthers with mostly divaricate sacs. Gynoecium of 2 united carpels. Ovary 1-celled or 2-celled by the meeting of the placentae. Ovules numerous. Fruit a capsule. Seeds winged or appendaged.—About 60 genera and more than 500 species, mostly tropical.

Leaf-blades compound: vines or rarely herbaceous plants: calyx 5-lobed.
  Calyx with an undulate margin: capsule flattened parallel with its partition.
    1. ANISOSTICHUS.
  Calyx with 5 lobes: capsule flattened at right angles with its partition.

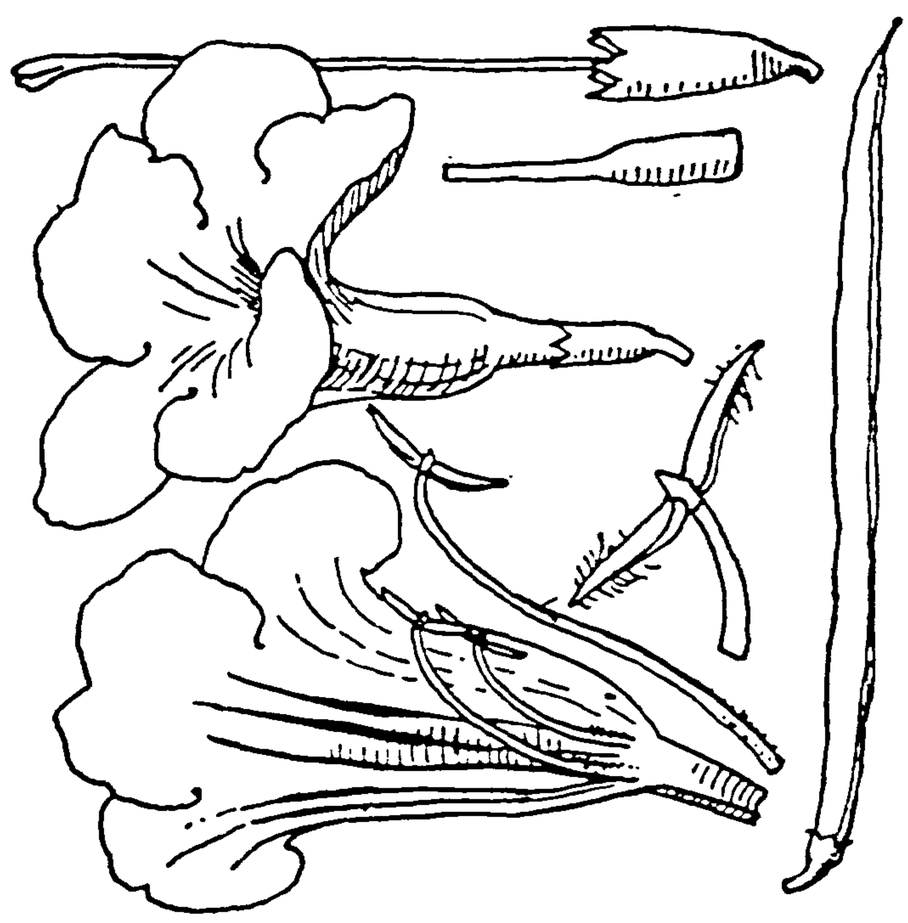
Erect plant: pod linear, not stipitate. 2. TECOMA.
Climbing plant: pod clavate or fusiform, stipitate. 3. BIGNONIA.
Leaf-blades simple: shrubs or trees: calyx 2-lobed.
Anther-bearing stamens 2: leaves opposite: fruit slender, dehiscent. 4. CATALPA.
Anther-bearing stamens 4: leaves alternate or scattered: fruit thick, roundish, indehiscent.
Leaves clustered on spurs; blades of a spatulate or oblanceolate type: fruit rounded at the apex, with fleshy placentae. 5. CRESCENTIA.
Leaves alternate; blades of a broad type: fruit umbonate at the apex, with dry placentae. 6. ENALLAGMA.

1. ANISOSTICHUS Bureau. Vines. Leaf-blades 2-foliolate or rarely 1-foliolate, often tendril-bearing: leaflets usually with entire blades. Calyx campanulate or cupulate. Corolla with a short tube abruptly expanded into a campanulate throat. Capsule narrow. Seeds winged.—One species.



1. A. crucigera (L.) Bureau. Glabrous vine: leaves prolonged into tendrils; leaflets mostly 2; blades elliptic to elliptic-lanceolate, 5–15 cm. long, cordate or auricled at the base: calyx 5–8 mm. long, shallowly lobed: corolla red-orange without, yellow within, 4–5 cm. long: filaments villous at the base: capsule linear, 10–17 cm. long. [*Bignonia capreolata* L.]—(CROSS-VINE. TRUMPET-FLOWER.)—Swamps, stream-banks, thickets, and woods, Coastal Plain and adj. provinces, Fla. to La., Ill., and Va. (or Md.?)—Spr.—Also called smoke vine, as sections of the stems which show a strikingly cross-shaped pith, are smoked as cigars.

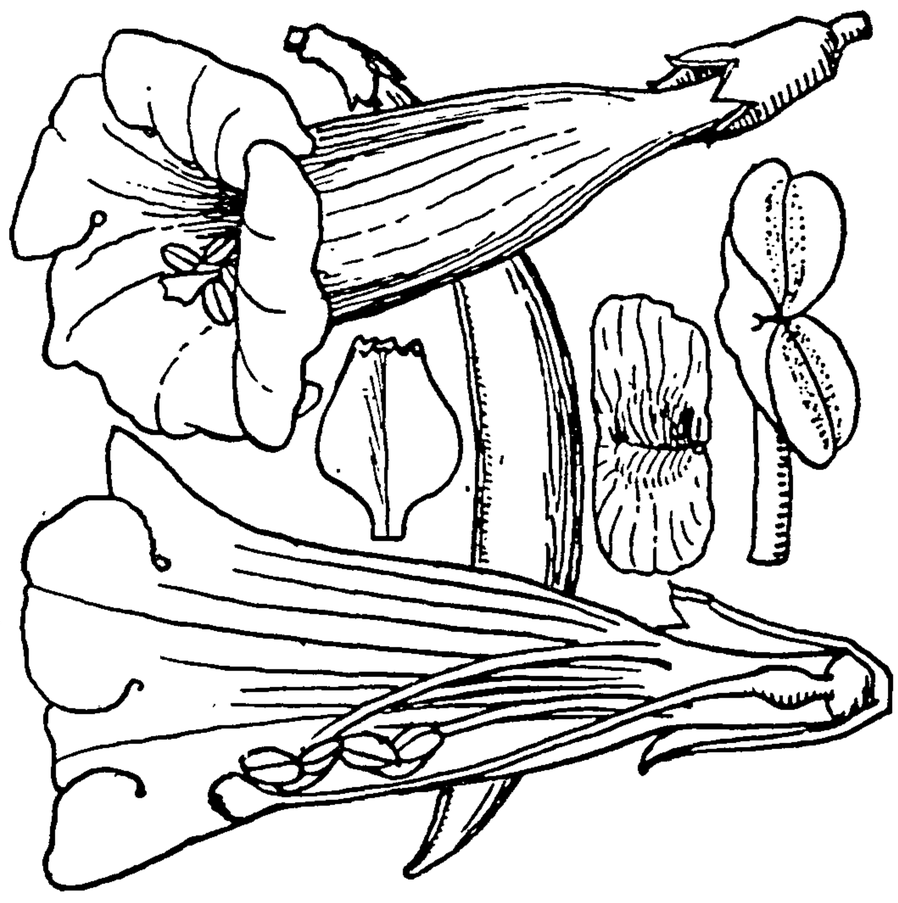
2. TECOMA Juss. Shrubs or partly herbaceous plants. Leaf-blades unequally pinnate. Flowers clustered. Calyx tubular-campanulate, nearly equally 5-lobed. Corolla with the tube gradually enlarged into the funnelform throat. Seeds membranous-winged.—About 10 species, mostly tropical American.



1. T. stans (L.) Juss. Plant 1–8 m. tall: leaves 1–2.5 dm. long; leaflets 7–13, the blades lanceolate to elliptic, or narrower, 4–10 cm. long, coarsely serrate: calyx 3–5 mm. long; lobes often triangular: corolla yellow, 3.5–4.5 cm. long: capsule 10–20 cm. long.—(YELLOW TRUMPET-FLOWER. YELLOW-ELDER.) — Hammocks, woods, and thickets, Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*).—All year.

3. BIGNONIA [Tourn.] L. Vines. Leaf-blades unequally pinnate: leaflets with toothed blades. Flowers clustered. Calyx tubular-campanulate,

nearly equally 5-lobed. Corolla tubular-funnelform. Capsule stout, fusiform. Seeds membranous-winged.—Two species, the following and 1 in Japan.

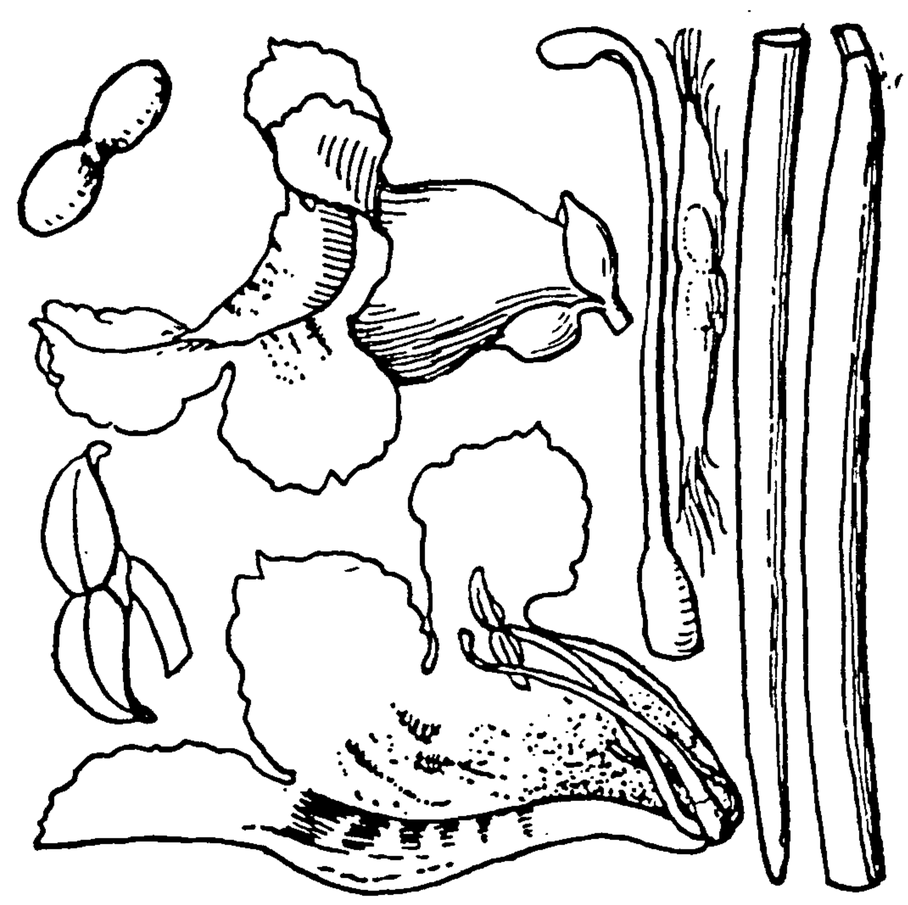


1. B. radicans L. Stout vine: leaves many, 2–2.5 dm. long; leaflets 7–11, the blades oval, ovate, or elliptic, 2–6 cm. long, coarsely serrate: calyx 14–18 mm. long; lobes triangular to triangular-ovate: corolla red or orange, 5–9 cm. long: capsule fusiform, 10–18 cm. long. [*Tecoma radicans* Juss.]—(TRUMPET-CREEPER. COW-ITCH. TRUMPET.)—Woods, river-swamps, thickets, and fencerows, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and N. J.—Sum.–fall.—The leaves of this plant are often mistaken for those of *Toxicodendron,* whence the name "cow-itch." The bigonias, however, have no poisonous effect on the skin.

4. CATALPA L. Shrubs or trees, with scaly bark. Leaves deciduous: blades broad, membranous. Flowers paniculate. Calyx 2-lobed. Corolla mainly white or yellow, the tube abruptly expanded into the throat. Capsule slender and elongate. Seeds fimbriate-winged. About 5 species, North American and Japanese.—INDIAN-BEANS. INDIAN-CIGARS. CIGAR-TREES. SMOKING-BEANS. CATALPAS. CATAWBAS.

Panicles many-flowered, crowded: corolla with a limb 4–5 × 5–6 cm. 1. *C. Catalpa.*
Panicles few-flowered, lax: corolla with a limb 6–7 × 7–8 cm. 2. *C. speciosa.*

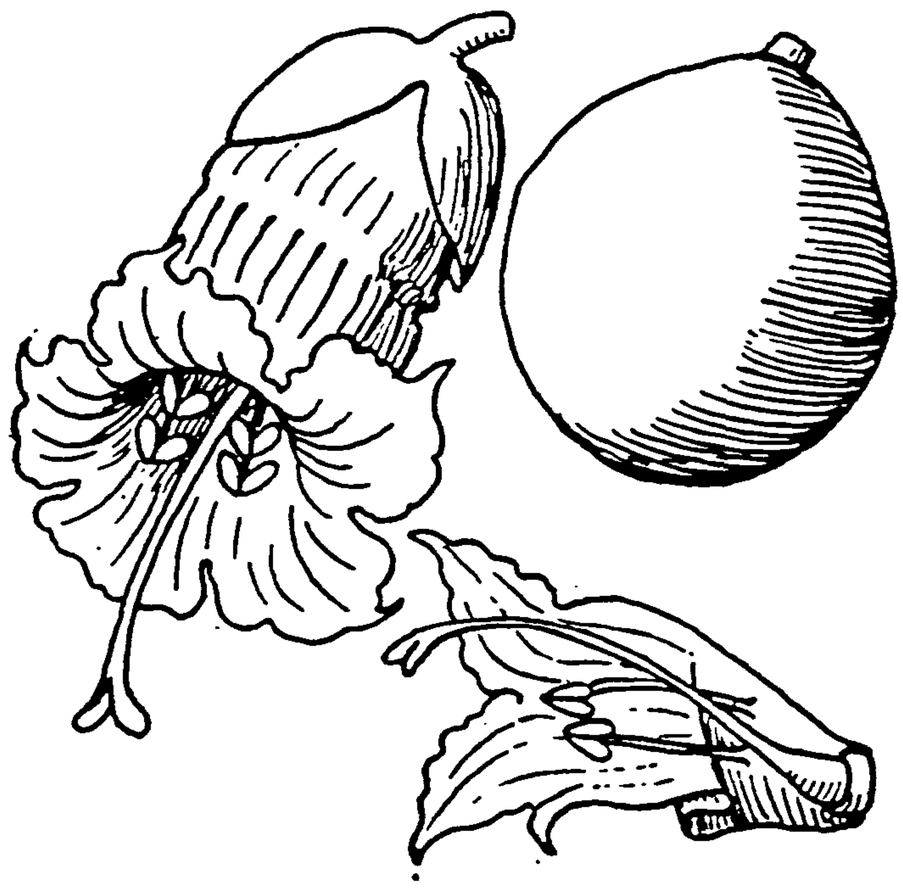
1. C. Catalpa (L.) Karst. Tree becoming 20 m. tall: leaf-blades ovate, 1–3 dm. long: calyx 8–12 mm. long; lobes abruptly pointed: corolla 3–4 cm. long, or sometimes larger; throat campanulate, channeled and keeled on the lower side, with yellow blotches along the ridges within and purple or magenta spots except on the top within; limb oblique, the lower lobe erect: capsule 1.5–4 dm. long.—Woods and stream-banks, various provinces, Fla. to Tex., and naturalized as far N as N. Y.—The dried capsules are frequently smoked by children wherever the tree is found.—Spr.–sum.



2. C. speciosa Warder. Tree becoming 40 m. tall: leaf-blades ovate to oblong-ovate, 1–3 dm. long: calyx 10–11 mm. long; lobes abruptly acuminate: corolla 3.5–5.5 cm. long, rather less copiously spotted within than *C. Catalpa;* throat conic-campanulate: capsule 3.5–5 dm. long.—(BOIS-PLANT.)—Damp soil or swamps, various provinces N of Coastal Plain, Tenn. to Tex., Mo., and Ind.—Spr.

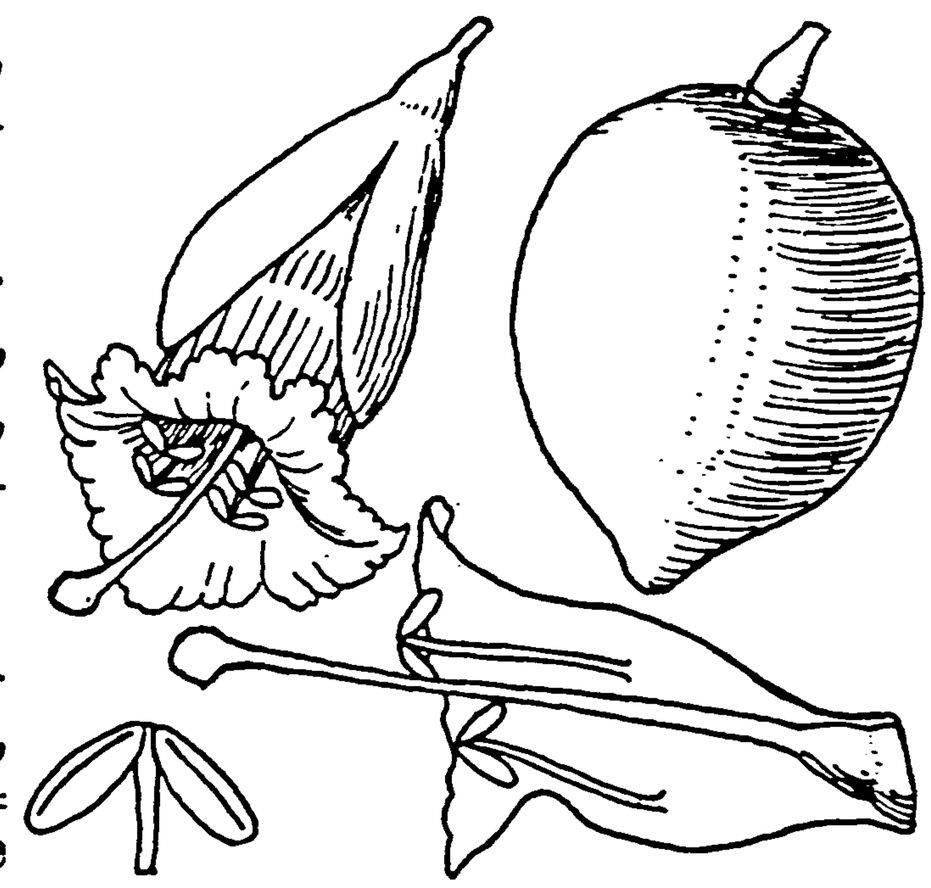
5. CRESCENTIA L. Trees with scaly bark. Leaves clustered on spurs: blades of a spatulate or oblanceolate type. Flowers in clusters or solitary, on

the spurs, pediceled. Calyx 2-lobed, leathery. Corolla mainly yellowish-green and magenta-streaked, with a fold between the tube and the campanulate throat: lobes 5, unequal. Anthers mostly included. Fruit relatively large, rounded at the apex, with a thick, hard pericarp. Seeds flat, obcordate.—About 5 species, tropical American.



1. C. Cujete L. Tree becoming 12 m. tall: leaf-blades 8–15 cm. long, abruptly acuminate or obtuse, narrow-based: calyx 2–3 cm. long: corolla yellowish-green and magenta-streaked; lobes undulate: capsule subglobose, oval, or ellipsoid, 15–30 cm. long.—(CALABASH-TREE.)—Hammocks, Florida Keys. Nat. of tropical America.—Spr.–sum.

6. ENALLAGMA Baill. Trees with scaly bark. Leaves alternate: blades of an oblong, oval, or obovate type. Flowers solitary or clustered at the ends of the branchlets, long-pedicelled. Calyx 2-lobed, leathery. Corolla mainly whitish, purplish or greenish-yellow, with a fold between the tube and the campanulate throat: lobes 5, unequal. Anthers mostly exserted. Fruit relatively small, umbonate at the apex, with a thin brittle pericarp. Seeds convex, notched at both ends.—Four species, tropical American.



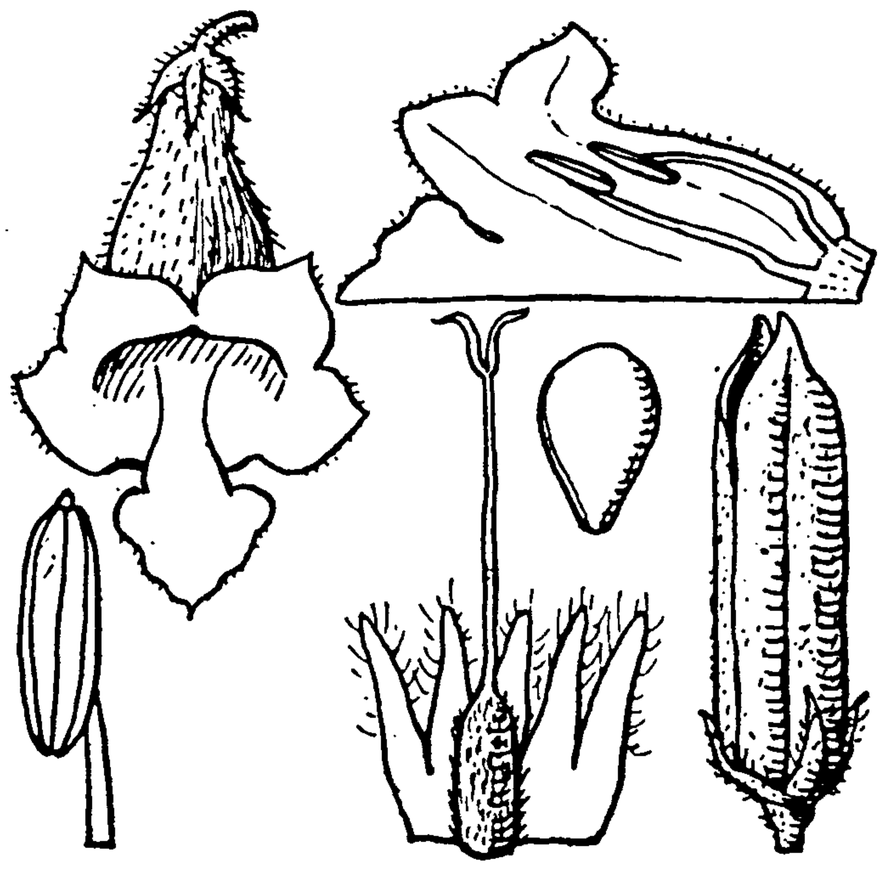
1. E. latifolia (Mill.) Small. Tree becoming 8 m. tall: leaf-blades 7–15 cm. long, abruptly pointed, broad-based: calyx 2.5–4 cm. long: corolla 5–6 cm. long, pale-purple to yellowish-white; lobes toothed: capsule ellipsoid or oval, 5–11.5 cm. long. [*Crescentia ovata* Fl. SE. U. S.]—(BLACK-CALABASH.)—Hammocks, often along the coast, S pen. Fla. and Florida Keys.—(*W. I.*)—Spr.–sum.

FAMILY 19. **PEDALIACEAE** — BENNE FAMILY

Herbs or rarely shrubs. Leaves opposite or sometimes alternate: blades entire, toothed or lobed, usually petioled. Flowers perfect, in axillary or terminal clusters. Calyx of 5 partly united unequal sepals. Corolla irregular: tube long or short, rarely spurred at the base: limb 2-lipped, the 5 lobes usually broad. Androecium of 4 didynamous stamens and one staminodium. Gynoecium of usually 2 united carpels. Style elongate. Stigmas 2, often somewhat foliaceous. Fruit a capsule, unarmed or with simple or hooked spines.—About 14 genera and 45 species, in the Old World.

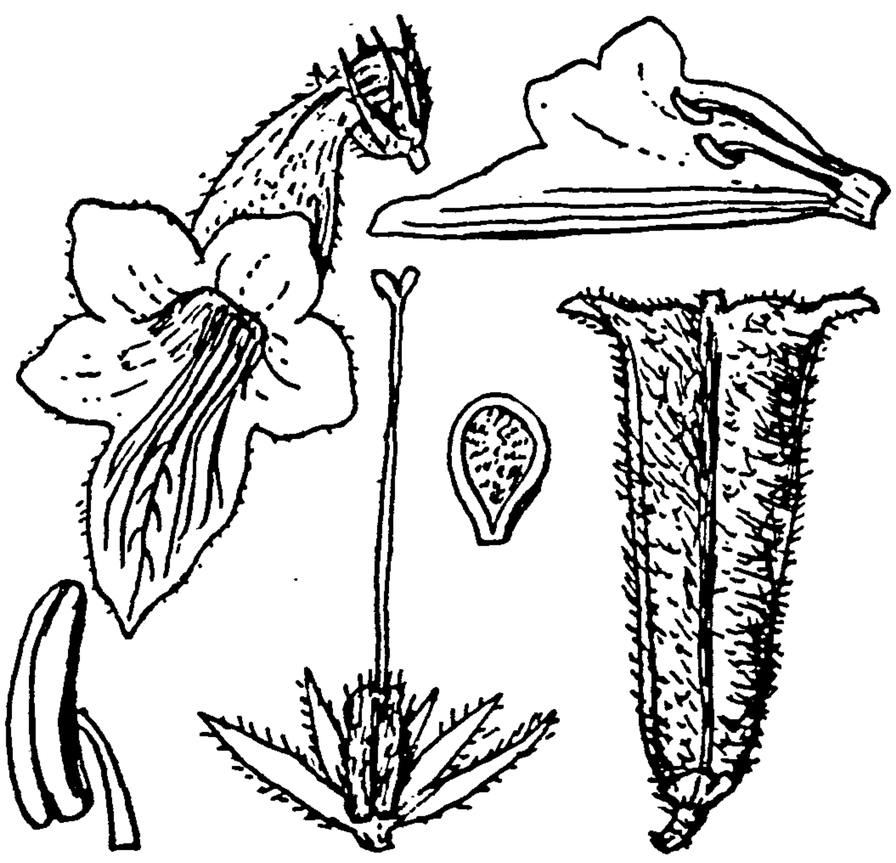
Ovary slightly 2-lobed at the apex: capsule abruptly pointed or short-beaked at the apex. 1. SESAMUM.
Ovary truncate at the apex: capsule truncate and with 2 lateral horns at the apex. 2. CERATOTHECA.

1. SESAMUM L. Herbs. Leaves opposite or partly alternate: blades broad or narrow. Flowers axillary. Calyx-lobes slightly unequal. Corolla horizontal: tube very short: throat campanulate: limb 2-lipped, the lower lip much larger than the upper one. Stamens included. Capsule angled or somewhat flattened. Seeds wingless.—About 12 species, in tropical Asia and Africa.



1. S. indicum L. Plant 1.5 m. tall or less, finely pubescent: leaf-blades ovate, toothed or lobed and long-petioled on the lower part of the stem, lanceolate to linear-lanceolate, undulate or entire and short-petioled above: calyx-lobes lanceolate or linear-lanceolate, 5–7 mm. long: corolla pink, yellowish, or white, 2–2.5 cm. long; lobes rounded: capsule ellipsoid, 2.5–3 cm. long, abruptly pointed.—(BENNE.)—Roadsides, cult. grounds, and waste-places, Coastal Plain, Fla. to Tex. Nat. of East Indies.—(*W. I., Mex., C. A., S. A.*)—All year.

2. CERATOTHECA Endl. Differs from Sesamum chiefly in the 2-horned capsule and in the case of our species in the broader leaf-blades. Leaves alternate on the upper part of the stem: blades toothed or lobed, petioled, subpalmately veined. Flowers axillary, opposite or alternate, subtended by bracts narrower than the leaves. Calyx-lobes unequal. Corolla nodding: tube mostly shorter than the calyx: throat subcampanulate: limb very oblique, the lower lip much longer than the upper one. Stamens included. Capsule somewhat flattened, truncate at the top. Seeds margined.—Five species, African.

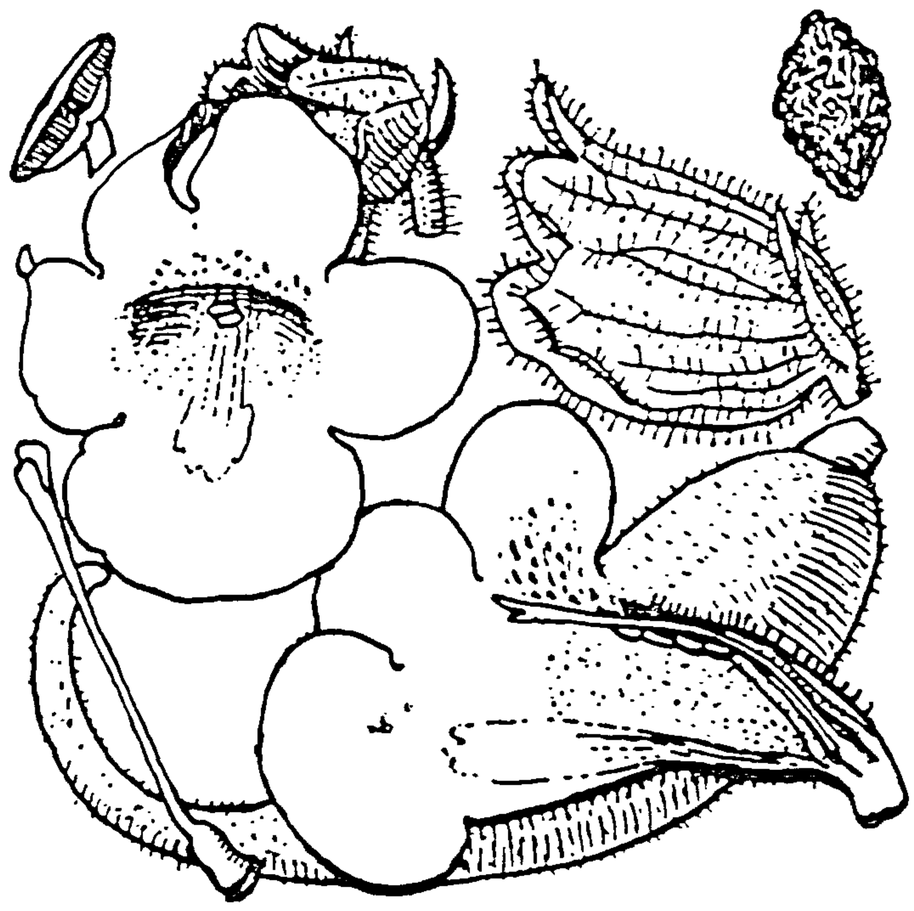


1. C. triloba E. Meyer. Plant 1–2 m. tall, the stem 4-angled and with grooved sides: leaves clammy-pubescent: blades sub-orbicular or ovate-orbicular, mostly 1–5 cm. long, crenate, those of the lower leaves more or less 3-lobed, all petioled: calyx-lobes lanceolate to linear-lanceolate, 6–7 mm. long: corolla lavender or pale-violet, 4.5–6.5 cm. long; blades obtuse: capsule slightly broadened upward, 1.5–2 cm. long, the horns divergent, pubescent, the sides grooved.—High pinelands and roadsides, pen. Fla. Nat. of Africa.—Sum.–fall.

FAMILY 20. **MARTYNIACEAE** — UNICORN-PLANT FAMILY

Annual or perennial, stocky herbs, with stout weak stems. Leaves opposite or rarely alternate: blades undulate or lobed. Flowers perfect, irregular, in racemes. Calyx of mostly 5 well-united sepals, oblique, the lobes short. Corolla of 5 partly united petals: tube often decurved: limb 5-lobed, oblique. Androecium of 4 didynamous stamens (or the posterior pair mere staminodia). Gynoecium 2-carpellary. Ovary 1-celled, the placentae parietal.—Three genera and 12 species, mostly tropical.

1. MARTYNIA L. Annual or perennial, very stout, herbs with clammy, strong-scented pubescence. Leaf-blades broad. Corolla declined, the limb oblique. Capsule 2-valved, the body crested, terminating in a curved or hooked beak.—About 8 species, American.



1. M. louisiana Mill. Annual, densely viscid-pubescent: leaf-blades sinuate, 0.5–3 dm. wide, petioled: flowers not fragrant: calyx-lobes ovate, obtuse: corolla-lobes undulate: capsule stout, 8–15 cm. long, curved, separating into 2 elastically spreading valves, the beak longer than the body.—(UNICORN-PLANT. RAM'S-HORN. PROBOSCIS-FLOWER.)—River-banks, fields, waste-places, and about gardens, various provinces, Ga. to N. M., Utah. Ia., and Pa. Nat. of the Miss. valley.—(*Mex.*)—Sum.–fall.

ORDER **PLANTAGINALES** — PLANTAGINAL ORDER

Annual or perennial herbs, or partially woody plants. Leaves wholly or mainly basal, or crowded on a simple or branched caudex: blades typically 1–several-ribbed. Flowers perfect, monoecious or dioecious, spicate. Calyx of 4 (3–5), partly united sepals. Corolla of 4 (3–5), partly united scarious and veinless petals. Androecium of 4 or 2 stamens, (or of 1 stamen). Gynoecium typically 2-carpellary. Ovary superior. Fruit capsular, usually a pyxis.

FAMILY 1. **PLANTAGINACEAE** — PLANTAIN FAMILY

Herbs. Leaf-blades typically 1–several-ribbed. Calyx-lobes, and corolla-lobes, 4. Style and stigma elongate.—Three genera and 225 species, widely distributed.

1. PLANTAGO [Tour.] L.[1] Acaulescent (ours) or caulescent herbs. Leaf-blades broad or narrow. Spikes usually elongate, green, or brown or grayish. Filaments partially adnate to the corolla-tube. More than 200 species, of wide geographical distribution.—PLANTAINS.

Flowers mainly dioecious: corolla lobes erect or closing over the capsule: plants annual or biennial.
- Stamens 2: leaf-blades narrow, linear or filiform. — I. PUSILLAE.
- Stamens 4: leaf-blades relatively broad. — II. VIRGINICAE.

Flowers perfect: corolla-lobes spreading or reflexed on the top of the capsule.
- Plants annual: flowers heterogonous, mostly cleistogamous. — III. ARISTATAE.
- Plants perennial: flowers proterogynous.
  - Calyx-lobes various, the lower united, the upper distinct. — IV. LANCEOLATAE.
  - Calyx-lobes all essentially distinct. — V. MAJORES.

I. PUSILLAE

- Capsule about twice as long as the calyx: seeds 10–30. — 1. *P. heterophylla.*
- Capsule slightly surpassing the calyx: seeds 2–4. — 2. *P. pusilla.*

[1] Prepared from matter contributed by Edward Lyman Morris.

II. VIRGINICAE

Plant with spatulate, obovate or elliptic, usually repand denticulate leaf-blades, and obtuse calyx-lobes. — 3. *P. virginica.*

III. ARISTATAE

Rigid plant with narrow entire leaf-blades and a stiff spike with long spreading bracts. — 4. *P. aristata.*

IV. LANCEOLATAE

Plant with narrow leaf-blades and short cylindric spikes which terminate wiry peduncles. — 5. *P. lanceolata.*

V. MAJORES

Lateral nerves of the leaf-blades free and remote from the midrib.

Spikes interrupted throughout: bracts much shorter than the calyx: seeds 2. — 6. *P. sparsiflora.*

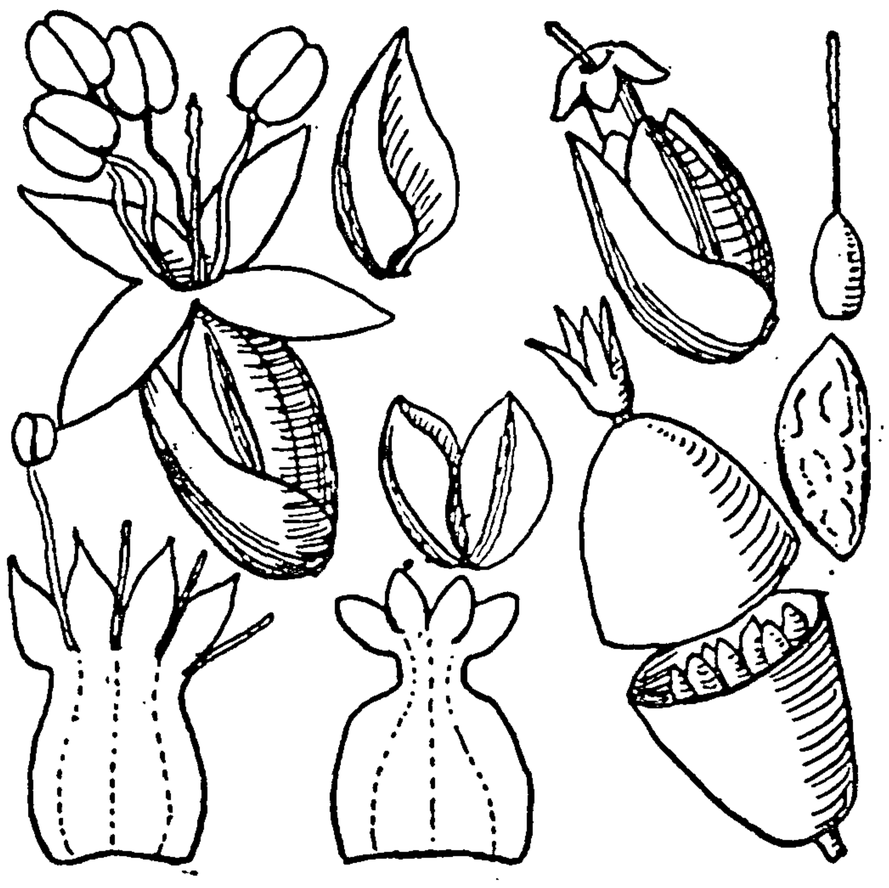
Spikes continuous at least above the base: bracts one half the length of the calyx or more: seeds 4–18.

Capsules conic or ellipsoid-conic, circumscissile below the middle. — 7. *P. Rugelii.*

Capsules ovoid, circumscissile at about the middle. — 8. *P. major.*

Lateral nerves of the leaf-blades partially confluent with the midrib. — 9. *P. cordata.*

1. **P. heterophylla** Nutt. Leaves basal, 2–18 cm. long; blades linear or nearly filiform, acute, entire or with several remote teeth or spreading narrow lobes, narrowed to the dilated base: scapes usually numerous, 2–25 cm. long, equalling or surpassing the leaves: spike slender, 2–15 cm. long, loosely-flowered: bracts ovate, 1.5–2 mm. long, blunt: flowers dioecious or polygamous: calyx-lobes oval to rhombic-obovate, about 1.5 mm. long, obtuse, mostly shorter than the bracts: corolla glabrous; lobes erect, ovate, 0.5 mm. long, acute: capsule ellipsoid, 3–3.5 mm. long, circumscissile below the middle: seeds mainly 0.5–0.7 mm. long, dark-red.—Moist soil, fields and pastures, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and N. J.—Spr.–sum.



2. **P. pusilla** Nutt. Leaves basal, several 2–12 cm. long; blades linear or nearly filiform, blunt-tipped, entire, obscurely 1-nerved, sometimes early deciduous: scapes usually several together, nearly filiform, 5–25 cm. long, surpassing the leaves, often glabrate above: spike rather loosely-flowered, slender: bracts ovate, 1–1.3 mm. long, acutish: flowers dioecious or polygamous: calyx-lobes oval to obovate, 1.3–1.5 mm. long, obtuse, about equalling the bracts: corolla glabrous; lobes erect, lanceolate to ovate-lanceolate: capsule ellipsoid or ovoid-ellipsoid, about 2 mm. long, circumscissile below the middle: seeds 1–1.5 mm. long, dark-red.—Dry sandy soil, various provinces, Ga. to Tex., Kans., and Mass.—Spr.–sum.

3. **P. virginica** L. Leaves basal, spreading or ascending, 1–15 cm. long; blades spatulate to obovate or elliptic, obtuse or acutish, entire or repand-denticulate, 3–5-nerved, narrowed into margined petioles or nearly sessile: scapes erect or ascending, 0.5–20 dm. tall, much surpassing the leaves: spike dense, sometimes interrupted below: flowers dioecious: bracts linear-lanceolate to lanceolate: calyx-lobes elliptic or ovate, 2–2.5 mm. long, obtuse, surpassing the bracts: corolla various, those of staminate flowers with spreading lobes, those of pistillate flowers with lobes usually unequally erect after fertilization: capsule ovoid or oval-ovoid, 1.5–2 mm. long, circumscissile at about the middle: seeds 2–4, 1.3 mm. long, golden-yellow.—Dry soil, Fla. to Tex., Ariz., Mich., and R. I.—Spr.–sum.

4. P. aristata Michx. Leaves nearly basal, 5–25 cm. long: blades linear, acuminate, entire and callous-tipped, narrowed into margined petioles, 3–5-nerved: scapes erect, 10–50 cm. tall, rigid, surpassing the leaves: spike dense, 2–15 cm. long, pubescent but not woolly: bracts linear, puberulent, 1–3 cm. long, surpassing the flowers by several times their length: flowers perfect: calyx-lobes spatulate-elliptic or cuneate, 2–2.5 mm. long, obtuse, the outer herbaceous, the inner widely scarious-margined: corolla glabrous; lobes ovate or orbicular- ovate, 2 mm. long, obtuse, cordate: capsule slightly narrowed upward, 2.5–3 mm. long, slightly surpassing the calyx, circumscissile at the middle: seeds 2, 2–3 mm. long.—Dry plains and prairies, various provinces, La. to N. M., B. C., Alas., and Ill.; naturalized eastward to Fla. and Me.—Spr.–fall.

5. P. lanceolata L. Leaves basal, often numerous, 4–30 cm. long; blades linear-elliptic to broadly elliptic, acute and callous-tipped at the apex or acuminate at both ends, 3–7-nerved, entire or denticulate, narrowed into margined petioles; which are dilated and hairy at the base: scapes erect or nearly so, 1–7 dm. tall, ridged: spike cylindric, dense, 1–8 cm. long, 6–8 mm. thick: bracts rhombic, 4–5 mm. long, the tip bent: flowers perfect: calyx-lobes 2–3 mm. long, broadly elliptic to oval, obtuse, the 2 lower ones usually united, their midribs closely subparallel: corolla glabrous; lobes broadly lanceolate, 2–2.5 mm. long: capsule ellipsoid, 3 mm. long, slightly longer than the calyx, circumscissile at about the middle: seeds 2, fully 2 mm. long.—(RIB-GRASS. ENGLISH-PLANTAIN. RIPPLE-GRASS.)—Fields, roadsides, and waste-places, various provinces, Fla. to Tex., N. M., Alas., Sask., and N. B. Nat. of Eurasia.—(*W. I.*)—Spr.–fall.

6. P. sparsiflora Michx. Leaves basal, 8–30 cm. long; petioles shorter than the blades, margined; blades lanceolate to very narrowly elliptic-lanceolate, acute or acuminate, 5(–7)-nerved, entire or indistinctly denticulate: scapes erect, 2–7 dm. tall, slender, simple: spike slender, sometimes 3.8 dm. long, glabrous or nearly so, loosely-flowered: bracts ovate, very much shorter than the calyx: flowers perfect: calyx-lobes orbicular to obovate, about 2 mm. long, rounded, each with a green midrib and scarious margins: corolla with tube slightly surpassing the calyx, glabrous; lobes reflexed: capsule ellipsoid-cylindric, 3–4 mm. long, nearly twice as long as the calyx, circumscissile at the lower third: seeds 2, fully 2 mm. long.—Low marshy pinelands, Coastal Plain, Fla. to N. C.—Spr.–fall.

7. P. Rugelii Decne. Leaves basal, 5–40 cm. long; petioles usually purple at the base; blades broadly ovate to elliptic, longer than the petioles or sometimes shorter, 5–7-nerved, entire or shallowly toothed, cuneately or abruptly narrowed at the base: scapes often surpassing the leaves, 10–50 cm. tall: spike 2–30 cm. long, sometimes broadly bracted near the base: bracts fully one half as long as the calyx, acute: flowers perfect: sepals elliptic, acute 2–2.5 mm. long, keeled, often scarious-margined: corolla glabrous; tubes slightly surpassing the calyx; lobes spreading: capsule conic or ellipsoid-conic, 4–4.5 mm. long, circumscissile below the middle: seeds 4–9, 1.5–2 mm. long.—Roadsides, fields, waste-places and woods, various provinces, Fla. to Tex., N. D., and N. B.; naturalized further westward.—Spr.–fall.—The leaves are shining green.

8. P. major L. Leaves basal, 5–35 cm. long; petioles usually green at the base; blades ovate or oval, or rarely elliptic, obtuse or acutish, 5–7-nerved, entire or coarsely toothed, rounded or cordate at the base, longer than the petioles or shorter: scapes surpassing the leaves, 8–40 cm. tall: spikes 4–20 cm. long, dense: bracts ovate, barely equalling the calyx: flowers perfect:

calyx-lobes ovate to obovate, obtuse, not keeled, scarious-margined: corolla inconspicuous; tubes about as long as the calyx; lobes spreading or reflexed: capsule ovoid, about 3 mm. long, slightly surpassing the calyx-lobes, circumscissile at the middle: seeds 6–18, 0.7 mm. long.—Waste-places, roadsides, cult. grounds, and damp banks, various provinces, U. S. and S Can. In part naturalized from Eu.—(*W. I., Mex.*)—Spr.–fall.—The leaves are dull-green.

9. **P. cordata** Lam. Leaves basal, 1–4.5 dm. long; blades ovate to suborbicular, 5–30 cm. long, acute or obtuse, 7–9-nerved, these confluent with the midrib below the middle of blade, entire or shallowly toothed, rounded or cordate at the base: scapes erect, surpassing the leaves, 15–50 cm. tall: spike loosely-flowered, sometimes interrupted: bracts orbicular-ovate or reniform, 1.5–3 mm. long: calyx-lobes ovate to suborbicular, 2.5–3 mm. long, obtuse or acutish: corolla surpassing the calyx; lobes ovate or orbicular-ovate, spreading or reflexed in age: capsule globose-ovoid, 4–5 mm. long, circumscissile at the middle or slightly below it: seeds 1–4, 3.5–4 mm. long. —Stream-banks, shaded swamps, various provinces, Ala. to La., Ont., and Va.—Spr.–sum.

Order **SANTALALES** — Santalal Order

Herbs, shrubs, or trees, mostly root- or tree-parasites. Leaves with expanded blades or scale-like. Flowers inconspicuous, perfect or imperfect. Calyx present, but often a mere border. Corolla present or wanting. Androecium of as many stamens as there are sepals, or petals, or twice as many. Gynoecium of several united carpels. Ovary more or less inferior. Fruit a drupe, a nut, or a berry.

Stamens as many as the petals or sepals: ovules not freely pendulous from an erect placenta.
  Leaves opposite: fruit a berry: tree-parasites. — Fam. 1. Loranthaceae.
  Leaves mainly alternate: fruit a drupe or a nut: root-parasites. — Fam. 2. Santalaceae.
Stamens twice as many as the petals, except in *Schoepfia*: ovules freely pendulous from the erect placenta. — Fam. 3. Olacaceae.

Family 1. **LORANTHACEAE**[1] — Mistletoe Family

Green or olive-brown shrubs or half-shrubs, with chlorophyll-bearing tissues, growing on woody plants from which they take sap through specialized roots (*haustoria*). Leaves opposite, sometimes scale-like. Flowers regular, minute, dioecious and seemingly apetalous in our species. Calyx of mostly 3 valvate sepals, each with a minute opposed stamen. Gynoecium compound, often 2-carpellary, but ovary inferior, 1-celled with a single little-differentiated ovule. Style single or wanting: stigma blunt or capitate. Fruit a berry or a drupe, the mesocarp very viscid.—About 21 genera and 500 species, most abundant in the tropics.

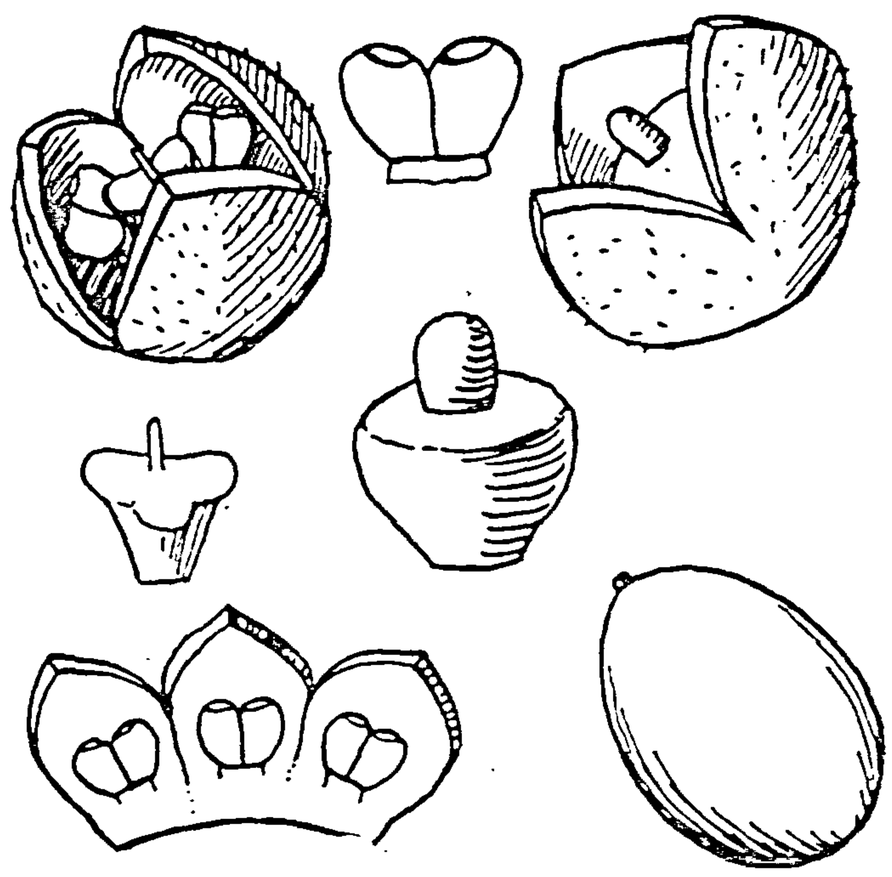
1. **PHORADENDRON** Nutt. Stem rather fleshy about a woody axis, brittle at the nodes. Leaves opposite, scale-like or fleshy-coriaceous. Inflorescence 1- to several-jointed. Spikes solitary or clustered in the axils. Flowers very small, apetalous, dioecious: staminate with a 3-lobed (rarely 2- to 5-lobed) calyx: anthers nearly sessile, 2-celled, dehiscing upwards: pistillate similar, the stigma nearly sessile. Berry subglobose, sessile, crowned with the per-

[1] Contributed by William Trelease.

sistent sepals. Seed solitary.—About 100 species, American.—AMERICAN-MISTLETOES. MISTLETOES.

Spikes permanently short (2–3 cm.), rather closely covered with berries.
  Leaf-blades relatively broad, oblanceolate to obovate, or orbicular. 1. *P. flavescens.*
  Leaf-blades relatively narrow, spatulate or elliptic-spatulate. 2. *P. Eatoni.*
Spikes elongating (6–7 cm.) with the berries in separated whorls. 3. *P. macrotomum.*

1. P. flavescens (Pursh) Nutt. Stem minutely puberulous, becoming glabrate: leaf-blades oblanceolate to obovate (or orbicular in the southwestern *P. flavescens orbiculatum*), obtuse, cuneately subpetioled, 20–50 mm. long: spikes short, mostly 10–15 mm. long, short-peduncled, with about 4 short joints, some joints 6-flowered when pistillate, others 12-flowered when staminate: berries white or slightly yellowish, 4 mm. in diameter, covering the spike, with inflexed sepals.—On many kinds of deciduous trees, various provinces, Fla. to E Tex., Okla., W. Va., and N. J.—Plants forming large rather compact tufts.



2. P. Eatoni Trelease. Stem slender, glabrescent: leaves elliptic-spatulate or spatulate, obtuse, gradually attenuate at base, 25–50 mm. long: spikes moderately short, 20–30 mm. long, short-peduncled, with 2 or 3 to 6 ellipsoid joints 6–12-flowered or even 30-flowered when staminate, and about 3 short joints some 6-flowered when pistillate: berries nearly white, broadly ellipsoid, 4×5 mm. in diameter, with inflexed sepals.—On ash trees or sometimes on oaks and other trees, S pen. Fla.—Plants in dense much-branched tufts.

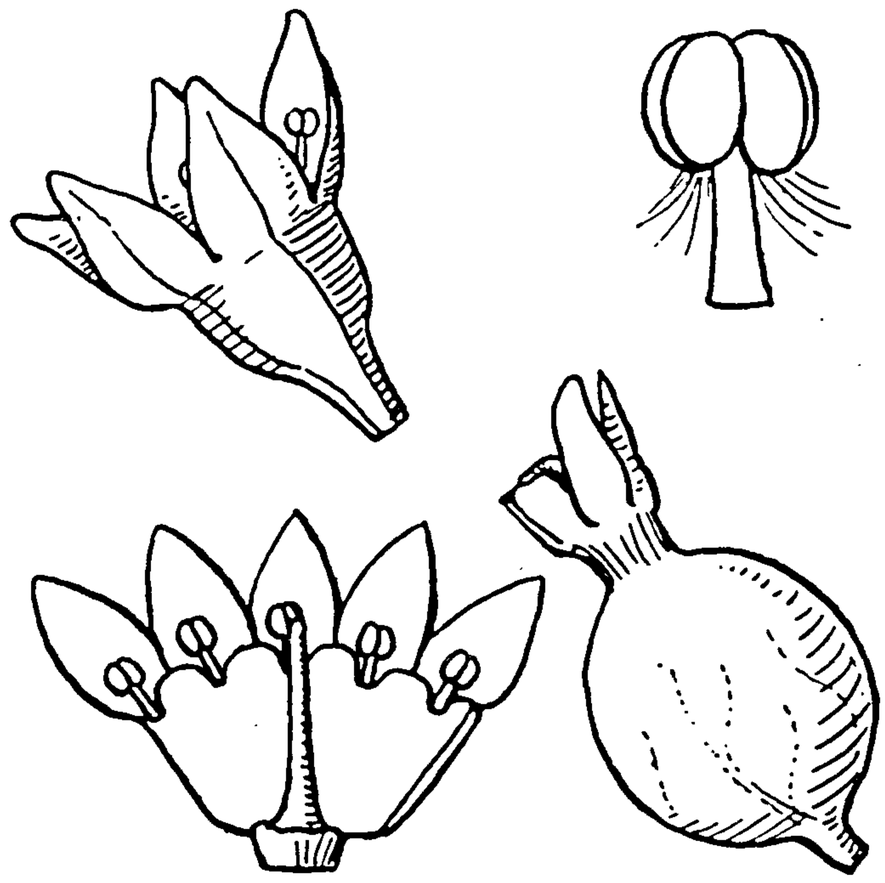
3. P. macrotomum Trelease. Stem minutely puberulous or glabrescent: leaf-blades oblanceolate, obtuse, cuneately subpetioled, 50–70 mm. long: spikes rather long, 20–30 mm., reaching 60–70 mm. in fruit, short-peduncled, with about 5 rather short joints, some joints 6-flowered when pistillate, others 20-flowered when staminate: berries greenish-white, ellipsoid, 4 mm. in diameter, in separated whorls, with inflexed sepals.—On various deciduous trees, Fla.—Plants forming large rather open tufts.

FAMILY 2. SANTALACEAE — SANDAL-WOOD FAMILY

Herbs, shrubs, or trees, parasitic on the roots of other plants. Leaves opposite or alternate: blades entire. Flowers perfect, polygamous, or dioecious, the staminate clustered, the pistillate often solitary. Calyx of 3–6 sepals. Corolla wanting. Androecium of 3–6 stamens opposite the sepals on the edge of the hypanthium. Gynoecium compound. Fruit mostly drupaceous.—About 26 genera and 250 species, mostly tropical.

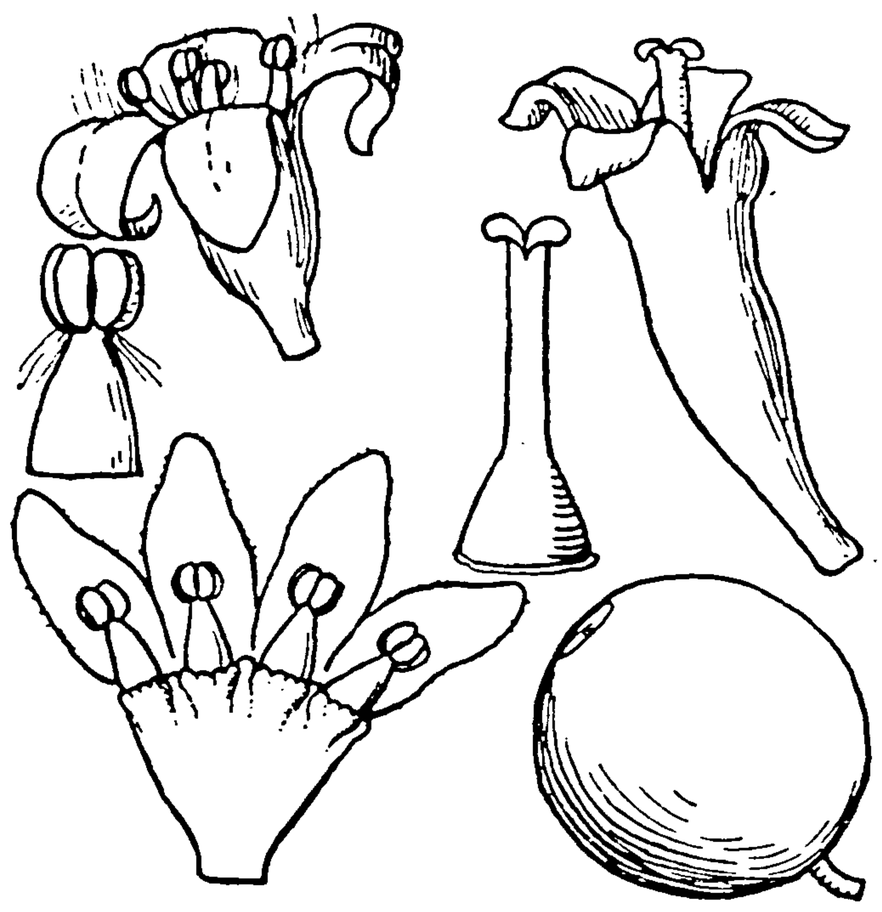
Herbaceous perennials: flowers perfect: stigma capitate. 1. COMANDRA.
Shrubs: flowers dioecious or polygamous: stigma 2–4-lobed.
  Staminate flowers in umbels or umbel-like clusters: leaves leaves opposite or nearly so.
    Hypanthium of the staminate flowers turbinate: anthers connected with the sepals by a tuft of hairs. 2. NESTRONIA.
    Hypanthium of the staminate flowers flat: anthers not connected with the sepals. 3. BUCKLEYA.
  Staminate flowers in racemes: leaves alternate. 4. PYRULARIA.

1. **COMANDRA** Nutt. Herbs with long rootstocks. Leaves alternate: blades narrow. Flowers perfect, cymose. Style columnar: stigma capitate. Drupe crowned with the persistent calyx.—Five species, one of them European.



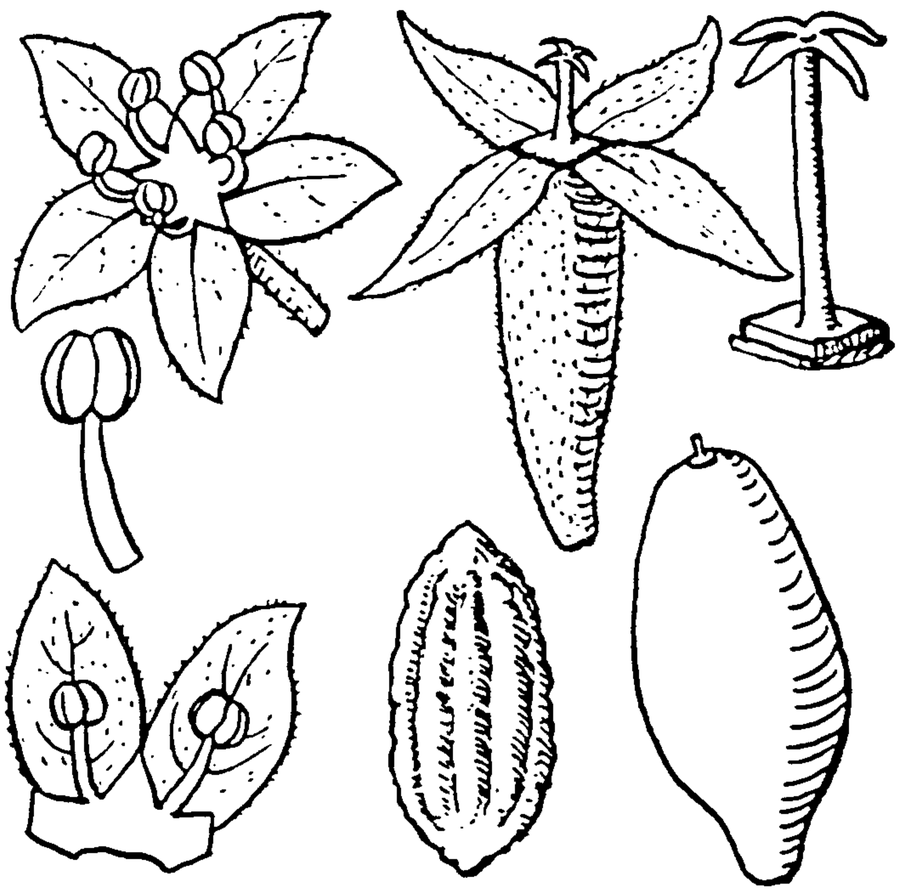
1. C. umbellata (L.) Nutt. Plant 2–4 dm. tall: leaf-blades elliptic, oval, or elliptic-lanceolate, 1–3.5 cm. long: sepals elliptic-ovate, 2–2.5 mm. long, white; stamens ½ as long as the sepals: drupe greenish-drab, about 5 mm. in diameter.—(BASTARD-TOAD-FLAX.)—Dry ground, thickets, and banks, various provinces, Ga. to Ark., Alb., and N. B.—Spr.–sum.—This is the only santalaceous genus in North America with more than one species, three additional to the above occurring in western North America.

2. **NESTRONIA** Raf. Shrubs with spreading branches. Leaves opposite: blades broad. Flowers polygamo-dioecious, the staminate umbellate: sepals not veiny. Style conic; stigma 3–4-lobed. Drupe of an oval type.—One species.



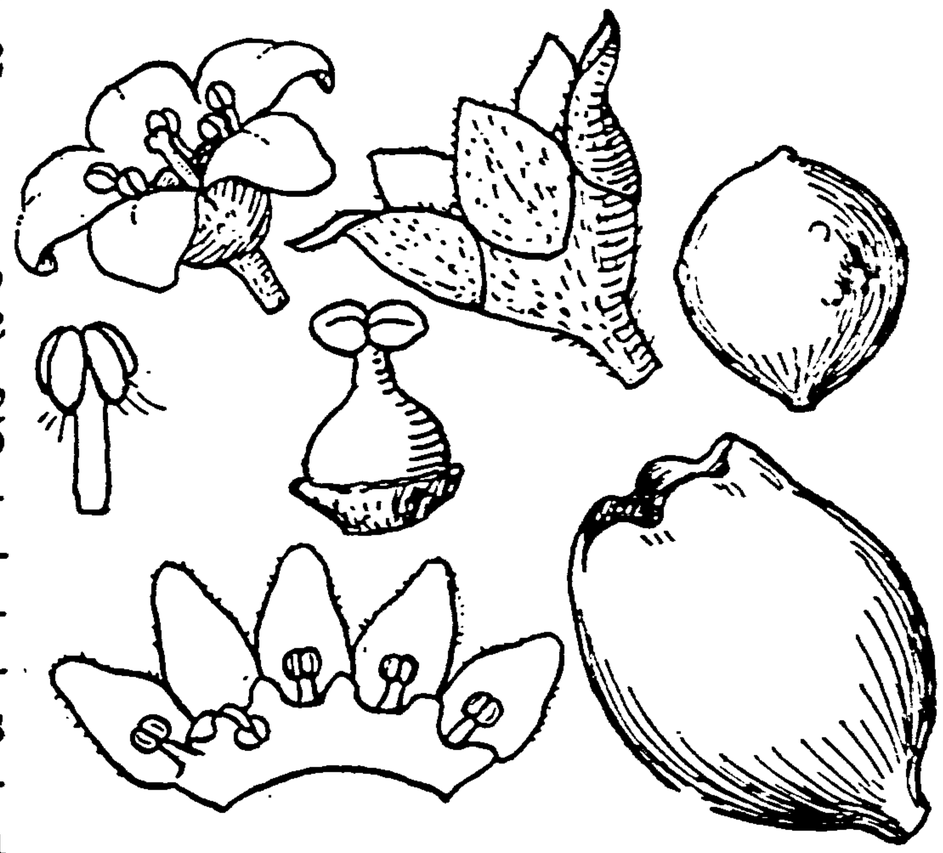
1. N. umbellula Raf. Shrub 3–10 dm. tall, the branches glabrous: leaf-blades oval, varying to ovate or obovate, 2–7 cm. long: sepals broad at the base, greenish, those of the staminate flowers elliptic-ovate, 2–2.5 mm. long: stamens ⅔ as long as the sepals: drupes 10–13 mm. long.—Woods and stream-banks, Piedmont to Appalachian Plateau, Ga. to Ala. and Va.—Spr.—This shrub, unlike *Buckleya*, is, as far as we know, parasitic on the roots of the deciduous-leaved shrubs and trees with which it grows. Coniferous trees are often wanting there.

3. **BUCKLEYA** Torr. Shrubs with 2-ranked branches. Leaves opposite or nearly so, distichous: blades rather broad. Flowers dioecious, the staminate umbellate: sepals veiny. Style conic: stigma 4-lobed. Drupe of an ellipsoid type.—One species.



1. B. distichophylla (Nutt.) Torr. Shrub 2–4 m. tall, the branches pubescent: leaf-blades lanceolate to ovate-lanceolate, 2–7 cm. long: sepals rounded at the base, greenish, those of the staminate flowers ovate, 2.5–3 mm. long: drupe 2–2.5 cm. long.—River-banks, Blue Ridge, N. C. and Tenn.—Spr.–sum.—Parasitic on the roots of hemlock trees. The geographic range is very restricted, only three localities being definitely known at present, although others have been reported. The species is in danger of extermination.

4. PYRULARIA Michx. Shrubs or trees, with diffuse branches. Leaves alternate: blades broad. Flowers dioecious or polygamous, racemose. Style very short: stigma depressed. Drupe pyriform.—Three species, the following and 2 Asiatic.



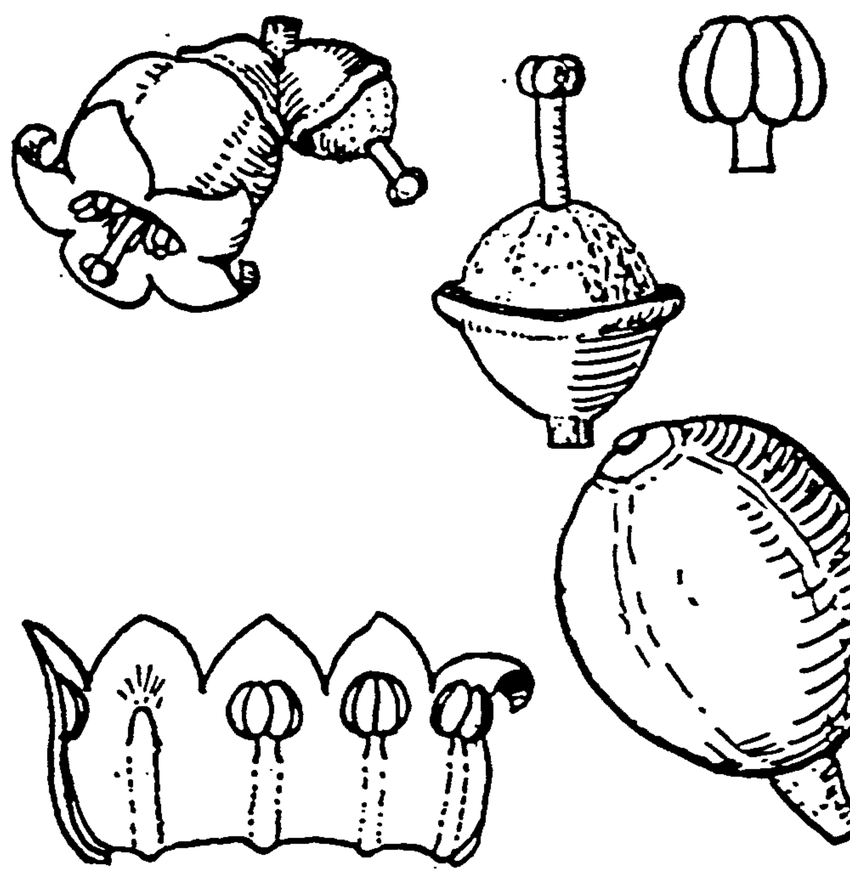
1. P. pubera Michx. Shrub 1–3 m. tall, with pubescent branches: leaf-blades elliptic or commonly broadest above the middle, 4–15 cm. long: sepals ovate, green, 2–2.5 mm. long: drupe 2–2.5 cm. long.—(BUFFALO-NUT. OIL-NUT. MOUNTAIN-COCONUT.)—River-banks and woods, Blue Ridge to Appalachian Plateau, Ga. to Ala. and Pa.—Spr.–sum.—A curious shrub, inconspicuous in flower, but obvious in fruit by the dangling drupes, which are, at first light-green and later yellowish. An oil, resembling olive oil, but ill-scented and poisonous, has been pressed from the drupes.

FAMILY 3. **OLACACEAE** — XIMENIA FAMILY

Shrubs, trees, or vines. Leaves usually alternate: blades entire or rarely toothed. Flowers perfect or polygamous, regular, in dichotomous or raceme-like cymes. Calyx of 4–6 small sepals, surmounting the hypanthium. Corolla of 4–6 distinct or united petals. Androecium of 4–12 stamens. Gynoecium 3–4-carpellary. Fruit a drupe.—About 25 genera and 140 species, mostly tropical.

Petals united to above the middle: stamens as many as the corolla-lobes and opposite them: drupe nearly enclosed in the disk. 1. SCHOEPFIA.
Petals nearly distinct: stamens twice as many as the petals: drupe naked. 2. XIMENIA.

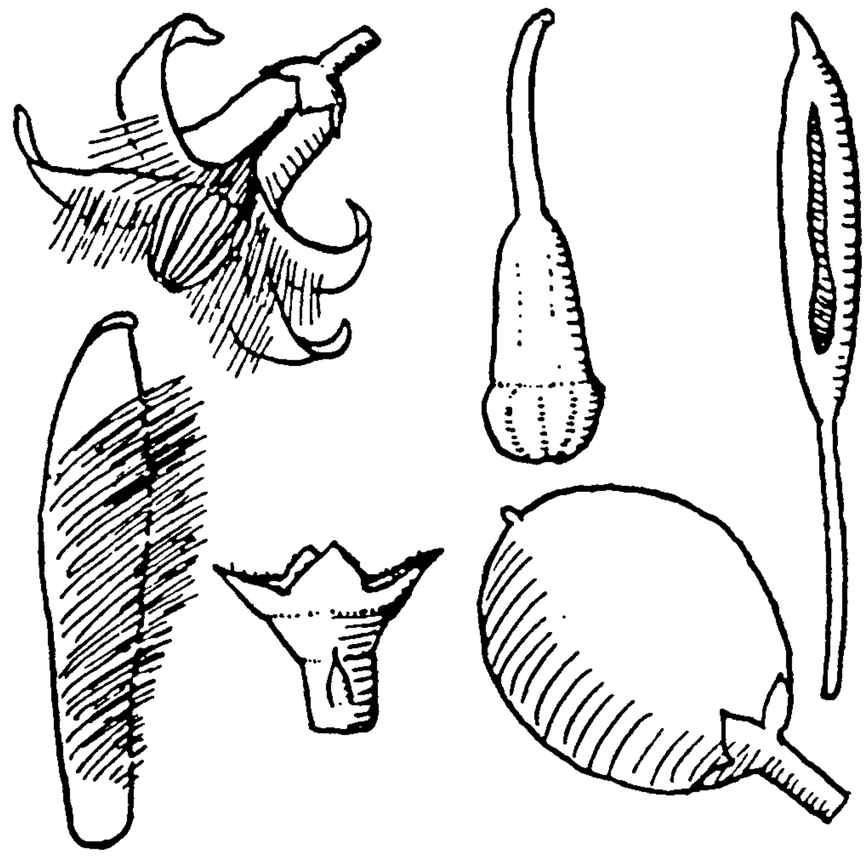
1. SCHOEPFIA Schreb. Unarmed shrubs or trees. Leaf-blades entire. Hypanthium filled with an elevated disk. Sepals broad. Petals united to above the middle. Filaments adnate to about the middle of the corolla-tube. Anthers oval or ovoid. Ovary about ½ inferior.—About 15 species, tropical American and Asiatic.



1. S. chrysophylloides (A. Rich.) Planch. Shrub or small tree, with pale branches: leaf-blades ovate to oblong-ovate, 2–6 cm. long: corolla red or reddish, about 4 mm. long: lobes ovate, glabrous: drupes ovoid or oval-ovoid, 10–12 mm. long. [*S. Schreberi* (Fl. SE. U. S.)]—(WHITEWOOD.)—Coastal and inland hammocks, pen. Fla. and the Keys.—(*W. I.*)—All year.

2. XIMENIA [Plum.] L. Thorny shrubs or trees. Leaf-blades entire. Hypanthium without an elevated disk. Sepals minute. Petals nearly dis-

tinct. Anthers linear. Ovary nearly superior.—About 5 species, tropical.



1. X. americana L. Shrub or small tree, with dark branches: leaf-blades oblong to elliptic or nearly so, 3–7 cm. long: corolla yellow or yellowish-white, about 10 mm. long; lobes linear, densely pubescent within: drupes subglobose or broadly oval, 14–17 mm. long. — (TALLOW-WOOD.) — Hammocks, pen. Fla. and hammocks and pine-lands, Everglade Keys, Fla. and Fla. Keys.—(*W. I.*)—Spr.–fall, or all year southward.—The tallow tree has become accommodated to a variety of soils and habitats. These factors are reflected in its habits. In the sterile soil of the "scrub" it is a sprawling shrub often only knee high; in hammocks it is an erect shrub or small tree.

ORDER **RUBIALES** — RUBIAL ORDER

Herbs, shrubs, or trees. Leaves opposite, sometimes whorled. Flowers perfect or polygamous, axillary or cymose. Hypanthium present. Calyx of 2 or more often small sepals. Corolla of 3 or more partially united petals. Androecium of as many stamens as there are petals or twice as many. Gynoecium 2–several-carpellary. Ovary wholly or partially inferior. Fruit a capsule, a berry, or a drupe.

Leaves with stipules adnate to the stem between the leaf-bases.	Fam. 1. RUBIACEAE.
Leaves without stipules, or if present these adnate to the petiole.	Fam. 2. CAPRIFOLIACEAE.

FAMILY 1. **RUBIACEAE** — MADDER FAMILY

Herbs, shrubs, trees, or vines. Leaves opposite or whorled, with interpetiolar or foliaceous stipules. Flowers perfect or polygamous, regular or nearly so. Calyx of 2–6, or more, sepals surmounting the hypanthium, or obsolete. Corolla of 3–6, or more, more or less united petals. Androecium of as many stamens as there are petals and alternate with them. Gynoecium 2–several-carpellary. Fruit a capsule, a drupe, or a berry.—About 340 genera and 6,000 species, widely distributed; most abundant in the tropics.

Cavities of the ovary with several to many ovules each: seeds several to many.	Subfamily I. CINCHONOIDEAE.
Cavities of the ovary with a single ovule each: seed solitary.	
Stipules not foliaceous, usually minute.	Subfamily II. COFFEOIDEAE.
Stipules foliaceous, nearly or quite as large as the leaf-blades, thus making the leaves appear as in whorls.	Subfamily III. GALIOIDEAE.

Subfamily I. CINCHONOIDEAE

Fruit dry.	
Seed wingless.	
Ovules very numerous: shrubs or trees.	1. PINCKNEYA.
Ovules several: herbs, sometimes woody at the base.	
Sepals and corolla-lobes 4.	
Top of the capsule not extending beyond the hypanthium.	2. OLDENLANDIA.
Top of the capsule extending beyond the hypanthium.	3. HOUSTONIA.

Sepals and corolla-lobes 5. 4. PENTODON.
Seed winged. 5. EXOSTEMA.
Fruit pulpy.
Fruit 2-celled.
Flowers in cymes. 6. CASASIA.
Flowers solitary.
Corolla-lobes 5, convolute. 7. RANDIA.
Corolla-lobes 4, valvate. 8. CATESBAEA.
Fruit 5-celled. 9. HAMELIA.

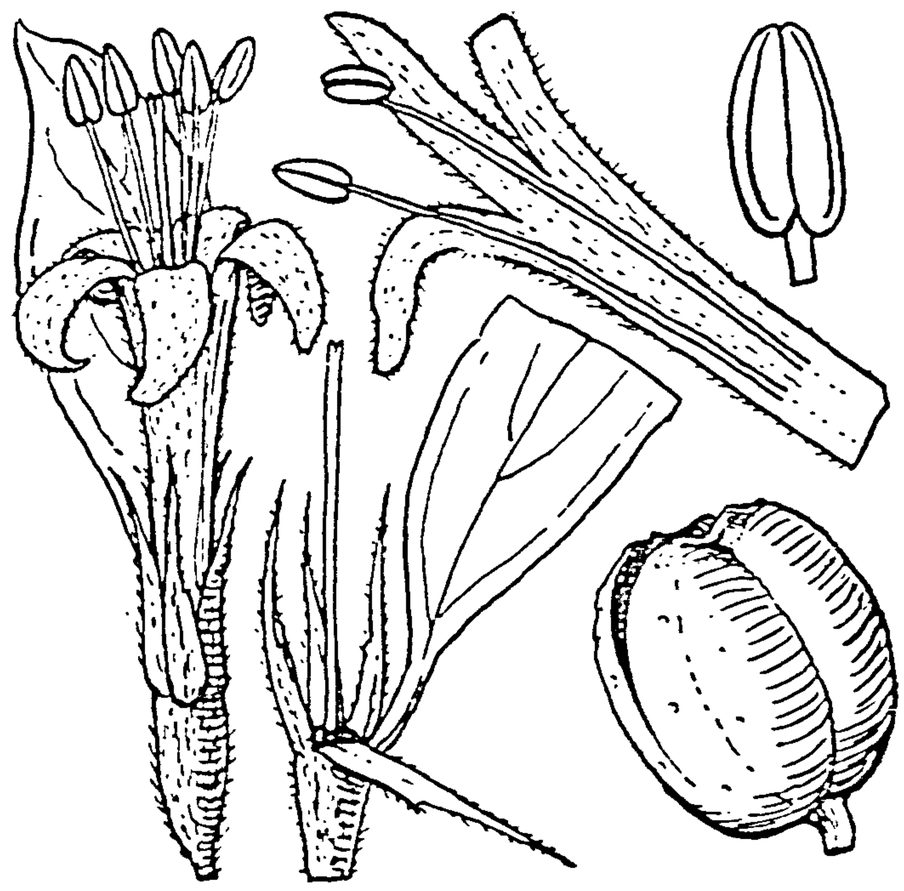
Subfamily II. COFFEOIDEAE

Flowers in dense heads. 10. CEPHALANTHUS.
Flowers solitary or in open inflorescences.
Ovule pendulous.
Filaments wholly or partly adnate to the corolla-tube. 11. GUETTARDIA.
Filaments not adnate to the corolla-tube.
Inflorescence terminal. 12. ERITHALIS.
Inflorescence axillary. 13. CHIOCOCCA.
Ovule not pendulous.
Corolla-lobes imbricate. 14. STRUMPFIA.
Corolla-lobes valvate.
Ovule or seed with a basal attachment.
Flowers not paired, the ovaries distinct.
Corolla funnelform: seed wingless: erect. 15. PSYCHOTRIA.
Corolla campanulate: seed winged: vines. 16. PAEDERIA.
Flowers paired, the ovaries united. 17. MITCHELLA.
Ovule or seed with a lateral attachment.
Shrubs or trees. 18. MORINDA.
Herbs.
Ovary 3- or 4-celled. 19. RICHARDIA.
Ovary 2-celled.
Fruit drupaceous, the carpels neither dehiscent nor separating. 20. ERNODEA.
Fruit not drupaceous, the carpels dehiscent or separating.
Mature carpels merely separating.
Styles partly united: stigmas slender: corolla salverform. 21. DIODIA.
Styles united to the top: stigma capitate or 2-lobed: corolla funnelform. 22. DIODELLA.
Mature carpels dehiscent.
Fruit septicidal, and both carpels ventrally dehiscent. 23. BORRERIA.
Fruit separating into carpels, one of which opens through the ventral face, the other remaining closed. 24. SPERMACOCE.

Subfamily III. GALIOIDEAE

Stipules foliaceous, usually resembling the leaves. 25. GALIUM.

1. **PINCKNEYA** Michx. Shrubs or trees. Leaves with broad entire blades. Flowers in corymbose cymes. Sepals 5, 1 or 2 of them, at least in the outer flowers, transformed into leaf-like members. Corolla with a stout tube and 5 rather broad lobes. Stamens 5: filaments adnate to the lower part of the corolla-tube, glabrous: anthers ellipsoid, exserted. Capsule as wide as long. Seeds flat, wingless.—One species.



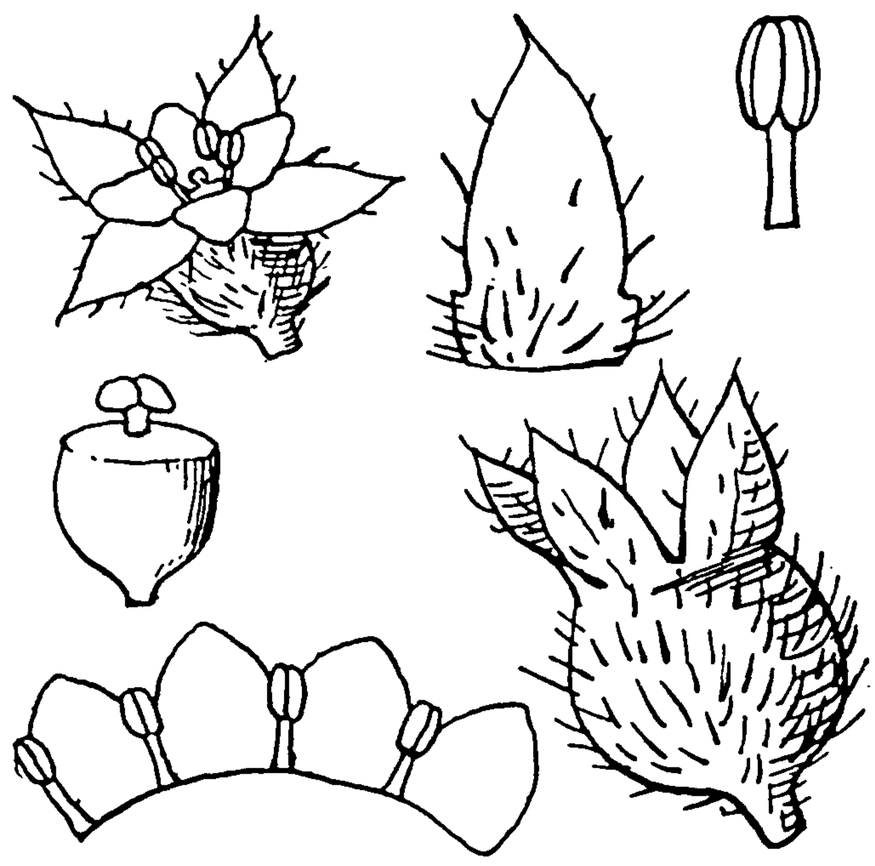
1. P. pubens Michx. Shrub or small tree, with pubescent foliage: leaf-blades elliptic, oval, or ovate, 5–20 cm. long, short-petioled: foliaceous sepals like the leaves in shape, but smaller and pink: unchanged sepals linear to linear-lanceolate, 1–1.5 cm. long: corolla

greenish, mottled with brown or purple: tube 1.5–2 cm. long; lobes as long as the tube or shorter: capsule subglobose or obovoid, nearly 2 cm. in diameter.—(FEVER-TREE.)—Sandy swamps, Coastal Plain, W Fla. to S. C.—Spr.–sum.—The numerous bright-pink foliaceous sepals make the plants conspicuous on the edges of swamps.

2. **OLDENLANDIA** L. Annual or perennial, often diffuse herbs, or woody plants. Leaf-blades mostly narrow. Flowers in axillary or terminal congested cymes. Sepals 4, broad. Corolla rotate, minute: tube very short: lobes broad. Stamens 4: filaments adnate to the base of the corolla-tube. Style very short or wanting. Capsule scarcely longer than the hypanthium, terete or angled.—About 175 species, most abundant in tropical Asia.

Flowers sessile or nearly so, solitary or glomerate.
  Annual plants: sepals ciliate, acute.
    Stem hirsute: leaf-blades short-petioled. 1. *O. uniflora.*
    Stem glabrous: leaf-blades sessile. 2. *O. fasciculata.*
  Perennial plants: sepals eciliate, acuminate. 3. *O. Boscii.*
Flowers on filiform pedicels and peduncles. 4. *O. corymbosa.*

1. **O. uniflora** L. Stem 1–4 dm. long, often much branched: leaf-blades ovate to elliptic, 0.5–2.5 cm. long: sepals about 1.5 mm. long: petals about ½ as long as the sepals, white or nearly so, ciliate at the tip: capsule 1–1.5 mm. long.—Moist sandy soil, Coastal Plain, Fla. to Tex. and N. Y.—Spr.–fall, or all year southward.



2. **O. fasciculata** (Bertol.) Small. Stem 1–5 dm. long, sometimes diffusely branched: leaf-blades elliptic to lanceolate or ovate-lanceolate, 0.5–2 cm. long: sepals about 1.5 mm. long: petals about ½ as long as the sepals, pearl-blue, eciliate: capsule 1.5–2 mm. long.—Sandy beaches, swamps, muddy banks about tide-water, Coastal Plain, Fla. to Miss.—Sum.–fall.

3. **O. Boscii** (DC.) Chapm. Stem weak, commonly diffusely branched, 1–3 dm. long: leaf-blades linear or attenuate to the bases, 1–2 cm. long: sepals barely 1.5 mm. long: petals triangular or ovate-triangular, about 0.5 mm. long, white or purplish: filaments finely pubescent: capsule about 2 mm. long.—Wet soil, borders of ponds, and ditches, Coastal Plain and adj. provinces, Fla. to Tex., Ark., Tenn., and S. C.—Spr.–fall.

4. **O. corymbosa** L. Stem erect or decumbent and diffuse, 2–5 dm. long: leaf-blades linear to linear-lanceolate, 1–4 cm. long: sepals about 1 mm. long: corolla white, about 2 mm. long; lobes ovate, pubescent within: filaments glabrous: capsule about 2 mm. long.—Roadsides and waste-places, S pen. Fla.—(*W. I., C. A., S. A., O. W.*)—Spr.–sum.

3. **HOUSTONIA** L. Annual or perennial, erect or creeping herbs. Leaf-blades narrow or broad. Flowers in open or compact cymes. Sepals 4, commonly narrow. Corolla funnelform or salverform: tube long: lobes mostly shorter than the tube. Stamens 4: filaments adnate to above the middle of the corolla-tube. Style slender. Capsule seated on or in the hypanthium, flattened.—About 35 species, North American.

Flowers solitary on terminal pedicels or also on pedicels axillary to leaf-like bracts, not aggregated into a terminal cyme. — I. CAERULEAE.
  Pedicels erect in fruit. — II. ROTUNDIFOLIAE.
  Pedicels recurved in fruit. — III. ANGUSTIFOLIAE.
Flowers borne in terminal, more or less effuse cymes.

I. CAERULEAE

Plant perennial by slender horizontal rootstocks or creeping stems.
  Plant erect: sepals lanceolate: corolla-tube glabrous within. — 1. *H. caerulea.*
  Plant diffusely creeping: sepals elliptic: corolla-tube pubescent within. — 2. *H. serpyllifolia.*
Plant annual, with slender roots.
  Sepals much surpassed by the corolla-tube: capsule about equalling the sepals. — 3. *H. pusilla.*
  Sepals about equalling the corolla-tube: capsule much exceeded by the sepals. — 4. *H. minima.*

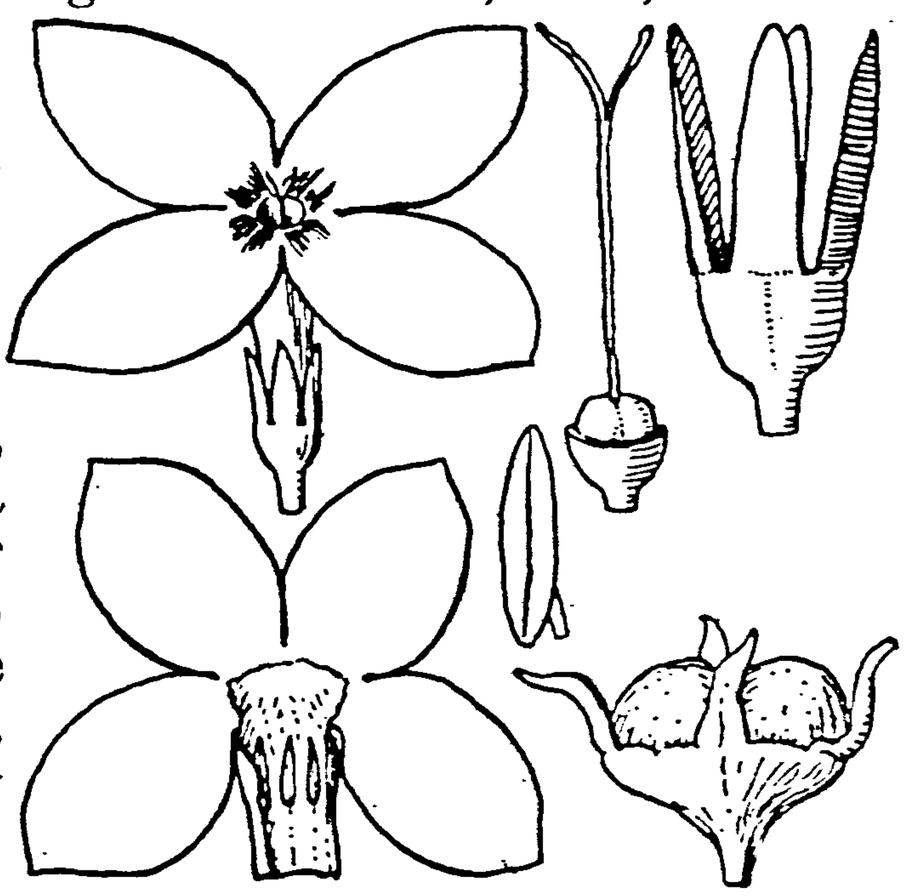
II. ROTUNDIFOLIAE

Plant prostrate, usually in light-green mats: corolla bright-white, starry. — 5. *H. procumbens.*

III. ANGUSTIFOLIAE

Sepals fully as long as the hypanthium.
  Sepals conspicuously surpassing the capsule.
    Corolla less than twice as long as the sepals: sepals 4–8 mm. long. — 6. *H. lanceolata.*
    Corolla over twice as long as the sepals: sepals 2–3 mm. long.
      Sepals subulate to linear-lanceolate during anthesis: corolla-tube 6–7 mm. long. — 7. *H. purpurea.*
      Sepals ovate to ovate-lanceolate during anthesis: corolla-tube 9–11 mm. long. — 8. *H. montana.*
  Sepals slightly surpassing the capsule.
    Leaf-blades, especially those of basal leaves, conspicuously ciliate. — 9. *H. canadensis.*
    Leaf-blades perfectly glabrous, at least never ciliate.
      Corolla 8–9 mm. long: mature hypanthium and calyx 3.5–4 mm. long. — 10. *H. longifolia.*
      Corolla 4–5.5 mm. long: mature hypanthium and calyx 2.5–3 mm. long. — 11. *H. tenuifolia.*
Sepals shorter than the hypanthium.
  Stem erect or ascending, sometimes diffusely branched at the base, the branches neither spreading nor prostrate.
    Capsule much longer than broad, 2.5–3 mm. long. — 12. *H. angustifolia.*
    Capsule fully as broad as long, 1–1.5 mm. long. — 13. *H. filifolia.*
  Stem branched at the base, the branches prostrate or spreading. — 14. *H. pulvinata.*

1. H. caerulea L. Plant often matted, the stem slender, 2–15 cm. tall: leaf-blades oval, ovate, or spatulate, 2–5 mm. long: corolla lilac, blue, or white, except the yellow eye, lobes 5–7 mm. long: capsule 3–4 mm. wide.—(BLUETS. INNOCENCE.)—Damp grassy places and meadows, various provinces, Ga. to La., Ont., N. S., and Miquelon.—Spr.–sum.



2. H. serpyllifolia Michx. Plant matted, the stems creeping: leaf-blades ovate, oval, or suborbicular, 1–6 mm. long: corolla usually deep-blue, except the yellowish or white eye; lobes 5–7 mm. long: capsule 2–3 mm. wide.—Mt. tops and damp slopes, Blue Ridge to Appalachian Plateau, Ga. to W. Va. and Pa.—Spr.–sum.—Introduced locally into the Coastal Plain.

3. H. pusilla Schoepf. Plant 1–10 cm. tall, sometimes sparingly branched: leaf-blades oval, elliptic, or ovate, or sometimes narrowly spatulate to nearly

linear, 2–10 mm. long: sepals becoming 2–2.5 mm. long: corolla deep-blue; limb 6.5–8 mm. wide: capsule 4–5 mm. wide. [*H. minor* (Michx.) Britton.]—Sandy soil, Coastal Plain, and adj. provinces, Fla. to Tex., Ark., Ill., and Va.—Spr.

4. **H. minima** Beck. Plant more or less diffusely branched, the branches 1–10 cm. long: leaf-blades spatulate to obovate or ovate, 2–8 cm. long: sepals becoming 3–3.5 mm. long: corolla lilac or bluish; limb 7.5–9 mm. wide: capsule 3–4 mm. wide.—Dry hillsides, various provinces N of Coastal Plain, Tenn. to Tex. and Mo.—Spr.

5. **H. procumbens** (Walt.) Standley. Plant with prostrate, often creeping stems and branches 0.5–4 dm. long, sparingly pubescent or nearly glabrous: leaf-blades oval to suborbicular, 5–18 mm. long: sepals broadly elliptic to ovate, 1–1.5 mm. long: corolla white, glabrous within: capsule 4–4.5 mm. wide, sparingly pubescent. [*H. rotundifolia* Michx.]—Sandy soil, often in damp pinelands. Coastal Plain, Fla. to La. and S. C.—Spr.–fall.

6. **H. lanceolata** (Poir.) Britton. Plant 1–3 dm. tall: blades of the stem-leaves elliptic-lanceolate to lanceolate, acute; sepals linear, 4–8 mm. long, recurved at the tip, fully twice as long as the hypanthium: corolla lilac or bluish; tube 5–6 mm. long: capsule 3 mm. thick.—Woods, Coastal Plain and adj. provinces, Ala. to Okla., Ill., and N. C.—Spr.

7. **H. purpurea** L. Plant 0.5–4 dm. tall: blades of the stem-leaves suborbicular to ovate or elliptic-ovate (elliptic to lanceolate and relatively small in *H. purpurea pubescens*), 2.5–4.5 cm. long: sepals subulate or linear-lanceolate, 2–3.5 mm. long, about as long as the hypanthium: corolla lilac, light-purple or white; tube 6–7 mm. long: capsule 2.5–3 mm. thick.—Moist soil, various provinces, rarely Coastal Plain, Ga. to Ark., Ia., and Md.—Spr.–fall.

8. **H. montana** (Chickering) Small. Similar to *H. purpurea* in habit, but typically smaller: blades of the stem-leaves ovate, 0.5–1.5 cm. long: sepals lanceolate to elliptic-lanceolate at maturity, about 2 mm. long, about as long as the hypanthium: corolla purple; tube 9–11 mm. long: capsule 3–3.5 mm. thick.—Cliffs, Roan Mt. and vicinity, in the Blue Ridge of N. C. and Tenn. —Sum.

9. **H. canadensis** Willd. Plant 0.5–2 dm. tall, with the leaves mainly approximate on a caudex: blades of the stem-leaves elliptic or spatulate, mainly 1–3 cm. long: sepals elliptic to elliptic-lanceolate, 2–3 mm. long, longer than the hypanthium: corolla blue; tube 7–9 mm. long: capsule 2–2.5 mm. thick. [*H. ciliolata* Torr.]—Woods or rocky soil, various provinces, Tenn. to Ark., Ont., and Me.—Spr.–sum.

10. **H. longifolia** Gaertn. Plant 1–4 dm. tall, often tufted; blades of the stem-leaves linear to linear-lanceolate or linear-elliptic, 1–3 cm. long: sepals linear-subulate to lanceolate-subulate, 1.5–2 mm. long, slightly longer than the hypanthium: corolla pinkish or bluish; tube about 4 mm. long: capsule 2–2.5 mm. thick.—Sandy soil and rocky banks, various provinces, Ga. to Miss., Mo., Man., and Me.—Sum.

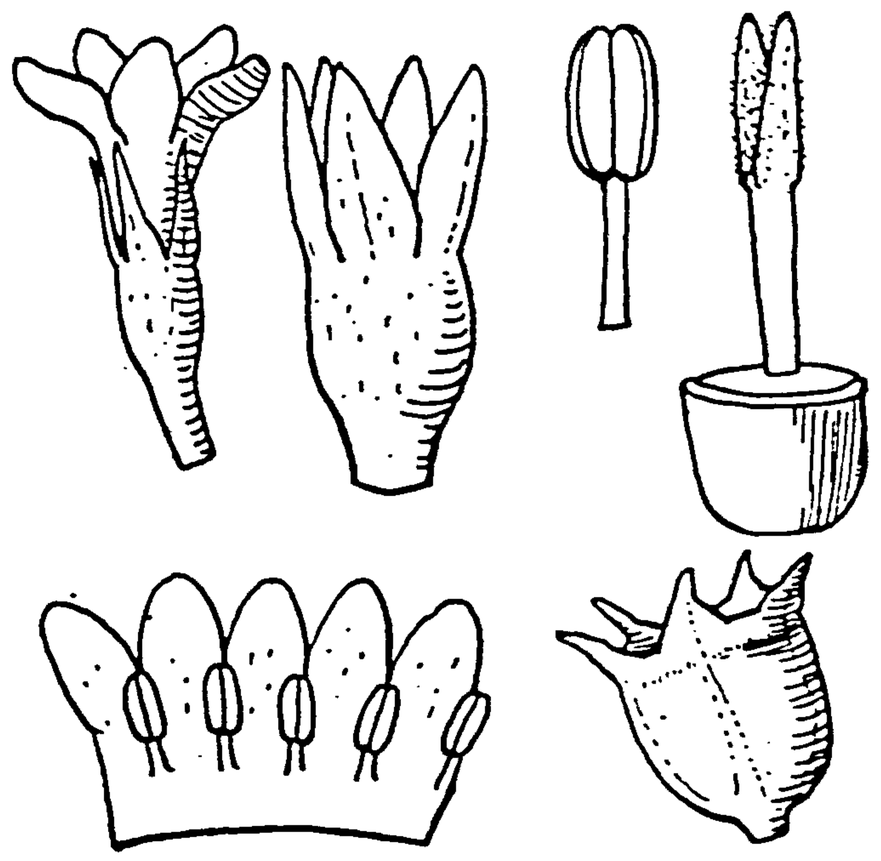
11. **H. tenuifolia** Nutt. Plant 1–4 dm. tall, slender: blades of the stem-leaves linear to linear-filiform, 1–4 cm. long: sepals lanceolate to subulate-lanceolate, 1–1.5 mm. long, slightly longer than the hypanthium: corolla pale-blue or whitish; tube 4–5.5 mm. long: capsule 1.5–2 mm. thick.—Dry soil and rocky banks Blue Ridge to Appalachian Plateau, Ga. to Ala., Ohio, and Va.—Spr.–sum.

12. H. angustifolia Michx. Plant 0.5–3 dm. tall, tufted or diffuse: blades of the stem-leaves narrowly linear to linear-filiform, 4 cm. long: sepals lanceolate, 1–1.5 mm. long, much shorter than the hypanthium at maturity: corolla white or purple-tinged; tube about 3 mm. long: capsule 2.5–3 mm. long, nearly ellipsoid, nearly equalling the sepals.—Dry soil, limestone rocks, barrens, and prairies, various provinces, Fla. to Tex., Kans., and Ill.—Spr.–sum.

13. H. filifolia (A. Gray) Small. Plant loosely or diffusely branched, 0.5–2 dm. tall: blades of the stem-leaves narrowly linear to subulate, 0.5–3 cm. long: sepals lanceolate, becoming deltoid, scarcely 1 mm. long: corolla white or purplish; tube about 3 mm. long, sparingly pubescent within: capsule globose-obovoid, about 1.5 mm. long.—Pinelands and sandy places, Everglade Keys, Fla. and Fla. Keys.—All year.

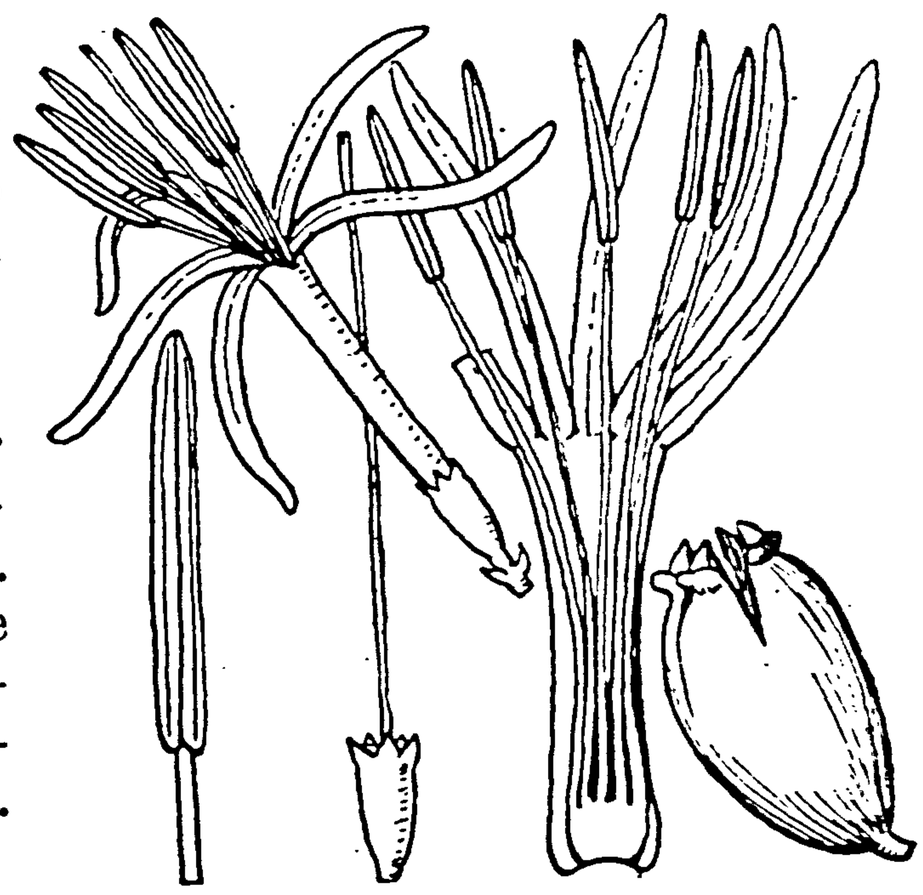
14. H. pulvinata Small. Plant compactly much branched, 0.8–1.2 dm. tall, the branches angled: blades of the stem-leaves linear or nearly so, mainly 1–1.5 cm. long, often curved: sepals ovate to elliptic-ovate, fully 1 mm. long: corolla bluish; tube about 3 mm. long, copiously pubescent within: capsule obovoid, about 2.5 mm. long.—Sand-dunes, pen. Fla.—Spr.–fall.

4. **PENTODON** Hochst. Annual tender herbs. Leaf-blades broad. Flowers in axillary or terminal cymes. Sepals 5, rather long. Corolla funnelform: tube short: lobes somewhat shorter than the tube. Stamens 5: filaments adnate to above the middle of the corolla-tube. Style columnar. Capsule included in the hypanthium, 2-lobed.—Two species, the following and 1 African.



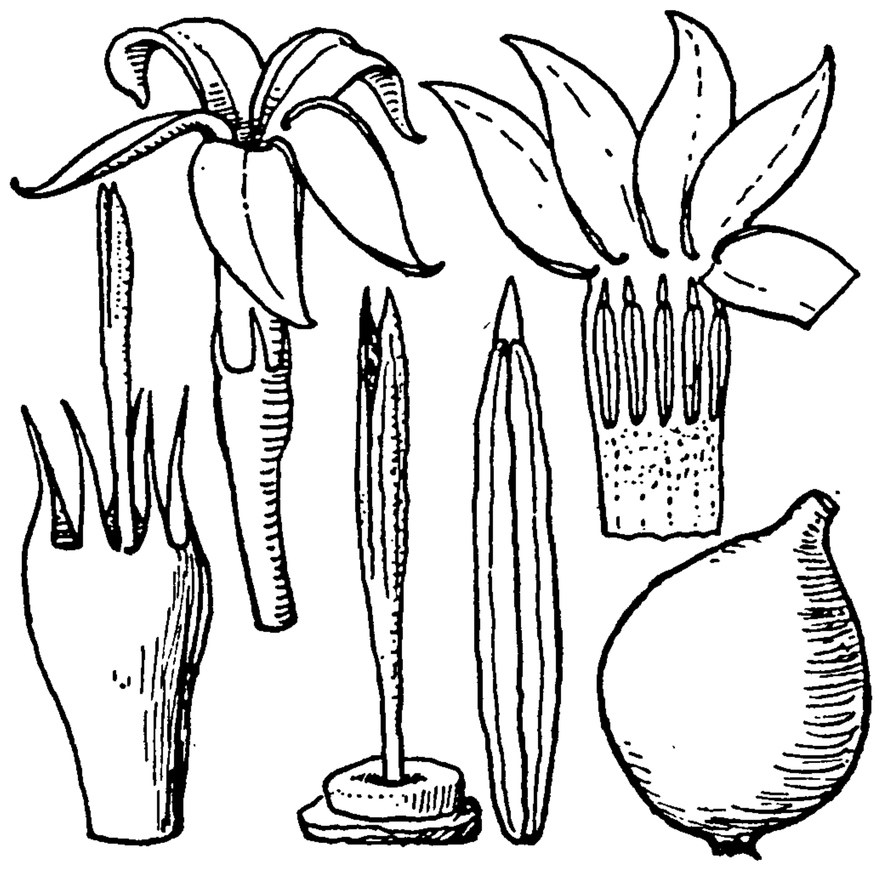
1. P. Halei (T. & G.) A. Gray. Plant glabrous, often diffusely branched and partly creeping: leaf-blades elliptic to oval or elliptic-lanceolate, 1–5 cm. long, entire: hypanthium clavate: sepals triangular-lanceolate or lanceolate, about 2.5 mm. long: corolla white; tube 3 mm. long: lobes ovate to ovate-lanceolate: capsule 3–4 mm. long.—Swampy grounds, Coastal Plain, Fla. to La.—Spr.–fall.

5. **EXOSTEMA** L. C. Rich. Shrubs or trees. Leaf-blades leathery. Flowers axillary or in paniculate cymes. Sepals 5, short. Corolla with slender tube and 5 narrow lobes. Stamens 5: filaments adnate to the base of the corolla-tube, pubescent below: anthers narrowly linear, exserted. Capsule elongate. Seeds winged.—About 30 species, tropical American.



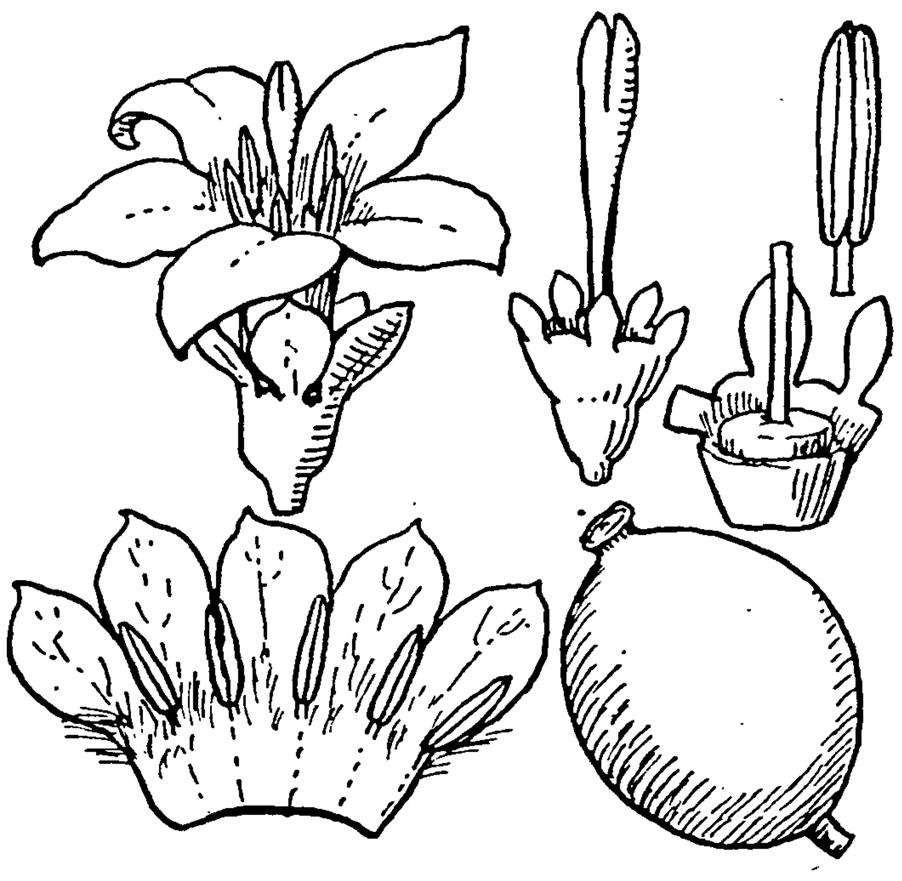
1. E. caribaeum (Jacq.) R. & S. Shrub or small tree, the foliage glabrous: leaf-blades elliptic, 2–6 cm. long: sepals 1–2 mm. long: corolla white or rose-tinged, the tube 3.5–4 cm. long; lobes narrowly linear: capsule ellipsoid, 10–12 mm. long.—(Princewood.)—Hammocks, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—Spr.–sum.

6. CASASIA A. Rich. Unarmed shrubs or trees. Leaf-blades leathery. Flowers in axillary cymes. Sepals 5, broad or narrow. Corolla with a stout tube and 5 relatively broad lobes. Stamens 5: filaments adnate to the lower part of the corolla-tube: anthers elongate, linear-sagittate, included. Berry thick. Seeds angled. —About 8 species, West Indian.



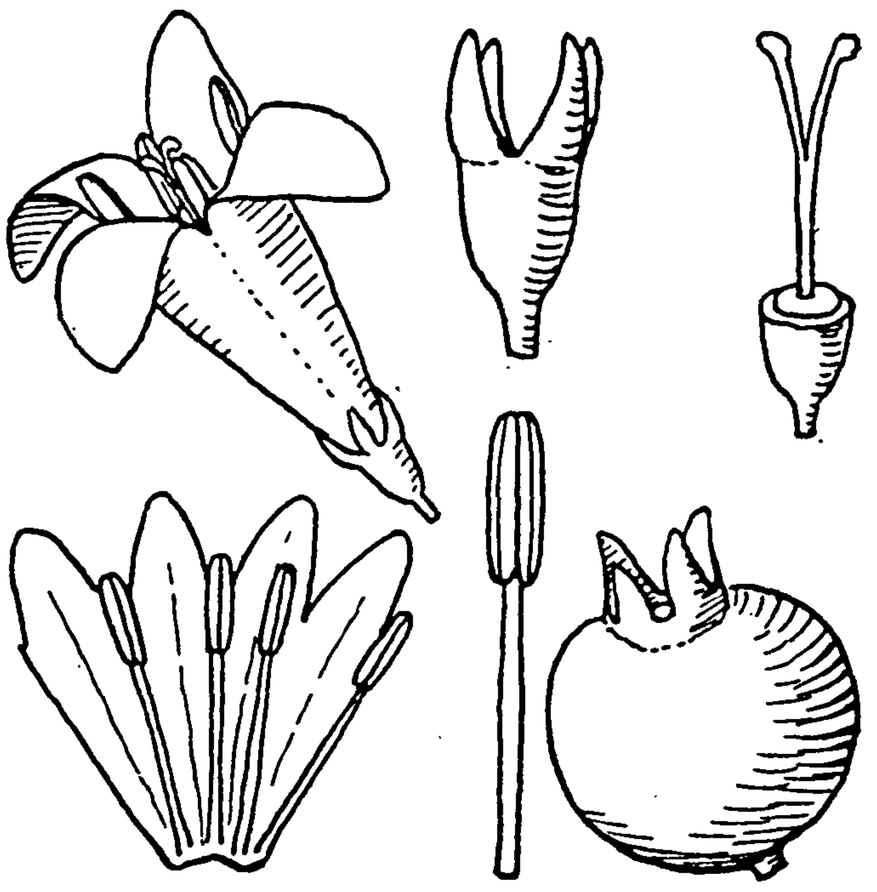
1. C. clusiifolia (Jacq.) Urban. Shrub or small tree, the bark pale: leaves clustered at the branch-tips; blades cuneate to obovate, 5–15 cm. long: hypanthium turbinate: sepals subulate: corolla white; tube 16–20 mm. long; lobes acuminate, shorter than the tube: berry mainly obovoid, 5–7 cm. long. [*Genipa clusiifolia* Jacq.] — SEVEN-YEAR APPLE.)—Coastal sand-dunes and hammocks, near the coast, S pen. Fla. and Florida Keys.—(*W. I.*)—All year.

7. RANDIA [Houst.] L. Armed shrubs or trees. Leaves relatively few: blades leathery. Flowers axillary. Sepals 4–5, short. Corolla with a short tube and 5 often very broad lobes. Stamens 4 or 5: filaments adnate to near the top of the corolla-tube: anthers ellipsoid or linear, partly exserted or included. Berry globular or elongate.—About 100 species, tropical.



1. R. aculeata L. Shrub 0.3–3 m. tall: leaves 1.5–5 cm. long; blades spatulate to oval, elliptic, or suborbicular: sepals triangular to ovate, about 1 mm. long: corolla white; tube 5–7 mm. long; lobes elliptic to ovate: berry oval to subglobose, 8–10 mm. long, greenish-white.—Hammocks and pinelands, S pen. Fla., and Florida Keys.—(*W. I.*)—All year.

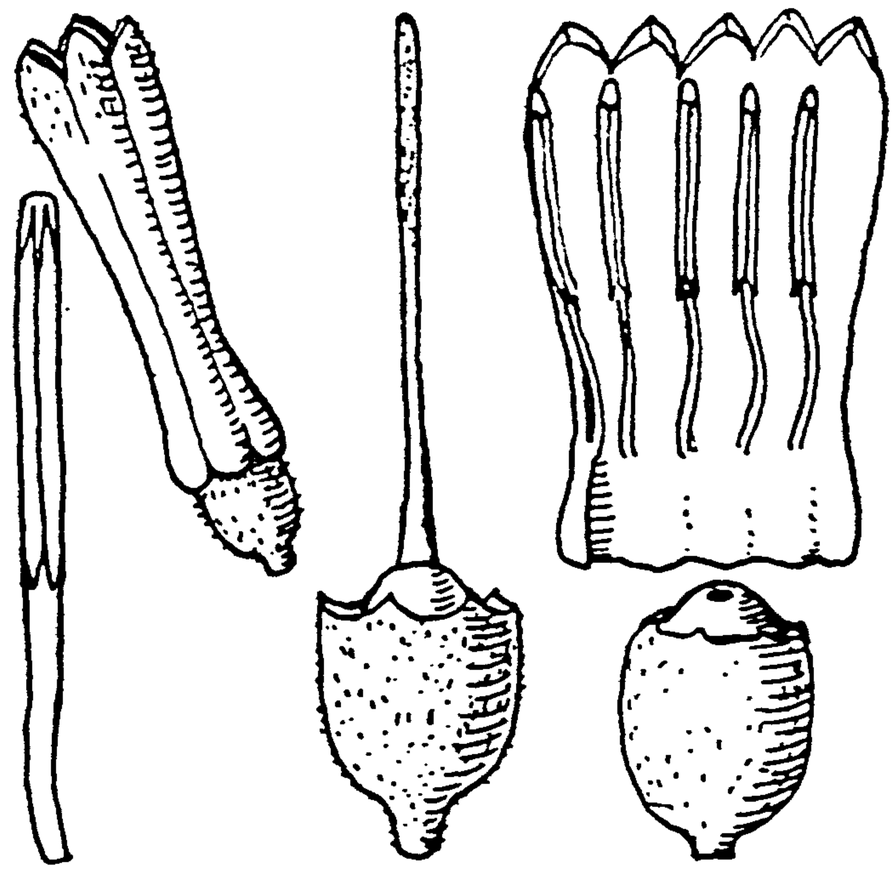
8. CATESBAEA L. Armed shrubs. Leaves very numerous: blades leathery. Flowers axillary. Sepals 4, short. Corolla with a long tube and 4 short lobes. Stamens 4: filaments adnate to the base of the corolla-tube: anthers narrow or linear. Berry thick.—About 8 species, West Indian.



1. C. parviflora Sw. Shrub 1–3 m. tall: leaves 5–15 mm. long; blades spatulate, obovate or suborbicular, lustrous: sepals triangular to triangular-lanceolate, 1–1.5 mm. long: corolla white; tube campanulate, 3.5–4 mm. long; lobes deltoid, acutish: berry subglobose, 6–18 mm. long, blue or black.—Hammocks and dunes, Florida Keys.—(*W. I.*)—All year.—Fires and storms have greatly depleted the naturally rather limited growth of this shrub. The most extensive

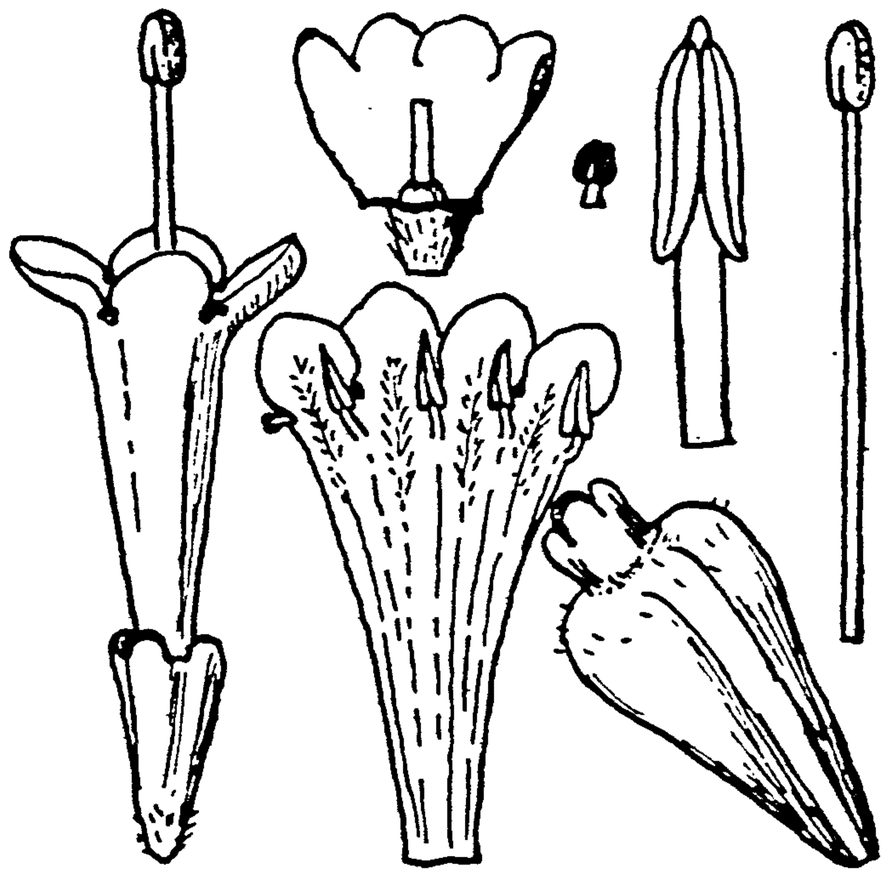
growth now extant is on the sand-dunes behind the barrier dune on Bahia Honda Key.

9. **HAMELIA** Jacq. Unarmed shrubs or trees. Leaf-blades membranous. Flowers in dichotomous cymes. Sepals 5, minute. Corolla with a narrow fluted tube and 5 very short lobes. Stamens 5: filaments adnate to the base of the corolla-tube: anthers linear, included. Berry thick. —About 25 species tropical American.



1. H. patens Jacq. Shrub or small tree: leaf-blades elliptic, or elliptic-ovate, 8–15 cm. long: hypanthium turbinate: sepals about 1 mm. long: corolla crimson, 1.5–2.3 cm. long; lobes 2–3 mm. long: berry oval or ovoid, 5–7 mm. long, black. [*H. erecta* Jacq.?]—(HAMELIA.)—Hammocks, S pen. Fla. and Fla. Keys.—(*W. I.*)—All year.—Sometimes popularly known as fire-bush on account of the red inflorescence. This shrub or small tree is most conspicuous on the edges of hammocks. Not only are the calyx and corolla red, but also the inflorescence branches and the hypanthium.

10. **CEPHALANTHUS** L. Shrubs or trees. Leaf-blades thinnish. Flowers in capitate cymes. Sepals usually 4, rounded. Corolla with a long tube and usually 4 short lobes. Stamens usually 4: filaments adnate to the throat of the corolla: anthers ellipsoid or nearly so. Nut-like fruit obpyramidal.—About 6 species, American and Asiatic.



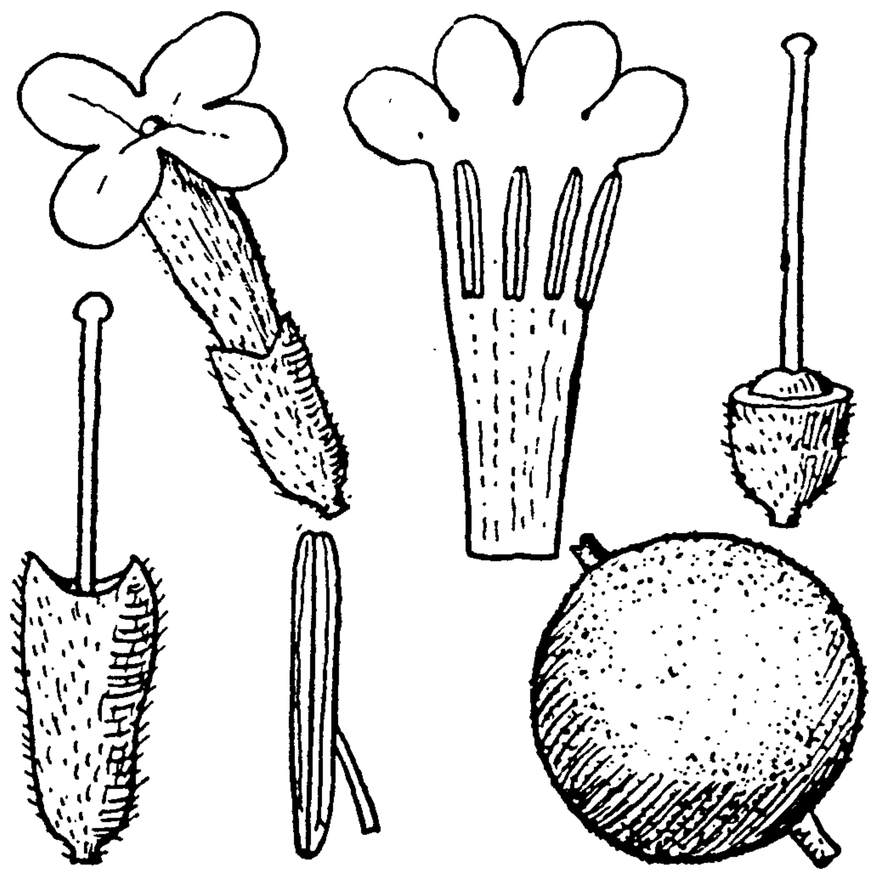
1. C. occidentalis L. Shrub or small tree: leaf-blades elliptic-lanceolate, or ovate-lanceolate, 5–20 cm. long, short-petioled: flower-heads globose, 2.5–3.5 cm. thick: sepals about 0.5 mm. long: corolla white, about 10 mm. long; lobes ovate to elliptic ovate: nutlets 7–8 mm. long.—(BUTTONBUSH.)—Swamps, ponds, low hammocks, and stream-banks, various provinces, Fla. to Tex., Calif., Ont., and N. B.—(*W. I., Mex.*)—Sum.–fall, or all year southward.

11. **GUETTARDA** L. Shrubs or trees. Leaf-blades thin or thickish. Flowers in axillary peduncled cymes. Sepals 2–4 or more, short, or obsolete. Corolla with a long tube and 4, or more, shorter lobes. Stamens 4–9: filaments adnate to near the top of the corolla-tube: anthers narrow, but short. Drupe globular, pubescent.—About 65 species, mostly tropical American.—All year.

Corolla 6–8 mm. long: leaf-blades strigillose or glabrate, not rugose. 1. *G. elliptica.*
Corolla 20–25 mm. long: leaf-blades scabro-pubescent, rugose. 2. *G. scabra.*

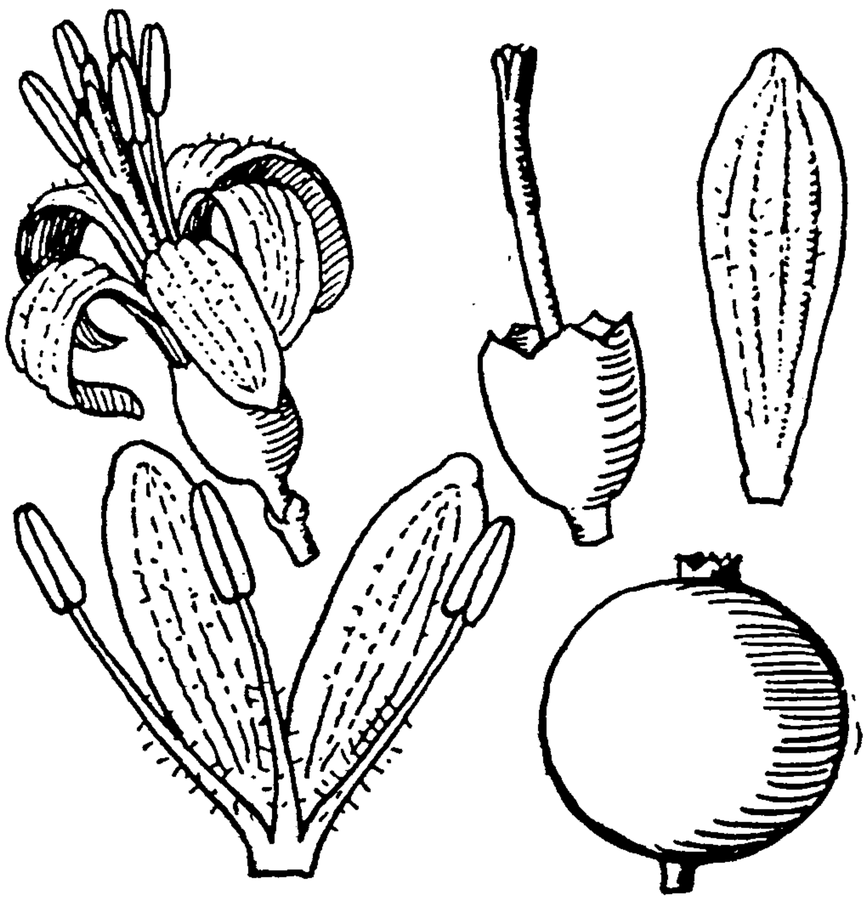
1. G. elliptica Sw. Shrub or small tree: leaf-blades thin, mainly elliptic, oval, or obovate, 2–4 cm. long: corolla pink or reddish; lobes mostly 4: style

glabrous: drupe 8–11 mm. in diameter.—(VELVET-SEED.)—Hammocks and pinelands, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)



2. G. scabra Vent. Shrub or small tree: leaf-blades thick, mainly elliptic, oval, or elliptic-ovate, 4.5–8 cm. long, or rarely smaller: corolla white or reddish; lobes mostly 6 or 7: style pubescent: drupe about 6 mm. in diameter.—(ROUGH VELVET-SEED.)—Hammocks and pinelands, Everglade Keys, Fla. and Fla. Keys, and coastal hammocks, pen. Fla.—(*W. I.*)—The pinelands are not the normal habitat for these plants. Where hammocks have been destroyed some of the trees become adapted to the conditions of the pinelands and persist in much reduced stature, the soil being scant and poor in plant foods.

12. ERITHALIS P. Br. Shrubs. Leaf-blades leathery. Flowers in terminal cymes. Sepals 5–10, short or obsolete. Corolla with a short tube and 5–10 narrow lobes. Stamens 5–10: filaments adnate to the base of the corolla-tube: anthers ellipsoid to linear. Drupe berry-like.—About 6 species, tropical American.



1. E. fruticosa L. Shrub with glabrous foliage: leaf-blades oval to elliptic-obovate, 2.5–5 cm. long, lustrous: sepals minute: corolla white; lobes elliptic, 3–5 mm. long: drupe subglobose, 3–4 mm. thick, dark-purple.—Sand-dunes and coastal hammocks, S pen. Fla. and the Keys.—(*W. I.*)—This, like many of the coastal dune plants thrive in the sands apparently devoid of nourishment. It often grows in large colonies. These vary much in height—in some the shrubs are knee high in others head high.

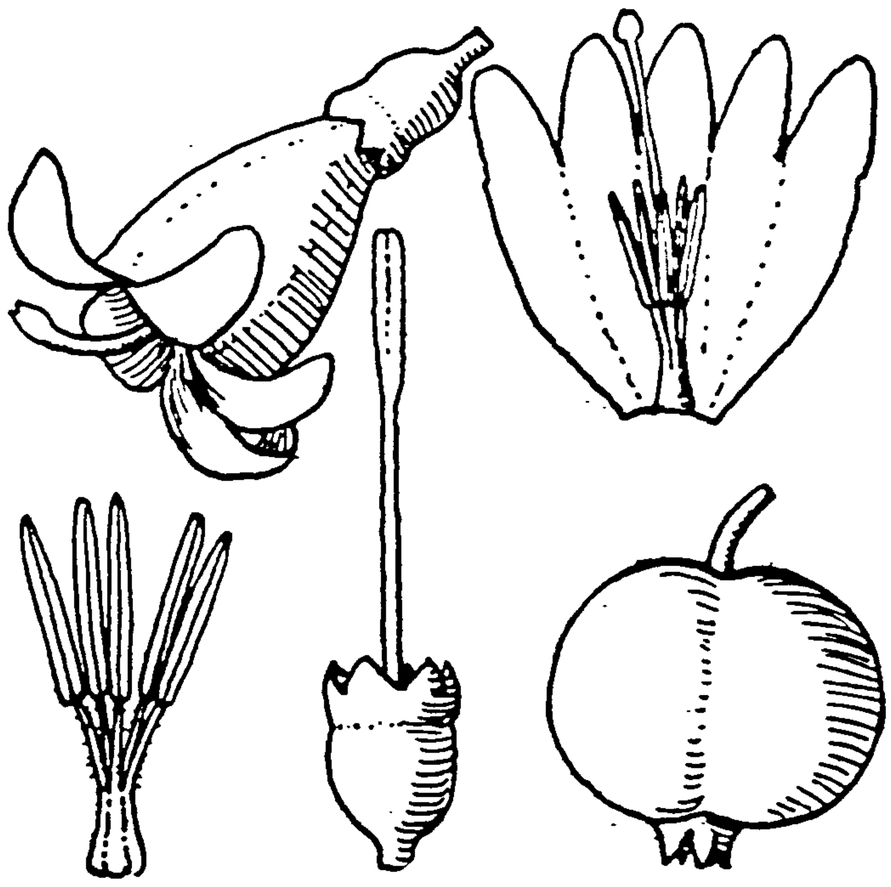
13. CHIOCOCCA P. Br. Shrubs or vines. Leaf-blades leathery. Flowers on axillary raceme-like cymes. Sepals 5, short. Corolla with a relatively short tube and 5 shorter lobes. Stamens 5: filaments long, essentially free from the corolla-tube and united around the base of the style: anthers linear. Drupe somewhat flattened, globular.—About 10 species, tropical American.—All year.—SNOWBERRIES.

Corolla-lobes about 3 mm. long: anthers about 3 mm. long: seed 4–5 mm. long. 1. *C. alba.*

Corolla-lobes about 2 mm. long: anthers about 2 mm. long: seed 2–2.5 mm. long. 2. *C. pinetorum.*

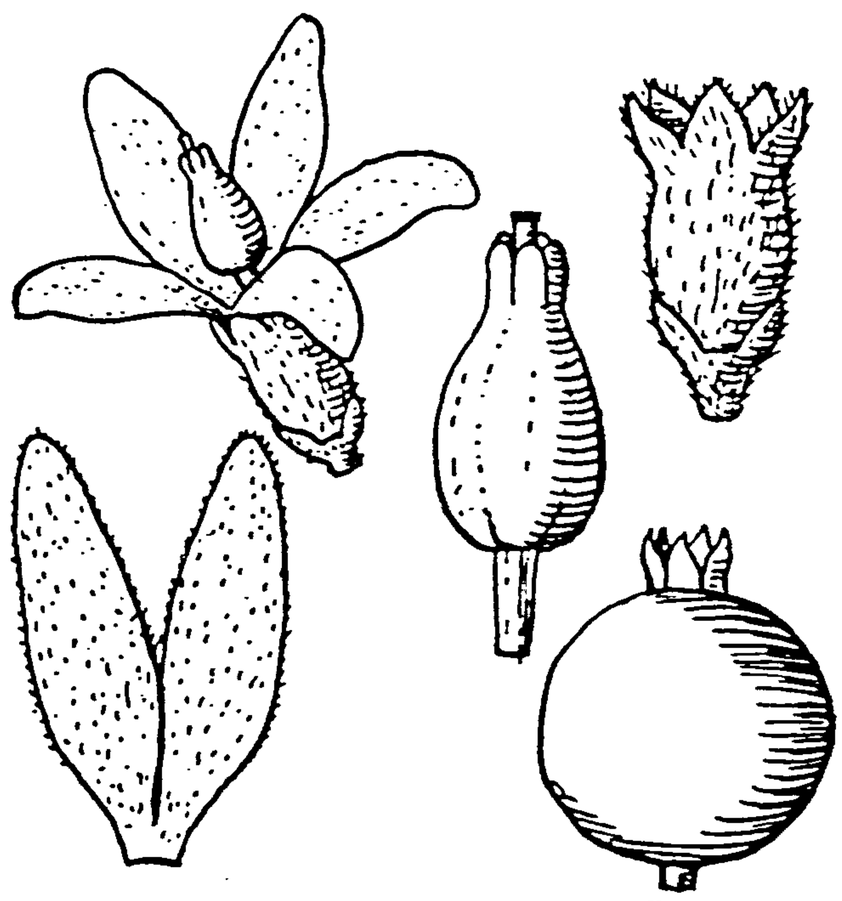
1. C. alba (L.) A. Hitchc. Large, erect, diffuse, or reclining plants: leaf-blades elliptic, oval, or ovate, 3–7 cm. long: corolla white, often becoming

yellow; tube 7–8 mm. long: drupe white, 5.5–6.5 mm. in diameter. [*C. racemosa* L.] —Hammocks, pen. Fla. and the Keys.—(*W. I.*)



2. C. pinetorum Britton. Small, trailing plant: leaf-blades elliptic or sometimes oval, broadest below the middle, 1–3 cm. long: corolla permanently white; tube 3.5–4 mm. long: drupe white, 4–4.5 mm. in diameter.—Pinelands, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—On the lower Keys a form grows in the hammocks which is more robust than the typical form, but is here referred to this species. The Florida representatives of this genus need extensive study. Variations in the leaves, flowers, and fruits are frequent. Marked forms occur in the hammocks of the lower eastern coast, in the Big Cypress Swamp, and on the Florida Keys. *Chiococca alba* is rarely found in the form of a small tree on the upper Keys.

14. STRUMPFIA Jacq. Shrubs. Leaf-blades rigid-leathery. Flowers in axillary raceme-like panicles. Sepals 5, short. Corolla rotate, with a very short tube and 5 longer lobes. Stamens 5: filaments very short, scarcely adnate to the base of the corolla-tube, united: anthers adnate by their broad connectives. Drupe thick.—One species.



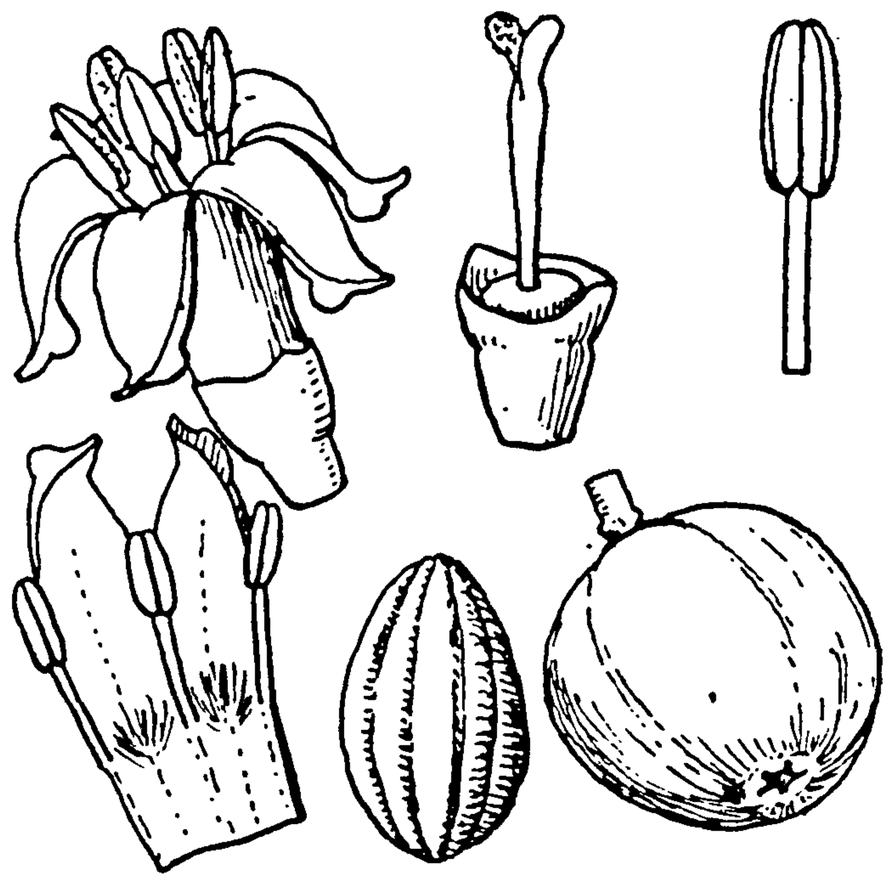
1. S. maritima Jacq. Much-branched pubescent shrub, the branches short-jointed: leaf-blades linear to linear-elliptic, 1–2.5 cm. long, revolute: sepals triangular to ovate-triangular, becoming about 1 mm. long, acute: corolla white, pubescent; lobes lanceolate to elliptic, 3–4 mm. long: drupe 4–6 mm. long, white or red.—Coastal sand-dunes, and hammocks, Florida Keys.—(*W. I.*)—All year.—Dried fruits have the fragrance of red-cedar wood.

15. PSYCHOTRIA L. Shrubs or trees. Leaf-blades thinnish. Flowers in terminal or axillary cymes. Sepals 4–6, short and broad. Corolla with a relatively short tube and 4–6 usually somewhat shorter lobes. Stamens 4–6: filaments adnate to near the top of the corolla-tube: anthers ellipsoid to oval. Drupe thick, often berry-like.—More than 300 species, tropical American.—Spr.-sum., or sporadically all year.

Inflorescence, twigs, and leaves pubescent: corolla-lobes as long as the tube: stone with high ridges.	1. *P. Sulzneri.*
Inflorescence, twigs, and leaves glabrous: corolla-lobes shorter than the tube: stone with flat ridges.	
Cymes sessile: sepals very shallow.	2. *P. nervosa.*
Cymes peduncled: sepals deltoid.	3. *P. bahamensis.*

1. P. Sulzneri Small. Shrub, the branches pubescent: leaf-blades narrowly oblong, elliptic, or elliptic-lanceolate, 8–15 cm. long: corolla green; tube 2–2.5

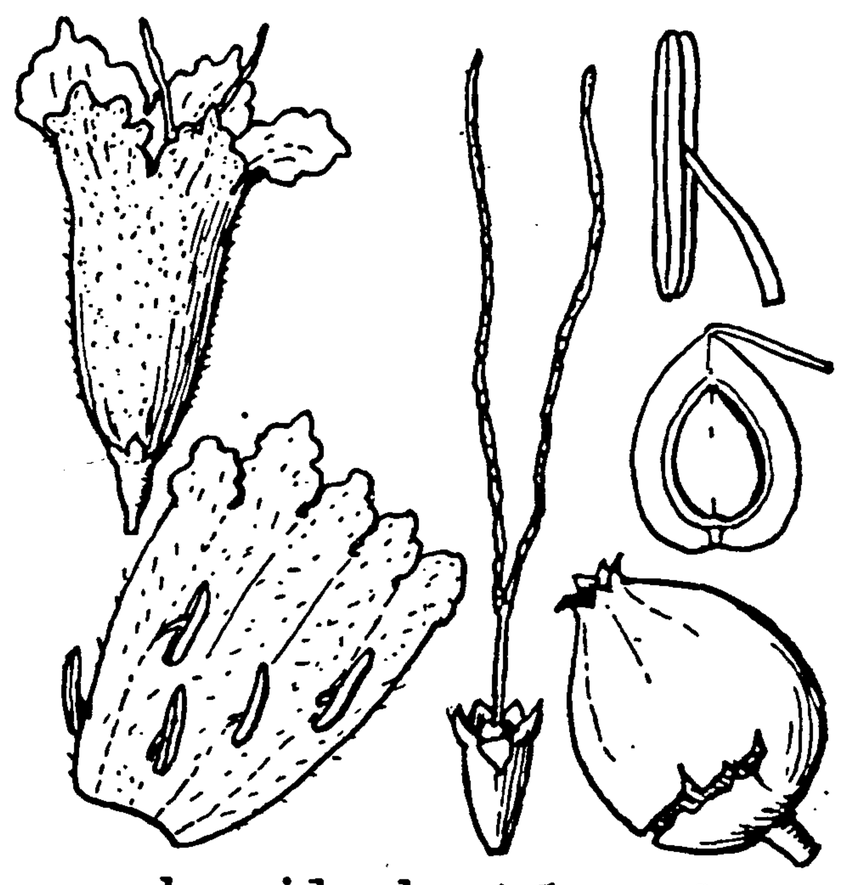
mm. long: anthers ellipsoid: drupe 5–6 mm. long, scarlet, orange, or yellow. [*P. tenuifolia* Griseb. Not Sw.]—(WILD-COFFEE.)—Hammocks, S pen. Fla. and adj. islands.—(*W. I.*)



2. P. nervosa Sw. Shrub or small tree, the twigs glabrous: leaf-blades oval, elliptic, or elliptic-lanceolate, 6–15 cm. long: corolla white; tube 2.5–3 mm. long: anthers oval: drupe ellipsoid, 7–9 mm. long, red or rarely yellow.—(WILD-COFFEE.)—Hammocks, pen. Fla. and the Keys.—(*W. I.*)

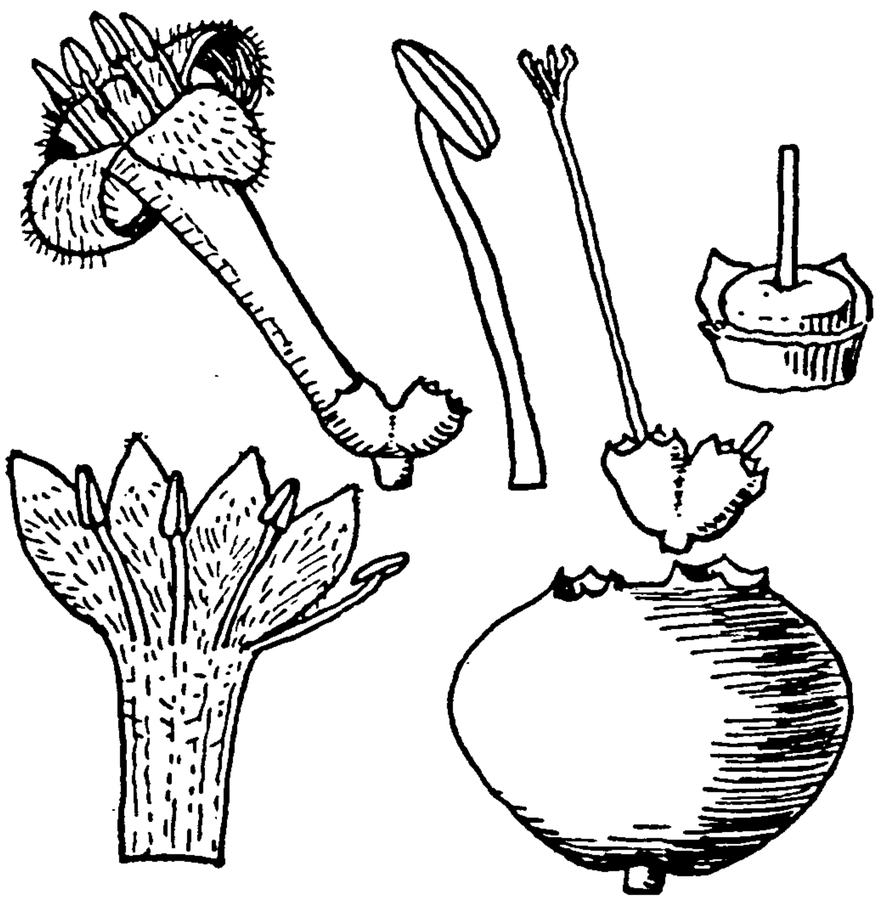
3. P. bahamensis Millsp. Shrub or small tree, the twigs glabrous: leaf-blades lanceolate, elliptic, or oblanceolate, 3–12 cm. long: corolla white; tube 3–4 mm. long: anthers oblong: drupe oval or ellipsoid, 6–8 mm. long, bright-orange.—(BAHAMAN WILD-COFFEE.)—Hammocks, Fla. Keys.—(*W. I.*)

16. PAEDERIA L. Woody vines. Leaves opposite: blades broad, at least relatively so, entire. Flowers borne in dichotomous cymes. Sepals 4 or 5, narrow. Corolla campanulate: lobes 4 or 5, relatively short. Filaments almost wholly adnate to the corolla-tube: anthers narrow. Styles slender, united at the base. Berry rather dry, the outer coat brittle and early falling away. Seeds flat, margined.—About 18 species, mostly Asiatic.



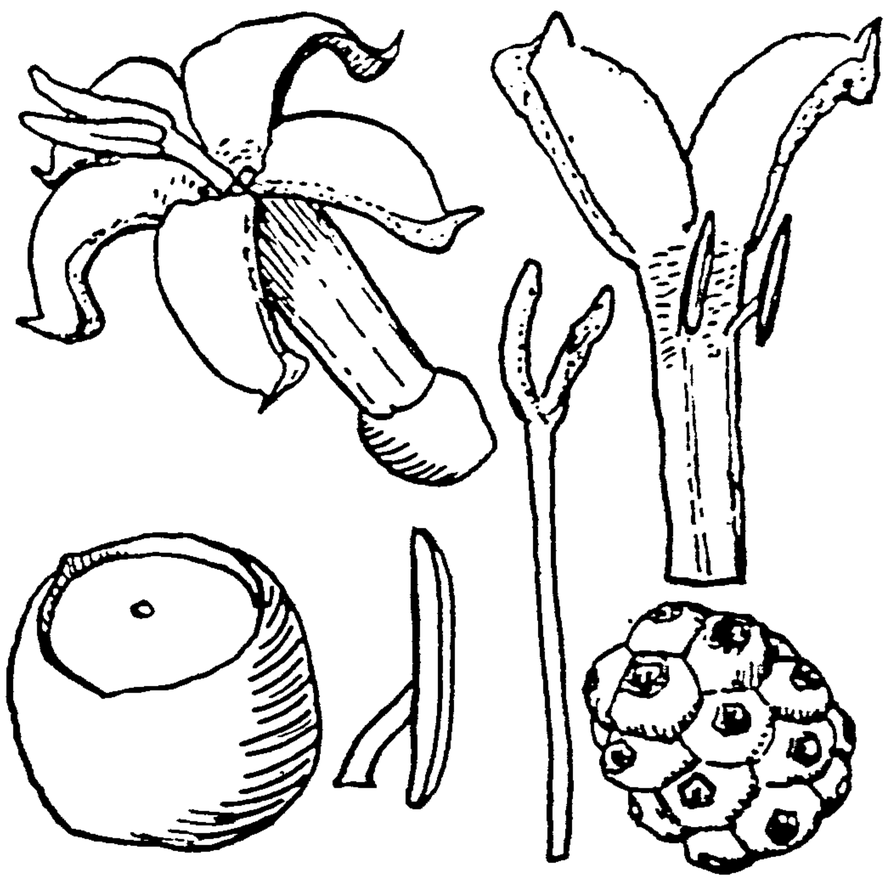
1. P. foetida L. Stem twining, often slightly pubescent in lines: leaf-blades elliptic to elliptic-lanceolate, 3–11 cm. long, acuminate at the apex, rounded, truncate or subcordate at the base, slender-petioled: sepals acute: corolla pale-lilac, 7–9 mm. long; lobes about ¼ as long as the tube, apiculate: berry obovoid, about 1 cm. long.—Thickets and fence-rows, pen. Fla. Nat. of East Indies.—Spr.–fall.

17. MITCHELLA L. Undershrubs with creeping stems. Leaf-blades leathery. Flowers in pairs, the hypanthia coalescent. Sepals usually 4, short. Corolla with a relatively long tube and usually 4 short lobes. Stamens 4: filaments adnate to the corolla-tube. Drupes paired.—Two species, the following and 1 Asiatic.



1. M. repens L. Stem and branches matted, 1–4 dm. long: leaf-blades ovate to orbicular, or elliptic, 8–30 mm. long: sepals deltoid, less than 1 mm. long: corolla white or pinkish; tube 9–12 mm. long; lobes ovate to elliptic: fruit globular, 7–10 mm. thick, red or white, aromatic.—(TWIN-BERRY. PARTRIDGE-BERRY.)—Damp woods, sandy hammocks, and shaded banks, often in acid soil, various provinces, Fla. to Tex., Minn., and N. S.—Spr.–fall.

18. MORINDA [Vaill.] L. Shrubs or trees. Leaf-blades rather thin. Flowers in capitate cymes, the hypanthia coalescent. Sepals usually 5, minute or obsolete. Corolla with a relatively short tube and usually 5 somewhat shorter lobes. Stamens usually 5: filaments adnate to near the top of the corolla-tube: anthers linear. Drupe united into a fleshy syncarp.—About 40 species, tropical.

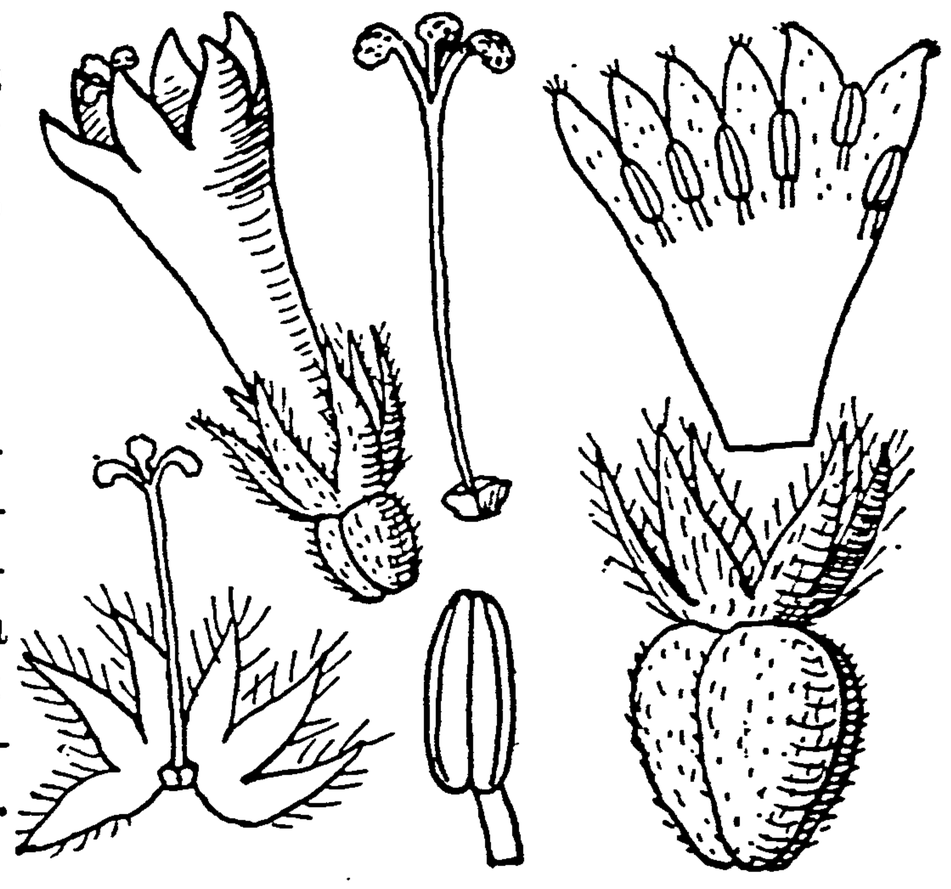


1. M. Roioc L. Shrub or vine: leaf-blades elliptic to cuneate, 5–10 cm. long: flowers several in a head: corolla white or reddish; lobes elliptic or elliptic-lanceolate, 2.5–3.5 mm. long: syncarp 2–3.5 cm. long, yellow.—Hammocks and pinelands, pen. Fla. and the Keys.—All year.

19. RICHARDIA L. Annual or perennial diffuse herbs. Leaf-blades herbaceous. Flowers in contracted involucrate cymes. Sepals 4–8, rather broad. Corolla with a relatively short tube and 4–8 shorter lobes. Stamens 4–8: filaments adnate to the top of the corolla-tube: anthers ellipsoid to oval. Mature carpels separating from each other. [*Richardsonia* Kunth.]—About 8 species, in the warm part of America.—Spr.–fall or all year.

Corolla 5–6.5 mm. long; tube about twice as long as the calyx: mature carpels 3–3.5 mm. long. 1. *R. scabra.*
Corolla 3.5–4 mm. long; tube about thrice as long as the calyx: mature carpels 2–2.5 mm. long. 2. *R. brasiliensis.*

1. R. scabra St. Hil. Annual, the stems more or less branched: leaf-blades elliptic, lanceolate, or ovate, 2–8 cm. long: sepals lanceolate to ovate-lanceolate, becoming 2–2.5 mm. long: corolla white; lobes less than ⅓ as long as the tube: anthers ellipsoid: mature carpels ellipsoid.—Sandy soil, especially in cult fields, Coastal Plain, Fla. to Tex. and N. C.; also in Ind.—(*Mex.*)—Nat. of Trop. Am.

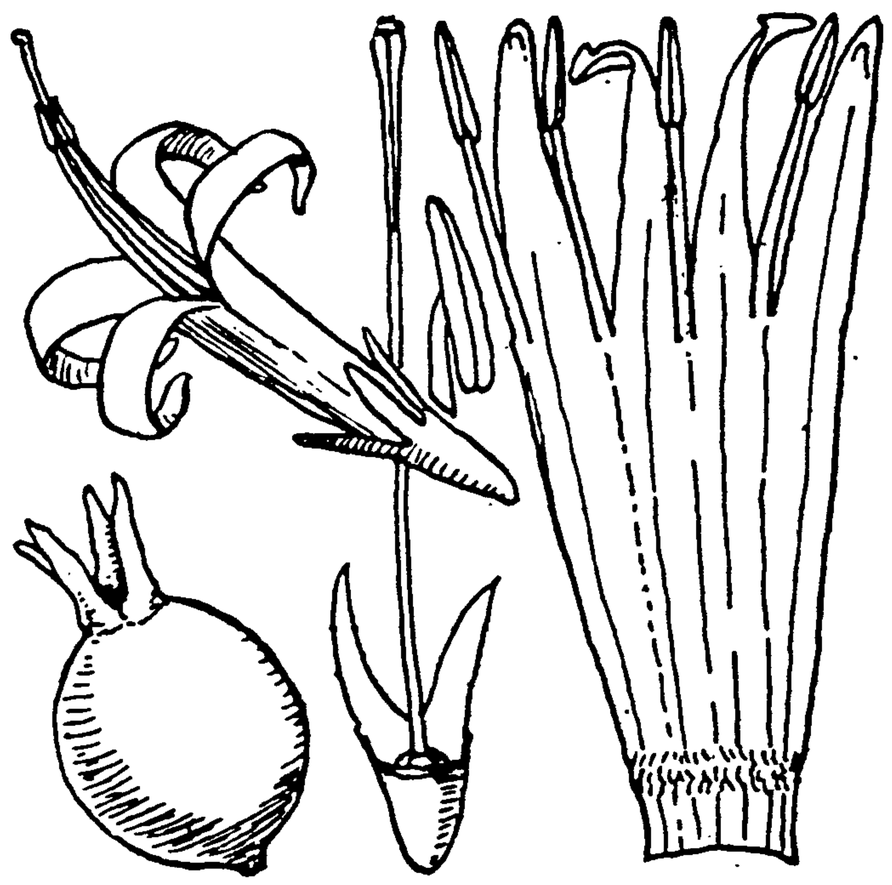


2. R. brasiliensis (Moq.) Gomez. Perennial, the branches diffuse: leaf-blades elliptic, 1.5–4 cm. long: sepals ovate to elliptic-ovate, becoming about 1 mm. long: corolla white; lobes fully ⅓ as long as the tube: anthers oval: mature carpels obovoid.—Waste-places and pinelands, pen. Fla. Nat. of S. Am.

20. ERNODEA Sw. Diffuse or vine-like shrubs. Leaf-blades leathery. Flowers axillary. Sepals 4–6, narrow. Corolla with a long tube and 4–6 relatively long lobes. Stamens 4–6: filaments adnate to the top of the corolla-tube: anthers narrow. Drupe thin-fleshy.—About 6 species, tropical American.—The plants of the following species flower throughout most of the year.

Sepals about one-third as long as the corolla-tube: anthers linear. 1. *E. littoralis.*
Sepals about one-half as long as the corolla-tube: anthers narrowly ellipsoid. 2. *E. angusta.*

1. E. littoralis Sw. Stem and branches prostrate: leaves fleshy; blades mainly elliptic, sometimes narrowly so, 2–3.5 cm. long: corolla white; tube mostly over 10 mm. long: anthers over 2 mm. long: drupe mostly globular.—Coastal sand-dunes and rocky shores, southern pen. Fla. and the Keys.—(*W. I.*)

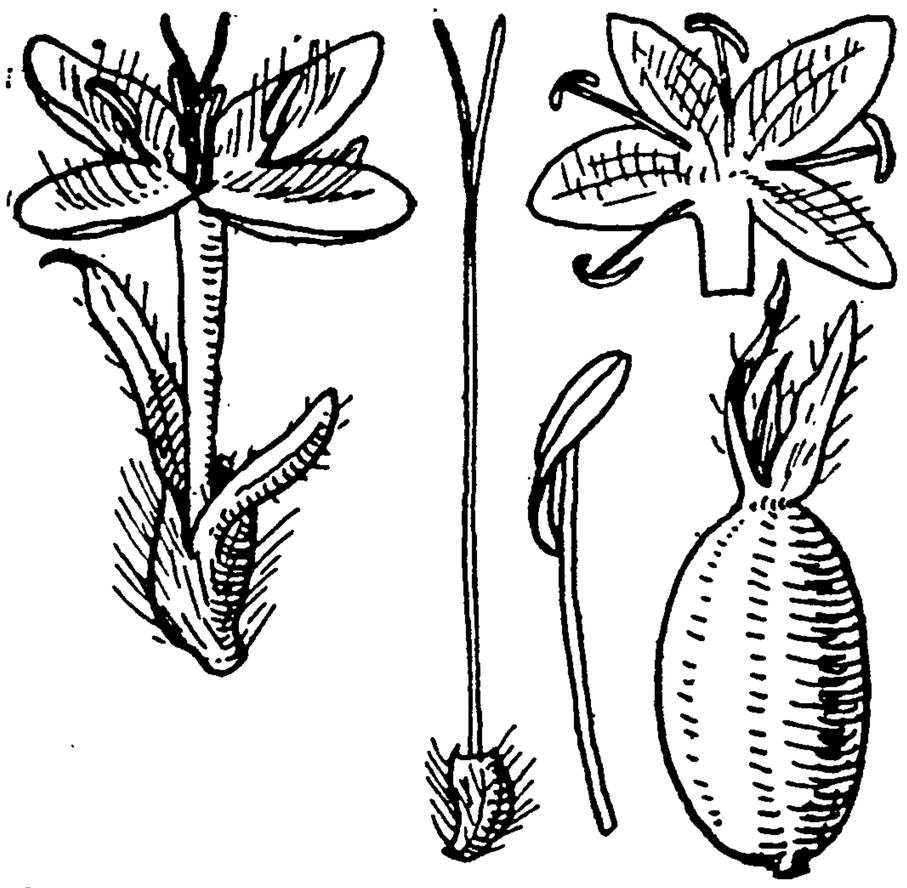


2. E. angusta Small. Stem and branches more slender than those of *E. littoralis*: leaves firm; blades linear, 2–4 cm. long: corolla usually reddish; tube mostly less than 10 mm. long: anthers over 1.5 mm. long: drupe mostly oval.—Pinelands, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—Our two species occupy quite different habitats, but they are both sprawling or creeping vine-like shrubs. The first species grows in the poorest soil, the coastal dunes, where it completely covers large areas of sand with its wiry stems and myriad leaves.

21. DIODIA [Gronov.] L. Perennial creeping herbs. Leaf-blades soft-herbaceous. Flowers axillary. Sepals 2. Corolla white or pink, salverform, with a long slender tube and 4 narrow lobes. Stamens 4: filaments adnate to the top of the corolla-tube, the free portion elongate: anthers linear. Stigmas filiform. Drupe thin-fleshy, ribbed. About 20 species, mostly American.—Spr.–fall, or all year S.—BUTTONWEEDS.

Corolla-tube over 6 mm. long: capsule oval or ellipsoid: sepals ciliate.
  Stem sparingly pubescent on the angles or nearly glabrous.
    Capsules ellipsoid: leaf-blades narrowed at the base. 1. *D. virginiana.*
    Capsules oval: leaf-blades truncate or subcordate at the base. 2. *D. tetragona.*
  Stem hirsute. 3. *D. hirsuta.*
Corolla-tube less than 5 mm. long: capsule globular: sepals eciliate. 4. *D. Harperi.*

1. D. virginiana L. Stem branching, 1–15 dm. long, sparingly pubescent on the angles: leaf-blades thinnish, spatulate, to linear-elliptic, 3–8 cm. long, acute or acuminate: sepals linear to linear-lanceolate, 4–6 mm. long: corolla-tube 6–8 mm. long: fruit 7–9 mm. long.—Low grounds, swamps, and stream banks, Coastal Plain, Fla. to Tex., Mo., and N. J.



2. D. tetragona Walt. Stem branching, 2–10 dm. long, the angles often pubescent: leaf-blades spatulate to obovate, usually somewhat rhombic: sepals ovate to ovate-lanceolate, 4–5 mm. long: corolla-tube 6.5–7 mm. long: fruit 4.5–5.5 mm. long.—Damp sandy soil, Coastal Plain, Fla. to La. and N. C.

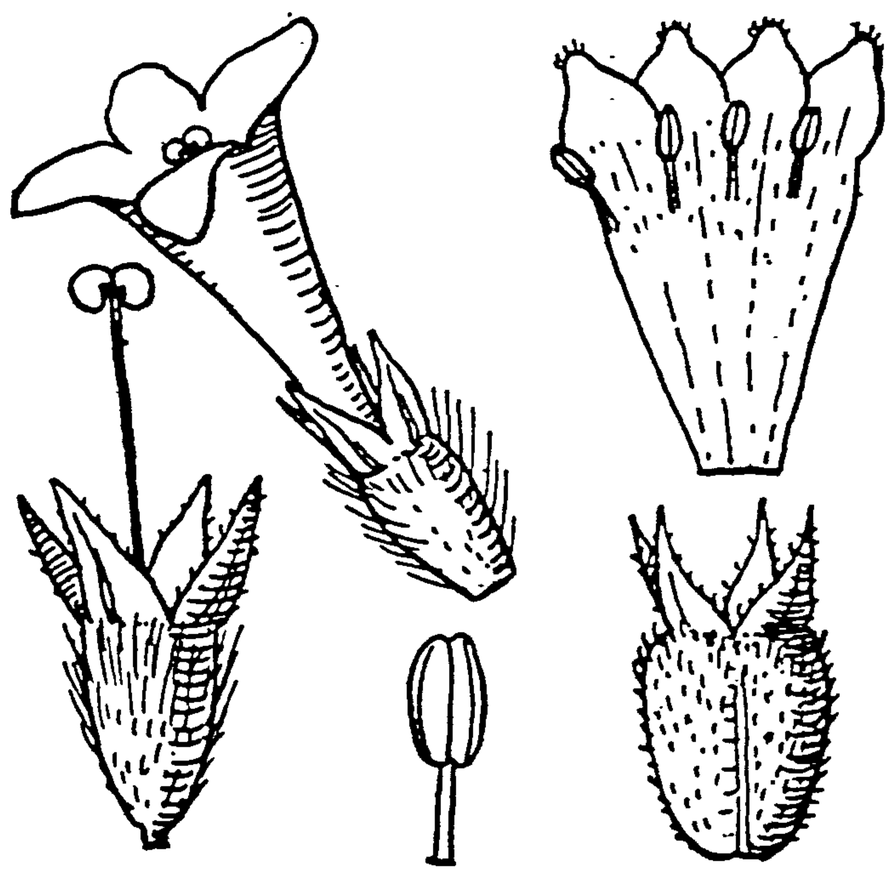
3. D. hirsuta Pursh. Stem branching, 1–8 dm. long, hirsute throughout: leaf-blades thickish, linear-spatulate to linear, 2–5 cm. long, somewhat acuminate: sepals subulate-lanceolate, 4–5 mm. long: corolla-tube 8–10 mm. long: fruit 7–9 mm. long.—Sandy soil, Coastal Plain, Fla. to N. C.

4. D. Harperi Small. Plant smaller than that of the three preceding species, glabrous throughout: leaf-blades spatulate to linear, 1–3 cm. long, acute, eciliate: sepals lanceolate, 3–4 mm. long: corolla-tube 3.5–4.5 mm. long: fruit about 5 mm. long.—Pond margins, Coastal Plain, S Ga.

22. DIODELLA Small. Annual diffuse herbs. Leaf-blades firm-herbaceous. Flowers axillary. Sepals 4. Corolla with a relatively short thick tube and 4 broad lobes. Stamens 5: filaments adnate up to the top of the corolla-tube, the free portions very short: anthers oval or ovoid. Stigma capitate or 2-lobed. Capsular fruit crustaceous, lobed. About 15 species, American.—BUTTON-WEEDS.

Corolla 4–5 mm. long: fruit hispidulous. 1. *D. teres.*
Corolla 6–10 mm. long: fruit strigillose. 2. *D. rigida.*

1. D. teres (Walt.) Small. Stem or branches 1–4 dm. long, spreading or creeping, pubescent: leaf-blades linear or narrowly linear-lanceolate, 1–4 cm. long: sepals 4, acute, 1.5–2 mm. long: corolla white or pinkish, 4–5 mm. long; lobes broadly ovate to deltoid: fruit obovoid, 4–4.5 mm. long. [*Diodia teres* Walt.]—Stony soil, fields, roadsides, open woods, dry sandy banks, various provinces, Fla. to Tex., Kans., Mich., and Conn.—Sum.–fall.



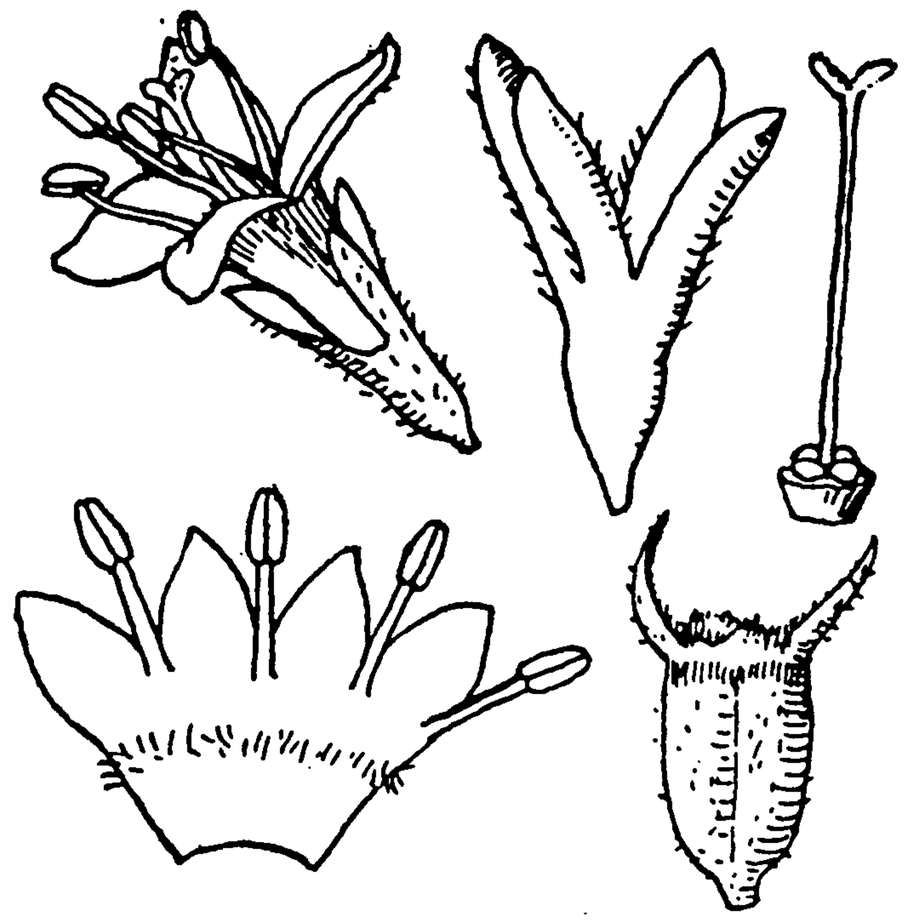
2. D. rigida (Cham. & Schlecht.) Small. Stem and branches procumbent or prostrate, finely pubescent: leaf-blades thick, linear to linear-lanceolate, mostly 1–3.5 cm. long, acute, minutely rough-pubescent; stipules long-setose: sepals ovate to ovate-lanceolate, 1.5–2 mm. long: corolla white or pinkish, 6–10 mm. long or rarely larger; lobes ovate to ovate-lanceolate: fruit obovoid, 3–3.5 mm. long.—Pinelands, Everglade Keys, Fla.—(*W. I.*)—All year.

23. BORRERIA Meyer. Herbs or woody plants. Leaf-blades herbaceous. Flowers in compact axillary cymes. Sepals usually 2, sometimes 4, unequal. Corolla white with a short tube and 4 broad lobes. Stamens 4: filaments adnate to the top of the corolla-tube: anthers globular to oval. Capsule with each carpel open along the inner face.—About 90 species, in warm and tropical regions.—All year.—The following species are recognized as growing within our range. *Borreria ocimoides* appears in a multitude of forms, some of which may represent other species when more thoroughly studied.

Plant perennial: flowers in a dense terminal glomerule, and sometimes in supplementary glomerule in the upper leaf-axils: leaves fleshy; blades of the upper ones, at least, narrowly linear. 1. *B. terminalis.*
Plant annual: flowers in clusters in all or many of the leaf-axils: leaves herbaceous; blades not linear.
Sepals subulate, nearly or quite as long as the capsule. 2. *B. ocimoides.*
Sepals ovate, much shorter than the capsule. 3. *B. laevis.*

1. B. terminalis Small. Perennial, 0.5–3 dm. tall, the stems often in colonies: leaf-blades linear-spatulate to linear, often narrowly so, 1–3 cm. long, veinless:

corolla about 3 mm. long; lobes ovate, about as long as the tube. [*B. podocephala* (Fl. SE. U. S.)]—Pinelands, Everglade Keys, Fla. and lower Florida Keys.—A related species, *B. tenella* (H.B.K.) C. & S., has been collected at Pensacola, Fla. It has subulate calyx-lobes and a corolla about 5 mm. long, with the lobes much shorter than the tube.



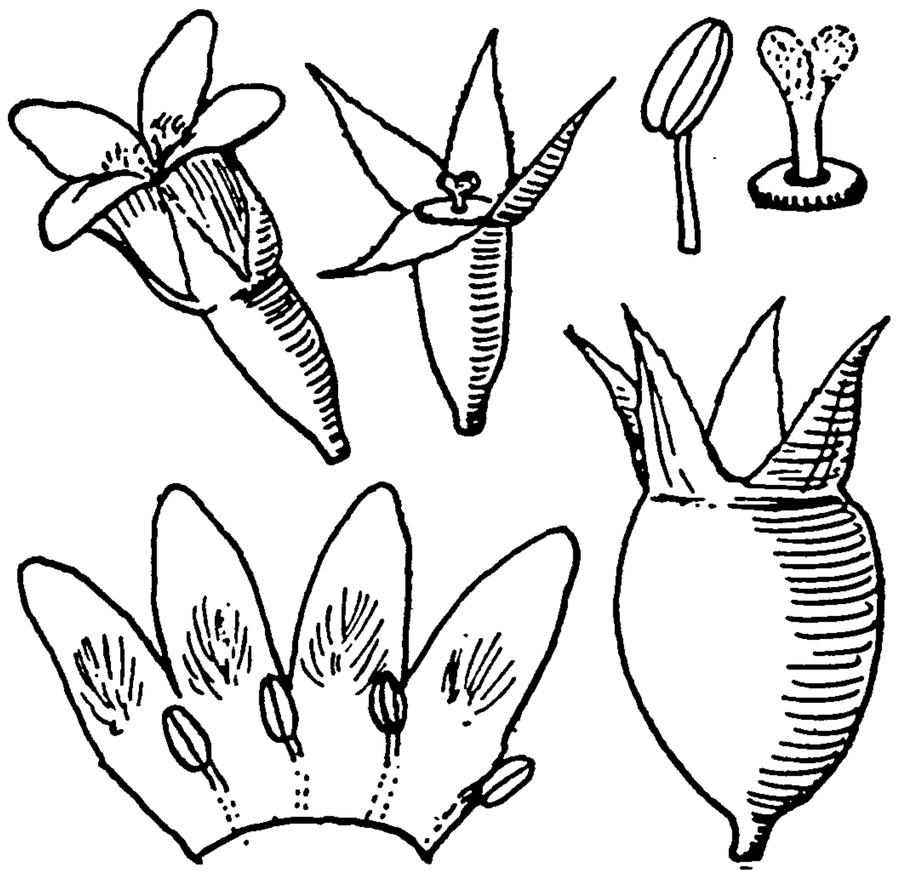
2. B. ocimoides (Burm.) DC. Annual, 1–9 dm. tall: leaf-blades elliptic or linear-elliptic, 1–2.5 cm. long, veiny: corolla about equalling the calyx; lobes about 1 mm. long. [*B. parviflora* G. F. W. Meyer. *B. micrantha* F. & G.]—Pinelands, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A., O. W.*)

3. B. laevis (Lam.) Griseb. Annual, 2–6 dm. tall: leaf-blades elliptic or oval, 1.5–6 cm. long, veiny: corolla much exceeding the calyx; lobes about 2 mm. long. [*Spermacoce Chapmanii* T. & G.]—Woods and stream-banks, Coastal Plain, Fla. to La.—(*W. I., Mex., C. A., S. A.*)

24. SPERMACOCE [Dill.] L. Herbs or woody plants. Leaf-blades herbaceous. Flowers in dense, axillary cymes. Sepals usually 4. Corolla with a short tube and 4 broad lobes. Stamens 4: filaments adnate at least to the lower part of the corolla-tube: anthers oval or globular. Capsule with 1 dehiscent and 1 indehiscent carpel.—Four or 5 species, American.

Stem and leaves glabrous or nearly so.	
Plant perennial: corolla very villous in the throat.	1. *S. glabra.*
Plant annual: corolla glabrous or slightly hairy in the throat.	
Corolla-lobes shorter than the tube; hypanthium bristly-pubescent.	2. *S. tenuior.*
Corolla-lobes longer than the tube: hypanthium not bristly.	3. *S. keyensis.*
Stem and leaves hirsute with whitish hairs.	4. *S. tetraquetra.*

1. S. glabra Michx. Stem 1–6 dm. tall, glabrous or nearly so: leaf-blades elliptic, varying to broadest below or above the middle, 2–7 cm. long: sepals becoming 1.5 mm. long, eciliate or nearly so: corolla white; lobes elliptic-ovate: fruit about 3 mm. long.—River-banks and low grounds, various provinces, Fla. to Tex., Kans., and Ohio.—Sum. or all year S.



2. S. tenuior (L.) Lam. Stem 1–5 dm. tall, or prostrate: leaf-blades elliptic, or elliptic-lanceolate, 2–5 cm. long: sepals finely bristly-pubescent: corolla white; lobes ovate, shorter than the tube: fruit over 2 mm. long, coarsely hispidulous.—Hammocks, Coastal Plain, Fla. to La. and Ga.—Spr.–sum.

3. S. keyensis Small. Stem and branches prostrate, 1–4 dm. long, glabrous: leaf-blades elliptic, varying to broadest below or above the middle, or elliptic-lanceolate, mostly 1–2 cm. long: sepals minutely pubescent: corolla white; lobes ovate, longer than the tube: fruit 1.5–2 mm. long, minutely hispidulous. [*S. porto-*

ricensis (Fl. SE. U. S.)]—Open hammocks and sandy places, Florida Keys.—All year.

4. S. tetraquetra A. Rich. Stem 2–14 dm. tall, usually branched, hirsute, four-sided: leaf-blades elliptic, often narrowly so, varying to broadest above or below the middle, acute; flower-clusters dense: hypanthium hispid: sepals lanceolate to subulate-lanceolate, 1–1.5 mm. long; corolla white, 2–2.5 mm. long; lobes ovate, much shorter than the tube, pubescent at the base within: fruit ellipsoid, fully 2–2.5 mm. long, hispid.—Pinelands, Everglade Keys, Fla.—(*W. I.*)—All year.

25. **GALIUM** L. Perennial, or sometimes annual, weak spreading herbs. Leaves with blades and stipules about equal in size. Flowers in simple or branched cymes. Sepals usually obsolete. Corolla rotate, with 3–5 lobes. Stamens 3–5. Fruit globular or didymous. About 250 species, widely distributed.—BEDSTRAWS. CLEAVERS.

Fruit dry.
  Plants annual.
    Flowers in axillary cymules.
      Fruit densely uncinate-hispid. — I. APARINA.
      Fruit slightly granular or smooth. — II. PARISIENSA.
    Flowers solitary in the axils. — III. VIRGATA.
  Plants perennial.
    Fruit uncinate-hispid.
      Leaves and stipules in 4's; blades not bristle-tipped. — IV. PILOSA.
      Leaves and stipules in 6's; blades bristle-tipped. — V. TRIFLORA.
    Fruit smooth and glabrous or merely warty.
      Corolla brownish or brownish-purple. — VI. LATIFOLIA.
      Corolla white or greenish. — VII. TINCTORIA.
Fruit fleshy. — VIII. BERMUDENSA.

I. APARINA

Plant with the long weak reclining stems retrorse-scabrous or prickly on the angles. — 1. *G. Aparine.*

II. PARISIENSA

Plant diffusely branched, the branches minutely scabrous on the angles. — 2. *G. parisiense.*

III. VIRGATA

Plant with slender stems and remote whorls of very short leaves and stipules. — 3. *G. virgatum.*

IV. PILOSA

Flowers manifestly pedicelled. — 4. *G. pilosum.*
Flowers sessile or nearly so.
  Leaf-blades elliptic-ovate to oval: corolla pubescent. — 5. *G. circaezans.*
  Leaf-blades lanceolate or ovate-lanceolate: corolla glabrous or nearly so. — 6. *G. lanceolatum.*

V. TRIFLORA

Plant fragrant in drying: leaf-blades bristle-tipped. — 7. *G. triflorum.*

VI. LATIFOLIA

Leaf-blades broadly lanceolate, 3-veined: fruit smooth. — 8. *G. latifolium.*
Leaf-blades narrowly or linear-lanceolate, mostly 1-veined: fruit minutely warty. — 9. *G. arkansanum.*

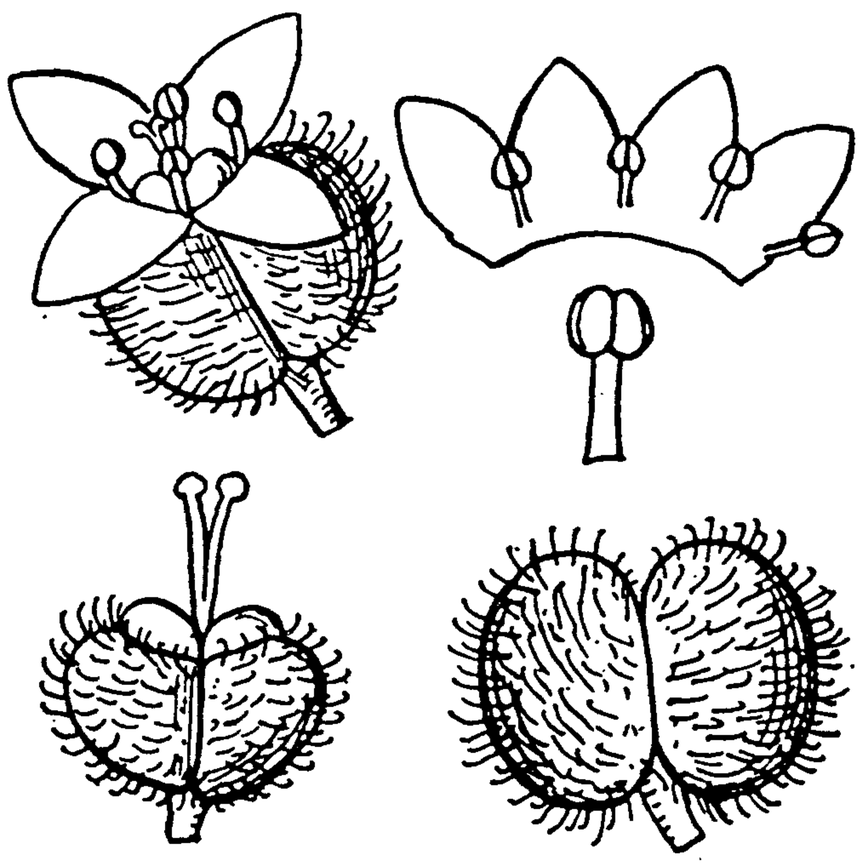
VII. TINCTORIA

Leaf-blades obtuse or merely acute.
  Corolla-lobes 3, obtuse: stem scabrous. — 10. *G. Claytonii.*
  Corolla-lobes 4, acute: stem smooth.
    Stipules as large as the leaves or nearly so: fruits when didymous 3–3.5 mm. wide. — 11. *G. tinctorium.*
    Stipules much smaller and narrower than the leaves: fruits when didymous 4–5 mm. wide. — 12. *G. filifolium.*
Leaf-blades cuspidate. — 13. *G. asprellum.*

VIII. BERMUDENSA

Leaf-blades linear or nearly so. — 14. *G. uniflorum.*
Leaf-blades elliptic to oval. — 15. *G. bermudense.*

1. G. Aparine L. Plant reclining, 1–15 dm. long, the stem retrorse-scabrous or prickly: leaves, and stipules, with linear-spatulate blades 1–8 cm. long, the upper side with short stout hairs (small-leaved, abundantly fruited, and with longer-hispidulous fruits in *G. Aparine Vaillantii*): corolla white; lobes ovate, 1–1.5 mm. long, acute: fruit 3–5 mm. thick, densely uncinate-hispid.—(GOOSE-GRASS. SPRING-CLEAVERS.) —Thickets, rich shaded soil, and waste-places, various provinces, Fla. to Tex., Alas., Ont., and N. B.—(*Eurasia.*)—Spr.–sum.



2. G. parisiense L. Plant 1.5–3 dm. tall, the stem retrorse-scabrous on the angles: leaves and stipules with linear to linear-spatulate blades, 7–10 mm. long, scabrous: corolla white; lobes about 0.5 mm. long: fruit about 0.5 mm. thick, papillose-roughened.—Fields and roadsides, Blue Ridge to Appalachian Plateau, N. C. to Tenn. and Va. Nat. of Eu.—Sum.

3. G. virgatum Nutt. Plant 1–3 dm. tall, the stem hispid, with short internodes: leaves and stipules with linear-elliptic blades, 3–10 mm. long, very hispid on the margin and midrib: corolla white; lobes ovate, less than 1 mm. long, glabrous: fruit about 3 mm. thick, uncinate-hispid, (glabrous and smooth like the foliage, *G. virgatum leiocarpum*).—Dry soil, Coastal Plain and adj. provinces, Tenn. to La., Tex., and Mo.—Spr.

4. G. pilosum Ait. Plant 3–8 dm. tall, the stem hirsute, 4-angled above the swollen nodes (or internodes merely pubescent with uncinate hairs on the angles in *G. pilosum puncticulosum;* glabrous in *G. pilosum laevicaule*): leaves and stipules, with oval-ovate or elliptic blades 8–10 mm. long, sparingly pubescent, pellucid-punctate beneath: corolla yellowish or purplish; lobes ovate to lanceolate, about 1.5 mm. long: fruit about 4 mm. thick, uncinate-hispid.—Open woods, shaded banks, fence-rows, and thickets, various provinces, Fla. to Tex., Kans., Ont., and Mass.—(*W. I.*)—Sum.

5. G. circaezans Michx. Plant 2–4 dm. tall, the stem glabrous or sparingly pubescent: leaves and stipules with elliptic-ovate or oval blades 15–30 mm. long, or more, sparingly pubescent: corolla greenish; lobes ovate, acute, less than 2 mm. long: fruit about 5 mm. thick, uncinate-hispid.—(WILD-LIQUORICE.) —Dry woods, thickets, and open banks, various provinces, Fla. to Tex., Minn., and Que.—Sum.

6. G. lanceolatum Torr. Plant sparingly pubescent in parts, the stem branched at the base, mostly 2.5–6 dm. tall: leaves and stipules shorter than the internodes, 30–75 mm. long; blades of the upper leaves lanceolate or ovate-lanceolate, acute or slightly acuminate, sparingly pubescent, especially on the veins beneath, 3-ribbed: flowers few, sessile on the spreading cyme-branches: corolla glabrous or nearly so, 3–5 mm. broad, greenish, or yellowish, becoming purple; lobes 4, slender-tipped: fruit as in *G. circaezans*.—(WILD-LIQUORICE.)—Dry thickets and rocky woods, various provinces, N of Coastal Plain, N. C. to Ky., Ont., and Que.—Sum.

7. G. triflorum Michx. Plant reclining, sweet-scented in drying, the stem 3–10 dm. long, sparsely hispid or rarely glabrous: leaves and stipules in 6's, with broadly linear to elliptic blades 1–8 cm. long, the margins and midrib hispid: flowers relatively few, 3 together on the ultimate peduncles: corolla

greenish or yellowish-white; lobes fully 1.5 mm. long: fruit about 3 mm. thick, uncinate-hispid.—(SWEET-SCENTED BEDSTRAW.)—Thickets and woods, various provinces, Fla. to Tex., Calif., Alas., Ont., and Newf.—(*Eurasia.*)—Spr.–sum.

8. **G. latifolium** Michx. Plant 3–6 dm. tall, the stem glabrous (hispid, like the leaves, in *G. latifolium hispidifolium*): leaves and stipules with broadly lanceolate blades 3–6 cm. long: corolla brownish; lobes ovate-lanceolate, acuminate, about 2.5 mm. long: fruit about 2.5 mm. thick, glabrous, slightly fleshy.—Woods, Blue Ridge to Appalachian Plateau, Ga. to Ala. and Pa.—Sum.–fall.

9. **G. arkansanum** A. Gray. Plant about 3 dm. tall, the stem glabrous below, retrorse-scabrous above: leaves and stipules with narrowly or linear-lanceolate blades 25–40 mm. long, scabrous on the margin and midrib, densely pellucid-punctate beneath: corolla brownish purple: lobes ovate-lanceolate, acuminate, about 2.5 mm. long: fruit 2–2.5 mm. thick, glabrous.—Dry soil, often in rocky woods, various provinces N of Coastal Plain, Tenn. to Okla. and Mo.—Sum.

10. **G. Claytonii** Michx. Plant more or less diffuse, 1.5–6 dm. tall, the stem retrorse-scabrous on the angles: leaves and stipules mostly in 5's or 6's, with linear-spatulate or spatulate-elliptic blades 8–15 mm. long, obtuse, with scabrous margins and midrib: corolla white; lobes about 1 mm. long: fruit about 1.5 mm. thick, glabrous.—Marshes and ditches, various provinces, N. C. to Tex., Nebr., and Que.—Spr.–sum.

11. **G. tinctorium** L. Plant 1.5–2.5 dm. tall, the stem glabrous or nearly so: leaves and stipules mostly in 4's, with linear-lanceolate blades 15–25 mm. long; (plants decumbent with linear-spatulate leaves, in *G. tinctorium floridanum*): flowers 2 or 3 in terminal clusters: corolla white; lobes about 1 mm. long: fruit, when didymous, 3–3.5 mm. wide, smooth.—Damp shaded places, swamps, and wet thickets, various provinces, Fla. to Tex., Ariz., Nebr., and Que.—Spr.–sum., or all year southward.

12. **G. filifolium** (Wiegand) Small. Plant 1.3 dm. tall, the stem and branches diffuse, more or less sprawling in age, glabrous: leaves and stipules mostly in 4's, with very narrowly linear blades mostly 1–1.5 cm. long: flowers in open cymes, filiform-pedicelled: corolla white, about 1 mm. long: fruit, when didymous, 4–5 mm. wide, glabrous.—Low pinelands, swamps, and stream-banks, Coastal Plain, Ga. to N. C.—Spr.–sum.

13. **G. asprellum** L. Plant reclining, the stem 3–16 dm. long, retrorsely scabrous or prickly: leaves and stipules in 6's, with elliptic-spatulate to elliptic blades 1–2 cm. long, the margins and midrib scabrous: flowers very numerous: corolla white; lobes fully 1.5 mm. long: fruit about 2.5 mm. thick, smooth and glabrous.—(ROUGH-BEDSTRAW.)—Open swamps and moist thickets, various provinces, N. C. to Nebr., Ont., and Newf.—Spr.–sum.

14. **G. uniflorum** Michx. Plant evergreen, about 3 dm. tall, the stem smooth and glabrous: leaves and stipules with linear blades 25–28 mm. long, acute, glabrous beneath: flowers solitary in pairs: corolla white; lobes broadly ovate, about 2 mm. long: fruit about 1.5–2 mm. thick, baccate, glabrous.—Dry woods, Coastal Plain and adj. provinces, Fla. to Tex. and S. C.—Sum.

15. **G. bermudense** L. Plant evergreen, diffuse, the stem 1–6 dm. long, hispidulous or glabrous: leaves and stipules oval or elliptic, 5–25 mm. long, cuspidate, pellucid-punctate and pubescent beneath: flowers 3–5 together: corolla greenish-white; lobes narrowly ovate, about 2 mm. long: fruit about 5 mm. thick, baccate, usually smooth and glabrous. [*G. hispidulum* Michx.]—Dry sandy soil, Coastal Plain, Fla. to La. and N. J.—(*W. I.*)—Spr.–sum.

Sherardia arvensis L. with the habit of *Galium*, but with funnelform corollas, has been found in grass plots in northern Fla. and in Tenn.

Family 2. **CAPRIFOLIACEAE** — Honeysuckle Family

Shrubs, trees, vines, or perennial herbs. Leaves opposite: blades entire, toothed, or pinnate. Flowers mostly perfect, in terminal or axillary cymes, or axillary. Calyx of mostly 4 or 5 minute or foliaceous sepals. Corolla of 4 or 5 partly united petals, often irregular. Androecium of 4 or 5 stamens: filaments partly adnate to the corolla-tube. Gynoecium 2–5-carpellary. Ovary inferior. Fruit baccate, drupaceous, or capsular.—About 12 genera and 300 species, mostly in the Northern Hemisphere.

Corolla rotate to urceolate, regular or nearly so: stigma 3–5-lobed: style wanting or very short. — Tribe I. Sambuceae.
Corolla tubular to tubular-campanulate or trumpet-shaped, often irregular: stigma capitate: style elongate. — II. Lonicereae.

I. Sambuceae

Leaf-blades pinnate: drupe berry-like with 3–5 nutlets. — 1. Sambucus.
Leaf-blades simple: drupe with one nutlet. — 2. Viburnum.

II. Lonicereae

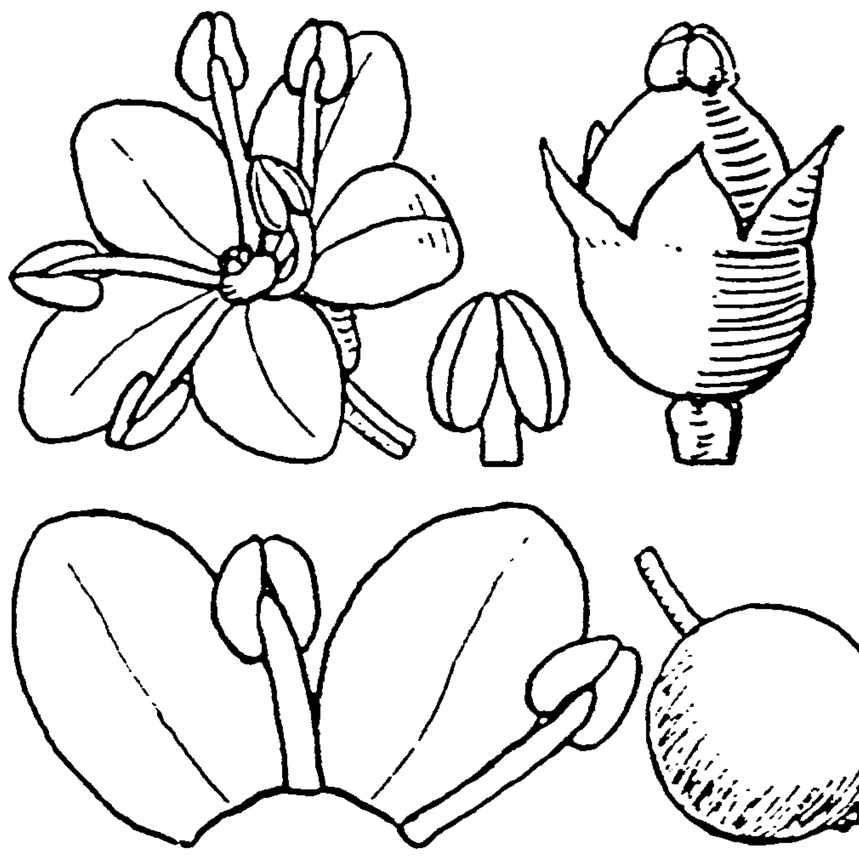
Flowers axillary: herbs. — 3. Triosteum.
Flowers in axillary or terminal clusters or open cymes: shrubs or vines.
  Fruit baccate.
    Corolla regular or nearly so; tube short or elongate: limb with ascending or spreading lobes.
      Corolla short, more or less campanulate; tube short: stamens adnate up to the top of the corolla-tube. — 4. Symphoricarpos.
      Corolla elongate, nearly tubular; tube gradually enlarged upward: stamens not adnate up to the top of the corolla-tube. — 5. Phenianthus.
    Corolla irregular; limb 2-lipped.
      Flowers in pairs each of which terminates an axillary peduncle, accompanied by a pair of bracts and bractlets.
        Bracts minute, very different from the leaves: corolla-tube gibbous at the base: upright shrubs. — 6. Xylosteon.
        Bracts foliaceous, resembling the leaves: corolla-tube not gibbous at the base: vines. — 7. Nintooa.
      Flowers in whorls at or near the ends of the branches, the bracts and usually some of the upper pairs of leaves connate-perfoliate. — 8. Lonicera.
  Fruit capsular. — 9. Diervilla.

1. SAMBUCUS [Tourn.] L. Shrubs or trees, with pithy stems. Leaf-blades pinnate. Flowers white, in thyrsoid or flat-topped cymes. Sepals small. Anthers ellipsoid or oval. Ovary 3–5-celled. Drupe with 3–5 nutlets—About 25 species, widely distributed.—Spr. or all year S.—Elders.

Cyme flat-topped or slightly convex: fruit dark-purple to black.
  Lateral leaflets merely toothed, or the lower pair rarely with a lateral pinna. — 1. *S. canadensis.*
  Lateral leaflets, at least the lower pair, pinnately 2- or 3-foliolate. — 2. *S. Simpsonii.*
Cyme compact, rounded: fruit red. — 3. *S. pubens.*

1. S. canadensis L. Shrub with soft wood and white pith: leaflets mostly 5–11, the blades of the lateral ones elliptic, lanceolate, ovate or oval, 3–14 cm.

long, serrate with incurved teeth: cyme merely convex: corolla 5–6 mm. wide: drupe 4–5 mm. in diameter.—(COMMON-ELDER.)—Open places, woods, river-banks, and swamps, various provinces, Ga. to Tex., Man., and N. B.



2. S. Simpsonii Rehder. Tall shrub or small tree with white pith: leaflets 5–9, the blades of the lateral ones elliptic or nearly so, 3–8 cm. long, serrate: cyme flat: corolla 5–7 mm. wide: drupe 5–6 mm. in diameter. [*S. intermedia* (Fl. SE. U. S.)]—(GULF-ELDER. SOUTHERN-ELDER.)—Hammocks and marshes, Coastal Plain, Fla. to La.—Forms vast thickets in the Lake Okeechobee region and the coastwise lagoons of southern Florida, where it blooms throughout the year.

3. S. pubens Michx. Shrub with brown pith: leaflets 5–7, the blades lanceolate, elliptic, or oblanceolate, or nearly oval, 5–15 cm. long: cyme thyrsoid: corolla 4–5 mm. wide: drupe 4–6 mm. in diameter.—(RED-BERRIED ELDER.)—Shaded hillsides and rocky woods, Blue Ridge and more northern provinces, Ga. to Colo., Calif., Alas., Ont., and Newf.

2. VIBURNUM [Tourn.] L. Shrubs or trees, the stems not pithy. Leaf-blades simple. Flowers in round-topped cymes. Sepals small. Corolla white. Anthers oblong. Ovary 1-celled. Drupe with a single stone.—About 100 species, widely distributed.—Spr.–sum.—ARROW-WOODS.

Cyme with some of the marginal flowers radiant and sterile: drupe red to scarlet. I. ALNIFOLIA.
Cyme without radiant marginal flowers: drupe blue or dark-purple to black.
  Leaf-blades palmately veined or palmately lobed. II. ACERIFOLIA.
  Leaf-blades pinnately veined, entire or toothed.
    Filaments as long as the corolla or longer: leaves with manifest distinction between blades and petiole.
      Leaf-blades with straight pinnate veins which terminate in the teeth: stone of the drupe usually grooved. III. DENTATA.
      Leaf-blades with curved veins which anastomose near the entire or toothed margin: stone flat and even. IV. PRUNIFOLIA.
    Filaments much shorter than the corolla: leaves without distinction between blade and petiole. V. OBOVATA.

I. ALNIFOLIA

Shrub with diffuse or procumbent, sometimes creeping (rooting) branches. 1. *V. lantanoides.*

II. ACERIFOLIA

Leaf-blades with salient lobes, the teeth manifestly acute or flaring. 2. *V. acerifolium.*
Leaf-blades merely toothed or obscurely lobed, the teeth rounded or relatively blunt. 3. *V. densiflorum.*

III. DENTATA

Leaf-blades sessile or very short-petioled. 4. *V. Rafinesquianum.*
Leaf-blades decidedly petioled, sometimes relatively long-petioled.
  Lower surfaces of the leaf-blades glabrous or merely with tufts of hairs in the axils of the veins.
    Corolla 5–6 mm. wide: drupe globose-ovoid. 5. *V. dentatum.*
    Corolla about 8 mm. wide: drupe oval or ovoid. 6. *V. bracteatum.*
  Lower surfaces of the leaf-blades stellate-pubescent. 7. *V. semitomentosum.*

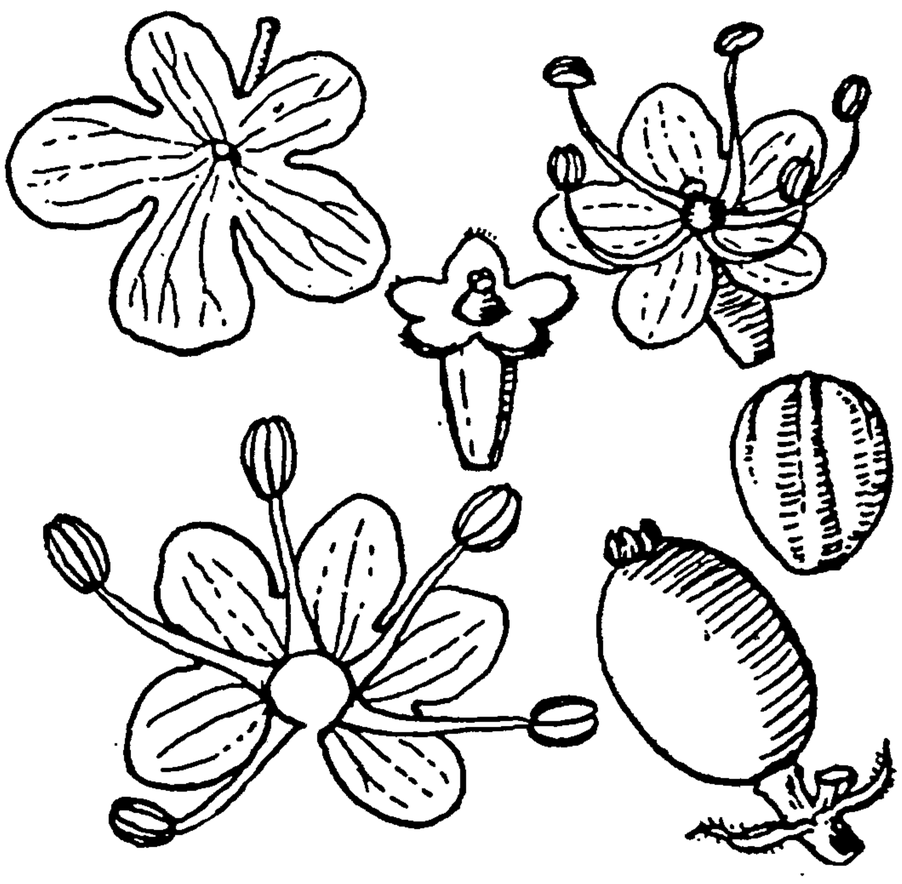
IV. Prunifolia

Cyme peduncled.
  Peduncles shorter than the cymes. 8. *V. cassinoides.*
  Peduncles as long as the cymes or longer. 9. *V. nudum.*
Cyme sessile or nearly so.
  Leaf-blades prominently acuminate, serrate. 10. *V. lentago.*
  Leaf-blades obtuse or merely acute, serrulate.
    Petioles and leaf-surfaces glabrous or nearly so: stone of the drupe elliptic. 11. *V. prunifolium.*
    Petioles and leaf-surfaces more or less densely red-tomentose: stone orbicular or nearly so. 12. *V. rufotomentosum.*

V. Obovata

Drupe 6–7 mm. long; stone turgid, suborbicular. 13. *V. obovatum.*
Drupe 10–11 mm. long; stone flat, elliptic-obovate. 14. *V. Nashii.*

1. V. lantanoides Michx. Straggling shrub: leaf-blades ovate to suborbicular, 9–20 cm. long, serrate: sepals ovate, about 1.5 mm. long, pubescent: corolla 5–6 mm. wide (those of the marginal ones larger), the lobes ovate: drupe 10–15 mm. long. [*V. alnifolium* (Fl. SE. U. S.)] —(Hobble-bush. Moosewood. Witch-hobble.)—Damp woods, Blue Ridge, and more northern provinces, N. C. to Mich. and N. B.



2. V. acerifolium L. Erect shrub: leaf-blades prominently 3-lobed, 4–10 cm. long: sepals reniform, about 0.5 mm. long: hypanthium glabrous or nearly so: corolla-lobes mostly reniform: drupe oval, 9–10 mm. long, black or purple-black.—Rocky hillsides, woods, and thickets, various provinces, Ga. to Ont., and N. B.

3. V. densiflorum Chapm. Erect shrub: leaf-blades undulate, shallowly toothed or sometimes slightly 3-lobed: sepals deltoid, about 0.7 mm. long: hypanthium pubescent: corolla-lobes mostly ovate: drupe ellipsoid, 8–9 mm. long.—Wooded hillsides, Coastal Plain, W Fla. (and Ala.?)

4. V. Rafinesquianum Schult. Shrub: leaf-blades ovate to elliptic or suborbicular, sharply serrate-dentate, 2–7 cm. long: corolla-lobes broadly ovate: filaments about equalling the corolla-lobes: drupe ellipsoid, 7–9 mm. long, black or nearly so. [*V. pubescens* (Ait.) Pursh]—Rocky woods, Blue Ridge and more northern provinces, Ga. to Minn. and Que.

5. V. dentatum L. Shrub: leaf-blades suborbicular, oval, or ovate, sharply dentate, 3–8 cm. long; petioles over 1.5 cm. long: corolla-lobes reniform: filaments much exceeding the corolla-lobes: drupe globose-ovoid, 5–6 mm. long, deep-blue or nearly black.—(Arrow-wood.)—Wet thickets, swamps, and meadows, various provinces, Fla. to Ont. and N. B.

6. V. bracteatum Rehder. Shrub: leaf-blades ovate, often broadly so, crenate-dentate, 5–12 cm. long; petioles mostly less than 1.5 cm. long: corolla-lobes obovate: filaments mostly longer than the corolla-lobes: drupe oval or ovoid, about 1 cm. long, bluish-black.—Banks of the Coosa River, Appalachian Valley, Ga.

7. V. semitomentosum (Michx.) Rehder. Shrub: leaf-blades suborbicular, broadly ovate or elliptic, crenate-dentate, 3–9 cm. long: corolla 5–8 mm. wide: filaments slightly exceeding the corolla-lobes: drupe globose-ovoid, 8–9 mm. long

deep-blue.—Low ground and swamps, Coastal Plain, Fla. to Tex. and Pa.—A counter-part of this species in the Blue Ridge province of Ga. and adj. Tenn. and N. C., with large coarsely-toothed leaf-blades in *V. carolinianum* Ashe. A plant with sparingly pubescent foliage and small leaves (2.5–6 cm.) in S Miss., has been described as *V. Ashei* Bush.—*V. molle* Michx., with ellipsoid fruits about 1 cm. long, ranges from Ky. to Mo. and La.

8. **V. cassinoides** L. Shrub: leaf-blades thickish, ovate-elliptic, ovate-lanceolate, or oblanceolate, undulate or crenate, 3–8 cm. long: corolla 4–5 mm. wide: filaments much exceeding the corolla-lobes: drupe ovoid or globose-ovoid, 6–9 mm. long, deep-blue or rarely pink.—(WITHE-ROD. WILD-RAISIN. SWAMP-HAW.)—Swamps and wet woods, various provinces, Fla. to Miss., Man., and Newf.

9. **V. nudum** L. Shrub: leaf-blades thick, oval-ovate, elliptic, broadly lanceolate, or oblanceolate (linear-elliptic or narrowly elliptic-lanceolate in *V. nudum angustifolium* = *V. nitidum*), undulate or obscurely toothed, 5–15 cm. long (up to 30 cm. long in *V. nudum grandifolium*): corolla often larger than that of *V. cassinoides* (smaller in *V. nudum serotinum*): drupe oval to subglobose, 6–10 mm. long, deep-blue.—(POSSUM-HAW. SWAMP-HAW.)—Swamps and low grounds, often in acid soil, Coastal Plain and adj. provinces, Fla. to Tex., Ky., and Conn.

10. **V. Lentago** L. Shrub or tree: leaf-blades ovate to obovate or rarely suborbicular, finely and sharply serrate, 4–10 cm. long: sepals mostly acute or acutish: corolla-lobes ovate: filaments twice as long as the corolla or nearly so: drupe oval, 10–12 mm. long, bluish-black.—(NANNYBERRY. SHEEPBERRY. WILD-RAISIN. SWEET-VIBURNUM.)—Woods and banks of streams, various provinces, Ga. to Mo., Man., and Que.

11. **V. prunifolium** L. Shrub or tree: leaf-blades thinnish, oval varying to ovate or obovate, or rarely suborbicular, finely, sometimes obscurely, serrulate, 2.5–5 cm. long: sepals obtuse: corolla-lobes suborbicular: filaments much less than twice as long as the corolla: drupe elliptic, sometimes broadly so, 7–9 mm. long bluish-black under the bloom.—(BLACK-HAW. STAG-BRUSH. SLOE.)—Thickets, woods and open banks, various provinces, Ga. to Ark., Kans., Mich., and Conn.

12. **V. rufidulum** Raf. Shrub or small tree: leaf-blades thick, elliptic, or nearly so, serrate, 4–10 cm. long: corolla 7–10 mm. wide: drupe broadly oblong, 10–14 mm. long, deep-blue under the bloom. [*V. rufotomentosum* Small.]—(SOUTHERN BLACK-HAW.)—Woods, thickets, hammocks, and bluffs, various provinces, Fla. to Tex., Kans., and Va.

13. **V. obovatum** Walt. Shrub or small tree: leaf-blades oblanceolate, cuneate, or obovate, 1.5–6 cm. long, entire or slightly toothed near the apex: corolla 5–6 mm. wide: filaments scarcely equalling the corolla-tube: drupe oval, 6–8 mm. long, black.—(SMALL-VIBURNUM.)—River-swamps and low hammocks, Coastal Plain, Fla. to Va.

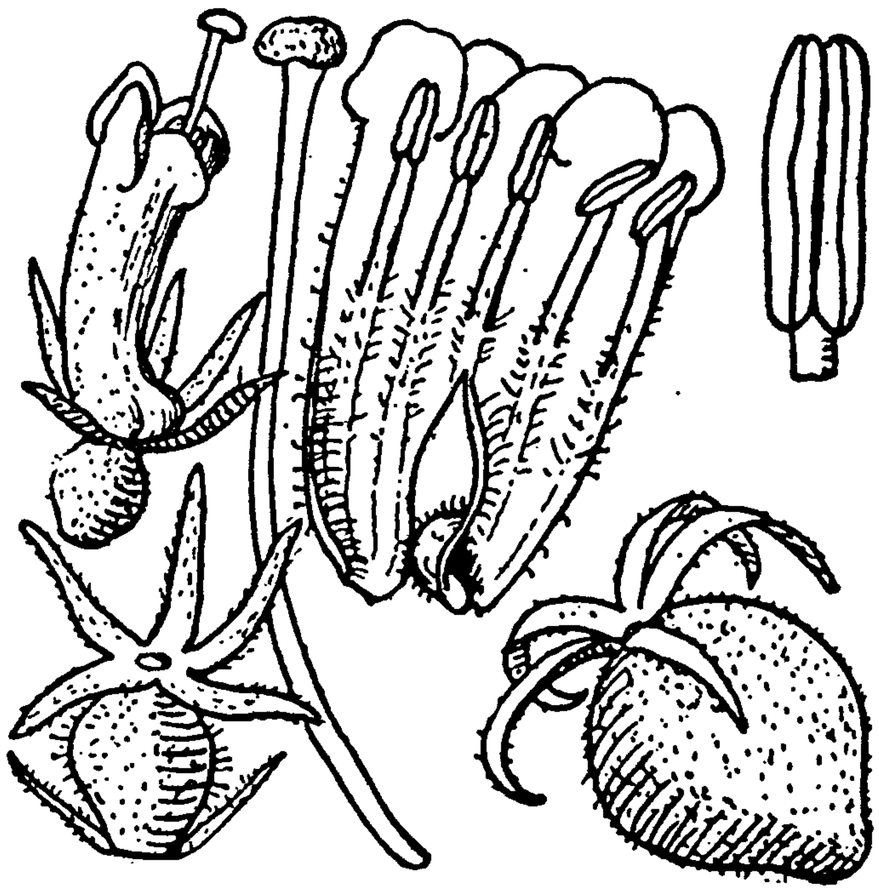
14. **V. Nashii** Small. Shrub or small tree: leaf-blades suborbicular or broadly obovate to spatulate, 4–5 cm. long, more or less crenate: drupe ellipsoid, 10–12 mm. long, black.—(NASH'S-VIBURNUM.)—River-swamps, Fla.

3. **TRIOSTEUM** L. Herbs with simple stems. Leaf-blades entire, sometimes connate-perfoliate. Flowers axillary. Sepals foliaceous. Corolla yellow, greenish-yellow, or maroon. Filaments adnate to the lower part of the corolla-

tube. Anthers linear. Ovary 3–5-celled. Drupe leathery or fleshy. About 6 species, the following and 3 Asiatic.—Sum.—HORSE-GENTIANS. FEVERWORTS.

Leaf-blades narrowed to the sessile or slightly connate-perfoliate bases.
  Leaves less than thrice as long as broad: corolla dull-red. 1. *T. aurantiacum.*
  Leaves over thrice as long as broad: corolla yellowish. 2. *T. angustifolium.*
Leaf-blades with broadly dilated connate-perfoliate bases. 3. *T. perfoliatum.*

1. T. aurantiacum Bicknell. Similar to *T. angustifolium* in habit: blades of the upper leaves ovate-elliptic to elliptic-lanceolate, 15–25 cm. long: sepals 12–20 mm. long: corolla 14–20 mm. long: drupe 12–14 mm. long.—Rocky woods, sandy thickets, and rich hillsides, various provinces, rarely Coastal Plain, N. C. to Minn. and Que.



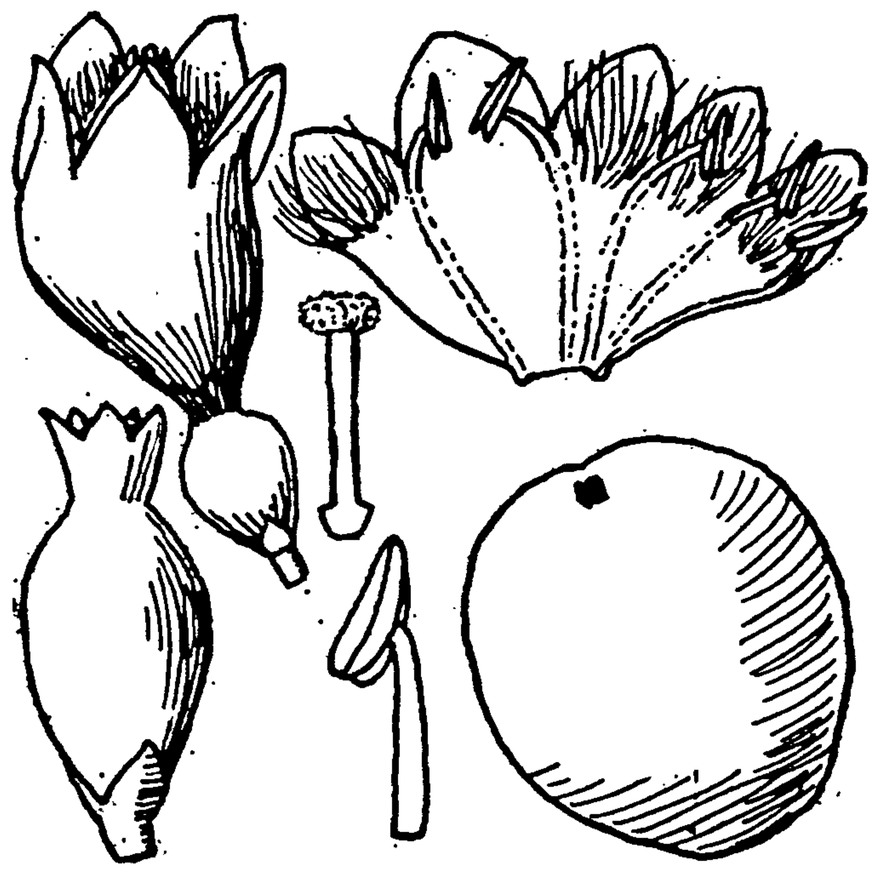
2. T. angustifolium L. Stem hirsute or softly hispid, 3–9 dm. tall: blades of the upper leaves usually narrowly elliptic, varying to lanceolate or oblanceolate, 3–15 cm. long: sepals 8–10 mm. long: corolla 12–15 mm. long: drupe about 10 mm. long.—Rich soil and edges of thickets, Coastal Plain and adj. provinces, Ala. to La., Mo., and Conn.

3. T. perfoliatum L. Stem softly pubescent: blades of the upper leaves ovate to broadly oval, 10–25 cm. long: sepals 11–15 mm. long: corolla 12–15 mm. long: drupe 8–12 mm. long.—(WILD-COFFEE. TINKER'S-WEED.)—Rich woods and thickets, various provinces, rarely Coastal Plain, Ala. to Nebr. and Mass.

4. SYMPHORICARPOS [Dill.] Ludwig. Shrubs with much branched stems. Leaf-blades entire, or lobed on shoots. Flowers in spikes or racemes. Sepals minute. Corolla white or red. Filaments adnate to the top of the corolla-tube. Anthers ellipsoid. Ovary 4-celled. Berry drupe-like, fleshy, with 2 nutlets. About 10 species, North American.—Sum.

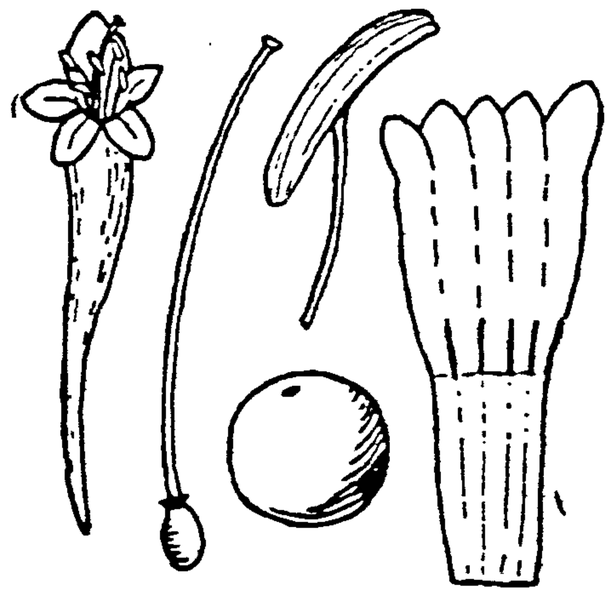
Style glabrous: drupe white: corolla pale. 1. *S. albus.*
Style pubescent: drupe red or purple: corolla dark. 2. *S. Symphoricarpos.*

1. S. albus (L.) Blake. Shrub 1–2 m. tall, the twigs and leaves glabrous: leaf-blades elliptic or suborbicular, 3–6 cm. long: flowers short-pedicelled: corolla white or pinkish, 6–7 mm. long: drupe 6–10 mm. long. [*S. racemosus* Michx.]—(SNOWBERRY.)—Rocky woods and river-banks, various provinces, N. C. to Calif., B. C., and N. S.



2. S. Symphoricarpos (L.) MacM. Shrub 1–2 m. tall, the twigs and leaves pubescent: leaf-blades ovate, oval, or elliptic, 1–4 cm. long, or rarely larger: flowers sessile or nearly so: corolla greenish-red, 2.5–3.5 mm. long: drupe 3–4 mm. long. [*S. vulgaris* Michx.]—(CORAL-BERRY. INDIAN-CURRANT.)—Thickets, edges of woods, and roadsides, various provinces, Ga. to Tex., N. D. and N. Y.; naturalized eastward.

5. **PHENIANTHUS** Raf. Woody vines or diffuse shrubs. Leaf-blades entire, the upper pairs of bracts often connate-perfoliate. Flowers in sessile axillary clusters. Sepals very small. Corolla-elongate, bright-colored: tube slightly ventricose near the base. Berries subglobose, usually clustered.—About 6 species, mostly North American.

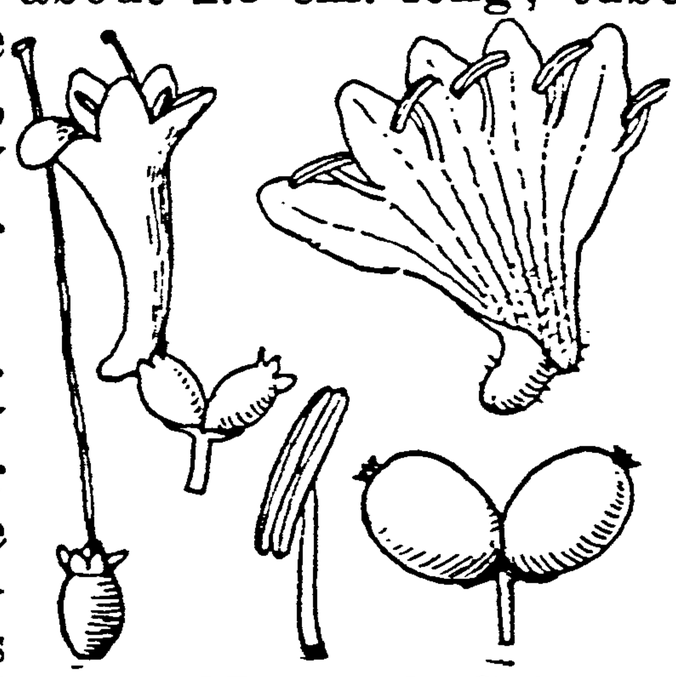


1. P. sempervirens (L.) Raf. Twining vine, the twigs glabrous: leaf-blades narrow or broad, mostly 2–9 cm. long, glaucous and often glabrous beneath: sepals very broad: corolla 3.5–4.5 cm. long, scarlet or red without, yellow within, or sometimes yellow throughout; lobes mostly 4–5 mm. long, obtuse, the lower lobe often narrower than the upper lobes: filaments 4–4.5 mm. long: berry red or orange. [*Lonicera sempervirens* L.]—(TRUMPET-HONEYSUCKLE. CORAL-HONEYSUCKLE. WOODBINE.)—Thickets, woods, swamps, and fencerows, various provinces, Fla. to Tex., Nebr., and Me.

6. **XYLOSTEON** B. Juss. Erect shrubs. Leaf-blades entire. Flowers in pairs at the end of an axillary peduncle, accompanied by 2 minute bracts and 2 bractlets, the hypanthia more or less united. Sepals minute or obsolete. Corolla relatively short: tube gibbous at the base. Berry distinct or didymous. —About a dozen species, in the north temperate zone.—HONEYSUCKLE.

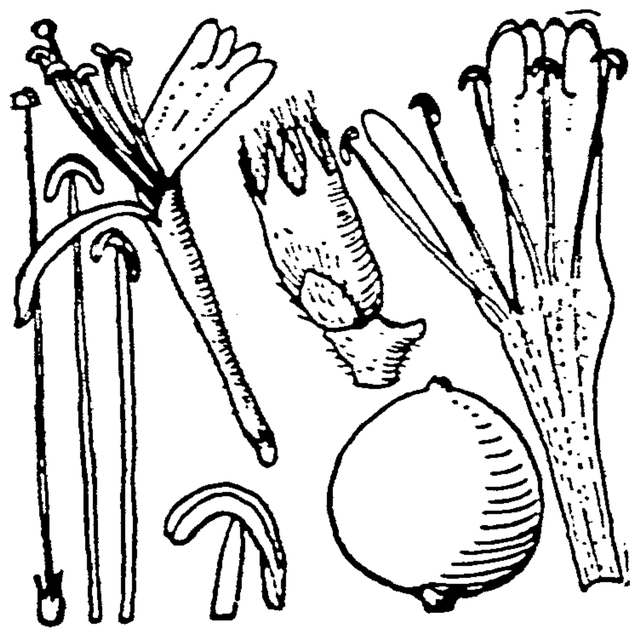
Corolla funnelform, the lobes shorter than the tube.	1. *X. ciliatum.*
Corolla 2-lipped, the lobes as long as the tube.	2. *X. fragrantissimum.*

1. X. ciliatum (Muhl.) Pursh. Shrub 0.5–2 m. tall: leaf-blades thin, ovate or oval-ovate, 3–8 cm. long, ciliate: corolla yellowish, about 1.5 cm. long; tube prominently gibbous at the base: stamens and style included or style exserted: berry ovoid or oval-ovoid, 6–10 mm. long, red.—(FLY-HONEYSUCKLE.)—Rocky woods, Blue Ridge and more northern provinces, N. C. to Minn. and N. S.—Spr.



2. X. fragrantissimum (Lindl. & Paxton) Small. Shrub 3 m. tall or less with glabrous or nearly glabrous twigs: leaf-blades ovate, oval, elliptic, or obovate, 1.5–4 cm. long, pale beneath: corolla white or nearly so, about 1 cm. long; tube slightly gibbous at the base: berry 6–8 mm. long.—Roadsides and about gardens, Augusta, in the Piedmont of Ga. Nat. of China.—Wint.–spr.

7. **NINTOOA** Sweet. Woody vines. Leaf-blades entire, or pinnatifid on young shoots. Flowers in pairs terminating axillary peduncles, accompanied by 2 foliaceous bracts and 2 small bractlets, the hypanthia distinct. Sepals slender or subulate. Corolla relatively long: tube not gibbous: limb 2-lipped. Berries distinct.—Four or 5 species, Asiatic.



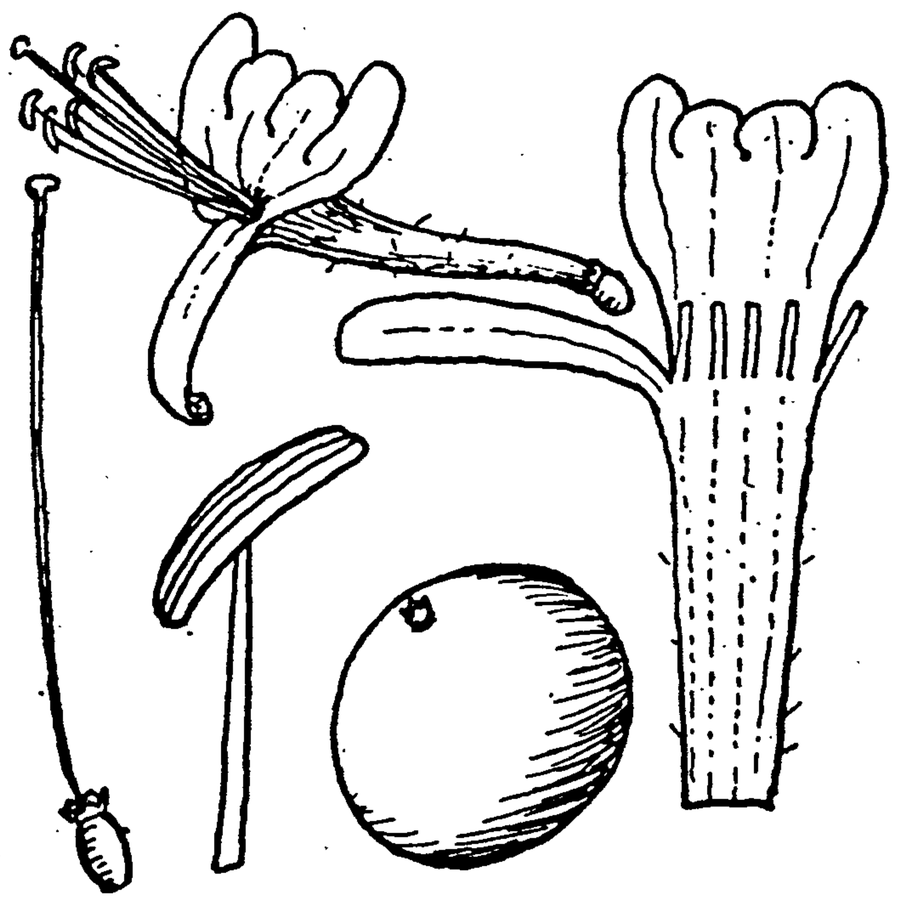
1. N. japonica (Thunb.) Sweet. Diffusely creeping or climbing vine: leaf-blades elliptic-ovate or orbicular-ovate, 2–5 cm. long: evergreen or nearly so: corolla white or pink, becoming yellow; tube about 2 cm. long: stamens and style exserted: berries subglobose or oval, 4–6 mm. long, black.—(JAPANESE-

HONEYSUCKLE.)—Woods, banks, sand-dunes, throughout the E U. S. Nat. of Asia. This species has a red-leaved, red-stemmed, and red-flowered form.

8. **LONICERA** L. Woody vines. Leaf-blades entire, or lobed on shoots. Flowers in sessile axillary clusters. Hypanthium short. Sepals minute. Corolla mostly 2-lipped: tube more or less gibbous at the base. Berries clustered. —About 80 species, mostly in the north temperate zone.—Spr.–sum.—HONEYSUCKLES. WOODBINES.

Corolla-tube glabrous within.	1. *L. Caprifolium.*
Corolla-tube pubescent within.	
Corolla-tube abruptly gibbous at the base.	
Corolla glabrous without.	2. *L. dioica.*
Corolla pubescent without.	3. *L. glaucescens.*
Corolla-tube scarcely gibbous at the base.	
Style pubescent: corolla pale-yellow: filaments pubescent at the base.	4. *L. Sullivantii.*
Style glabrous: corolla deep-yellow or orange: filaments glabrous.	
Corolla-tube about 15 mm. long, copiously pubescent within: filaments as long as the corolla-lips.	5. *L. flavida.*
Corolla-tube about 20 mm. long, glabrous or sparingly pubescent within: filaments shorter than the corolla-lips.	6. *L. flava.*

1. L. caprifolium L. A twining vine, the twigs often pubescent: leaf-blades elliptic, oval, or obovate, 2–7 cm. long: corolla purple without; tube 2.5–3 cm. long; limb white within, fading yellow: berry red.—Thickets and woods, various provinces, Ga. to La., Mich., and N. Y. Nat. of Eu.



2. L. dioica L. A diffuse or twining vine, the twigs glabrous: leaf-blades elliptic, ovate, oval, or obovate, 5–12 cm. long: corolla yellowish-green tinged with purple; tube 10–12 mm. long. [*L. glauca* Hill]—(MOUNTAIN-HONEYSUCKLE.)—Rocky banks and dry hillsides, Blue Ridge and more northern provinces, Ga. to Mo., Man., and Que.—In the typical plant the swelling of the corolla-tube is close to the base. A form occurs in the mountains of N. Carolina with the swelling higher up, thus leaving a stipe-like base to the corolla-tube.

3. L. glaucescens Rydb. A twining vine, the twigs sometimes sparingly pubescent: leaf-blades elliptic, 5–12 cm. long: hypanthium glaucous (or glandular and more or less pubescent in *L. glaucescens dasygyna*): corolla yellow, becoming reddish; tube 8–10 mm. long.—Thickets and ravines, Blue Ridge and more northern provinces, N. C. to Okla., Sask., and Ont.

4. L. Sullivantii A. Gray. A twining vine, the twigs glabrous: leaf-blades elliptic, oval, or obovate, 2.5–8 cm. long: corolla pale-yellow; tube stout, as long as the lips or slightly longer.—Rocky woods, various provinces N of Coastal Plain, Tenn. to Wisc. and Ont.

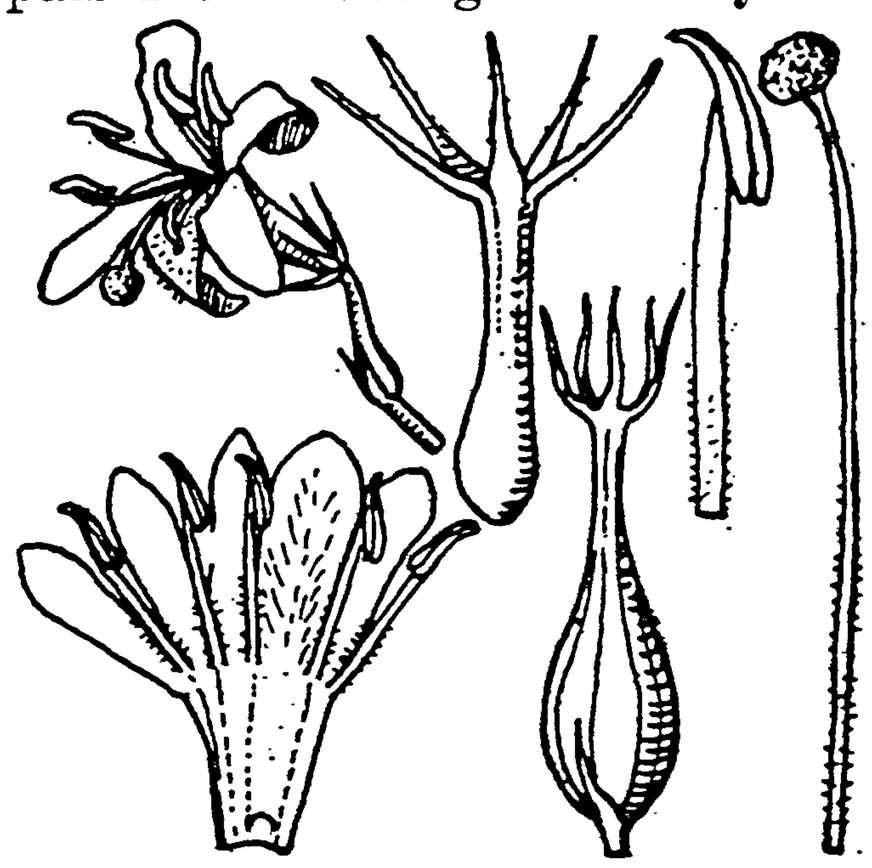
5. L. flavida Cockerell. A trailing or twining vine, the twigs green: leaf-blades oblanceolate to elliptic or rhombic-ovate, 8–12 cm. long: corolla light-yellow; tube stout, longer than the lips. [*L. flavescens* Small not Dippel]—Bluffs and shaded banks, Interior Low Plateaus, Tenn. and Ky.

6. **L. flava** Sims. A twining vine, the twigs green, glabrous: leaf-blades oval or ovate, or rarely obovate or elliptic, 3–9 cm. long: corolla orange-yellow; tube slender, much longer than the lips.—Rocky woods, various provinces N of Coastal Plain, Ga. to Ala., Tenn., and N. C.

9. **DIERVILLA** [Tourn.] Mill. Shrubs. Leaves with mostly toothed blades. Flowers in dichotomous cymes. Hypanthium elongate. Sepals 5, narrow. Corolla unequally 5-lobed. Capsule elongate. Three species, as follows:—Spr.–sum.

Leaf-blades petioled, ciliate. 1. *D. Diervilla.*
Leaf-blades sessile or nearly so, not ciliate.
  Leaf-blades glabrous beneath or essentially so: capsule 9–12 mm. long. 2. *D. sessilifolia.*
  Leaf-blades pubescent beneath: capsule 5–6 mm. long. 3. *D. rivularis.*

1. **D. Diervilla** (L.) MacM. Shrub 5–15 dm. tall, the twigs terete: leaf-blades oval to elliptic-ovate, 3–15 cm. long: sepals 4–5 mm. long: corolla yellow, turning red or reddish: capsule gradually long-beaked. [*D. trifida* Moench.]—(BUSH-HONEYSUCKLE.)—Rocky woods, various provinces, in Coastal Plain only northward, Ga. to Mich., Man., and Newf.



2. **D. sessilifolia** Buckl. Shrub 5–18 dm. tall, the twigs pubescent in lines: leaf-blades lanceolate to ovate-lanceolate or sometimes ovate, 5–15 cm. long: sepals 2–3 mm. long: corolla greenish-yellow: capsule abruptly short-beaked, the body ellipsoid.—Mt. woods, Blue Ridge to Appalachian Plateau, Ga., to Ala., Tenn., and N. C.

3. **D. rivularis** Gattinger. Shrub 5–20 dm. tall, the twigs densely pubescent: leaf-blades ovate to elliptic-lanceolate, 3–8 cm. long: sepals 1.5–2 mm. long: corolla yellow: capsule gradually long-beaked, the body ellipsoid-ovoid.—Damp mt. woods and rocky banks, Blue Ridge to Appalachian Plateau, Ga. to Ala., Tenn., and N. C.

ORDER **VALERIANALES** — VALERIANAL ORDER

Caulescent or rarely acaulescent, succulent, coarse or woody plants. Leaves opposite: blades entire, toothed, or divided. Flowers mainly perfect. Calyx of partly united sepals, pappus-like, or obsolete. Corolla of 2–5 partly united petals. Androecium of usually fewer stamens than there are petals. Gynoecium 1–3-carpellary. Ovary inferior, 2 of the carpels commonly abortive. Fruit an achene, or nut-like.

Gynoecium 3-carpellary, but with two of the cavities empty: flowers not in involucrate heads. Fam. 1. VALERIANACEAE.
Gynoecium 1-carpellary: flowers in dense involucrate heads. Fam. 2. MORINACEAE.

FAMILY 1. **VALERIANACEAE** — VALERIAN FAMILY

Annual or perennial, caulescent, succulent herbs. Leaves opposite: blades entire or pinnately divided. Flowers in variously disposed cymes. Calyx of 3–5 sepals, or sometimes pappus-like, or obsolete. Corolla of 3–5

partially united petals: tube often swollen or spurred. Androecium of 1–4 stamens: filaments adnate to the corolla-tube. Gynoecium 3-carpellary but only 1 carpel fructiferous. Ovary inferior. Fruit a kind of leathery or crustaceous nutlet.—About 9 genera and 300 species, widely distributed.

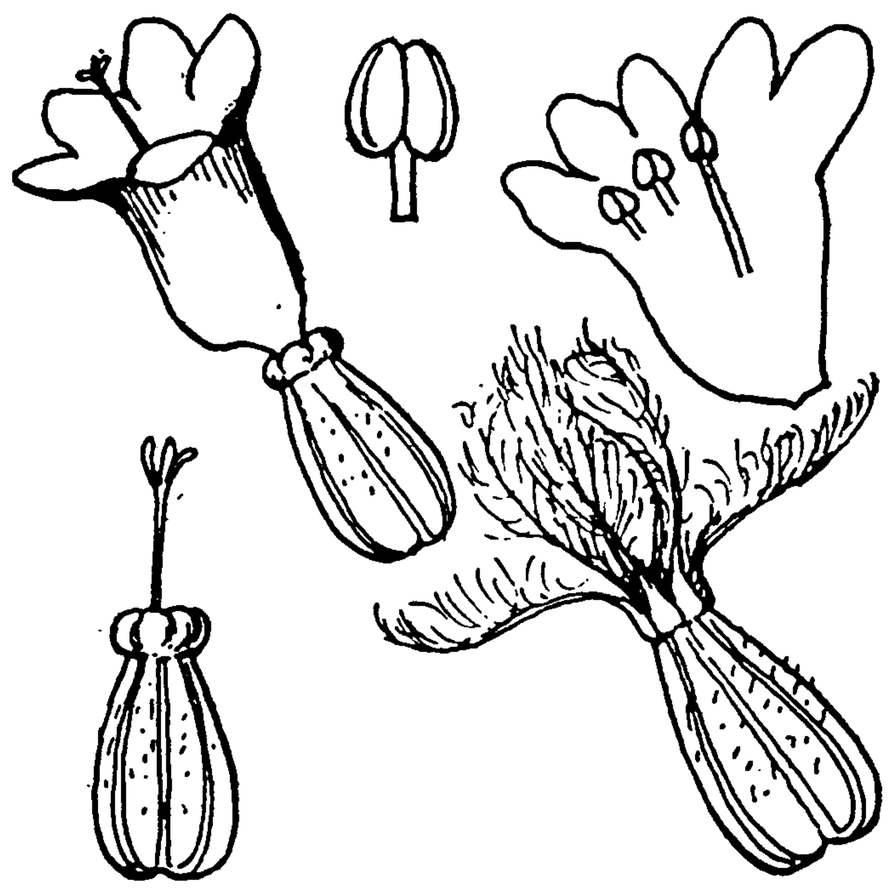
Sepals becoming bristle-like or awn-like: fruit 1-celled: tall herbs often with divided leaf-blades. 1. VALERIANA.
Sepals minute or wanting: fruit 3-celled: low herbs with undivided leaf-blades. 2. VALERIANELLA.

1. VALERIANA [Tourn.] L. Perennial heavy-scented herbs or vines. Leaf-blades entire, toothed, or pinnatifid. Flowers perfect, in compact cymes. Calyx with an inrolled limb which ultimately expands and develops 5–15 plumose bristles. Corolla funnelform or salverform. Stamens 3 or fewer. Fruit 1-celled, the 2 abortive carpels appearing as 4 ridges.—About 175 species, most abundant in the cooler parts of the north temperate zone and the mts. of South America.

Corolla 1.5–2 mm. long: fruit pubescent: upper stem-leaves ternate. 1. *V. scandens.*
Corolla 16–20 mm. long: fruit glabrous: upper stem-leaves pinnate. 2. *V. pauciflora.*

1. V. scandens L. Vine: blades of the basal leaves ovate, entire: bracts 1–2 mm. long: inflorescence open: corolla pinkish; lobes nearly ½ as long as the tube: fruit ovoid, 2.5–3 mm. long.—Thickets and hammocks, pen. Fla.—(*W. I., Mex., C. A., S. A.*)—All year.

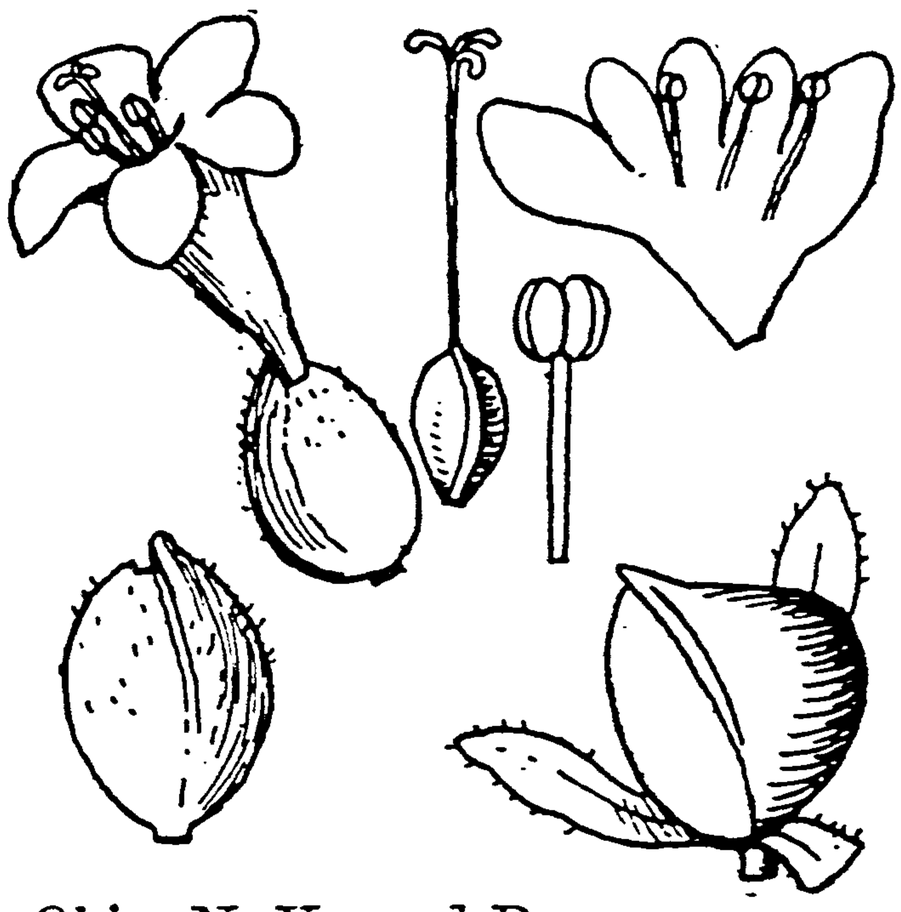
2. V. pauciflora Michx. Plants 1 m. tall or less: blades of the basal leaves ovate or triangular-ovate, mostly toothed: bracts 4–8 mm. long: inflorescence congested: corolla pale-pink; lobes less than ⅛ as long as the tube: fruit oblong, 5–6 mm. long.—Stream-banks and rich woods, various provinces N of Coastal Plain, Tenn. to Mo., Pa., and Va.—Late spr.—These two species of *Valeriana* are of very diverse habits, the one a rampant vine with inconspicuous flowers, the other an erect herb with flowers showy.



2. VALERIANELLA [Tourn.] Mill. Annual, vernal, succulent herbs, the stems dichotomous. Leaf-blades entire, toothed, lobed, or pinnatifid. Flowers perfect, in clustered or corymbose cymes. Calyx shallowly lobed or obsolete. Corolla funnelform, white, pink, or blue. Stamens 3. Fruit with the abortive carpels more or less elongate. About 50 species, natives of Northern Hemisphere.—Spr.–sum.—CORN-SALADS. LAMB'S-LETTUCES.

Corolla blue or purplish: fruit about twice as broad as thick. 1. *V. Locusta.*
Corolla white: fruit about as broad as thick: species native.
  Fruit with the fertile portion fully as wide as the sterile portion: fruit ovoid-tetragonal, with a broad and shallow groove between the sterile portions. 2. *V. radiata.*
  Fruit with the fertile portion much smaller and narrower than the sterile portion.
    Empty cavities broad, bladder-like by the infolding of the edges and forming a cross-shaped umbilication. 3. *V. umbilicata.*
    Empty cavities never infolded so as to make a bladder-like body.
      Empty cavities dilated and divergent, forming a saucer-shaped body notched at both ends. 4. *V. patellaria.*
      Empty cavities contiguous, with an elliptic depression between them. 5. *V. Woodsiana.*

1. **V. Locusta** (L.) Bettke. Stem 1–4 dm. tall: blades of the stem-leaves elliptic-lanceolate: corolla 2 mm. long: fruit about twice as long as thick. [*V. olitoria* Poll.]—Stream-banks, thickets, meadows, and waste-grounds, various provinces, Ala. to La., Idaho, Ont., Me., and N. C. Nat. of Eu.



2. **V. radiata** (L.) Dufr. Stem 2–7 dm. tall: blades of the upper stem-leaves oblanceolate to elliptic or ovate: fruits obovoid-tetragonal.—Stream-banks, moist hillsides, and meadows, various provinces, Fla. to Tex., Minn., and N. Y.

3. **V. umbilicata** (Sulliv.) Krok. Stem 1–3 dm. tall: blades of the upper stem-leaves lanceolate; empty portion of the fruit with a cross-shaped umbilication.—Low grounds, various provinces N of Coastal Plain, Tenn. to Ohio, N. Y., and Pa.

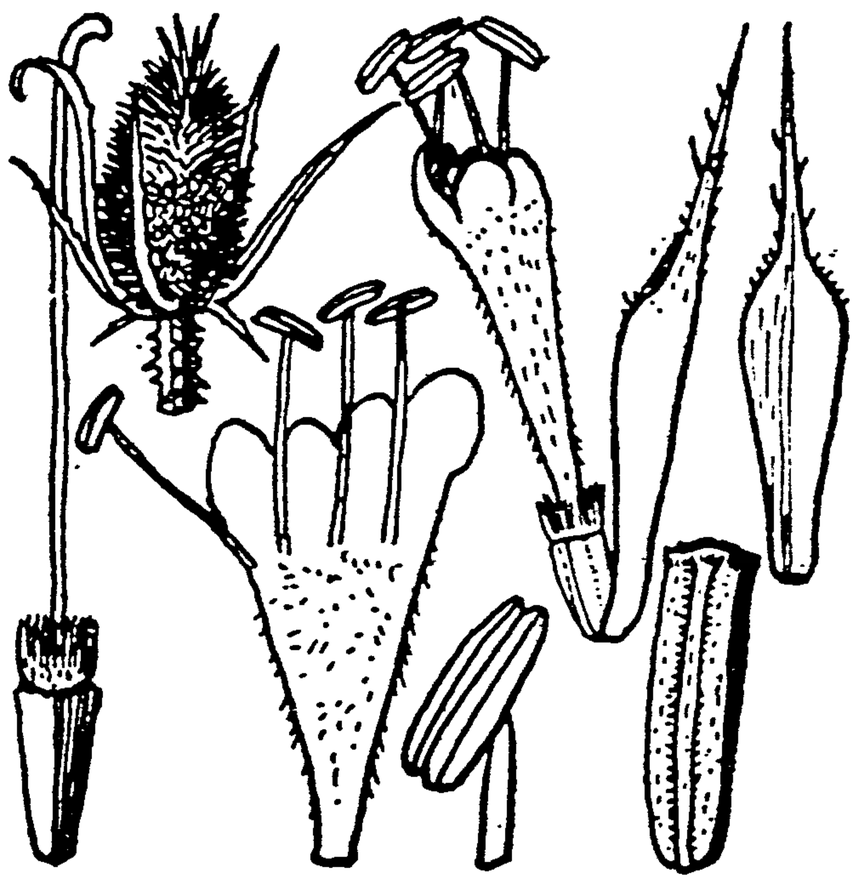
4. **V. patellaria** (Sulliv.) Krok. Stem 1–4 dm. tall: blades of the upper stem-leaves similar to those of *V. radiata:* empty carpels of the fruits with a saucer-shaped body notched at each end.—Fields, meadows, and low grounds, various provinces N of Coastal Plain, Tenn. to Ohio and Pa.

5. **V. Woodsiana** (T. & G.) Walp. In habit and leaves resembling *V. radiata*: fruits about 2 mm. long, with the fertile portions much smaller and narrower than the sterile, the cavities of this latter contiguous, with an elliptic depression between them.—Moist banks and low grounds, various provinces, Tenn. to N. Y. and Pa.

Family 2. **MORINACEAE** — Teasel Family

Annual or perennial, often prickly herbs, or woody plants. Leaves opposite: blades entire, toothed, or dissected. Flowers perfect, each subtended by an involucel, commonly crowded on a receptacle and involucrate. Calyx a cup-like border or of several bristles. Corolla of 2–5 partially united petals, sometimes 2-lipped. Androecium of 2–4 stamens: filaments adnate to the corolla-tube. Gynoecium 1-carpellary. Ovary inferior. Fruit an achene crowned with a calyx.—About 7 genera and 150 species, natives of the Old World.

1. **DIPSACUS** [Tourn.] L. Coarse prickly herbs. Leaf-blades often connate-perfoliate. Flower-heads globular or elongate. Involucral bracts rigid. Calyx cup-like, sometimes 4-lobed. Corolla tubular-funnelform. Ovary enclosed in the involucel. Achenes 8-ribbed.—About 15 species, natives of the Old World.



1. **D. sylvestris** Huds. Biennial, 1–2.5 m. tall: blades of the stem-leaves lanceolate, entire: heads ovoid, 5–6 cm. long, the involucral bracts rough: calyx fully 1 mm. long: corolla 11–13 mm. long; lobes 4, lilac, broadly ovate: stamens exserted: achenes 5 mm. long.—(Teasel.)—Fields and waste-places, various provinces, Fla. to Tex., Ont., and Me. Nat. of Eu.—Sum.

ORDER **ARISTOLOCHIALES** — ARISTOLOCHIAL ORDER

Herbs, shrubs, or vines. Leaves alternate: blades mostly cordate or hastate. Flowers perfect, often conspicuous. Hypanthium mostly adnate to the ovary. Calyx regular or very irregular. Corolla wanting or rudimentary. Androecium of as many stamens as there are calyx lobes or more. Gynoecium of usually 6 united carpels. Fruit a capsule.

FAMILY 1. **ASARACEAE** — BIRTHWORT FAMILY

Perennial herbs, shrubs, or vines. Leaves alternate: blades sometimes lobed, generally cordate. Flowers perfect, regular or very irregular. Calyx usually colored, the tube often bent or inflated. Androecium of 6–many stamens. Gynoecium of 4–6 united carpels. Ovary mostly inferior. Fruit capsular.—About 6 genera and 200 species, widely distributed.

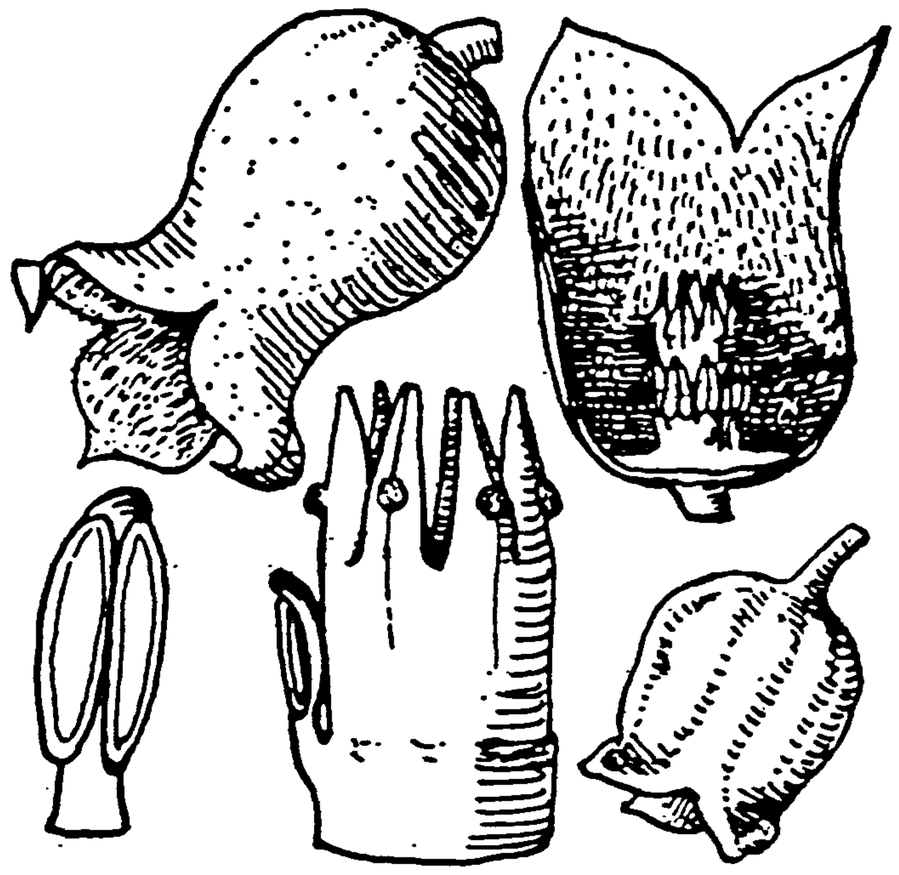
Acaulescent herbs: calyx regular, persistent: capsule fleshy.
  Ovary superior: filaments shorter than the anthers: styles distinct: leaves persistent. 1. HEXASTYLIS.
  Ovary inferior: filaments longer than the anthers: styles united: leaves deciduous. 2. ASARUM.
Caulescent herbs or vines: calyx irregular, deciduous: capsule dry. 3. ARISTOLOCHIA.

1. **HEXASTYLIS** Raf. Acaulescent gingerous herbs. Leaves 1 every year: blades lustrous above. Flower-stalk subtended by a bract. Hypanthium terete, glabrous without. Sepals green or purplish without, dark-purple, and sometimes blotched within, persistent. Capsule enveloped in the calyx and hypanthium. Seeds flattened.—Eight species, as follows.—Spr. or spr.–sum.—The leaves are evergreen with coriaceous blades.—HEART-LEAFS.

Leaf-blades of a broadly ovate type, varying to suborbicular or reniform, not hastate.
  Hypanthium and calyx of an urceolate type in anthesis.
    Hypanthium and calyx 3–4 cm. long, the lobes over 1 cm. wide. 1. *H. Shuttleworthii.*
    Hypanthium and calyx 1–2 cm. long, the lobes less than 1 cm. wide.
      Calyx-limb over 1.5 cm. wide in anthesis; lobes nearly or quite half as long as the tube. 2. *H. virginica.*
      Calyx-limb less than 1.5 cm. wide in anthesis; lobes very short. 3. *H. Memmingeri.*
  Hypanthium and calyx of a turbinate or turbinate-campanulate type in anthesis. 4. *H. heterophylla.*
Leaf-blades of a hastate type.
  Calyx without any decided limb, the lobes erect or somewhat spreading.
    Hypanthium and calyx ovoid-urceolate, the small lobes erect, the tube not constricted. 5. *H. Ruthii.*
    Hypanthium and calyx campanulate-urceolate, the large lobes spreading, the tube constricted.
      Leaf-blades predominantly of an ovate type. 6. *H. callifolia.*
      Leaf-blades predominantly of a triangular-hastate type. 7. *H. arifolia.*
  Calyx with a salver-campanulate limb surmounting the tube. 8. *H. speciosa.*

1. **H. Shuttleworthii** (J. Britten) Small. Leaf-blades orbicular, varying to ovate or somewhat rhombic, 5–8 cm. long, the sinus narrow: hypanthium and

calyx long-urceolate, 3–5 cm. long; lobes broad, ascending or spreading, and more or less incurved at the tip: anther-sacs 3 mm. long, exceeded by the broad blunt connective-tip: styles 5–5.5 mm. long: seed 3 mm. long.—Rich or somewhat acid woods, inner Piedmont to Appalachian Valley, Ala. to Tenn., and S Va.



2. H. virginica (L.) Small. Leaf-blades broadly ovate, varying to orbicular-ovate or deltoid-ovate, 4–9 cm. long, the sinus often narrow: hypanthium and calyx short-urceolate, 1–2 cm. long; lobes broad, somewhat spreading: anther-sacs 2–2.5 mm. long, scarcely exceeded by the minute connective-tip: styles about 4 mm. long: seed about 3 mm. long. [*Asarum virginicum* L.] Woods, often in acid soil, various provinces, especially Coastal Plain, S. C. to Tenn., W. Va., and Va.

3. H. Memmingeri (Ashe) Small. Leaf-blades suborbicular to orbicular-ovate or orbicular-reniform, 4–7 cm. long, the sinus often narrow or closed: hypanthium and calyx short-urceolate, 1–1.5 cm. long; lobes broad, erect or slightly spreading: anther-sacs 2.5 mm. long, not exceeded by the connective-tip: styles 2.5 mm. long: seed about 2 mm. long.—Acid woods, inner Piedmont to Appalachian Plateau, Ga. to W. Va. and S Va.

4. H. heterophylla (Ashe) Small. Leaf-blades orbicular-reniform to orbicular-ovate or triangular-ovate, 4–10 cm. long: hypanthium and calyx turbinate or turbinate-campanulate, 2–2.5 cm. long; lobes very broad, somewhat spreading: anther-sacs about 2.5 mm. long, slightly exceeded by the minute connective-tip: styles 2–2.5 mm. long: seed about 2.5 mm. long.—Woods, Piedmont, to Appalachian Plateau, Ga. to Ala., W. Va., and S Va.

5. H. Ruthii (Ashe) Small. Leaf-blades hastate, varying from individually ovate to broadly triangular in outline, 3–15 cm. long: hypanthium and calyx narrowly urceolate, with 3 short ovate, erect or converging lobes surmounting the narrow neck: anther-sacs 2–2.5 mm. long, much exceeded by the narrow connective-tips: seed fully 3 mm. long.—Rich woods, Blue Ridge to Appalachian Plateau, Ala. to Tenn. and S Va.

6. H. callifolia Small. Leaf-blades ovate, 5–9 cm. long: hypanthium and calyx broadly urceolate, with reniform, more or less spreading lobes surmounting a broad neck: anther-sacs about 4 mm. long, much exceeded by the broad connective-tip—Woods, N Fla.

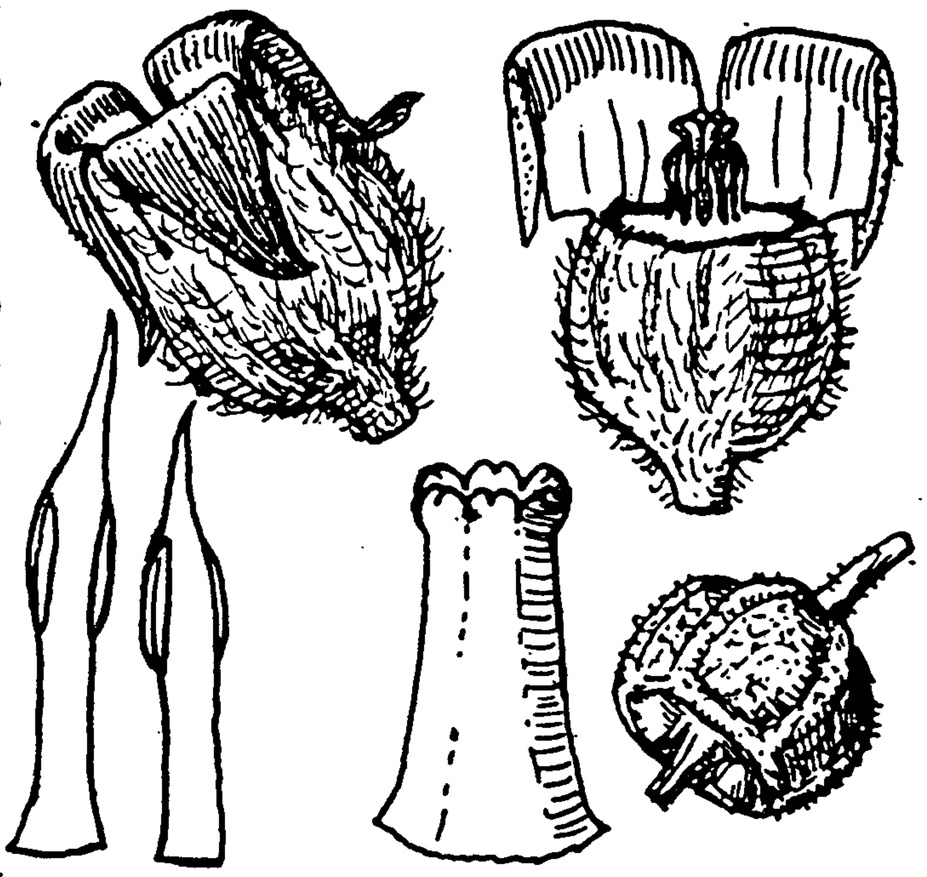
7. H. arifolia (Michx.) Small. Leaf-blades hastate, varying from individually ovate to deltoid or reniform in outline, 5–1.2 cm. long: hypanthium and calyx urceolate, with 3 broad spreading lobes surmounting the constricted neck: anther-sacs 2.5 mm. long, slightly exceeded by the minute connective-tips: seeds about 3 mm. long. [*Asarum arifolium* Michx.]—Rich or sterile woods, various provinces, Fla. to Ala., Tenn., and S Va.

8. H. speciosa Harper. Leaf-blades ovate-hastate, 6–12 cm. long: hypanthium and calyx campanulate-salverform, calyx conspicuous, the hemispheric base surmounted by a cap-like limb with 3 broad spreading parallel-lined lobes: anther sacs 3 mm. long, the connective broadly rounded at the apex which slightly exceeds the sacs: styles 2–2.5 mm. long.—Rich woods, Autauga Co., in the Coastal Plain of Ala.

2. ASARUM [Tourn.] L. Acaulescent gingerous herbs. Leaves in pairs: blades not lustrous. Flower-stalks arising between the petioles. Hypanthium angled, pubescent. Sepals brown within, deciduous. Capsule inferior. Seeds turgid.—About 20 species, natives of the north temperate zone.—Spr.—The leaves are not evergreen, with thick-membranous blades.—WILD-GINGERS.

Sepals triangular, merely acute, about as long as the hypanthium or shorter. 1. *A. reflexum.*
Sepals lanceolate-acuminate, longer than the hypanthium.
  Sepals slightly longer than the hypanthium, the tubular portion 4–8 mm. long: species mainly Alleghenian. 2. *A. canadense.*
  Sepals much longer than the hypanthium, the tubular portion 10–20 mm. long: species campestrian. 3. *A. acuminatum.*

1. A. reflexum Bicknell. Leaf-blades reniform, 6–14 cm. wide, the sinus open: flowers smaller than those of the preceding species: sepals 8–10 mm. long, early reflexed, obtuse at the tip—Rocky hillsides and rich woods, various provinces N of Coastal Plain, N. C. to Kans., Ia., and Conn.



2. A. canadense L. Leaf-blades reniform, 6–15 cm. wide, the sinus closed: hypanthium thinly pubescent: sepals abruptly acuminate, the tubular portions curving upward.—Rich woods and rocky hillsides, various provinces, N. C. to Ark., (La.?), Ont., and N. B.

3. A. acuminatum (Ashe) Bicknell. Similar to *A. canadense,* but more pubescent: hypanthium densely pubescent: sepals gradually acuminate, the tubular tips recurved-spreading.—Woods, Blue Ridge and more northern provinces, Tenn to Minn.

A. rubrocinctum Peattie is said to differ from *A. canadense* and *A. acuminatum* by its larger flowers and less pubescent leaf-blades, and also from the former by its longer sepals. It occurs in the mountains of N. C.

3. ARISTOLOCHIA [Tourn.] L. Caulescent herbs, shrubs, or vines. Leaves with narrow or broad blades. Flowers irregular, often S-shaped or resembling a "dutch pipe," the calyx usually corolloid. Hypanthium often ribbed. Ovary inferior. Styles united into an angled column. Capsule pendulous.—About 200 species, in tropical and temperate regions.—BIRTHWORTS.

Erect herbs: flowers borne at the base of the stem: calyx-tube swollen at each end. I. HASTATAE.
Twining vines: flowers borne along the branches.
  Herbaceous vines: calyx-tube swollen at the base: calyx-limb expanded on one side: stamens 5. II. PENTANDRAE.
  Woody vines: calyx-tube swollen in the middle: calyx-limb expanded on all sides: stamens 6. III. MACROPHYLLAE.

I. HASTATAE

Plant sparingly and indistinctly pubescent with soft hairs: capsule sparingly pubescent.
  Leaf-blades hastate, delicate: capsule 5–6 mm. long or rarely longer. 1. *A. hastata.*
  Leaf-blades not hastate, membranous: capsule about 1 cm. long. 2. *A. Serpentaria.*
Plant manifestly pubescent with stiff spreading hairs: capsule copiously pubescent. 3. *A. convolvulacea.*

II. PENTANDRAE

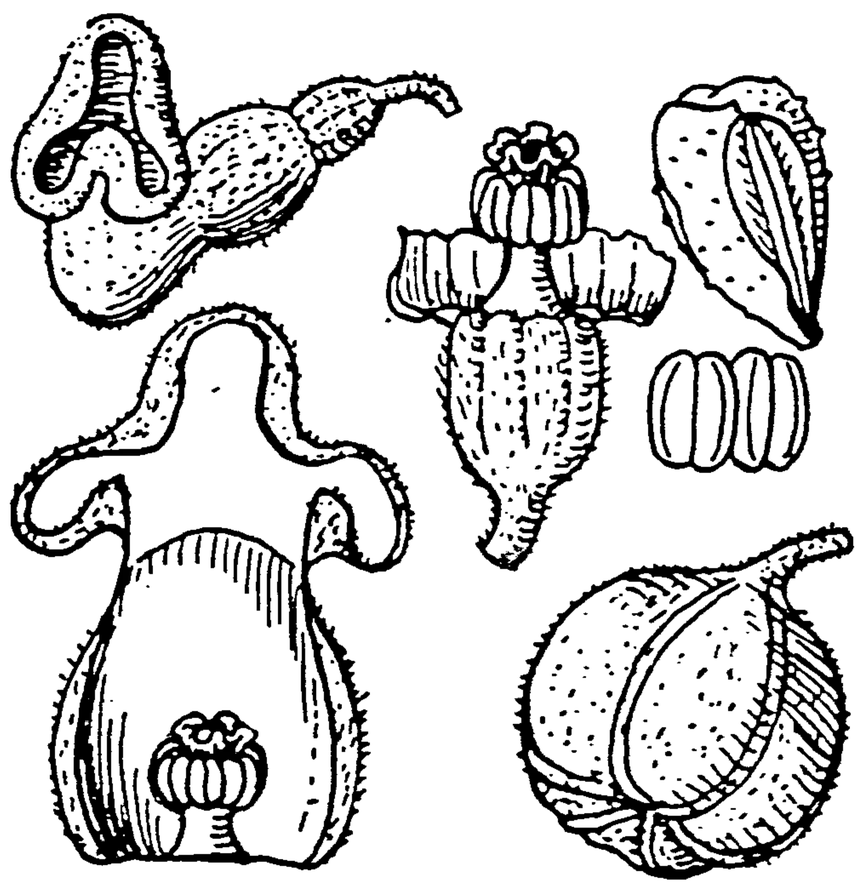
Diffusely twining vine with fleshy leaf-blades and globular drooping capsules. 4. *A. pentandra.*

III. MACROPHYLLAE

Young foliage densely tomentose: leaf-blades coriaceous: hypanthium tomentose. 5. *A. tomentosa.*

Young foliage minutely pubescent or glabrous: leaf-blades membranous: hypanthium glabrous. 6. *A. macrophylla.*

1. **A. hastata** Nutt. Plant light-green, 1–3 dm. tall: leaf-blades very thin, linear to lanceolate, hastate, 2–12 cm. long: flowers about 1.5 cm. long: hypanthium densely hirsutulous: calyx purple or greenish-purple: capsule 5–11 mm. in diameter: seed 3.5–4 mm. long, with minute scattered papillae on the face. [*A. Nashii* Kearney] — (SNAKEROOT.) — Damp woods, various provinces, Fla. to La. and S Va.—Sum.



2. **A. Serpentaria** L. Plant dark-green, 1–4 dm. tall: leaf-blades elliptic-lanceolate to oval-lanceolate, or rarely lanceolate, 4–15 cm. long; flowers 1–1.5 cm. long: hypanthium villous-hirsutulous: calyx purple; limb obtusely 3-lobed: capsule about 10 mm. in diameter: seed about 4 mm. long, with many approximate papillae on its face.—(VIRGINIA-SNAKEROOT.)—Rich woods, various provinces, Fla. to Tex., Mo., Mich., and Conn.—Spr.–fall.

3. **A. convolvulacea** Small. Plant bristly-pubescent, 1–3 dm. tall: leaf-blades broadly ovate to oval, 2–8 cm. long: flowers about 1.5 cm. long: hypanthium densely hirsute: calyx purplish; limb 3-lobed: capsule 6–8 mm. in diameter. —Woods, Piedmont to Appalachian Plateau, Ga.—Spr.–sum.

4. **A. pentandra** Jacq. Stem reclining and twining: leaf-blades ovate, 4–10 cm. long: hypanthium minutely pubescent: calyx nearly straight, greenish or purplish, the limb narrow, nearly erect: capsule globular, 15–20 mm. long, wing-angled: seed black, 5–6 mm. long.—Coastal hammocks, S Pen. Fla. and the Keys.—(*W. I.*)—All year.

5. **A. tomentosa** Sims. Stem woody, high-climbing, the branches downy; leaf-blades ovate to suborbicular, 10–18 cm. long, rounded at the apex: peduncle wanting: calyx abruptly bent above the ovary, the limb 2–2.5 cm. wide, yellowish or greenish-yellow, except the purple orifice, rugose: capsule 4–6 cm. long. (PIPEVINE.)—Woods, various provinces, Fla. to Okla., Mo., Ill., and N. C.—Spr.

6. **A. macrophylla** Lam. Stem greatly elongate, climbing, the branches glabrous or nearly so: leaf-blades suborbicular to broadly ovate, 5–25 cm. long, abruptly acute or obtuse: peduncles 1–2 cm. long: calyx abruptly bent above the ovary, the limb 2–3 cm. wide, brown or yellowish, veiny: capsule 5–6 cm. long. [*A. Sipho* L'Her.]—(DUTCHMAN'S PIPE.)—Woods, various provinces N of Coastal Plain, Ga. to Kans., Minn., and Pa.—Spr.–sum.

Aristolochia maxima L. of tropical America and cultivated, with large variegated flowers and capsules 1–1.5 dm. long, has escaped from cultivation into hammocks in S Fla.

Order **CAMPANULALES** — Campanulal Order

Herbs, or rarely shrubs or trees. Leaves mainly alternate: blades simple, entire, or divided. Flowers perfect, monoecious or dioecious, sometimes irregular. Hypanthium well-developed. Calyx of several distinct or partly united sepals. Corolla of several distinct or partly united petals. Androecium of 1–5 stamens. Anthers distinct or connate. Gynoecium of 1–several united carpels, the ovary wholly or partially inferior. Fruit capsular, baccate, or drupaceous.

Flowers variously disposed, but not in heads.
  Flowers monoecious or dioecious: plant usually tendril-bearing vines: endosperm wanting. — Fam. 1. Campanutaceae.
  Flowers perfect or mainly so: herbs or shrubs: endosperm present.
    Corolla regular. — Fam. 2. Campanulaceae.
    Corolla irregular, split on one side:
      Anthers united around the style: stigma naked: herbs. — Fam. 3. Lobeliaceae.
      Anthers separate: stigma surrounded by a cup-like indusium: succulent shrubs. — Fam. 4. Brunnoniaceae.
Flowers capitate, on a flat or elongate receptacle. — Fam. 5. Calyceraceae.

Family 1. **CUCURBITACEAE** — Gourd Family

Vines, usually tendril-bearing. Leaves alternate: blades palmately or pedately veined, and commonly lobed. Flowers monoecious or dioecious. Calyx of 4 or 5, or rarely 6, distinct or partly united sepals. Corolla of 4 or 5, or rarely 6, distinct or partly united petals, sometimes adherent to the calyx. Androecium of 3 stamens (2 anthers 2-celled and 1 anther 1-celled), or rarely of 1, 2, 4, or 5 stamens. Filaments sometimes united. Anthers straight or bent. Gynoecium 1–several-carpellary. Styles united. Fruit a fleshy or partly dry berry (pepo).—About 90 genera and 700 species, mostly tropical.

Stamens distinct or with the filaments partly united.
  Anther-sacs straight or merely curved. — Tribe I. Melothrieae.
  Anther-sacs S-shaped or V-shaped. — Tribe II. Cucurbiteae.
Stamens united into a column. — Tribe III. Sicyoideae.

I. Melothrieae

Slender trailing or climbing, mostly monoecious vines. — 1. Melothria.

II. Cucurbiteae

Ovules horizontal, numerous.
  Corolla rotate.
    Anthers distinct.
      Calyx with 2 or 3 scales at the bottom within. — 2. Momordica.
      Calyx without basal scales within.
        Staminate flowers racemose: fruit dry. — 3. Luffa.
        Staminate flowers solitary or in clusters: fruit fleshy.
          Anther-sacs not surpassed by the connective: tendrils branched. — 4. Citrullus.
          Anther-sacs surpassed by the connective: tendrils simple. — 5. Cucumis.
    Anthers capitate. — 6. Cucurbita.
  Corolla campanulate. — 7. Pepo.
Ovules erect or ascending: 1–4 in each cavity. — 8. Cayaponia.

III. Sicyoideae

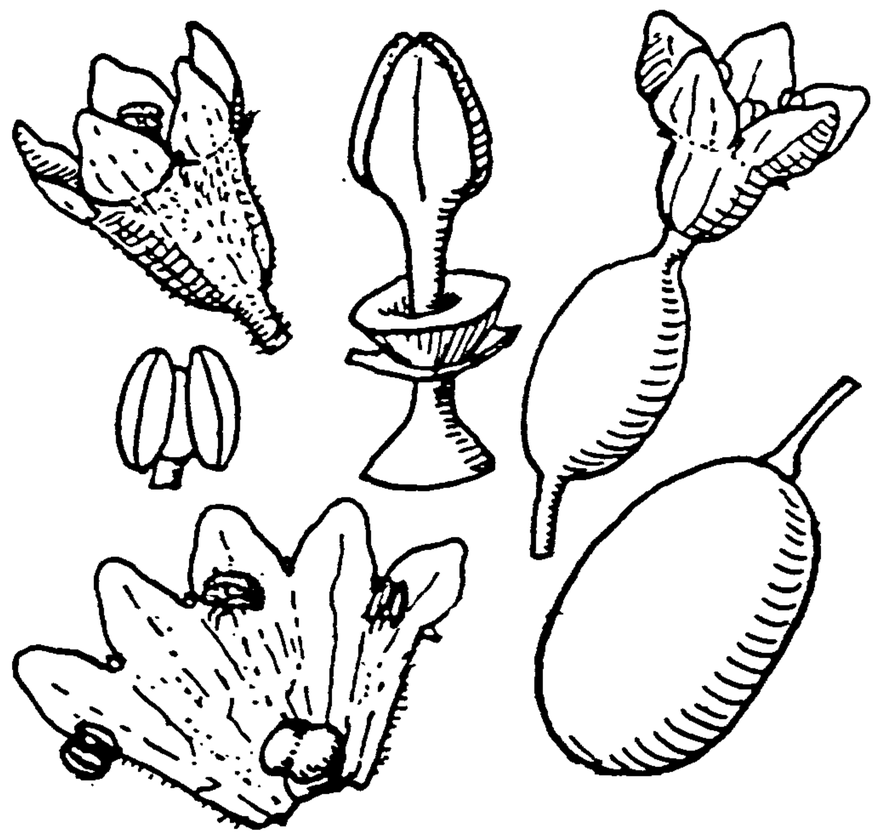
Corolla campanulate: fruit smooth. — 9. Coccinea.
Corolla rotate: fruit bristly or echinate.
  Pistillate flowers mostly solitary: ovary 2- or 3-celled, with few ovules: fruit bladdery, few-seeded, opening at the apex. — 10. Micrampelis.
  Pistillate flowers clustered: ovary 1-celled, with one ovule: fruit succulent, indehiscent. — 11. Sicyos.

1. **MELOTHRIA** L. Slender perennial vines. Leaves with toothed or lobed blades. Flowers mainly monoecious. Hypanthium of the pistillate flowers relatively short. Corolla yellow, that of the pistillate flowers relatively short, about 8 mm. broad (in our species), that of the staminate flower smaller. Berry juicy, the rind tender. Seed flat.—About 70 species, natives of warm and tropical regions.—CREEPING-CUCUMBERS. MELONETTES.

Berry ellipsoid or oval.
- Stem climbing: leaf-blades longer than wide, the lobes angular: berry dark-purple or blackish. 1. *M. pendula.*
- Stem trailing or creeping: leaf-blades wider than long, the lobes low and rounded: berry green and somewhat variegated. 2. *M. crassifolia.*

Berry globose or subglobose.
- Berry over 10 mm. in diameter: leaf-blades deeply lobed. 3. *M. Nashii.*
- Berry less than 10 mm. in diameter: leaf-blades shallowly lobed. 4. *M. microcarpa.*

1. M. pendula L. Leaves glabrous or nearly so (or with hispidulous petioles and deeply lobed blades in *M. pendula aspera*); blades suborbicular to ovate in outline, 3–8 cm. wide, with 3–5 angular shallow-toothed lobes; petioles hispid: hypanthium glabrous or pubescent: berry ellipsoid or oval, 10–25 mm. long.—Swamps and thickets, various provinces, Fla. to Tex., Mo., and S Pa.—(*Mex.*)—Spr.–fall.



2. M. crassifolia Small. Leaf-blades suborbicular, reniform, or ovate in outline, 3–8 cm. wide, with 3–5 angular shallow-toothed lobes: hypanthium glabrous or pubescent: berry ellipsoid or oval, 10–25 mm. long.—Hammocks, pen. Fla. and the Keys.—All year.

3. M. Nashii Small. Leaf-blades fleshy, suborbicular to triangular-ovate in outline, 2–3.5 cm. long, 5-lobed, the lobes entire or with 1 or 2 teeth or small lobes; petioles hispid: berry globose, 12–15 mm. in diameter.—Pinelands, pen. Fla.—Spr.–fall.

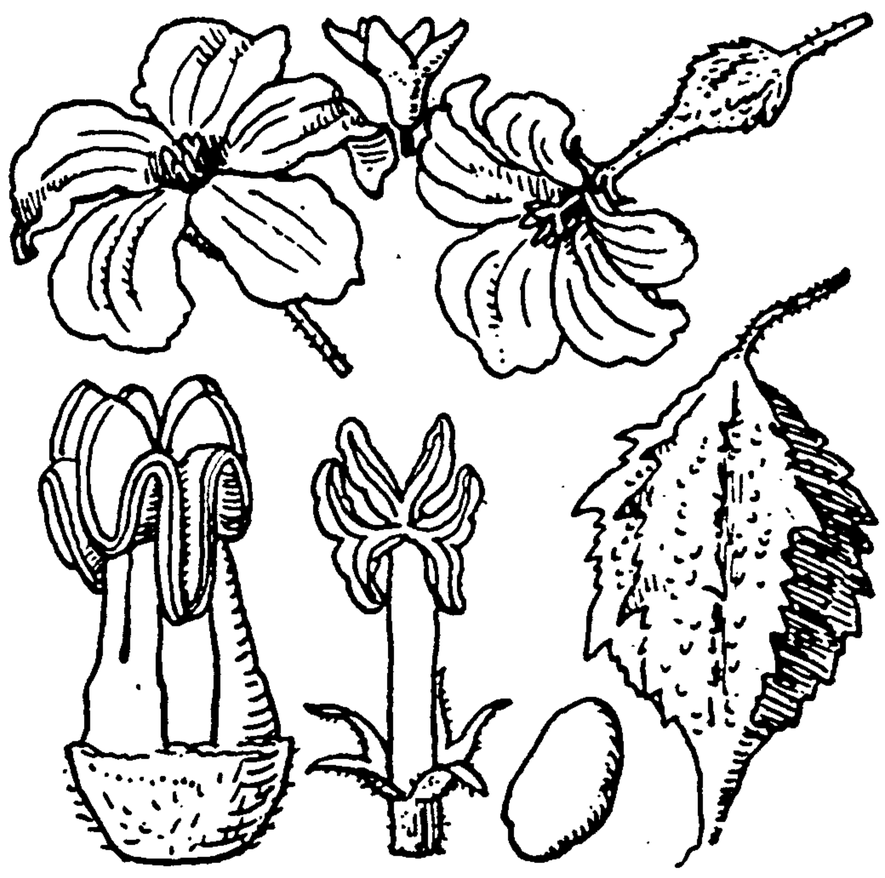
4. M. microcarpa Shuttlw. Leaf-blades thinnish, commonly as long as wide, 1–3 cm. long, 3–5-lobed, the lobes irregularly toothed: petioles hispidulous: berry globose, 7–9 mm. in diameter.—Thickets, Appalachian Plateau, Ala.—Spr.–sum.

2. **MOMORDICA** L. Annual or perennial vines. Leaves with entire, lobed, or pedately dissected blades. Flowers monoecious or dioecious. Staminodia of the pistillate flowers gland-like, or wanting. Stalk of the staminate flowers bracted. Style slender. Stigmas 3. Berry warty.—About 25 species, native of the Old World Tropics.—The plants flower most of the year.

Leaf-blades with obtuse or acutish teeth: bract entire, at the middle or base of the staminate peduncle. 1. *M. Charantia.*
Leaf-blades with acuminate teeth: bract toothed, at the apex of the staminate peduncle. 2. *M. Balsamina.*

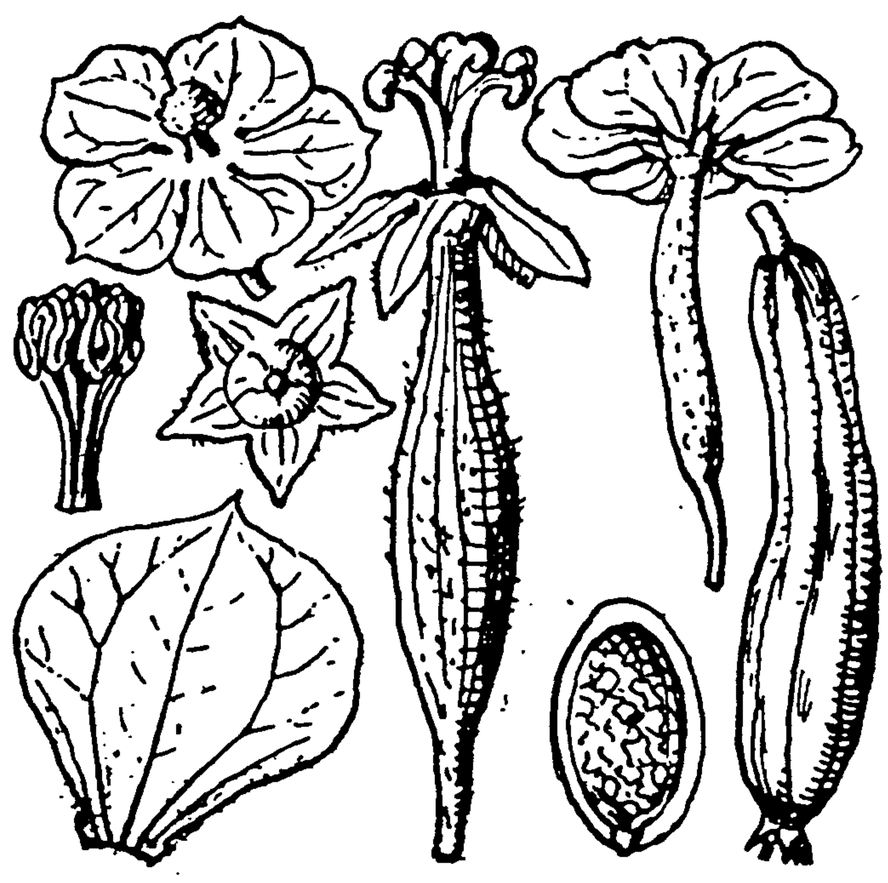
1. M. Charantia L. Stem creeping or climbing, often greatly elongate: leaf-blades 4–12 cm. wide, 5–7-lobed, the lobes with acutish or obtuse teeth, villous

or glabrate: sepals oval or oval-ovate, 3–4.5 mm. long: corolla yellow about 2 cm. wide: berry 4–12 cm. long, golden-yellow: seed elliptic, 9–12 mm. long or rarely larger.—(WILD BALSAM-APPLE.)—Hammocks, thickets, and waste-places, outer Coastal Plain, Fla. to Tex.—(*W. I., Mex., C. A., S. A.*)



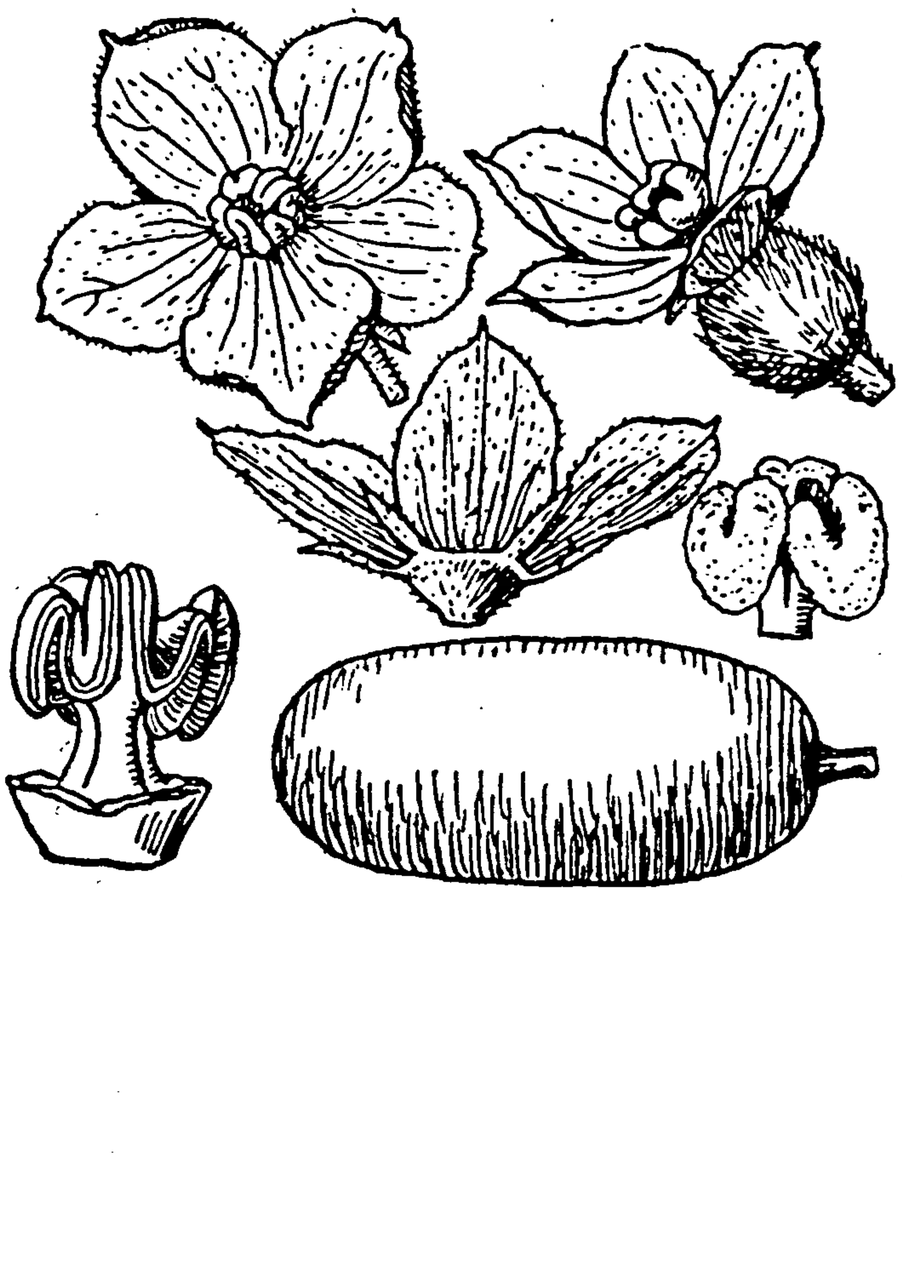
2. M. Balsamina L. Stem mostly climbing, much-branched: leaf-blades 3–8 cm. wide, 3–5-lobed, the lobes with acuminate teeth; petioles usually puberulent: sepals elliptic, about 6 mm. long: corolla golden-yellow and dark or black at the center, about 2.5 cm. wide: berry 3–6 cm. long, orange: seed ovoid or oval, 10–12 mm. long—(BALSAM-APPLE.)—Sandy soil, Coastal Plain, La. and Tex.—(*W. I., Mex., C. A., S. A.*)

3. LUFFA L. Annual vines. Leaves with 5–7-lobed blades. Flowers monoecious. Corolla yellow, pink, or whitish. Staminodia of the pistillate flowers 3. Style columnar. Stigmas 3, each 2-lobed. Berry elongate, ribbed.—About 7 species, all but 1 in the Old World tropics.



1. L. cylindrica (L.) Roem. Stem and branches ribbed: leaf-blades suborbicular in outline, mostly 1–3 dm. broad and 5–7-lobed, the lobes coarsely toothed: sepals lanceolate to triangular-lanceolate, those of the pistillate flowers about twice as long as those of the staminate: corolla yellow, that of the pistillate flower 10–12 cm. wide, that of the staminate flower smaller: berry cylindric or clavate, 2.5–6.5 dm. long.—(VEGETABLE-SPONGE. DISHCLOTH-GOURD.)—Roadsides, waste-places, and thickets, pen. Fla. Nat. of Old World tropics.—(*W. I., Mex., C. A., S. A.*)—All year.

4. CITRULLUS Schrad. Annual or perennial vines. Leaves with lobed blades. Flowers monoecious. Staminodia of the pistillate flowers prominent. Style short. Stigmas reniform. Berry smooth.—About 4 species, Asiatic and African.

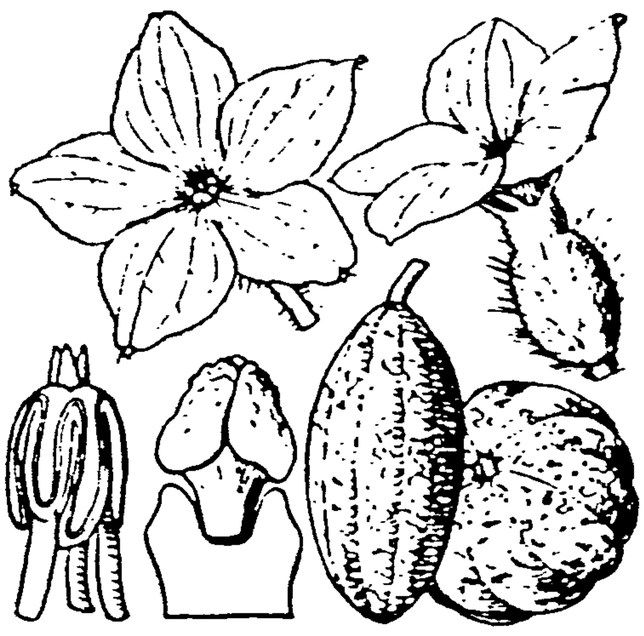


1. C. Citrullus (L.) Small. Stem trailing, with spreading hairs: leaf-blades ovate in outline, 3–7-lobed: sepals linear or nearly so: corolla pale-yellow; lobes ovate or elliptic: berry globose to ellipsoid-cylindric, 1–6 dm. long, smooth, edible: seed flat.—(WATERMELON.) — Waste-places, woods, pinelands, and roadsides, various provinces, Fla. to Tex. and N. C. Nat. of tropical Africa.—Spr.–fall.—The watermelon plant is too sensitive to cold to become a permanent member of our flora.

5. CUCUMIS L. Annual or perennial vines. Leaves with toothed or prominently lobed blades. Flowers monoecious. Corolla rotate. Staminodia of the pistillate flowers obsolete or wanting. Style short. Stigmas obtuse. Berry rugose or echinate.—About 25 species, mostly Asiatic and African.

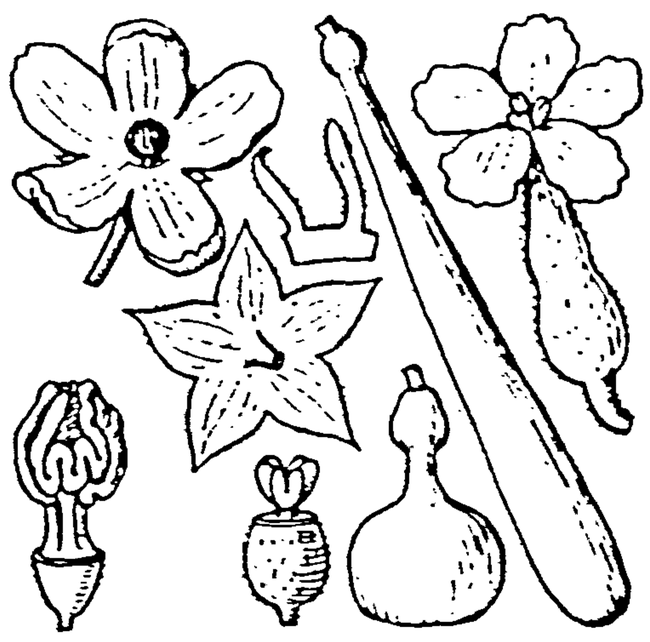
Corolla 3–5 cm. broad: fruit not prickly. 1. *C. Melo.*
Corolla 1–1.5 cm. broad: fruit prickly. 2. *C. Anguria.*

1. C. Melo L. Stem stout: leaf-blades reniform to suborbicular, 1.5 dm. long or less, merely toothed or shallowly lobed: corolla 3–5 cm. wide, yellow: fruit elongate or depressed, rugose.— (MELON. CANTALOUPE. MUSKMELON.)—Pinelands, cult. grounds, and waste-places, Coastal Plain, Fla. to Tex. Nat. of Asia and cult.—(*W. I., Mex., C. A., S. A.*)



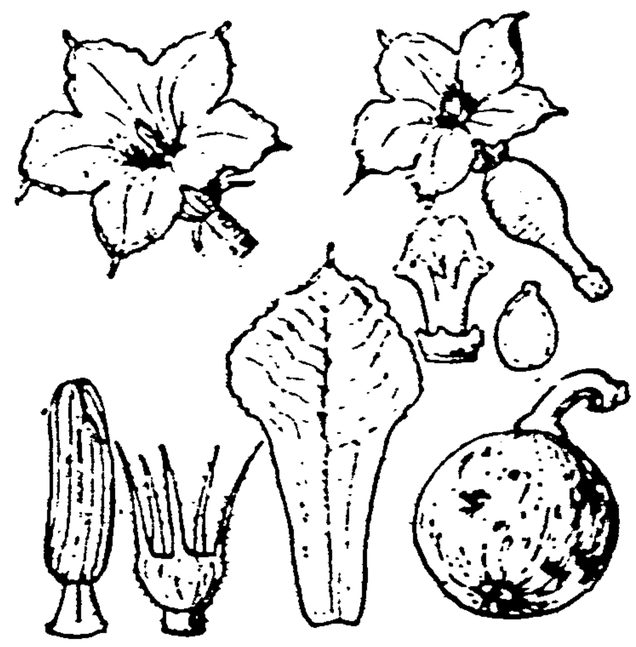
2. C. Anguria L. Stem slender: leaf-blades mostly 5–8 cm. long, deeply 3–5-lobed: corolla 1–1.5 cm. wide, yellow: fruit oval to ellipsoid.—(BUR-GHERKIN. WEST-INDIAN GHERKIN. GOOSE-BERRY GOURD.)—Thickets and waste-places, Coastal Plain, Fla. to Tex., and Ga.—(*W. I., Mex., C. A., S. A.*)—These two species of *Cucumis,* although not permanently naturalized in our range, continue to appear.

6. CUCURBITA [Tourn.] L. Annual vines. Leaves with lobed blades. Flowers monoecious or rarely dioecious. Corolla rotate. Staminodia wanting. Stigmas erect, 2-lobed. Berry variable in shape, the rind smooth, woody.—One species.



1. C. Lagenaria L. Plant musk-scented, clammy-pubescent: leaf-blades ovate to triangular or orbicular-ovate, 1–3 dm. long, sinuate or denticulate: corolla white with greenish veins, 5–7 cm. wide; lobes broadened upward, erose-crenate: berry usually somewhat clavate. [*Lagenaria Lagenaria* Cockerell.]—(BOTTLE-GOURD. GOURD. CALABASH.)—Thickets and waste-places, Coastal Plain, Fla. to Tex. Nat. of Old World tropics and cult.—(*W. I., Mex., C. A., S. A.*)

7. PEPO [Tourn.] Mill. Annual or perennial vines. Leaves with toothed or lobed blades. Flowers monoecious. Corolla campanulate, typically large. Pistillate flowers with staminodia. Ovary 1-celled. Stigmas 2-lobed. Berry fleshy, with a tough rind.—About 10 species, American, African, and Asiatic.—PUMPKINS. GOURDS.



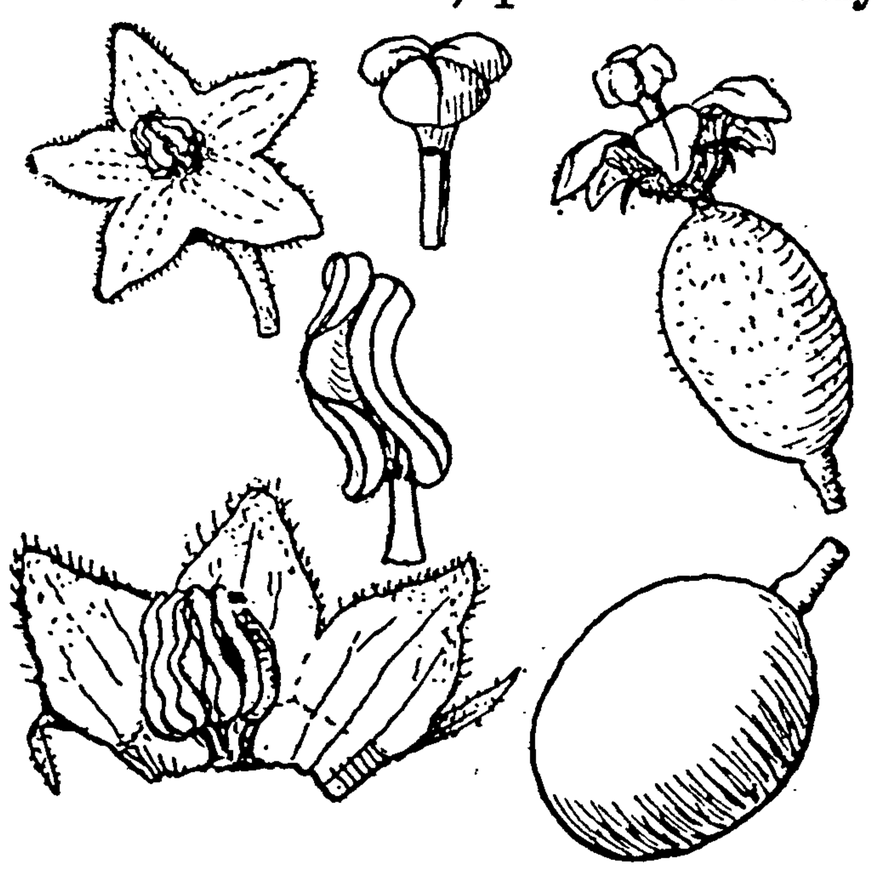
1. Pepo okeechobeensis Small. Annual with clammy pubescent foliage and unequally forked tendrils: leaf-blades suborbicular or orbicular-reniform in outline, 1–2 dm. wide, deeply cordate, shallowly 5–7-lobed, the lobes irregularly dentate: flowers pedicelled: hypanthium pubescent: sepals subulate or subulate-lanceolate: corolla cream-colored, campanulate, finely pubescent, the lobes erose-crenulate: berry (pepo) globular, 7–9 cm. in diameter, bright-green and usually flecked and somewhat streaked with whitish or dark-green spots: seeds obovate, 8–12 mm. long, thick-margined.—

(OKEECHOBEE-GOURD).—Hammocks, about Lake Okeechobee, Fla.—Spr.–sum.—Cultivated relatives, sometimes met with in the field are: the field-pumpkin (*Pepo Pepo* (L.) Britton.), with harshly pubescent foliage, bright-yellow or orange corollas and usually larger orange-colored fruits, nativity undetermined; the so-called crookneck squash, (*Pepo moschata* (Duchesne) Britton), with fruits of many shapes, known in Florida as the Seminole-pumpkin, may be found growing wild about Indian settlements and abandoned camp sites.

8. **CAYAPONIA** Manso. Vines. Leaves with toothed or lobed blades. Flowers monoecious or dioecious. Corolla rotate or broadly campanulate, relatively small. Pistillate flowers with staminodia. Ovary 3-celled, smooth. Stigmas dilated. Berry juicy, with a tender rind.—About 60 species, American.

Leaf-blade not decurrent on the petiole: anther free.
  Berry oval, less than 1.5 cm. long: leaf-blades usually less than 1 cm. wide. 1. *C. Boykinii.*
  Berry ellipsoid, over 1.5 cm. long: leaf-blades usually over 10 cm. wide. 2. *C. grandifolia.*
Leaf-blade decurrent on the petiole: anthers coherent. 3. *C. racemosa.*

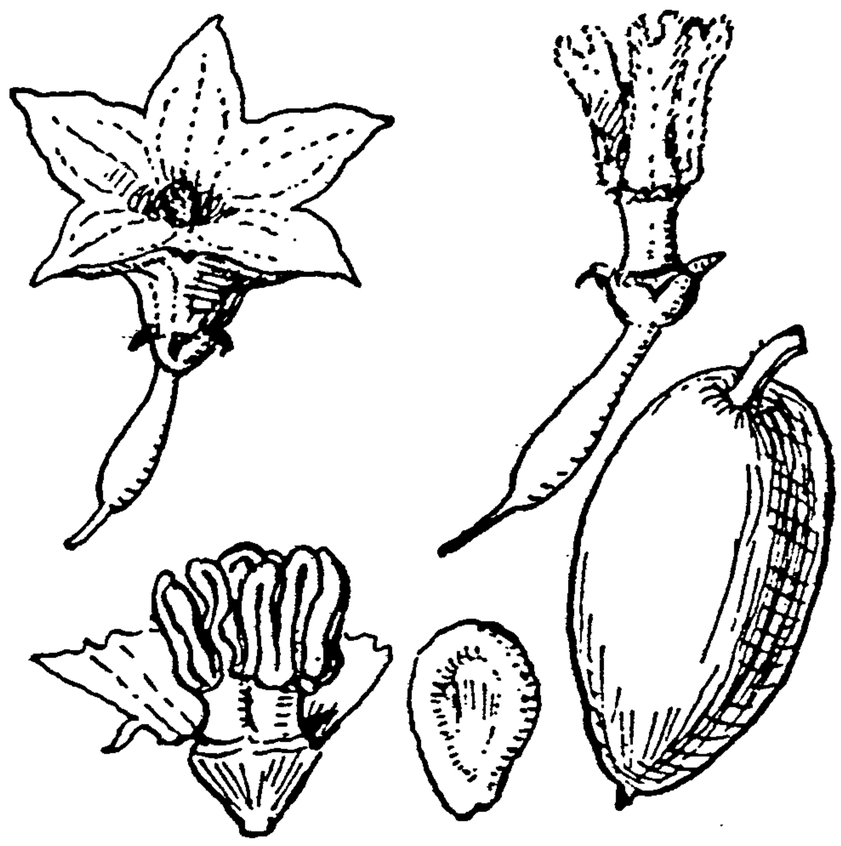
1. C. Boykinii (T. & G.) Cogn. Stem finely pubescent: leaf-blades thickish, 5–10 cm. long, 3-angled or 3-lobed, sparingly pubescent beneath; petioles bristly villous: corolla greenish-white, the staminate 5–6 mm. wide: berry 12–14 mm. long: seed 6–7 mm. long. [*Trianosperma Boykinii* Roem.]—Along streams, Coastal Plain, Ga. to La.—Sum.



2. C. grandifolia (T. & G.) Small. Stem sparingly pubescent: leaf-blades thin, 12–18 cm. long, 3-lobed; petioles softly villous: corolla greenish-white, the staminate 7–9 mm. wide: berry 16–20 mm. long.—Bottomlands, Coastal Plain, Miss to La. and Ark. —Sum.

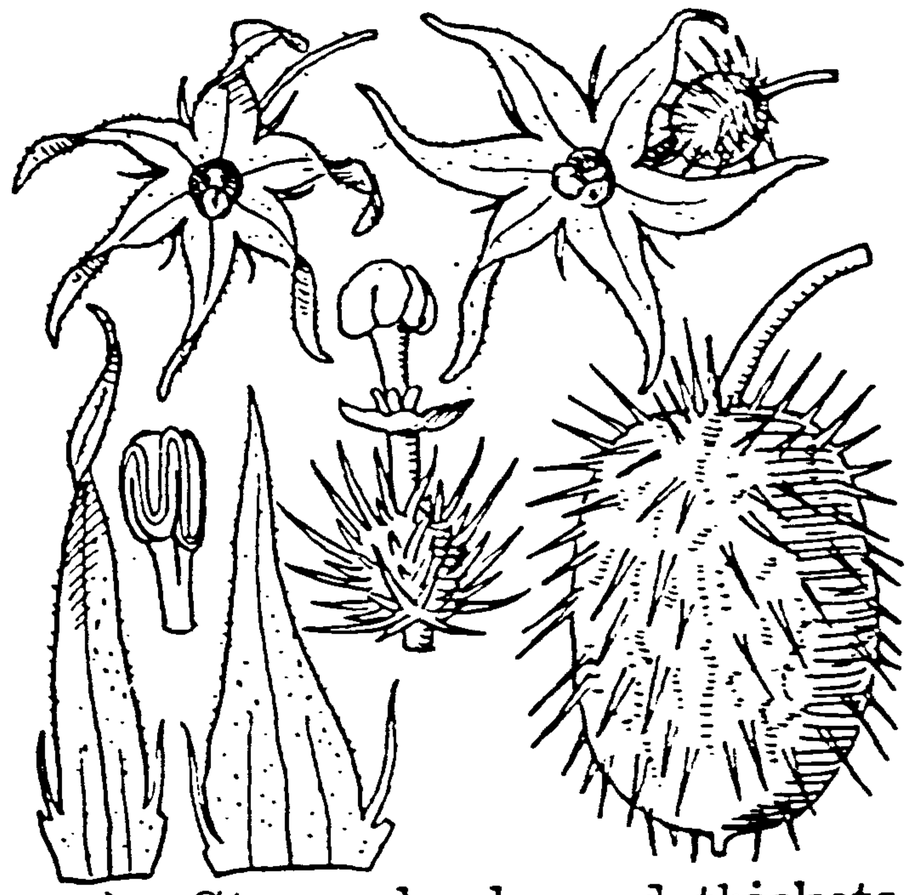
3. C. racemosa (Sw.) Cogn. Stem glabrous or nearly so: leaf-blades thick, 6–13 cm. long, 3-lobed, closely hispidulous beneath; petioles glabrous or nearly so: staminate corolla 8–10 mm. wide, greenish: berry ellipsoid to oval, 15–20 mm. long: seed 9–10 mm. long.—Hammocks, Everglade Keys, Fla.—(*W. I.*)—Spr.–sum.

9. **COCCINEA** W. & A. Perennial dioecious vines. Leaves with angulate or shallowly lobed blades. Corolla campanulate, relatively large. Pistillate flowers solitary, with 3 staminodia. Ovary smooth and glabrous. Berry smooth. Seeds numerous.—About a dozen species, natives of the Old World tropics.



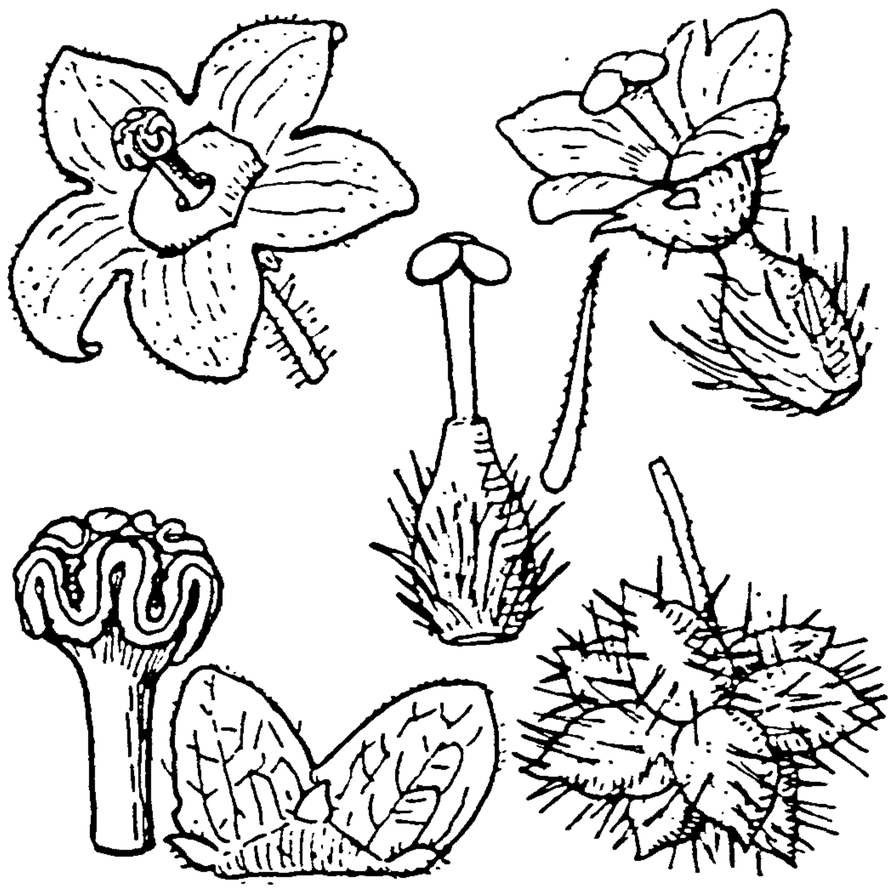
1. C. cordifolia (L.) Cogn. Stem glabrous, climbing: leaf-blades ovate to orbicular in outline, 4–10 cm. long, 3–5-lobed, cordate, slender-petioled: sepals subulate or linear-subulate, 3–4 mm. long, reflexed: corolla white, 3–4 cm. wide: berry ellipsoid or obovoid, 4–5 cm. long, scarlet.—Hammocks, pen. Fla. Nat. of Asia.—(*W. I., Mex., C. A., S. A.*)—All year.

10. MICRAMPELIS Raf. Annual or perennial vines. Leaves with angulate or lobed blades. Flowers monoecious. Corolla rotate, relatively small. Pistillate flowers usually solitary, with staminodia. Ovary echinate. Stigmas lobed. Berry echinate, fibrous within, the rind tough. Seeds not filling the cavities.—About 25 species, American.



1. M. lobata (Michx.) Greene. Stem and branches tender: leaf-blades 4–15 cm. long, palmately 3–5-lobed, the lobes triangular-ovate to lanceolate: sepals 2–4 mm. long: corolla rotate, 7–9 mm. wide, white or cream-color; lobes lanceolate: berry inflated, ellipsoid to globose-ellipsoid, 3–4.5 mm. long, bursting at the apex. [*Echinocystis lobata* T. & G.]—(WILD BALSAM-APPLE. MOCK-APPLE.)—Stream-banks and thickets, various provinces, Ga. to Tex., Colo., Sask., and N. B.—Sum.

11. SICYOS L. Annual monoecious vines. Leaves with angulate or lobed blades. Corolla rotate, relatively small. Pistillate flowers clustered, without staminodia. Ovary and berry bristly. Seeds filling the cavity.—About 35 species, American and Australian.



1. S. angulata L. Stem and branches viscid-pubescent: leaf-blades 6–15 cm. wide, 5-angled or 5-lobed, the lobes distinctly toothed: hypanthium flattish: sepals of the staminate flowers triangular, 3–5 mm. long: corolla rotate, white, striped with green, 10–12 mm. wide: berries clustered, ovoid, 1.5–2 cm. long.—(NIMBLE-KATE. STAR-CUCUMBER.)—Thickets, stream-banks, and cult. grounds, various provinces, Fla. to Tex., Minn., and Que.—Sum.–fall.

FAMILY 2. CAMPANULACEAE — BELL-FLOWER FAMILY

Herbs or woody plants. Leaves alternate: blades entire, toothed, or lobed. Flowers perfect, regular, sometimes dimorphous. Calyx of 5 sepals, or fewer in cleistogamous flowers. Corolla of 5 partly united petals. Androecium of 5 distinct stamens. Gynoecium 2–5-carpellary, the ovary more or less inferior. Fruit capsular.—About 40 genera and more than 1,000 species, widely distributed.

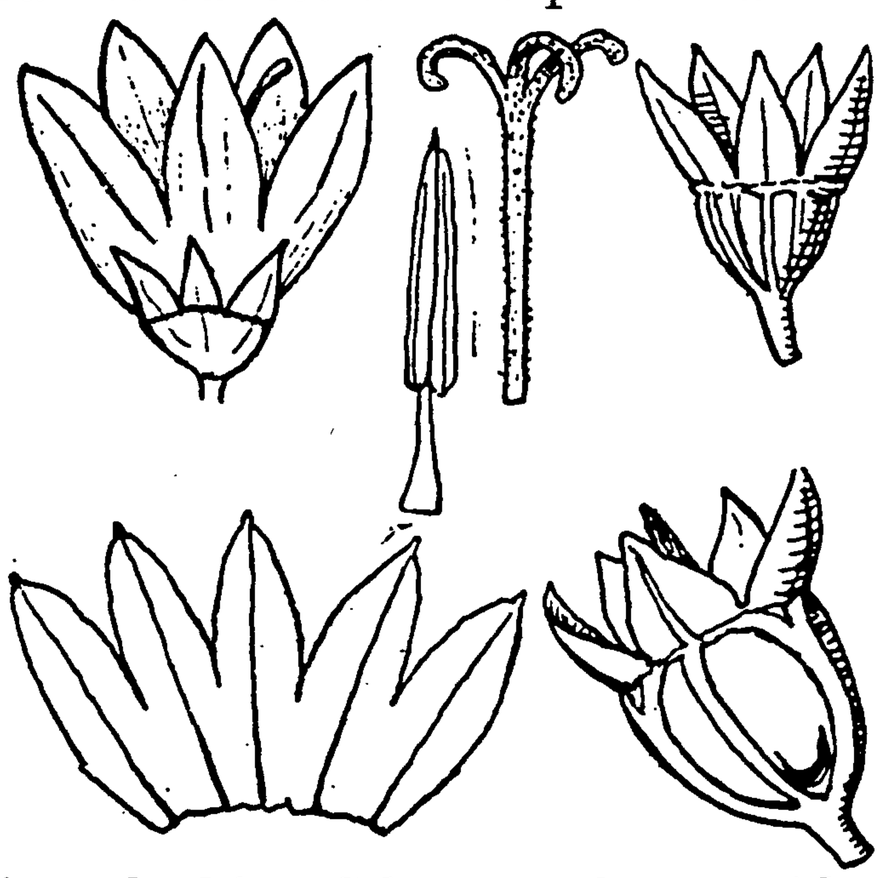
Style with pollen-collecting hairs: filaments free or nearly so: corolla usually valvate or induplicate in the bud.
- Corolla campanulate or funnelform: inflorescence racemose or paniculate. — 1. CAMPANULA.
- Corolla rotate.
  - Flowers axillary. — 2. ROTANTHA.
  - Flowers in spikes.
    - Style declined: flowers complete throughout. — 3. CAMPANULASTRUM.
    - Style straight: flowers various, the earlier ones cleistogamous. — 4. SPECULARIA.

Style without collecting hairs: filaments adnate to the corolla: corolla imbricate in the bud. — 5. SPHENOCLEA.

1. CAMPANULA [Tourn.] L. Perennial or sometimes annual herbs. Leaf-blades entire, toothed, or lobed. Flowers perfect, all alike and complete. Hypanthium relatively short in age. Corolla campanulate to funnelform. Stamens included. Capsule opening by lateral or basal perforations or valves. —About 250 species, natives of the Northern Hemisphere.—BELLFLOWERS.

Style shorter than the corolla or sometimes about equalling it: leaf-blades entire or slightly toothed. 1. *C. aparinoides.*
Style exceeding the corolla: leaf-blades laciniately toothed. 2. *C. flexuosa.*

1. C. aparinoides Pursh. Stem 2–6 dm. long, prickly throughout: leaf-blades 1–3.5 cm. long, those of the upper leaves linear to lanceolate: sepals ovate to triangular-ovate, 1.5–2 mm. long: corolla white, pale blue, or pink, 5–8 mm. long: capsule globose-obovoid: seed about 0.5 mm. long, smooth. — (MARSH - BELLFLOWER.) — Acid swamps, meadows and spring-runs, various provinces, Ga. to Ky., Colo., and Me.—Sum.



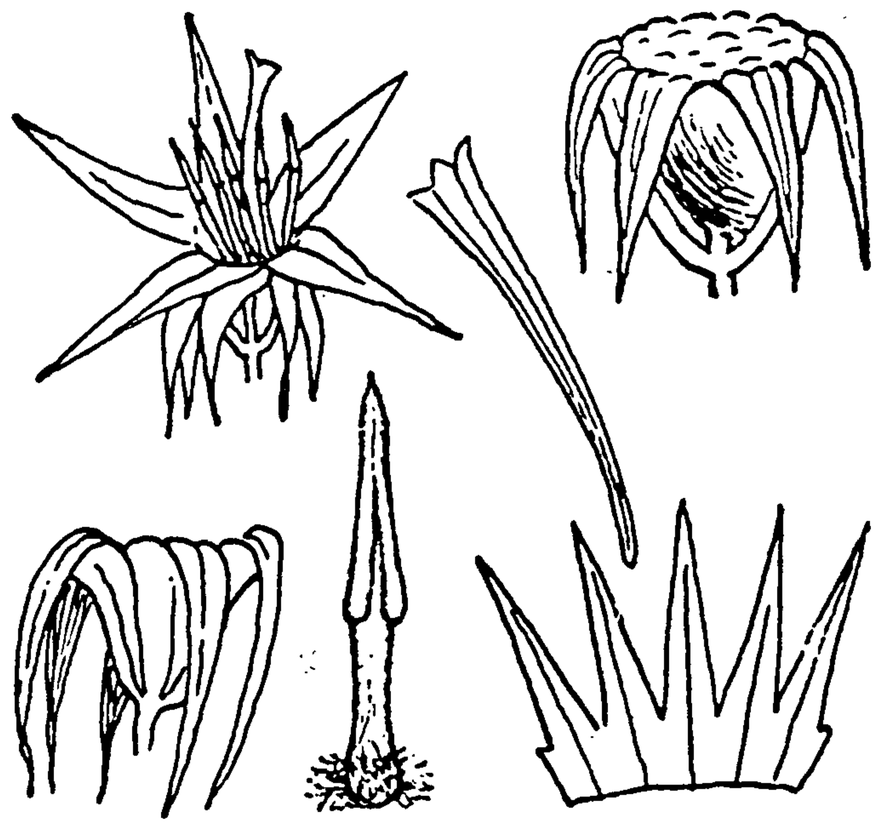
2. C. flexuosa Michx. Stem 2–10 dm. tall, smooth: leaf-blades 2–12 cm. long, lanceolate to ovate-lanceolate or elliptic: sepals subulate, 4–6 mm. long: corolla violet-blue or white, 6–8 mm. long: capsule turbinate-campanulate: seed fully 1 mm. long, wrinkled. [*C. divaricata* Michx.] — Cliffs and woods often in acid soil, Blue Ridge to Appalachian Plateau, Ga. to Ala., Ky., W. Va., and W Md.—Sum.–fall.

Campanula persicifolia L., a native of Europe, up to 1 m. tall, with spatulate to linear leaf-blades and large blue or white corollas 2–2.5 cm. wide, has escaped from gardens, W N. C.

2. ROTANTHA Small. Annual or perennial, smooth, diffuse herbs. Leaf-blades entire, or obscurely or shallowly toothed. Flowers perfect, all alike and complete. Hypanthium short. Corolla rotate. Stamens exserted. Capsule opening by perforations.—Two species, natives of Florida.

Corolla 14–18 mm. wide: sepals nearly or quite as long as the corolla-lobes: capsule obovoid. 1. *R. floridana.*
Corolla 7–8 mm. wide: sepals less than half as long as the corolla-lobes: capsule subglobose. 2. *R. Robinsiae.*

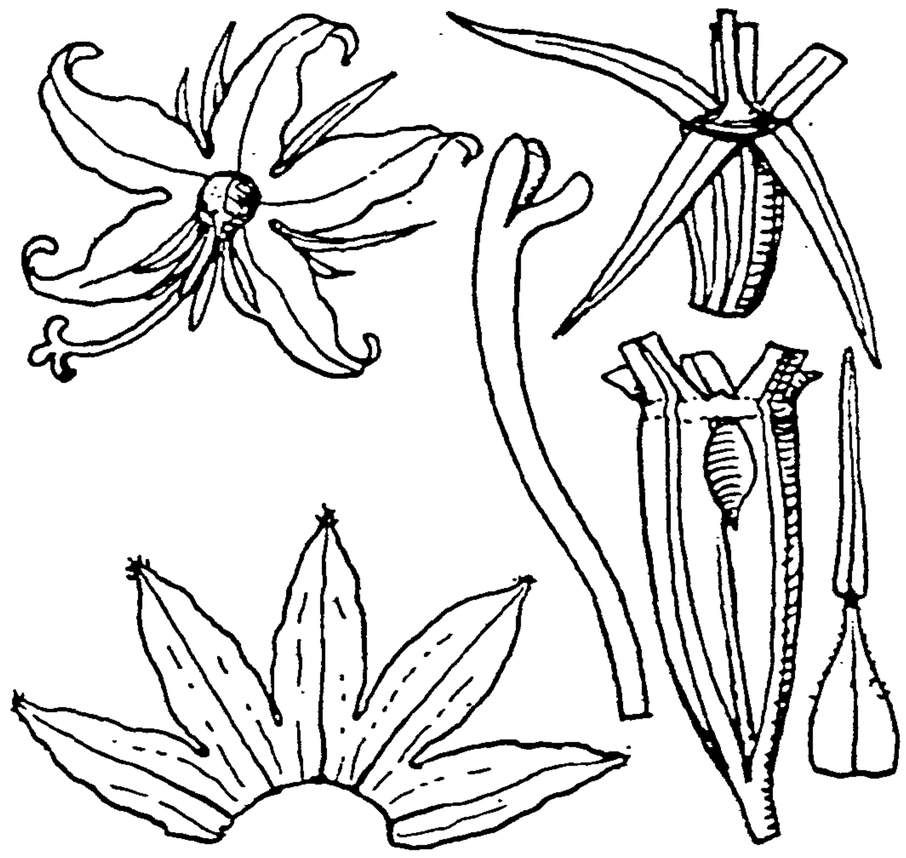
1. R. floridana (S. Wats.) Small. Perennial: stems and branches diffusely spreading and often intertwined, 2–4 dm. long: leaf-blades narrowly elliptic-oblanceolate, linear, or linear-lanceolate, 1–4 cm. long, obscurely toothed: hypanthium obovate-turbinate: sepals linear-lanceolate to linear-subulate, 6–9 mm. long: corolla violet; lobes narrowly lanceolate: anthers 3–4 mm. long: capsule obovoid, 3–4 mm. long. [*Campanula floridana* S. Wats.]— Grassy swamps and marshes, E Fla. and the pen.—All year.



2. R. Robinsiae Small. Annual: stem with several or many slender erect branches, 0.5–1 dm. tall: leaf-blades spatulate to elliptic, lanceolate, or ovate, or rarely narrower, 0.3–1.2 cm. long, entire or sharply few-

toothed: hypanthium subglobose: sepals lanceolate to subulate-lanceolate, 1–1.5 mm. long: corolla violet or blue; lobes elliptic; anthers 1–1.5 mm. long: capsule subglobose, 2–2.5 mm. in diameter. [*Campanula Robinsiae* Small]—Grassy slopes of Chinsegut Hill, near Brooksville, Fla.—Spr.–fall.

3. **CAMPANULASTRUM** Small. Annual or biennial herbs. Leaf-blades toothed. Flowers perfect and complete. Hypanthium elongate in age. Corolla rotate. Stamens exserted. Capsule opening by subapical valves. Seed flattish, broad, margined.—One species.

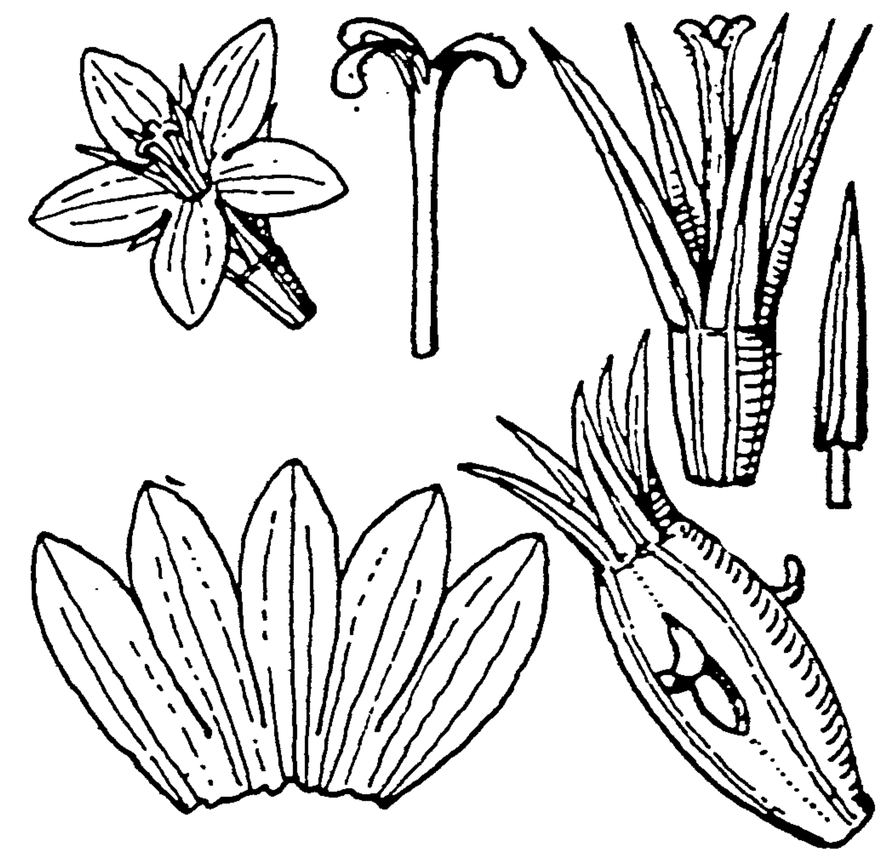


1. **C. americanum** (L.) Small. Plant 2–20 dm. tall, often widely branched: blades of the upper leaves usually lanceolate, 5–12 cm. long, acuminate: sepals linear-subulate, 6–10 mm. long: corolla blue or white; lobes 10–13 cm. long: capsule turbinate-clavate, 8–10 mm. long: seed oval, about 1.5 mm. long.—Rich woods and rocky river-banks, various provinces, Fla. to Ark., S. Dak., and N. B.—Sum.

4. **SPECULARIA** [Heist.] Fabr. Annual or biennial herbs. Leaf-blades toothed. Flowers dimorphous, the earlier ones with 3 or 4 sepals and undeveloped corollas, the later ones with 5 sepals and rotate corolla. Capsule prismatic, opening by lateral valves.—About 10 species, in the Northern Hemisphere.—VENUS'S LOOKING-GLASSES.

Leaf-blades clasping, usually fully as wide as long: capsule with the valves near the middle. 1. *S. perfoliata.*
Leaf-blades sessile, longer than wide: capsule with the valves at the top. 2. *S. biflora.*

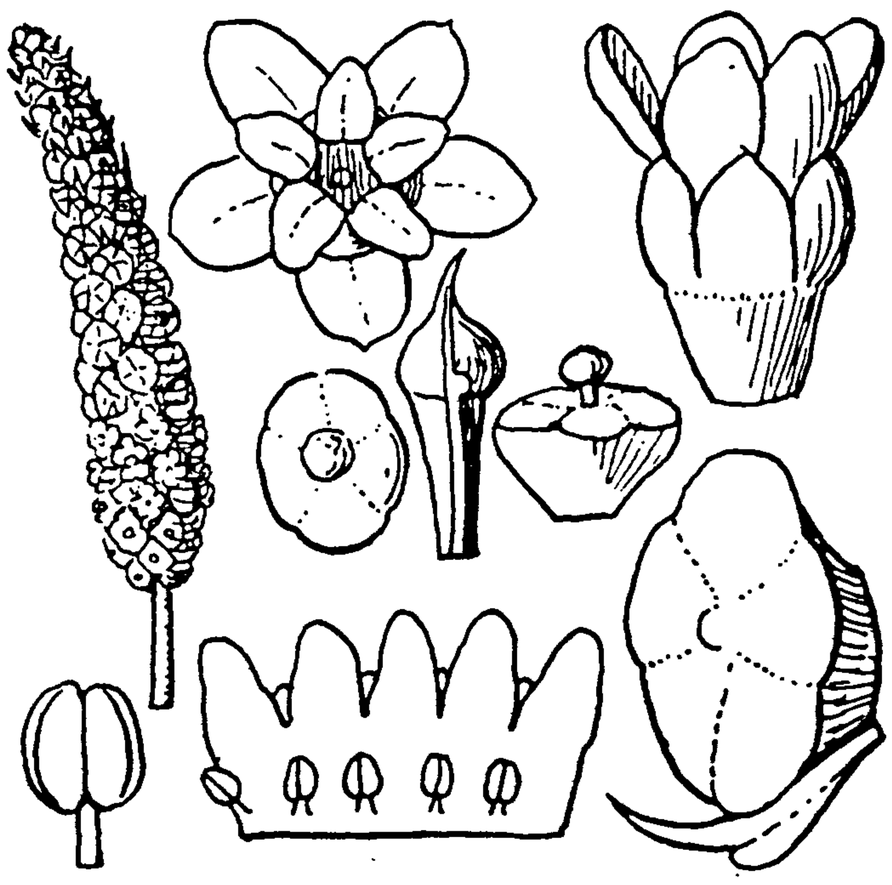
1. **S. perfoliata** (L.) A. DC. Stem 1–5 dm. tall: leaf-blades suborbicular to triangular-ovate: corolla purple, 10–15 mm. wide: capsule ellipsoid-prismatic or obconic, 5–6 mm. long: seed oval, about 0.5 mm. long.—Woods, fields, and waste-places, various provinces, Fla. to Tex., Calif., B. C., and Ont.—(*W. I., Mex., C. A., S. A.*)—Sum.



2. **S. biflora** (R. & P.) F. & M. Stem 1–5 dm. tall: leaf-blades ovate to elliptic or lanceolate above: corolla purple, 15–20 mm. wide: capsule cylindric to fusiform, 6–9 mm. long: seed nearly 1 mm. long.—Fields and open places, various provinces, Fla. to Tex., Calif., Kans., and Que.—(*W. I., Mex.*)—Spr.–fall.

5. **SPHENOCLEA** Gaertn. Annual herbs. Leaf-blades entire. Flowers all alike, borne in a continuous dense spike. Sepals broad. Corolla short-

campanulate: lobes short. Stamens with very short filaments. Ovary depressed. Stigma nearly sessile. Capsule circumscissile, the lid and calyx adnate.—One species.



1. S. zeylanica Gaertn. Plant 2–13 dm. tall: leaf-blades mainly elliptic to almost linear, 3–12 cm. long, paler beneath than above: spikes 3–11 cm. long: sepals broadly ovate, 1.5 mm. long: corolla white or greenish, about 2 mm. long, the ovate lobes about as long as the tube: capsule 3–4 mm. wide. —Low grounds, Coastal Plain, La. to Ark. Nat. of the Old World tropics.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall.

Family 3. **LOBELIACEAE** — Lobelia Family

Herbs, or rarely trees, the sap often milky. Leaves alternate: blades entire, toothed, or parted. Flowers perfect, or rarely dioecious, irregular. Calyx of 5 sepals. Corolla more or less 2-lipped, the tube open on one side. Androecium of 5 stamens, the filaments sometimes cohering. Gynoecium mostly 2-carpellary, the ovary more or less inferior. Fruit capsular or baccate.—About 20 genera and 600 species, widely distributed.

1. LOBELIA [Plum.] L. Annual or perennial herbs. Leaf-blades entire or toothed. Flowers in spikes, racemes, or panicles. Hypanthium mostly ribbed. Sepals entire or often glandular-toothed, sometimes with basal appendages. Corolla variously colored or white: upper lip 2-lobed: lower lip 3-lobed. Anthers in a ring around the style, 2 often smaller than the others. Ovary 2-celled. Capsule 2-valved.—About 225 species, widely distributed.—In the following descriptions cauline leaves are considered.

Corolla red (pink or white forms are rare). — I. Cardinales.
Corolla blue or white, or blue variegated with white.
  Flowers large (corolla-tube over 1 cm. long).
    Stem not scape-like, leafy to the inflorescence. — II. Siphiliticae.
    Stem scape-like, leafy at the base, the upper leaves reduced and remote. — III. Paludosae.
  Flowers small (corolla-tube less than 1 cm. long).
    Raceme secund. — IV. Appendiculatae.
    Raceme not secund.
      Blades of the cauline leaves sessile.
        Upper cauline leaves with broad blades, at least not linear: raceme spike-like, continuous. — V. Spicatae.
        Upper cauline leaves with narrow, usually linear, or filiform blades: raceme relatively few-flowered, open. — VI. Nuttallianae.
      Blades of the cauline leaves manifestly petioled. — VII. Xalapenses.

I. Cardinales

Perennial herb with offsets: raceme elongate, mostly 1-sided, very showy. — 1. *L. cardinalis.*

II. Siphiliticae

Sepals pinnatifid, the auricles hiding the hypanthium: leaves not at all or only slightly reduced above: blades pinnatifid-toothed. — 2. *L. brevifolia.*

Sepals entire or glandular-toothed, the auricles, if present, not hiding the hypanthium: leaves on the upper part of the stem much smaller than those below.
Sepals with deflexed or broadly rounded auricles at the base, the edges ciliate, not glandular-toothed.
Hypanthium hemispheric in anthesis: sepals strongly auricled at the base, erose and more or less irregularly toothed. 3. *L. siphilitica.*
Hypanthium turbinate in anthesis: sepals slightly auricled at the base, merely ciliate. 4. *L. puberula.*
Sepals without basal auricles.
Sepals entire, glandless.
Leaf-blades broad, usually bluntly toothed: sepals shorter than the corolla-tube. 5. *L. amoena.*
Leaf-blades narrow, undulate or glandular-toothed: sepals as long as the corolla-tube or longer. 6. *L. elongata.*
Sepals glandular-toothed.
Lower lip of the corolla glabrous: hypanthium glabrous: leaf-blades broad. 7. *L. glandulifera.*
Lower lip of the corolla pubescent within: hypanthium bristly-pubescent: leaf-blades narrow. 8. *L. glandulosa.*

III. Paludosae

Sepals not auricled at the base: anther-head about 2 mm. long: corolla-tube less than 1 cm. long. 9. *L. paludosa.*
Sepals auricled at the base: anther-head about 4 mm. long: corolla-tube over 1 cm. long. 10. *L. floridana.*

IV. Appendiculatae

Sepals lanceolate, glandular-toothed, much shorter than the corolla-tube: corolla finely pubescent without: hypanthium turbinate in anthesis. 11. *L. flaccidifolia.*
Sepals subulate, entire or merely erose: nearly or quite as long as the corolla-tube: corolla glabrous or puberulent without: hypanthium campanulate in anthesis. 12. *L. Gattingeri.*

V. Spicatae

Capsule partly inferior: mature hypanthium hemispheric: sepals more or less auricled at the base.
Sepals lanceolate, with minute spreading auricles at the base, shorter than the corolla-tube. 13. *L. spicata.*
Sepals slender-subulate, with long deflexed auricles at the base, quite as long as the corolla-tube.
Bracts elongate, nearly or quite surpassing the flowers: corolla copiously pubescent without. 14. *L. bracteata.*
Bracts short, not surpassing the flowers: corollas glabrous or slightly puberulent without. 15. *L. leptostachya.*
Capsule wholly inferior: mature hypanthium obovoid, oval, or ovoid: sepals not at all auricled. 16. *L. inflata.*

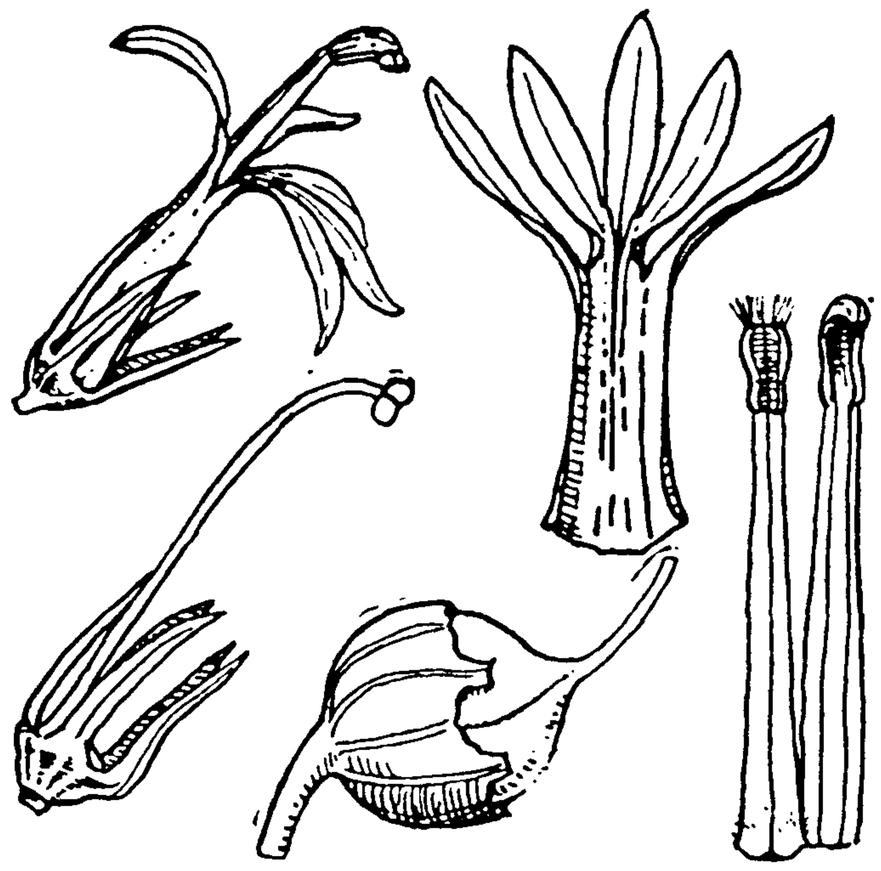
VI. Nuttallianae

Pedicels mostly shorter than the bracts, shorter than the corollas in anthesis.
Sepals lanceolate: corolla less than 1 cm. long: mature hypanthium hemispheric or depressed-hemispheric. 17. *L. Nuttallii.*
Sepals linear-subulate: corolla mostly over 1 cm. long: mature hypanthium ellipsoid or turbinate-ellipsoid. 18. *L. Canbyi.*
Pedicels much exceeding the bracts, longer than the corollas. 19. *L. Boykinii.*

VII. Xalapenses

Pedicels long, over 1 cm. long in anthesis: capsule ½ inferior or less.
Corolla 4–6 mm. long: sepals lanceolate. 20. *L. Cliffortiana.*
Corolla 8–10 mm. long: sepals subulate. 21. *L. homophylla.*
Pedicels short, less than 1 cm. long in anthesis: capsules 2/3 inferior. 22. *L. Fcayana.*

1. **L. cardinalis** L. Stem 3–12 dm. tall, simple, glabrous or finely hirsute: blades of the lower leaves elliptic to elliptic-spatulate, serrate or dentate:



raceme continuous, rather conspicuously bracted: sepals linear-attenuate to linear-subulate, entire: corolla-lobes on either side of the cleft linear-oblanceolate or nearly linear: anther-head 5–6 mm. long: capsule hemispheric, short-beaked: seed about 1 mm. long. — (CARDINAL-FLOWER.) — Wet ravines, swamps and stream-banks, various provinces, Fla. to Tex., Ont., and N. B.—Sum.–fall.

2. L. brevifolia Nutt. Stem 3–8 dm. tall, rather copiously and evenly leafy, sometimes branched: leaf-blades fleshy, spatulate or obovate to elliptic or linear-elliptic, 0.5–2.5 cm. long, pinnatifid-toothed, the teeth gland-tipped: raceme interrupted, not conspicuously bracted: sepals lanceolate to hastate-ovate, pinnatifid, each with 2 obtuse basal auricles which invest the hypanthium: corolla blue, pubescent without; lobes of the upper lip lanceolate: capsule 5–7 mm. long: seed about 0.5 mm. long.—Moist pinelands, Coastal Plain, Fla. to La.—Sum-fall.

3. L. siphilitica L. Stem 2–10 dm. tall, sparingly pubescent, often branched: leaf-blades thin or thinnish, oblanceolate to elliptic or lanceolate, 2.5–20 cm. long, coarsely serrate or sinuate-dentate: sepals lanceolate, bristly ciliate, acuminate from a broad base, each with large acute basal auricles: corolla light-blue, or rarely white, straightened out, over 2 cm. long: anther-head fully 5 mm. long: capsule over 7 mm. wide, with the sepal-auricles reaching nearly or quite to the base: seed ellipsoid.—(GREAT-LOBELIA.)—Low grounds, meadows, and along streams, various provinces, Ga. to La., Colo., S. Dak., Ont., and Me. —Sum.–fall.

4. L. puberula Michx. Stem 3–10 dm. tall, softly fine-pubescent: leaf-blades thick, oblanceolate to obovate, elliptic, lanceolate, or ovate, 2–10 cm. long, finely toothed: sepals lanceolate, finely pubescent, each with small rounded basal auricles: corolla bright-blue, straghtened out 2 cm. long or less; anther-head less than 5 mm. long: capsule less than 7 mm. wide, finely pubescent with the sepal auricles reaching to above the middle: seed linear-cylindric.—Wet woods, low grounds, and thickets, often in acid soil, various provinces, Fla. to Tex., Ga., and N. J.—Fall.

5. L. amoena Michx. Stem 3–12 dm. tall, glabrous or softly hirsute: leaf-blades thinnish, elliptic, varying to obovate or ovate, undulate to sinuate, or unevenly crenate: sepals narrowly linear-subulate, 7–8 mm. long, entire, slender-tipped: corolla bright-blue, straightened out 2–2.5 cm. long or sometimes less; anther-head 2–2.5 mm. long: capsule 5–6 mm. wide: seed linear-cylindric, fully 1 mm. long.—Acid swamps or moist hillsides, Coastal Plain, Fla. to Miss. and Va.—Sum.–fall.

6. L. elongata Small. Stem 3–12 dm. tall, glabrous: leaf-blades linear or nearly so, or narrowly linear-lanceolate on the upper part of the stem, 2–10 cm. long, undulate, serrate, or dentate-serrate: sepals elongate, linear-subulate or linear-setaceous, entire: corolla deep-blue, straightened out about 2 cm. long: anther-head about 4 mm. long: capsule about 5 mm. wide: seed narrowly ellipsoid, barely 1 mm. long.—Low grounds, Coastal Plain, Fla. to La. and Va. —Sum.–fall.

7. L. glandulifera (A. Gray) Small. Stem 3–7 dm. tall, glabrous or sparingly pubescent: leaf-blades narrowly elliptic to elliptic-ovate, 3–12 cm. long, irregu-

larly dentate or undulate: hypanthium glabrous: sepals narrowly lanceolate to linear-lanceolate, 7–9 mm. long, pectinately glandular-toothed: corolla deep-blue, straightened out 2–2.5 cm. long: anther-head 3–4 mm. long: capsule about 5 mm. wide: seed ellipsoid, about 1 mm. long.—Low grounds, meadows, and swamps, Coastal Plain, Fla. to Miss. and Va.—Sum.–fall.

8. L. glandulosa Walt. Stem 3–12 dm. tall, glabrous: leaf-blades linear-oblanceolate to linear, 2–15 cm. long, repand or shallowly toothed, the teeth gland-tipped: hypanthium pubescent: sepals lanceolate or linear-lanceolate, 6–9 mm. long, prominently glandular-toothed: corolla deep-blue, straightened out 2–2.5 cm. long; lobes of the lower lip broadly ovate: capsule 6–7 mm. wide: seed ellipsoid, less than 1 mm. long.—Wet pinelands and swamps, Coastal Plain, Fla. to Va.; reported also from Miss.—Spr.–fall or all year southward.

9. L. floridana Chapm. Stem 8–15 dm. tall: leaf-blades linear or slightly linear-spatulate below, 10–40 cm. long, undulate or crenate-undulate: sepals hastate-lanceolate, 4–5 mm. long, coarsely toothed: corolla blue, sometimes pale, straightened out over 1.5 cm. long: capsule 4–4.5 mm. wide.—Swamps, and low pinelands, Coastal Plain, Fla. to Miss.—Spr.–fall.

10. L. paludosa Nutt. Stem 2–9 dm. tall: leaf-blades linear-spatulate, or rarely elliptic-obovate to linear, 3–25 cm. long, entire or sinuate-crenate: sepals lanceolate to linear-lanceolate, 3–5 mm. long, shallowly toothed or often entire: corolla light-blue or white, straightened out less than 1.5 cm. long: capsule 3–3.5 mm. wide.—Swamps, and low pinelands and ponds, Coastal Plain, Fla. to La. and Del.—Spr.–fall, or all year southward.

11. L. flaccidifolia Small. Stem 2–6 dm. tall: leaf-blades thin, obovate to elliptic-spatulate at the base of the stem, linear-elliptic or rarely linear-lanceolate above, 3–11 cm. long, undulate or crenate-undulate: hypanthium in anthesis turbinate: sepals lanceolate, 3–5 mm. long, glandular-toothed, auricled at the base: corolla 14–16 mm. long: capsule 5–8 mm. long.—River swamps, Coastal Plain, Fla. and Ga.—Sum.

12. L. Gattingeri A. Gray. Stem 2–4 dm. tall, glabrous: leaf-blades thick, obovate at the base of the stem, elliptic, oval, or ovate above, 1–4 cm. long, irregularly toothed or nearly entire: hypanthium in anthesis campanulate: sepals subulate, 4–6 mm. long, eciliate, not auricled at the base: corolla 8–9 mm. long: capsule 5–6 mm. long.—Cedar glades and limestone prairies, Interior Low Plateaus, Ala. and Tenn.—Spr. Plants, perhaps referable to *L. appendiculata* in which the ciliate sepals are auricled at the base, have been found in Ala.

13. L. spicata Lam. Stem 1–12 dm. tall, pubescent, at least near the base: leaf-blades spatulate, obovate, or suborbicular at the base of the stem, oblanceolate to lanceolate above, 1–10 cm. long, crenate-dentate or nearly entire: hypanthium in anthesis hemispheric: sepals lanceolate, 3–3.5 mm. long, with minute spreading auricles at the base: corolla blue, 6–9 mm. long: capsule 2.5–3 mm. long.—Woods, moist fields, and meadows, various provinces, Ga. to Tex., Sask., and P. E. I.—Sum.

14. L. bracteata Small. Stem 8–10 dm. tall: leaf-blades spatulate at the base of the stem, elliptic, lanceolate or elliptic-lanceolate above, 3–10 cm. long, glandular-toothed: hypanthium in anthesis somewhat depressed: sepals slender-subulate, 4–4.5 mm. long, with deflexed auricles at the base: corolla 8–9 mm. long: capsule 5–7 mm. long.—Woods, Piedmont, Ga. to N. C.—Sum.

15. L. leptostachys A. DC. Stem 3–12 dm. tall: leaf-blades obovate to oblanceolate at the base of the stem, elliptic to lanceolate above, 3–10 cm. long, entire or indistinctly toothed: hypanthium in anthesis depressed: sepals slender-subulate, 5–6 mm. long, with deflexed auricles at the base: corolla 6–8 mm. long: capsule 3–4 mm. long.—Dry soil, various provinces, rarely Coastal Plain, Ga. to Miss., Kans., Ohio, and Va.—Sum.

16. L. inflata L. Stem 1–10 dm. tall, finely hirsute: leaf-blades obovate to oval or ovate, 2–9 cm. long, crenate: hypanthium in anthesis campanulate: sepals linear, 2.5–3.5 mm. long, entire: corolla lilac, 6–8 mm. long: capsule 5–8 mm. long, inflated.—(INDIAN-TOBACCO. WILD-TOBACCO. EYEBRIGHT.)—Fields, woods, and thickets, various provinces, Ga. to Ark., Sask., and Lab. —Sum.–fall.

17. L. Nuttallii Roem. & Schult. Stem 2–7 dm. tall: leaf-blades obovate to ovate at the base of the stem, oblanceolate to linear above, 2–4 cm. long, entire or toothed: hypanthium in anthesis much depressed: sepals lanceolate, about 2 mm. long, entire: corolla light-blue, 6–7.5 mm. long: capsule 2.5–3 mm. long. —Low grounds or pinelands, Coastal Plain and rarely Appalachian provinces, Fla. to Miss., Pa., and S N. Y.—Spr.–fall.

18. L. Canbyi A. Gray. Stem 3–8 dm. tall: leaf-blades elliptic-linear to linear, 2–6 cm. long, glandular-denticulate: hypanthium in anthesis campanulate: sepals linear-subulate, 3–4 mm. long, obscurely glandular-denticulate: corolla bright-blue, 10–11 mm. long: capsule about 4 mm. long, wholly inferior.—Pineland swamps, local, Coastal Plain, S. C. to N. J.—Sum.–fall.

19. L. Boykinii T. &. G. Stem 3–8 dm. tall, hollow, virgate, sometimes with few virgate branches: leaf-blades inconspicuous, linear-filiform to filiform, 1–3 cm. long or shorter, indistinctly glandular-toothed: hypanthium in anthesis turbinate: sepals slender-subulate, 3.5–4.5 mm. long, entire: corolla bright-blue, 8–10 mm. long: capsule 3–4 mm. long, half-inferior.—Pineland swamps and cypress-ponds, Coastal Plain, Fla. to S. C.—Spr.–sum.

20. L. Cliffortiana L. Stem 3–6 dm. tall, often finely pubescent: leaf-blades ovate to ovate-lanceolate, 2–10 cm. long, coarsely toothed or sinuate: sepals lanceolate, about 2 mm. long, entire: corolla 4–6 mm. long: capsule 5–6 mm. long.—Wet places, waste-places, and cult. grounds, Coastal Plain, Fla. to Tex. Nat. of Trop. Am.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall.

21. L. homophylla F. E. Wimmer. Stem 2–6 dm. tall, glabrous or finely pubescent: leaf-blades ovate to suborbicular, 1–4 cm. long, rather closely and irregularly crenate or incised-dentate, cordate to truncate at the base: sepals subulate, 2.5–3.5 mm. long, entire: corolla 8–10 mm. long: capsule 6–7 mm. long. [*L. Cliffortiana xalapensis* (Chapm. Fl.). *L. xalapensis* (Fl. SE U. S.).] —Pinelands, fence-rows, and roadsides, pen. Fla.—Spr.–fall.

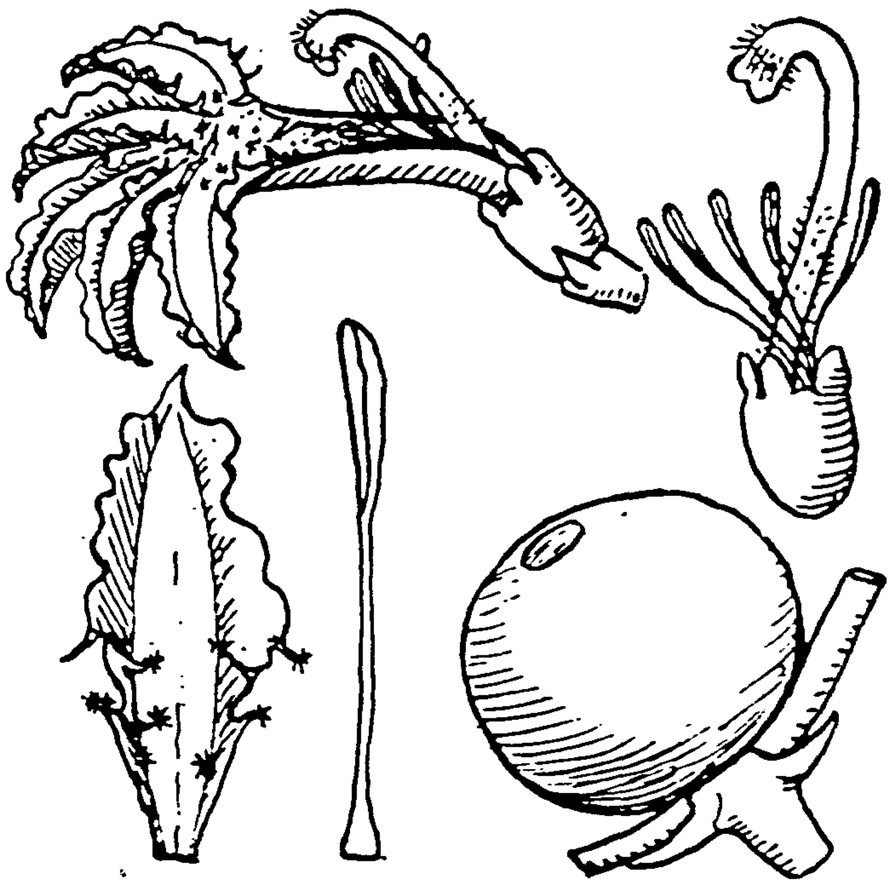
22. L. Feayana A. Gray. Stem 1–3 dm. tall, glabrous: leaf-blades reniform, suborbicular, or orbicular-ovate at the base of the stem, obovate to ovate above, 0.5–1.5 cm. long, entire or crenate: sepals lanceolate, 1.5–2 mm. long, entire: corolla 7–9 mm. long: capsule about 4 mm. long.—(BAY-LOBELIA.)—Pinelands, Fla.—Spr.–fall.

FAMILY 4. **BRUNONIACEAE** — GOODENIA FAMILY

Herbaceous or woody plants. Leaves alternate or sometimes opposite: blades entire, toothed, or pinnatifid. Flowers perfect. Calyx of 5 par-

tially united sepals, or rarely obsolete. Corolla of 5 equally or unequally united petals. Androecium of 5 distinct stamens. Gynoecium mostly of 2 united carpels, the ovary inferior. Stigma surrounded with an indusium. Fruit drupaceous, baccate, or capsular.—Twelve genera and more than 200 species, mostly Australian.

1. **SCAEVOLA** L. Succulent herbs or shrubs. Leaf-blades mostly entire. Flowers irregular, in cymes. Calyx 5-lobed, or obsolete. Corolla-tube open to the base on one side, the lobes winged. Stigma with a ciliate indusium. Berry with a fleshy exocarp.—About 60 species, mostly Australian.

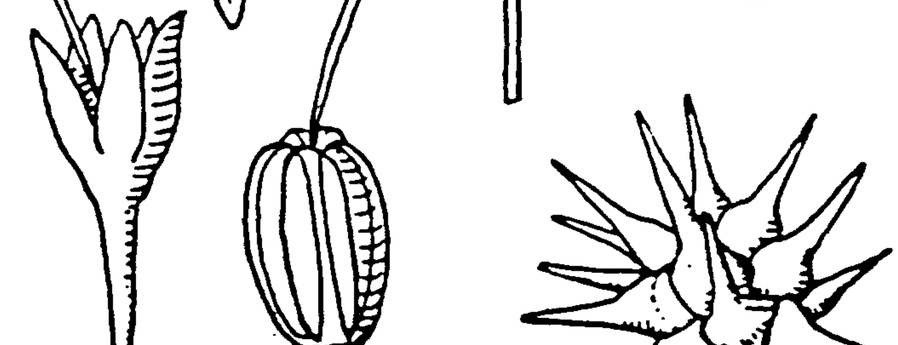


1. S. Plumieri Vahl. Plant 3–18 dm. tall: leaf-blades obovate to spatulate, 4–6 cm. long: calyx-lobes rounded: corolla white or pinkish, 22–28 mm. long, woolly within; lobes linear to lanceolate: berries oval to globular, 10–14 mm. long, black, very juicy. —Coastal sand-dunes, pen. Fla. and Florida Keys.—(*W. I.*)—All year.—Stems often spreading under the sand and forming large patches.

FAMILY 5. **CALYCERACEAE** — CALYCERA FAMILY

Herbs or partly woody plants. Leaves alternate: blades usually narrow, entire, toothed, or pinnatifid. Flowers small, in heads which are solitary at the end of each peduncle, or sessile, the receptacle short or elongate. Involucre of one or two series of distinct or united bracts. Calyx of 4–6 more or less accrescent sepals. Corolla elongate: tube slender, the throat shorter than the tube, the limb 4–6-lobed. Androecium of 4–6 stamens. Filaments adnate up to the throat of the corolla. Anthers erect, adnate around the style. Gynoecium of a single carpel. Ovary inferior. Style elongate. Stigma minute. Fruit an achene, often crowned with the calyx.—Three genera and 25 species, South American.

1. **ACICARPHA** Juss. Annual diffuse or procumbent herbs. Leaves various: blades of the basal ones usually petioled, those of the cauline leaves sessile or clasping, all entire or toothed. Heads sessile or short-peduncled, spiny at the base, the marginal flowers fruit-producing, the central flowers not fruit-producing. Receptacle elongate. Sepals erect, persistent. Corolla colored, with a long tube and a short throat: lobes narrow. Achenes more or less united to each other.—Three species, South American.



1. A. tribuloides Juss. Plant mostly 1–4 dm. tall, glabrous: basal leaves 3–11 cm. long; blades spatulate: blades of the cauline

leaves elliptic to lanceolate, clasping, all coarsely toothed: sepals about 1 mm. long, acuminate: corollas yellow, about 3 mm. long; lobes lanceolate: achene crowned with the accrescent subulate sepals, 4–5 mm. long.—Fields and roadsides, N Fla. Nat. of S. Am.—Spr.–fall.

Order **CARDUALES**—Cardual Order

Herbs, shrubs, or rarely trees. Leaves mainly alternate: blades entire, toothed, or divided. Flowers perfect, monoecious, or dioecious, few or many aggregated on a receptacle and surrounded with an involucre, or the involucre rarely obsolete. Calyx one or two rows of bristles, scales, a mere border or crown, or obsolete, or wanting. Corolla of several more or less united petals, or wanting. Androecium of usually 5 stamens, the anthers converging, or united. Gynoecium mostly of 2 united carpels. Ovary inferior. Styles or stigmas mostly 2. Fruit an achene.

Flowers with tubular corollas, or those of the outer ones prolonged into ligules.	
Stamens distinct, or the filaments sometimes united, the anthers merely converging about the stigma.	Fam. 1. Ambrosiaceae.
Stamens united by their anthers, thus forming a tube around the stigma, except in *Kuhnia*.	Fam. 2. Carduaceae.
Flowers with each corolla prolonged into a ligule.	Fam. 3. Cichoriaceae.

Family 1. **AMBROSIACEAE** — Ragweed Family

Annual or perennial herbs, or shrubs, the plants often coarse. Leaf-blades entire, toothed, lobed, or divided. Flowers in inconspicuous heads, the bracts of the pistillate heads distinct or sometimes united and accrescent into a bur. Fruit-producing flowers apetalous or with much reduced corollas. Achenes subtended by or enclosed in an involucre. Pappus wanting or obsolete.—Eight genera and about 75 species, mostly American.

Staminate and pistillate flowers in the same head, the pistillate marginal, fewer than the staminate, or rarely wanting: heads neither bur-like nor nut-like.	Tribe I. Iveae.
Staminate and pistillate flowers in different heads, the pistillate flowers 1–7, enclosed in a bur-like or nut-like involucre, which also later encloses the achenes.	II. Ambrosieae.

I. Iveae

Plants with androgynous nodding heads and broad or narrow leaf-blades.	1. Iva.

II. Ambrosieae

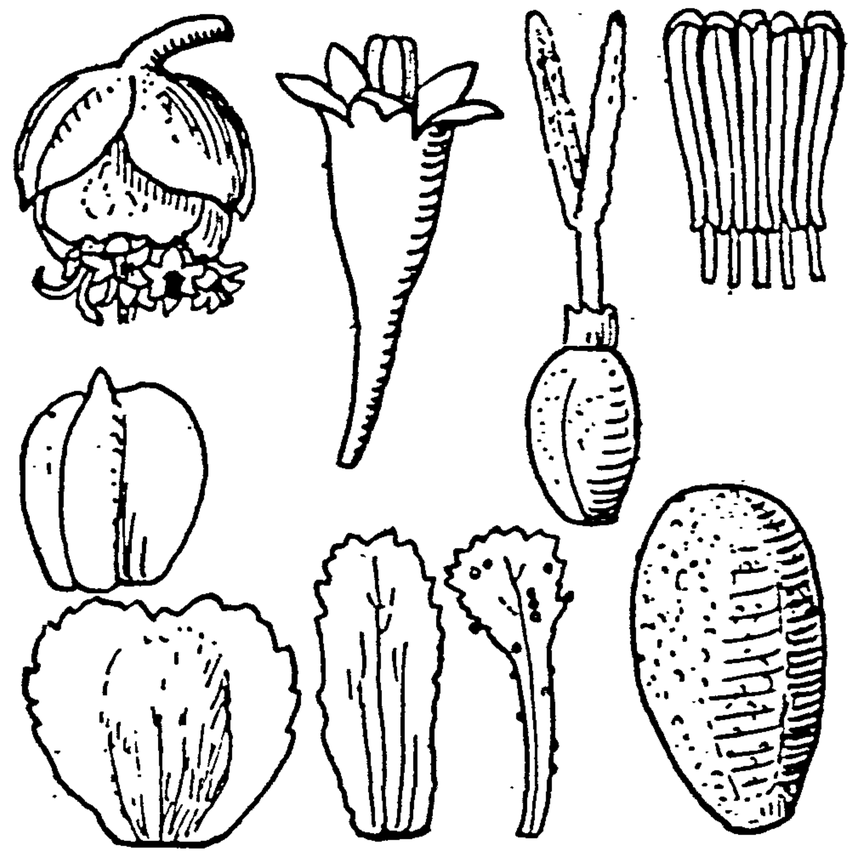
Bracts of the staminate involucre more or less united: receptacle flat or merely convex: filaments free.	
Tubercles or spines of the pistillate involucres in a single series: fruit with a truncate or equally 3–5-toothed beak.	2. Ambrosia.
Tubercles or spines in several series: fruit with a 2-toothed beak, the teeth incurved, the outer one the longer.	3. Franseria.
Bracts of the staminate involucre distinct: receptacle elongate filaments united.	
Leaves pinnately veined or lobed, the stipules simple or pronged stipular spines: bur with straight beaks.	4. Acanthoxanthium.
Leaves digitately veined or lobed, the stipules not spiny: bur with curved or hooked beaks.	5. Xanthium.

1. IVA L. Annual or perennial, glabrous, strigose, or hispidulous herbs, or shrubs. Leaves, at least the lower, opposite: blades entire or toothed. Heads axillary to leaf-like bracts. Involucre turbinate to hemispheric: bracts 3–6,

or 5–9 in *I. imbricata.* Receptacle with large bractlets. Corolla of the pistillate flowers a truncate tube. Achenes slightly flattened, usually obovoid.—About 20 species, American.—MARSH-ELDERS.

Plants perennial: heads mostly peduncled: bracts of the involucre 5–9, or rarely 4.
  Bracts of the involucre 6–9, imbricate in two series: leaf-blades entire. 1. *I. imbricata.*
  Bracts of the involucre 5 or rarely 4, in one series and only slightly overlapping: leaf-blades toothed. 2. *I. frutescens.*
Plants annual: heads sessile: bracts of the involucre 3, or rarely 4 or 5.
  Leaf-blades broad, coarsely toothed, petioled: those of the inflorescence different, sessile.
    Leaves of the inflorescence with ovate to lanceolate short-acuminate blades. 3. *I. ciliata.*
    Leaves of the inflorescence with linear or linear-lanceolate caudate-acuminate blades. 4. *I. caudata.*
  Leaf-blades narrow, entire or shallowly toothed, sessile or short-petioled; those of the inflorescence nearly similar.
    Bracts of the involucre distinct: staminate and pistillate flowers three each: leaf-blades linear. 5. *I. microcephala.*
    Bracts of the involucre partly united: pistillate flowers usually solitary: leaf-blades oblong. 6. *I. asperifolia.*

1. I. imbricata Walt. Perennial with a woody base: stem 1 m. tall or less, smooth and glabrous: leaf-blades linear to linear-elliptic, linear-oblanceolate, or linear-subulate above, 2–5 cm. long, glabrous, entire or shallowly toothed: involucres subtended by foliaceous bracts, 3–4 mm. high or larger in age; inner bracts suborbicular: achenes 3–3.5 mm. long.—Coastal sand-dunes and rocky shores, Fla. to La. and Va.—(*W. I.*)—Sum.–fall.



2. I. frutescens L. Perennial with a woody base: stem 3.5 m. tall or less, pubescent, at least above: leaf-blades elliptic, linear-elliptic, elliptic-lanceolate or nearly linear above, 4–10 cm. long, pubescent, coarsely serrate: involucres 3.5–4 mm. high; inner bracts oval or obovate: achenes 2–2.5 mm. long.—(MARSH-ELDER. HIGH-WATER SHRUB.)—Salt marshes and margins, Coastal Plain, Fla. to Tex. and Va.—Sum.–fall.

3. I. ciliata Willd. Annual, 1.8 m. tall or less: stem copiously rough-pubescent: leaf-blades ovate, oval, or elliptic, 4–10 cm. long, acute or short-acuminate, serrate: heads contiguous, subtended by bristly-ciliate bracts: involucres 3–4 mm. high, rough-pubescent: achenes colored, about 3 mm. long, with faint tubercular-roughened ridges.—Moist soil, various provinces, La. to N. M., Nebr., and Ill.; extending as a weed E to Ala.—Sum.–fall.

4. I. caudata Small. Annual, 1 m. tall or less: stem rather sparingly hispidulous: leaf-blades ovate to elliptic, 4–15 cm. long, acuminate, coarsely and unevenly serrate: heads contiguous or approximate, subtended by coarsely ciliate bracts: involucres sparingly pubescent: achenes broadly cuneate-obovoid, 3.5 mm. long, with prominent even ridges.—Swamps and low grounds, Coastal Plain and adj. provinces, Miss. to La., Mo., and Ill.—Sum.-fall.

5. I. microcephala Nutt. Annual, 1 m. tall or less: stem glabrous or minutely pubescent especially above, often with numerous erect branches: leaf-blades narrowly linear, 2–5 cm. long, entire or shallowly toothed, glandular-punctate: heads contiguous or nearly so, subtended by subulate or linear-filiform bracts: involucre campanulate, about 2 mm. high; bracts obovate to suborbicular:

achenes narrowly obovoid, fully 1 mm. long, muriculate.—Low pinelands and prairies, Coastal Plain, Fla. to S. C.—Sum.–winter.—Sometimes a weed.

6. I. asperifolia Less. Annual, or perhaps sometimes perennial, 0.5 m. tall or less: stem sometimes decumbent, sparingly rough-pubescent at least above: leaves narrowly elliptic to linear-oblanceolate, 1–2 cm. long, entire, glandular-punctate: heads contiguous or approximate: involucre turbinate, about 3 mm. high; bracts cuneate to suborbicular: achenes obovoid, about 2 mm. long, granular-muriculate.—Waste-places, Pensacola, Fla. Nat. of Mex.—Sum.–fall.

2. AMBROSIA L. Annual or rarely perennial coarse caulescent branching herbs. Leaves alternate or opposite: blades toothed, lobed, or dissected, long-petioled. Heads in spikes or racemes, the staminate above the pistillate, with a usually saucer-shaped 5–12-lobed involucre. Pistillate involucre erect, nut-like, usually with a single series of tubercles or spines near the apex, the beak truncate or 3- to 4-toothed.—About 20 species, mostly American.—RAGWEEDS.

Staminate heads spicate: involucre very oblique, produced on the side away from the stem into a lanceolate acuminate lobe: annuals. I. CERCOMERIS.
Staminate heads racemose: involucre slightly, if at all, oblique, not produced into an elongate lobe on either side: annuals or perennials. II. EUAMBROSIA.

I. CERCOMERIS

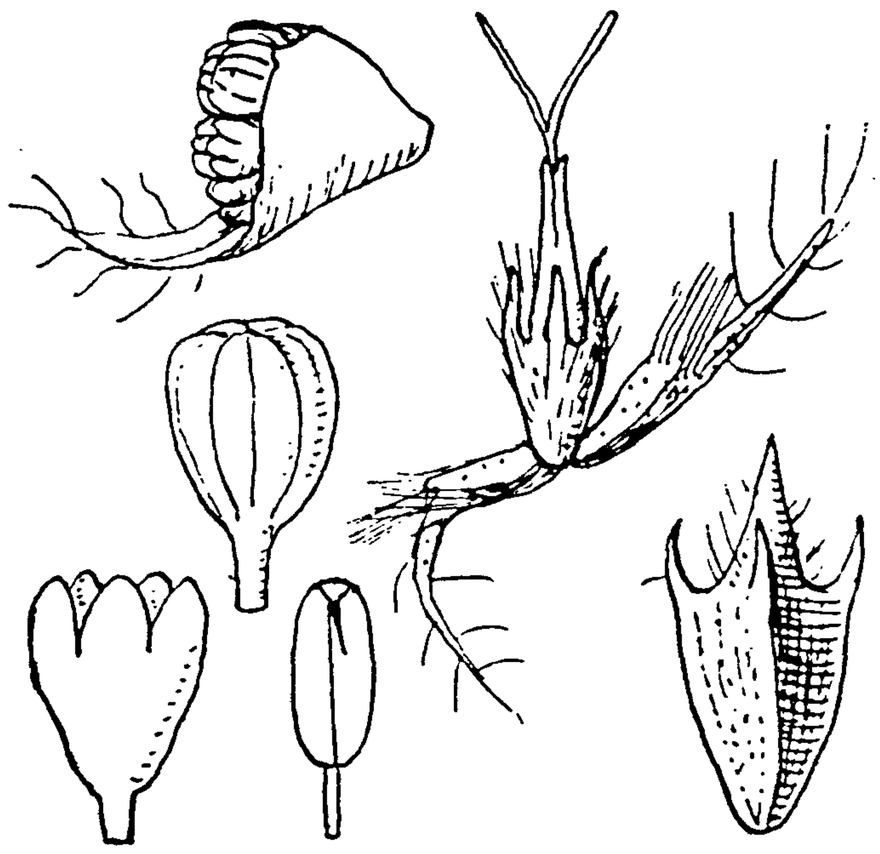
A rough hirsute herb: leaf-blades of a lanceolate type, usually with a lobe on each side near the base. 1. *A. bidentata.*

II. EUAMBROSIA

Leaf-blades pinnatifid to tripinnatifid.
- Leaf-blades green at least above: plants annual.
  - Fruit-body 2–2.5 mm. long, the beak 1 mm. long or less.
    - Fruits rugose. 2. *A. monophylla.*
    - Fruits smooth. 3. *A. glandulosa.*
  - Fruit-body 3 mm. long or more, the beak more than 1 mm. long.
    - Blades of the lower leaves mostly bipinnatifid, the segments narrow: staminate heads about 3 mm. wide. 4. *A. elatior.*
    - Blades of the lower leaves mostly pinnatifid, the segments broad: staminate heads 4–5 mm. wide. 5. *A. Rugelii.*
- Leaf-blades canescent: plants perennial. 6. *A. hispida.*

Leaf-blades entire, toothed, or 3–5-lobed.
- Leaves with winged petioles: fruits slightly if at all pitted between the ridges which end in short conic spines. 7. *A. trifida.*
- Leaves with wingless petioles: fruits pitted between the ridges which end in tubercle-like spines. 8. *A. aptera.*

1. A. bidentata Michx. Stem 1 m. tall or less, rough hirsute: leaf-blades lanceolate, linear-lanceolate, or elliptic-lanceolate, 2–8 cm. long, each with a sharp lobe-like tooth on one or both sides near the base: staminate involucre turbinate: pistillate heads solitary or two together in the axils: fruit 6–7 mm. long, the body much longer than the beak, the spines subulate, directed forward, ½ as long as the beak.—Prairies, Interior Low Plateaus and adj. provinces, Miss. to Tex., Nebr., and Ky.—Sum.–fall.



2. A. monophylla (Walt.) Rydb. Stem 1.5 m. tall or less, pubescent with lax more or less scattered hairs: leaf-blades deeply bipinnatifid, or those of the upper leaves pinnatifid or merely toothed, scabrous above,

strigillose beneath, the segments lanceolate, acute: staminate involucre broadly obconic, 1.5–2 mm. high: fruit 2.5–3 mm. high, the body obovoid, short-beaked, with 5–7 short conic spines.—Prairies, coastal dunes, pinelands, and waste-places, Coastal Plain, Fla. to Tex. and N. C.—(*W. I.*)—All year.

3. **A. glandulosa** Scheele. Stem 1 m. tall or less, sparingly pubescent: leaf-blades bipinnatifid or pinnatifid, strigose on both sides, the segments linear to linear-lanceolate, acute or acuminate: staminate involucre saucer-shaped, 1–1.5 mm. high: fruit about 2.5 mm. long, the body broadly obovoid, short-beaked with usually 5 or 6 tubercle-like spines.—Low grounds, river-bottoms, and banks, Coastal Plain, W Fla. to Tex.—Sum.–fall.

4. **A. elatior** L. Stem 1.5 m. tall or less; more or less hirsute: leaf-blades bipinnatifid or those of the upper ones merely pinnatifid, strigillose above, often hirsute beneath, the segments lanceolate to subelliptic, usually acute: staminate involucre saucer-shaped, 1–1.5 mm. high: fruit 4–4.5 mm. long, the body obovoid, often broadly so, rather long-beaked, with 5–7 short-subulate spines. [*A. artemisiifolia* Fl. SE U. S.]—(ROMAN-WORMWOOD. HOT-WEED. BITTER-WEED.)—Dry soil, beaches, prairies, pinelands, and cult. grounds, various provinces, N. C. to Tex., Calif., Wash., and N. S.—(*W. I.*)—Spr.–fall.

5. **A. Rugelii** Rydb. Stem 1 m. tall or less, densely hirsute: leaf-blades pinnatifid or partly bipinnatifid, hispidulous and strongly veined, the segments ovate to lanceolate: staminate involucre shallowly cupulate, 1.5–2 mm. high: fruit 4–4.5 mm. long, the body obovoid, short-beaked, with 5 or 6 short-subulate or tubercle-like spines.—Sand-dunes and pinelands, Coastal Plain, Fla. and Ga.—Sum.–fall.—The short-petioled or sessile leaves turn dark in drying.

6. **A. hispida** Pursh. Stem and branches prostrate, creeping, several m. long or less, white hirsute or hispidulous: leaf-blades tripinnatifid, broadly ovate in outline, the segments divergent, ovate to obovate, obtuse or merely acutish: staminate involucre cupulate, about 2 mm. high: fruit 3.5–4 mm. long, the body obovoid, veinly, glandular, short-beaked, with 1–5 unequal short-conic spines.—Beaches and coastal dunes, Fla.—(*W. I., Mex., C. A., S. A.*)—All year.—Often efficacious as a sand-binder.

7. **A. trifida** L. Stem 5 m. tall or less, hispidulous or hirsute: leaf-blades except sometimes those of the upper ones, 3- or 5-lobed, mostly 1–3 dm. long; lobes ovate to lanceolate, serrate: staminate involucre saucer-shaped, about 1 mm. high: fruit 7–8 mm. long, the body broadly obovoid, with 6 or 7 ridges which end in short-conic spines, stout-beaked.—(GREAT-RAGWEED. HORSE-CANE.)—River-banks, cult. grounds, and waste-places, various provinces, Fla. to Tex., Colo., B. C., and Que.—Sum.–fall.—Plants whose juvenile main stem is cut off, produce unlobed leaf-blades.

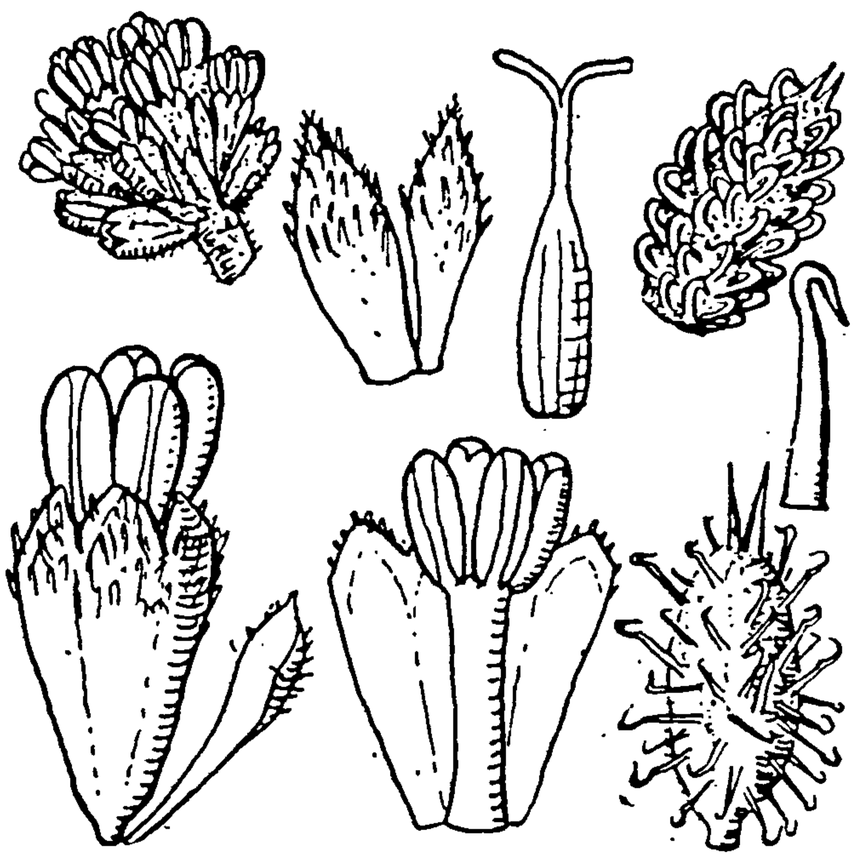
8. **A. aptera** DC. Stem 5 m. tall or less, scabrous: leaf-blades, except some of the upper ones, 3- or 5-lobed, the lobes lanceolate to ovate, coarsely serrate or unevenly toothed: staminate involucre saucer-shaped about 1 mm. high: fruit 5–6 mm. long, the body obovoid, with 4–8 ridges which end in tubercle-like spines, short-beaked.—Low grounds and wet places, various provinces, Miss. to Ariz.—Sum.–fall.—In this and the next preceding species, the staminate involucre and corollas are black-streaked.

3. **FRANSERIA** Cav. Anual or perennial caulescent herbs, or low shrubs: leaves alternate or opposite: blades toothed or dissected. Heads in spikes or

racemes, the staminate with saucer-shaped or turbinate lobed involucres. Pistillate involucre of several fused bracts, nut-like, becoming a several- or many-spined bur, 2-lipped or 2-beaked at the tip.—About 25 species, American.—RAGWEEDS.

1. **F. confertiflora** (DC.) Rydb. Perennial, 2 m. tall or less, more or less strigose: leaf-blades bipinnately or tripinnately dissected, the segments lanceolate to linear, acute, the terminal one elongate: staminate involucre 2 mm. high or nearly so, hirsutulous: fruit ovoid or globose in outline, 2–3 mm. long, with a single beak and usually 6–18 spines.—Plains and moist grounds, various provinces, Tenn. to Tex., N. M., and Colo.—(*Mex.*)—Sum.–fall.

4. **ACANTHOXANTHIUM** Fourr.[1] Coarse monoecious annual herbs. Leaves alternate, with 3-pronged or simple stipular spines: blades pinnately lobed or entire. Staminate heads mostly in terminal capitate clusters: involucre of distinct bracts: corolla tubular-funnelform, 5-lobed: filaments monadelphous. Pistillate involucres axillary, closed, 1- or 2-beaked or sometimes beakless, the body cylindric-ellipsoid, 1- or 2-flowered, armed with numerous spines which are first bent backward and then hooked forward, the beaks straight, if two, unequal in length: corolla wanting: stigmas 2. Achenes 1 or 2 in each bur.—Four species, South American.



1. **A. spinosum** (L.) Fourr. Stem 3–10 dm. tall, in age stramineous, branched: leaf-blades lanceolate, entire or 3–5-lobed, strigose above, white-tomentose beneath, 5–10 cm. long; spines 3-pronged, up to 2.5 cm. long: bur with an ellipsoid body, 10–13 mm. long, pubescent, the prickles about 2 mm. long; the beaks up to 3 mm. long. [*Xanthium spinosum* L.]—(CLOTBUR.)—Waste-places, fields, and roadsides, various provinces, Fla. to Tex., Calif., B. C., and Me. Nat. of S. Am.—(*W. I.*, *Mex.*, *C. A.*, *O. W.*)—Sum.

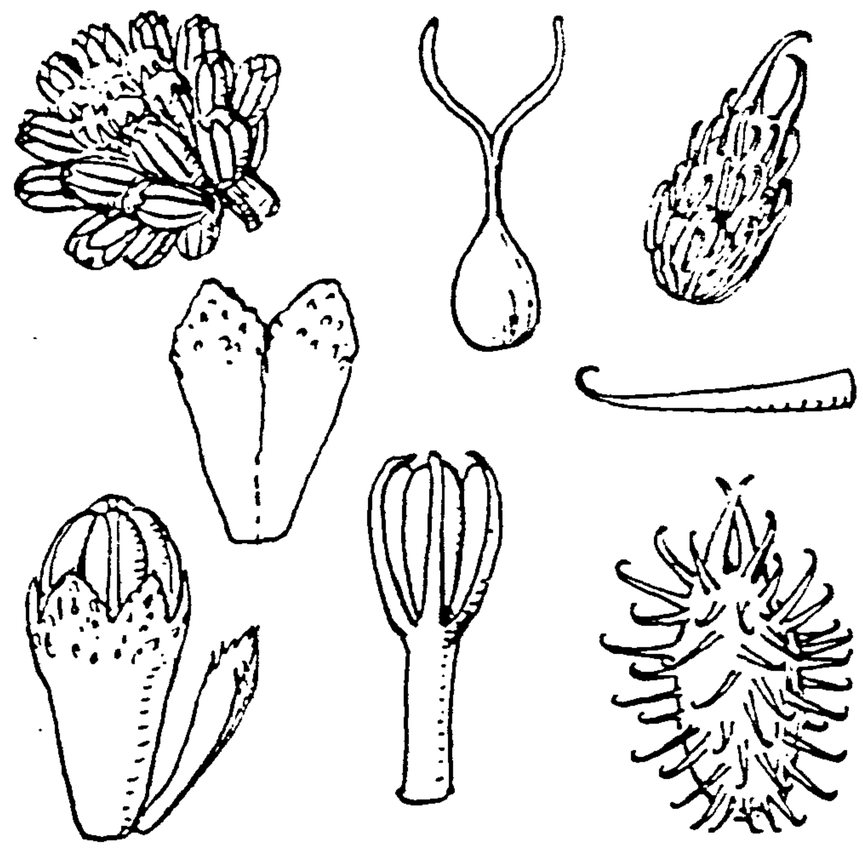
5. **XANTHIUM** L.[1] Coarse monoecious annual herbs. Leaves alternate: blades usually ovate to reniform in outline, more or less digitately 3–5-lobed, often cordate at the base. Staminate heads in terminal spikes or racemes: involucre of distinct bracts in 1–3 series: corolla tubular-funnelform, 5-lobed: filaments monadelphous. Pistillate involucre closed, 2- or 3-beaked, the body cylindric-fusiform, ellipsoid, or ovoid, 2- or 3-flowered, armed with spines which are hooked at the apex, the beaks nearly equal, more or less curved, 2-lobed, the outer lobe the longer and incurved: corolla wanting: stigmas 2. Achene

[1] Contributed by the late Per Axel Rydberg.

solitary in each cavity of the bur.—About 40 species, widely distributed.—Sum.—CLOTBURS. BURWEEDS. COCKLEBURS.

Body of the bur 1.5–3 cm. long.
  Bur minutely glandular-puberulent, hispidulous, or glabrate.
    Body of the bur broadly fusiform, nearly half as wide as long. 1. *X. americanum.*
    Body of the bur almost cylindric, about a third as wide as long. 2. *X. cylindraceum.*
  Bur more or less coarsely hispid, especially on the lower part of the spines.
    Body of the bur cylindro-fusiform, about a third as wide as long, less than 2 cm. long; spines 5–7 mm. long. 3. *X. pennsylvanicum.*
    Body of the bur ellipsoid, half as wide as long or nearly so.
      Body of the bur about 1.5–1.8 cm. long; spines 3–5 mm. long. 4. *X. echinatum.*
      Body of the bur about 2.5–3 cm. long; spines 8–11 mm. long. 5. *X. speciosum.*
Body of the bur about 1 cm. long. 6. *X. echinellum.*

1. **X. americanum** Walt. Plant glabrate or finely pubescent, 2–13 dm. tall: leaf-blades ovate to deltoid, 5–30 cm. long: body of the bur broadly fusiform, 15–18 mm. long, thickly beset with 100–200 slender, more or less hooked spines, which are 3–4 mm. long, and nearly equalling the beaks which are straight nearly to the apex. [*X. chinense* Millsp. & Sherff scarcely Mill. *X. glabratum* (DC.) Britton]—Waste-places, cult. grounds, and woodsides, various provinces, Fla. to Tex., Nebr., and Mass.



2. **X. cylindraceum** Millsp. & Sherff. Plant rough-puberulent, 5–15 dm. tall: leaf-blades deltoid-ovate, 8–10 cm. long: body of the bur almost cylindric, beset with 125–175 slender hooked spines about 3 mm. long; beaks 4–5 mm. long, strongly incurved.—Waste-places, old fields, and cult. grounds, Piedmont, N. C.

3. **X. pennsylvanicum** Wallr. Plant rough-pubescent, at least above, 2–6 dm. tall: leaf-blades ovate to reniform: body of the bur cylindro-fusiform, 15–20 mm. long, the spines 100–150, nearly as long as the diameter of the body; beaks 4–6 mm. long, often incurved.—Rich soil, various provinces, Fla. to Tex., Minn., Mass., and Va.

4. **X. echinatum** Murr. Plant rough-pubescent, 3–16 dm. tall: leaf-blades ovate to deltoid, or reniform: body of the bur ellipsoid, 15–18 mm. long, hispid, the spines 100–200, stout, more or less hooked; beaks 3–5 mm. long, stout, incurved.—River-banks, beaches, and waste-places, various provinces, N. C. to Nebr., N. D., and Me.

5. **X. speciosum** Kearney. Plant somewhat pubescent, 10–15 dm. tall: leaf-blades deltoid-ovate to somewhat reniform: body of the bur 25–30 mm. long, pubescent and closely beset with 200 or more incurved spines; beaks 8–10 mm. long, incurved.—Sandy bottoms, Interior Low Plateaus and adj. provinces, Tenn. to Tex., Mont., and Minn.

6. **X. echinellum** Greene. Plant sparingly hispidulous and the stem striate and reddish: leaf-blades broadly cordate, 5–18 cm. long and fully as wide, 3-

ribbed, 3–5-lobed: burs 3–8 together; body about 1 cm. long, about 5 mm. wide, sparingly glandular-puberulent, the spines 150–200, slender, about 3 mm. long; beaks stout, ascending, nearly straight, 4 mm. long.—Clay County, Miss.

Family 2. **CARDUACEAE** Neck.— Thistle Family

Herbs or rarely shrubs, or sometimes trees in tropical regions. Leaves opposite or alternate, sometimes all basal, without stipules; blades various. Flowers perfect, pistillate, or neutral, or sometimes monoecious or dioecious, aggregated on a receptacle, surrounded by an involucre. Receptacle smooth, pitted, or honey-combed, naked or with scales, chaff, fimbrillae, or bristles subtending the flowers. Calyx of bristles, awns, or scales, or a crown or cup-like, forming pappus at maturity, or wanting. Corolla of 5 united petals, usually equally 5-lobed, or in the case of the marginal flowers of the head the corolla is often produced on one side into a ligule; when ray-flowers are present the head is said to be radiate, when wanting it is said to be discoid. Androecium of 5 stamens: filaments mostly adnate to the corolla-tube: anthers often appendaged at the apex and sometimes also at the base, united into a ring (syngenecious) except in *Kuhnia*. Gynoecium 2-carpellary. Ovary inferior, 1-celled. Stigmas of the fructiferous flowers 2. Ovule solitary. Fruit an achene. Seed erect.—About 800 genera and 10,000 species, of wide geographic distribution. In the following figures the filaments and the anthers are not always shown in proper proportions.

Anthers not caudate at the base.

- Heads discoid, but rarely with the corollas split on one side and thus ligulate: corollas varying from white to red or blue, never yellow or brown: stigmas half-cylindric.
  - Stigmas much elongate, acute, with stigmatic part on the inside, hispidulous without.
    - Achene not 4-angled, or if 4-angled not clavate: pappus-squamellae, if any, not with strong midribs. — Tribe I. Vernonieae.
    - Achenes 4-angled, clavate: pappus of elongate squamellae with strong midribs (*Palafoxia* and *Polypteris* in) — VII. Helenieae.
  - Stigmas somewhat elongate, obtuse or rounded at the apex, with the stigmatic part on the inside only near the base, the upper portion, as well as the outside, hispidulous. — II. Eupatorieae.
- Heads radiate, or, if discoid, the disk-corollas usually yellow or brown: stigmas either without appendages, truncate or rounded at the apex, or with acute appendages.
  - Leaves or bracts, or both, with conspicuous resinous glands. — VIII. Tageteae.
  - Leaves and bracts without resinous glands (rarely punctate with oil glands).
    - Pappus of squamellae or stiff bristles, or coroniform, or wanting.
      - Involucral bracts not scarious-margined, usually green and more or less foliaceous.
        - Receptacle chaffy (paleaceous). — VI. Heliantheae.
        - Receptacle naked or fimbrillate in *Gaillardia*.
          - Involucral bracts imbricate in several series. — III. Astereae.
          - Involucral bracts in 1 or 2 subequal series. — VII. Helenieae.
      - Involucral bracts with dry scarious or hyaline margins or tips.
        - Pappus of squamellae: stigmas with acute or acutish appendages. — VII. Helenieae.
        - Pappus coroniform or wanting: stigmas truncate at the apex. — IX. Anthemideae.

Pappus, at least in part, of many capillary bristles.
Stigmas flattened, with appendages, hairy on the outside: involucres imbricate. — III. ASTEREAE.
Stigmas terete, truncate, or appendaged: involucral bracts in one series. — X. SENECIONEAE.
Anthers caudate at the base.
Stigmas without a ring of long hairs below.
Disk-corollas not 2-lipped.
Pistillate flowers with filiform corollas, without ligules. — IV. GNAPHALIEAE.
Pistillate flowers with ligulate corollas. — V. INULEAE.
Disk-corollas 2-lipped, the upper lip 2-lobed, lower 3-lobed. — XII. MUTISIEAE.
Stigmas with a ring of long hairs at the base of the stigmatic portion: heads discoid or the ray-corollas actino-morphic and neutral. — XI. CYNAREAE.

I. VERNONIEAE

Corollas all alike, equal: bracts of the involucre unappendaged.
Pappus of 2 series: corollas regular: heads many-flowered, not glomerate.
Achenes ribbed or grooved: both series of the pappus persistent: perennials. — 1. VERNONIA.
Achenes terete, ribless: inner series of the pappus deciduous: annuals. — 2. SENECIODES.
Pappus simple: corollas irregular, split on the inner side: heads 2–5-flowered, in involucrate heads of a second order. — 3. ELEPHANTOPUS.
Corollas of the marginal flowers enlarged, oblique: an inner series of bracts with pectinate-spinulose appendages. — 4. STOKESIA.

II. EUPATORIEAE

Anthers truncate or broadly rounded at the apex, the connective without appendages: heads few-flowered. — 5. HARTWRIGHTIA.
Anthers with the connective produced into an appendage at the apex.
Achenes 3–5-angled.
Pappus of squamellae, sometimes cup-like or crown-like.
Leaves whorled: bracts of the involucre nerveless: corolla-tube abruptly dilated into the broad throat. — 6. SCLEROLEPIS.
Leaves opposite, or alternate above: bracts of the involucre striate: corolla narrow throughout. — 7. AGERATUM.
Pappus of elongate bristles or hairs.
Involucral bracts more than 4: flowers 4–many.
Receptacle of the flowers flat.
Involucral bracts leathery or coriaceous, in several series, striate. — 8. OSMIA.
Involucral bracts thin, membranous, in 1–few series, few-ribbed or ribless. — 9. EUPATORIUM.
Receptacle conic or hemispheric. — 10. CONOCLINIUM.
Involucral bracts and flowers 4. — 11. MIKANIA.
Achenes 8–10-ribbed or 8–10-striate.
Involucral bracts in several series, well imbricate.
Bracts not herbaceous, thin, striate.
Pappus-bristles scabrous or barbellate: anthers united: involucral bracts usually many. — 12. COLEOSANTHUS.
Pappus-bristles plumose: anthers distinct: involucral bracts few. — 13. KUHNIA.
Bracts herbaceous or partly colored, not striate: pappus of capillary or plumose bristles.
Receptacle chaffy: heads corymbose. — 14. CARPHEPHORUS.
Receptacle naked.
Herbs: heads spicate or racemose: bracts of the involucre spirally imbricate.
Heads corymbose: basal leaves in depressed rosettes; blades rather broad. — 15. LITRISA.

Heads spicate or racemose or rarely cymose: basal leaves not in rosettes, erect or nearly so: blades elongate.
Pappus in one series of equal bristles: leaves herbaceous: plant usually with a globose-woody root. 16. LACINIARIA.
Pappus in two series, the outer bristles shorter than the inner: leaves succulent: plant with an elongate fleshy root. 17. AMMOPURSUS.
Shrub: heads corymbose: bracts of the involucre imbricate in definite vertical ranks. 18. GARBERIA.
Involucral bracts subequal, little imbricate, not striate. 19. TRILISA.

III. ASTEREAE

Plants not dioecious.
Ray-corollas yellow or none or white in *Solidago bicolor*.
Pappus of squamellae or awns, or wanting, not of capillary bristles.
Heads small, few-flowered: involucre campanulate or cylindric, not more than 5 mm. high: ligules of the ray 10 or less, less than 5 mm. long.
Disk-flowers sterile: leaves with narrow entire blades. 20. AMPHIACHYRIS.
Disk-flowers fertile: leaves with cordate toothed blades. 33. BRACHYCHAETA
Heads larger, many-flowered: involucre hemispheric or depressed: ligules of the ray 12 or more, 1 cm. long or more (wanting in a few species): pappus of 2–8 deciduous stout awns. 21. GRINDELIA.
Pappus, at least in part, of capillary bristles.
Pappus double, at least in the disk-flowers, the inner of capillary bristles, the outer of short squamellae or short bristles.
Ray-achenes flattened, with well developed pappus.
Leaf-blades not grass-like, glabrous or pubescent, but not silky: achene somewhat turgid, turbinate, obovoid, or ellipsoid-obovoid, with no neck. 22. CHRYSOPSIS.
Leaf-blades grass-like, silky-tomentose: achene spindle-shaped, with more or less of a neck. 23. PITYOPSIS.
Ray-achenes turgid, with obsolete or coroniform pappus. 24. HETEROTHECA.
Pappus simple.
Heads discoid.
Involucre narrowly turbinate; bracts more or less arranged in definite (usually 5) vertical ranks. 25. CHONDROPHORA.
Involucre broadly turbinate to hemispheric; bracts squarrose, imbricate, but not in definite vertical ranks. 26. BRINTONIA.
Heads radiate.
Leaf-blades pinnatifid or toothed; lobes or teeth spinulose-tipped. 27. SIDERANTHUS.
Leaf-blades entire or toothed, the teeth not bristle-tipped.
Pappus-bristles elongate, equaling or longer than the achenes.
Bracts of the involucre narrow, neither longitudinally ribbed nor striate.
Annual or biennial herbs. 28. ISOPAPPUS.
Perennial herbs or undershrubs.
Ray-flowers not more numerous than the disk-flowers: recep-

tacle alveolate or pitted.
Leaves with distinct depressions; blades veinless, entire: under-shrubs. 29. CHRYSOMA.
Leaves without depressions; blades veiny, usually toothed: herbs. 30. SOLIDAGO.
Ray-flowers more numerous than the disk-flowers: receptacle fimbriolate; heads corymbose. 31. EUTHAMIA.
Bracts of the involucre longitudinally ribbed or striate. 32. OLIGONEURON.
Pappus-bristles much shorter than the achenes. 33. BRACHYCHAETA.
Ray-corollas blue, purple, pink, or white.
Pappus a mere crown or of a few squamellae, or subulate bristles, or wanting.
Pappus of a mere crown or wanting.
Pappus wanting or obsolete: bracts of the involucre imbricate in 2 or 3 series. 34. ASTRANTHIUM.
Pappus a small crown: bracts of the involucre imbricate in few series. 35. APHANOSTEPHUS.
Pappus of a series of short squamellae and usually also 2–4 slender bristles. 36. BOLTONIA.
Pappus, at least of the disk-flowers, of numerous capillary bristles.
Ray-corollas conspicuous, longer than the pappus: ligules of the ray usually equaling or exceeding the disk, spreading.
Stigma-tips lanceolate to filiform.
Pappus-bristles not in two distinct series.
Disk-corollas as well as ray-corollas white or stramineous.
Bracts of the involucre leathery, with green thick tips. 37. SERICOCARPUS.
Bracts not leathery, their green tips not thick (see *Solidago bicolor*). 30. SOLIDAGO.
Disk-corollas typically yellow, changing to red, brown, or purple: ray-corollas various: bracts of the involucre in several series, more or less foliaceous, at least at the tip: perennials with rootstocks. 38. ASTER.
Pappus distinctly double, the outer series of short subulate bristles.
Inner pappus-bristles clavate at the apex: bracts of the involucre thin-coriaceous, without herbaceous tips, shorter than the disk. 39. DOELLINGERIA.
Inner pappus-bristles filiform throughout: bracts of the involucre equaling the disk. 40. IONACTIS.
Stigma-tips triangular or ovate, obtuse, rarely acutish: bracts of the involucre in 1–2, rarely 3 series. 41. ERIGERON.
Ray-corollas inconspicuous, not longer than the pappus: ligules of the ray short and erect: stigma-tips obtuse. 42. LEPTILON.
Plants dioecious: heads unisexual, discoid: pappus-bristles of the staminate flowers with clavate tips. 43. BACCHARIS.

IV. GNAPHALIEAE

Receptacle not chaffy.
Involucral bracts not scarious: stigmas of the perfect (usually sterile) flowers elongate and acute.
Stem not winged by the decurrent leaves: involucral bracts persistent.
Caulescent herbs or shrubs: stem and branches not wiry. 44. PLUCHEA.

Acaulescent herbs: scape and branches wiry. 45. SACHSIA.
Stem winged by the decurrent leaves: involucral bracts mostly deciduous. 46. PTEROCAULON.
Involucral bracts scarious or with scarious colored tips: stigmas of the perfect flowers short, truncate, distinct or sometimes united.
Plants dioecious or the pistillate heads with a few hermaphrodite flowers in the center: perfect flowers usually sterile.
Pappus-bristles of the pistillate flowers falling off in a ring: central perfect flowers none. 47. ANTENNARIA.
Pappus-bristles of the pistillate flowers falling off separate: central perfect flowers present in the pistillate heads. 48. ANAPHALIS.
Plants not dioecious: flowers pistillate or perfect, all fertile.
Pappus-bristles capillary, not plumose. 49. GNAPHALIUM.
Pappus-bristles plumose. 50. FACELIS.
Receptacle chaffy.
Receptacle subulate: perfect flowers fertile, their achenes with capillary pappus. 51. GIFOLA.
Receptacle hemispheric: perfect flowers usually sterile, their achenes without pappus. 52. FILAGINOPSIS.

V. INULEAE

Achene not contracted at the apex into a short neck: pappus-bristles not united at the base into a cup.
Achene 4-angled: outer involucral bracts foliaceous. 53. INULA.
Achene not angled: involucral bracts not foliaceous. 54. VICOA.
Achene contracted at the apex into a neck: pappus-bristles united at the base into a cup. 55. CUPULARIA.

VI. HELIANTHEAE

Disk-flowers perfect, but sterile.
Achene thick, not conspicuously flattened: pappus wanting.
Inner involucral bracts smooth, merely embracing the achenes.
Achenes strongly many-striate: leaves palmately lobed. 56. SMALLANTHUS.
Achenes 3–5-ribbed or 3–5-angled: leaves pinnately lobed. 57. POLYMNIA.
Inner involucral bracts prickly, closely and permanently enclosing the achenes and falling off with them. 58. ACANTHOSPERMUM.
Achene conspicuously flattened.
Achenes falling free, wing-margined. 59. SILPHIUM.
Achenes adnate to 2 or 3 bractlets (subtending as many sterile flowers), and falling away with them, wingless.
Ligules of the ray well developed, plane and exserted: receptacle flat.
Leaves opposite: pappus semicupulate, *i.e.*, with the crown developed on the outside only. 60. CHRYSOGONUM.
Leaves alternate: pappus wanting or of 2 short awns or teeth. 61. BERLANDIERA.
Ligules of the ray poorly developed, reduced to small lobe or 2 or 3 teeth, the marginal corollas reduced to a truncate or obliquely cleft tube. 62. PARTHENIUM.
Disk-flowers perfect and fertile.
Ray-corollas ligulate, persistent on the achenes and becoming papery in texture: ray-flowers fertile.
Achenes of the disk-flowers flattened or compressed, 4-angled; those of the ray-flowers often 3-angled: bractlets conduplicate around the achenes. 63. ZINNIA.
Achenes not flattened: involucre broad: receptacle convex or conic. 64. HELIOPSIS.
Ray-corollas ligulate, deciduous from the achenes, or heads discoid.
Involucre conspicuously 4- (rarely 5-) angled in the bud; bracts (outer) 4 or 5, foliaceous, valvate, connate at the base. 65. TETRAGONOTHECA.

- Involucre not 4-angled; bracts several or numerous, distinct.
  - Pappus consisting of a small crown or wanting, or of a few squamellae or awns on the angles of the achenes, and rarely some minute ones interposed.
    - Achenes, at least those of the disk, not obcompressed, *i.e.*, if compressed, arranged radially.
      - Paleae of the receptacle mere chaffy awns or bristles: disk-corollas 4- or 5-lobed: achenes of the disk compressed; those of the ray 3-sided. — 66. VERBESINA.
      - Paleae of the receptacle concave or conduplicate.
        - Bracts of the involucre dry or papery: heads usually discoid: pappus of few, slender awns. — 67. MELANTHERA.
        - Bracts of the involucre herbaceous or foliaceous: heads usually radiate.
          - Receptacle high, hemispheric, conic, subulate, columnar, or globose.
            - Ray-flowers fertile: stigmas of the disk-flowers truncate: pappus an awn on one or more achene-angles, or none. — 68. SPILANTHES.
            - Ray-flowers sterile: stigmas of the disk-flowers with acute, hispid appendages.
              - Achenes 4-angled or terete, wingless.
                - Disk-corollas without a tube: ligules of the ray purplish, rarely white or yellow. — 69. ECHINACEA.
                - Disk-corollas with a manifest but short tube: ligules of the ray yellow or none.
                  - Achene 4-angled.
                    - Achenes quadrilaterally compressed, apex commonly covered with the corolla-tube. — 70. VIGUIERA.
                    - Achenes equally 4-angled, apex not covered by the corolla-tube. — 71. RUDBECKIA.
                  - Achene terete. — 72. DRACOPIS.
              - Achenes compressed, winged, or wing-margined.
                - Receptacle columnar: bracts of the involucre numerous. — 73. RATIBIDA.
                - Receptacle globose: bracts of the involucre few. — 84. RIDAN.
          - Receptacle flat or merely convex, or rarely somewhat conic.
            - Achene not strongly compressed, not wing-margined.
              - Ray-flowers fertile.
                - Achenes turgid or those of the disk obscurely angled: herbs.

Pappus of several paleae partly united into a cup or ring.
Achene corky, tubercled, turgid, bluntly 3-angled: ligules of the ray mostly 3-toothed. — 74. WEDELIA.
Achene neither corky nor tubercled, compressed, unequally 3-angled; ligules of the ray mostly 2-cleft. — 75. STEMMODONTIA.
Pappus of several distinct paleae, and occasionally with 2 additional short awns. — 76. PASCALIA.
Achenes sharply 4-angled or those of the rays 3-angled: shrubs. — 77. BORRICHIA.
Ray-flowers sterile or wanting: achene more or less compressed, 4-angled.
Pappus of several scales and awns; the scales persistent: involucral bracts in two distinct series. — 78. TITHONIA.
Pappus of few early deciduous awns: involucral bracts in 3 or 4 series. — 79. HELIANTHUS.
Achene strongly compressed.
Receptacle flat or convex: bracts of the involucre numerous.
Intermediate squamellae of the pappus present or the awns connected by their bases. — 80. PHOEBANTHUS.
Intermediate squamellae wanting, the awns distinct.
Involucre flat; bracts elongate, spreading: annual herbs with petioled leaf-blades. — 81. XIMENESIA.
Involucre campanulate to hemispheric; bracts short, appressed: perennial herbs with decurrent or sessile leaves.
Ray-flowers fertile: heads numerous, corymbose: achenes long-awned. — 82. PHAETHUSA.
Ray-flowers sterile: heads solitary or few together: achenes

with short or obsolete awns. — 83. PTEROPHYTON.
Receptacle globose: bracts of the involucre few: leaves decurrent. — 84. RIDAN.
Achenes decidedly obcompressed, *i.e.*, flattened parallel to the involucral bracts.
Involucre simple, of 1 or 2 herbaceous and several chaffy bracts.
Achenes of the ray with ascending marginal bristles. — 85. SYNEDRELLA.
Achenes of the ray without marginal bristles. — 85a. CALYPTOCARPUS.
Involucre manifestly double, the outer one involucellate.
Pappus a pair of fimbriolate squamellae, short awns, a minute crown, or wanting. — 86. COREOPSIS.
Pappus of 2–4 usually barbellate awns.
Achene beakless: ligules of the ray yellow or white. — 87. BIDENS.
Achene distinctly beaked: ligules of the ray purple or rose, or orange-yellow. — 88. COSMOS.
Pappus of many similar squamellae.
Paleae of the receptacle concreted, forming alveoli, the receptacle resembling a honeycomb: ray-flowers neutral.
Pits of the receptacle with broad erose-toothed edges: head solitary: ray-flowers 20–30. — 89. ENDORIMA.
Pits of the receptacle with cuspidate and erose toothed edges: heads corymbose: ray-flowers 8–18. — 90. ACTINOSPERMUM.
Paleae of the receptacle distinct, thin.
Ray-flowers wanting: squamellae of the pappus nerveless. — 91. MARSHALLIA.
Ray-flowers present, pistillate and fertile.
Squamellae of the pappus of the disk flowers with thick midribs and fimbriate margins. — 92. GALINSOGA.
Squamellae of the pappus aristate-acuminate, plumose-ciliate. — 93. TRIDAX.

VII. HELENIEAE

Achenes distinctly 3–5-angled, or if less distinctly so, then obconic.
Stigmas either short or with a distinct appendage, not hispidulous to or below the fork; either disk- or ray-corollas or both yellow, if purple the involucre not narrow.
Bracts of the involucre wholly herbaceous, or somewhat chartaceous at the base, without scarious margins.
Involucre companulate or hemispheric; bracts erect or ascending, not reflexed; outer bracts more or less united below. — 94. HYMENOXYS.
Involucre rotate; bracts spreading, wholly or the tips reflexed.
Receptacle not bristly: pappus-scales thin and scarious, the midrib, when present, not becoming spine-like. — 95. HELENIUM.
Receptacle bristly, fimbrillate, triangular-fimbrillate, or naked: pappus-scales scari-

ous, but becoming rigid, the midrib excurrent as a rigid spine. 96. GAILLARDIA.
Bracts of the involucre with thin, more or less scarious and colored margins. 97. HYMENOPAPPUS.
Stigmas long and filiform, stigmatose to near the apex, hispidulous down to the fork or below; both disk- and ray-corollas rose-purple: involucre from elongate-turbinate to almost cylindric.
Throat of the disk-corollas short-campanulate or scarcely any, much shorter than the long linear lobes and the tube. 98. POLYPTERIS.
Throat of the disk-corollas cylindric, much longer than the lanceolate lobes and the tube. 99. PALAFOXIA.
Achenes 8–10-ribbed or -striate, linear or elliptic, terete or oval in cross-section: heads few-flowered and few-bracted. 100. FLAVERIA.

VIII. TAGETEAE

Stigmas of the perfect flowers elongate, appendiculate or truncate: leaves, if simple, not bristly-ciliate.
Squamellae of the receptacle few, 3–10, some of them, usually 1 or 2, longer, linear or subulate, acute, the rest broader and shorter, usually obtuse; bracts of the involucre united to near the apex. 101. TAGETES.
Squamellae of the receptacle 10 or more, rarely less, each with 9 or more stiff bristles. 102. BOEBERA.
Stigmas of the perfect flowers short, elliptic: leaves simple, bristly-ciliate, at least towards the base. 103. PECTIS.

IX. ANTHEMIDEAE

Receptacle with chaff, this consisting of usually membranous, concave, elongate paleae.
Achene more or less obcompressed, subrhombic or obliquely triquetrous in cross-section: tube of the disk-corollas more or less flattened: heads small: ligules of the ray few, short. 104. ACHILLEA.
Achene terete, cylindric, obovoid, or ellipsoid: heads large and broad: ligules of the ray conspicuous or wanting.
Ray-flowers fertile: paleae of the receptacle membranous, or cartilaginous in *Ormenis*, subtending all the flowers.
Tube of the disk-corollas produced into a spur-like appendage at the base: ligules of the ray, in ours white with a yellow base. 105. ORMENIS.
Tube of the disk-corollas not appendaged at the base: ligules of the ray white or wanting. 106. ANTHEMIS.
Ray-flowers neutral: paleae of the receptacle subulate, stiff, subtending only the innermost flowers. 107. MARUTA.
Receptacle without chaff, naked or hairy.
Heads radiate, with usually flat ligules: anther-tips deltoid, mostly obtuse.
Pappus of a more or less developed crown or margin.
Receptacle high, hemispheric, conic or subglobose: achene with 3–5 ribs on the inner half, and nerveless on the back. 108. CHAMOMILLA.
Receptacle convex or nearly flat: achene equally 5–10-ribbed or 5–10-angled. 109. MATRICARIA.
Pappus, at least of the disk-flowers, wanting.
Achenes all 10-ribbed or 10-angled: ligules of the ray white or pink. 110. LEUCANTHEMUM.
Achenes of the ray-flowers 2- or 3-winged: ligules of the ray yellow. 111. CHRYSANTHEMUM.
Heads discoid or apparently so: pistillate ray-flowers, if present, without well-developed ligules.
Marginal pistillate flowers, if present, with corollas or sometimes wanting in *Artemisia:* achene not flattened.
Anthers with ovate obtuse tips: corollas of the marginal flowers oblique: pappus coroniform. 112. TANACETUM.
Anthers with subulate tips: corollas of the marginal flowers regular: pappus wanting. 113. ARTEMISIA.
Marginal pistillate flowers without corollas: achene flattened, obcompressed.

Achenes not hairy at the apex, with thin flat wings: disk-corollas cylindric, without differentiation between tube and throat: anthers broad, rounded at the base. 114. SOLIVA.
Achenes villous at the apex, with thick corky wings: disk-corollas with a slender tube and elongate-funnelform throat: anthers narrow, somewhat sagittate at the base. 115. GYMNOSTYLES.

X. SENECINEAE

Leaves opposite, but in our species all near the base. 116. ARNICA.
Leaves alternate.
Stigmas filiform, elongate, acute: throat of the corolla cylindric.
Heads with no outer involucre: achene 5-angled. 117. EMILIA.
Heads with outer involucre present: achene 8–10 ribbed, terete. 118. GYNURA.
Stigmas short, truncate at the apex: throat of the corolla campanulate.
Heads discoid; corollas whitish or pinkish.
Marginal pistillate flowers wanting, the flowers all perfect.
Corolla-lobes longer than the throat: involucral bracts 5–8: center of the receptacle usually with a fleshy point. 119. MESADENIA.
Corolla-lobes not longer than the throat: involucral bracts 12–15: receptacle flat. 120. SYNOSMA.
Marginal pistillate flowers present, their corollas actinomorphic, 4–5-lobed, similar to but more slender than those of the disk-flowers. 121. ERECHTITES.
Heads usually radiate, if discoid the corollas yellow. 122. SENECIO.

XI. CYNAREAE

Achenes inserted by their very bases or nearly so, not obliquely.
Bracts of the involucre hooked: leaves not with spinose lobes and tips. 123. ARCTIUM.
Bracts of the involucre not hooked: leaves with spinose lobes and tips.
Filaments papillose or pilose, free.
Receptacle bristly: pappus-bristles plumose. 124. CIRSIUM.
Receptacle deeply honeycombed, the pits with a toothed margin: pappus-bristles scabrous or barbellate. 125. ONOPORDON.
Filaments glabrous, united into a tube: receptacles bristly: pappus barbellate. 126. MARIANA.
Achenes inserted obliquely on the receptacle.
Achene truncate at the apex: pappus of several series of short scales or bristles of different lengths, or none: head not subtended by several spiny leaves. 127. CENTAUREA.
Achene 10-toothed at the apex: pappus of 10 longer naked outer bristles and 10 inner fimbriolate ones: head subtended by several spiny leaves. 128. CNICUS.

XII. MUTISIEAE

Heads heterogamous: marginal corollas ligulate. 129. CHAPTALIA.

1. **VERNONIA** L. Perennial, caulescent or scapose herbs. Leaves alternate: blades narrow or broad, mostly toothed. Heads not involucrate. Flowers purple or white. Corolla-lobes lanceolate to linear. Anther-appendages lanceolate to elliptic. Achene 10-ribbed or -grooved. Pappus double, the outer series of scales or stout bristles, the inner of numerous capillary bristles, both series persistent.—About 500 species, most abundant in South America.—IRONWEEDS.—Sum.–fall or all year S.

Plant caulescent: leaves mainly cauline.
Bracts of the involucre, at least some of them, with filiform or subulate tips.
Leaf-blades smooth above. I. NOVEBORACENSES.
Leaf-blades scabrous above. II. SCABERRIMAE.
Bracts of the involucre obtuse, acute, or acuminate.
Leaf-blades, at least above the base of the stem, narrow, mostly of a linear type. III. ANGUSTIFOLIAE.

Leaf-blades broad, of an ovate, or lanceolate type.
Leaf-blades glabrous or thinly pubescent and scabrous beneath. IV. ALTISSIMAE.
Leaf-blades tomentose beneath. V. INTERIORES.
Plant scapose: leaves basal or mainly so. VI. ACAULES.

I. NOVEBORACENSES

Pappus purple or tawny-purple.
Head with 42 flowers or less: bracts of the involucre mainly ovate, each abruptly narrowed into the tip. 1. *V. noveboracensis.*
Head with 55 flowers or more: bracts mainly lanceolate, each gradually narrowed into the tip. 2. *V. Harperi.*
Pappus stramineous. 3. *V. glauca.*

II. SCABERRIMAE

Leaf-blades broad, mostly 3 or 4 times as long as wide, prominently serrate, sometimes coarsely so. 4. *V. pulchella.*
Leaf-blades narrow, mostly 5–16 times as long as wide, entire or merely serrulate.
Bracts of the involucre closely appressed at the base, the tips recurved or spreading. 5. *V. recurva.*
Bracts of the involucre loosely appressed at the base, the tips not recurved. 6. *V. scaberrima.*

III. ANGUSTIFOLIAE

Leaf-blades scabrous above.
Leaf-blades linear; usually narrowly so, revolute. 7. *V. angustifolia.*
Leaf-blades linear-lanceolate to elliptic, not revolute. 8. *V. dissimilis.*
Leaf-blades smooth and glabrous or nearly so.
Heads about 13-flowered. 9. *V. concinna.*
Heads about 21-flowered. 10. *V. Blodgettii.*

IV. ALTISSIMAE

Head with 13 flowers or less. 11. *V. gigantea.*
Head with 18 flowers or more.
Pappus purple or purplish.
Bracts of the involucre rounded at the apex, abruptly tipped. 12. *V. altissima.*
Bracts of the involucre acute or cuspidate. 13. *V. ovalifolia.*
Pappus tawny or yellowish, or stramineous.
Involucre 5–6 mm. high; bracts acute or cuspidate, often stramineous. 13. *V. ovalifolia.*
Involucre 3–4 mm. high; bracts obtuse or subacute. 14. *V. flaccidifolia.*

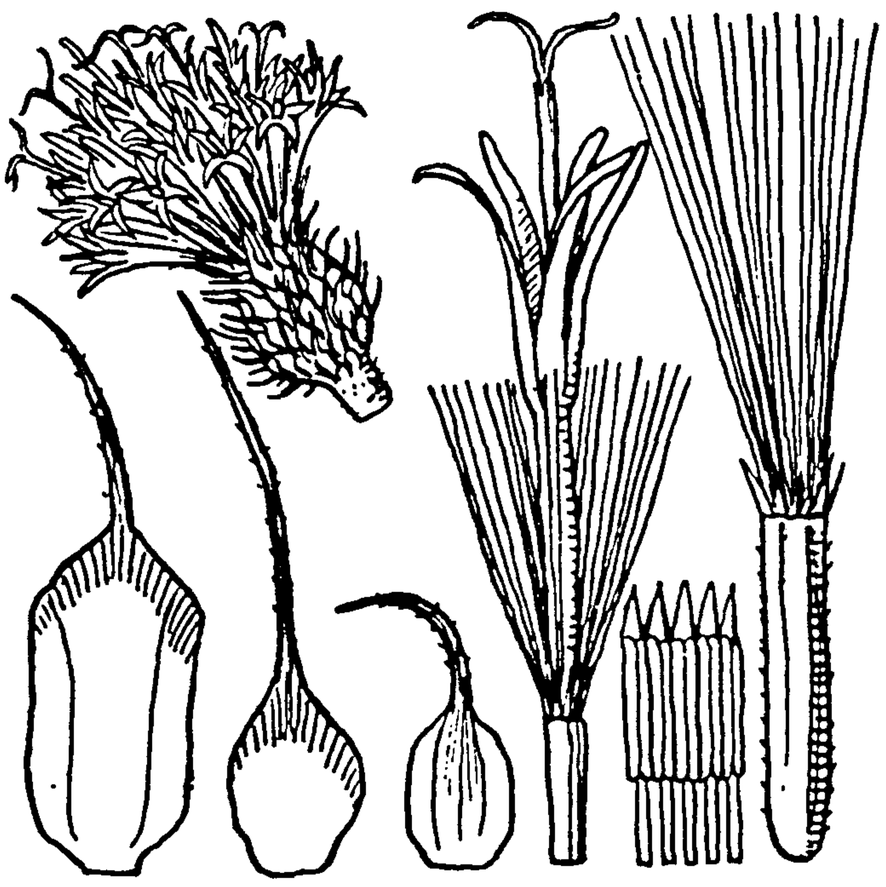
V. INTERIORES

Bracts of the involucre with closely appressed tips: head with mostly 29 flowers or more. 15. *V. missurica.*
Bracts of the involucre with spreading or reflexed tips: head 18–34-flowered. 16. *V. Baldwinii.*

VI. ACAULES

Blades of the basal leaves elliptic, oblanceolate, spatulate, or obovate, 3–7 cm. wide. 17. *V. acaulis.*
Blades of the basal leaves lanceolate, 1–2 cm. wide. 18. *V. georgiana.*

1. V. noveboracensis (L.) Willd. Stem 1–3 m. tall, glabrous or thinly pubescent, branching above: leaves rather numerous; blades linear-lanceolate or elliptic-lanceolate, 1–2 dm. long, acuminate, finely serrate or nearly entire: corymb 1–3 dm. broad, commonly irregular: involucre hemispheric, 6–7 mm. high; bracts purple, ovate or ovate-lanceolate, prolonged into filiform tips, glabrous or sparingly ciliate: corolla about 10 mm. long: achene 4–4.5 mm. long, upwardly barbed along the sharp angles; pappus purple or tawny-purple.—Woods, thickets, meadows, and open places, various provinces, Ga. to Miss., Ont., and Mass.



2. V. Harperi Gleason. Stem 1 m. tall or more, puberulent, divaricately branched above: leaves numerous; blades lanceolate,

12–18 cm. long or smaller near the top of the stem, thin, acuminate, dentate-serrate: corymb 3 dm. wide or more, lax: involucre broadly campanulate, 7–9 mm. high; bracts green, with ovate or triangular-ovate bases and erect elongate tips, arachnoid-ciliate: achene 3.5 mm. long, pubescent on the ribs: pappus dull-purple.—Damp grounds and wet woods, in the Coastal Plain of Ga.

3. V. glauca (L.) Britton. Stem 1–2 m. tall, glabrous or nearly so, often widely branched above: leaves numerous; blades linear-lanceolate to elliptic or elliptic-oblanceolate, acute or short-acuminate, sharply and saliently serrate: corymb 1–3 dm. broad: involucre hemispheric, about 5–7 mm. high; bracts lanceolate to nearly elliptic, purple, the outer ones merely acuminate, glabrous or nearly so: achene 2–3 mm. long, with the sharp ribs barbed: pappus stramineous. [*V. noveboracensis latifolia* A. Gray.]—Wooded slopes and river-banks, various provinces N of Coastal Plain, Ga. to Ala., Pa., and N. J.

4. V. pulchella Small. Stem 3–10 dm. tall, pubescent, branched above: leaves firm; blades elliptic-lanceolate or elliptic or sometimes narrower above, 2–10 cm. long, acute, serrate, often sharply so, somewhat crisped, revolute, sessile, but not at all cordate: corymb 1–1.5 dm. broad: involucre campanulate, 6–7 mm. high; bracts lanceolate to linear-elliptic, prolonged into soft linear-subulate spreading or recurved tips, often purplish: achene about 3 mm. long: pappus stramineous.—Sand-hills, Coastal Plain, Ga. and S. C.

5. V. recurva Gleason. Stem about 7 dm. tall, pubescent below, glabrate above: leaves firm, mostly near the base of the stem; blades elliptic-linear to linear, 5–7 cm. long, or shorter above, acute, revolute, entire or sparingly callous-toothed, scabrous, rounded at the base: corymb about 15 cm. wide: involucre cylindric-campanulate, about 8 mm. high; bracts lanceolate to elliptic-lanceolate, long-acuminate, appressed at the base, the long tips recurved or spreading: achene 3.5 mm. long, pubescent on the angles: pappus tawny.—Dry pinelands, Coastal Plain, SE Ga.

6. V. scaberrima Nutt. Stem 3–8 dm. tall, glabrous or puberulent below, usually branched: leaves firm; blades linear to linear-elliptic, 1.5–8 cm. long, acute, entire or remotely serrate, sessile or nearly so, cordate or truncate at the base: corymb with comparatively few heads: involucre campanulate, 5–6 mm. high: bracts subulate-linear to elliptic, prolonged into rigid subulate tips: achene about 2 mm. long, with scabrous ribs: pappus purplish.—Sandy soil, Coastal Plain, Fla. to N. C.

7. V. angustifolia Michx. Stem 0.5–1 m. tall, glabrous or pubescent, often widely branched above: leaves numerous; blades linear, usually narrowly so, 5–15 cm. long, acute, revolute: involucre turbinate or turbinate-campanulate, 5–6 mm. high, acute or somewhat rounded at the base; bracts lanceolate to elliptic, acute or apiculate, with more or less spreading tips: achene 2 mm. long, or more, with scabrous ribs: pappus purplish.—Sandy woods, pinelands, and dry hillsides, Coastal Plain, Fla. to Miss. and N. C.—*V. texana* (A. Gray) Small, with tawny pappus and lower leaf surface pitted, has been reported from Meadville in S W Miss.

8. V. dissimilis Gleason. Stem stout, 8–11 dm. tall: leaves numerous; blades linear-lanceolate to elliptic, 10–15 cm. long, firm, acuminate, sharply serrate, except the smaller upper ones, not revolute, scabrous above: corymb rather dense: involucre campanulate, about 4 mm. high; bracts ovate or ovate-lanceolate, obtuse or obtusish, or the outer ones acute, arachnoid-ciliate, appressed: achene 2.5 mm. long, with hirsute ribs: pappus bright-purple.—Dry banks and woods, Piedmont, E Ala.

9. V. concinna Gleason. Stem 1 m. tall or less, green, glabrous: leaves numerous; blades narrowly oblanceolate to elliptic-linear, 10–12 cm. long or less, thin, acute, entire or with minute callous teeth, glabrous above, minutely pubescent beneath, flat: corymb rather lax: involucre turbinate-campanulate, 6–7 mm. high; bracts elliptic-lanceolate, broader than the slightly spreading outer ones, acute or mucronate, glabrous or slightly ciliate: achene about 3 mm. long, minutely pubescent: pappus purplish-tawny.—Hammocks, M pen. Fla.

10. V. Blodgettii Small. Stem often branched near the base, 2–5 dm. tall, glabrous or nearly so, corymbose above: leaves mostly near the base of the stem; blades linear or nearly so, 2–4.5 cm. long, obtuse or acutish, entire, erect or ascending, slightly revolute: involucre campanulate, about 5 mm. high; bracts elliptic to linear-elliptic, acute or apiculate, slightly pubescent: achene 2.5 mm. long, with pubescent ribs: pappus stramineous, slightly roughened.—Low pinelands and adj. Everglades, S pen. Fla. and the Florida Keys.—The general trend of migration of native Florida plants, through the agencies of man has been southward. The range of this ironweed, however, has been extended northward. Occasional specimens have recently been found nearly half way up the eastern coast.

11. V. gigantea (Walt.) Trelease. Stem 1–2.5 m. tall, glabrous, often widely branched above: leaves numerous; blades mostly elliptic, 0.8–3 dm. long, acute or acuminate, sharply serrate: corymb 1–4 dm. broad: involucre cylindric, 4–5 mm. high, narrowed at the base; bracts elliptic-lanceolate to narrowly elliptic, rounded on the back, the outer acutish, the inner obtuse, lax or loosely spreading at maturity; achene 3 mm. long, with scabrous angles: pappus purplish. [*V. oligantha* Greene.]—Low grounds, river-bottoms, and swamps, Coastal Plain and rarely adj. provinces, Fla. to Ala. and S. C.

12. V. altissima Nutt. Stem 1–3 m. tall, glabrous, branching above: leaves rather numerous; blades narrowly elliptic to lanceolate or narrowly lanceolate, 1–3 dm. long, acuminate, sharply serrate: corymb 1–4 dm. broad; involucre hemispheric-campanulate, 4 mm. to almost 5 mm. high, rounded at the base; bracts ovate to elliptic, nearly flat, acute or mucronate, appressed, ciliate; achene 3 mm. long, with barbed ribs: pappus light-purple or deep-purple. [*V. maxima* Small.]—Low grounds, alluvial banks, bottoms and fields, various provinces N of Coastal Plain, Ga. to Ala., Mo., and Pa.

13. V. ovalifolia T. & G. Stem 1–2 m. tall, glabrous or puberulent, branching above: leaves rather numerous; blades elliptic, or the upper elliptic-lanceolate, all acute, or short-acuminate, rather coarsely toothed, abruptly or sometimes gradually contracted at the base: corymb 1–3 dm. broad: involucre campanulate, 5–6 mm. high; bracts lanceolate to elliptic, acute or cuspidate, mainly appressed: achene 2.5–3 mm. long, slightly barbed along the ribs: pappus stramineous or pale-purplish.—Rich woods and sandy stream-banks, Coastal Plain, N Fla. to Ala. and Ga.

14. V. flaccidifolia Small. Stem 1–1.5 m. tall, glabrous, glaucous, with slender branches above: leaves rather numerous; blades thin, elliptic to narrowly lanceolate, 0.8–2 dm. long, acuminate, sharply serrate, sometimes doubly so, short-petioled: corymb 1–2 dm. broad; branches slender: involucre hemispheric, 3–4 mm. high; bracts ovate to elliptic, light-green or deeper at the tip, obtuse or subacute, ciliate, not spreading: achene 3 mm. long, with sharp barbed ribs: pappus pale stramineous.—Rich woods, stream-banks, and wooded hillsides, Blue Ridge to Appalachian Plateau, Ga. to Ala., Tenn., and S. C.

15. V. missurica Raf. Stem 1–2 m. tall, tomentose, branching above: leaves numerous; blades elliptic to elliptic-lanceolate or lanceolate, 1–3 dm. long,

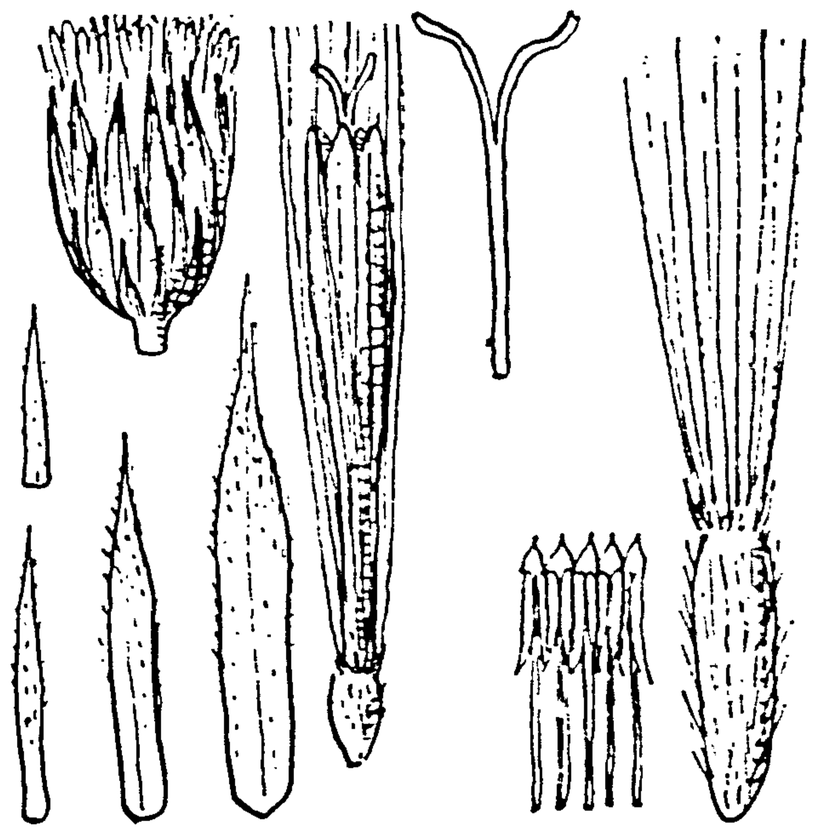
acute or short-acuminate, sharply and coarsely serrate: corymb usually 1–4 dm. broad: involucre campanulate to cylindric-campanulate, 7–8 mm. high; bracts ovate to elliptic, acute or apiculate: achene 4–5 mm. long, with smooth and glabrous ribs: pappus tawny or tinged with purple. [*V. Drummondii* Werner not Shuttl.]—Low woods, ravines, and rich sandy soil, various provinces N of Coastal Plain, Ala. to Tex., Kans., and Ont.—*V. fasciculata* Michx., with subacuate or rounded involucral scales, has been reported from Starkville in NE Miss.

16. V. Baldwinii Torr. Stem 1–1.5 m. tall, tomentose, branching above: leaf-blades elliptic to ovate, 1–2 dm. long, short-acuminate, sharply serrate: corymb 1–3 dm. wide, irregular: involucre campanulate to hemispheric, 5–7 mm. high; bracts closely imbricate at the base, spreading or reflexed at the glandular acuminate tips: achene 3 mm. long, pubescent and resinous: pappus tawny or purplish.—Dry woods and hills, Interior Plateaus, Tenn. to Okla. and Mo.

17. V. acaulis (Walt.) Gleason. Scape minutely pubescent, 2–7 dm. tall: leaves basal; blades elliptic, oblanceolate, spatulate, or obovate, mainly 1–3 dm. long, obtuse or acutish, serrate or dentate, sometimes doubly so: involucre campanulate, 7–8 mm. high; bracts linear to linear-lanceolate, narrowed into subulate tips: achene 3 mm. long, barbed upward in the ribs: pappus pale-stramineous. [*V. oligophylla* Michx.]—Dry woods or pinelands, Coastal Plain, Fla. to N. C.

18. V. georgiana Bartlett. Scape puberulent, 2–10 dm. tall: leaves basal; blades lanceolate, 5–15 cm. long, acute or obtuse, denticulate, narrowed at the base, scabrous above: involucre campanulate, 6–7 mm. high; bracts narrow, subulate at the tip, glabrous or obscurely ciliate, the outer with spreading tips: achene 3 mm. long, pubescent: pappus pale-stramineous.—Dry pinelands, Coastal Plain, Ga. and S. C.

2. **SENECIODES** Post & Kuntze. Annual, caulescent herbs. Leaves alternate: blades broad, toothed. Heads corymbose. Flowers pale-purple or white; nearly as in *Vernonia*. Achene terete, ribless. Pappus double, the inner series deciduous.—About 12 species, natives of the Old World.



1. S. cinerea (L.) Kuntze. Stem corymbose above, 1 m. tall or less, cinereous-pubescent: leaf-blades ovate to elliptic-ovate, mostly 2–8 cm. long, shallowly toothed, paler beneath than above: peduncles slender: involucre 4–5 mm. high; bracts subulate to linear, acuminate: corolla about 4 mm. long: achene about 1 mm. long, terete or nearly so: pappus white. [*Vernonia cinerea* L.]—Hammocks, Florida Keys. Nat. of Asia.—(*W. I., Mex., C. A., S. A.*)—All year.

3. **ELEPHANTOPUS** [Vaill.] L. Perennial, scapose or caulescent herbs. Leaves alternate: blades shallowly toothed. Heads involucrate. Flowers lilac-purple. Corolla-lobes linear-lanceolate. Anther-appendages deltoid to ovate. Pappus single, of several rigid bristles terminating scale-like bases.—About 15 species, native of tropical and warm regions.—Sum.–fall.—ELEPHANTFOOTS.

Stem leafy: leaves mainly cauline, all of the same type. I. CAROLINIANI.
Stem naked or with few bract-like leaves: leaves mainly basal. II. TOMENTOSI.

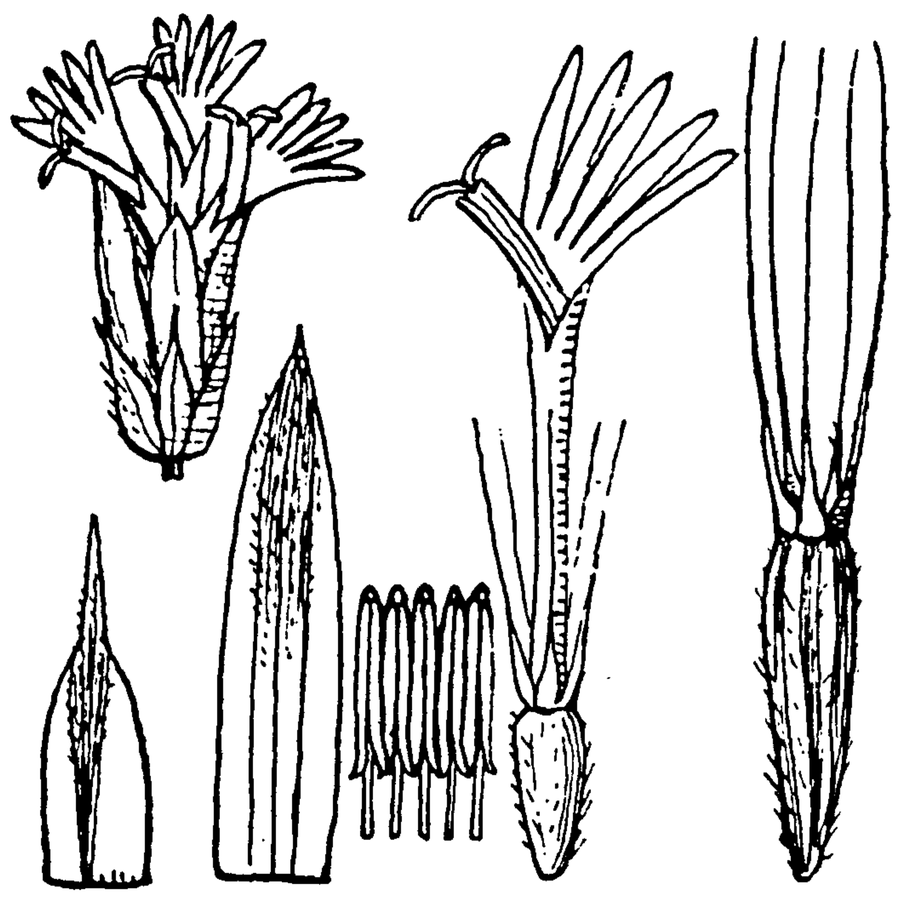
I. CAROLINIANI

A rather coarse, softly hirsute herb, with thinnish leaf-blades. 1. *E. carolinianus.*

II. TOMENTOSI

Longer bracts of the involucre 8 mm. long or less: pappus bristles 3.5–5 mm. long: midrib of the leaf pubescent beneath with appressed hairs.
  Stem with spreading rather than reflexed hairs: leaf-blades closely and softly pubescent: scale-like base of the pappus gradually narrowed into the tip. 2. *E. elatus.*
  Stem with appressed rather than spreading hairs: leaf-blades glabrous or sparingly pubescent: scale-like base of the pappus abruptly narrowed into the tip. 3. *E. nudatus.*
Longer bracts of the involucre 9–12 mm. long: pappus-bristles 6–8 mm. long: midrib of the leaf pubescent beneath with spreading and reflexed hairs. 4. *E. tomentosus.*

1. E. carolinianus Willd. Stem 3–9 dm. tall, rather hirsute: leaf-blades elliptic or oval, 5–15 cm. long, crenate-serrate or repand: inner bracts of the involucre 8–10 mm. long, acute: achene 3.5–4 mm. long.—Woods and thickets, various provinces, Fla. to Tex., Kans., and N. J.

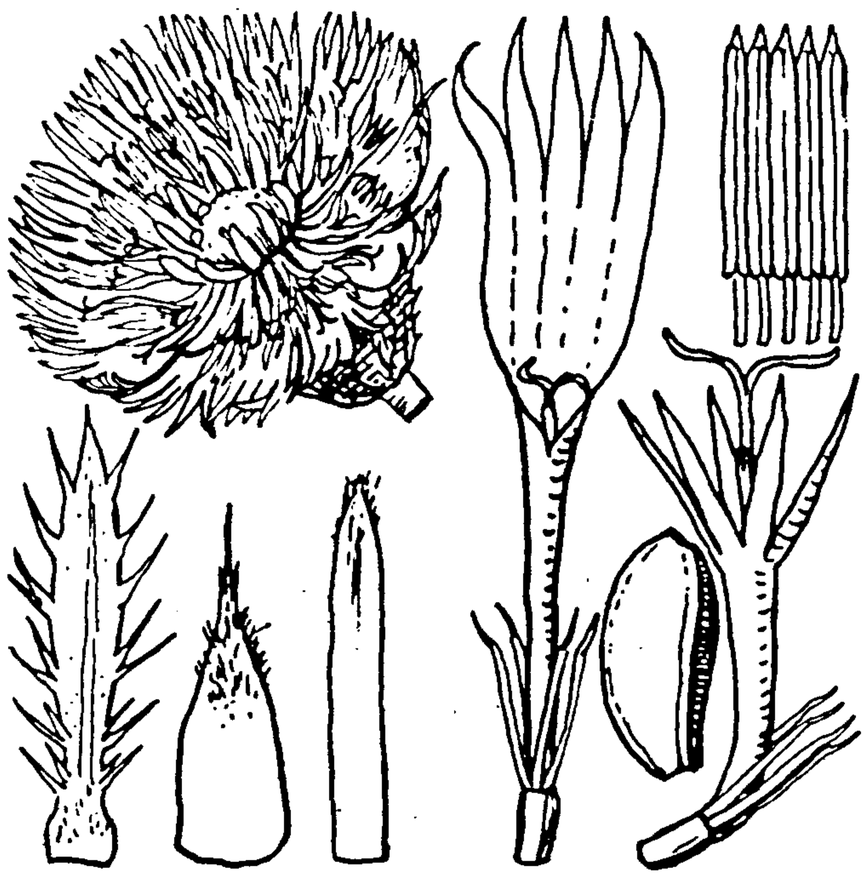


2. E. elatus Bertol. Stem 7–12 dm. tall, mainly hirsute: blades of the basal leaves spatulate to ovate-elliptic, 10–25 cm. long, crenate-serrate: inner bracts of the involucre obtuse: achene 2.5–3 mm. long: bases of the pappus-bristles minute.—Dry soil, Coastal Plain and adj. provinces, Fla. to Ark. and S. C.

3. E. nudatus A Gray. Stem 2–8 dm. tall, mainly strigose; blades of the basal leaves oblanceolate to spatulate, crenate-serrate: inner bracts of the involucre acuminate or abruptly pointed: bases of the pappus-bristles shorter than the breadth of the achene.—Sandy soil, Coastal Plain, Fla. to La., Ark., and Del.

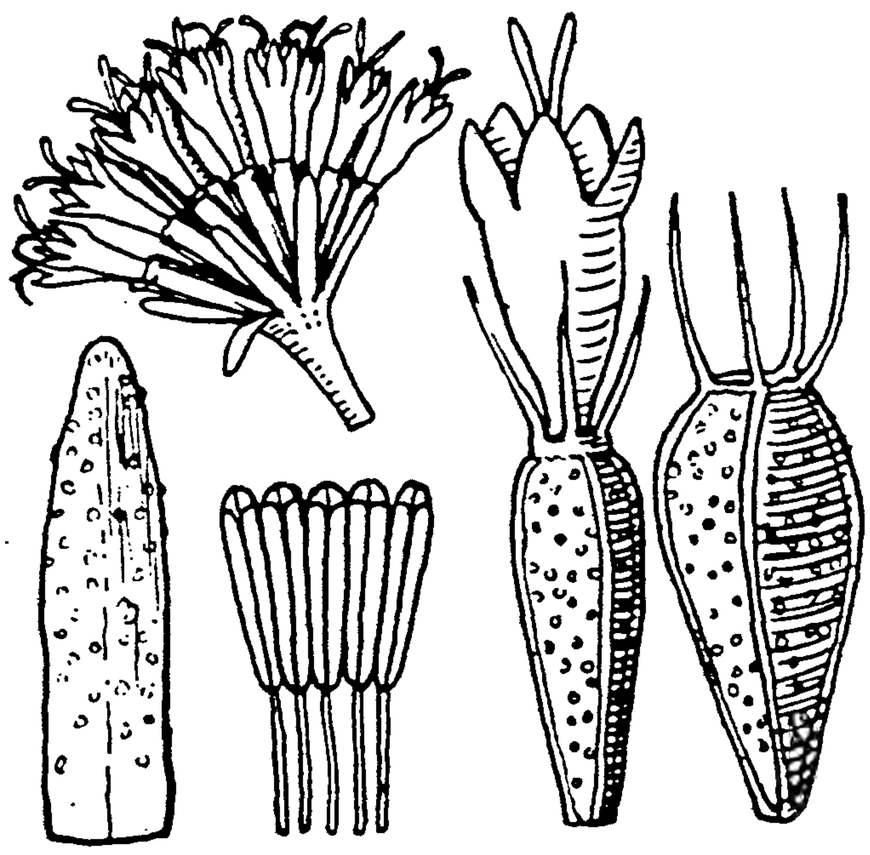
4. E. tomentosus L. Stem 2–7 dm. tall, mostly hirsute above: blades of the basal leaves elliptic, oval, or elliptic oblanceolate, crenate-serrate: inner bracts of the involucre acuminate: bases of the pappus-bristles as long as the breadth of the achene.—Pinelands and dry woods, various provinces, Fla. to Tex., Ky., and Va.

4. STOKESIA L'Her. Perennial, stout, pubescent herbs. Leaves alternate: blades spinulose-ciliate near the base, elongate. Heads large, showy, bristly, solitary or few in a corymb, many-flowered. Involucre broad and depressed: bracts foliaceous, the outer entire, lax, the inner with a large pectinate-spinulose appendage on a small base, the innermost, narrow, entire. Receptacle flat, naked. Corollas various, the inner ones tubular, with 5 narrow lobes; the outer ligulate, the marginal ones radiate, the blade prominently lobed. Anther-appendages ovate. Achene stout, 3- or 4-angled. Pappus of 4 of 5 slender caducous awns.—One species, remarkable in its group on account of the ligulate marginal corollas.



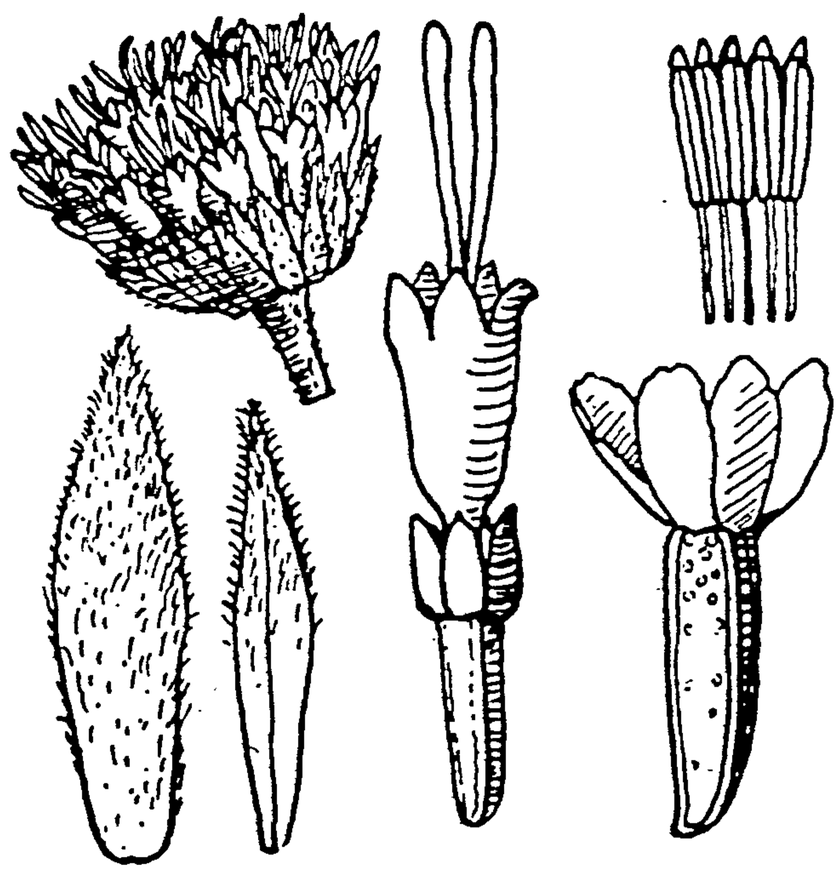
1. S. laevis (Hill) Greene. Stem 2–5 dm. tall, woolly, permanently so above: leaves few; blades various, those of the basal and lower cauline elliptic to narrowly elliptic-lanceolate, narrowed into petiole-like bases and dilated at the base, those of the upper cauline lanceolate to elliptic-lanceolate or ovate-lanceolate, clasping: heads solitary at the ends of stem or its few branches: involucre bristly: corolla purplish-blue or rarely white, the lobes all linear-lanceolate: achene narrowly obovoid, about 5 mm. long, the angles callous-thickened. [*S. cyanea* L'Her.] —Moist pinelands, Coastal Plain, Fla. to La. and S. C.—Spr.–sum.—Rare east of Ala. Much more showy than its relatives, the ironweed and the elephant-foot. Widely cultivated.

5. HARTWRIGHTIA A. Gray. Perennial, glabrous, slender herbs. Leaves alternate: blades elongate, entire. Heads rather small, smooth, inconspicuous, loosely corymbose, few-flowered. Involucre turbinate: bracts herbaceous, entire. Receptacle elevated, with few bractlets near the edge. Corolla with a very short tube and a funnelform throat, the lobes broad. Anthers unappendaged. Achene enlarged upward. Pappus of several slender bristles or wanting.—One species representing a group of genera otherwise mainly tropical American.



1. H. floridana A. Gray. Stem 4–15 dm. tall, branched above: basal leaves elongate; blades spatulate, elliptic, or elliptic-lanceolate, long-petioled: blades of the cauline leaves narrowly lanceolate to linear: branches of the inflorescence with small clavate scales: bracts of the involucre linear to linear-lanceolate, 4–5 mm. long, obtuse: corollas white or purple, 3–3.5 mm. long; lobes ovate: achene obpyramidal, 4.5–5.5 mm. long.—Swamps and marshes, N Fla. and N part of the pen.—Sum.–fall.—One of the rarer Florida plants. The basal leaves resemble those of *Limonium*.

6. SCLEROLEPIS Cass. Perennial, stoloniferous herbs. Leaves whorled: blades narrow, entire. Heads solitary, not showy. Involucre broad, many-flowered: bracts narrow, appressed. Receptacle conic, naked. Corollas with a very short tube and a funnelform throat, the lobes broad. Anther-appendages ovate. Achene narrow, sharply angled. Pappus of 5 broad scales.—One species.



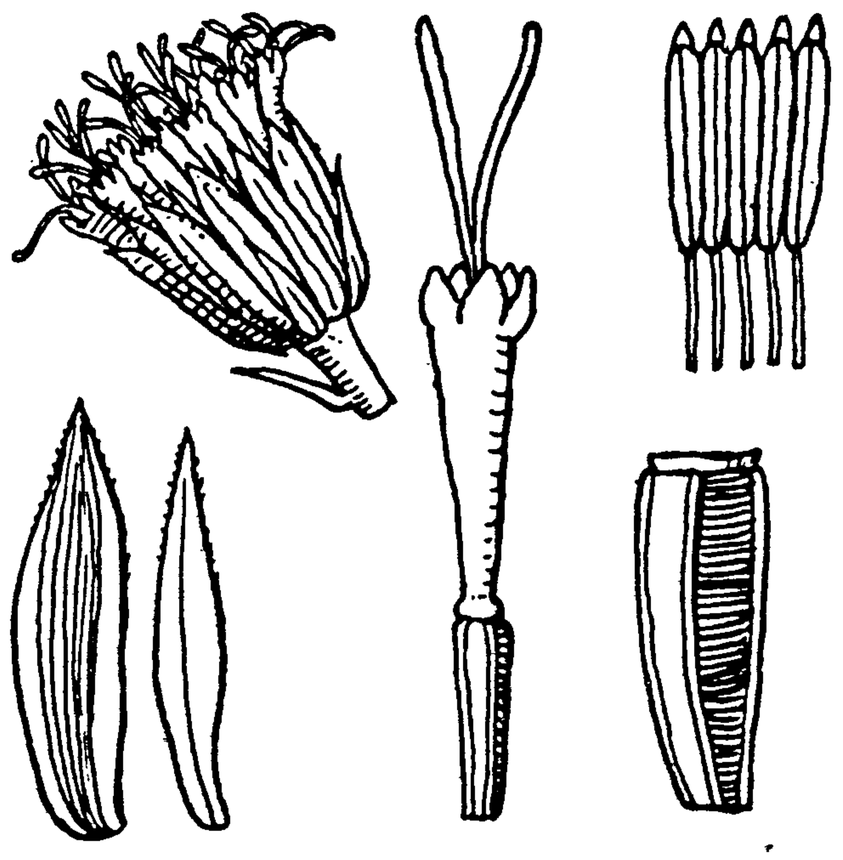
1. S. uniflora (Walt.) B. S. P. Stem 2–7 dm. long, often decumbent: leaves 4–6 in a whorl; blades linear to narrowly linear-lanceolate or linear-filiform, 1–2.5 cm. long: heads slender-peduncled: bracts of the involucre ciliate, lanceolate or with a lanceolate or narrowly ovate tip above a thicker base, acute or acuminate: corolla rose-purple or pink, nearly 2 mm. long, the tube shorter than the throat: achene slightly broadened upward, 1 mm. long, excluding the stipe-like base: pappus-scales broad, shorter than the achene, blunt. [*S. verticillata* Cass.]—Bogs and pine-

land ponds, Coastal Plain and New England coast, Fla. to Ala. and N. H.—Spr.–fall.—Usually growing in water or at least in soft mud. Sometimes very densely matted and then striking on account of the very numerous whorled leaves and the numerous stems each with an erect small head.

7. **AGERATUM** L. Annual or rarely perennial, stiff herbs or partly woody plants. Leaves usually opposite: blades toothed. Heads corymbose. Involucre campanulate. Receptacle elevated. Flowers blue, purple, pink, or white. Corolla-lobes erect, deltoid. Anther-appendages ovate. Achene 5-angled short. Pappus of several short blunt or long slender-tipped scales, or cup-like or crown-like.—About 30 species, tropical American, several widely cultivated.—AGERATUMS.

Pappus cup-like or crown-like, the scales very short: achene glabrous: foliage glabrous: leaves succulent. 1. *A. littorale.*
Pappus of distinct scales as long as the pubescent achenes or longer: foliage pubescent: leaves herbaceous.
  Involucre over 4 mm. high; bracts long-tipped; pappus decidedly longer than the achene. 2. *A. Houstonianum.*
  Involucre less than 4 mm. high; bracts short-tipped: pappus about as long as the achene. 3. *A. conyzoides.*

1. **A. littorale** A. Gray. Stem 2–7 dm. tall, glabrous, often branched at the base: leaf-blades ovate, 1–5 cm. long, crenate-serrate, usually cuneate at the base: corymbs terminating long peduncle-like branches: involucre 4 mm. high in anthesis; bracts merely ciliolate: corolla about 2.5 mm. long: achene 2 mm. long: pappus very short.—Sand-dunes and shore hammocks, Florida Keys and Cape Sable.—All year.—An exceedingly showy plant both on account of the bright-green succulent leaves and the numerous blue flower-heads. Only cultivated locally.



2. **A. Houstonianum** Mill. Stem 3–11 dm. tall, rather copiously pubescent with crisped hairs, sometimes branched: leaf-blades ovate to deltoid mostly 4–7 cm. long, crenate, thick: involucre about 5 mm. high in anthesis; bracts subulate to linear-lanceolate, copiously pubescent: corolla nearly 3 mm. long: achene about 2 mm. long, stout: pappus-scales nearly 2.5 mm. long, the slender tip less than twice as long as the body.—Pinelands and cult. grounds, Fla. Nat. of Mex.—(*W. I., C. A.*)—Sum.–fall.—Commonly cultivated for ornament. The flowers are very fragrant.

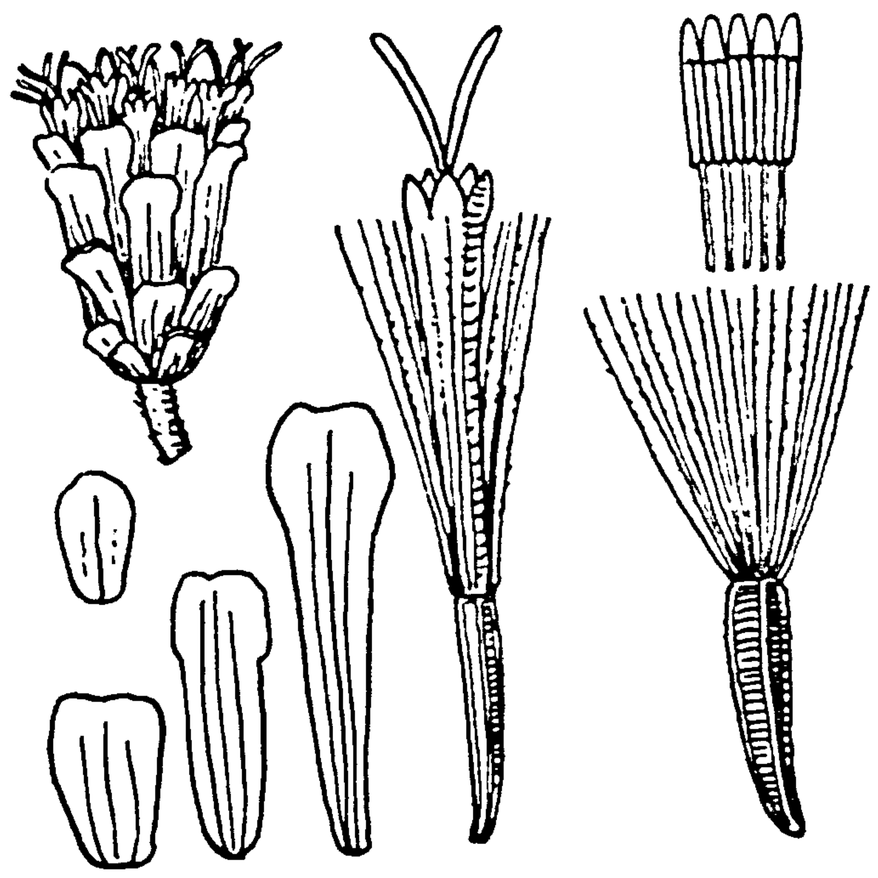
3. **A. conyzoides** L. Stem 1–9 dm. tall, sparingly pubescent or nearly glabrous, often branched: leaf-blades ovate to deltoid-ovate, 1.5–4 cm. long, crenate, thinnish: involucre about 3 mm. high in anthesis; bracts subulate to linear-subulate, sparingly pubescent: corolla nearly 2 mm. long: achene 1.5 mm. long, slender: pappus-scales about 1.5 mm. long, the slender tip fully twice exceeding the small body.—Waste-places and cult. grounds, Coastal Plain, Fla. to Miss. and N. C. Nat. of trop. Am.—Sum.–fall.—Has smaller heads than the preceding species and is less commonly cultivated.

8. **OSMIA** Sch. Bip. Shrubs or perennial herbs, with much-branched stems. Leaves opposite: blades broadest below the middle, often coarsely toothed. Heads borne in corymbs, relatively few-flowered. Flowers lilac, pale-purple, bluish-purple, or white. Involucre narrowly ovoid or stout-cylindric:

bracts in several series, chartaceous, the outer very short, the inner long and narrow. Corolla-lobes ovate or rounded. Anther-appendages triangular. Achene elongate, angled. Pappus of capillary bristles.—More than 50 species, tropical.

Tips of the involucral bracts spreading, bluish, much thinner than the body: inner bracts broadened upward: achene wing-angled. 1. *O. ivaefolia.*
Tips of the involucral bracts appressed, light-green or dark-green: inner bracts pale, linear, each with a minute colored tip: achene not wing-angled.
  Bracts of the involucre 5–7-ribbed, the inner acute: involucre less than 8 mm. high. 2. *O. frustrata.*
  Bracts of the involucre 3-ribbed, the inner obtuse: involucre over 8 mm. high. 3. *O. odorata.*

1. O. ivaefolia (L.) Small. Stem 3–15 dm. tall, finely pubescent or sometimes slightly hirsute: leaf-blades lanceolate, elliptic-lanceolate, or nearly linear, 1–7 cm. long, acute, with short petiole-like bases: involucre about 6 mm. high; bracts striate and azure-tipped: corollas purplish-red or bluish-purple: receptacle small, flat-topped: achene 2–2.5 mm. long. [*Eupatorium ivaefolium* L.]—Prairies, pinewoods, and fields, Coastal Plain, Miss. to Tex.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.—One of several tropical plants that occur in our range only in or near the lower end of the Mississippi drainage basin.



2. O. frustrata (B. L. Robinson) Small. Stem 5–20 dm. tall, minutely pubescent, with mostly ascending branches: leaf-blades ovate, deltoid-ovate, or ovate-lanceolate, 2–5 cm. long, acute or obtuse, with rather slender petiole-like bases: involucre about 7 mm. high; bracts sometimes slightly green-tipped: corolla pale-purplish or bluish, about 4 mm. long: achene stoutish, less than 4 mm. long. [*Eupatorium heteroclinum* Chapm. not Griseb.]—Hammocks, S pen. Fla. and the Keys.—All year.—An endemic species. It is particularly abundant in the Cape Sable region and in hammocks of the Ten Thousand Islands.

3. O. odorata (L.) Sch. Bip. Stem 6–28 dm. tall, pubescent, with divergent branches: leaf-blades ovate to lanceolate, 4–12 cm. long, acuminate, with long slender petiole-like bases: involucre 9–10 mm. high; bracts decidedly green-tipped: corolla white or pale-lilac, about 5 mm. long: achene very slender, over 4 mm. long. [*Eupatorium conyzoides* Vahl.]—Hammocks, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—All year.—The largest of our three species, often forming dense thickets on the Florida Keys.

9. EUPATORIUM [Tourn.] L. Shrubs or caulescent herbs. Leaves alternate or opposite: blades entire, toothed, or dissected. Heads borne in corymbs. Involucre campanulate, turbinate or cylindric: bracts appressed. Corollas white, pink, lilac, red, or purple. Corolla-lobes ovate or triangular. Anther-appendages ovate. Achene angled. Pappus of capillary bristles.—More than 500 species, mostly in warm and tropical region.—The leaves are sometimes whorled.

Herbs: mostly temperate plants of various habitats.
  Leaf-blades dissected or pinnatifid, the segments narrow. I. CAPILLIFOLIA.

Leaf-blades entire, toothed, or merely incised.
Leaves alternate or merely opposite, sometimes whorled on individual plants.
Involucre of closely imbricate unequal bracts in several series.
Leaf-blades petioled or merely sessile.
Leaf-blades petioled, often long-petioled.
Head 10–15-flowered: involucre campanulate: leaf-blades of a lanceolate type, borne horizontally. — II. SEROTINA.
Head about 5-flowered: involucre cylindric: leaf-blades of an ovate type, borne vertically. — III. CRASSIFOLIA.
Leaf-blades sessile or essentially so.
Leaf-blades narrowed at the base.
Bracts of the involucre acute, acuminate, or mucronate. — IV. ALBA.
Bracts of the involucre obtuse or individually mucronulate. — V. HYSSOPIFOLIA.
Leaf-blades broad at the base. — VI. ROTUNDIFOLIA.
Leaf-blades connate-perfoliate or connate-clasping. — VII. PERFOLIATA.
Involucre of nearly equal bracts in one row, or a few outer ones shorter. — VIII. URTICAEFOLIA.
Leaves in whorls of 3–6. — IX. PURPUREA.
Shrub: tropical plant of hammocks. — X. VILLOSA.

I. CAPILLIFOLIA

Leaf-segments filiform.
Inflorescence-branches secund-recurved: inner involucral bracts prominently scarious-margined, gradually long-aristate. — 1. *E. leptophyllum.*
Inflorescence-branches fastigiate: inner involucral bracts obscurely scarious, abruptly short-aristate. — 2. *E. capillifolium.*
Leaf-segments linear, linear-filiform, or lanceolate.
Leaf-blades 1- or 2-parted.
Inflorescence paniculate or thyrsoid.
Heads 3–6-flowered, not glomerate on the inflorescence-branches: bracts of the involucre punctate and viscid. — 3. *E. compositifolium.*
Heads 6–9-flowered, glomerate or clustered at the ends of the inflorescence-branches: bracts of the involucre neither punctate nor viscid. — 4. *E. Eugenei.*
Inflorescence corymbose. — 5. *E. pinnatifidum.*
Leaf-blades mainly pectinately pinnatifid. — 6. *E. pectinatum.*

II. SEROTINA

Tall, rather coarse, herb with coarsely toothed long-petioled leaf-blades not placed vertically. — 7. *E. serotinum.*

III. CRASSIFOLIA

Low, somewhat fleshy, herbs, with repand or crenate-dentate petioled leaf-blades placed vertically. — 8. *E. mikanioides.*

IV. ALBA

Blades of the upper cauline leaves linear or of a linear type. — 9. *E. leucolepis.*
Blades of the upper cauline leaves ovate, lanceolate, or elliptic.
Bracts of the mature involucre copiously fine-pubescent, not scarious-margined, the inner ones 5.5 mm. long or less. — 10. *E. anomalum.*
Bracts of the mature involucre glabrous or with scattered hairs, more or less scarious-margined, the inner ones 7 mm. long or more.
Inner bracts of the involucre not petaloid, long-acuminate, linear-subulate. — 11. *E. album.*
Inner bracts of the involucre petaloid, short-mucronate, linear-spatulate. — 12. *E. petaloideum.*

V. HYSSOPIFOLIA

Leaf-blades linear, often narrowly so or linear-filiform.
Inner bracts of the involucre over 4 mm. long, outer bracts lanceolate: achene 2.5–3 mm. long. — 13. *E. hyssopifolium.*

Inner bracts of the involucre less than 4 mm. long, outer bracts ovate: achene about 2 mm. long. 14. *E. lecheaefolium.*
Leaf-blades broader.
Inner bracts of the involucre linear: leaf-blades entire or coarsely toothed, but the teeth not salient.
Inner bracts of the involucre 4 mm. long or more.
Leaf-blades typically or predominantly narrowed upward.
Leaves spreading: inner bracts of the involucre broadly linear: achene about 3 mm. long. 15. *E. Torreyanum.*
Leaves reflexed: inner bracts of the involucre narrowly linear: achene about 2 mm. long. 16. *E. recurvans.*
Leaf-blades typically or predominantly broadened upward.
Blades of the cauline-leaves entire or nearly so: achene about 3 mm. long. 17. *E. tortifolium.*
Blades of the cauline leaves coarsely toothed: achene about 2.5 mm. long. 18. *E. cuneifolium.*
Inner bracts of the involucre 3.5 mm. long or less. 19. *E. semiserratum.*
Inner bracts of the involucre elliptic: leaf-blades stiff, prominently ribbed, usually saliently toothed. 20. *E. altissimum.*

VI. Rotundifolia

Leaf-blades crenate, serrate-crenate, or dentate-serrate or somewhat incised: bracts of the involucre acute or acuminate.
Branches of the inflorescence alternate: blades of the upper leaves coarsely few-toothed. 21. *E. verbenaefolium.*
Branches of the inflorescence opposite: blades of the upper leaves more finely and evenly toothed.
Leaf-blades about as wide as long, the upper ones of a deltoid or suborbicular type, truncate or subcordate at the base. 22. *E. rotundifolium.*
Leaf-blades longer than wide, the upper ones of an ovoid type, rounded or broadly cuneate at the base.
Involucre over 6 mm. long: achene nearly 3 mm. long. 23. *E. pubescens.*
Involucre less than 6 mm. long: achene about 2 mm. long. 24. *E. scabridum.*
Leaf-blades sharply serrate: bracts of the involucre obtuse. 25. *E. sessilifolium.*

VII. Perfoliata

Leaf-blades connate-clasping: bracts of the involucre mostly less than 12: head more than 15-flowered.
Involucre cylindric-turbinate, over 4 mm. high, acute at the base; inner bracts linear, acuminate. 26. *E. Chapmanii.*
Involucre campanulate, less than 4 mm. high, rounded at the base; inner bracts elliptic, abruptly short-pointed or obtuse. 27. *E. cuneatum.*
Leaf-blades connate-perfoliate, except in *E. perfoliatum truncatum:* bracts of the involucre mostly more than 12: head less than 15-flowered. 28. *E. perfoliatum.*

VIII. Urticaefolia

Corolla pink to pale-purple, wholly glabrous. 29. *E. incarnatum.*
Corolla white, the lobes pubescent, sometimes very slightly so.
Leaf-blades sharply or saliently toothed, the upper cauline-leaves slender-petioled, with petioles nearly or quite one-half as long as the blades.
Large-leaved plants; blades of the leaves of the stem typically nearly or quite 1 dm. long, of an ovate type.
Involucre mostly less than 20-flowered, 3 mm. wide or less at maturity; bracts mostly 13 or fewer. 30. *E. urticaefolium.*
Involucre mostly more than 25-flowered, 4 mm. wide or more at maturity; bracts mostly 16 or more. 31. *E. roanensis.*
Small-leaved plants; blades of the leaves of the stem typically less than 6 cm. long, of a hastate or deltoid type. 32. *E. jucundum.*

Leaf-blades crenate, the teeth blunt or rounded, the upper cauline leaves short-petioled or sessile.
Involucre sparingly pubescent; inner bracts nearly linear or spatulate, glabrous or sparingly ciliate, scarious-margined. 33. *E. aromaticum.*
Involucre copiously pubescent; inner bracts spatulate or narrowly cuneate, copiously ciliate, not scarious-margined. 34. *E. latidens.*

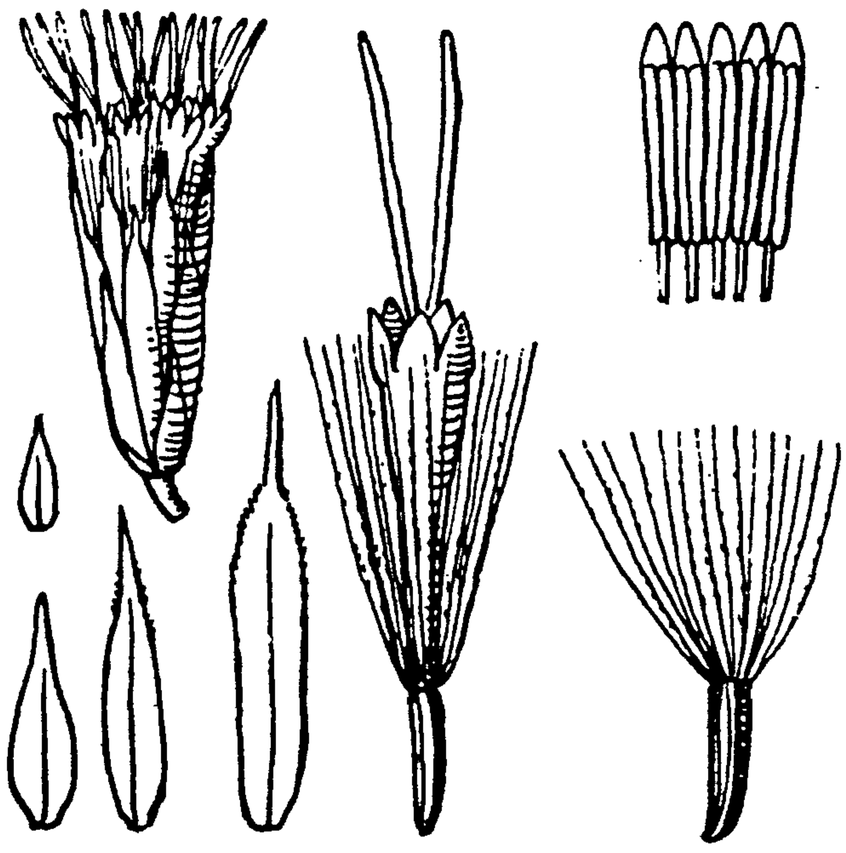
IX. PURPUREA

Stem hollow, very glaucous: leaf-blades elliptic-lanceolate, crenate-serrate. 35. *E. maculatum.*
Stem normally solid, green or slightly glaucous: leaf-blades of an ovate type, sharply serrate.
Stem very purple at the nodes: leaf-blades very thin: flowers not ill-scented: corollas light-purple. 36. *E. trifoliatum.*
Stem not purple at the nodes: leaf-blades thickish, rugose: flowers ill-scented: corollas crimson. 37. *E. purpureum.*

X. VILLOSA

Shrub with ovate or deltoid-ovate leaf-blades. 38. *E. villosum.*

1. E. leptophyllum DC. Stem 4–13 dm. tall, glabrous, with recurved-secund branches above: leaf-blades with filiform segments: bracts of the involucre long-tipped, the inner between 3 and 4 mm. long: corolla white, about 3 mm. long: achene fully 1.5 mm. long.—(FENNEL.)—Low grounds, margins of ponds, and swamps, Coastal Plain, Fla. to Miss. and S. C.—Sum.–fall, or all year S.



2. E. capillifolium (Lam.) Small. Stem 9–30 dm. tall, pubescent, fastigiate above: leaf-blades with filiform segments: bracts of the involucre short-tipped, the inner between 2 and 3 mm. long: corolla white, about 2 mm. long: achene fully 1 mm. long.—(DOG-FENNEL.)—Hammocks, old fields, roadsides, and banks, Coastal Plain and adj. provinces, Fla. to Tex., Tenn., and Del.—Sum.–fall.

3. E. compositifolium Walt. Stem 6–12 dm. tall, puberulent to finely pubescent, paniculate above: leaf-blades with linear or nearly linear segments: inflorescence plumose: bracts of the involucre mucronate, the inner 3.5–4 mm. long: corolla white, 3 mm. long: achene 1.5–2 mm. long.—(DOG-FENNEL.)—Dry soil, especially in pinelands, Coastal Plain and adj. provinces, Fla. to Tex., and N. C. Sum.–fall.

4. E. Eugenei Small. Stem 6–14 dm. tall, pubescent: leaf-blades with linear, entire, or toothed segments, or those of the upper leaves merely toothed or incised: inflorescence not plumose: bracts of the involucre mucronate, the inner 3–3.5 mm. long: corolla white, 2.5–3 mm. long: achene less than 2 mm. long.—Pinelands and woods, Coastal Plain and adj. Piedmont, Fla. and Ala.—Fall.

5. E. pinnatifidum Ell. Stem 6–12 dm. tall, finely pubescent: leaf-blades with linear or nearly linear segments: involucre about 3 mm. long; bracts cuspidate, the inner about 3 mm. long: corolla white, about 2 mm. long: achene fully 1 mm. long.—Dry soil and damp borders of thickets, Coastal Plain and adj. provinces, Fla. to Ala. and N. C.—Sum.–fall.

6. E. pectinatum Small. Stem 9–20 dm. tall, finely pubescent, corymbose above: leaf-blades elliptic in outline, or broadest above or below the middle: involucre 4–5 mm. long; bracts obtuse or retuse-aristulate, the inner 3.5–4 mm. long: corolla white, 3 mm. long: achene fully 1 mm. long.—Sandy soil, Coastal Plain, Fla. and Ga.—Sum.–fall.

7. E. serotinum Michx. Stem 8–20 dm. tall, finely pubescent, corymbose above: leaf-blades herbaceous, lanceolate to ovate-lanceolate, 5–25 cm. long, acute or acuminate, coarsely serrate: involucre less than 5 mm. long; bracts linear to linear-elliptic, broadened upward, rounded at the apex, white-margined, the inner 3–3.5 mm. long: corolla white, 3 mm. long: achene less than 2 mm. long.—Rich woods, banks, and wet grounds, various provinces, Fla. to Tex., Ia., and Md.—Sum.–fall.

8. E. mikanioides Chapm. Stem 5–11 dm. tall, tomentulose, at least when young: leaf-blades vertical, fleshy, deltoid-ovate to hastate-ovate, or sometimes elliptic, 3–6 cm. long, obtuse or acutish, repand or crenate-dentate: involucre over 5 mm. long; bracts linear, abruptly pointed, green-margined, the inner 4–5 mm. long: corolla white or pinkish, nearly 4 mm. long: achene fully 1 mm. long.—Low sandy soil, damp, sandy or marly pinelands, and salt marshes, Fla.—Sum.–fall.

9. E. leucolepis T. & G. Stem 3–8 dm. tall, rough-pubescent, or tomentulose above; leaf-blades linear to lanceolate, 3–8 cm. long, remotely serrate or nearly entire: involucre tomentulose; bracts slenderly acuminate, the inner ones broadly linear, 6–6.5 mm. long: corolla white, about 3.5 mm. long: achene 2.5 mm. long. [*E. Mohri* Greene.]—Pinelands, and acid, sandy bogs, Coastal Plain, Fla. to La. and N. Y.—Sum.–fall.

10. E. anomalum Nash. Stem 8–15 dm. tall, tomentulose: leaf-blades ovate-lanceolate to ovate, 3–7 cm. long, coarsely and sharply serrate: involucre finely pubescent; bracts acute or short-acuminate, the inner narrowly linear, 5–5.5 mm. long: corolla white, about 3.5 mm. long: achene 2–2.5 mm. long.—Sandy soil, Fla.—Sum.–fall.

11. E. album L. Stem 3–9 dm. tall, harshly pubescent: leaf-blades elliptic to lanceolate, or those at the base of the stem ovate to obovate, 3–10 cm. long, serrate: involucre cylindric-turbinate, the inner bracts linear-subulate, 8–9 mm. long, abruptly pointed: corolla white, about 5 mm. long: achene about 3 mm. long.—Dry, acid, sandy soil, in pinelands and deciduous woods, Coastal Plain and adj. provinces, Fla. to La., Tenn., and N. Y.—Sum.–fall.

12. E. petaloideum Britton. Stem 3–7 dm. tall, rough-pubescent: leaf-blades elliptic to ovate or ovate-lanceolate, or the lower ones oval or obovate, 2–8 cm. long, bluntly serrate or crenate-serrate: involucre trumpet-shaped, the inner bracts spatulate, 10–11 mm. long, or sometimes shorter, mucronate: corolla white, 4 mm. long: achene about 3 mm. long.—Pinelands, Coastal Plain, Fla. and Ala.—Sum.–fall.

13. E. hyssopifolium L. Stem 3–8 dm. tall, puberulent: leaf-blades linear, 2–6 cm. long, sometimes undulate: involucre 5–6 mm. high; inner bracts narrowly linear or linear-lanceolate, ciliolate, obtuse, the inner 5–5.5 mm. long: corolla white, 3.5–4 mm. long: achene 2.5–3 mm. long.—Woods, banks, and thickets, various provinces, Fla. to Tex., Ky., and Mass.—Sum.–fall.

14. E. lecheaefolium Greene. Stem 3–7 dm. tall, puberulent or finely pubescent: leaf-blades narrowly linear, 1–8 cm. long, entire: involucre 3–4 mm. high; inner bracts elliptic, ciliolate at the mucronate apex: corolla white, 2.5–3 mm. long: achene about 2 mm. long.—Sandy soil, Coastal Plain, Fla. to Ga. and Ala.—Sum.–fall.

15. E. Torreyanum Short. Stem 4–12 dm. tall, finely pubescent: leaf-blades broadly linear to narrowly lanceolate, coarsely and sharply serrate to laciniate: involucre turbinate: bracts broadly linear, ciliate, the inner 5–5.5 mm. long:

corolla white, 3 mm. long: achene 3 mm. long.—Low woods and wooded hillsides, often in acid soil, various provinces, Fla. to Tenn., Ky., and Pa.—Sum.–fall.

16. **E. recurvans** Small. Stem 4–9 dm. tall, finely pubescent: leaves more or less reflexed; blades narrowly elliptic to lanceolate, 1.5–4 cm. long, coarsely and bluntly toothed: involucre cylindric: bracts narrowly linear, slightly ciliate, the inner about 4 mm. long: corolla white, 3 mm. long: achene about 2 mm. long.—Pinelands, Coastal Plain, Fla. to Ala. and Ga.—Sum.–fall.

17. **E. tortifolium** Chapm. Stem 3–7 dm. tall, tomentulose above: leaf-blades spatulate, oblanceolate, or nearly linear, 1–3 cm. long, entire or shallowly and remotely toothed: outer bracts of the involucre ovate; inner bracts linear: corolla white, about 3 mm. long: achene about 3 mm. long.—Sandy ridges and dry pinelands, Coastal Plain, Fla. to Ala. and S. C.—Sum.–fall.

18. **E. cuneifolium** Willd. Stem 4–8 dm. tall, tomentulose above: leaf-blades cuneate, elliptic-cuneate, or linear-elliptic, 1–3 cm. long, serrate, or the upper ones individually entire: outer bracts of the involucre oval; inner bracts narrowly elliptic: corolla white, about 3.5 mm. long: achene about 2.5 mm. long.—Rich woods, Coastal Plain and adj. provinces, Fla. to Ala. and S. C.—Sum.–fall.

19. **E. semiserratum** DC. Stem 5–12 dm. tall, tomentulose: leaf-blades elliptic-spatulate to elliptic, 3–10 cm. long, sharply serrate: involucre nearly cylindric; bracts obtuse, ciliate, not pale-margined, the inner linear, 3–3.5 mm. long: corolla white, 2–2.5 mm. long: achene about 2 mm. long.—Sandy soil, wet places, and pond-margins, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Va.—Sum.–fall.

20. **E. altissimum** L. Stem 8–20 dm. tall, hoary-tomentulose: leaf-blades linear-lanceolate to linear-elliptic, mostly 4–12 cm. long, sharply serrate: involucre campanulate; bracts ciliate, obtuse, pale-margined, the inner elliptic, 4.5–5 mm. long: corolla white, about 4 mm. long: achene 3–3.5 mm. long.—Dry soil, various provinces, Miss. to Tex., Ia., Pa., and N. C.—Sum.–fall.

21. **E. verbenaefolium** Michx. Stem 6–12 dm. tall, finely pubescent: leaf-blades ovate to lanceolate, 2–12 cm. long, coarsely serrate: bracts of the involucre abruptly short-pointed, the inner mostly linear-elliptic or narrowly elliptic, 4–4.5 mm. long: corolla white, 3 mm. long: achene about 3 mm. long.—Sandy soil, moist grounds, and acid swamps, Coastal Plain and adj. provinces, Fla. to La., Tenn., and Mass.—Sum.–fall.

22. **E. rotundifolium** L. Stem 3–12 dm. tall, tomentulose: leaf-blades suborbicular to orbicular-ovate, 2–4 cm. long, crenate or crenate-dentate: intermediate bracts of the involucre acuminate, the inner ones 5.5–6 mm. long, narrowly linear: corolla white, about 3 mm. long: achene fully 2 mm. long.—(FALSE-HOARHOUND.)—Dry woods, pinelands, and swamps, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and R. I.—Sum.–fall.

23. **E. pubescens** Muhl. Stem 3–15 dm. tall, canescent-tomentulose: leaf-blades ovate, 2–10 cm. long, serrate or incised-serrate: intermediate bracts of the involucre acute or abruptly pointed, the inner ones 5.5–6 mm. long, linear-elliptic: corolla white, about 3 mm. long: achene 2.5–3 mm. long.—Rocky woods, acid, sandy banks, and thickets, Coastal Plain and adj. provinces, Fla. to Miss., Tenn., and Me.—Sum.–fall.

24. **E. scabridum** Ell. Stem 4–12 dm. tall, canescent-tomentose: leaf-blades elliptic to ovate-elliptic, 2–8 cm. long, serrate or incised-serrate: bracts of the

involucre abruptly pointed, the inner 4–5 mm. long, linear-elliptic: corolla white, 2.5–3 mm. long: achene fully 2 mm. long.—Low pinelands, Coastal Plain, Fla. to S. C.—Sum.–fall.

25. E. sessilifolium L. Stem 4–15 dm. tall, tomentulose above: leaf-blades lanceolate, 8–25 cm. long, acuminate, sharply serrate, sessile, sometimes slightly clasping: bracts of the involucre obtuse, the inner linear-elliptic, 4.5–5 mm. long: corolla white, 3 mm. long: achene 3–3.5 mm. long.—Thickets, open woods and rocky banks, various provinces, rarely Coastal Plain, Ga. to Ala., Mo., Vt., and Mass.—Sum.–fall.

26. E. Chapmanii Small. Stem 4–12 dm. tall, tomentulose above: leaf-blades elliptic to elliptic-ovate, or narrowly ovate, 2–10 cm. long, crenate; inner bracts of the involucre acuminate, linear, 4–4.5 mm. long: corolla white, 3 mm. long: achene about 1.5 mm. long.—Sandy woods, Fla.—Sum.

27. E. cuneatum Engelm. Stem 5–16 dm. tall, tomentose above: leaf-blades lanceolate to elliptic-lanceolate, 9–20 cm. long, finely crenate-serrate: inner bracts of the involucre abruptly short-pointed or obtuse, elliptic, 3–3.5 mm. long: corolla white, 3 mm. long: achene 1.5 mm. long.—Low grounds, Coastal Plain and adj. provinces, Ala. to La., Mo., and N. C.—Sum.–fall.

28. E. perfoliatum L. Stem 3–12 dm. tall, tomentulose above: leaf-blades lanceolate, 8–25 cm. long, crenate-serrate, connate-perfoliate (or truncate in *E. perfoliatum truncatum*): inner bracts of the involucres cuneate-spatulate, acuminate, 6–6.5 mm. long or shorter: corolla white, 3–4 mm. long: achene 2 mm. long, or mostly shorter.—(BONESET. THOROUGHWORT.)—Moist meadows, and swamps, various provinces, Fla. to Tex., N. D., and N. B.—Sum.–fall.

29. E. incarnatum Walt. Stem 5–12 dm. tall, minutely pubescent: leaf-blades thin, ovate to deltoid, and usually somewhat hastate, 2–6 cm. long, acute or acuminate, coarsely serrate, on long and slender petioles: involucre narrow; bracts linear or nearly so, or the outer subulate, often ciliolate at the apex, the outer ones often pubescent, especially near the base, the inner 4–4.5 mm. long: corolla lilac, about 3 mm. long: achene 2–2.5 mm. long.—Rich sandy woods, Coastal Plain and adj. provinces, Fla. to Tex., Ind. and Va.—(*Mex.*) —Sum.–fall.

30. E. urticaefolium Reichard. Stem 4–12 dm. tall, puberulent or glabrate: leaf-blades thin, ovate or rarely ovate-lanceolate, 4–12 cm. long, acuminate, coarsely serrate, long-petioled: involucre turbinate: bracts narrowly linear, ciliolate at the apex, the inner 3–5 mm. long, acuminate: corolla white, 3–4 mm. long: achene slender-fusiform, 2–2.5 mm. long.—(WHITE-SNAKEROOT. WHITE-SANICLE.)—Rich woods and thickets, various provinces, Ga. to La., Okla., Ont., and N.B.—Sum.–fall.

31. E. roanensis Small. Stem 1 m. tall or less, finely pubescent at least above: leaf-blades ovate, often broadly so, 7–14 cm. long, acuminate, serrate, rather coarsely so, long-petioled: involucre campanulate; bracts broadly linear or somewhat spatulate, minutely pubescent, the inner 5–6 mm. long, acute: corolla white, 3–4 mm. long: achene stout-fusiform, about 2.5 mm. long.—Woods, Roan Mt., in the Blue Ridge, N. C. and Tenn.—Sum.–fall.

32. E. jucundum Greene. Stem 4–12 dm. tall, glabrous or minutely pubescent above: leaf-blades thin, ovate, often broadly so or deltoid, or somewhat hastate, 1.5–6 cm. long, obtuse or acutish, coarsely crenate-serrate or incised-serrate, slender-petioled: involucre cylindric or nearly so; bracts acute or acuminate, the inner narrowly linear, 3–3.5 mm. long: corolla white, about 4 mm. long: achene about 2.5 mm. long.—Hammocks and pinelands, N and upper pen. Fla.—Fall–wint.

33. E aromaticum L. Stem 3–15 dm. tall, puberulent or minutely pubescent: leaf-blades thickish, ovate or orbicular-ovate to ovate-lanceolate, 2–10

cm. long, obtuse or acute, crenate, sessile or short-petioled: involucre cylindric or turbinate-cylindric: bracts narrow, linear, or the inner ones spatulate, ciliate, 4–4.5 mm. long: corolla white, 4.5–5 mm. long: achene 2.5–3 mm. long.—(WILD-HOARHOUND.)—Dry, acid, woods, thickets, and pinelands, Coastal Plain and adj. provinces, Fla. to Miss., Tenn., Pa., and Mass.—Sum.–fall.

34. E. latidens Small. Stem 7–12 dm. tall, finely pubescent often closely so above: leaf-blades deltoid-ovate or orbicular-ovate, or suborbicular or reniform-orbicular on the lower part of the stem, 4–11 cm. long, obtuse or acutish, coarsely toothed, usually crenate, sessile or short-petioled: involucre campanulate; bracts broad, elliptic, or the inner spatulate or narrowly cuneate, all copiously ciliate, obtuse or acute: corolla white, 3–3.5 mm. long: achene about 2 mm. long.—Woods, Appalachian Valley, Tenn.—Sum.–fall.

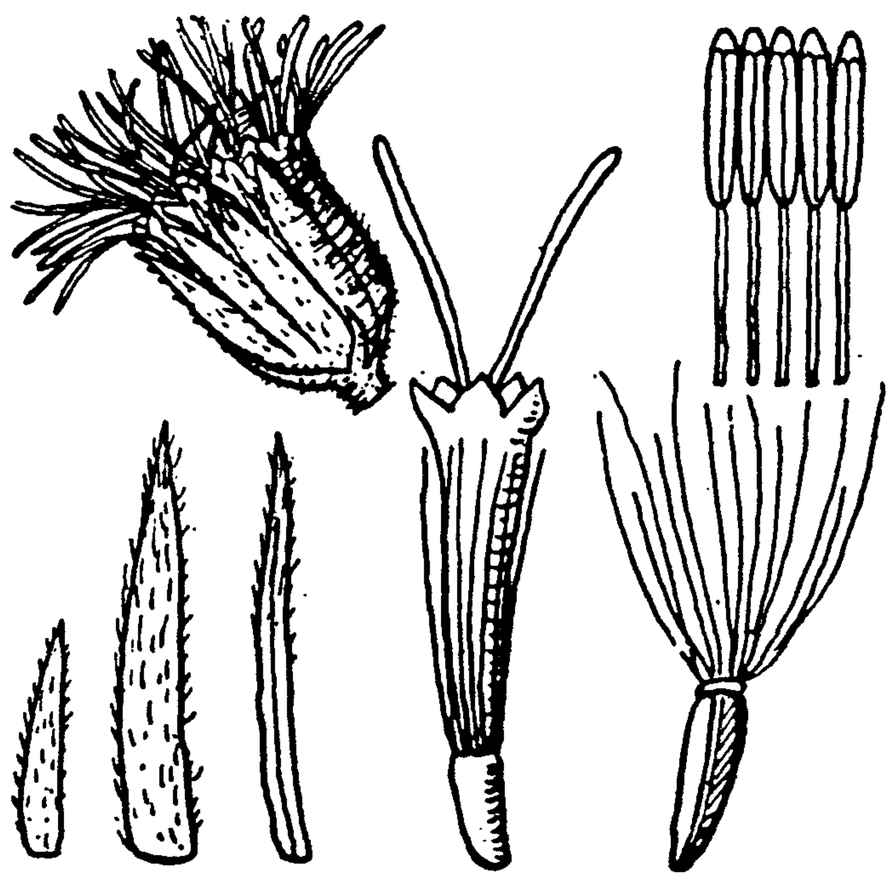
35. E. maculatum Justineus. Stem glabrous, 2–5 m. tall, usually mottled: leaves in whorls of 4–7, usually of 5 or 6; blades elliptic-lanceolate, 1–3 dm. long, acuminate, firm: corymb more or less elongate, round-topped: involucre usually 6- or 7-flowered: corolla 3.5–5 mm. long.—(JOE-PYE-WEED. SMOKEWEED.)—Moist soil, often in thickets, various provinces, Fla. to Tex., Ohio, and Me.—Sum.–fall.

36. E. trifoliatum L. Stem glabrous or sparingly pubescent, 1–2 m. tall: leaves in whorls of 3–5, mostly in fours; blades lanceolate to elliptic-lanceolate, 1.5–2 dm. long, acuminate: corymb convex: involucre usually 5–7-flowered: corolla 5.5–7.5 mm. long.—(JOE-PYE-WEED.)—Open woodlands, various provinces, Ga. to Okla., Nebr., Wis., and N. H.—Sum.–fall.

37. E. purpureum L. Stem more or less pubescent, scabrous, 0.5–2 m. tall, purplish-tinged: leaves in whorls of 2–5, usually in threes or fours; blades firm, ovate, 0.5–2 dm. long, sharply-serrate, 3-ribbed: corymb somewhat convex: involucre usually 6–9-flowered: corolla 4.5–5.5 mm. long.—(JOE-PYE-WEED.)—Moist soil, often in swamps, Coastal Plain and adj. provinces, S. C. to N. H.—Sum.–fall.

38. E. villosum Sw. Stem 5–20 dm. tall, woody, tomentulose: leaf-blades ovate to deltoid-ovate, 1.5–7 cm. long, obtuse, entire or repand: heads in small clusters: involucre campanulate: bracts obtuse, or the inner acute, 3–4 mm. long: corolla white or pinkish, barely 3 mm. long: achene 1.5–2 mm. long.—Hammocks and pinelands, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—All year.

10. CONOCLINIUM DC. Perennial caulescent herbs. Leaves opposite: blades toothed or lobed. Heads in open or compact peduncled clusters. Involucre campanulate or hemispheric, many flowered: bracts narrow, imbricate in several series. Corolla regular, blue or violet, very narrowly funnelform: lobes ovate or deltoid. Androecium included. Anther-appendages ovate. Achene narrowly obpyramidal or somewhat ellipsoid, angled. Pappus of few capillary bristles.—Eight or ten species, mostly tropical. Plants, and flower-heads, often resemble ageratum.



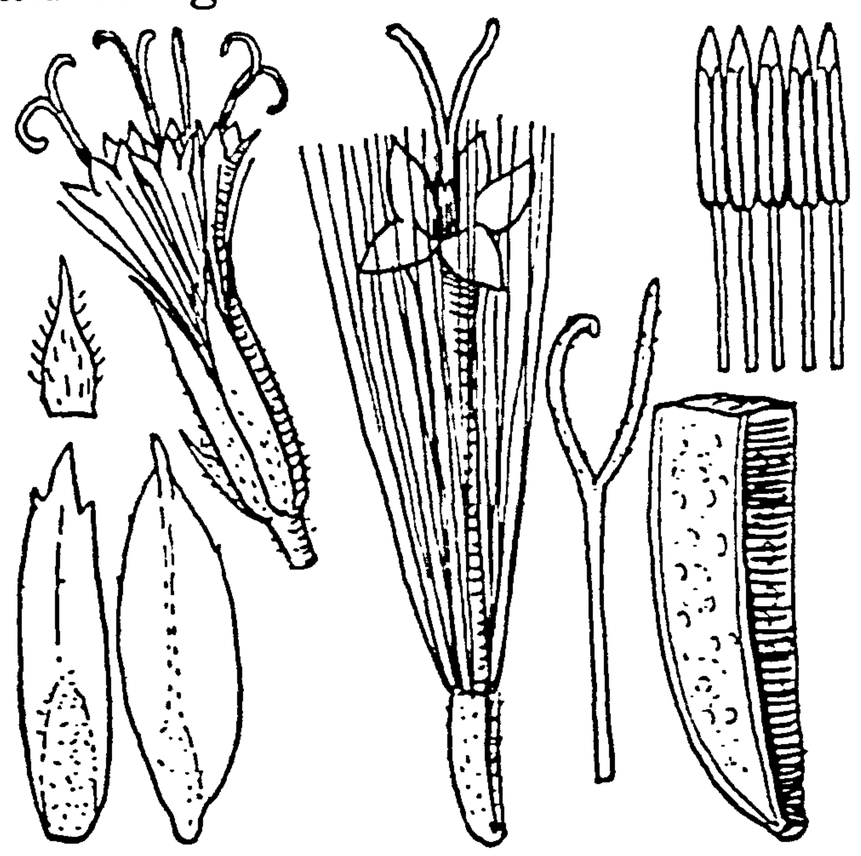
1. C. coelestinum (L.) DC. Stem 2–11 dm. tall, appressed-pubescent, branched: leaf-blades ovate, deltoid, triangular or triangular-lanceolate, 3–12 cm. long, crenate or serrate-crenate, sometimes coarsely so, those of the lower leaves, at least, long-petioled: involucre about

4 mm. high; bracts subulate or linear-subulate, ribbed, pubescent: corolla about 2.5 mm. long: achene barely 1.5 mm. long. [*Eupatorium coelestinum* L. *C. dichotomum* Chapm.]—(MIST-FLOWER.)—Stream-banks, marshes, and thickets, various provinces, Fla. to Tex., Kans., Mich., and N. J.—(*Cuba.*)—Sum.–fall or all year S.—Sometimes cultivated and used in place of species of *Ageratum.*

11. MIKANIA Willd. Herbaceous vines. Leaves opposite, herbaceous: blades of a hastate or deltoid type, mostly toothed. Heads borne in corymbs. Involucre cylindric. Corolla pink or white, with a campanulate throat: lobes lanceolate to triangular-ovate. Androecium exserted: anther-appendages ovate. Achene angled. Pappus of many capillary bristles. [*Willugbaeya* Neck.]—About 150 species, American.—CLIMBING HEMPWEEDS.

Bracts of the involucre acute or acuminate.
  Bracts of the involucre scarcely 4 mm. long. 1. *M. batatifolia.*
  Bracts of the involucre over 4 mm. long. 2. *M. scandens.*
Bracts of the involucre obtuse. 3. *M. cordifolia.*

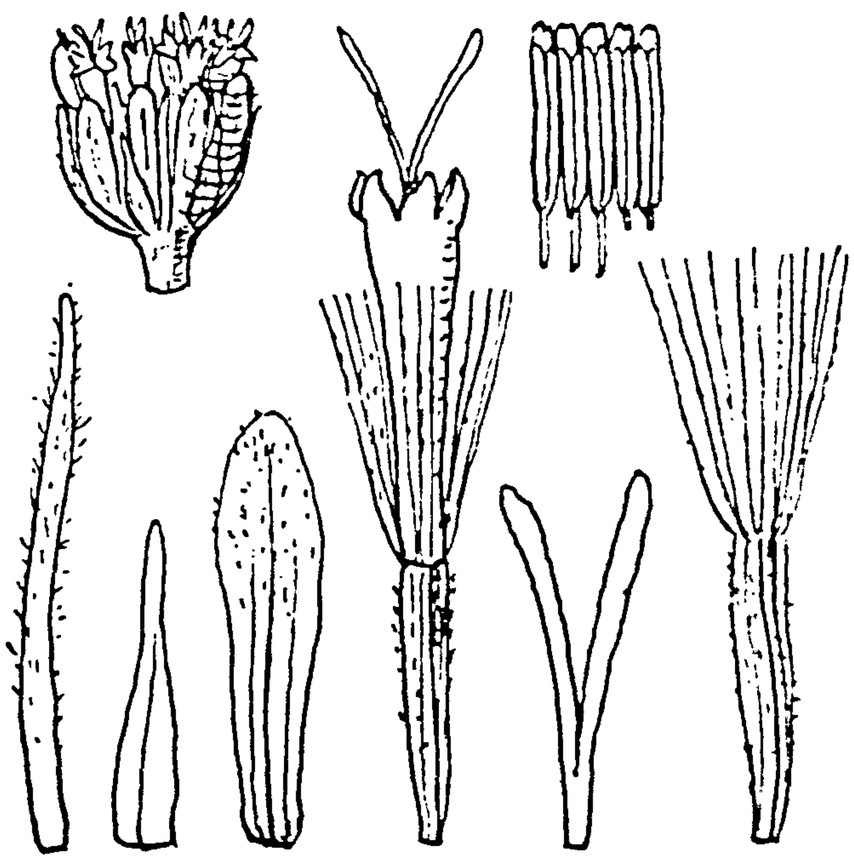
1. M. batatifolia DC. Plant glabrous: leaf-blades deltoid to hastate-ovate, 1–3 cm. long, entire or repand: heads in small irregular clusters: bracts of the involucre 3–4 mm. long: corolla about 3 mm. long. [*W. heterophylla* Small.]—Hammocks, low pinelands, and Everglades, S pen. Fla. and the Keys.—(*W. I.*)—All year.



2. M. scandens (L.) Willd. Plant finely pubescent or nearly glabrous: leaf-blades deltoid-ovate to hastate, 5–8 cm. long, undulate or angulately lobed: bracts of the involucre 5–5.5 mm. long, acuminate or abruptly pointed: corolla about 4 mm. long: achene 2–2.5 mm. long.—(CLIMBING HEMPVINE.)—Woods, thickets, and swamps, various provinces, Fla. to Tex., Ont., and Me.—Sum.

3. M. cordifolia (L.) Willd. Plant densely pubescent: leaf-blades ovate to hastate, 6–15 cm. long, coarsely toothed, or lobed, cordate at the base: corymbs rounded or rather flat-topped: heads numerous: involucre narrow, but rather stout; bracts elliptic to linear-elliptic, 7–8 mm. long, obtuse: corolla about 6 mm. long.—Hammocks, S pen. Fla. and the Keys.—(*W. I., Mex., C. A., S. A.*)—All year.—The most vigorous of the three climbing-hempweeds. Well-developed vines produce prodigious inflorescences. The flowers are very fragrant.

12. COLEOSANTHUS Cass. Perennial, branching herbs or woody plants. Leaves opposite or alternate: blades usually broad and toothed. Heads borne in corymbose cymes. Involucre cylindric to campanulate: bracts ribbed. Corolla-throat narrow, scarcely wider than the tube; lobes ovate to deltoid. Anther-appendages ovate, obtuse. Achene ribbed or striate. Pappus of many capillary bristles. [*Brickellia* Ell.]—About 70 species, mostly American.



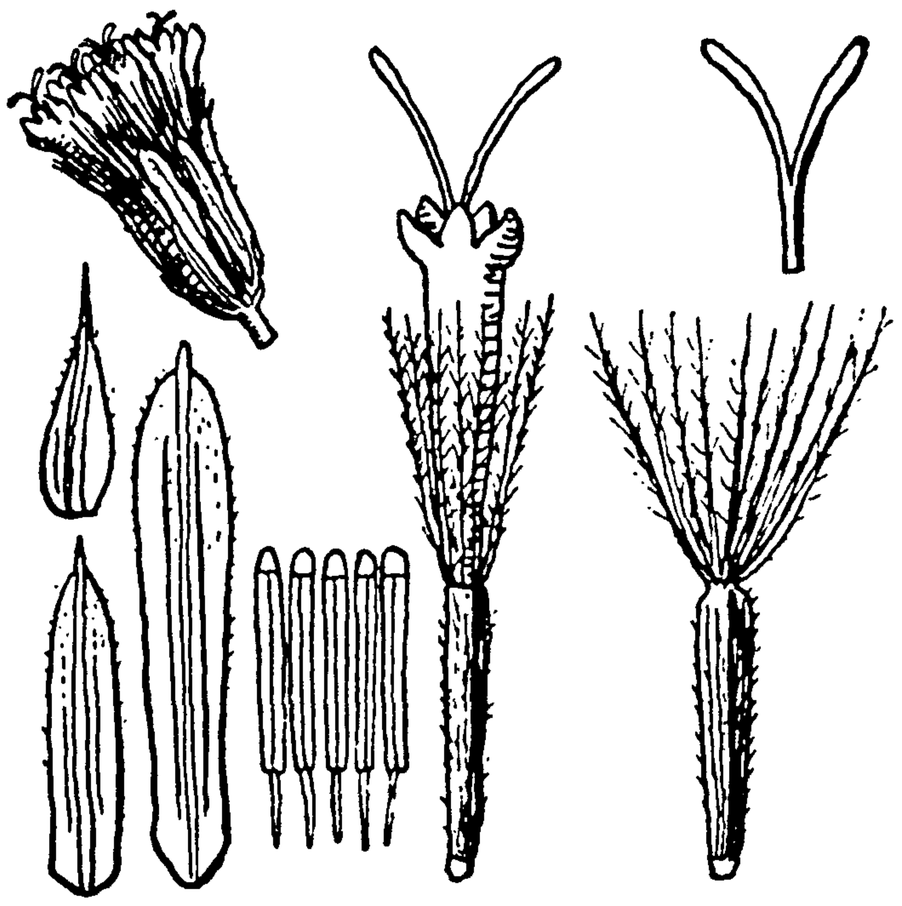
1. C. cordifolius (Ell.) Kuntze. Stem 6–12 dm. tall, puberulent or tomentulose: leaf-blades ovate to deltoid-ovate, or nearly lanceolate above, 5–10 cm. long, crenate-serrate: heads many-flowered: involucre

campanulate, lax: outer bracts linear-subulate; inner bracts linear, obtuse, 9–10 mm. long: corolla pale-purple: achene slender, about 6 mm. long, sparingly pubescent: pappus purplish.—Rich soil, woods, and pinelands, Coastal Plain, Fla. to Ala. and Ga.—Sum.–fall.

13. KUHNIA L. Perennial, pubescent herbs. Leaves alternate: blades narrow, or rarely of an ovate type, resinous-dotted. Heads in open or compact corymbose or paniculate clusters. Involucres cylindric, often narrow. Corolla cream-colored or nearly white, narrowly funnelform, the tube and throat scarcely distinguishable: lobes triangular to lanceolate. Anther-appendages ovate, obtuse. Achene columnar, striate. Pappus of many capillary bristles.—About 10 species, North American.—FALSE-BONESETS.—Sum.–fall.

Peduncle and involucre finely close-pubescent: bracts of the involucre slenderly and not very prominently ribbed, the inner ones narrowly linear.
  Leaves, at least those of the stem, with linear or nearly linear blades: blades thick, entire or obscurely toothed. 1. *K. Mosieri.*
  Leaves, at least those of the stem, with blades predominantly of a lanceolate type: blades thin, the larger coarsely toothed. 2. *K. eupatorioides.*
Peduncle and involucre villous-tomentose: bracts of the involucre broadly and prominently ribbed, the inner ones broadly linear. 3. *K. glutinosa.*

1. K. Mosieri Small. Plant 3–11 dm. tall, slender, deep-green: leaves 1–3 cm. long, usually spreading or reflexed; blades linear or nearly so, entire or obscurely toothed: mature involucre 8–9 mm. high; inner bracts narrowly and sharply ribbbed: corolla mostly over 6 mm. long: pappus pale-brown or whitish. [*K. paniculata* (Fl. SE. U. S.)]—Pinelands, Everglade Keys, Fla.—Specimens from as far west as S Ala. may be referable to this species.



2. K. eupatorioides L. Plant 15 dm. tall or less, stoutish, often pale-green: leaves 3–10 cm. long, ascending; blades lanceolate, sometimes narrowly so, coarsely toothed, or entire above: mature involucre 9–10.5 mm. high; inner bracts with prominent rounded ribs: corolla mostly less than 6 mm. long: pappus tawny.—Woods and stream-banks, Coastal Plain and adj. provinces, Fla. to Miss., Ind., and N. J.

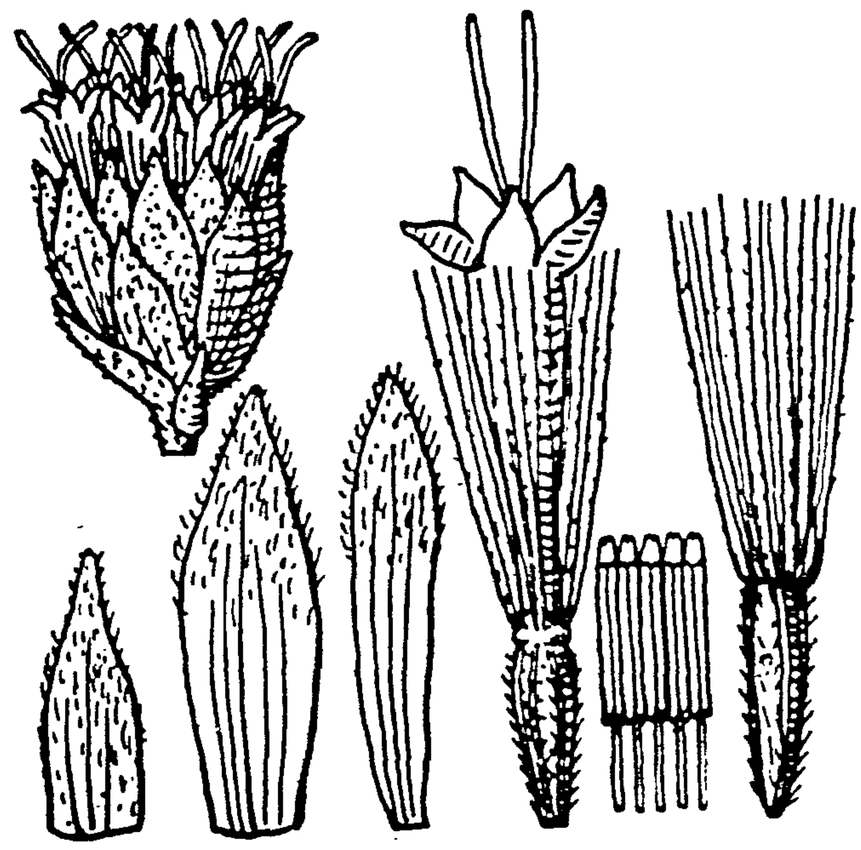
3. K. glutinosa Ell. Plant 12 dm. tall or less, stoutish, gray or grayish: leaves 1.5–7 cm. long, erect or ascending; blades lanceolate to ovate, coarsely toothed: heads often conspicuously glomerate: mature involucre 8–9 mm. high; inner bracts coarsely ribbed: pappus tawny.—Dry prairies or plains, various provinces, Ala., to Tex., Mont., and Ill.

14. CARPHEPHORUS Cass. Perennial, simple-stemmed herbs. Leaves alternate; blades narrow, flat, or acerose, entire. Heads in a terminal corymbose cyme, this sometimes cluster-like. Involucre hemispheric to campanulate: bracts in several series. Corolla rose-purple: throat narrowly funnelform, longer than the narrower tube; lobes lanceolate to deltoid. Androecium included: anther-appendages mostly notched. Achene fusiform, sharply ribbed. Pappus of many pale capillary bristles.—Four species, as follows:

Basal leaves with elongate acerose blades: outer bracts of the involucre lanceolate. 1. *C. Pseudo-Liatris.*

Basal leaves with broader or linear-spatulate blades: outer bracts of the involucre, especially the median ones, broad.
Bracts of the involucre with lax or spreading thick acute or acutish tips. 2. *C. tomentosus.*
Bracts of the involucre with thin or scarious erect rounded or retuse tips.
Heads in a cluster-like cyme: stem copiously pubescent. 3. *C. corymbosus.*
Heads in an open slenderly branched cyme: stem glabrous or nearly so. 4. *C. bellidifolius.*

1. C. Pseudo-Liatris Cass. Stem 3–9 dm. tall, finely crisped-pubescent: leaf-blades acerose, involute, reduced to narrow scales above: outer bracts of the involucre lanceolate; inner 7–8 mm. long, broadly linear: bractlets (chaff) linear: achene about 3 mm. long.—Moist pinelands, Coastal Plain, Fla. to La. and Ga.—Fall.

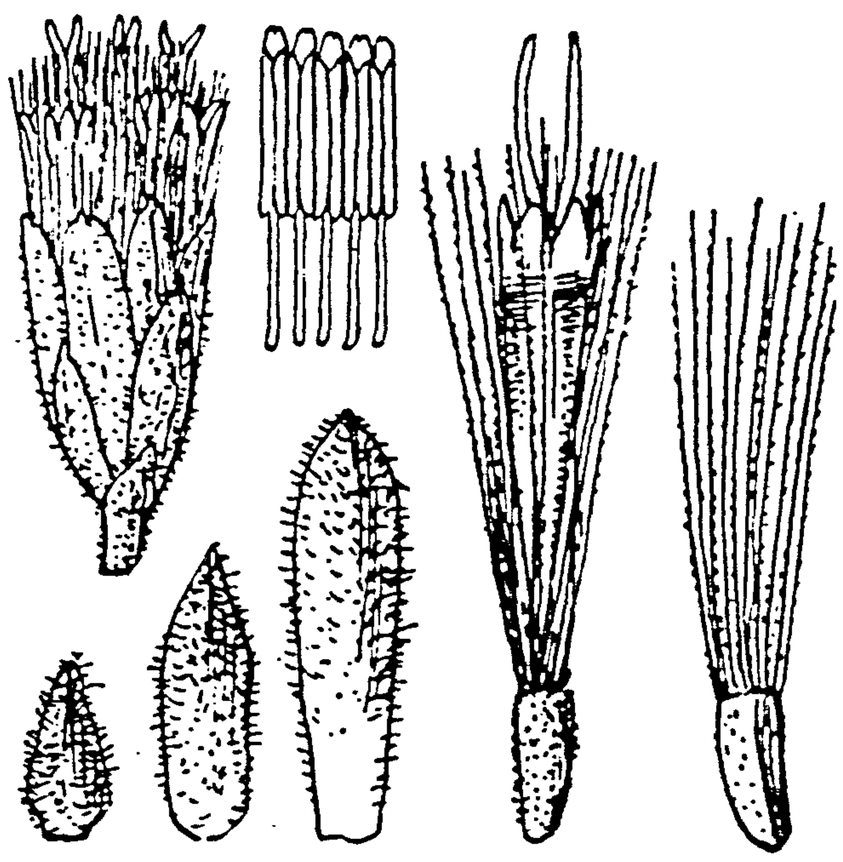


2. C. tomentosus (Michx.) T. & G. Stem 3–7 dm. tall, copiously crisped-pubescent or often hirsutulous below: leaf-blades linear-spatulate below, to obovate to elliptic-oval above: outer bracts of the involucre ovate; inner narrowly linear, 9–12 mm. long, entire: bractlets narrowly linear or linear-spatulate: achene about 4 mm. long.—Pinelands, Coastal Plain, Fla. to N. C.—Sum.–fall.—Rather rare.

3. C. corymbosus (Nutt.) T. & G. Stem 3–9 dm. tall, pubescent: leaf-blades spatulate or elliptic-spatulate below to cuneate, elliptic, or ovate above: bracts of the involucre scarious-margined, erose-ciliate; outer ovate; inner 6–8 mm. long, cuneate: achene stout, about 3 mm. long.—Pinelands, Coastal Plain, Fla. to N. C.—Sum.–fall.

4. C. bellidifolius (Michx.) T. & G. Stem 3–5 dm. tall, glabrous or obscurely pubescent: leaf-blades linear-spatulate to linear: bracts of the involucre not scarious-margined, ciliolate, 8–9 mm. long, obtuse: achene slender, about 4 mm. long.—Pinelands, Coastal Plain, and adj. provinces, Fla. to N. C.—Sum.–fall.

15. LITRISA Small. Perennial somewhat succulent caulescent herbs, the stems single or clustered from short, branched, knotty rootstocks. Leaves alternate, the basal ones larger than the cauline: blades fleshy-leathery, entire, parallel-veined. Heads corymbose. Involucre campanulate, few-flowered; bracts few, relatively broad, pubescent. Corolla bright-purple, with a short tube and a cylindric throat. Androecium included. Anther-appendages ovate, nearly entire, obtuse. Achene cuneate, ribbed. Pappus of many barbellate bristles.—One species.



1. L. carnosa Small. Stem 3–8 dm. tall, finely pubescent; basal leaves in a rosette; blades mostly 2–8 cm. long, linear, varying

to lanceolate or spatulate, acute; cauline leaves remote; blades sessile; involucre erect; bracts mostly acute or mucronate, purple-tinged, the outer ovate, the inner elliptic or broadly linear, about 4 mm. long; achene 2–2.5 mm. long, pubescent.—Prairies and low pinelands, pen. Fla.—Sum.–fall.

16. **LACINIARIA** Hill.[1] Perennial, typically simple herbs with thick roots. Leaves alternate, often numerous; blades narrow, entire. Heads in spikes, racemes, panicles, or rarely in cymes. Involucre ovoid to cylindric or turbinate: bracts few or many, imbricate, rarely petaloid. Corolla rose-purple: throat narrow-funnelform, much longer than the slightly narrower tube: lobes lanceolate. Anther-appendages entire or notched. Achene short, ribbed. Pappus of many barbellate or plumose bristles.—About 40 species, North American.—BUTTON-SNAKEROOTS. BLAZING-STARS. RATTLESNAKE-MASTERS.

Pappus bristles plumose.
- Bracts of the involucre with dilated or petal-like, rose, (or white), apical appendages. — I. ELEGANTES.
- Bracts of the involucre not petal-like at the apex.
  - Heads many (16–60) -flowered: corolla-lobes pubescent within. — II. SQUARROSAE.
  - Heads few (3–6) -flowered: corolla-lobes glabrous. — III. PUNCTATAE.

Pappus bristles barbellate.
- Bracts of the involucre acute, acuminate, or mucronate at the apex.
  - Bracts with recurved-spreading tips. — IV. PYCNOSTACHYAE.
  - Bracts with erect or appressed tips.
    - Heads secund-spreading on the rachis. — V. PAUCIFLORAE.
    - Heads not secund, erect or appressed. — VI. TENUIFOLIAE.
- Bracts of the involucre obtuse or rounded at the apex (except in No. 17).
  - Involucre campanulate, nearly cylindric, or turbinate; few-flowered. — VII. SPICATAE.
  - Involucre hemispheric; many-flowered. — VIII. SCARIOSAE.

I. ELEGANTES

- Petal-like tips of the involucral bracts much longer than wide, serrulate, acuminate. — 1. *L. elegans.*
- Petal-like tips of the involucral bracts about as broad as long, rounded and erose-denticulate. — 2. *L. flabellata.*

II. SQUARROSAE

- Stout plant with approximate cauline leaves and large heads: involucral bracts with rigid, acuminate, spreading tips. — 3. *L. squarrosa.*

III. PUNCTATAE

- Slender plant with very narrow leaves: involucral bracts with slightly petaloid tips. — 4. *L. Boykinii.*

IV. PYCNOSTACHYAE

- Involucral bracts with strongly recurved, small petaloid tips. — 5. *L. pycnostachya.*
- Involucral bracts with slightly recurved, green tips. — 6. *L. chlorolepis.*

V. PAUCIFLORAE

- Stem and rachis glabrous: involucral bracts not glandular punctate. — 7. *L. pauciflora.*
- Stem and rachis pubescent: involucral bracts glandular punctate. — 8. *L. secunda.*

VI. TENUIFOLIAE

- Leaves gradually decreasing in length from the base of the stem to the inflorescence.
  - Bracts of the involucre linear or nearly so, usually long-acuminate. — 9. *L. Chapmanii.*
  - Bracts of the involucre, ovate-lanceolate, usually mucronate.

[1] Contributed by Edward Johnston Alexander.

Bracts numerous, about 20, glabrous or sparingly ciliate: stem and rachis glabrous. — 10. *L. regimontis.*
Bracts few, about 10, pubescent with crisped hairs: stem and rachis pubescent. — 11. *L. Garberi.*
Leaves abruptly smaller near the base of the stem, the lower ones very much elongate. — 12. *L. tenuifolia.*

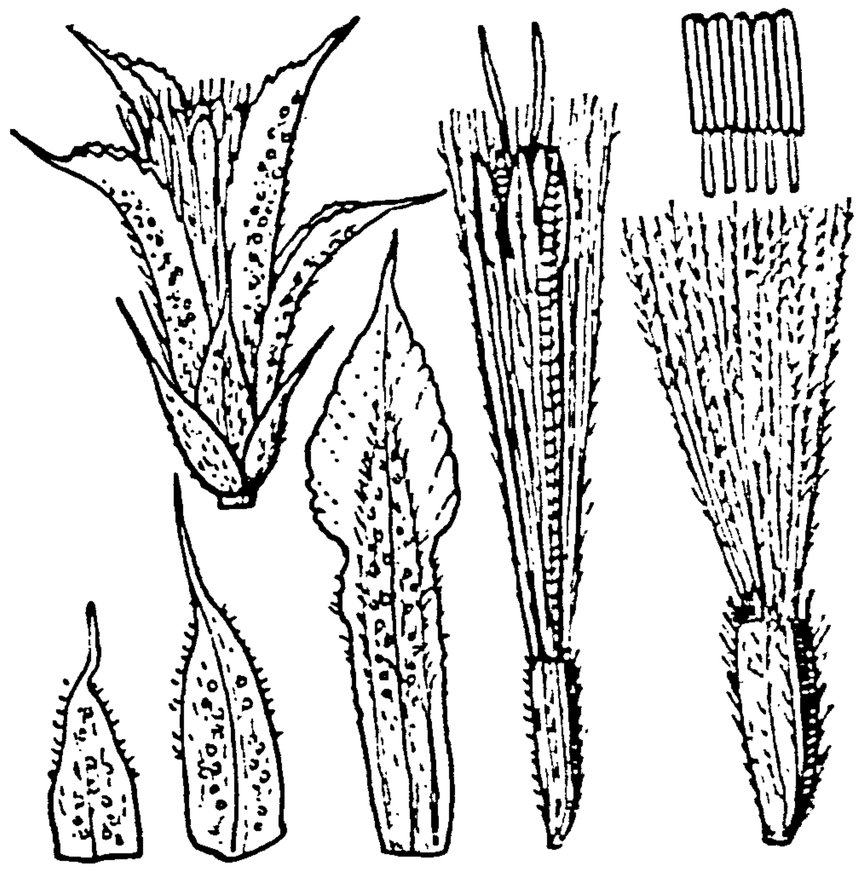
VII. Spicatae

Involucre campanulate; heads sessile.
Involucral bracts with broad petaloid margins.
Involucral bracts with merely scarious margins. — 13. *L. spicata.*
Involucre turbinate: heads sessile or peduncled.
Stem and rachis copiously pubescent. — 14. *L. laxa.*
Stem and rachis glabrous or nearly so.
Involucre 8–12-flowered.
Pappus-bristles nearly or quite as long as the corolla-tube.
Involucre nearly cylindric. — 15. *L. microcephala.*
Involucre turbinate, sometimes broadly so.
Involucre over 9 mm. long.
Involucral bracts rounded at the tip. — 16. *L. graminifolia.*
Involucral bracts pointed at the tip. — 17. *L. Smallii.*
Involucre less than 8 mm. long. — 18. *L. gracilis.*
Pappus-bristles about half as long as the corolla-tube. — 19. *L. Helleri.*
Involucre about 20-flowered. — 20. *L. pilosa.*

VIII. Scariosae

Involucral bracts with broad, petaloid margins and tips. — 21. *L. aspera.*
Involucral bracts with merely scarious margins or not margined at all.
Involucres usually 1 cm. or more high.
Involucral bracts only ciliate margined or glabrous, often with a few scattered hairs: leaves glabrous or scabrate-margined. — 22. *L. scariosa.*
Involucral bracts densely puberulent: leaves scabrous. — 23. *L. Shortii.*
Involucre usually less than 1 cm. high.
Leaves narrowly linear, scabrous all over. — 24. *L. Tracyi.*
Leaves elliptic to linear-elliptic, smooth, or scabrate merely on the margin. — 25. *L. Ruthii.*

1. L. elegans (Walt.) Kuntze. Stem 3–12 dm. tall, finely pubescent: blades of the lower leaves linear to linear-spatulate; upper leaves reflexed: involucral bracts densely pubescent, the petaloid tips glabrous; tips of the inner ones irregularly serrulate.—Pinelands and dry, sandy woods, Coastal Plain, Fla. to Tex. and S Va.—Sum.–fall.



2. L. flabellata Small. Stem 3–6 dm. tall, lanuginous: blades of the lower leaves linear or nearly so: upper leaves reflexed: involucral bracts sparingly pubescent, except the outer bracts which are densely pubescent; tips of the inner bracts erose-denticulate.—Pinelands and open woods, St. Helena Id., S. C.—Fall.

3. L. squarrosa (L.) Hill. Stem 3–8 dm. tall, pubescent: blades of the lower leaves linear to linear-elliptic: bracts of the involucre spatulate with abruptly acuminate, spreading tips, heavily ciliate-margined, with some cilia on the bract-body (rarely glabrous, only the outermost slightly ciliate); inner bracts linear, acute, 15–22 mm. long: corollas about 15 mm. long: achene about 6 mm. long, short-pubescent.—Dry sandy soil, various provinces, Fla. to Tex., Mo., Ind., and Va.—Sum.–fall.—The constituents of this species are rather difficult to interpret at present. The following divisions may help understanding the group. *L. squarrosa intermedia* (Lindl.) DC., with

heads more narrow and bracts erect or little spreading, less prolonged, has the same range as the type. *L. squarrosa alabamensis* Alexander, with heads more narrow, bracts glabrous except the outermost, abruptly short-acuminate and very squarrose, is in Ala. and Miss.

4. L. Boykinii (T. & G.) Kuntze. Stem 3–6 dm. tall, glabrous or nearly so: blades of the lower leaves narrowly linear: heads loosely spicate-racemose, slender-peduncled: inner bracts of the involucre linear, 9–12 mm. long, acuminate, glabrous or nearly so: corolla 6–7 mm. long: achene 4–4.5 mm. long, or sometimes shorter.—Dry or sandy soil, Coastal Plain, Ga.—Sum.—Perhaps a hybrid between *L. elegans* and *L. tenuifolia.*

5. L. pycnostachya (Michx.) Kuntze. Stem 6–15 dm. tall, more or less pubescent, especially above: blades of the lower leaves linear: involucral bracts ciliate-margined, often heavily so; inner bracts 9–11 mm. long, acuminate: corollas 10–11 mm. long: filaments less than half as long as the anthers: achene 4.5–5 mm. long. [*L. macilenta* Small]—Dry soil, various provinces, Tex. to Nebr., Minn., Wis., Ky., and Miss.—Sum.–fall.—*L. Langloisii* Green, distinguished by its woolly stem and involucres, may be distinct.

6. L. chlorolepis Small. Stem 3–6 dm. tall, hirsute-tomentulose: blades of the lower leaves narrowly linear: involucral bracts pubescent, with short recurved green tips; inner bracts 6–7 mm. long, obtuse, long-ciliate: filaments fully half as long as the anthers: achene 3–3.5 mm. long. [*L. Garberi* Small, not Kuntze.]—Sandy pinelands, near Tampa, Fla.—Fall.

7. L. pauciflora (Pursh) Kuntze. Stem 2–9 dm. tall, glabrous: blades of the lower leaves narrowly linear: involucral bracts glabrous; inner bracts 12–13 mm. long, abruptly pointed or somewhat acuminate: achene 4–4.5 mm. long.—Dry sand, Coastal Plain, Fla. to S. C.—Sum.–fall.

8. L. secunda (Ell.) Small. Stem 3–8 dm. tall, densely short-pubescent: blades of the lower leaves linear, often narrowly so: inner bracts of the involucre linear, broadened upward, 7–10 mm. long, acuminate, scattered, short-pubescent: achene 3–5 mm. long. [*L. carinata* Small.]—Sandhills and pinelands, Coastal Plain and Piedmont, Fla. and Ala. to N. C.—Fall.

9. L. Chapmanii (T. & G.) Kuntze. Stem 2–6 dm. tall, tomentose: blades of the lower leaves narrowly linear, mostly less than 10 cm. long (or those of the basal and lower stem-leaves longer in *L. Chapmanii longifolia*); involucral bracts glabrous or nearly so; inner bracts 11–13 mm. long, linear-acuminate: achene 5.5–6 mm. long. [*L. Deamii* Lunell.]—Pinelands, Coastal Plain, Fla. and Ga.

10. L. regimontis Small. Stem 3–9 dm. tall, glabrous: blades of the lower leaves narrowly linear: involucral bracts glabrous or sparingly ciliate; inner bracts cuneate, 8–9 mm. long, acute: filaments less than half as long as the anthers: achene about 4 mm. long.—Wooded slopes, outliers of the Blue Ridge in the Piedmont, also in adj. provinces, Ga. to N. C.—Sum.–fall.

11. L. Garberi (A. Gray) Kuntze. Stem 2–5 dm. tall, hirsute: blades of the lower leaves narrowly linear: involucral bracts broadly elliptic, ciliate and viscid, and abruptly acuminate; inner bracts 8–9 mm. long, ciliate, viscid and glandular-punctate: achene 2.5–3 mm. long. [*L. Nashii* Small.]—Pinelands, pen. Fla.—Sum.–fall.—Unusual on account of its clustered fleshy tuberous roots.

12. L. tenuifolia (Nutt.) Kuntze. Stem 6–12 dm. tall, glabrous: blades of the lower leaves linear-filiform: involucral bracts minutely ciliate; inner bracts 5–6 mm. long: corollas 6–7 mm. long: filaments pubescent, less than half as long as the anthers: achene 3.5–4.5 mm. long. [*Liatris laevigata* Nutt. *L.*

laevigata Small.]—Pinelands, Coastal Plain and adj. provinces, Fla. to Ala. and N. C.—Sum.–fall.

13. L. spicata (L.) Kuntze. Stem 6–15 dm. tall, sometimes sparingly hirsute: blades of the lower leaves linear: involucral bracts glabrous; intermediate bracts oblong-ovate; inner bracts 8–9 mm. long, broadly linear: corollas 6.5–7.5 mm. long; lobes glabrous: achene 4–5 mm. long.—Moist woods, prairies, low-pinelands, and low grounds, various provinces, Fla. to La., Minn., and Mass.—Sum.–fall.—*L. spicata montana* Gray, with broader leaves and larger heads occurs in the Blue Ridge from Ga. and S. C. to Va.

14. L. laxa Small. Stem 4–6 dm. tall, thinly tomentulose: blades of the lower leaves linear: involucral bracts finely and densely ciliate; inner bracts narrowed at the tip, 4–5 mm. long: achene mostly over 3 mm. long. [*L. gracilis* Fl. SE U. S.)]—Coastal sand-dunes, Fla. to Ala. and S. C.—Spr.

15. L. microcephala Small. Stem 3–7 dm. tall, glabrous: blades of the lower leaves narrowly linear, often elongate: involucral bracts glabrous, nearly cylindric; inner bracts 7–8 mm. long: corollas 1.5–2.5 mm. long: filaments fully half as long as the anthers: achene clavate, 4 mm. long. [*L. polyphylla* Small.]—Sandy soil, Blue Ridge to Interior Low Plateaus, Ga. to Tenn.—Sum.

16. L. graminifolia (Walt.) Kuntze. Stem 2–12 dm. tall, glabrous: leaves ciliate near the base; blades of the lower ones linear: involucral bracts narrowly linear elliptic, minutely ciliate; the inner ones 7–8 mm. long, linear: achene 4–5 mm. long. [*L. vittata* Greene.]—Arid fields open woods, and damp savannas, Coastal Plain and adj. provinces, Fla. to Tenn. and N. J.—Sum.

17. L. Smallii Britton. Stem 1–8 dm. tall, glabrous: leaves ciliate near the base; blades of the lower ones broadly or narrowly linear: involucral bracts ciliate margined, broadly linear and bluntly often dark-tipped; inner bracts broadly linear, ciliolate all around, 8–9 mm. long: corolla-tube scarcely longer than the pappus: achene 4–5 mm. long.—Mt. slopes, Blue Ridge, Ga. to Va.—Sum.–fall.

18. L. gracilis (Pursh) Kuntze. Stem 4–10 dm. tall, glabrous: lower leaves with long, linear or narrowly elliptic blades: bracts of the involucre narrowly linear-elliptic, glabrous (sometimes puberulent), finely ciliate, the inner 4–5 mm. long: achene very coarsely ribbed, 2–3 mm. long.—Dry, open woods, fields and slopes, Coastal Plain and adj. provinces, Fla. to Miss. and Ga.—Late sum.–fall.—Probably *L. elegantula* and *L. elongata* of Greene belong here.

19. L. Helleri Porter. Stem 1–4 dm. tall, glabrous or nearly so: blades of the lower leaves linear: involucral bracts minutely ciliate: inner bracts narrowly linear, 7–8 mm. long: corolla-tube twice as long as the pappus: achene about 4 mm. long.—Rocky soil and cliffs, Blue Ridge, N. C. and Va.—Sum.–fall.

20. L. pilosa (Ait.) Heller. Stem 2–7 dm. tall, glabrous: blades of the lower leaves broadly linear or linear-oblong: involucral bracts narrowly linear-elliptic, glabrous; inner ones linear, 8–10 mm. long: achene fully 5 mm. long.—Dry rocky or sandy slopes, various provinces N of Coastal Plain, Ga. to Ala., W. Va., and S Va.—Sum.

21. L. aspera (Michx.) Greene. Stem 3–15 dm. tall, densely pubescent: blades of the lower leaves narrowly elliptic: involucral bracts with only the central portion herbaceous, the entire tip and sides being so broadly scarious as to appear winged, the tip usually concave, and spreading, purplish-tinged or stramineous: achene 4–5 mm. long.—Prairies and plains, various provinces, Ark. and Okla. to Nebr., Minn. and Ind.—Sum.–fall.—*L. aspera sphaeroidea* (Michx.) Alexander, a variety with glabrous leaves occurs on mountain slopes

and rocky soil, in the mountains of Ga., N. C. and Tenn., and in various provinces, to Minn. and Mich.—Sum.–fall.

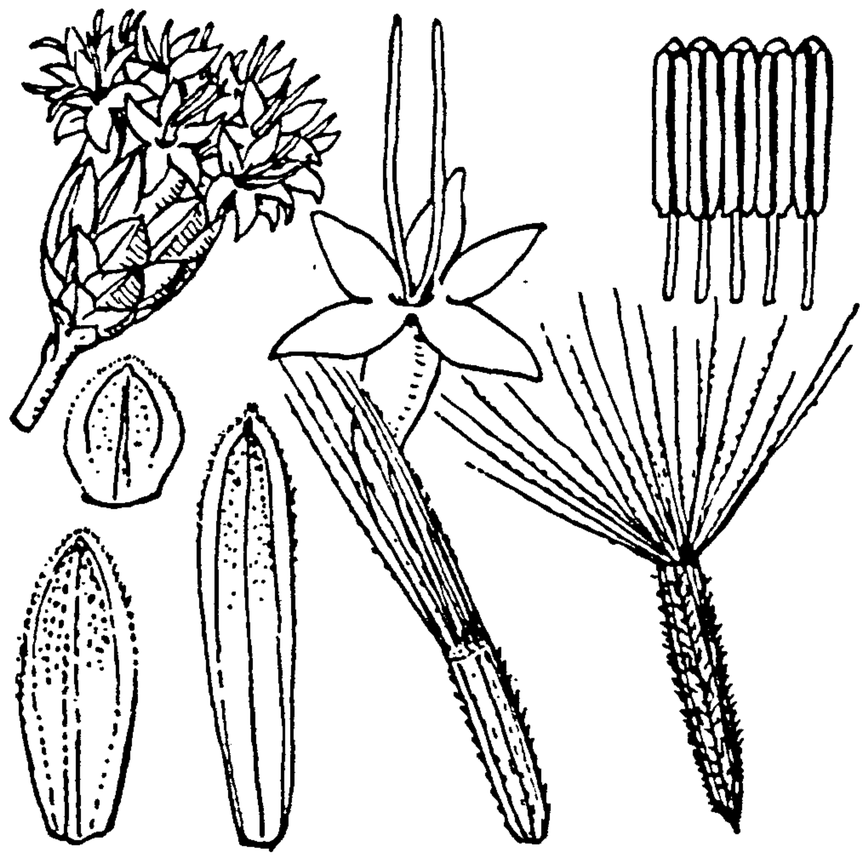
22. L. scariosa (L.) Hill. Stem 3–10 dm. tall, usually very closely pubescent: blades of the lower leaves linear to elliptic, often very broadly so: inner bracts of the involucre 10–15 mm. long in typical plants, shorter in some small mountain forms; glabrous or nearly so, linear with slightly spatulate tips, becoming definitely spatulate in the intermediate bracts and nearly ovate in the outer ones, apices varying from rounded in the inner bracts to nearly acute in the outer, the margins erose or ciliate, sometimes foliaceous with only a slight scarious margin, at other times markedly scarious-margined but still foliaceous and thick: achene 4–6 mm. long. [*L. squarrulosa* Michx.]—Plains, hillsides, and open woods, various provinces, Fla. to Ill., Mich., and Mass.—Sum.–fall.

23. L. Shortii Alexander. Stem 6–9 dm. tall, densely pubescent: blades of the lower leaves elliptic, very short-pubescent: bracts of the involucre with a very narrow scarious margin, otherwise quite herbaceous, densely short-pubescent, very spatulate, the inner nearly linear, 10–12 mm. long: achene about 5 mm. long.—Dry or rocky soil, various provinces, Miss. and La., to Ark. and Ohio. —Sum.–fall.

24. L. Tracyi Alexander. Stem about 4 dm. or more tall, densely pubescent: blades of the lower leaves linear, very scabrous: bracts of the involucre rounded at the tip, somewhat spatulate, pubescent; inner ones 7–8 mm. long: achene about 5 mm. long.—Baldwin Co., in the Coastal Plain of Ala.—Fall.

25. L. Ruthii Alexander. Stem 3–16 dm. tall, pubescent: blades of the lower leaves linear to elliptic glabrous or nearly so: involucral bracts rather narrowly spatulate, usually green, lightly pubescent, narrowly if at all scarious-margined, the inner bracts 8–11 mm. long: achene 4–5 mm. long.—Woods and thickets, various provinces chiefly the Blue Ridge and Appalachian, Ga. to Tenn. and N. C.—Sum.–fall.

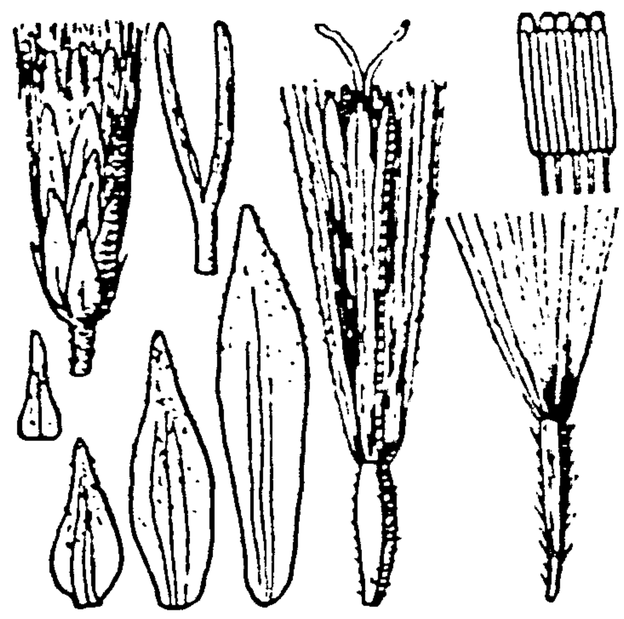
17. AMMOPURSUS Small. Perennial, succulent, caulescent herb, the stem from a long, perpendicular, fleshy tap-root. Leaves alternate, fleshy: blades narrow, entire, punctate, sessile. Heads solitary or in panicles, showy, not radiate, erect. Involucre cylindric-campanulate, many-flowered: bracts broad, in six or more series, appressed, fimbriolate-ciliate. Receptacle naked, honeycombed. Flowers perfect. Corolla rose-purple: tube slender-cylindric: throat thicker than the tube, more or less urceolate: limb slightly zygomorphic: lobes 5, spreading, about as long as the throat. Stamens included: filaments filiform-subulate: anthers linear, rounded or emarginate at the apex, cordate at the base, the lobes rounded. Style filiform. Stigmas filiform, usually longer than the style. Achene fusiform, 10–12-ribbed, pubescent. Pappus of numerous capillary barbellate bristles in two series, the outer shorter than the inner, the inner as long as or longer than the achene. —One species.



1. A. Ohlingeri (Blake) Small. Stem 2–11 dm. tall, solitary or several from the top of the root, usually paniculately branched above, minutely pubescent with pale crisped hairs: leaves fleshy, narrowly linear or linear-clavate, acute, glabrous: involucre about 2 cm. long;

bracts numerous, the outer orbicular-reniform, thence gradually longer and narrower to the linear-spatulate inner ones, all obtuse, the body deep green, punctate, the scarious margins pale: corollas bright rose-purple, about 2 cm. long: tube slender; throat cylindric-urceolate; lobes lanceolate, 5–6 mm. long, acute: achene fusiform, 8–9 mm. long, about 10-ribbed, densely pubescent with spreading hairs: pappus whitish, much shorter than the corolla, barbellate. [*Laciniaria Ohlingeri* Blake.]—Scrub, S end of lake region, Fla.—Sum.

18. **GARBERIA** A. Gray. Much-branched shrubs. Leaves alternate, evergreen: blades broad, entire. Heads in rather dense corymbose cymes. Involucre narrowly turbinate. Corolla rose-purple: throat campanulate, rather shorter than the much narrower tube: lobes ovate to lanceolate. Androecium conspicuously exserted: anther-appendages notched. Achene long, sharply ribbed. Pappus of scabro-barbellate capillary bristles in 2 or more rows.—One species.



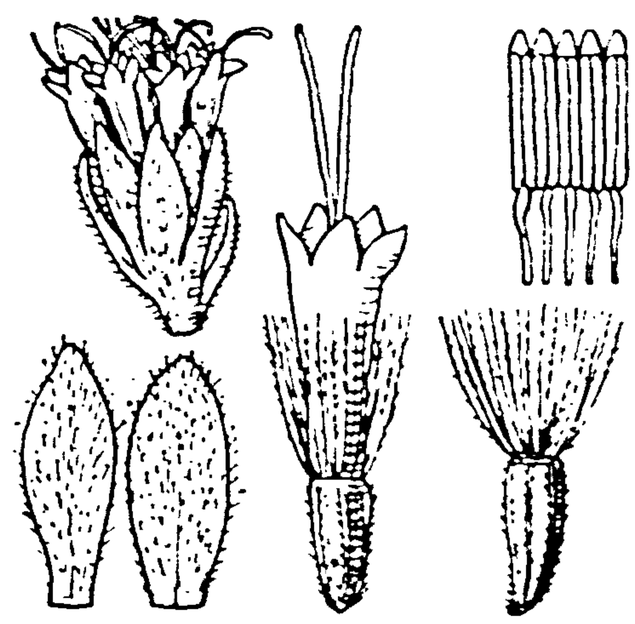
1. **G. fruticosa** (Nutt.) A. Gray. Plant 1–2 m. tall, the twigs scurfy: leaf-blades spatulate to obovate, 2–3 cm. long: involucre 10–12 mm. long; bracts narrow, the outer lanceolate, the inner linear-cuneate, all acute or acuminate, scurfy-puberulent: achene slender-fusiform, 7–8 mm. long or sometimes longer, pubescent.—Scrub and coastal dunes, pen. Fla.—Spr.–fall.—Conspicuous in the scrub in winter from its persistent brown pappus.

19. **TRILISA** Cass. Perennial caulescent herbs; the stem from short rootstocks. Leaves alternate, the basal ones much larger than the cauline: blades leathery, entire or shallowly toothed, sparingly pinnate-veined. Heads thyrsoid-paniculate or corymbose. Involucre turbinate, few-flowered: bracts few, relatively narrow, glandular. Corolla rose-purple, with a short tube and a cylindric throat. Androecium included. Anther-appendages ovate. Achene fusiform, sharply ribbed. Pappus of many capillary barbellate bristles.—Two species:

Stem viscid-pubescent: heads thyrsoid-paniculate: involucral bracts with stalked glands. 1. *T. paniculata.*

Stem glabrous or nearly so: heads corymbose: involucral bracts with sessile glands. 2. *T. odoratissima.*

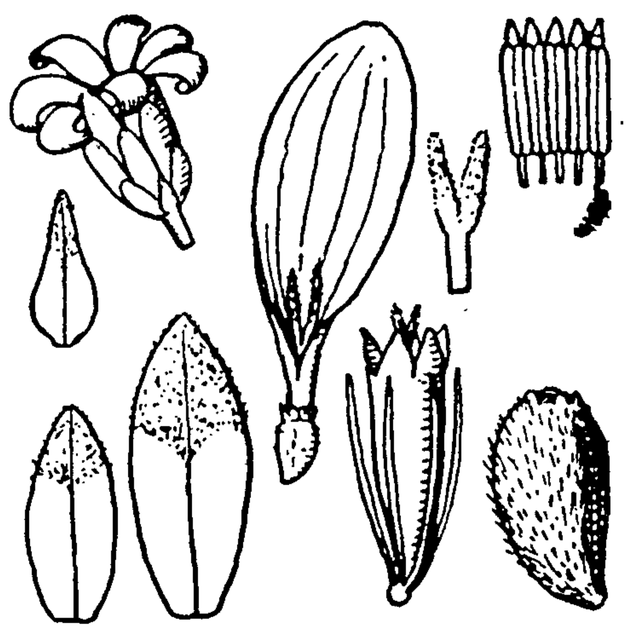
1. **T. paniculata** (Walt.) Cass. Stem 2–17 dm. tall, sparingly hirsute: basal leaves mostly 5–20 cm. long; blades elliptic to almost linear: blades of the cauline leaves narrow, sessile: inner bracts of the involucre less than 5 mm. long: corolla-lobes rather ovate: achene fully 3 mm. long.—Low pinelands, Coastal Plain, Fla. to La., and N. C. (or S Va.?).—Fall-wint.



2. **T. odoratissima** (Walt.) Cass. Stem 5–15 dm. tall, somewhat glaucous: basal leaves mostly 10–30 cm. long; blades elliptic, cuneate or spatulate: blades of the cauline leaves broad, slightly clasping: inner bracts of the involucre over 4 mm. long; corolla-lobes rather lanceolate: achene 2–3 mm. long.—(VANILLA-PLANT. DEER'S-TONGUE. HOUND'S-TONGUE.)—Low pinelands, Fla. to La., and N. C. (or S Va.?).—Sum.–fall.—The leaves contain coumarin and have been used as a flavoring agent.—Extreme

forms often indicate the possibility of two species being involved. One with a strong coumarin odor, broad, clasping, coarsely toothed upper leaf-blades and slightly viscid involucres, the other with only a faint odor, narrow entire upper leaf-blades and very viscid involucres.

20. **AMPHIACHYRIS** DC. Annual or perennial, glabrous herbs. Leaves alternate: blades narrow, entire. Heads small. Involucre campanulate to cylindric, the bracts obtuse. Ray-flowers with small ligules. Disk-corollas with a cylindric-campanulate throat. Anthers narrow. Stigmas pubescent. Achenes of the ray with a crown-like pappus, those of the disk abortive, with bristle-like pappus-scales.—Two species, North American.

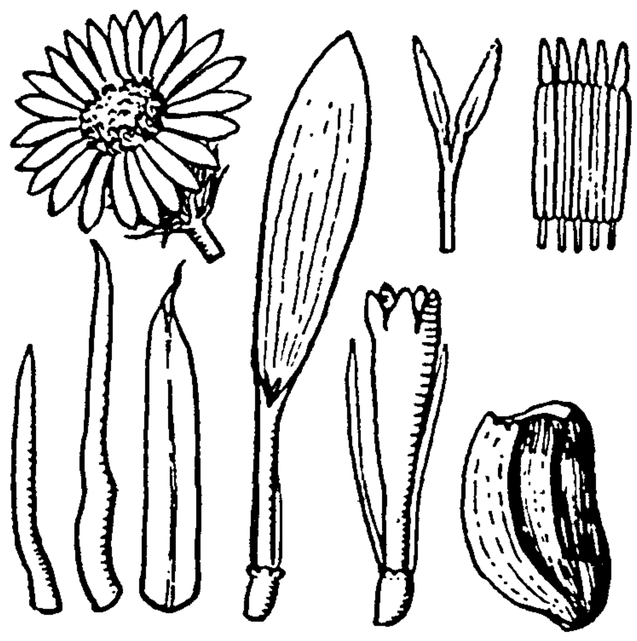


1. A. dracunculoides (DC.) Nutt. Stem 3–7 dm. tall: leaf-blades narrowly linear or linear-filiform, 1–5 cm. long; bracts of the involucre lustrous, the inner 4–5 mm. long: ligules yellow, 3–4 mm. long: achene about 1 mm. long.—Dry soil, various provinces, N of Coastal Plain, Ala. to Tex., N. M., Kans., and Mo.—Sum.–fall.

21. **GRINDELIA** Willd. Perennial or rarely annual or biennial herbs, or woody, often glutinous plants. Leaves alternate: blades mostly spinulose toothed. Heads large. Involucre hemispheric or depressed, the bracts slender-tipped, eciliate. Ray-flowers with conspicuous yellow ligules, or rarely wanting. Disk-corollas with a narrowly funnelform throat longer than the tube. Anthers linear; appendages lanceolate. Stigmas linear. Achene ribbed. Pappus of the disk of 2–8 smooth awns or stiff bristles, caducous.—About 30 species, western American.—GUM-PLANTS. STICKY-HEADS.

Leaf-blades coarsely spiny-toothed: achene 2-lobed at the apex. 1. *G. lanceolata.*
Leaf-blades finely spiny-toothed: achene truncate at the apex. 2. *G. squarrosa.*

1. G. lanceolata Nutt. Stem 5–8 dm. tall, glabrous, usually sparingly branched above: blades of the cauline leaves lanceolate to linear-lanceolate or almost linear, 2–8 cm. long, more or less acuminate: bracts of the involucre with spreading tips: achene 3–3.5 mm. long, 2-lobed at the apex, rather bluntly ribbed.—Dry soil, barrens, prairies and waste-places, various provinces, Ala. to Tex., Kans., and Tenn.—Sum.



2. G. squarrosa (Pursh) Dunal. Stem 3–10 dm. tall, glabrous, more or less branched above and sometimes also branched at the base: blades of the cauline leaves elliptic to linear-elliptic or somewhat broadened upward, 2–5 cm. long, obtuse or acute: bracts of the involucre with recurved tips: achene 2.5–3 mm. long, truncate at the apex, rather sharply ribbed.—Dry soil, prairies and plains, various provinces, Tex. to Ariz., Nev., Sask., and Minn.; widely naturalized on roadsides, railroad banks, and fields in the E states.—(*Mex.*).

22. **CHRYSOPSIS** Nutt. Biennial herbs, with villous, hirsute, floccose, cottony, or arachnoid pubescence. Leaves alternate: blades narrow or broad, but neither nervose nor gramineous, mostly entire. Heads in a terminal corymb.

Involucre ovoid to hemispheric, the bracts narrow. Ray-flowers with conspicuous yellow ligules. Disk-corollas with a narrow funnelform throat. Anther-appendages lanceolate. Stigmas subulate. Achene somewhat turgid, ellipsoid or obovoid, 3–5-nerved. Pappus double, of numerous bristles, the outer series very short and scale-like.—About 20 species, North American.—Mostly sum.–fall.—GOLDEN-ASTERS.

Plant perennial: achene 3–5-nerved.
  Bracts of the involucre glabrous. — I. TRICHOPHYLLAE.
  Bracts of the involucre glandular or cobwebby.
    Bracts of the involucre copiously glandular, without cobwebby hairs. — II. MARIANAE.
    Bracts of the involucre with cobwebby hairs. — III. PILOSAE.
Plant annual, with a tap-root: achene 10-nerved. — IV. NUTTALLIANAE.

I. TRICHOPHYLLAE

Bracts of the involucre prolonged into subulate tips. — 1. *C. subulata.*
Bracts of the involucre acute, mucronate, or short-acuminate.
  Cauline leaves, at least the lower ones, with spatulate, elliptic, or elliptic-lanceolate blades.
    Bracts of the involucre acute or short-acuminate. — 2. *C. trichophylla.*
    Bracts of the involucre abruptly pointed or mucronate. — 3. *C. gigantea.*
  Cauline leaves with narrowly linear blades. — 4. *C. hyssopifolia.*

II. MARIANAE

Pubescence deciduous: foliage rough-glandular. — 5. *C. scabrella.*
Pubescence persistent: foliage smooth or soft-glandular.
  Bracts of the involucre 1 mm. wide or less.
    Stem and leaves cobwebby-pubescent. — 6. *C. mariana.*
    Stem and leaves white cottony-lanate.
      Peduncles cottony-lanate and with some glands under the involucre. — 7. *C. arenicola.*
      Peduncles only glandular.
        Bracts of the involucre acuminate recurved: inflorescence conspicuously glandular. — 8. *C. lanuginosa.*
        Bracts of the involucre acute, erect: inflorescence inconspicuously glandular. — 9. *C. floridana.*
  Bracts of the involucre 2 mm. wide or more. — 10. *C. latisquama.*

III. PILOSAE

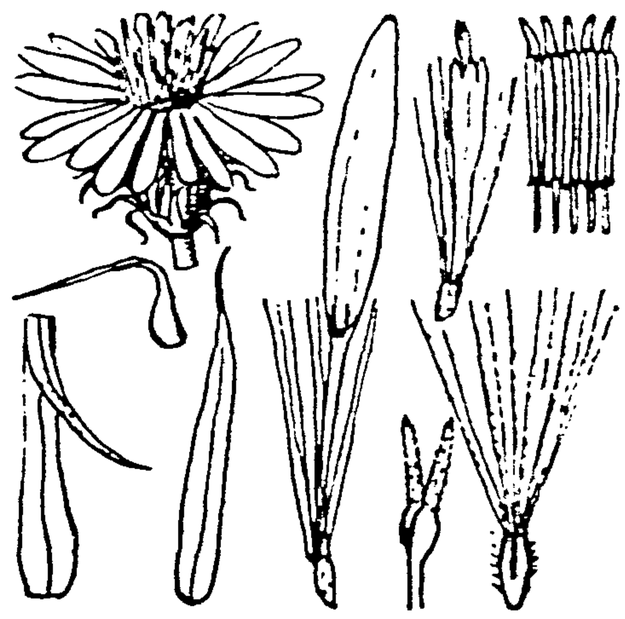
Peduncles glandular: bracts of the involucre sparingly cobwebby. — 11. *C. decumbens.*
Peduncles densely villous-cobwebby: bracts of the involucre densely villous-cobwebby. — 12. *C. pilosa.*

IV. VILLOSAE

Plant pubescent, the stem simple below the inflorescence or sometimes branched throughout. — 13. *C. Nuttallii.*

1. C. subulata Small. Stem 3–11 dm. tall, short cobwebby: blades of the basal leaves narrowly spatulate, those of the cauline leaves spatulate to linear, usually entire: involucre 6–8 mm. long; bracts with curved or bent caudate tips: achene 1.5–2 mm. long.—Pinelands and scrub, pen. Fla. and rarely N Fla.—Spr.–fall or all year.

2. C. trichophylla Nutt. Stem 3–11 dm. tall, more or less long cobwebby, at least when young: blades of the basal leaves broadly spatulate, those of the cauline leaves spatulate to elliptic-obovate, linear, or lanceolate, entire or sometimes sparingly toothed: involucre 7–9 mm. long: bracts acute or short-acuminate, often with slightly spreading tips: achene about 2 mm. long.—Pinelands, Coastal Plain, Fla. to S. C. and Miss., (La.?).



3. C. gigantea Small. Stem 8–15 dm. tall, sparingly cobwebby-pubescent, at least when old: leaves numerous, the basal and lower cauline with spatulate, to oblanceolate or oblong-oblanceolate blades; upper cauline leaves with oblong to oblong-lanceolate blades, often obscurely serrulate, sometimes apiculate: involucre 7–9 mm. high; bracts linear-lanceolate to linear, acute to slightly acuminate, glabrous: achene 2–2.5 mm. long.—Pinelands, Fla.

4. C. hyssopifolia Nutt. Stem 3–9 dm. tall, glabrous or sparingly cobwebby when young: leaves numerous, the basal in a dense rosette, white cottony, with spatulate or linear-spatulate blades, cauline leaves often crowded; blades narrowly linear to linear-filiform, 1–6 cm. long: involucre 6–8 mm. long; bracts rigid, acute, often abruptly so with erect tips: achenes 2–2.5 mm. long.—Dry pinelands, Coastal Plain, Fla. and Ala.

5. C. scabrella T. & G. Stems 3–12 dm. tall, more or less rough-glandular: leaves rather numerous, the basal in a very dense rosette, white-cottony, with spatulate, often coarsely toothed blades: blades of the cauline leaves linear-spatulate to linear, acute, entire, more or less glandular-scabrous acute, sessile: involucre 6–9 mm. high; bracts linear-subulate to linear, rigid, acute, often abruptly so: achene 2.5–3 mm. long.—Pinelands, prairies, and scrub, Coastal Plain, Fla. to Miss.

6. C. mariana (L.) Nutt. Stem 1–6 dm. tall, more or less cobwebby; and glandular in the inflorescence: blades of the cauline leaves spatulate to elliptic or oblong, 2–12 cm. long, often acute, entire or remotely toothed, the lower ones narrowed into petiole-like bases: heads showy: involucre 8–10 mm. long, bracts linear, acute, glandular, ciliolate: achene about 2 mm. long.—Dry woods and hillsides, various provinces, Fla. to La., Tenn., and S N. Y.

7. C. arenicola Alexander. Stem about 3 dm. tall, white cottony: blades of the cauline leaves various, the lower ones slightly broadened upward, 1–3 cm. long, the upper ones oblong-lanceolate to linear-lanceolate, auricled at the base, sessile, all white cottony-lanate: bracts of the involucre rather rough-glandular, the inner bracts narrowly linear, acuminate: achenes about 2 mm. long.—Sandhills, near Hartsville, S. C.

8. C. lanuginosa Small. Stem below the inflorescence, white-woolly, finely glandular above and in the inflorescence, 2 dm. tall or more, sometimes branched near the base: leaves white-cottony, basal and lower cauline leaves with spatulate blades mostly 1 dm. long or less; blades of the upper cauline cuneate-spatulate or cuneate, entire: involucre about 1 cm. high; bracts linear or nearly so, except the recurved or spreading slender green tips, finely, softly, and copiously glandular-pubescent.—Grassy places, near Lynn Haven, N. Fla.

9. C. floridana Small. Stem usually branched at the base, the branches curved, 2.5–4 dm. long, white-cottony below, glandular above: leaves white-cottony; basal and lower cauline leaves with spatulate blades mostly less than 1 dm. long; blades of the upper cauline entire: cuneate to oblong-cuneate, 1.5–2.5 cm. long, obtuse, partly clasping: peduncles inconspicuously glandular: involucre 6–8 mm. high; bracts firm, glandular, often sparingly so, acute or slightly acuminate.—Scrub, sand-dunes and pinelands, pen. Fla.

10. C. latisquama Pollard. Stem 3–7 dm. tall, copiously cobwebby below, glandular above, the branches often elongate: basal and lower stem-leaves with spatulate or oblanceolate blades; upper cauline leaves smaller; blades oblong to linear-oblong or broadly linear, serrulate or undulate: involucre 7–8 mm. high;

bracts mostly broadest above the middle, not woolly, glandular, deep-green, the outer rather foliaceous, usually acute.—Pinelands and hammock-borders, pen. Fla.

11. C. decumbens Chapm. Stem decumbent, 6–12 dm. long, white-cottony or cobwebby-cottony; blades of the cauline leaves spatulate to oblong or oblong-lanceolate, obtuse or abruptly acute, entire, sessile: involucre 8–10 mm. high; bracts sparingly cobwebby, acuminate.—Pinelands, Coastal Plain, Fla. to N. C.

12. C. pilosa (Walt.) Britton. Stem 3–7 dm. tall, lanate: blades of the cauline leaves spatulate, oblong, or oblong-spatulate, obtuse or apiculate, entire or sparingly toothed, often partly clasping: involucre about 1 cm. high; bracts densely villous-cobwebby, acute or acuminate. [*C. gossypina* Nutt.]—Sandhills, woods, and pinelands, Fla. to Ala. and N. C., (Va.?)

13. C. Nuttallii Britton. Stem villous or softly hirsute, 3–8 dm. tall, simple below the inflorescence or sometimes branched throughout: leaves few or numerous, 1.5–4.5 cm. long: blades oblong to linear-oblong, entire or distantly or coarsely toothed, acute, sessile, or the lower ones oblong-oblanceolate and commonly incised: heads showy: involucres 8–10 mm. high; bracts linear or linear-subulate, acuminate: ray-flowers with ligules 10–15 mm. long: achenes 10-nerved.—Rocky open woods, sandy hills, prairies, and oak-woods, Miss. to Tex., Kans., and Mo.

23. PITYOPSIS Nutt. Perennial herbs with silvery or lead-colored, silky pubescence, or rarely glabrate. Leaves alternate: blades elongate, nervose or gramineous, entire. Heads terminating irregular peduncles or corymbose. Involucre campanulate to turbinate: bracts narrow. Ray-flowers with yellow ligules. Disk-corollas with a narrow funnelform throat. Anther-appendages ovate to lanceolate. Stigmas lanceolate. Achene compressed-fusiform. Pappus double, the outer series very short and scale-like. About 10 species of eastern North America.

Cauline leaves numerous, filiform; glabrous or nearly so. — I. PINIFOLIAE.
Cauline leaves few, linear, silky-lanate, sometimes narrowly so, or linear-lanceolate.
  Peduncles, branches, and stem woolly-tomentose. — II. GRAMINIFOLIAE.
  Peduncles, branches, and sometimes the stem, glandular. — III. ASPERAE.

I. PINIFOLIAE

Slender plant with linear-filiform leaves and not very numerous heads of flowers. — 1. *P. pinifolia.*

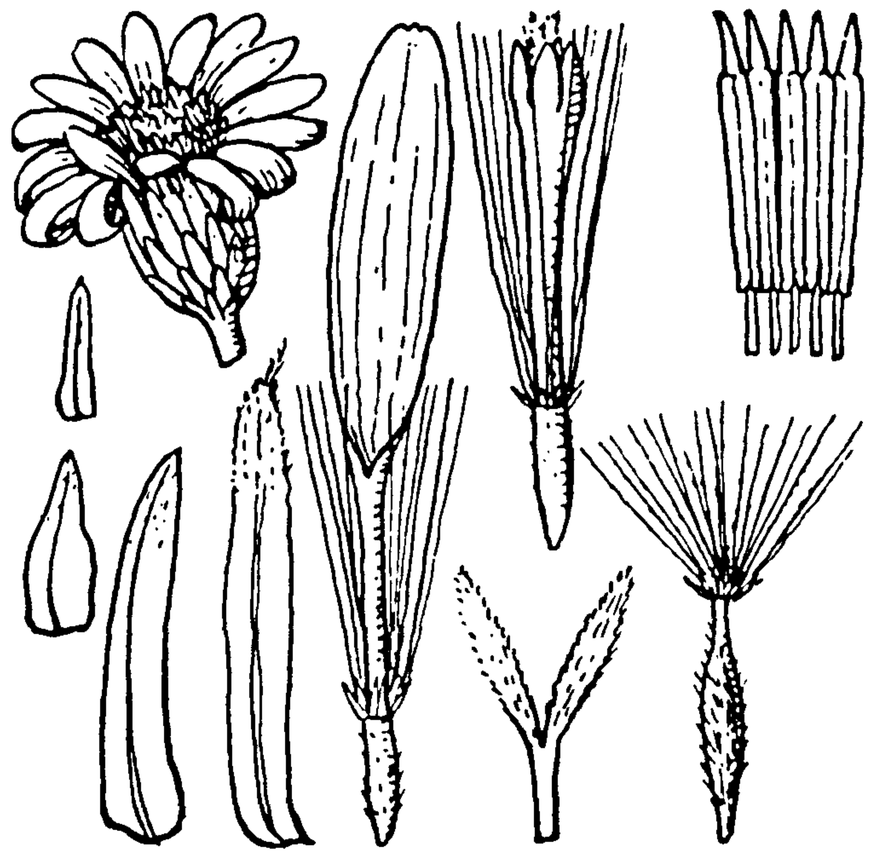
II. GRAMINIFOLIAE

Stem conspicuously zigzag. — 2. *P. flexuosa.*
Stem strict or essentially so.
  Involucres 10–12 mm. high.
    Inflorescence-branches few or several: ligules of the ray-flowers mostly over 1 cm. long. — 3. *P. Tracyi.*
    Inflorescence-branches many: ligules of the ray-flowers less than 1 cm. long. — 4. *P. graminifolia.*
  Involucres 4–7 mm. high. — 5. *P. microcephala.*

III. ASPERAE

Lower cauline leaves not markedly longer than the upper. — 6. *P. Ruthii.*
Lower cauline leaves conspicuously longer than the upper.
  Stem-leaves numerous, approximate; blades narrow: ligules of the ray-flowers less than 1 cm. long. — 7. *P. aspera.*
  Stem leaves mostly 2–4, distant: blades relatively broad: ligules of the ray-flowers over 1 cm. long. — 8. *P. oligantha.*

1. **P. pinifolia** (Ell.) Nutt. Stem 2–4 dm. tall: blades of the cauline leaves linear-filiform: inner bracts of the involucre 4–5.5 mm. long, glabrous: ligules 6–7 mm. long. [*Chrysopsis pinifolia* Ell.]—Sandhills, Taylor County in the Coastal Plain of Ga.—Fall.



2. **P. flexuosa** (Nash) Small. Stem 2–4 dm. tall, zigzag: blades of the cauline leaves narrowly linear-lanceolate to linear: inner bracts of the involucre 10–12 mm. long: ligules 8–10 mm. long: disk-corollas 7–8 mm. long. [*Chrysopsis flexuosa* Nash].—Dry sandy pinelands, M Fla.—Sum.–fall.

3. **P. Tracyi** Small. Stem 3–5 dm. tall: blades of the cauline leaves narrowly linear, the lower ones greatly elongate: inner bracts of the involucre 7–9 mm. long, long-ciliate ligules 11–12 mm. long. [*Chrysopsis Tracyi* Small.]—Pinelands, pen. Fla. and the Keys.—All year.

4. **P. graminifolia** (Michx.) Nutt. Stem 3–9 dm. tall: blades of the cauline leaves linear-lanceolate, linear or linear-subulate: inner bracts of the involucre 7–11 mm. long: ligules 7–9 mm. long: disk-corollas 7–8 mm. long [*Chrysopsis graminifolia* (Michx.) Nutt. *C. argentea* Pers.]—Sandy, often acid, soil, Coastal Plain and adj. provinces, Fla. to Tex., Tenn., and Md.—(*W. I.*)—Sum.—early wint. or all year S.—*P. graminifolia latifolia* Fernald, distinguished by the upper cauline leaves nearly the same length as the lower, grades into the typical form.

5. **P. microcephala** Small. Stem 4–7 dm. tall: blades of the cauline leaves linear-lanceolate: outer bracts of the involucre broadly lanceolate, not glandular; inner bracts 5–6 mm. long: ligules 3–4 mm. long: filaments shorter than the anthers. [*Chrysopsis microcephala* Small].—Sandy soil, Coastal Plain and adj. provinces, Fla. to Tex. and S. C.—Sum.–fall.

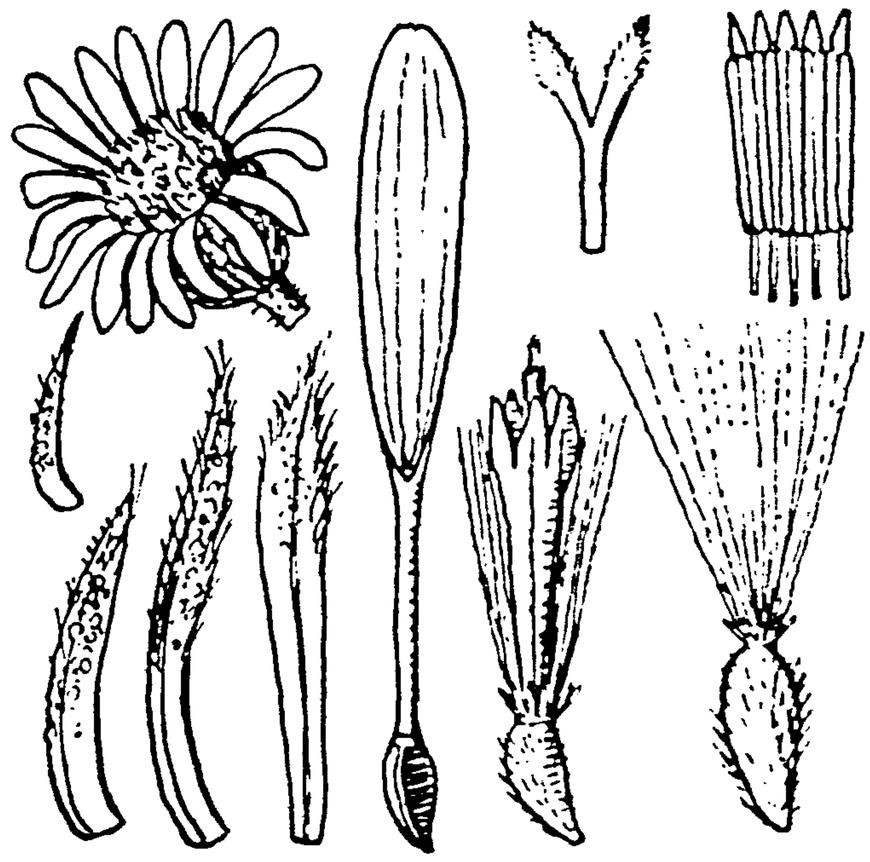
6. **P. Ruthii** Small. Stem 1–3 dm. tall: blades of the cauline leaves linear to narrowly linear-lanceolate: outer bracts of the involucre subulate, glandular; inner bracts 6.5–7.5 mm. long: filaments longer than the anthers. [*Chrysopsis Ruthii* Small.]—Rocks, Appalachian Valley, Hiawassee Valley, Tenn.—Fall.

7. **P. aspera** (Shuttlw.) Small. Stem 3–7 dm. tall: blades of the cauline leaves linear to narrowly linear-lanceolate: outer bracts of the involucre lanceolate, glandular; inner bracts 6–8 mm. long: disk corollas 4–5 mm. long: filaments much shorter than the anthers. [*Chrysopsis aspera* Shuttlw.]—Dry soil, mostly in pinelands, Coastal Plain, Fla. to La. and Va.—Sum.–fall.

8. **P. oligantha** (Chapm.) Small. Stem 3–6 dm. tall: blades of the cauline leaves linear to elliptic: outer bracts of the involucre lanceolate, glandular; inner bracts 7–9 mm. long, strongly ciliate: disk-corollas 7–8 mm. long: filaments as long as the anthers or longer. [*Chrysopsis oligantha* Chapm.].—Pinelands, Coastal Plain, N Florida and SE Ala.—Spr.

24. **HETEROTHECA** Cass. Annual or biennial, pubescent herbs. Leaves alternate: blades entire or toothed. Heads rather large. Involucre

hemispheric or campanulate, the inner bracts ciliate. Ray-flowers with conspicuous yellow ligules. Disk-corollas with a funnelform throat about as long as the tube. Anther-appendages lanceolate. Stigmas lanceolate or triangular. Achenes of the ray thickish, those of the disk flat. Pappus of the disk of many bristles, those of the outer series shorter and stouter than those of the inner.—About 6 species, North American.

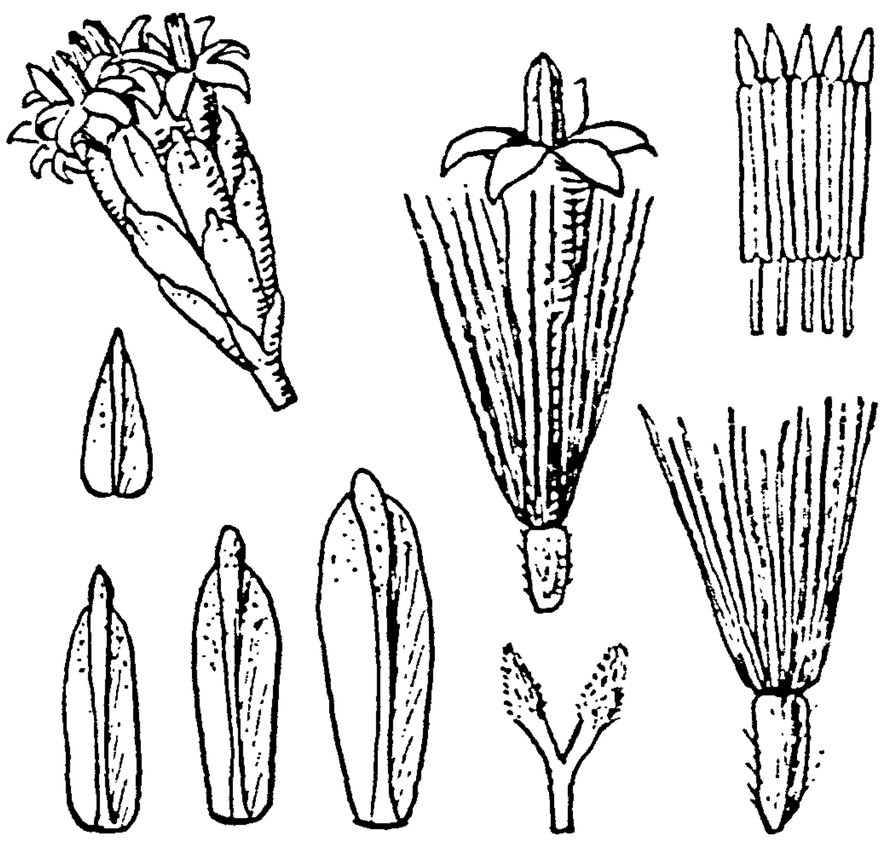


1. H. subaxillaris (Lam.) Britt. & Rusby. Stem 3–12 dm. tall, hirsute or hispid; blades of the stem-leaves elliptic to elliptic-lanceolate, 1–7 cm. long, serrate: involucre 7–8 mm. high; outer bracts glandular-pubescent: achene about 2 mm. long. [*H. Lamarckii* Cass.].—(CAMPHOR-PLANT.)—Pinelands, sand-dunes, and waste-places, various provinces, Fla. to Tex., Ariz., Kans., and Del.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall, or all year S.—A weedy plant, very variable in habit and with a great variety of leaf-forms.

25. CHONDROPHORA Raf. Perennial, glabrous, slender, virgate-stemmed herbs. Leaves alternate: blades very narrow, entire. Heads in terminal corymbs, or rarely thyrsoid. Involucre narrow, few-flowered: bracts narrow, abruptly or gradually narrowed at the apex. Ray-flowers wanting. Disk-corollas yellow, with a broadly funnelform throat about as long as the tube or longer: lobes lanceolate. Achenes 1–2-ribbed on each side. Pappus of 1 series of bristles.—Two species.—Sum.—RAYLESS-GOLDENRODS.

Stem-leaves with linear or linear-spatulate blades. 1. *C. nudata.*
Stem-leaves with filiform blades. 2. *C. virgata.*

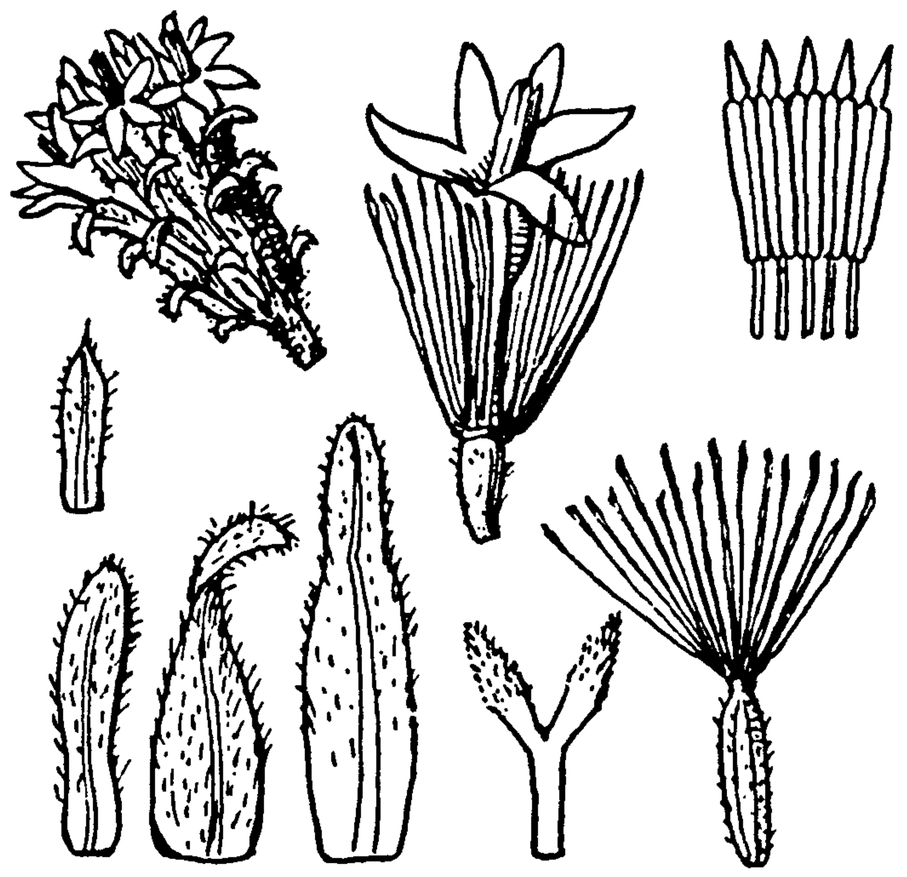
1. C. nudata (Michx.) Britton. Stem 2–6 dm. tall: blades of the basal leaves spatulate to linear-spatulate, 3–12 cm. long: inner bracts of the involucre linear-oblong or linear-elliptic, 4.5–5 mm. long, acute or acutish.—Pinelands, Coastal Plain, Fla. to Tex. and Va. (or N. J.?).



2. C. virgata (Nutt.) Greene. Similar to *C. nudata* in habit: blades of the basal leaves filiform: inner bracts of the involucre lanceolate, 4–4.5 mm. long, acuminate.—On rocks, rocky creek-banks, open woods and prairies, Coastal Plain and adj. provinces, W Fla. to Tex. and Ga.—The greenish-yellow very numerous flower-heads of these species, when the plants grow *en masse*, especially on prairies, shows a color not usually seen in this family.

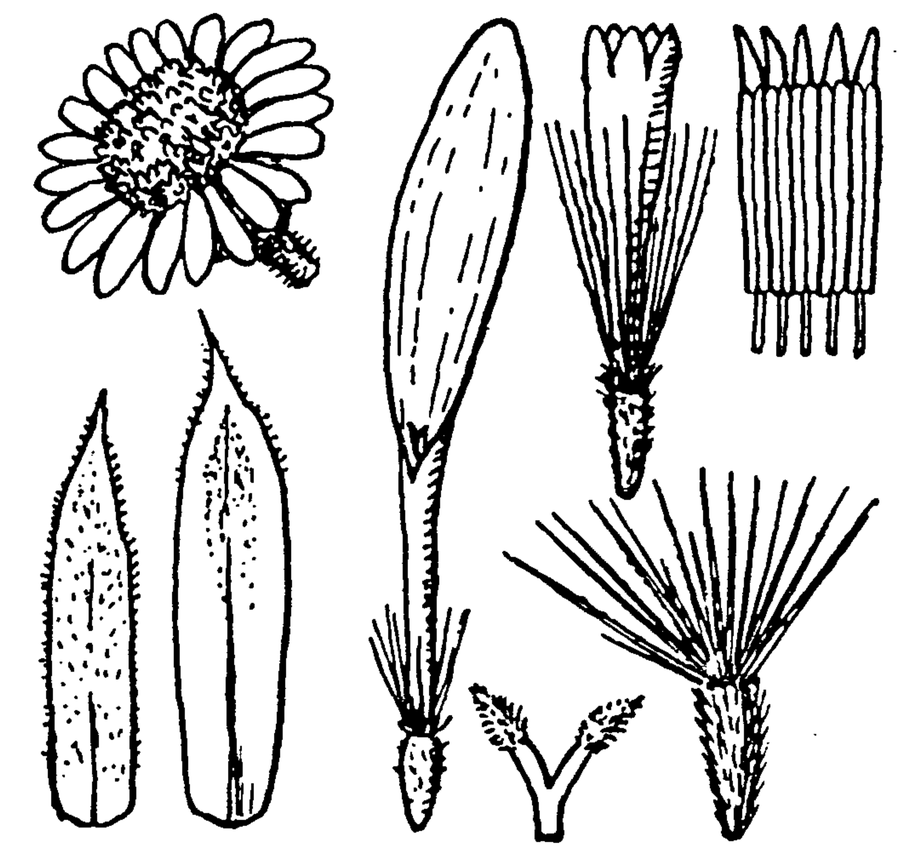
26. BRINTONIA Greene. Perennial pubescent, leafy-stemmed herbs. Leaves alternate: blades broad, coarsely toothed, with wide petiole-like bases.

Heads many, racemose. Involucre campanulate, several-flowered: bracts rather narrow, the inner ones broader than the outer. Ray-flowers wanting. Disk-corollas with a funnelform throat and a somewhat shorter tube: lobes ovate. Anthers longer than the filaments: appendages lanceolate. Stigmas lanceolate or ovate. Achene ribbed. Pappus-bristles numerous, the inner clavate at the tip.—One species.



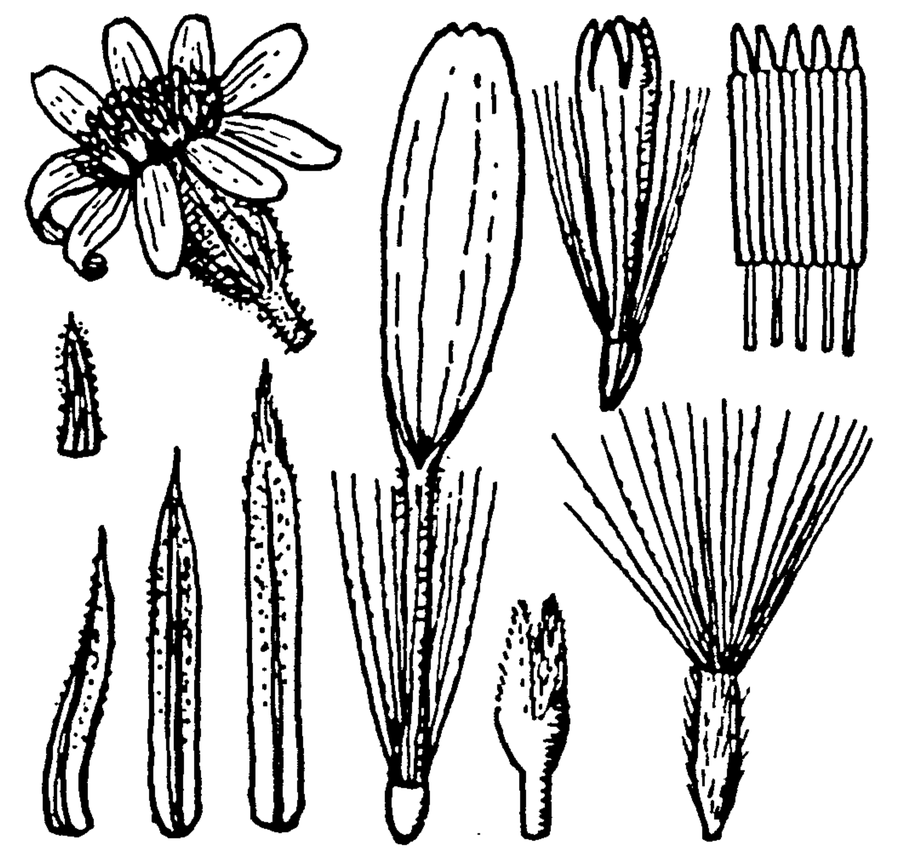
1. B. discoidea (Ell.) Greene. Stem 8–15 dm. tall, finely hirsute: leaf-blades oval, ovate, or elliptic-ovate, 4–9 cm. long: involucres 6–8 mm. high: corollas about 4 mm. long, white or whitish, and often purple-tinged.—Dry soil, borders of woods, and thickets, Coastal Plain, Fla. to La. and Ga.—Sum.–fall.

27. SIDERANTHUS Fraser. Annual or perennial, more or less widely branching herbs, or shrubs. Leaves alternate: blades spinulose-toothed, lobed, or pinnatifid. Heads terminating the branches. Involucre hemispheric or campanulate, many-flowered: bracts narrow, usually acuminate. Ray-flowers yellow, several. Disk-corollas with a narrowly funnelform throat and a shorter tube: lobes deltoid to triangular. Stigmas lanceolate. Achene pubescent, mostly 8–10-nerved. Pappus of 1–3 series of bristles.—About 20 species, American.



1. S. megacephalus (Nash) Small. Stem 8–12 dm. tall, finely pubescent: leaf-blades lanceolate to linear-elliptic, 2–7 cm. long, distantly toothed: outer bracts of the involucre 10–12 mm. long, acute, ciliolate.—Coastal dunes and waste places, Coastal Plain, Fla. and Tex.—Sum.–fall.

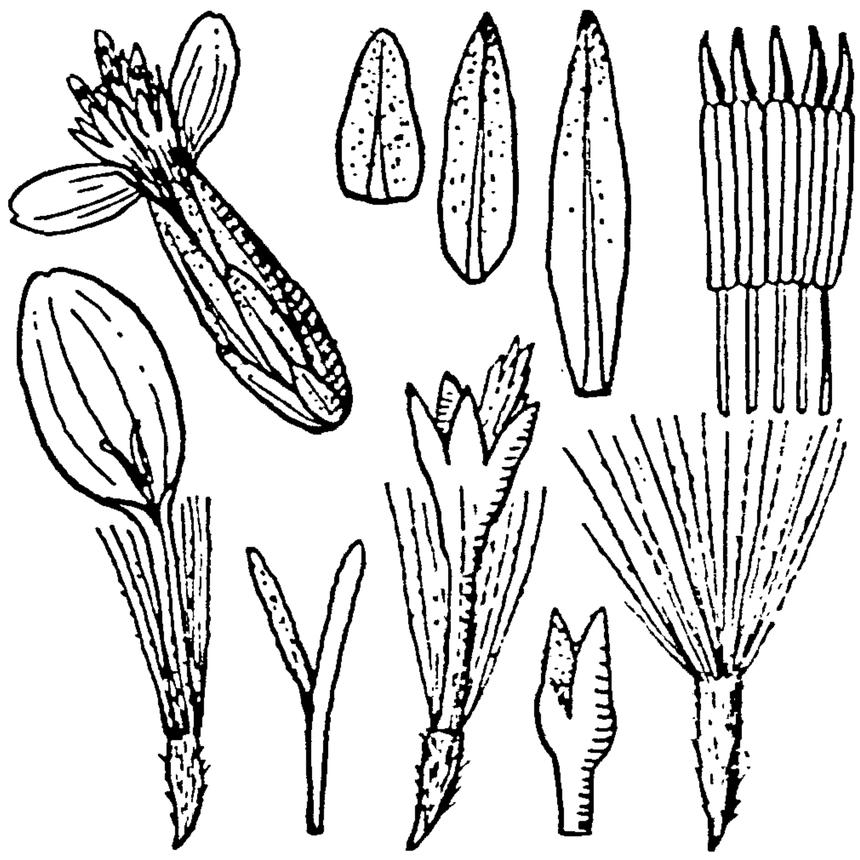
28. ISOPAPPUS T. & G. Annual or biennial, virgate-stemmed herbs. Leaves alternate: blades narrow, some of them coarsely toothed. Heads in open panicles. Involucre narrow: bracts subulate to linear or lanceolate. Ray-flowers few or several: corolla with a long tube and a yellow ligule. Disk-corollas with a narrowly funnelform throat and a very short tube: lobes deltoid. Anthers as long as the filaments or shorter: appendages ovate. Stigmas subulate. Achene terete, short. Pappus a series of rough capillary bristles.—Three species, North American.



1. I. divaricatus (Nutt.) T. & G. Stem 3–12 dm. tall, hispid and glandular: leaf-blades linear-oblanceolate to narrowly linear,

2–10 cm. long: involucral bracts ciliolate near the tip, the inner as well as the outer glandular: filaments longer than the anthers.—Dry soil, sandy fields, and roadsides, various provinces, Fla. to Tex., Kans., and S. C.—Sum.–fall.

29. **CHRYSOMA** Nutt. Shrubs or partly woody plants. Leaves evergreen, alternate: blades narrow, fleshy-leathery, conspicuously fine-pitted. Heads numerous, thyrsoid, or somewhat corymbose. Involucres narrow, few-flowered: bracts narrow, the inner much longer than the outer. Ray-flowers 1–3: corollas with a long tube and a yellow ligule. Disk-corollas with a funnelform throat and a tube of about equal length: lobes lanceolate. ovate. Anthers longer than the filaments. Stigmas of the disk-corollas lanceolate. Pappus of 1 or 2 series of brownish capillary bristles.—One species.



1. C. pauciflosculosa (Michx.) Greene. Stem 3–9 dm. tall: leaf-blades grayish-green, linear-spatulate to linear-oblong, 3–6 cm. long: involucres 4–6 mm. long, the inner bracts linear-lanceolate: ligules of the ray-corollas 4–6 mm. long: achene 3–4 mm. long.—Sandy soil, Coastal Plain, Fla. to Miss. and S. C.

30. **SOLIDAGO** L.[1] Perennial caulescent herbs, with long horizontal stolons often well-developed. Leaves alternate, the basal ones often in very large and conspicuous tufts (rosettes). Blades various, mostly toothed. Heads usually relatively small, sometimes medium sized or even large, paniculate or thyrsoid, or umbellate. Involucre campanulate, turbinate, or cylindric, few—many-flowered: bracts (tegules) in several series, the inner narrow, at least relatively so, and longer or much longer than the outer. Ray-flowers few to many: corolla with a slender tube and a yellow or very rarely a white ligule. Disk-corollas with a tube which is usually abruptly dilated into a funnelform or campanulate throat nearly or quite as long: lobes lanceolate, spreading. Anthers nearly or quite as long as the filaments. Stigmas mostly lanceolate, rarely elongate-lanceolate. Pappus of 1 or 2 series of capillary bristles.—About 125 species, mostly North American.—GOLDENRODS.

Stigmas several times as long as wide: heads large or very large, not unilaterally racemose (not secund): plant without long horizontal stolons: leaf-blades not triple-ribbed: achene sparsely silky above. — I. MACROPHYLLAE.
Stigmas lanceolate, 1–3 times as long as wide.
  Achene glabrous at maturity, sometimes sparsely hairy when young: plant without long horizontal stolons: heads not unilaterally racemose (not secund): leaf-blades not triple-ribbed.
    Main lateral veins of leaf-blades on the lower side elevated: leaf-blades not coriaceous.
      Involucral bracts, at least the outer ones, with spreading tips. — II. SQUARROSAE.
      Involucral bracts with tips not spreading. — III. HISPIDAE.
    Main lateral veins of leaf-blades on the lower side imbedded: leaf-blades coriaceous. — IV. CONFERTAE.
Achene permanently hairy, or if (rarely) glabrate, the heads unilaterally racemose (secund).

[1] Contributed by Kenneth Kent Mackenzie.

Plant without long horizontal stolons.
- Thyrse spicate or umbel-like, the heads not unilaterally racemose (not secund). — V. VIRGA-AUREAE.
- Thyrse paniculate, usually with many of the heads unilaterally racemose (secund).
  - Leaf-blades strongly pellucid-punctate. — VI. ODORAE.
  - Leaf-blades not pellucid-punctate.
    - Basal rosettes wanting: stem-leaves gradually reduced upward. — VII. ULMIFOLIAE.
    - Basal rosettes usually present, very large and conspicuous: lower stem-leaves much larger than the upper.
      - Larger leaf-blades cordate at the base, triple-ribbed from near the base: petioles amplexicaule. — VIII. NOTABILES.
      - Leaf-blades not cordate at the base: petioles not amplexicaule.
        - Leaf-blades not triple-ribbed.
          - Longer petioles not or scarcely clasping at the base: dry ground plant. — IX. ARGUTAE.
          - Longer petioles strongly clasping at the base.
            - Leaf-blades crenate-serrate or serrate, not coriaceous: plants of swamps. — X. ULIGINOSAE.
            - Leaf-blades thick and coriaceous, entire: plants of sea-beaches or salt-marshes. — XI. SEMPERVIRENTES.
        - Leaf-blades, at least partially triple-ribbed. — XII. NEMORALES.

Plant with long horizontal stolons.
- Basal rosettes and basal leaves conspicuous, the blades much larger than the abruptly reduced upper leaves.
  - Leaf-blades with the veins not impressed, serrate or crenate-serrate. — XIII. VERNAE.
  - Leaf-blades with impressed veins, entire or shallowly crenate-serrate. — XIV. PETIOLATAE.
- Basal rosettes wanting or very inconspicuous.
  - Thyrse with the lower heads in axillary clusters, the upper spicate: leaf-blades not triple-ribbed. — XV. FLEXICAULES.
  - Thyrse paniculate, the heads unilaterally racemose (secund), at least on the lower branches: leaves very numerous, gradually reduced upward.
    - Leaf-blades not triple-ribbed. — XVI. ALTISSIMAE.
    - Leaf-blades triple-ribbed. — XVII. SEROTINAE.

I. MACROPHYLLAE

Plant with basal rosettes large and conspicuous: heads 10–15 mm. high, the lower ones in clusters, the upper forming a spike-like thyrse: stigmas much elongate and conspicuous, somewhat flattened. — 1. *S. glomerata.*

II. SQUARROSAE

Plant with heads medium-sized or large, 6–12 mm. high, borne in a narrow terminal thyrse, which is sometimes much contracted, more or less interrupted below: involucral bracts, at least of the outer ones with spreading tips: stigmas strongly flattened, 2–3 times as long as wide: achene glabrous, dark-brown or yellowish-brown or blackish at maturity, more or less compressed, sometimes sparingly hairy when young.

- Basal rosettes conspicuous: blades of the lower stem-leaves and those of the basal rosettes 6–12 cm. long, 3–5 cm. wide, their petioles as long as or longer than the blades. — 2. *S. squarrosa.*
- Basal rosettes usually wanting: blades of the lower leaves 2–12 cm. long, 0.8–5 cm. wide, their petioles very short (up to 6 mm. long).
  - Leaf-blades thick, oblong-oval, firm, shallowly crenate-serrate, the larger mostly 6–8 cm. long, 1.5–2 cm. wide: stem closely short hispid above: involucral bracts loose. — 3. *S. Milleriana.*
  - Leaf-blades thin, oblong-obovate or oblong-oblanceolate, strongly crenate-serrate the larger mostly 8–12 cm. long, 2.5–5 cm. wide: stem pilose above: involucral bracts closely appressed. — 4. *S. Buckleyi.*

III. Hispidae

Plant with heads medium-sized or smallish to large, 4–11 mm. high, borne in a dense narrow terminal thyrse, only the lowermost (rarely more) in axillary clusters: involucral bracts with tips not spreading: stigmas strongly flattened, 2–3 times as long as wide: achene linear or linear-cylindric, or cylindric-clavate, glabrous at maturity, dull or blackish in color, not compressed.

Involucral bracts obtuse.
- Stem copiously pubescent.
  - Ligules of the ray cream-color, veinless or obscurely veined: achene columnar. — 5. *S. bicolor.*
  - Ligules of the ray orange-yellow, strongly veined: achene broadened upward. — 6. *S. hispida.*
- Stem glabrous or minutely puberulent.
  - Involucre 4–5.5 mm. high: bracts minutely puberulent: achene yellowish. — 7. *S. erecta.*
  - Involucre 5–7.5 mm. high: bracts strigillose: achene blackish. — 8. *S. Porteri.*

Involucral bracts, at least the inner, acute to acuminate.
- Stem closely puberulent or short-pubescent: involucral bracts with the midrib obsolete or obscure.
  - Blades of the leaves about the middle of the stem oblong-obovate, hispidulous above all over: inner involucral bracts gradually narrowed, oblong-lanceolate, nearly 1 mm. wide. — 9. *S. puberula.*
  - Blades of the leaves about the middle of the stem oblanceolate, strongly hispidulous above on midrib, slightly so elsewhere; inner involucral bracts rather abruptly narrowed above middle, very narrowly lanceolate, about 0.5 mm. wide. — 10. *S. pulverulenta.*
- Stem glabrous or sparingly loosely pubescent: involucral bracts mostly 3-ribbed. — 11. *S. roanensis.*

IV. Confertae

Plant with heads medium-sized to large, 6–10 mm. high, borne in a narrow or large terminal thyrse: involucral bracts appressed: stigmas strongly flattened, 2–3 times as long as wide: achene linear or linear-oblong, slightly dilated upward, glabrous and dark-tinged at maturity, truncate at the apex.

Inflorescence-branches hairy: basal leaves with narrowly to broadly lanceolate to obovate blades; leaf-blades with main lateral veins conspicuous: rootstocks not forming hard ligneous masses.
- Involucre cylindric; bracts narrowly linear-oblong, obtuse to acutish: achene as long as pappus. — 12. *S. Harperi.*
- Involucre campanulate; bracts oblong, very obtuse: achene half length of pappus.
  - Ligules of the ray light-yellow: thyrse large and broad, not strict: involucral bracts with midvein little thickened, strongly dilated, minutely hispidulous: leaf-blades 2.5–10 cm. wide: basal rosettes conspicuous. — 13. *S. conferta.*
  - Ligules of the ray deep-yellow: thyrse narrow or broad, strict, or not strict: involucral bracts thick, with conspicuous thick central oil-tube, glabrous: leaf-blades 1–3 cm. wide: basal rosettes usually inconspicuous. — 14. *S. rigidiuscula.*

Inflorescence-branches nearly glabrous: basal leaves with linear-spatulate blades: rootstocks forming very hard ligneous masses. — 15. *S. plumosa.*

V. Virga-Aureae

Plant with heads medium-sized or large, 5–10 mm. high, usually not very numerous, often few, borne in a thyrse (sometimes markedly corymbiform): involucral bracts appressed: stigmas strongly flattened, 2–3 times as long as wide: achene narrow, pubescent, often dilated upward, truncate at the apex. — 16. *S. spithamaea.*

VI. Odorae

Plant without long horizontal stolons: basal rosettes wanting or very inconspicuous: leaves very numerous; blades not triple-ribbed, entire, pellucid-punctate, anise-scented, sessile or slightly petioled: heads unilaterally racemose, usually numerous, 4 mm. high, few-flowered: involucre cylindric; bracts thin, narrow, acute: stigmas flattened, longer than wide: achene hairy, dilated upward, truncate at the apex.

Stem pubescent in lines: leaf-blades linear-lanceolate or linear: pappus not exceeding the involucre at flowering time. — 17. *S. odora.*

Stem usually pubescent all over: leaf-blades oblong-ovate, lanceolate, or linear-oblong: pappus markedly exceeding involucre at flowering time. 18. *S. Chapmanii.*

VII. Ulmifoliae

Plant without long horizontal stolons: basal rosettes wanting or very inconspicuous: leaves gradually reduced upwards; blades not triple-ribbed, not pellucid-punctate, the larger serrate or crenate-serrate, prominently ribbed and veined beneath, sub- or very short-petioled: heads unilaterally racemose, on widely spreading branches, small or medium sized, 4–6 mm. high: involucral bracts very unequal: stigmas flattened, longer than wide: achene hairy, cylindric, obconic, conspicuously ribbed, rounded at the apex. 19. *S. ulmifolia.*

VIII. Notabiles

Plant without long horizontal stolons: leaf-blades triple-ribbed, the stem-leaves strongly amplexicaule: inflorescence with rather few widely spreading branches or the branches sometimes short and inflorescence contracted: heads not secund, small, 4 mm. high, few-flowered: achene linear-cylindric, enlarged upward, grayish, hirsutulous, strongly about 10-ribbed, the pappus rather sparse, as long or somewhat shorter. 20. *S. notabilis.*

IX. Argutae

Plant without long horizontal stolons: basal rosettes often very large and conspicuous: leaves much reduced upward; blades not triple-ribbed, not pellucid-punctate, not grayish-canescent, thin, prominently ribbed and veined beneath, the larger serrate or doubly serrate and long-petioled: heads small or medium sized, 4.5–8 mm. high, unilaterally racemose, on widely spreading branches or rarely the branches erect: stigmas flattened, longer than wide: achene pubescent, sometimes sparsely so or glabrate in age, ribbed, truncate at the apex.

Inflorescence-branches glabrous: achene not blackish, 1.5 mm. long: (leaves of basal tufts with ovate-lanceolate or obovate-lanceolate blades). 21. *S. juncea.*

Inflorescence-branches pubescent: achene 1.75–2.5 mm. long.

Achene not blackish: basal tufts of leaves often poorly developed, blades lanceolate, oblong-oval, ovate-lanceolate, oval-obovate or ovate, singly serrate or crenate-serrate.

Stem glabrous beneath the inflorescence.

Involucre 2–4 mm. high.

Leaf-blades glabrous below, glabrous or sparingly pustular-hairy above, thickish, firm, serrate. 22. *S. Boottii.*

Leaf-blades pustular-hairy on both sides, especially on the veins, thin, shallowly-serrate. 23. *S. strigosa.*

Involucre 5–6 mm. high. 24. *S. yadkinensis.*

Stem strongly and closely short-pubescent: leaf-blades glabrous (or strigillose above). 25. *S. brachyphylla.*

Achene blackish, 2.25 mm. long: basal tufts of leaves very strongly developed, their blades ovate, more or less doubly serrate.

Leaf-blades much lighter-green beneath than above, thin: mature achene glabrate: pappus 3–4 mm. long: involucre 3–4.5 mm. high, 2–2.5 mm. thick; inner bracts linear-oblong. 26. *S. arguta.*

Leaf-blades little lighter-green beneath than above, firm: mature achene hairy: pappus 2.5–3.5 mm. long: involucre 4–6 mm. high, 2.5–4 mm. thick; inner bracts oblong-obovate. 27. *S. Harrisii.*

X. Uliginosae

Plant without long horizontal stolons: basal rosettes very large and conspicuous: leaves much reduced upwards; blades not triple-ribbed, not pellucid-punctate, not grayish canescent, thin or moderately fleshy, prominently ribbed and veined beneath, the larger serrate or crenate and long-petioled: the petioles strongly clasping at the base: heads small or medium-sized, 4.5–8 mm. high, unilaterally racemose on widely spreading branches or sometimes the branches erect: stigmas flattened, longer than wide: achene pubescent, sometimes sparsely so, ribbed, truncate at the apex.

Internodes of the stem terete or essentially so: leaf-blades not very rough (retrorsely scabrous) above.

Leaf-blades serrate with conspicuous callus-tipped teeth.

Involucre narrowly campanulate: pedicels and inflorescence-branches usually more or less hairy. 28. *S. uniligulata.*

Involucre broadly campanulate: pedicels and inflorescence-branches usually glabrous. 29. *S. austrina.*

Leaf-blades crenate-serrate. 30. *S. flavovirens.*

Internodes of the stem prominently angled below the leaves, (the leaves being decurrent): leaf-blades very rough (retrorsely scabrous) above.
- Involucre broadly campanulate, 4.5–5 mm. high, about 3 mm. thick: achene two-thirds length of the pappus. 31. *S. rigida.*
- Involucre campanulate to narrowly campanulate, 4 mm. high, 2.5 mm. thick; achene equalling the pappus. 32. *S. salicina.*

XI. Sempervirentes

Plant without long horizontal stolons: basal rosettes large and conspicuous: leaves gradually much reduced upwards; blades not triple-ribbed, not pellucid-punctate, not grayish-canescent, thick or fleshy, glabrous on both sides, entire, the midrib prominent, the lateral largely obscure, the veins prominent, the lower petioles 1–3 times length of blades, strongly clasping at the base: infloresence large, the branches spreading, the heads unilaterally racemose, small to rather large, 5–9 mm. high: stigmas flattened, longer than wide: achene silky-pubescent, obscurely or obsoletely ribbed, gray, or at maturity blackish, truncate at the apex. 33. *S. mexicana.*

XII. Nemorales

Plants without long horizontal stolons: basal rosettes conspicuous: leaf-blades at least partially triple-ribbed: heads small or middle-sized, 3–8 mm. high, unilaterally racemose: stigmas triangular-lanceolate flattened; achene hairy at least above.

Stem glabrous: branches of inflorescence glabrous: achene about equalling the pappus.
- Cauline leaves abruptly smaller from near the base of the stem: involucral bracts with obscure midribs or ribless: involucre narrowly campanulate. 34. *S. Gattingeri.*
- Cauline leaves not abruptly smaller above the base of the stem: involucral bracts with conspicuous midribs: involucre cylindric. 35. *S. pinetorum.*

Stems closely pubescent: branches of inflorescence pubescent: achene little more than half the length of the pappus.
- Upper leaves with oblanceolate or spatulate blades: involucre campanulate, the pedicel little bracteolate: involucral bracts rather thin: veins of leaf-blades little anastomosing beneath; the hairs little pustular. 36. *S. nemoralis.*
- Upper leaves with oval, ovate, or obovate blades: involucre turbinate, the pedicels strongly bracteolate: involucral bracts thickish: veins of leaf-blades strongly anastomosing beneath; the hairs strongly pustular. 37. *S. radula.*

XIII. Vernae

Plant with long slender horizontal stolons: basal rosettes conspicuous: blades of the lower leaves with ovate or ovate-cordate blades; not triple-ribbed, not pellucid-punctate, firm, serrate or crenate-serrate, the veins not impressed: inflorescence paniculate, the branches nearly naked below, the lower heads more or less unilateral: heads small to rather large, 5–8 mm. high: ligules of the ray bright-yellow, conspicuous: style not or but little exserted: stigmas flattened, triangular: achene somewhat dilated upward, appressed-pubescent.

Leaf-blades tomentose beneath; petioles strongly margined: involucre 4–4.5 mm. high. 38. *S. verna.*

Leaf-blades glabrous; petioles margined above only; involucre 5–7 mm. high. 39. *S. tarda.*

XIV. Petiolatae

Plant with long slender horizontal stolons: basal rosettes conspicuous, the leaves much the larger: leaves abruptly and very conspicuously reduced upward; blades of the lower leaves with linear to spatulate blades; all blades firm, glabrous, not triple-ribbed, not pellucid punctate, entire or shallowly crenate-serrate, the lateral veins beneath scarcely impressed: inflorescence spike-like or narrowly paniculate with the heads unilateral on long and widely spreading branches, glabrous or nearly so: heads small to rather large, 5–9 mm. high; style not or but little exserted: stigmas flattened, triangular: achene linear, sparsely pubescent.

Heads numerous to very numerous: involucral bracts thin, except at the midrib, glabrate: blades of the basal leaf linear to oblong-elliptic or spatulate or lanceolate, the petioles not markedly uneven.
- Heads in a narrow terminal thyrse and secund at the end of 2–5 very long branches: blades of the lower stem-leaves shallowly crenate-serrate: ligules of the ray one, or wanting. 40. *S. gracillima.*
- Heads in a narrow thyrse, the lower branches short, sometimes recurved or spreading: blades of the stem-leaves entire, or shallowly crenate-serrate: ray-flowers several with conspicuous ligules. 41. *S. petiolata.*

Heads few (5–15): involucral bracts firm, thickish, strigillose: blades of the basal leaf spatulate to oblanceolate, the inner much shorter-petioled than outermost. 42. *S. pulchra.*

XV. Flexicaules

Plant with long slender horizontal stolons: basal rosettes wanting or very inconspicuous: leaf-blades gradually reduced upward, not triple-ribbed, not pellucid-punctate, the lateral veins well developed: lower heads in axillary clusters, the upper spicate; all small, medium sized or rarely rather large 4–8 mm. high: stigmas triangular-lanceolate: achene silky-pubescent.

Involucral bracts one-ribbed or essentially so (the lateral ribs wanting or developed towards base only).
- Stem, inflorescence-branches, and involucre glabrous or nearly so.
  - Stem and branches bluish-gray and more or less glaucous (before too old), the stem terete, or very obscurely angled, not zig-zag: leaf-blades usually more than twice as long as wide: achene slenderly about 10-ribbed.
    - Leaf-blades round-tapering at the base, firm, 0.5–3 cm. wide: petioles 1–2 mm. long: involucre 3.5–4 mm. high, 1.5–2 mm. wide. 43. *S. caesia.*
    - Leaf-blades cuneate-tapering at the base, thin, 1.5–5.5 cm. wide: petioles 1–5 mm. long: involucre 4–4.5 mm. high, 2.5–3.5 mm. wide. 44. *S. latissimifolia.*
  - Stem and branches green, not glaucous, the stem strongly angled, usually zig-zag: leaf-blades broadly ovate, 2.5–10 cm. wide, less than twice as long as wide: achene with ribs concealed by pubescense. 45. *S. flexicaulis.*
- Stem, inflorescence-branches, and involucre pubescent: upper part of the thyrse spike-like: involucre 3–4.5 mm. high: stem terete below, not glaucous. 46. *S. pubens.*

Involucral bracts 3–5-ribbed.
- Involucre narrowly campanulate, 3–4.5 mm. high. 47. *S. Curtisii.*
- Involucre broadly campanulate, 5–6 mm. high. 48. *S. lancifolia.*

XVI. Altissimae

Plant with long slender horizontal stolons: basal rosettes wanting or very inconspicuous: leaf-blades not triple-ribbed, often conspicuously veined: heads small to rather large, 3.5–8 mm. high; at least the lower heads unilaterally racemose: stigmatic appendages triangular-lanceolate: achene pubescent, not strongly ribbed.

Leaf-blades narrowly linear-oblong, linear-lanceolate, or oblong-lanceolate, channeled, with the lateral veins usually very obscure, those of the lower leaves at least recurved-spreading or recurved, and more or less twisted at the base. 49. *S. tortifolia.*

Leaf-blades wider, neither markedly channeled, recurved-spreading, or twisted at the base, with the lateral veins very prominent.
- Leaf-blades oblong-oblanceolate or oblong-lanceolate, sessile, with a broad, somewhat clasping base, with few teeth or entire: stem strongly white-hirsute above. 50. *S. fistulosa.*
- Leaf-blades oblong-oblanceolate or elliptic or broader, petioled or sessile, not clasping, with many teeth.
  - Heads mainly in a strict thyrse and not secund, but sometimes all except upper ones secund on strongly developed widely spreading branches. 51. *S. dispersa.*
  - Heads strongly secund on widely spreading branches.
    - Stem strongly hairy above: dry-ground plants.
      - Leaf-blades not cordate, short-petioled, acute or acuminate, mostly over thrice as long as wide: the pubescence of pustular hairs: involucre cylindric, the pedicel moderately bracteolate. 52. *S. altissima.*
      - Well-developed leaf-blades shallowly cordate, sessile or very short-petioled, obtuse or short-acute, mostly about twice as long as wide, the pubescence on the stem of weak not or scarcely pustular hairs: involucre turbinate-cylindric, the pedicel usually very strongly bracteolate. 53. *S. celtidifolia.*
    - Stem glabrous below the inflorescence or sparingly hairy above: wet-ground or damp-ground plants.

Leaves somewhat fleshy: involucres nearly cylindric, the bracts thick, the outer ovate, the inner with erect tips. 54. *S. Elliottii.*

Leaves not fleshy: involucres broadly campanulate or cylindric, the bracts thin or chaffy, the outer lanceolate or ovate-lanceolate.

Involucre broadly campanulate, 5 mm. high; bracts thin, but firm, the outer ovate-lanceolate, acutish, the inner with erect tips. 55. *S. Edisoniana.*

Involucre cylindric, 6 mm. high; bracts thin and chaffy, the outer lanceolate, acuminate, the inner with inflexed or incurved tips. 56. *S. mirabilis.*

XVII. Serotinae

Plant with long horizontal stolons: basal rosettes wanting or very inconspicuous: stem closely leafy, the leaf-blades triple-ribbed, usually serrate: heads very small to medium-sized, 2–7 mm. high, unilaterally racemose in our species: stigmas triangular-lanceolate: achene pubescent.

Branches of the inflorescence glabrous. 57. *S. glaberrima.*

Branches of the inflorescence pubescent.

Stems glaucous, glabrous (minutely pulverulent): head 4.5–6 mm. high. 58. *S. serotina.*

Stems not glaucous.

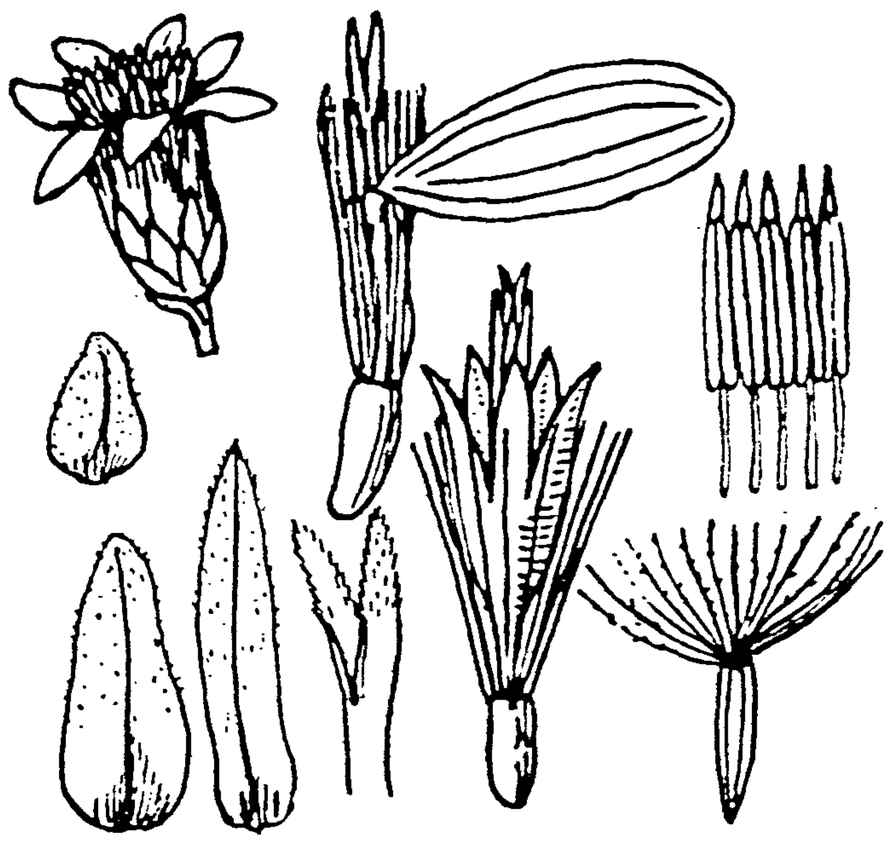
Involucre 2–3 mm. high: achene about the length of the pappus: main stem glabrous or hairy. 59. *S. canadensis.*

Involucre 3–5 mm. high: achene half the length of the pappus: main stem conspicuously hairy at least at the bases of the petioles.

Larger leaf-blades narrowly lanceolate or oblanceolate: stem pubescent below the petioles. 60. *S. Leavenworthii.*

Larger leaf-blades of a lanceolate or oblong-lanceolate type: stem pubescent all over. 61. *S. hirsutissima.*

1. S. glomerata Michx. Stem stout, 3–11 dm. tall, glabrous, conspicuously angled: blades of the basal leaves thin, 8–15 cm. long, 2.5–5 cm. wide, ciliate, sharply serrate, the petiole about as long: stem-leaves reduced; blades contracted into a petiole-like base, the upper less serrate: involucral bracts firm, thickish, hispidulous, the midrib conspicuously dilated at apex: disk-corollas 6.5–7.5 mm. long.—Cliffs and rocky woods, high altitudes, Blue Ridge, N. C. and Tenn.—Sum.–fall.



2. S. squarrosa Muhl. Stem stout, 4–15 dm. tall, white-pubescent above: basal rosettes conspicuous, their leaves with thin but firm blades, 6–12 cm. long, 3–5 cm. wide, crenate, hispidulous above, sparsely pubescent beneath, the petiole as long or longer: stem-leaves reduced, the lower more sharply serrate, the upper entire or nearly so: heads 10–12 mm. high: involucral bracts lanceolate, pubescent, acute, all except inner with strongly squarrose tips.—Rocky woodlands and hillsides, various provinces N of Coastal Plain, "Ga." and N. Car. to Ind., Ont., and N. B.—Sum.–fall.

3. S. Milleriana Mackenzie. Stem 3–12 dm. tall, strict, closely short-hispid above, glabrate towards base: basal rosettes wanting: leaf-blades oblong-oval, the larger mostly 6–8 cm. long, 1.5–2 cm. wide, scabrous-hispidulous above, sparsely pubescent beneath, thick, firm, those of the lower leaves shallowly and sparingly crenate-serrate, those of the upper ones with entire blades: petioles 1–2 mm. long: heads 7–8 mm. high: involucral bracts lanceolate, acute, appressed-pubescent, all except the inner with spreading tips. ["*S. petiolaris* Ait."]—Sandy pinelands, acid soils, mostly Coastal Plain, Fla. to Ala. and N. C.—Sum.–fall.

4. S. Buckleyi T. & G. Stem 6–12 dm. tall, strict, strongly pilose above, sparsely so below: basal rosettes wanting: leaf-blades oblong-obovate or oblong-oblanceolate, mostly 8–12 cm. long, 2.5–5 cm. wide, hispidulous on veins above, sparingly pilose below, thin, those of the lower leaves strongly crenate-serrate, those of the upper entire or nearly so; petioles 1–5 mm. long: heads 7–8 mm. high: involucral bracts oblong-lanceolate, acute or acutish, hispidulous and ciliate, the tips of the outer only spreading: achene blackish, somewhat compressed.—Dry woodlands in limestone regions, Appalachian Plateau, Ala. to Ill. and Mo.—Sum.–fall.

5. S. bicolor L. Stem usually 5–8 (2–12) dm. tall, white-hirsute; lower leaves with ovate or oblong-ovate blades 5–10 cm. long, 2.5–5 cm. wide, crenate-serrate, white-pubescent or -hirsute on both sides; petioles ½ to length of blades: heads 4–6 mm. high; involucral bracts oblong, chartaceous, nearly smooth, usually whitish-yellow with the greenish midrib conspicuously dilated above.—Dry banks, woods and thickets usually in acid soils, various provinces, Ga. to Mo., Ont., and N. B.—Sum.–fall.

6. S. hispida Muhl. Similar to *S. bicolor* in habit, but with the heads usually slightly larger: involucral bracts narrowly oblong, firm, strigillose, subherbaceous, usually greenish-stramineous, with the green midrib obscurely to strongly dilated above.—Rocky banks and dry hillsides in limestone soils, various provinces N of Coastal Plain, Ga. to Ark., Man., and Newf.—Sum.–fall.

7. S. erecta Pursh. Stem usually 5–10 (3–13) dm. tall; lower leaves 6–9 cm. long, 1.8–3 cm. wide, the blades broadly oblanceolate, essentially glabrous on both sides, shallowly crenate: heads 8–10 mm. high: involucre campanulate: achene columnar, narrowly linear.—Dry open woodlands, acid soils, various provinces, Ga. to Miss., Wis., and Conn.

8. S. Porteri Small. Stem 6–14 dm. tall, glabrous below, sparsely pubescent above, short-pubescent in the inflorescence: leaf-blades oblong-oblanceolate, 8–18 cm. long, 2.5–4.5 cm. wide, crenate-serrate, sparsely hairy on both sides: involucral bracts oblong; achene linear-clavate, blackish.—Dry woods, Piedmont of Ga.—Sum.–fall.

9. S. puberula Nutt. Stem 3–10 dm. tall: basal rosettes conspicuous, their leaf-blades spatulate, 3–10 cm. long, 1.5–2.5 cm. wide, crenate-serrate, sparsely hispidulous-puberulent on both sides; petioles as long or longer: involucral bracts thin, the midrib obsolete: ligules of the ray rarely white: achene olive-green, slightly dilated upward.—Dry open woodlands, acid soils, various provinces, Fla. to Miss., Tenn., Que., and P. E. I., most common near the coast. —Sum.–fall.

10. S. pulverulenta Nutt. Stem 4–12 dm. tall: lower leaf-blades oblong-obovate or oblanceolate, 3–8 cm. long, 1.2–2.5 cm. wide, crenate-serrate, the petiole as long or longer: involucral bracts thin, with the midrib obscure: achene somewhat dilated upward.—Dry pinelands, acid soils, Coastal Plain, Fla. to Ala. and N. C.—Sum.–fall.

11. S. roanensis Porter. Stem 2–8 dm. tall, pubescent above and in the inflorescence only, or sparingly loosely pubescent: basal rosettes conspicuous: lower leaf-blades oblong-obovate or obovate, 3–10 cm. long, 2–5 cm. wide, crenate-serrate or serrate, hispidulous above and pubescent beneath mostly on the veins; petiole usually shorter: involucral bracts glabrous: achene linear, obscurely ribbed. [*S. monticola* T. & G. not Jordon *S. Maxoni* Pollard *S. alleghaniensis* House]—Dry woods, in acid soils, Blue Ridge to Appalachian Plateau, "Ga." to "Ala.," W. Va., and Md.—Sum.–fall.

12. S. Harperi Mackenzie. Stem 10–15 dm. tall: lower leaf-blades oblong-elliptic, 6–12 cm. long, 1.5–2.5 cm. wide, glabrous, entire, dull-green above, lighter beneath: thyrse narrowly ovoid, 2–3 dm. long, 8–12 cm. wide, its branches hirsutulous: heads 7–9 mm. high: involucral bracts minutely ciliolate, thickish, firm, not keeled.—Dry woods, Coastal Plain and more northern provinces, Ga. to E Tenn.—Fall.

13. S. conferta Mill. Stem 8–20 dm. tall: lower leaf-blades oblong-obovate or oblanceolate, 1.2–2.5 dm. long, crenate or crenate-serrate; petioles usually somewhat shorter: branches of the thyrse hirsutulous: heads 7–10 mm. high: involucral bracts ciliate. [*S. speciosa* Nutt.]—Dry woodlands, various provinces N of Coastal Plain, N. C. to Okla., Minn., and Mass., and introduced northeastward.—Fall.

14. S. rigidiuscula (T. & G.) Porter. Stem 6–12 dm. tall: lower leaf-blades narrowly lanceolate to ovate-lanceolate, 5–10 cm. long, entire or sometimes crenate; petioles short: thyrse with hirsutulous branches: heads 6–8 mm. high: involucral bracts ciliate.—Dry sunny places, various provinces, Ga. to Tex., S. Dak., and Minn.—Sum.–fall.

15. S. plumosa Small. Stem 4–10 dm. tall: lower leaf-blades linear-spatulate, 4–10 cm. long, 7–14 mm. wide, glabrous, sparingly crenate-serrate above, dull-green on both sides: thyrse oblong, 1.5–3 dm. long, 5–10 cm. wide, its branches nearly glabrous: heads 8–10 mm. high: involucre campanulate; bracts glabrous, thick, linear-lanceolate, obtusish: achene half the length of the pappus.—Crevices of rocks, at the junction of the Coastal Plain and the Piedmont, Yadkin River, N. C.—Sum.–fall.

16. S. spithamaea M. A. Curtis. Stem 0.5–3.5 dm. tall, pubescent especially above: lower stem-leaves with blades narrowly oblong-obovate, 4–10 cm. long, 1.2–2.5 cm. wide, sessile, crenate-serrate or serrate, sparingly hairy on the veins: heads 7–9 mm. high, in a flat-topped or rounded corymbiform thyrse: involucral bracts lanceolate, acute, thin, ciliate, hispidulous.—Sunny exposures, high altitudes, Blue Ridge, N. C. and Tenn.—Sum.–fall.—A very well marked species. Our only representative of a most widely distributed group of goldenrods, which is abundant northward, especially in alpine localities.

17. S. odora Ait. Stem 5–13 dm. tall: leaf-blades linear-lanceolate or linear, the larger 4–16 cm. long, 4–16 mm. wide, the margins ciliolate: heads 4–5.5 mm. high, 2 mm. thick: involucral bracts yellow, glabrous, not exceeded by the pappus at flowering time.—(SWEET-GOLDENROD)—Dry acid woodlands, especially in pinelands, various provinces, Fla. to Tex., Okla., and Me.—Sum.–fall. —Sometimes erroneously referred to *S. suaveolens* Schoepf. which is apparently *Euthamia graminifolia* (L.) Nutt.

18. S. Chapmanii T. & G. Stem 2–14 dm. tall: leaf-blades linear-oblong, lanceolate, or oblong-ovate, the larger 3–6 cm. long, 1–1.8 mm. wide, the margins revolute, ciliolate: heads 6–7 mm. high, 2–3 mm. thick: involucral bracts light-yellowish, glabrous, ciliate, markedly exceeded by the pappus at flowering time. —Pinelands and sandy hammocks, Fla. to S. Ga.—Sum.–fall.

19. S. ulmifolia Muhl. Stem 6–15 dm. tall, glabrous or nearly so below inflorescence: leaf-blades ovate or obovate or narrower, the larger 6–14 cm. long, 2–4.5 cm. wide, serrate, thin, sparsely hairy especially below: inflorescence-branches few, widely spreading, the longer not flower-bearing towards base: heads 4–6 mm. high: involucral bracts narrow, acute, the inner lanceolate or oblong-lanceolate: achene 1.5 mm. long, slightly enlarged upward.—Dry or rocky soil, open woods and thickets, various provinces, rarely Coastal Plain, Ga. to Tex., Minn., and N. S.—Sum.–fall.

20. S. notabilis Mackenzie. Stem 3–8 dm. tall, closely short white-pubescent: lower leaf-blades ovate or cordate, 4–8 cm. long, 3–5 cm. wide, sharply serrate, closely hispidulous above, closely short white-pubescent beneath, the petiole about length of blade, the larger strongly cordate: upper stem-leaves oblong-lanceolate or oblong-ovate, frequently entire, strongly amplexicaul, often abruptly contracted below the middle: inner involucral bracts much the longer, narrowly linear, acute. [''*S. amplexicaulis* Martens.''] — Dry woodlands, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and Tenn.—Sum.–fall.

21. S. juncea Ait. Stem 4–15 dm. tall, glabrous: larger leaf-blades ovate-lanceolate or obovate-lanceolate, 8–15 cm. long, 3–6 cm. wide, glabrous, sharply serrate, the upper gradually reduced: panicle-branches flower-bearing to much below the middle: heads usually strongly secund, 4.5–6 mm. high: involucral bracts linear-oblong, acutish, the midrib conspicuous: achene 5-ribbed, brownish, finely short-pubescent.—Dry fields and open woodlands, various provinces, Ga. to ''Mo.'' ''Sask.'' Que., and N. S.—Sum.–fall.

22. S. Boottii Hook. Stem 5–15 dm. tall, glabrous below the inflorescence: larger leaf-blades of an oval-obovate type, 5–10 cm. long, 2.5–3.5 cm. wide, serrate, thickish, firm: inflorescence-branches widely spreading, the longer ones flower-bearing towards the end only: heads about 6 mm. high: involucral bracts thin, linear-oblong, obtuse or acutish: achene 1.75 mm. long, dilated upward.—Dry woodlands, various provinces, Fla. to Tex., Tenn., and Md.—Sum.–fall.

23. S. strigosa Small. Stem 6–12 dm. tall, glabrous below the inflorescence: larger leaf-blades of an oblong-oval type, 10–18 cm. long, 5–8 cm. wide, hispidulous or strigose especially on the veins, thin, sharply, but shallowly singly serrate: inflorescence-branches several, widely spreading, the longer ones flower-bearing above the middle: heads 4.5–5.5 mm. high: involucral bracts thickish, oblong, obtuse or acutish: achene 2.5 mm. long, strongly clavate, conspicuously ribbed.—Dry woodlands, Coastal Plain, Ga. to La., Ark., and SE Mo.—Sum.–fall.

24. S. yadkinensis (Porter) Small. Stem 5–14 dm. tall, glabrous except in the inflorescence: lower leaf-blades ovate, 8–15 cm. long, 6–9 cm. wide, thickish, singly serrate, minutely hispidulous, otherwise glabrous; petiole much shorter than the blade: inflorescence with ascending stiff branches, flower-bearing to the base: heads 7–9 mm. high: involucral bracts oblong, obtuse: achene linear-clavate, ribbed. [*S. arguta caroliniana* A. Gray *S. Vaseyi* Heller]—Woods and low grounds, Coastal Plain and Piedmont, Fla. to Ala. and N. C.—Sum.–fall.

25. S. brachyphylla Chapm. Stem 5–13 dm. tall, closely short pubescent, closely leafy throughout: larger leaf-blades oblong-oval or oval-obovate, 3–7 cm. long, 1.2–2.5 cm. wide, crenate-serrate: branches of inflorescence much elongate, often not flower-bearing on lower part: heads few-flowered, 5 mm. high: involucre cylindric; bracts oblong, obtuse, firm: achene 2.25 mm. long, strongly dilated upward, 8–10-ribbed. [*S. pallescens* C. Mohr]—Dry woodlands, Coastal Plain, Fla. to Miss. and S. Car.—Sum.–fall.

26. S. arguta Ait. Stem 6–12 dm. tall, glabrous except in the inflorescence: lower leaf-blades ovate, 8–15 cm. long, 5–8 cm. wide, thin, sharply more or less doubly serrate, deep-green above, much lighter-green beneath, the petioles as long as the blades or longer: inflorescence large and loose, the branches flower-bearing at the ends: involucre 3–4.5 mm. high, 2–2.5 mm. thick; inner bracts linear-oblong: stigmas strongly exserted, conspicuous in the disk: achene glabrate or nearly so; pappus 3–4 mm. long.—Dry woodlands, various provinces, N. C. to ''Ala.,'' ''Miss.,'' Ky., and Me.—Sum.–fall.

27. S. Harrisii Steele. Stem 6–12 dm. tall, glabrous except in the inflorescence: lower leaf-blades ovate, 6–18 cm. long, 3–9 cm. wide, firm, sharply more or less doubly serrate, little lighter-green beneath than above; petioles as long as the blades or longer: inflorescence large and loose, the branches widely spreading, flower-bearing at the tips: involucre 4–6 mm. high, 2.5–4 mm. thick; inner bracts oblong-obovate: stigmas partially exserted, inconspicuous in the disk: achene hairy: pappus 2.5–3.5 mm. long. [*S. Vaseyi* (Fl. SE. U. S.)]—Dry woodlands, Blue Ridge and adj. provinces, "Ga." and "Ala." to Ky. and W. Va.—Sum.–fall.

28. S. uniligulata (DC.) Porter. Stem 6–15 dm. tall, glabrous below the inflorescence: leaves numerous, strongly decreasing in size upwards; blades of the larger ones lanceolate or oblong-lanceolate, 1.5–3 dm. long, 1–3 cm. wide, shallowly serrate, firm or thickish, glabrous: heads very numerous to few, in a large to small thyrse, the lower branches hirsute, spreading, usually short, with the upper heads closely bunched: heads 6–8 mm. high: involucral bracts oblong, obtuse, with a conspicuous midrib: achene 1.5–2 mm. long, linear, dilated upward, ribbed. [*S. neglecta* T. & G.]—Acid swamps and bogs, various provinces, N. C. to Wis. and Newf.—Sum.–fall.—A related species, *S. uliginosa* Nutt., was apparently erroneously recorded from N. C. in Fl. SE. U. S. 1194.

29. S. austrina Small. Stem 8–15 dm. tall, glabrous usually even in the inflorescence: leaf-blades lanceolate, 6–10 cm. long, 1–2 cm. wide, glabrous, firm, serrate, tapering to a margined petiole which is usually shorter than the blade: thyrse narrow, elongate, the branches short-spreading, flower-bearing to base or nearly so: heads 7–8 mm. high: involucral bracts oblong, acutish or obtuse: achene 2.5 mm. long, ribbed.—Swamps, sometimes brackish, Coastal Plain and Piedmont, Ga. to Va.—Sum.–fall.

30. S. flavovirens Chapm. Stem 5–20 dm. tall, glabrous even in the inflorescence: larger leaf-blades oblong-ovate or oblanceolate, 1–2 dm. long, 2–5 cm. wide, glabrous, firm, thickish, crenate-serrate, tapering to a margined petiole, which varies from much shorter than the blade to nearly as long: thyrse narrow, long, the branches short, spreading, flower-bearing to base or nearly so: heads 7–9 mm. high: involucral bracts narrow, acutish: achene 2–2.5 mm. long, ribbed.—Brackish marshes, Apalachicola, Florida.

31. S. rigida L. Stem 5–20 dm. tall, stout, glabrous except in inflorescence: lower leaf-blades oblong-ovate, 1.2–2 dm. long, 5–9 cm. wide, firm but not thick, closely crenate-serrate, very rough above with minute retrorse hispid hairs, smooth and glabrous beneath: inflorescence elongate and loose, the branches recurved-spreading or occasionally erect, the heads often crowded towards the ends: heads 6–8 mm. high: involucre broadly campanulate; bracts oblong, obtuse: achene 2.5–3 mm. long, 10-ribbed, sparsely pubescent. [*S. patula* Muhl.]—Swampy woodlands and thickets, various provinces, Ga. to Mo., Ont., and Me.—Sum.–fall.

32. S. salicina Ell. Stem 6–15 dm. tall, scarcely stout, glabrous, except in the inflorescence: lower leaf-blades oblong-ovate to oblong-lanceolate, 0.5–2 dm. long, 1.5–3 cm. wide, thin but stiff, crenate-serrate or serrate, dull-green and strongly retrorsely scabrous above, smooth and light-green beneath: inflorescence elongate and narrow, the heads in few-flowered clusters or short racemes, not at all secund: heads 6–8 mm. high: involucre campanulate to narrowly campanulate; bracts linear-oblong, acute to obtusish: achene 2.5 mm. long, obscurely ribbed, sparsely pubescent.—Low grounds, Coastal Plain and adj. provinces, Fla. to La. and N. C.—Sum.–fall.

33. S. mexicana L. Stem 8–20 dm. tall, stout, glabrous below the inflorescence: lower leaf-blades oblong-lanceolate to linear-lanceolate, 1–2.2 dm.

long, 1.2–3 cm. wide, obtuse or acutish, hispid-ciliolate, entire: heads 5–7 mm. high, in an elongate narrow panicle, the branches short: involucral bracts narrowly oblong-lanceolate: rays 7–10, the ligules 2.5 mm. long, oblong-oval: achene 2.5 mm. long, ⅔ length of pappus, not narrowed above or scarcely so.—Salt-marshes, beaches, coastal sand-dunes, and banks of tidal rivers, coastal Fla. to Tex. and Del.; S Calif. (*W. I., Mex.*)—Sum.–fall or all the year S.—This species replaces *S. sempervirens* L. of northern regions, in the SE States.

34. **S. Gattingeri** Chapm. Stem 6–15 dm. tall, smooth and glabrous throughout: lower leaf-blades oblanceolate or narrowly spatulate, remotely shallowly serrate or entire: upper leaf-blades much smaller, linear-oblanceolate, entire: panicle ample, the branches widely spreading, glabrous, flower-bearing above the middle: heads 4–5 mm. high: involucral bracts thick, narrowly oblong: achene sparingly silky above.—Limestone barrens, various provinces N of Coastal Plain, Tenn. to Tex. and Mo.—Sum.–fall.

35. **S. pinetorum** Small. Stem 4–11 dm. tall, smooth and glabrous throughout: lower leaf-blades narrowly oblanceolate, crenate-serrate above the middle: upper leaf-blades smaller, narrower and entire: panicle medium-sized, the branches widely spreading, glabrous: heads 4–5 mm. high: involucral bracts linear-oblong, the midrib dilated at apex: achene sparingly silky.—Pinewoods, Piedmont, N. C.—Sum.–fall.

36. **S. nemoralis** Ait. Stem and rest of plant grayish-green, 1–9 dm. tall, erect, depressed, or rarely prostrate, closely short-pubescent: lower leaf-blades oblanceolate or spatulate, 4–15 cm. long, 1–2.5 cm. wide, thick, crenate or crenate-dentate, rough grayish-pubescent on both sides, the petiole longer than the blade: upper leaf-blades much smaller, narrower and entire: panicle medium-sized, the branches spreading or recurved: peduncles sparingly bracteolate: heads very numerous, 3–4 mm. high, 1.5 mm. thick: involucral bracts rather thin: ligules of the ray short.—Dry sunny situations, roadsides, banks, open woodlands, and especially in fields, various provinces, Fla. to Tex., Sask., and N. S.—Sum.–fall.—One of the most widely distributed and abundant species of *Solidago*.

37. **S. radula** Nutt. Stem 3–11 dm. tall, erect or ascending, roughly short-pubescent: lower leaf-blades oblong-obovate, oblanceolate, or oblong-lanceolate, 4–8 cm. long, 1–2.5 cm. wide, firm, rough-hairy on both sides, not at all hoary, strongly reticulate-veined beneath, crenate-dentate, usually shallowly so, or nearly entire: upper leaf-blades moderately smaller: inflorescence narrow to ample, the branches short, erect to recurved-spreading: heads 4–6 mm. high: involucral bracts narrow, obtuse, firm; ligules of the ray short.—Dry limestone ledges, various provinces, N. C., La. to Tex., Mo., and Ill.—Sum.–fall.

38. **S. verna** M. A. Curtis. Stem 5–9 dm. tall, softly pubescent, sometimes almost villous: lower leaf-blades 4–9 cm. long, 2–5 cm. wide, tomentose beneath, hispidulous above, acute, closely serrate; petioles as long as the blades or twice or thrice as long, strongly margined: inflorescence very lax, the heads conspicuously peduncled: involucre broadly campanulate, 4–4.5 mm. high; bracts linear, acutish: ray-flowers 10–12, the ligules linear-oblong, bright-yellow.—Pinelands, Coastal Plain, E N. C. and NE S. C.—Spr.—A very local species; rarely collected.

39. **S. tarda** Mackenzie. Stem 5–9 dm. tall, glabrous below the inflorescence: lower leaf-blades 4–9 cm. long, 3–5 cm. wide, acute, glabrous on both sides, dull-green above, lighter-green beneath, closely crenate-serrate, inequilaterally rounded at the base; petioles as long as the blades or up to thrice as long, margined above only: inflorescence typically somewhat lax, sometimes con-

gested, the heads rather short-peduncled: involucre campanulate, 5–7 mm. high; bracts oblong, acutish: ray-flowers 8–10, the ligules oblong, bright-yellow.—Pinelands, Coastal Plain, Ga.—Sum.–fall.

40. S. gracillima T. & G. Stem 4–10 dm. tall, slender; lower leaf-blades oblanceolate or spatulate, 2–8 cm. long, 8–12 mm. wide, dull-green above, lighter beneath, shallowly crenate-serrate except near base; petioles equalling or 2–3 times as long as the blades: stem-leaves numerous, much reduced; blades entire or nearly so: inflorescence with a terminal narrow spike-like portion, and 2–5 very long and slender spreading branches with the heads secund on the upper third only: heads 5–6 mm. high, few-flowered: involucral bracts short, oblong, obtuse: ray-flowers mostly wanting, sometimes solitary: achene linear, short-pubescent, dark-colored.—Sandy soil, Coastal Plain, Fla. and Ga.—Sum.–fall.—Rarely collected.

41. S. petiolata Mill. Stem 2.5–20 dm. tall, strict, slender: lower leaf-blades narrowly linear-oblanceolate to lanceolate, 6–15 cm. long, 0.6–2.5 cm. wide, entire or shallowly crenate-serrate; petioles one-fourth as long as the blade to as long: stem-leaves abruptly much reduced, very numerous, entire, sessile, appressed or spreading: heads in a strict spike-like thyrse or sometimes the lower branches short spreading and the heads unilateral, 6–7 mm. high: involucre turbinate-campanulate; bracts linear, acute, thin, erose ciliolate: ray-flowers several; ligules elliptic, conspicuous: achene linear-obconic, silky, dark-colored. [*S. stricta* Ait. *S. virgata* Michx. *S. angustifolia* Ell. *S. Chrysopsis* Small]—Wet pinelands, acid soils, Coastal Plain and rarely adj. provinces, Fla. to La., Tenn., and N. J.—(*W. I.*)—Sum.–fall.—A very variable species southward. Possibly representing more than one species, as here interpreted.

42. S. pulchra Small. Stem 2.5–4 dm. tall, glabrous, very slender: lower leaf-blades spatulate or oblanceolate, 2–5 cm. long, 8–14 mm. wide, entire, obtuse, glabrous, even the edges eciliate; petioles margined above, one-half to three times length of blade: stem-leaves abruptly much reduced, appressed, sessile, mostly 5–10 mm. long and 1–2.5 mm. wide: heads 5–15 in a simple narrow somewhat one-sided thyrse 2–8 cm. long, strongly peduncled, 6–8 mm. high: involucre campanulate or turbinate-campanulate; bracts oblong, acutish, strigillose: ray-flowers 5 or 6, the ligules ovate, bright-yellow, 4–5 mm. long: achene linear obconic, appressed silky.—Moist sandy soil, Coastal Plain, E N. C.—Fall.

43. S. caesia L. Stem 3–11 dm. tall, slender, straight, terete, with a bluish-gray glaucous bloom which is often obscure in age: leaf-blades oblanceolate, lanceolate, oblong-oblanceolate, or oblong-lanceolate, 0.5–1 dm. long, 0.5–3 cm. wide, glabrous, sharply shallowly serrate, firm, long-acuminate, round-tapering at base; petioles 1–2 mm. long: heads 4–6 mm. high: involucre 3.5–4 mm. high, 1.5–2 mm. wide; bracts obtuse: achene linear, 10-ribbed.—Woodlands, usually dry but sometimes damp soil, various provinces, Fla. to Tex., Wis., Ont., and Que.—Sum.–fall.

44. S. latissimifolia Mill. Stem 5–13 dm. tall, slender, straight, terete or sometimes obscurely angled, glabrous below, sparingly pubescent above, with a slight bluish-gray glaucous bloom: leaf-blades broadly oblanceolate to obovate, 6–20 cm. long, 1.5–5.5 cm. wide, thin, strongly acuminate, very sparingly hirsutulous, sharply and deeply serrate, cuneate-tapering at base; petioles 1–5 mm. long: heads 4.5–5.5 mm. high: involucre 4–4.5 mm. high, 2.5–3.5 mm. wide; bracts obtuse: achene oblong, enlarged upward. [*S. flaccidifolia* Small *S. asterifolia* Small]—Dry woodlands, Coastal Plain to Appalachian Plateau, Ga. to La.—Sum.–fall.

45. S. flexicaulis L. Stem 3–10 dm. tall, slender, strongly angled, usually zigzag, glabrous, not glaucous: leaf-blades broadly ovate, rather abruptly acumi-

nate, 0.5–1.8 dm. long, 2.5–10 cm. wide, thin, very sharply and deeply serrate, glabrous above, sparingly pubescent beneath, abruptly narrowed at the base, many times the length of the short margined petioles: heads 6 mm. high: involucral bracts acute or obtusish: achene hirsute-pubescent.—Deep woods especially among loose rocks along small streams, various provinces, Tenn. to Kans., S. Dak., and N. S., and Va.—Sum.–fall.

46. **S. pubens** M. A. Curtis. Stem 4–15 dm. tall, slender, pilose; leaf-blades narrowly oblanceolate to broadly oblanceolate, 6–16 cm. long, 2.5–4.5 cm. wide, sharply serrate, thin, hirsutulous above, pilose beneath on the veins; petioles 1–3 mm. long: heads 5–6 mm. high, in short or even long axillary racemes, the lower racemes much exceeded by the leaves, the upper aggregated and forming a short thyrse: involucre 3–4.5 mm. high; bracts hispidulous, ciliate, obscurely few-ribbed at the base: achene appressed-hirsutulous.—Rich woods, Blue Ridge, Ga. to Tenn. and N. Car.—Sum.–fall.

47. **S. Curtisii** T. & G. Stem 5–14 dm. tall, slender, glabrous below, pubescent above: leaf-blades narrowly oblanceolate to broadly oblanceolate, 8–20 cm. long, 1.5–4 cm. wide, thin, sharply serrate, glabrous or nearly so, long-acuminate, long-tapering at the base; petioles 1–10 mm. long: heads 5–6 mm. high, in axillary clusters or short racemes, all except the uppermost exceeded by leaves, even the uppermost scarcely forming a spike: involucre narrowly campanulate, 3–4.5 mm. high; bracts narrowly oblong, ciliolate, strongly 3–5-ribbed: achene appressed-hirsutulous.—Rich dry soil in open upland woods, Blue Ridge to Appalachian Plateau, Ga. to Ala., Tenn., Ky., and Va.—Sum.–fall.

48. **S. lancifolia** T. & G. Stem 8–15 dm. tall, stoutish or stout, glabrous below, sparingly pubescent above: leaf-blades lanceolate, 8–20 cm. long, 2–3 cm. wide, thin, sharply and deeply serrate, glabrous to very sparingly hirsutulous, long-acuminate, strongly cuneate-tapering at the base; petioles 2–6 mm. long: heads 6.5–8 mm. high, in elongate axillary racemes, the upper forming a narrow terminal thyrse: involucre broadly campanulate, 5–6 mm. high; bracts oblong, obtuse, ciliolate, granular-puberulent or hispidulous, strongly 3–5-ribbed: achene appressed-hirsutulous.—Rich woodlands, slopes and summits, Blue Ridge, Ga. to Tenn. and N. C.—Sum.–fall.

49. **S. tortifolia** Ell. Stem 3–11 dm. tall, closely roughly short-pubescent: leaves very numerous; blades narrowly linear-oblong, linear-lanceolate, or oblong-lanceolate, 1.5–8 cm. long, 2.5–6 mm. wide, channeled, those of the lower leaves, at least, recurved-spreading and slightly twisted at the base, shallowly serrate above the middle, hispidulous on the midvein and margins, sessile, with the lateral veins usually obscure: thyrse 6–15 cm. long, nearly as wide, the branches widely spreading: heads secund, 3.5–4.5 mm. high: involucre cylindric: achene sparsely and minutely pubescent.—Dry sandy soil, pinelands, Coastal Plain, Fla. to Tex. and Md.—Sum.–fall, or all year S.

50. **S. fistulosa** Mill. Stem 6–20 dm. tall, strongly white-hirsute above, glabrate towards the base: leaves very numerous; blades oblong-lanceolate or oblong-oblanceolate, 5–12 cm. long, 1.7–2.5 cm. wide, sparingly and shallowly crenate-serrate or entire or nearly so, sessile, thin, prominently veined, pubescent at least on the veins, with the broad base somewhat clasping: thyrse 0.5–2 dm. long, the branches numerous, spreading, usually flower-bearing nearly to the base: heads 5–7 mm. high, secund, long-peduncled: involucre cylindric-campanulate; bracts linear-lanceolate, acute, thin: achene pubescent. [*S. aspericaulis* A. H. Moore]—Moist sunny localities, low pine-lands, acid soils, Coastal Plain, La. to Fla. and N. J.—Sum.–fall.

51. S. dispersa Small. Stem 7–12 dm. tall, glabrous or sparingly hirsutulous especially in the inflorescence: lower leaf-blades oblong-oblanceolate, 8–15 cm. long, glabrous or sparingly hairy on the veins, strongly crenate-serrate, shining green above, duller beneath, tapering to a margined petiole-like base; upper leaves much reduced: thyrse long and narrow, the heads little secund, or with a few long widely spreading branches, flower-bearing towards the end and the heads secund: heads 6–7 mm. high: involucre turbinate-campanulate; bracts linear-oblong, firm, obtuse: achene short-pubescent, obscurely ribbed.—Low sandy open woods, Coastal Plain, Miss. to Tex.—Sum.–fall.

52. S. altissima L. Stem 3–25 dm. tall, strongly pubescent above, with the hairs stiff, pustular, glabrate towards the base, closely leafy: larger leaf-blades oblanceolate or oblong-lanceolate, 5–10 cm. long, 1.5–2 cm. wide, sharply-serrate, acute or acuminate, thin, prominently veined and sparingly hairy beneath, not cordate: thyrse variable, 0.4–3 dm. long, the branches few to many: peduncles moderately bracteolate: heads small, 3–4 mm. high: involucre cylindric: involucral bracts few, rather thin, the inner linear, mostly obtusish: achene appressed-hairy, obscurely few-ribbed. [*S. rugosa* Mill. *S. Earlei* Small]—Thickets, fields, and woodlands, dry soil, often very abundant, various provinces, Fla. to Tex., Mo., Ont., and Newf.—Sum.–fall.—One of our most abundant and widely distributed species of *Solidago*.

53. S. celtidifolia Small. Stem 6–20 dm. tall, closely leafy, closely and densely short pubescent above, glabrate towards base, the stem-hairs weak, not or scarcely pustular: larger leaves with oblong-ovate to ovate blades, 3–8 cm. long, 1.5–2.5 cm. wide, crenate-serrate, obtuse or short-acute, shallowly cordate, sessile or very short-petioled, very conspicuously veined especially below, the petiole somewhat glandular: thyrse variable, usually very large: peduncles usually strongly bracteolate: heads small, 4–5 mm. high, involucre turbinate-cylindric; bracts few, firm, the inner linear, acutish: achene hairy, obscurely few-ribbed.—Sandy soil or dry woodlands, Coastal Plain, Fla. to Tex., Ark., and Ga.—Sum.–fall.

54. S. Elliottii T. & G. Stem 8–18 dm. tall, glabrous, striate or striate-angled, usually simple below the inflorescence: cauline leaves numerous; blades elliptic or nearly so, 5–10 cm. long, acute or slightly acuminate, bluntly serrate, thick, glabrous, sometimes scabrous on the margins, somewhat veiny, sessile or nearly so: thyrse rather crowded, the branches glabrous or nearly so, with broad, entire or obscurely toothed, acute, foliaceous bracts among the secund heads: peduncles glabrous or nearly so: involucre nearly cylindric, 5–6 mm. high; bracts thick, the outer ovate, obtuse or acutish, the inner linear or slightly linear-spatulate, with obtuse erect tips: ray-flowers about 8; disk-flowers about 4, usually 2 or 3, fewer than the ray-flowers; achenes very sparingly hispidulous, sharply ribbed.—Damp rich soils, Parris Island, S. C., and doubtless at other points along the southern Atlantic coast.—Fall.—This species seems to be known only from the original specimen from Parris Island, S. C. Specimens ranging all the way from eastern Georgia to eastern Canada have been erroneously referred it.

55. S. Edisoniana Mackenzie. Stem 12–50 dm. tall, glabrous below, often sparingly pubescent and rather prominently ridged above, often irregularly branched: cauline leaves very numerous; blades elliptic, sometimes elliptic-oblanceolate on the lower part of the stem and elliptic-lanceolate above, 5–17 cm. long, usually acuminate, shallowly serrate, glabrous above, pubescent with scattered hairs beneath, finely veined, sessile: thyrse densely flowered, the branches closely fine-pubescent, with rather narrow finely toothed and scabrous-margined acute bracts among the secund heads: peduncles minutely pubescent: involucre broadly campanulate, 5 mm. high; bracts thin but firm, the outer ovate-

lanceolate, acutish, the inner narrowly linear, with obtuse erect tips; ray-flowers about 10: disk-flowers about 7: achenes sparingly hispidulous, ribbed.—Hammocks, near Ft. Mead, Fla.—Peculiar among our goldenrods of this and the next group in that it holds its lower cauline leaves throughout the growing season.

56. **S. mirabilis** Small. Stem 15–30 dm. tall, glabrous, ridged or rather sharply angled, simple or nearly so below the inflorescence: cauline leaves numerous; blades narrowly elliptic, varying to elliptic-oblanceolate or elliptic-lanceolate, 6–15 cm. long, acuminate, sharply serrate, except often the acuminate tip, thin, hispidulous on the veins and veinlets beneath, rather veiny, somewhat narrowed at the ciliate base, but sessile: thyrse usually ample, but not crowded, the branches hispidulous, with narrow, serrate, acuminate bracts among the secund heads: peduncles hispidulous, involucre cylindric 6 mm. high; bracts thin, the outer lanceolate, acuminate, the inner narrowly linear, with minute, acuminate, inflexed or incurved tips: ray-flowers 5–7; disk-flowers 3–5, usually 2 or 3 fewer than the ray-flowers: achene sparingly hispidulous, sharply ribbed.—Low hammocks, E coast of Fla., N of Cape Canaveral.—Sum.–fall.

57. **S. glaberrima** Martens. Stem 5–15 dm. tall, glabrous, rather slender, very leafy: middle leaf-blades narrowly lanceolate, 5–10 cm. long, 6–12 mm. wide, firm, rigid, thickish, acute or acuminate, sessile, narrowed and long-tapering at the base, remotely shallowly serrate or entire, reticulate-veined beneath; lower leaf-blades more spatulate, petioled: thyrse rather short, broad, the branches usually spreading or recurved, sometimes erect, glabrous: heads usually secund, 4–6 mm. high: involucral bracts thickish, oblong, obtuse: achene silky. [“*S. missouriensis* Nutt.”]—Dry open places, prairies, and barrens, calcareous districts, various provinces N of Coastal Plain, Tex. to Minn. and Tenn.—Sum.–fall.

58. **S. serotina** Retz. Stem 6–25 dm. tall, appearing glabrous below inflorescence, but minutely pulverulent, glaucous-tinged, closely leafy: larger leaf-blades lanceolate, 6–12 cm. long, 1–2 cm. wide, firm, acuminate, very short-petioled, tapering at the base, sharply closely serrate, glabrous throughout, or hairy on the veins beneath: thyrse large, the branches spreading or recurved, hairy: heads 4.5–6 mm. high, secund: involucre campanulate; bracts narrowly linear, acute: achene sparsely silky. [*S. gigantea* Ait.]—Moist thickets and woodlands, various provinces, Fla. to Tex., Ore., B. C., Ont., and N. B.—Sum.–fall.—One of our most widely distributed species of *Solidago*.

59. **S. canadensis** L. Stem 5–20 dm. tall, slender, glabrous or pubescent below, strigillose above, and strigose in inflorescence, closely-leafy: larger leaf-blades linear-oblanceolate or linear-lanceolate, 5–10 cm. long, 7–15 mm. wide, thin but firm, sharply acuminate, sharply remotely shallowly serrate, glabrous or pubescent, deep-green above; petioles 3–15 mm. long: thyrse large, the branches spreading or recurved: heads 3.5–4 mm. high, secund: involucre cylindric-campanulate; inner bracts narrowly lanceolate, acute, thickish: achene appressed-pubescent. [*S. rupestris* Raf.]—Rocky banks, various provinces N. of Coastal Plain, S. C. to Tex., N. Dak., and Newf.—Sum.–fall.—As here treated the species includes plants varying widely in pubescence, but all having very small heads.

60. **S. Leavenworthii** T. & G. Stem 5–12 dm. tall, glabrate towards the base, pubescent above in lines below the petioles, closely short-pubescent in the inflorescence, closely leafy: larger leaf-blades narrowly oblanceolate or lanceolate, 6–18 cm. long, 5–12 (typically about 8) mm. wide, triple-ribbed, but sometimes with the lateral veins little developed, long-acuminate, sessile, sharply serrate or crenate-serrate or nearly entire, short-hispidulous on the midvein above, otherwise glabrous, dull-green above: thyrse large, the branches widely spread-

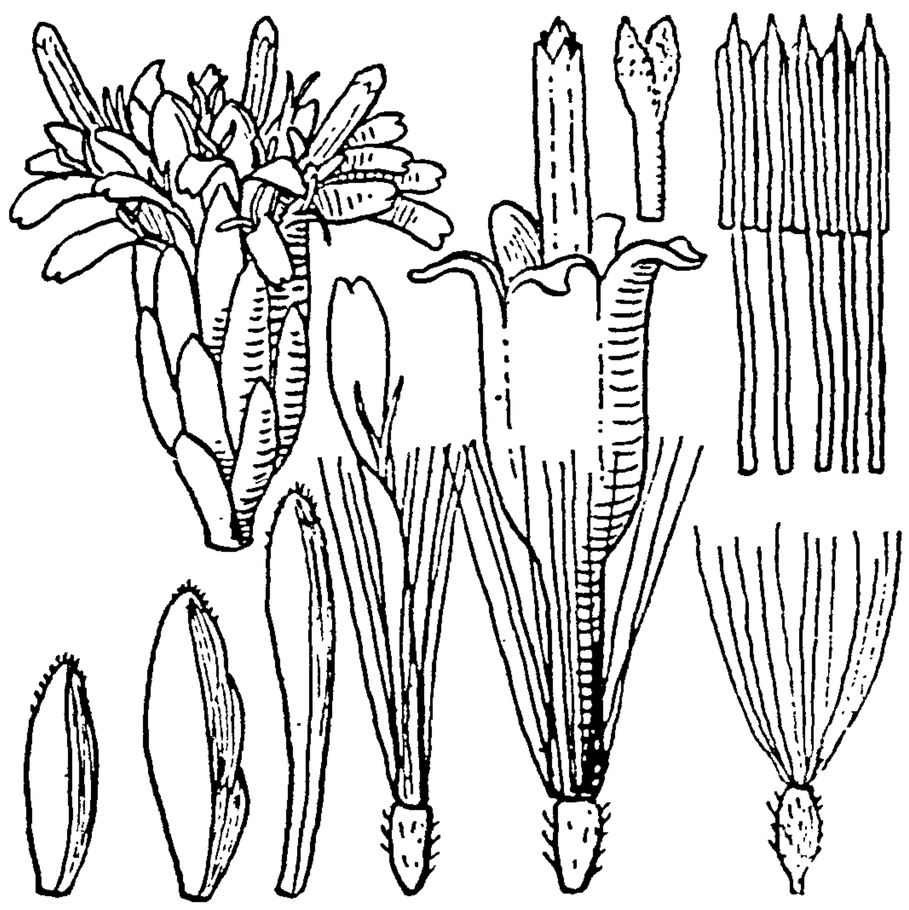
ing, flower-bearing nearly to the base: heads 5–6 mm. high, secund: involucral bracts linear, thickish: achene minutely appressed-pubescent. [*S. Nashii* Small]—Damp soil, Coastal Plain, Fla. to S. Car.—Sum.–fall.

61. S. hirsutissima Mill. Stem 8–30 dm. tall, stout, closely hirsute or pubescent, closely-leafy, much-branched above: larger leaf-blades lanceolate or oblong-lanceolate, 4–10 cm. long, 8–15 mm. wide, strongly triple-ribbed, acute or acuminate, hirsutulous above, pubescent also beneath, sharply but not closely serrate, subpetiolate or sessile: thyrse large, the branches widely spreading, not flower-bearing at the base: heads 4.5–6 mm. high, secund: involucral bracts narrowly linear, acute or obtusish: achene appressed-hairy. [''*S. canadensis* (Fl. SE. U. S.). ''*S. altissima* L.'']—Dry sunny places, fields, woodlands, and banks, various provinces, Fla. to Tex. and Me.—Sum.–fall.—One of our most widely distributed, abundant, and variable species of *Solidago*. As here treated both it and *S. canadensis* are probably aggregates.

31. EUTHAMIA Nutt. Perennial, herbaceous plants. Leaves alternate: blades elongate, herbaceous. Heads many, in corymbs. Involucre narrow, few–several-flowered: bracts various, the outer ones linear or nearly so. Ray-flowers more numerous than those of the disk: corolla yellow, with a slender tube and a very small ligule. Disk-corollas with a funnelform throat, and tube of about equal length: lobes lanceolate. Anthers as long as the filaments or longer. Stigmas lanceolate. Pappus of capillary bristles.—About 10 species, North American.

Leaf-blades manifestly 3–5-ribbed: ray-flowers 15–20. 1. *E. graminifolia.*
Leaf-blades 1-ribbed: ray-flowers 5–12.
  Leaf-blades mostly over 3 mm. wide: disk-flowers 3 or 4, the corollas 5–5.5 mm. long. 2. *E. leptocephala.*
  Leaf-blades mostly less than 3 mm. wide: disk-flowers 5 or 6, the corollas 3–3.5 mm. long. 3. *E. minor.*

1. E. graminifolia (L.) Nutt. Plant 13–14 dm. tall: leaf-blades linear, mainly over 4 mm. wide: heads in dense clusters: involucre campanulate, the inner bracts 3.5–4 mm. long: achene pubescent.—Rich soil, fields and thickets, various provinces, Fla. to Miss., Sask., and N. S.—Late sum.–fall.



2. E. leptocephala (T. & G.) Greene. Plant 4–11 cm. tall: leaf-blades linear, mostly over 3 mm. wide: involucre turbinate, the inner bracts 5.5–6 mm. long: filaments shorter than the anthers.—Moist soil, Coastal Plain and adj. provinces, Miss. to Tex. and Mo.—Sum.–fall.

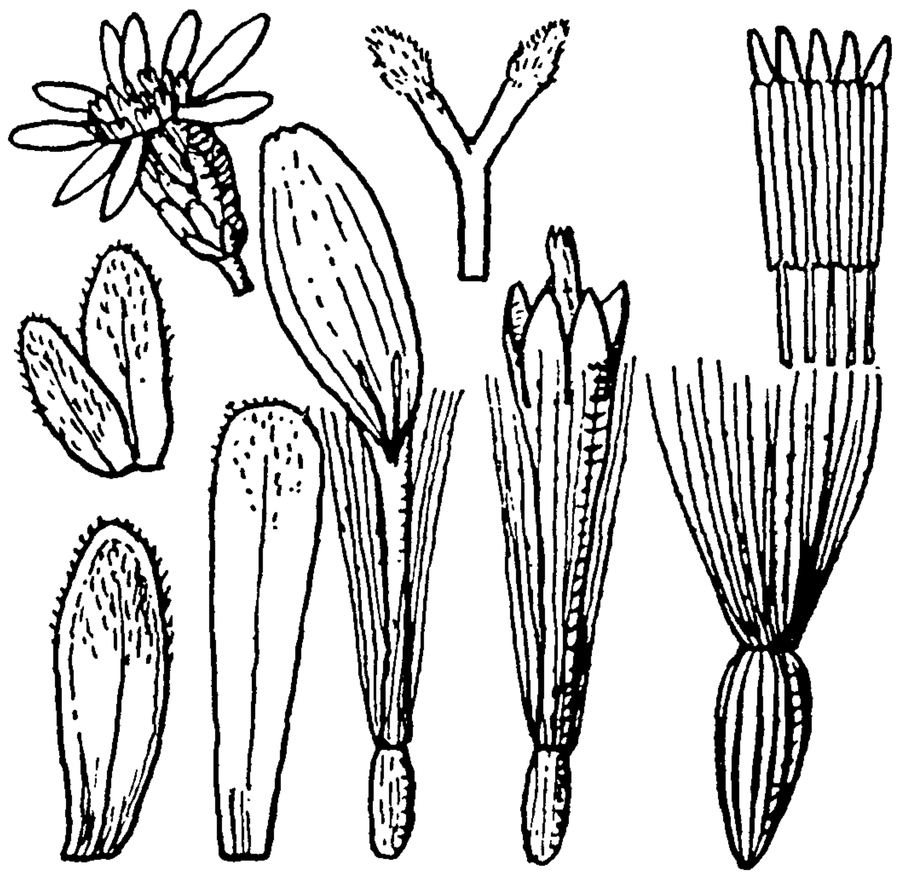
3. E. minor (Michx.) Greene. Plant 2–8 dm. tall: leaf-blades narrowly linear or linear-filiform, mostly less than 3 mm. wide: involucre cylindric to turbinate-cylindric, the inner bracts 4.5–5.5 mm. long.—Moist sandy soil and low-pinelands, Coastal Plain, Fla. to Tex. and Va.—Sum.–fall, or all year S.

32. OLIGONEURON Small. Perennial herbs, pubescent at least in the inflorescence. Leaves alternate: blades entire or nearly so. Heads in a terminal corymb. Involucre campanulate, several-flowered: bracts broad, rounded at the apex, the inner much longer than the outer. Ray-flowers few: corollas

with a very long tube and a yellow ligule. Disk-corollas with a funnelform throat and a shorter tube: lobes lanceolate. Filaments nearly as long as the anthers or longer. Stigmas elliptic or ovate-elliptic. Achene stout, glabrous ribbed. Pappus of many capillary bristles.—About 6 species, North American.—Sum.–fall.

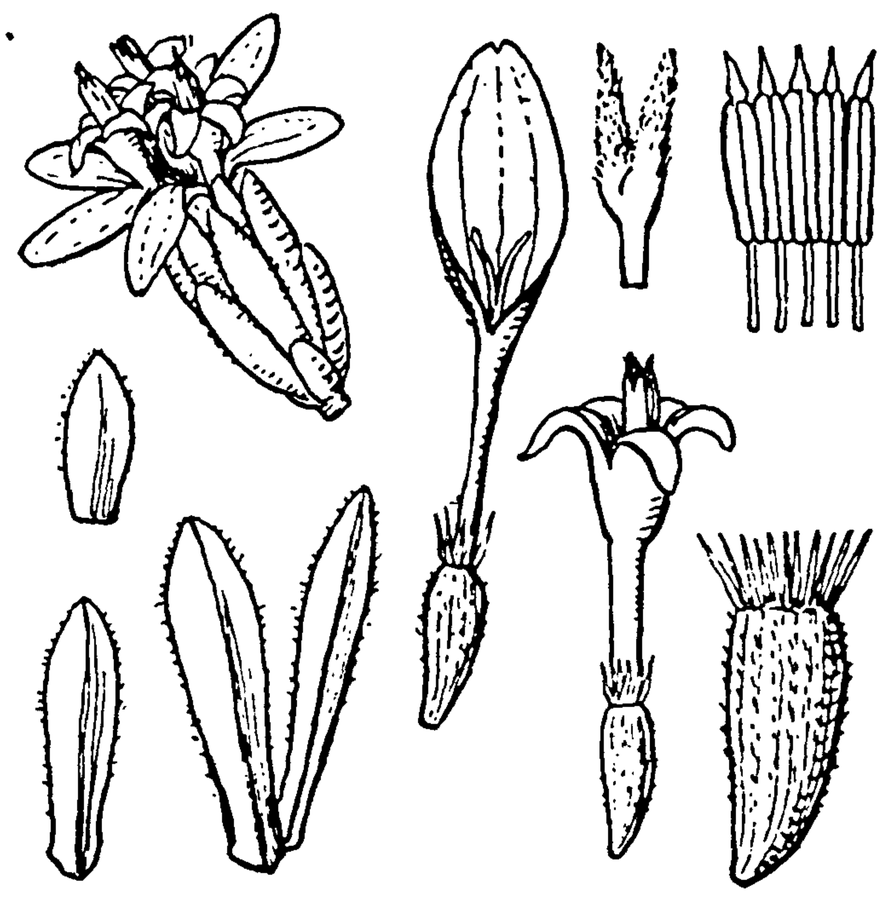
Involucre over 5 mm. thick: achene about 3 mm. long. 1. *O. grandiflorus.*
Involucre less than 5 mm. thick: achene about 2 mm. long. 2. *O. Jacksonii.*

1. O. grandiflorus (Raf.) Small. Stem 4–15 dm. tall, rough-pubescent: leaf-blades thick, those of the upper stem-leaves elliptic to ovate, 2–13 cm. long, closely pubescent, shallowly toothed or essentially entire: bracts of the involucre pubescent, the outer ovate: disk-corollas 5.5–6.5 mm. long: achene 12–15-ribbed. [*Solidago rigida* authors not L.].—Dry sandy soil and gravelly banks, various provinces N of Coastal Plain, Ga. to Tex., Man., and Md., and extending E to Mass. Nat. of W N. A.—Fall.



2. O. Jacksonii (Kuntze) Small. Stem 3–12 dm. tall, glabrous or nearly so below: leaf-blades thinnish, those of the upper stem-leaves elliptic to ovate, 2–9 cm. long, serrulate, somewhat scabrous above: bracts of the involucre glabrous, the outer elliptic-ovate. [*Solidago corymbosa* Ell.].—Dry banks and stony soil, Appalachian Plateau and adj. provinces, Ga. to Ala. and Ohio.

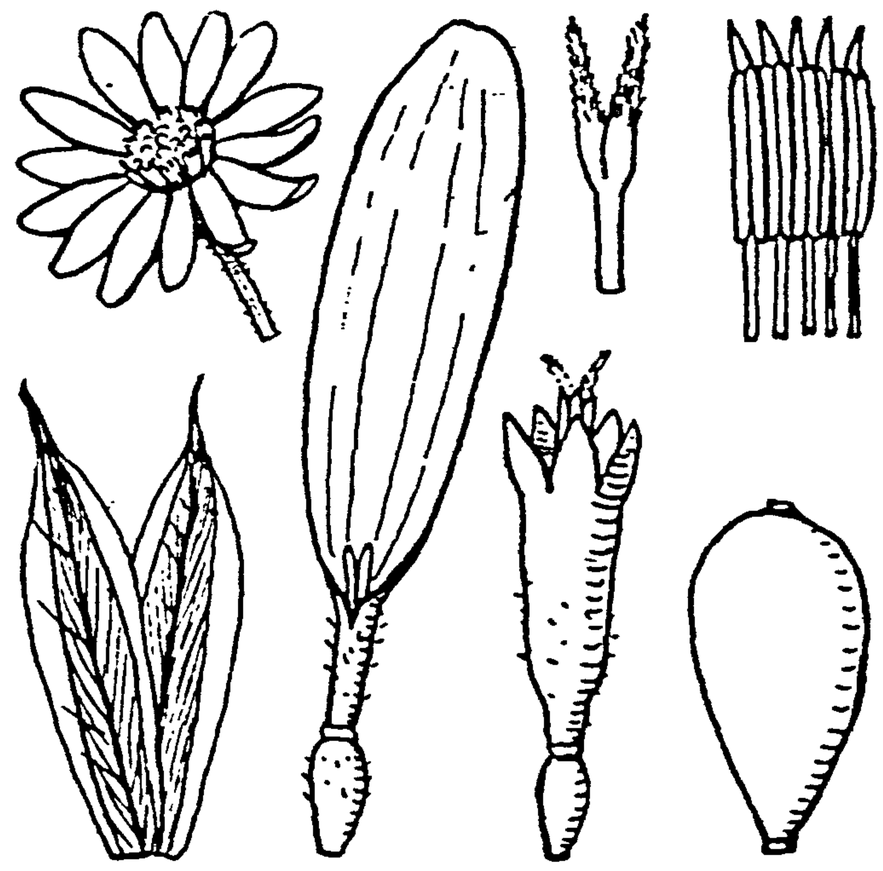
33. BRACHYCHAETA T. & G. Perennial herbs, resembling species of *Solidago*. Leaves alternate: blades broad, toothed. Heads numerous, thyrsoid. Involucre narrow, few-flowered: bracts various, the outer ones broad, the inner longer and relatively narrower. Ray-flowers few: corollas with a very slender tube and a small yellow ligule. Disk-corollas with a campanulate throat and a tube nearly as long as the throat: lobes triangular-lanceolate. Anthers about as long as the filaments: appendages slender. Stigmas lanceolate. Achene 8–10-ribbed. Pappus of scale-like bristles shorter than the achene.—One species.



1. B. sphacelata (Raf.) Britton. Stem 6–15 dm. tall, pubescent: leaf-blades orbicular-ovate to ovate on the lower part of the stem, ovate to oval or elliptic above: involucre 3.5–4 mm. long. [*B. cordata* T. & G.]—(FALSE GOLDENROD.)—Woods, various provinces N of Coastal Plain, Ga. to Ala., Ind., and S. Va.—Sum.–fall.

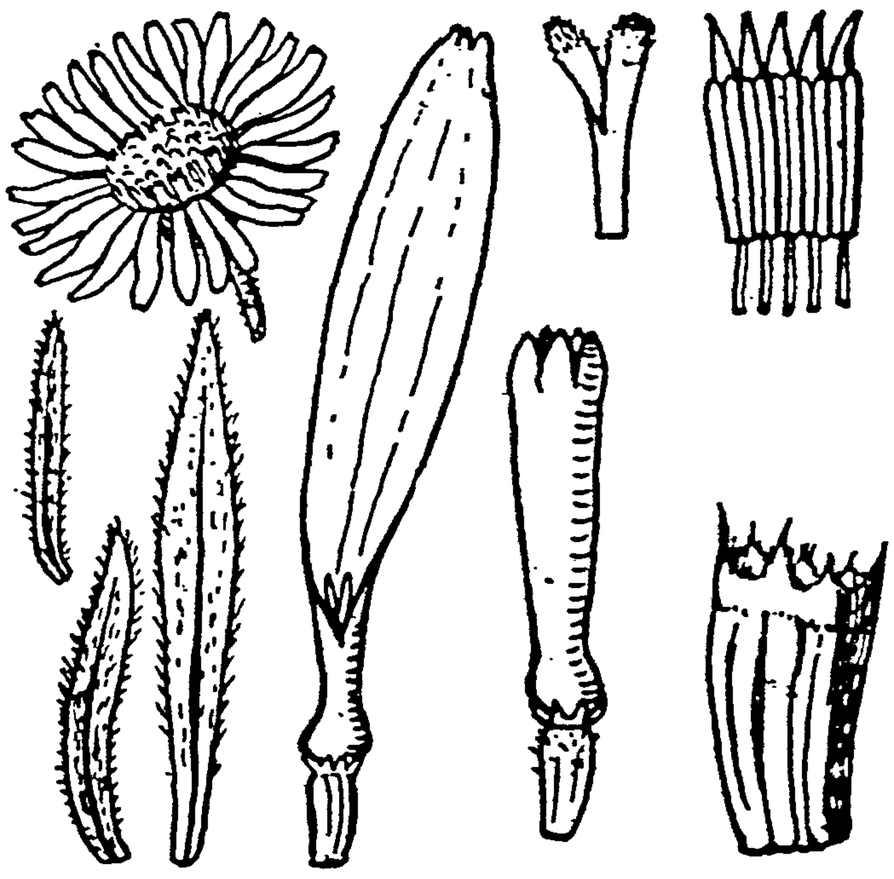
34. ASTRANTHIUM Nutt. Annual or perennial, caulescent herbs. Leaves alternate: blades commonly broadened upward, entire or toothed.

Heads solitary or several terminating branches. Involucre broadly campanulate or hemispheric, many-flowered: bracts in 2 or 3 series, rather broad. Ray-flowers numerous: corollas with a very short tube and a white, pink, purple, or violet ligule. Disk-corollas yellow, with a funnelform throat and a very short tube: lobes deltoid. Anthers longer than the filaments. Stigmas triangular. Achene nerved near the margins. Pappus wanting or obsolete.—About 7 species, in Mexico and SC. United States.



1. A. integrifolium (Michx.) Nutt. Stem 0.5–4 dm. tall: leaf-blades spatulate to elliptic, 1–4 cm. long, entire: bracts of the involucre elliptic-lanceolate, 2.5–3 mm. long, or 4 mm. long at maturity: ligules of the ray pale-purple or pale-violet, 6–14 mm. long. [*Bellis integrifolia* Michx.] —(DAISY.)—Low grounds, various provinces N of Coastal Plain, Ala. to Tex., Ark. and Ky.—Spr.–sum.

35. **APHANOSTEPHUS** DC. Annual or biennial, or probably perennial sparingly branched, aster-like herbs. Leaves alternate: blades narrow, some of them toothed or pinnatifid. Heads few, terminating branches. Involucre hemispheric, many-flowered: bracts in few series, rather narrow. Ray-flowers several: corollas with a very short tube and a narrow white, violet, or purple ligule. Disk-corollas yellow, with a cylindric-funnelform throat and a short tube: lobes deltoid. Anthers longer than the filaments. Stigmas obtuse. Achene ribbed. Pappus an entire, toothed, or ciliate crown.—About 5 species, North American.

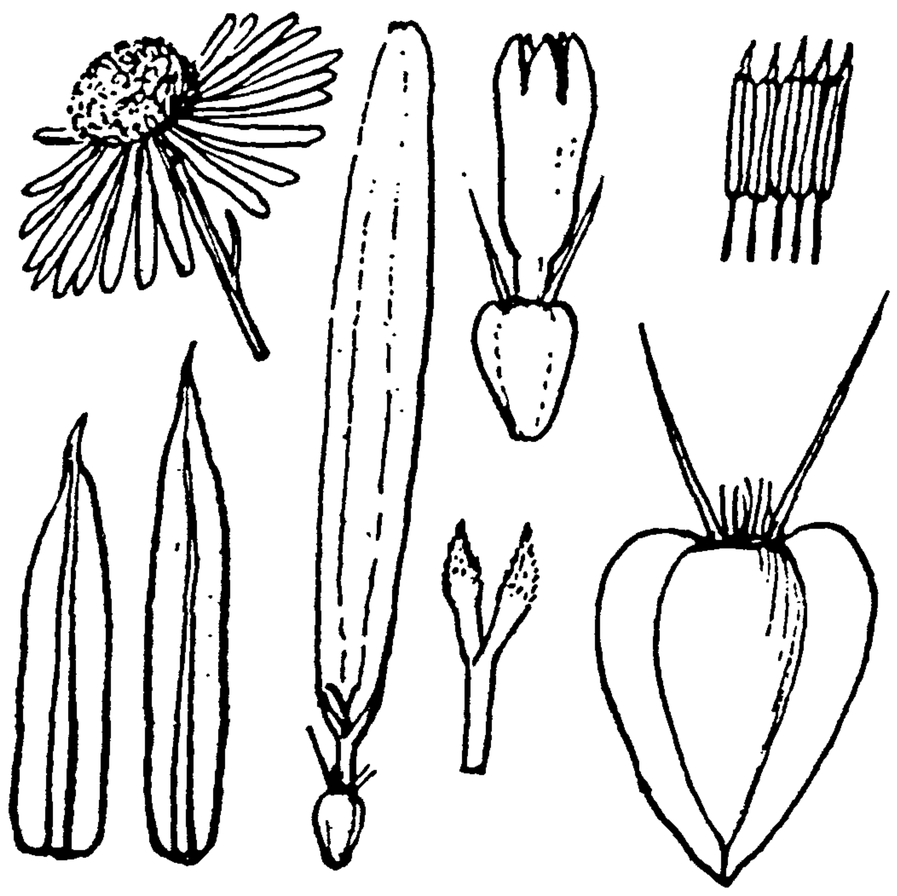


1. A. skirrobasis (DC.) Trelease. Stem 1–4 dm. tall, cinerous-pubescent: leaf-blades spatulate to elliptic or linear, 1.5–6 cm. long, sharply toothed or incised below: larger bracts of the involucre 5–6 mm. long, acuminate.—(WHITE-DAISY.)—Dry soil, various provinces, Tex. to Kans.; also Fla.—Spr.–sum.

36. **BOLTONIA** L'Her. Perennial tall, aster-like herbs. Leaves alternate: blades entire, sessile or decurrent. Heads many, widely panicled. Involucre broadly campanulate to hemispheric, many-flowered: bracts narrow or sometimes partly dilated. Ray-flowers often numerous: corollas with a short tube and narrow ligules. Disk-corollas with a narrowly funnelform throat and short tube: lobes triangular. Anthers as long as the filaments or longer. Achene flattened, broadest above the middle, the margins sometimes winged. Pappus a series of short scales usually accompanied by 2–4 bristles.—About 5 species, North American.

Disk about 4–5 mm. broad at maturity: corolla-tube very short. 1. *B. diffusa.*
Disk 7–12 mm. broad at maturity: corolla-tube nearly as long as the throat. 2. *B. asteroides.*

1. B. diffusa Ell. Plant 1–2 m. tall: blades of the upper leaves linear to linear-subulate, 2.5–8 cm. long: outer bracts of the involucre subulate, about 1.5 mm. long, the inner linear, about twice as long: ligules linear-elliptic to spatulate, white or purplish, 5–7 mm. long, white: disk achene about 4–5 mm. wide: corolla 1–1.5 mm. long, the throat 2–3 times longer than the tube: 1.5 mm. long. — (DOLL'S-DAISY.) — Low grounds, Coastal Plain and adj. provinces, Fla. to Tex., Ill., and S. C.—(*Mex.*)—Fall.

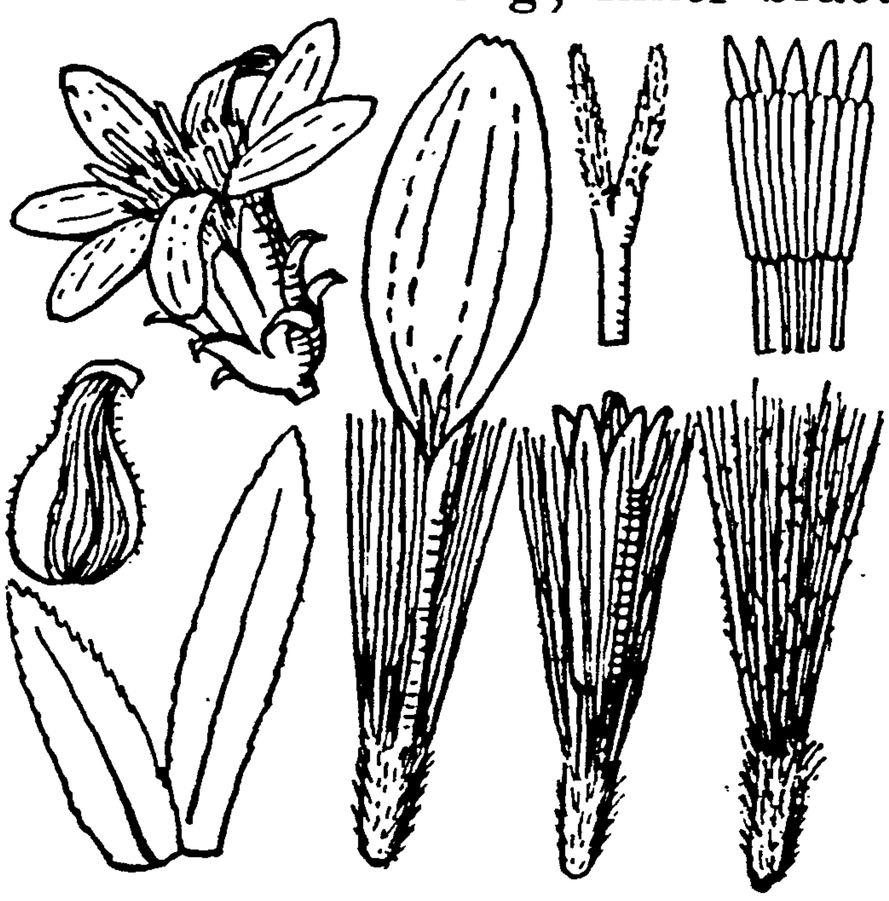


2. B. asteroides (L.) L'Her. Plant 1–2 m. tall: blades of the upper leaves oblong to linear, 3–12 cm. long: outer bracts of the involucre linear-lanceolate, 2–3 mm. long, the inner slightly longer: ligules linear, white or pale, 5–6.5 mm. long: disk 7–12 mm. wide: corolla about 2 mm. long, the throat about as long as the tube: achene about 2 mm. long.—Stream-banks, and sandy or gravelly shores, various provinces, Fla. to La., Minn., and Conn.—Sum.–fall.

37. SERICOCARPUS Nees. Perennial low, aster-like herbs. Leaves alternate: blades entire or toothed. Heads in corymbs. Involucre campanulate to cylindric, several-flowered: bracts broad, or the inner ones sometimes rather narrow. Ray-flowers several: corollas with a long tube and a narrow, white or pink ligule. Disk-corollas with a narrowly funnelform throat and a long tube: lobes lanceolate. Anthers slightly longer than the filaments or shorter: appendages lanceolate. Achene flattened, 1-nerved. Pappus of numerous scabrous bristles.—Four species as follows.—WHITE-TOPPED ASTERS. RAGGED-ASTERS.

Leaf-blades entire.
  Foliage glabrous or nearly so. 1. *S. linifolius.*
  Foliage manifestly pubescent.
    Bracts of the involucre obtuse, firm: peduncles rigid, stout. 2. *S. bifoliatus.*
    Bracts of the involucre acute, lax: peduncles weak, slender. 3. *S. acutisquamosus.*
Leaf-blades toothed. 4. *S. asteroides.*

1. S. linifolius (L.) B.S.P. Stem glabrous or nearly so, 2–7 dm. tall: blades of the upper leaves linear, 2–6 cm. long: involucre 4–6 mm. long; inner bracts often erose at the green tips: disk-corollas 4–5 mm. long: ligules 5–6 mm. long: pappus whitish. [*S. solidagineus* Nees.] — Acid, sandy thickets and dry banks, various provinces, Ga. to La., Ohio, and Me.—Sum.–fall.



2. S. bifoliatus (Walt.) Porter. Stem 3–7 dm. tall: blades of the upper leaves spatulate to obovate, 1–3 cm. long: involucre about 6 mm. high; inner bracts linear-elliptic: disk-corollas over 6.5 mm. long: anthers longer than the filaments. [*S. tortifolius* Nees.]—Dry pinelands, Coastal Plain and rarely adj. provinces, Fla. to La. and Va.—Sum.–fall, or all year southward.

3. **S. acutisquamosus** (Nash) Small. Similar to *S. bifoliatus* in habit: blades of the upper leaves elliptic-spatulate, 1–3.5 cm. long: involucre longer than that of *S. bifoliatus*; inner bracts linear: disk-corollas less than 6.5 mm. long: anthers shorter than the filaments.—Pinelands, Fla.—Sum.

4. **S. asteroides** (L.) B.S.P. Stem pubescent, 3–8 dm. tall: blades of the upper leaves ovate, elliptic-ovate, or lanceolate, 1.5–4 cm. long: involucre 6–9 mm. long; inner bracts broadly linear, rough-edged above: disk-corollas 5–6 mm. long: ligules whitish, 6–8 mm. long: pappus brownish. [*S. conyzoides* Nees.]—Rocky or sandy, usually dry, woods and thickets, various provinces, Fla. to Miss., Ohio and Me.—Sum.

38. **ASTER** [Tourn.] L.[1] Perennial herbs, various in habit, or rarely annual, occasionally shrubby or spinescent. Leaves alternate: blades broad or narrow, often enlarged and cordate at the base, entire or toothed. Rootstock often horizontal and bearing for several years a subterminal tuft of leaves. Lower, middle and upper cauline leaves often gradually transitional to each other in form, often of dissimilar types. Heads with both tubular and radiate flowers, either corymbed, racemed, or panicled and borne on erect, spreading or secund ultimate branchlets. Involucre hemispheric, campanulate, cylindric, or turbinate: bracts imbricate in several series: the outer usually smaller or shorter than the inner, and somewhat herbaceous or otherwise much modified at or toward the apex. Receptacle flat or convex, alveolate and often delicately fimbrillate. Ray-flowers pistillate, with white, pink, purple, blue, or violet ligules. Disk-flowers perfect, consisting of a tubular base (the tube), swollen above into a throat and 5 short lobes: disks typically yellow, usually changing to red, brown, or purple. Achenes columnar or more or less flattened nerved or ribbed. Pappus-bristles usually numerous, slender, in one series or rarely in two series, the tips of the inner ones sometimes thickened.—About 250 species, mostly North American.—ASTERS.

Blades of the basal and lower cauline leaves cordate and definitely petioled: those of the upper cauline leaves shorter petioled or even sessile or cordate-clasping.
  Blades of the leaves petioled or sessile, not clasping.
    Ligules of the ray white or occasionally roseate. — I. DIVARICATI.
    Ligules of the ray violet, purple, or blue.
      Radical leaves coarse: the blades larger than those of the cauline: foliage (except in *A. mirabilis*) glandular. — II. MACROPHYLLI.
      Radical leaves with blades smaller than those of the cauline: foliage not glandular. — III. HETEROPHYLLI.
  Blades of the upper cauline leaves sessile and cordate clasping. — IV. DIVERSIFOLII.
No leaves at once with cordate and definitely petioled blades.
  Blades, at least of the lower leaves abruptly narrowed or constricted below the middle, the base clasping.
    Plant herbaceous, neither woody nor vine-like. — V. PUNICEI.
    Plant a woody, trailing or climbing vine. — VI. CAROLINIANI.
  Blades of the leaves not abruptly narrowed or constricted below the middle, either clasping, sessile or wing-petioled.
    Blades of the cauline leaves with cordate or auriculate-clasping bases.
      Chief involucral bracts rigid, closely appressed unless at the tip.
        Stem glabrous below the inflorescence (sparsely pubescent in No. 46): leaves firm, sleek or subsucculent. — VII. LAEVES.

[1] Based on the treatment of the late Edward Sandford Burgess, revised in part for the present work by Edward Johnston Alexander.

Stem and leaves pubescent with short hair. VIII. PATENTES.
Chief involucral bracts thin, loosely appressed and at least the upper half spreading. IX. SQUARROSI.
Blades of the cauline leaves gradually narrowed or rounded at the base, but not clasping.
Leaves not fleshy or succulent.
Basal and lower cauline leaves not grass-like.
Inflorescence paniculate, racemose, or terminating elongate branches.
Leaf-blades silky or canescent on both sides, short, entire or nearly so. X. SERICEI.
Leaf-blades glabrous or pubescent, but not silky or canescent.
Blades of the basal leaves narrowed to winged petioles. XI. SPECTABILES.
None of the leaf-blades petioled.
Inflorescence widely and loosely paniculate, the heads scattered and not arranged unilaterally on the branches.
Involucral bracts acute or acuminate.
Plants relatively tall, spreading by stoloniferous rootstocks. XII. PANICULATI.
Plants relatively low, not stoloniferous.
Outer involucral bracts with acuminate, green tips. XIII. RAMOSISSIMI.
Outer involucral bracts with obtusish or merely acute tips. XIV. DUMOSI.
Involucral bracts very obtuse, bristle-pointed. XV. MULTIFLORI.
Inflorescence much branched, but the heads in unilaterally racemose arrangement. XVI. DIFFUSI.
Inflorescence in a terminal, umbellike corymb.
Leaf-blades usually entire, linear-lanceolate; thick. XVII. PTARMICOIDES.
Leaf-blades coarsely toothed, broadly oblanceolate to broadly elliptic, acuminate; thin. XVIII. ACUMINATI.
Basal and lower cauline leaves grass-like.
Leaf-blades entire or sparingly hack-serrate above. XIX. PALUDOSI.
Leaf-blades with several spinuliform teeth, especially near the base. XX. ERYNGIIFOLII.
Leaves fleshy or succulent.
Stem solitary, herbaceous, its base not woody: plant unarmed.
Plant perennial: heads mostly over 12 mm. wide. XXI. TENUIFOLII.
Plant annual: heads less than 10 mm. wide. XXII. SUBULATI.
Stems rush-like, several from a woody base: plant spine-armed. XXIII. SPINOSI.

I. DIVARICATI

Dominant leaves with long-acuminate blades, the teeth very sharp: inflorescence broadly corymbose.
Blades of the dominant leaves incurved-acuminate, the teeth very salient, curving backward.
Blades of the dominant leaves ovate-lanceolate, those of the upper axile leaves short or not greatly prolonged. 1. *A. divaricatus.*
Blades of the dominant leaves more elliptic, larger, darker, those of the upper axiles or some of them greatly prolonged. 2. *A. tenebrosus.*
Blades of the dominant leaves straight-acuminate, the teeth straight-backed. 3. *A. stilettiformis.*
Dominant leaves not long-acuminate.
Inflorescence-clusters convex.
Sinus (of cordated leaves) deep, enlarged: leaf-blades elliptic-lanceolate, curvescent-serrate: disk often crimson. 4. *A. excavatus.*

Sinus usually absent: leaf-blades ovate-lanceolate, slit-serrate: disk often chestnut color. 5. *A. castaneus.*
Inflorescence narrow, irregular or scant.
Involucral bracts very broad and short, scale-like. 6. *A. chlorolepis.*
Involucral bracts narrowly linear.
Leaf-sinus broad, enlarged: leaf-blades chiefly elliptic-acuminate. 7. *A. Boykinii.*
Leaf-sinus sharp: leaf-blades ovate-acute. 8. *A. flexilis.*

II. Macrophylli

Plant not very rough: leaf-blades not very thick: glandular hairs minute-tipped.
Blades of the lower leaves serrate; sinus deep, narrow. 9. *A. multiformis.*
Blades of the lower leaves coarsely dentate; sinus shallow, broad. 10. *A. riciniatus.*
Plant extremely rough: leaf-blades very thick: glands broadly capitate.
Leaf-sinus strongly developed: involucral bracts neither squarrose nor slender. 11. *A. macrophyllus.*
Sinus usually absent: involucral bracts squarrose.
Bracts acute. 12. *A. commixtus.*
Bracts obtuse. 13. *A. mirabilis.*

III. Heterophylli

Leaf-blades entire or chiefly so, thick or firm.
Involucre broadly campanulate: bracts mainly linear, thin: leaf-blades dull and scabrous above. 14. *A. Shortii.*
Involucre cylindric-campanulate; bracts mainly linear-subulate, rigid: leaf-blades lustrous and smooth above. 15. *A. Camptosorus.*
Leaf-blades serrate or otherwise toothed, at least the lower ones.
Leaf-blades not rough, or not rough on both sides, membranous.
Involucral bracts linear-obtuse or obtusish (acute in in a variety of No. 17).
Leaves with smooth firm blades and the chief petioles winged; inflorescence loosely narrow-panicled. 16. *A. Lowrieanus.*
Leaves with thin blades rough above and the chief petioles not winged: inflorescence broad panicled. 17. *A. cordifolius.*
Involucral bracts linear-acute or subulate.
Leaf-blades downy-pubescent or glabrous.
Plant 6–15 dm. high: blades of the chief leaves ovate-lanceolate, thin, the sinus open: heads compound-racemed. 18. *A. sagittifolius.*
Plant about 3 dm. high: blades of the chief leaves falcate-lanceolate, the sinus obsolescent: heads thyrsoid. 19. *A. plumarius.*
Leaf-blades canescent or hispid above, velvety-hispidulous beneath. 20. *A. trigonicus.*
Leaf-blades rough on both sides, of a spongy crumbling texture.
Blades of the chief leaves elliptic-lanceolate, shallow-serrate. 21. *A. azureus.*
Blades of the chief leaves grass-like. 22. *A. poaceus.*

IV. Diversifolii

Polymorphous leaf-forms present, no one type strongly dominant.
Leaves not delicate, pubescent beneath, rough when dry: inflorescence broad, divergently compound. 23. *A. undulatus.*
Leaves delicate, firm, rough, with little hair: inflorescence narrowly racemose. 24. *A. Proteus.*
Some dominant leaf-form present.
Blades of the dominant leaves broad, not greatly elongate.
Blades of the dominant leaves tomentulose beneath, ovate-elliptic, thick and rough, diminutive. 25. *A. asperifolius.*
Blades of the dominant leaves sparse-pubescent beneath, petioled, short-cordate, thinnish. 26. *A. sylvestris.*
Blades of the dominant leaves elongate.
Blades of the dominant leaves triangular-attenuate.
Slender plant: leaf-blades chiefly petioled and clasping. 27. *A. truellius.*

Robust plant, when fully developed: leaf-blades chiefly sessile.
Leaf-bases broad: leaf-axils usually foliose. 28. *A. corrigiatus.*
Leaf-bases narrow: leaves very rough. 29. *A. triangularis.*
Blades of the dominant leaves not triangular.
Blades of the dominant leaves ovate-elliptic to elongate-lanceolate.
Leaf-blades firm, crisp: stem bearing stalked glands: inflorescence irregular, narrow, often clavate in outline. 30. *A. claviger.*
Leaf-blades thinnish: plant without glands: inflorescence somewhat thyrsoid. 31. *A. gracilescens.*
Blades of the dominant leaves linear-elliptic with straight sides.
Leaf-blades soft, thinnish, many with long strap-like petioles: inflorescence usually racemose. 32. *A. linguiformis.*
Leaf-blades very rough, thick, usually sessile: inflorescence decompound.
Plant not glandular: leaves strap-shaped or thong-like. 33. *A. loriformis.*
Plant somewhat glandular: leaves grass-like, narrow. 34. *A. Mohrii.*

V. PUNICEI

Leaf-blades entire. 35. *A. puniceus.*
Leaf-blades sharply serrate (except the basal and lower cauline of No. 36).
Inflorescence irregularly congested or corymbed: pubescence often scanty.
Upper leaves little clasping: bracts of the involucre with linear-elliptic or linear subulate tips. 36. *A. Elliottii.*
Upper leaves sheathing the axils: bracts of the involucre with deltoid tips. 37. *A. conduplicatus.*
Inflorescence broadly panicled, diffuse, leafy: heads somewhat remote.
Leaves contracted into a broad petiolar portion: hair present in lines on the upper stem. 38. *A. prenanthoides.*
Leaves with nearly straight sides, little constricted below.
Tubercular-based hair scattered over the stem. 35. *A. puniceus.*
No tubercular-based hair on the stem. 58. *A. novi-belgii.*

VI. CAROLINIANI

A woody vine with trailing or climbing stems and branches, flowering the year round. 39. *A. carolinianus.*

VII. LAEVES

Involucre campanulate.
Leaves glabrous except the edges.
Involucral bracts elliptic-linear with broad rhomboid or deltoid green tips.
Cauline leaf-blades elliptic, oblanceolate, or ovate: inflorescence tending to the racemose panicle. 40. *A. laevis.*
Cauline leaf-blades linear to elongate-lanceolate: inflorescence tending to the corymbose panicle. 41. *A. concinnus.*
Involucral bracts linear, their green tips narrowly lanceolate.
Cauline leaves linear or narrowly lanceolate. 42. *A. purpuratus.*
Cauline leaves very narrowly linear: heads very small. 43. *A. attenuatus.*
Leaves glabrous above, often with minute hair beneath.
Leaf-blades entire, short, elliptic, remote. 44. *A. ursinus.*
Leaf-blades often coarsely toothed, prolonged, linear in type. 45. *A. falcidens.*
Involucre turbinate: leaf-blades scarcely clasping. 46. *A. turbinellus.*

VIII. PATENTES

Stem low: leaves rough: inflorescence broad.
Involucre turbinate-campanulate or turbinate.
Heads 3–4 cm. broad, few and scattered: involucral bracts pubescent, thick.
Leaf-blades thinnish: heads 6–8 mm. high. 47. *A. continuus.*
Leaf-blades very thick: heads 10–12 mm. high. 48. *A. georgianus.*
Heads about 2 cm. broad, numerous, crowded: involucral bracts merely ciliate, thin. 49. *A. fontinalis.*

Involucre campanulate;
Bracts linear-elliptic: branches divaricate. 50. *A. patens.*
Bracts narrow-linear or linear: branches diffuse. 51. *A. tenuicaulis.*
Stem tall: leaves soft pubescent beneath: inflorescence narrow. 52. *A. phlogifolius.*

IX. Squarrosi

Heads less than 2.5 cm. broad.
Stem closely set with small scale-like leaves: involucral bracts but slightly spreading.
Leaves erect and adnate to the stem and its branches. 53. *A. adnatus.*
Leaves more or less reflexed, not adnate to the stem. 54. *A. Walteri.*
Cauline leaves not markedly, if at all scale-like, not closely set: involucral bracts very squarrose. 55. *A. oblongifolius.*
Heads over 2.5 cm. broad.
Inflorescence widely branched: stem leaves reflexed, not elongate, very small. 56. *A. grandiflorus.*
Inflorescence compact: stem-leaves not reflexed, elongate.
Leaves soft-pubescent: broadly clasping: plant little branched below the inflorescence. 57. *A. novae-angliae.*
Leaves not soft-pubescent: but slightly clasping: plant much branched.
Stem rigid: leaves lanceolate, elliptic-lanceolate, or linear-lanceolate. 58. *A. novi-belgii.*
Stem weak: leaves bayonet-like, narrowly linear. 59. *A. elodes.*

X. Sericei

Heads corymbose-paniculate: outer bracts of the involucre elliptic, ovate-lanceolate, or lanceolate: achene glabrous. 60. *A. sericeus.*
Heads virgately racemed: bracts linear-elliptic to linear-lanceolate: achene pubescent.
Involucral bracts erect.
Cauline leaves with elliptic or narrowly elliptic blades. 61. *A. concolor.*
Cauline leaves with linear-elliptic to linear-lanceolate blades. 62. *A. simulatus.*
Involucral bracts loosely spreading or recurved. 63. *A. plumosus.*

XI. Spectabiles

Upper cauline leaves with broad, chiefly ovate, blades.
Upper cauline leaves with narrow, narrowly elliptic, varying to oblanceolate, lanceolate, or linear blades.
Involucre hemispheric, campanulate, or turbinate-hemispheric.
Tips of the involucral bracts foliaceous. 64. *A. Curtisii.*
Tips of the involucral bracts merely spreading or squarrose.
Bracts of the involucre glandular.
Involucral bracts mucronate or obtuse: cauline leaves numerous. 65. *A. Smallii.*
Involucral bracts tapering to acutish tips: cauline leaves few. 66. *A. spectabilis.*
Bracts of the involucre glabrous or merely ciliate.
Involucral bracts mucronate. 67. *A. surculosus.*
Involucral bracts acute.
Stem rigid: leaves narrowly elliptic-lanceolate. 58. *A. novi-belgii.*
Stem weak: leaves narrowly linear. 59. *A. elodes.*
Involucre narrowly turbinate. 68. *A. gracilis.*

XII. Paniculati

Heads over 16 mm. broad.
Ligules of the ray white, often fading pink or purplish.
Leaves glabrous or nearly so. 69. *A. Lamarckianus.*
Leaves and stem pubescent. 70. *A. missouriensis.*
Ligules of the ray lavender or violet.
Rameal leaves with elliptic, rather broad blades: inflorescence crowded. 71. *A. salicifolius.*
Rameal leaves with narrowly linear to subulate blades: inflorescence widely branched, the heads usually solitary.
Bracts of the involucre obtuse. 46. *A. turbinellus.*
Bracts of the involucre acute. 72. *A. Simmondsii.*

Heads less than 16 mm. broad.
Ligules of the ray white, often fading pink or purplish.
Cauline leaves with oval or elliptic blades. 73. *A. spatelliformis.*
Cauline leaves with narrow blades.
Heads abundant, closely panicled. 74. *A. Tradescanti.*
Heads remotely panicled or sparse. 75. *A. agrostifolius.*
Ligules of this ray lavender or violet. 76. *A. pinifolius.*

XIII. Ramosissimi

Ligules of the ray white, sometimes becoming purplish.
Heads numerous, 8–15 mm. broad.
Upper cauline leaves with linear-subulate blades: plant glabrous or nearly so. 77. *A. ramosissimus.*
Upper cauline leaves with linear to narrowly elliptic blades: plant more or less villose. 78. *A. pilosus.*
Heads more scattered, 12–18 mm. broad.
Branches divaricate, rigid, prolonged: rameals subulate. 79. *A. juniperinus.*
Branches often upturned or subcorymbose: rameals flat, linear. 80. *A. Faxoni.*
Ligules of the ray violet, purple or reddish (rarely white). 81. *A. Priceae.*

XIV. Dumosi

Rameal leaves merely firm: most peduncles not over 3 cm. long. 82. *A. dumosus.*
Rameal leaves rigid, very conspicuous but minute: peduncles often 10 cm. or more long.
Rameal leaves spreading or somewhat recurved: blades obtuse. 83. *A. coridifolius.*
Rameal leaves erect and usually appressed; blades acute. 84. *A. gracilipes.*

XV. Multiflori

A much branched low-growing plant, with very numerous white-liguled heads of flowers. 85. *A. ericoides.*

XVI. Diffusi.

Cauline leaves with linear to linear-lanceolate, often minutely hack-toothed blades.
Involucral bracts very short, not exceeding the achenes. 86. *A. brachypholis.*
Involucral bracts exceeding the achenes.
Plant sparsely branched, and with few heads. 87. *A. racemosus.*
Plant profusely branched: heads very numerous. 88. *A. vimineus.*
Cauline leaves with elliptic or lanceolate, more or less dentate or serrulate blades.
Stem and branches sparingly pubescent or glabrate. 89. *A. lateriflorus.*
Stem and branches villous, as also the midrib of the leaf-blades beneath. 90. *A. hirsuticaulis.*

XVII. Ptarmicoides

Plant with narrow, entire leaf-blades and a flat-topped corymbose inflorescence. 91. *A. ptarmicoides.*

XVIII. Acuminati

Gregarious plant with thin, deeply toothed leaf-blades, appearing as if whorled, and a somewhat corymbose-paniculate inflorescence. 92. *A. acuminatus.*

XIX. Paludosi

Involucral bracts long-ciliate and pubescent: inflorescence-branches densely pubescent. 93. *A. paludosus.*
Involucral bracts glabrous, the margins merely scabrose-ciliate: inflorescence-branches sparingly pubescent if at all so.
Outer involucral bracts linear to narrowly elliptic but not acuminate: leaf-blades linear to narrowly elliptic.
Plant from a woody, corm-like rootstock, not stoloniferous.
Outer involucral bracts usually longer than or at least as long as the inner bracts, elongate linear-lanceolate, only the innermost abruptly acute: bracts numerous. 94. *A. pedionomus.*
Outer involucral bracts somewhat shorter than the inner, all bracts except the outermost abruptly acute: bracts few. 95. *A. Gattingeri.*
Plant from a stoloniferous, wiry or woody rootstock. 96. *A. hemisphericus.*
Outer involucral bracts narrowly linear-acuminate: leaf-blades nearly filiform from a triangular base. 97. *A. verutifolius.*

XX. ERYNGIIFOLII

Heads sessile and subremote in the upper axils. 98. *A. spinulosus.*
Heads terminal, solitary or clustered. 99. *A. eryngiifolius.*

XXI. TENUIFOLII

Ligules of the ray 5–7 mm. long: heads 4–6 mm. high. 100. *A. Bracei.*
Ligules of the ray 10–20 mm. long: heads 6–8 mm. high.
  Involucral bracts broad: ligules of the ray violet: leaves chiefly basal. 101. *A. Chapmani.*
  Involucral bracts linear: ligules of the ray pale-violet or nearly white: leaves scattered. 102. *A. tenuifolius.*

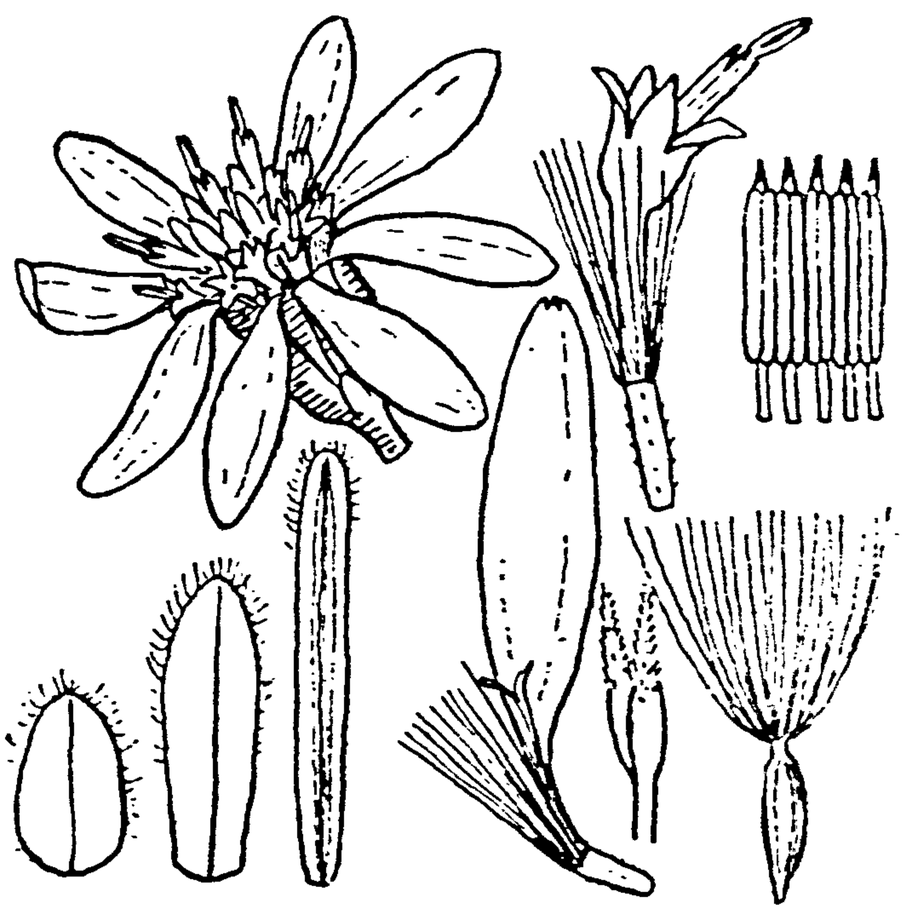
XXII. SUBULATI

Involucre campanulate to broadly turbinate.
  Inner bracts of the involucre 5–6 mm. long, acuminate: rays fewer than the disk flowers. 103. *A. exilis.*
  Inner bracts of the involucre 3–5 mm. long, acute or short acuminate: rays more numerous than the disk-flowers. 104. *A. inconspicuus.*
Involucre cylindric to narrowly turbinate. 105. *A. subulatus.*

XXIII. SPINOSI

A rush-like, much branched plant with scattered, white-rayed heads of flowers, the stem and branches spinescent. 106. *A. spinosus.*

1. A. divaricatus L. Stems tufted, 4–6 dm. tall, flexuous, brittle, terete, glabrate: leaf-blades thin, smoothish, slender-petioled, ovate-lanceolate, closely and saliently dentate with sharp teeth, incurved-acuminate, the basal sinus moderately large, broad and deep: leaves of the inflorescence (*bracteals*) typically small, sessile, short, ovate-acute to short-oval, nearly entire: corymb broad, flattish, repeatedly and widely forked, the slender branches long, divergent: heads 18–25 mm. broad: ray-flowers chiefly 6–9; ligules white, or rarely roseate or slightly crimson: young involucre short-cylindric; bracts broad, ciliate, the rounded or subtruncate tips with a broad green spot: disk turning reddish brown.—Rich woodlands and thickets, in rather dry soil, various provinces, Ga. to Ala., Man., and N. S.—Fall.



2. A. tenebrosus Burgess. Stem glabrate, striate, wide-branched: leaf-blades large, very thin and smooth, broadly elliptic and conspicuously cut with coarse remote acuminate curvescent teeth, then abruptly long-acuminate and entire; most leaves with a broad rounded sinus and slender petiole; those of the inflorescence prolonged, lanceolate, subentire and sessile: inflorescence broadly corymbose, often proliferously branched: rays usually 9–12: disk pale-yellow, turning purplish-brown: outer bracts green, acute, elongate-triangular, the others linear, obtusish.—Moist, shaded places, Blue Ridge and more N provinces, N. C. to Ohio and Mass.—Late sum.–fall.—Resembles *A. divaricatus*, but differs in being larger and thinner in all its parts, and in having a different leaf-form.

3. A. stilettiformis Burgess. Stem greenish, slender, weak and often decumbent: predominant leaf-blades deep-green, often roughened above, linear-elliptic and long-acuminate, with subtruncate base and short petioles, and closely set with conspicuous sharp straight-backed teeth; some lower leaves broader, ovate-acuminate with moderate sinus and with double-curved or couchant teeth; axile leaves divaricate, straight-tapered from a sessile truncate base, everywhere closely slit-toothed, suggesting a barbed stiletto: inflorescence

remotely diffused, but with short pedicels: bracts lingual, nearly uniform, green or mostly so: rays often 7; ligules sometimes reddening at the tips: disk turning brownish-red.—Shaded banks, Blue Ridge and more N provinces, S. C. to Tenn. and Mass.—Fall.—Differs from *A. divaricatus*, especially in stem, leaf-form, and bracts.

4. **A. excavatus** Burgess. Stem as in *A. divaricatus* L.: leaf-blades thin, smooth, all nearly alike, elliptic-lanceolate with the rounded base abruptly excavated into a deep narrow sinus; their margins continuously low-serrate with curvescent teeth; petioles very short and slender, shorter than the leaf-breadth, replaced by short broad wings at the principal axils; the upper axils often clasped by divaricate triangular-linear bracteals: heads forming convex clusters borne on long suberect branches or reduced to a few distant enlarged heads: bracts ciliate, smooth-backed, pale and thin, short-oblong and obtuse on some subsolitary heads, narrow and acutish on the smaller clustered heads, the inner attenuate and without green tips: ligules of the ray white, or sometimes reddened: disk broad, turning usually purplish-crimson.—Mountain or hillside woods, Blue Ridge and more N provinces, Ga. to N. Y.—Early fall.—Resembles *A. divaricatus*, but the narrower, less-attenuate, more uniform leaf-blades differ in outline, sinus, and teeth.

5. **A. castaneus** Burgess. Stem glabrate, terete, graceful and wandlike, red-dish-brown or greenish, with about 12 delicate straight darker striae, and becoming sinuous in the inflorescence: predominant leaf-blades dull-green, remote, very thin, of a dense and hard texture, minutely granular-roughened when dry, ovate-lanceolate, closely slit-serrate, often unequally decurrent upon the short slender petiole; the lowest leaves much shorter, ovate-acuminate, coarsely serrate and with a moderate sinus; rameal leaves lanceolate-attenuate or often all crescent-like and decurved, sessile by a short cuneate base: inflores-cence nearly naked, narrow, composed of several upcurved slender unequal branches bearing close convex clusters, all in flower at once and very short-lived: pedicels long, filiform, upcurved, sometimes bearing small circular bracteals or discules: bracts narrow, linear-obtuse, pale, with bright-green tips: rays often 9; ligules linear, snow-white, excessively thin, and soon pendulous: disk soon turning to rose-brown, sienna, or chestnut-color.—Clayey spots in swamps, various provinces N of Coastal Plain, N. C. to Ohio, also SE N. Y. and Conn.—Early fall.—Resembles *A. divaricatus*; differs in all the above characters, especially in the leaves, bracts, and inflorescence.

6. **A. chlorolepis** Burgess. Stem strong, glabrate, brownish, terete below, angulate-striate above: leaf-blades large, smooth, very thin, brownish-green, pale beneath, ovate-acute, very coarsely serrate with outflung teeth; sinus deep and sharp; petioles short, slender: axile leaves also large, elliptic-lanceolate, serrate with long forward-directed teeth, the upper ones sessile: inflorescence loose and irregular: heads large, long-peduncled, inclined to be widely sepa-rated: ligules of the ray nearly twice the length of the involucre: bracts quite uniform, thick, broad, short and scale-like, with very little ciliation or hair, chiefly golden brown with a short dark-green rounded tip: disk turning crimson. —Mt. woods, Blue Ridge and more N provinces, N. C. to W. Va. and N. Y.—Fall.—Resembles *A. tenebrosus* in the large heads, leaves, teeth, and bracts; differs especially in having the sinus sharp and the bracts rounded, and in the absence and greatly prolonged entire bracteals.

7. **A. Boykinii** Burgess. Stem slender, greenish and glabrate, much flexed; leaf-blades ovate to elliptic-acuminate, with broad enlarged sinus, set with strong and somewhat outflung teeth; petioles slender: inflorescence lax and irregular, of short branches given off at a wide angle, often continued in clusters among the lower axils; the upper axils often conspicuous with ovate

or subcircular sessile bracteals: disk turning reddish brown: ligules of the ray shorter than in its ally, *A. divaricatus* L., from which it differs especially in its more straggling habit, narrow irregular inflorescence, and less-coarsely toothed less prolonged leaves.—Mt. slopes, Blue Ridge, Ga.—Sum.

8. **A. flexilis** Burgess. Stem low, slender, smooth, and virgate: leaf-blades small, short, thin, dull, dark-green, ovate-acute with the broad double-rounded base bisected by a deep sharp sinus; margins crenate-serrate with low obscure teeth; petioles short: inflorescence scanty, tuft-like, or of a few slim-peduncled heads: bracts narrowly linear, obtuse, quite uniform: plant almost destitute of hair (under lens); otherwise much as *A. divaricatus* L.—Mt. woods, Blue Ridge, Ga.—Sum.—Differs from *A. Boykinii* (with which it grows), especially in its smaller, shorter dull leaf-blades, the sharp sinus, crenate margins, and the obtuse bracts.

9. **A. multiformis** Burgess. Stem 3–6 dm. high, minutely glandular, erect, slender, terete, or angular-striate in drying: radical leaves usually 2, their blades large, cordate-oblong; cauline leaves of several forms, their blades sharply serrate, rough above, minutely puberulent beneath, those of the lower ones ovate, acuminate, usually with a narrow sinus, those of the upper oval to ovate-lanceolate, petioled, the uppermost elliptic-lanceolate, serrulate, sessile or nearly so: corymb small, its branches upwardly directed: heads 30–40 mm. broad: ray-flowers about 13: ligules rounded and retuse at the apex: bracts green: inflorescence-glands few, almost hidden by the minutely strigose pubescence of the peduncles.—Moist, shaded places, various provinces N of Coastal Plain, N. C. to Pa. and Me.—Sum.–fall.—Resembles *A. macrophyllus*; but its leaves thinner, narrower, more polymorphous, with narrower sinus, and much less harsh; glands fewer, smaller, pale, less continuous down the stem: inflorescence more level-topped, obconic when past: rays bluer, though fading out early.

10. **A. riciniatus** Burgess. Stem smooth, red, terete, often 3 dm. high: radical leaves usually two, unequal; blades deltoid-cordate or ovate-cordate, with long low curvescent or crenate teeth; basal leaf smaller, the blade orbicular-ovate, without sinus; lower cauline leaves ovate in type, with slight broad open sinus; the others lanceolate or elliptic, with sessile tapered base; leaf-margins dentate below, becoming sharp-serrulate above; petioles slender or with narrow strap-like wings: inflorescence a small loose terminal tuft, with slender ascending pedicels: bracts uniform, lingual: ligules of the ray rose-purplish and then transiently violet, soon turning whitish, linear-biacuminate.—Moist mountain woods, Blue Ridge, N. C.—Late sum.—Plant very smooth and pale; much purplish-red occurs on stem and veins and especially along the bracts; glandular-pubescence very short, with small capitate glands, continuing down the stem to the base; strigose pubescence discoverable by lens on the upper leaves. Resembles *A. multiformis*, but the whole plant smoother and paler, with more red and less violet; leaves smaller, shorter, and often dentate; bracts narrower and more uniform; its colors neither sharp nor dull, but as if seen through a veil.

11. **A. macrophyllus** L. Stem 6–9 dm. high, reddened, angular: radical leaves developed in large colonies, usually 3 to each rootstock, larger and coarser than the similarly shaped lower cauline leaves (which are developed a subsequent year from the same rootstock); blades broad, cordate with a large irregular sinus, rough above, harsh, thick, the teeth broad, curved, somewhat crenate: upper stem-leaves with oblong blades and short broadly winged petioles, those of the uppermost sessile, acute: inflorescence strigose and glandular, broadly corymbose, irregular: heads 15–30 mm. broad: peduncles short, rigid, thickish: ray-flowers about 12–16; ligules 10–14 mm. long, chiefly lavender, sometimes violet, or rarely pale: bracts conspicuously green-tipped, the outer acute, the inner elliptic, obtuse: disk turning reddish-brown.—Moderately dry, sterile

soil, in shaded places, various provinces, rarely Coastal Plain, N. C. to Minn. and N. S.—Sum.

12. A. commixtus (Nees) Kuntze. Stem 5–6 dm. high, rather robust, glandular-pubescent over the upper half and strigose above: leaf-blades rough, thick, dull-green, paler beneath, ovate-acute in type, low-serrate or with curvescent teeth, and with slender petioles; only the basal leaves, if any, slightly cordate: upper leaves diminished, finally lanceolate and sessile; bracteals oval, small and few: inflorescence loosely corymbose, with long-ascending pedicels: bracts narrow and acute or subulate, ciliate and minutely puberulent, the apex squarrosely recurved: ligules of the ray pale-violet becoming white: disk becoming copper-brown.—Dry woods, Appalachian provinces, Ga. and Ala.—Late sum.–fall.—From its congeners *A. mirabilis* and the northern *A. Herveyi,* this is distinguished by the long acumination of its squarrose bracts; and from *A. mirabilis* by its capitate glands.

13. A. mirabilis T. & G. Stem 3–7 dm. tall, sparingly branched above, manifestly pubescent, the branches and especially the branchlets closely and finely pubescent: leaves various, the basal and lower cauline little known, the upper cauline rather remote; blades ovate to oblong-ovate, 2.5–9 cm. long, or those on the branchlets smaller, mostly acute, firm, serrate with appressed subcrenate teeth, mainly sessile, rough-pubescent, with appressed scattered hairs, those of the upper surface fewer, shorter, often spinescent: heads solitary or few in terminal clusters: involucre 8–10 mm. high; bracts firm, linear-elliptic to linear, pubescent without and ciliate, the recurved herbaceous broadly obtuse tips pubescent on both sides: ray-flowers about 20; ligules violet, 1.5–3 cm. long: achene about 3.5 mm. long, glabrous or nearly so, shorter than the tawny pappus whose inner bristles are thickened at the apex.—Near Columbia on the line between the Piedmont and Coastal Plain, S. C.—Fall.—Resembles *A. multiformis* Burgess, but the bracts squarrose and leaves hispidulous above; cordation seems wanting but will probably yet be found on some basal leaves.

14. A. Shortii Hook. Stem 6–12 dm. high, roughish or smooth, slender, paniculately branched above: leaf-blades thick, glabrous or nearly so above, finely and sparingly pubescent beneath; those of the basal and lower cauline leaves ovate or ovate-lanceolate, cordate, rounded or even acuminate at the base, often wholly entire, 5–15 cm. long, dull and scabrous above, borne on slender naked petioles; those of the upper cauline leaves lanceolate, entire, sessile or with short petiole-like bases, not cordate, those of the branches small and scale-like: heads numerous, 25–30 mm. broad: involucre broadly campanulate: bracts mainly linear, acute, puberulent, their green tips appressed: ray-flowers 10–15; ligules linear, violet, 10–12 mm. long: pappus tawny.—Banks and edges of woods, various provinces N of Coastal Plain, Ga. to Ala., Tenn., Ill., and Pa.—Fall.

15. A. Camptosorus Small. Stem 4–8 dm. tall, simple and glabrous below the inflorescence, slightly flexuous: leaf-blades lanceolate, attenuate, 6–16 cm. long, resembling those of *Camptosorus rhizophyllus,* entire, undulate and sometimes crisped, dark-green, smooth and lustrous above, paler and hispidulous beneath, those of the lower cauline leaves deeply cordate at the rounded auricled base, slender-petioled, those of the upper cauline subcordate or truncate at the base: heads relatively few, 25–30 mm. broad: peduncles minutely scaly, scabrous-pubescent: involucre cylindric-campanulate and more or less constricted at the middle, or turbinate when dry; bracts mainly linear-subulate, incurved, the middle and the acute tip deep-green: ray-flowers numerous; ligules deep-purple, about 1 cm. long.—Open woods, Coastal Plain and adj. provinces, Ga. to Ala. (Miss.)? and Tenn.—Fall.—Resembles *A. Shortii,* but leaf-blades narrower, darker, and shining.

16. A. Lowrieanus Porter. Stem 3–12 dm. tall, glabrous or nearly so throughout, branched: leaf-blades thickish, firm, a little succulent, those of the basal leaves slender-petioled, ovate to ovate-lanceolate, cordate, acute or obtusish, serrate, 5–15 cm. long, those of the cauline leaves ovate to elliptic, often cordate, contracted into winged petioles, the uppermost lanceolate: heads usually not very numerous, 15–25 mm. broad, loosely panicled: involucre turbinate; bracts obtuse or obtusish, appressed: ray-flowers 12–20; ligules light-blue, 6–8 mm. long, but variable in length.—Woods, various provinces N of Coastal Plain, Ala. to Ky., Ia., Conn., and N. C.—Fall.—Resembles *A. cordifolius*, but leaf-blades smooth and glabrous, more wing-petioled, and inflorescence less pubescent.

17. A. cordifolius L. Stem 3–15 dm. high, glabrous or nearly so, much-branched and bushy: leaf-blades thin, rough mainly above, pubescent, sharply serrate, acuminate, those of the basal and lower cauline leaves slender-petioled, broadly ovate-cordate, 5–12 cm. long, those of the upper cauline leaves short-petioled or sessile, ovate or lanceolate: heads very numerous, small, 12–18 mm. broad, handsome: involucre turbinate to cylindric; bracts elliptic-linear, obtuse or obtusish, green-tipped, appressed: ray-flowers 10–20; ligules 6–8 mm. long, blue or violet, sometimes pale, rarely white: pappus whitish.—Rich woods and thickets, various provinces, rarely Coastal Plain, Ga. to Miss., Minn., and N. B.—Late sum.–wint.—*A. cordifolius albearius*, ranging from N. C. and Tenn. to Mass., has the thin leaf-blades usually smoothish, cordate, triangular-lanceolate or broader: inflorescence dense, thyrsoid, not leafy, in form resembling that of the lilac: bracts linear, acute: heads medium-sized: ligules blue.

18. A. sagittifolius Willd. Stem rather slender, 6–15 dm. high, strict, glabrous, or sparingly pubescent above, the inflorescence tall and paniculate with ascending branches: leaf-blades thin, glabrous above or but slightly roughened, usually glabrate beneath, those of the basal and lower leaves ovate-lanceolate to lanceolate, with cordate or rarely sagittate base, sharply serrate, acuminate, 7–15 cm. long, with slender naked or narrowly margined petioles; blades of the upper cauline leaves lanceolate, sessile, or on short and usually margined petioles, serrate or entire, those of the branches very much smaller, linear-subulate: heads 16–20 mm. broad, numerous, crowded, racemose: involucre turbinate; bracts linear-subulate, glabrous or nearly so, their tips green and slightly spreading: ray-flowers 10–15; ligules light-blue or purplish, 6–8 mm. long: pappus whitish.—Dry soil, various provinces N of Coastal Plain, Ala. to Miss., Kans., N. D., N. B., and N. C.—Late sum.–fall.—Resembles *A. cordifolius* L.; but its bracts narrower, subulate-acuminate, and its inflorescence almost without leafiness, the axile leaves being reduced, narrowed and stringy rather than foliaceous.—*A. sagittifolius dissitiflorus*,. ranging from Fla. to Miss., Okla., and N. Y., differs from the typical form in its broader looser pyramidal inflorescence, its somewhat larger and longer-peduncled heads, and less serrate leaf-blades none of which may be cordate.

19. A. plumarius Burgess. Plant about 3 dm. high, chiefly composed of the dense plume-like violet inflorescence: stem smooth, zigzag: leaf-blades very smooth and firm, thickish, chiefly lanceolate-acuminate and slit-serrate, inclined to be strongly falcate at apex and unequal at the slightly cordate broadish base, measuring 7 x 1.5 cm. or less; veins strongly incurved; petioles narrow-margined; lower axile leaves conspicuous, but rapidly diminished, soon becoming narrowly falcate-lanceolate and entire, sessile by a taper subcuneate base: inflorescence otherwise naked, ovate-lanceolate in outline: bracts narrow, acute, their distinct enlarged green tips chiefly spatulate.—Mountain tops, chiefly on balds at 4,800–5,000 ft., Blue Ridge, N. C.—Fall.—Resembles a dwarf *A. sagittifolius*, but differs in leaves, bract-tips, and absence of bracteals.

20. A. trigonicus Burgess. Plant profusely branched, with rigid glabrate brownish stems and long flagellate ascending branches, which are closely short-branched or are spiciform and beset with small remotish subsessile heads: stem 8 dm. high or less: leaf-blades thick and heavy, somewhat canescent or hispid above, velvety-hispidulous below; leaf-form elongate triangular; the truncate base slightly rounded at the corners, and sometimes a little subcordate; leaf-blades 3 x 1 cm. or more, acute or obtusish, the sides straight, serrate or crenate; petiole short, forming a narrow cuneate wing: rameals stiff, very numerous, overlapping and appressed, linear-elliptic: heads small, hardly 2 cm. broad: bracts linear-acute, the green tip lanceolate.—Plains and prairies, various provinces, Ala. to Tex. and Kans.—Fall.

21. A. azureus Lindl. Stem 3–12 dm. high, slender, stiff, rough, with numerous ascending or patent branches: leaf-blades thick, of a peculiar crusty texture when dry, scabrous on both sides, those of the basal and lower cauline leaves cordate, ovate to elliptic-lanceolate in type, shallow-serrate, usually acute, 5–15 cm. long, with slender often pubescent petioles; those of the upper cauline leaves with short petiole-like bases or sessile, lanceolate or linear, entire; those of the branches reduced to small appressed scales: heads numerous, 20–25 mm. broad: involucre turbinate; bracts glabrous, linear-oblong, abruptly acute, imbricate, their broad sharp green tips appressed: ray-flowers 10–20; ligules bright-blue, 6–8 mm. long: pappus tawny.—Prairies and borders of woods, various provinces, rarely Coastal Plain, Ga. to Tex., Kans., Minn., and N. Y.—Sum.–fall.—Resembles *A. undulatus* L.; but leaves hispidulous on both surfaces: flowers smaller; rays darker and bluer; pubescence scanty.—*A. azureus scabrior*, ranging from La. to Mo., Minn., and Ont., has an extremely rough stem with more erect branches and principal leaves with elliptic-lanceolate, entire, long-petioled, noncordate blades.

22. A. poaceus Burgess. Stem diffusely and repeatedly much-branched, 8 dm. high or less: leaves very rough and stiff, of grass-like form; chief leaf-blades linear-elongate or falcate, often 13 cm. long, 0.5 cm. in uniform breadth, usually also with a narrow-margined petiole of 2–5 cm., apt to be erect, and with stout papillose-based bristles; radicals elliptic, measuring 8 x 1 cm. or less: inflorescence irregular, on very long and straggling branches, which are often for 1.5 to 3 dm. clothed with minute subulate sub-appressed bractlets: heads small, little over 1 cm. broad: bracts of the involucre linear, with long sharp tips.—Plains and prairies, various provinces, Ala. to Tex., Okla., and Mo.—Sum.–fall.—Represents the extreme of attenuation among the kindred of *A. azureus*.

23. A. undulatus L. Stem stiff, 3–10 dm. high, closely rough-pubescent, divaricately branched above: leaf-blades usually thick, rough on both sides when dry, pubescent beneath, dentate, undulate or entire, acute or acuminate, those of the radical leaves small, orbicular to ovate, soft-downy; the lower cauline leaves ovate, with cordate base, 5–12 cm. long, the naked petioles expanding into a clasping base, at least in some leaves; middle cauline leaves similar, lanceolate or elliptic; upper cauline leaves sessile or clasping, chiefly lance-elliptic; branch-leaves subulate, small and suddenly reduced: heads numerous, racemose and somewhat secund on the spreading branches, 16–20 mm. broad: involucre broadly turbinate: bracts of the involucre linear-elliptic, slightly pubescent, acute or acutish, their broad green tips appressed: ray-flowers 8–15; ligules usually pale-violet, 6–10 mm. long: pappus whitish.—Dry soil, various provinces, Fla. to Miss., Ark., Ont., and N. B.—*A. Baldwinii* T. & G., based on the upper part of a specimen of one of the undulatus group, cannot definitely be placed under any species on account of the absence of lower leaves, so that the name is best dropped from this treatment.

24. **A. Proteus** Burgess. Plant small, racemose, with many cordated leaves, of firm roughish texture but with little hair: stem slender, apt to be glabrate, and 3 dm. high, sometimes 7 dm., virgate and little branched, but sometimes forking near the base: leaves somewhat remote; blades delicate, polymorphous, not thick or thin; radicals numerous, resembling violet leaves, 4.5 x 2.5 cm. or less, cordate-ovate, almost acute, finely subcrenate, often nodding on their prolonged and very slender petioles: cauline leaves tend to assume about 4 types; the first, or basal, all similar to the radical, but with straighter sides, narrowly cordate-triangular and acutish, minutely serrulate, soon becoming entire; second form, triangular-lanceolate, sloping into a distinct winged petiole; third, narrowly linear or lanceolate, sessile by a short broad taper base; fourth, elliptic-acute, sessile by a broad base or with very short broad wing, numerous, much-reduced and disappearing among the middle axils: inflorescence nearly nude, a simple open raceme with spreading heads, or each head replaced by a racemose subsecund branch: ligules of the ray violet: disks not so dark as in related species: bracts linear, briefly acuminate, closely imbricate, the green tips conspicuous, narrow diamond-form or narrow lanceolate.—Dry ground, Coastal Plain, Fla. to Miss. and N. C.—Sum.–fall.

25. **A. asperifolius** Burgess. Plant small, racemose, minutely tomentulose throughout, very rough and heavy in texture: stem often but 3 dm. high: leaves subcoriaceous; blades hispid, subentire, obtuse, ovate-elliptic and longer than their short petioles; rameal leaves minute, adnate, subulate-filiform; radical leaves and chief caulines sometimes subcordate; petioles slender, naked or narrowly margined; amplexicaul dilation absent or rare: inflorescence a loose simple or compound naked receme, or several racemes which may become more short-peduncled and leafly: heads smaller than in *A. undulatus*: bracts of the involucre fewer, slightly pubescent, appressed, linear-elliptic, acute, with distinct rhomboid green tips. [*A. asperulus* T. & G., not Wall.]—Dry or sandy soil, Coastal Plain, Fla. to La. and S. C.—Fall.—The most hispid-pubescent and rounded-leaved of the southern correlatives of *A. undulatus*.

26. **A. sylvestris** Burgess. Stem slender, scabrous, erect, pale-green, usually 4 dm. high, minutely pubescent: leaves resembling *A. undulatus*, but blades broader, shorter, thinner, deeper-green, more uniformly petioled; predominant leaf-form broadly short-cordate, acute, with rounded basal lobes, deep or excavated sinus, broadly crenate or entire margin: petioles narrow, long and numerous, dilated at the base, seldom otherwise winged: upper leaves elliptic-acute, soon sessile; rameals uniform and spreading as in *A. undulatus*, oval to linear-elliptic; radicals small, orbicular, short-petioled; pilose and webby hair present on the leaves beneath but not velvety: inflorescence irregularly spreading or ascending, of long racemose branches: heads rather few: pedicels distinct, often 3 cm. long: ligules of the ray violet: bracts of the involucre linear, triangular-acute at apex, with large and broad rhomboid green tips.—Open woodlands, various provinces N of Coastal Plain, S. C. to Ala. and N. Y.—Fall.

27. **A. truellius** Burgess. Plant small, erect, with little hair: stem erect, strong but slender, rough: leaves subentire 5 x 2 cm., thickish, firm, rough, typically triangular-lanceolate with sides straight-tapered from the prominently shouldered truncate or cordate base, in form suggesting a mason's trowel: plant remarkable for its numerous short narrow petioles with large basal dilation, and above these, its strap-like petioles with slight basal dilation; radicals cordate-orbicular, crenate, somewhat velvety; axiles often deflexed, narrow-ovate; rameals spreading: ligules of the ray short, purplish-blue: disks soon reddish-brown: bract-tips diamond-shaped, broad and bright-green.—Sandy thickets, various provinces, rarely Coastal Plain, Ga. to Ala., Ky., and Vt.—Fall.

28. **A. corrigiatus** Burgess. Plant tall, robust, rough, with little hair, with predominantly narrow spearhead-shaped much-ruffled sessile leaves, foliose in the

axils, and with long and high inflorescence, small blue-violet heads and lozenge-tipped bracts: stem about 12 dm. high, or more, brown, terete-striate, rough, with short scattered strigose hair above: leaves tending to be narrowly lanceolate and broad-based, slanting straight both ways from near the base, tending to the form of an acute narrow spearhead, about 7 or 12 x 2 cm., very slowly diminished through the inflorescence; radicals small, short and broad, somewhat cordate-oval; a very few lower cauline leaves develop obscure cordation and a narrow petiole; rameals not conspicuous, linear-acute, somewhat appressed: inflorescence irregularly compound-racemose, long and rather narrow, disproportionately large for the plant; its branches tend to be spreading and short, its peduncles long or at least distinct, its heads medium-sized or less, its rays much darker than in typical *A. undulatus*.—Dry hillsides, various provinces, Ala. to La., Ohio, N. Y., and Conn.—Fall.—Peculiar in its strong tendency to become corrigiate, or cross-tied, by developing two conspicuous divaricate narrow-lanceolate leaf-blades (branch-form leaves) in the lower or middle axils of the cauline leaves.

29. **A. triangularis** Burgess. Plant cinereous green, tall, robust, very rough, with little or no obvious hair, like *A. corrigiatus;* but with leaves ovate-triangular-acuminate, thicker and with very pronounced acumination: stem dull reddish-brown, somewhat terete, 9 dm. high or more: leaves very numerous, sometimes foliosely corrigiate in the axils; blades not ciliate, beneath with slight short scattered strigose hair, on the upper surface close-set with pale slender rigid aculei pointing away from the midrib and thickened at the base; leaf-form ovate-triangular, long-acuminate, suddenly contracted at the sessile base, subclasping only: inflorescence rather narrow, of loosely-ascending branches with a brushy top, uniformly close-set or catenate with conspicuous appressed overlapping elliptic chain-like bracteals: heads small: ligules of the ray purple-blue: bracts of the involucre linear-elliptic, their tips apt to be of broad diamond form. [*A. undulatus triangularis* Burgess]—Open sandy slopes, various provinces, S. C. to Ala. and N. Y.—Fall.

30. **A. claviger** Burgess. Plant wand-like, apt to spring several from a common base, with glandular pubescence along the middle of the stem, and with leaves of a crisp firm texture: stem greenish, moderately and finely pubescent, or glabrate, smooth to the eye, about 6 dm. high or more: leaves quite uniform; blades ovate-elliptic, thickish sub-entire or crenulate, acute, chiefly with a short strap-like wing broadest at its base; the slight pubescence becoming a little rough in drying and the leaves spongy-coriaceous; a very few basal leaves cordate: inflorescence irregular and narrow-elliptic or clavate, sometimes narrowly pyramidal: heads rather small: ligules of the ray violet or purplish-violet: bracts linear-acute with the medium-sized tips broad-lanceolate to diamond-form; scattered capitate glandular hairs are mingled on the stem with dry strigose hair and also with broken down strigose hairs which become irregularly glandular-thickened; the definitely formed capitate glands are colored violet, only slightly thicker than their stiff stub-like stalks.—Wood borders, various provinces N of Coastal Plain, Ala. to N. Y. and Conn.—Fall.

31. **A. gracilescens** Burgess. Plant slender and less pubescent, less rough and more thyrsoid than its congener *A. undulatus*: stem slender, often 6 dm. high and somewhat arching: leaves quite uniform; blades large and conspicuous, thin, soft, elongate-lanceolate, chiefly sessile, 12 x 4 cm. or less, scantily soft-pubescent, not velvety like *A. undulatus,* only a little rough when dry, subentire, pale-green with paler midrib; axiles narrow-ovate, rameals elliptic-linear or spreading; cordation of leaf-base and dilation of petiole-base usually little developed; radicals sagittiform-cordate with acute sinus: inflorescence loose, ovoid or thyrsoid, with distinct pedicels 3 cm. long or less: heads larger and remoter than in its relative *A. undulatus*: bracts of the involucre linear-elliptic,

suddenly acute, the tips chiefly conspicuous, short, incurved-triangular-aculeate. —On "balds," in half-shade, or edges of rich woods, Blue Ridge and more N Provinces, S. C. to N. Y.—Quite common and rather showy.—Late Sum.—Fall.

32. **A. linguiformis** Burgess. Small racemose plants with little hair, or cordation, of soft thin texture, tending to great development of elongate linguiform leaves, partly with long strap-like winged petioles, and the upper ones sessile by a broad auricled base; stem 4–5 dm. high, minutely pubescent only; leaves tend to be remarkably entire and obtuse, sage-green, closely approximate; radicals few, narrowly ovate-elliptic, but slightly cordated, with rather long slender petioles; lower caulines lance-elliptic, 7 x 2 cm. or less, abruptly rounded and obtuse at base and apex, often surpassed by the strap-like petiole; other caulines and branch-leaves sessile-auriculate, prolonged linear-oblong or pandurate-elliptic, often rounded-truncate at apex; axiles linear-acutish: inflorescence usually a loose and nearly simple raceme with small distinct long-pedicelled heads: bracts of the involucre lax, linear, acute, the green tips rhomboid.—Dry, fertile thickets, near Jacksonville, Fla.—Sum.—Fall.

33. **A. loriformis** Burgess. Plant rough, with but little hair, tall, narrow, with strap-like leaves seldom developing petioles or cordation: stem somewhat purple, terete, erect, brittle, slender, and 4–6 dm. high, or stout and even 12 dm. high: leaves dull-green; blades thick, rigid when dry, rough, only minutely pubescent beneath, their type linear-elliptic and obtuse, with sides nearly straight from a sessile clasping base; margins apt to be much ruffled, often minutely and closely erose, occasionally gashed with a few coarse remote blunt protruding teeth; petioles slightly developed, though often a few lower leaves slope into a strap-like petiole; radicals apt to be oval-elliptic, with little or no cordation; upper caulines and axiles linear-lanceolate, acutish, more contracted at the base: as in *A. corrigiatus*, the inflorescence is tall and narrow, the heads smaller than in *A. undulatus* and the ligules of the ray a more blue-purple: bracts of the involucre narrower, the green tips diamond-form or lanceolate. [*A. undulatus loriformus* Burgess]—Sand-barrens, Coastal Plain and adj. provinces, Fla. to Ala. and Mass.—Fall.

34. **A. Mohrii** Burgess. Plant profusely and flagellately branched with very naked bushy inflorescence: stem rough, rigid, with many small dark capitate slender-stalked glands intermixed among strigose hairs; many of the latter are viscid, becoming broken down and irregularly incrassate: leaf-blades long, narrowly linear and grass-like, thickish, harsh, of uniform breadth, minutely rugulose above, or slightly acute; petioles obscure, slender or winged; occasional radical or basal leaves are shorter, broader, somewhat cordate-lanceolate, and at the slightly shouldered base are contracted into a distinct petiole; with but obscure or rare sinus and amplexicaul enlargement; axile leaves and rameal chiefly linear-oblong, clasping by a broad base: heads small, long-peduncled (5–7 cm.) racemosely compounded: bracts of the involucre linear-elliptic, acute, green-tips prominent, lance-elliptic: ligules of the ray reddish-purple, 12–15 or less. [*A. Baldwinii* β T. & G.]—Sandy soil, Coastal Plain, Fla. to La. and Ga.—Fall.—Fine strigose tomentum extends down the peduncles and much of the stem. Represents the extreme attenuation of the *A. undulatus* types.

35. **A. puniceus** L. Stem 9–25 dm. tall, usually stout, purplish, broadly corymbosely or racemosely branched above, hispid with rigid hairs rising from a reddened tubercular base: leaf-blades lanceolate to elliptic-lanceolate, 7–15 cm. long, acuminate, sessile and clasping by a broad or narrowed base, sharply serrate (or some upper ones entire), usually very rough above, pubescent on the midrib beneath: heads generally numerous, 2–4 cm. broad: involucre nearly hemispheric; bracts linear or elliptic, attenuate, imbricate in about 2 series,

glabrous or ciliate, green, loose, spreading, nearly equal, sometimes broadened: ray-flowers 20–40; ligules light-violet (sometimes purplish or pale), 10–14 mm. long, showy: pappus nearly white: achene pubescent.—Swamps and ditches, various provinces, Ga. to Ala., Minn., Ont., and N. S.—Sum.–fall.

36. **A. Elliottii** T. & G. Stem 5–11 dm. tall, glabrous or pubescent in lines, corymbosely paniculate above: leaves rather numerous; blades thickish, various, those of the basal and lower cauline elliptic to oblanceolate, 2–3 dm. long, with shallow appressed or rounded teeth, narrowed into broad petiole-like bases, those of the upper cauline elliptic to elliptic-lanceolate, appressed-serrate, acute or acuminate, sessile or with petiole-like bases: heads numerous, chiefly crowded at the end of each branch: bracts of the involucre very narrow, lax and often recurved, their tips linear-elliptic or linear-subulate, and spreading: ray-flowers numerous; ligules narrowly linear, 9–11 mm. long, bright-purple: achene glabrous or nearly so.—Swamps, Coastal Plain, Fla. to N. C.—Fall.—Resembles *A. puniceus*, but inflorescence more corymbosely crowded and level-topped: bracts more attenuate and more spreading: ligules of the ray deeper-colored: hairs tubercular at the base or wanting.

37. **A. conduplicatus** Burgess. Stem purple-red, nearly smooth, but with some lines of straggling thick-based bristles; branches short, rigidly spreading, congested toward their ends with irregularly crowded heads: leaf-blades sessile, spatulate-linear, thick, smooth beneath, very rough above, without obvious veins except the pale-green midrib, entire or remotely crenulate-serrulate above the middle; axils sheathed by the conduplicate bases of the upper leaves: rameal leaves short, crowded, spreading and irregular: heads almost sessile: ligules of the ray blue or violet, fading whitish: bracts of the involucre linear, with triangular-acute apex, white scarious edges and bright-green conspicuous deltoid tip.—Moist soil near Biltmore, in the Blue Ridge of N. C.—Fall.—Allied also to *A. novi-belgii* and *A. puniceus*.—Plant chiefly pale-green and smooth.

38. **A. prenanthoides** Muhl. Stem 3–6 dm. high, glabrous below, pubescent above, flexuous, much-branched: leaf-blades thin, elliptic to ovate-lanceolate, 7–15 cm. long, sharply and coarsely serrate, scabrous above, glabrous or nearly so beneath, acuminate, abruptly narrowed below into a broad-margined entire petiole, the base dilated and auriculate-clasping: heads usually numerous, 25 mm. broad or more: involucre hemispheric; bracts linear, acute, green, spreading, imbricate in 3 or 4 series, the outer shorter: ray-flowers 20–30; ligules violet, 8–12 mm. long: pappus tawny: achene pubescent.—Moist soil, various provinces N of Coastal Plain, Tenn. to Ia., Wis., and Mass.—Sum.–fall.—Unlike other asters in its leaf-form, characteristically a suborbicular base and an ovate-acuminate tip, connected by a strap-like middle.

39. **A. carolinianus** Walt. Stem shrubby, widely or diffusely branched, 1–4 m. long, arching or climbing, finely and softly more or less grayish pubescent: leaves relatively few, those of the stem and main branches with elliptic or elliptic-lanceolate entire blades 4–11 cm. long, acute or acuminate at the apex and usually somewhat sagittate and clasping at the base, minutely pubescent: heads solitary or clustered at the ends of spreading conspicuously leafy branches: involucre hemispheric, 6–8 mm. high; bracts narrow, the outer more or less spatulate, the inner linear, all with spreading or recurved and more or less foliaceous dark-green tips minutely pubescent within and without: ray-flowers numerous; ligules pale-purplish or pinkish, 1.5–2 cm. long: achene glabrous.—In and about swamps, Coastal Plain, Fla. to S. C.—Fall, continuing in flower the year round.

40. **A. laevis** L. Stem 6–12 dm. high, usually stout, glabrous, often glaucous, branched or simple: leaf-blades thick and almost leathery, very smooth, entire

or serrate, slightly rough-margined, the upper all sessile and strongly cordate-clasping elliptic-lanceolate, oblanceolate or ovate, acute or obtusish, 2–10 cm. long; those of the basal and lower cauline leaves gradually narrowed into winged petiolar bases, those of the branches often small and scale-like: heads usually numerous, about 25 mm. broad: involucre campanulate; bracts of the involucre rigid, acute, appressed, broadly green-tipped, imbricate in several series: ray-flowers 15–30; ligules blue or violet: pappus tawny: achene glabrous or nearly so.—Dry, or stony soil, various provinces, Ga. to La., Kans., N. D., Ont. and Me.—Fall.—Remarkable among asters for its smooth, cool, polished surfaces.

41. A. concinnus Willd. Similar to narrow-leaved forms of *A. laevis* in habit, the stem glabrous or sparingly pubescent above, 3–9 dm. high, paniculately branched: leaf-blades elongate-lanceolate to linear, entire (or sometimes serrulate), 2–7 cm. long, those of the upper cauline leaves sessile, somewhat clasping, those of the basal and lower cauline leaves spatulate, or elliptic, narrowed into margined petiole-like bases: heads usually numerous, about 25 mm. broad: bracts of the involucre with rhomboid acute herbaceous tips: ray-flowers with violet to purple ligules.—Open woods or dry soil, various provinces N of Coastal Plain, N. C. to Ark. and Conn.—Fall.—Resembles *A. laevis*, but more corymbed, the heads smaller and leaves narrower.

42. A. purpuratus Nees. Stem 4–12 dm. high, slender, glabrous, simple, or branched above, the branches sometimes puberulent: leaf-blades firm, glabrous, dark-green, entire, the upper sessile and clasping at the base, elongate-lanceolate or long-linear, 5–12 cm. long, acuminate; basal and lower cauline leaves petioled, elliptic-lanceolate, obtusish; those of the branches very small: heads rather few, loosely racemose, 16–25 mm. broad: involucre broadly campanulate: bracts coriaceous, lance-acuminate, appressed, imbricate in several series, the green tips lanceolate: ray-flowers 5–10, their ligules blue or violet, 6–10 mm. long: pappus tawny: achene glabrous.—Dry soil and open woods, various provinces, Ga. to Tex., Ark., and Va.—Late Sum.—Fall.—Resembles *A. laevis*, but its heads more racemed, apt to be solitary on long branches, the bracts narrower-tipped, the leaves greatly narrowed, the blades long-linear.

43. A. attenuatus Lindl. Stem glabrous, 6 dm. high or less: leaf-blades very narrowly linear with straight sides almost from the sessile base to the acute apex, very smooth but with hispid revolute margin, 1.5 dm. long or less, about 1 cm. broad, mostly sessile: inflorescence spicate-racemose, attenuate: bracts as in *A. purpuratus* in form, from which it differs in its leaves, its smaller heads, more narrowed inflorescence of short branches, and somewhat squarrose lower bracts which pass gradually into spreading bractlets on the pedicels. [*A. virgatus* γ T. & G.]—Dry soil, Coastal Plain, Ala. to La.—Fall.

44. A. ursinus Burgess. Stem stout, smooth, glabrous below the inflorescence, very peculiar in the crowded nodes of its base and inflorescence, there 1 cm. or less apart, and in the abruptly remote nodes of the stem between, nearly 10 cm. apart: leaves elliptic, chiefly fascicled at the base and there often short-lanceolate or spatulate, sometimes serrulate and 1–2 cm. broad, with ciliate petioles; minute stubby pubescence covers some even of the larger leaves beneath, and occurs on the main stem and branches throughout the inflorescence, which tends to ellipsoid and broadly racemose type: heads chiefly solitary on virgate branches, twice the size of *A. attenuatus*, 3 cm. broad, 1 cm. high: pedicels shaggy with conspicuous uniform closely-imbricate bractlets, which are 1 cm. long, each appressed half-way and with outcurved tip; upper bractlets more spreading and furry and passing indistinguishably into the bracts of the involucre; involucre loose, broad and short; bracts chiefly linear-attenuate, tapering from the base, their green tips large, lanceolate, and conspicuous. [*A. virgatus* β T. & G. not Banks]—Mountain slopes, Blue Ridge, Ga.—Late sum.–fall.

45. A. falcidens Burgess. Plant of firm smooth texture like *A. laevis*, with similar rays and bracts: stem slight or delicate, not rigid, generally arcuate, terete, reddened, usually under 5 dm. high; leaf-blades very thin, of linear type, apple-green, glaucescent, of dense opaque texture, remarkable for the absence of veins (unless under a strong lens), varying from exceedingly smooth and glabrous (even with the margin without ciliation or roughness) to leaves with minute hair beneath and some scabrous hair at the margins: radical leaves very pale and glaucous, with oval or obovate blades, the apex rounded or obtuse, a few acutish, their petioles narrow and longer; lower cauline leaf-blades lance-elliptic, entire, 7 x 2 cm., equalled by the narrow petiole (and resembling *Pogonia ophioglossoides*); middle caulines linear, often 2 dm. long by only 1 cm. broad, sessile, short-acuminate, frequently with several large projecting teeth which are nearly opposite or remotely scattered; these notches may be increased till the leaf is pinnatifid, or reduced to many shallow crenations, or may be replaced by prolonged oblanceolate-linear entire leaves: upper cauline leaves often numerous, 10–15 or more, ascending or spreading entire, linear, straight-sided, tapering slightly to each end but not acuminate, 15 cm. by 1.5 cm., finally becoming short, linear-acute and erect, until 5 cm. long: axiles subulate, rapidly reduced, leaving the inflorescence nearly naked: rameals minute, mostly erect-appressed, almost overlapping, broadly subulate or setaceous; branches ascending, short and filiform, reaching 5 cm. and bearing a single head, or 10 cm. and bearing several: heads often few, forming a short raceme: ligules of the ray pale-blue: disks early turning deep-crimson: bracts of the involucre linear-elongate, suddenly acute, their green tips rhomboid. [*A. gracilentus* T. & G., not Banks.]—Upland woods, Blue Ridge and more N provinces, Ala. to Ark., Pa., and N. C.—Fall.—Differs from the allied *A. laevis, A. concinnus* and close relatives, in its longer linear straight-sided leaf-blades and the coarse teeth.

46. A. turbinellus Lindl. Stem 6–9 dm. high, slender, paniculately branched, glabrous below, puberulent above: leaf-blades firm, lanceolate, or elliptic-lanceolate, 5–7 cm. long, entire, ciliate, acute or acuminate, those of the basal and lower cauline petioled, those of the upper sessile, those of the branches much smaller: heads about 25 mm. broad, mostly solitary at the ends of the branches: involucre turbinate; bracts elliptic, coriaceous, obtuse, appressed, imbricate in 5 or 6 series, their tips green only at the apex: ray-flowers 10–20; ligules 6–10 mm. long, violet: pappus tawny: achene finely pubescent.—Dry soil, especially on prairies, various provinces, La. to Ark., Kans., and Ill.—Sum.–fall.

47. A. continuus Small. Stem 5–11 dm. tall, pubescent, much branched above: leaf-blades spreading, more or less fiddle-shaped or oblong, 2–5 cm. long, acute, shallowly serrate or nearly entire, ciliolate, scabrous-pubescent on both sides, sessile and clasping at the base: heads showy, solitary or clustered at the end of the spreading closely pubescent branches: involucre turbinate-campanulate or turbinate; bracts numerous, linear or nearly so, erect or with slightly spreading green tips, acute, passing into the numerous scales of the peduncle: ray-flowers 12–15; ligules violet, 1–1.5 cm. long: achenes pubescent. Resembles *A. patens* Ait., but its bracteals closer; the involucre narrowly turbinate.—Dry soil, often in open woods, various provinces, Ala. to Tex., Kans., and Ark.—Fall.

48. A. georgianus Alexander. Stem 4.5–8 dm. tall, rough-pubescent, sparingly branched: leaf-blades sessile, elliptic to obovate, rough pubescent and very thick, stiff-spreading, auriculate-clasping at the base, entire, acute or obtuse, 3–7 cm. long; leaves of the branches much smaller, sometimes bract-like: heads 3–4 cm. broad, solitary at the ends of branches or branchlets; involucre turbinate-campanulate; bracts linear, somewhat acute, pubescent, the elliptic green tips spreading: ray-flowers 20–30; ligules violet, about 15 mm. long: pappus tawny.—Dry or open woods, inner Coastal Plain and Piedmont, Ga. and S. C.—Fall.

49. **A. fontinalis** Alexander. Stem 3–9 dm. tall, pubescent, much branched: leaf-blades sessile, linear-elliptic, rough-pubescent, stiff-spreading, auriculate-clasping at the base, entire, abruptly acute, 1.5–3 cm. long; lower cauline and radical leaves not seen, those of the branches small and bract-like: heads about 2 cm. broad, or more, at the ends of the numerous branches and branchlets; involucre turbinate-campanulate; bracts linear, with narrowly spatulate, green tips, remarkably thin for this group, but closely appressed and not at all spreading, glabrous, and ciliate margined: ray-flowers 15–30; ligules purplish-blue, 7–9 mm. long: pappus whitish.—Damp, wooded slopes, and moist soil, Fla.—Late fall.

50. **A. patens** Ait. Stem 3–9 dm. tall, slender, rough, divergently branched: leaf-blades sessile, ovate-elliptic or oval, rough-pubescent, thick and somewhat rigid, strongly auriculate-clasping at the broad base, entire, acute, or the lower ones obtuse, 2.5–7.5 cm. long, those of the branches much smaller and bract-like, their margins rough-ciliate: heads 25 mm. broad or more, solitary at the ends of the branches: involucre campanulate; bracts linear-elliptic, finely pubescent or scabrous, often somewhat glandular, imbricate, their green acute tips spreading: ray-flowers 20–30; ligules purplish-blue or deep-violet, 8–12 mm. long: pappus tawny: achene pubescent.—Dry, open places, often in acid soil, various provinces, Fla. to Tex., Minn., and Mass.—Sum.–fall.

51. **A. tenuicaulis** (C. Mohr) Burgess. Resembles *A. patens;* but its branches long and slender, flagelliform and diffuse when well developed: leaves and heads smaller: pedicels longer, often 1–4 cm.: bracts and their tips much narrower, narrowly linear; bractlets mucronate-acute, catenate or forming a chain-like series along the pedicels, appressed or slightly spreading. [*A. patens gracilis* Hook. *A. patens tenuicaulis* C. Mohr.]—Dry soil, Coastal Plain and adj. provinces, Ga. to Tex., Okla., and Ky.—Sum.–fall.

52. **A. phlogifolius** Muhl. Similar to *A. patens* in habit, but when well developed, much taller, more slender and soft: leaves larger; blades lanceolate to elliptic-lanceolate, entire, thin or membranous, acuminate at the apex, strongly auriculate, clasping at the base, roughish above, pubescent beneath, usually narrowed below the middle, sometimes 15 cm. long: heads usually numerous, 3–5 cm. broad, panicled or somewhat racemose on the branches: involucre campanulate; bracts lanceolate, glabrate, rather loose, with herbaceous tips: ray-flowers numerous; ligules purple-blue.—Woods and thickets, various provinces N of Coastal Plain, Ga. to Tenn., Ohio, and Mass.—Late sum.–fall.—Resembles *A. patens,* but less harsh and taller; heads larger: inflorescence narrow: leaf-blades elongate.

53. **A. adnatus** Nutt. Stem 2–8 dm. tall, hispidulous, virgately more or less branched, especially above: leaves various, the basal few, with obovate thinnish blades 1.5–2.5 cm. long, the cauline very numerous, approximate on the lower part of the stem, more or less imbricate above and on the branches; blades elliptic to lanceolate, 3–12 mm. long, firm, scabrous, erect and partly adnate to the stem and branches, sessile: heads relatively few, scattered, singly terminating the scaly branchlets: involucre 4–6 mm. high; bracts linear or slightly broadened upward, the dark-green tips slightly spreading: ray-flowers numerous; ligules 7–10 mm. long, violet: achene glabrous.—Dry pinelands, Coastal Plain, Fla. to Miss. and Ga.—Fall.—Remarkable among asters in its minute adnate scale-like leaves.

54. **A. Walteri** Alexander. Stem 2–6 dm. tall, loosely branched above or throughout, nearly glabrous: leaves very numerous, the basal spatulate to cuneate, entire, the cauline approximate or contiguous, rigid, reflexed; blades elliptic-lanceolate to ovate or subulate-ovate, 2–9 mm. long, ciliate, serrate, closely sessile: heads few, widely scattered, terminating scaly branchlets: involucre 5–6

mm. high; bracts broadened upward, the dark green acute or acutish tips slightly spreading: ray-flowers 14–24; ligules 6–9 mm. long, violet: achene glabrous. [*A. squarrosus* Walt.]—Dry pinelands, Coastal Plain, Fla. to N. C.—Fall.

55. **A. oblongifolius** Nutt. Stem much-branched, 3–7 dm. high, hirsute-pubescent, smooth with age, the branches divaricate or ascending; leaves numerous, often crowded; blades elliptic or elliptic-lanceolate, sessile by a broad or slightly clasping base, usually rigid, entire, mucronulate at the apex, rough or hispidulous on both sides, rough margined, those of the stem 3–5 cm. long, 4–8 mm. wide, those of the branches gradually smaller: heads corymbose, nearly 25 mm. broad: involucre hemispheric; bracts much imbricate, glandular-aromatic, linear or linear-elliptic, the acute green tips spreading: ray-flowers 20–30; ligules violet-purple, rarely rose-pink, 6–10 mm. long: pappus becoming light-brown: achene canescent.—Prairies and bluffs, often in calcareous soil, various provinces mostly N of Coastal Plain, Ala. to Tex., N. D., and Pa.—Sum.–fall.—*A. Kumleinii* Fries is not known in the east, the eastern specimens having been referred to *A. oblongifolius*.

56. **A. grandiflorus** L. Stem 3–7 dm. high, rather stiff, divaricately much branched, hispid with short hairs: leaf-blades elliptic, linear, or somewhat spatulate, rigid, sessile by a broad sometimes slightly clasping base, reflexed, entire, obtusish, hispid, the larger 5 cm. long, those of the branches very numerous 4–10 mm. long: heads about 5 cm. broad, terminating the branches: involucre hemispheric; bracts very squarrose and foliaceous, imbricate in 5–7 series, linear, or linear-elliptic, glandular, the outer obtusish, the inner acute: rays very numerous; ligules deep-violet, nearly 25 mm. long, 3 mm. wide: pappus becoming brownish: achene ribbed, canescent.—Dry soil, Coastal Plain and adj. provinces, Fla. to Va.—Sum.–fall.—Resembles *A. oblongifolius*, but heads larger and fewer, more glandular.

57. **A. novae-angliae** L. Stem stout, 6–25 dm. high, hispid-pubescent, corymbosely branched above, very leafy: leaf-blades elliptic-lanceolate, entire, acute, pubescent, 5–12 cm. long, 12–25 mm. wide, each clasping by an auriculate base: heads numerous, 3–5 cm. broad, clustered at the ends of the branches: involucre hemispheric; bracts linear-subulate, somewhat unequal, green, spreading, pubescent and more or less glandular-viscid: ray-flowers 40–50; ligules linear, 10–16 mm. long, violet-purple (typically a royal-purple, rarely replaced by rose-color, or white): achene pubescent: pappus becoming reddish-white.—Fields and neutral soil swamp margins, various provinces, rarely Coastal Plain, S. C. to Miss., Ark., Colo., Alta., and Que.—Sum.–fall.

58. **A. novi-belgii** L. Stem slender, 3–9 dm. high, usually much-branched, glabrous or slightly pubescent above: leaf-blades lanceolate, elliptic-lanceolate or linear-lanceolate, 5–12 cm. long, firm, entire, or slightly serrate, glabrous or very nearly so, acuminate at the apex, narrowed, sessile, and more or less clasping at the base, those of the lower ones petioled: heads corymbose-paniculate, usually numerous, 2–3 cm. broad: involucre hemispheric to campanulate; bracts linear, acute, green, somewhat spreading, in 3–5 series, the outer shorter: ray-flowers 15–25; ligules violet, 8–10 mm. long: pappus whitish: achene glabrous or nearly so.—Swamps and acid bogs, Coastal Plain and adj. provinces, Ga. to Ala. and Newf.—Sum.–fall.—Several forms have been distinguished: *A. novi-belgii litoreus* with low and spreading, more or less fleshy, much-branched stems: leaf-blades shorter and broader, thicker, acute, 3–6 cm. long: principal bracts of the involucre obtuse, loose, spatulate, ranges in salt-marshes, from Ga. to E Can. *A. novi-belgii atlanticus* with lanceolate leaf-blades tapering from the middle to an acuminate apex and base: heads usually fewer: inflorescence racemose-corymbose, ranges in swamps, from N. C. to Mass.

59. A. elodes T. & G. Stem up to 7 dm. tall, slender, smooth, little-branched, terete, pale and reddened: leaf-blades narrowly linear, entire, shining and firm, smooth and coriaceous when dry, 5–15 cm. long, often not more than 1 cm. broad, scarcely clasping by the contracted sessile base, divaricately spreading and becoming deflexed; rameal leaves very numerous, approximate, elliptic-oval to linear, divaricate-recurvate, with abruptly contracted base and apex, diminished to 1 cm. long on the pedicels: leaves (especially the rameal) with their margins hardened, thickened, minutely spinulose and revolute: inflorescence loosely panicled, with domed, flattened or irregular top: heads often approximate; chief bracts of the involucre closely imbricate, rigid, erect, their tips lanceolate, erect or spreading, with pale or purple margin; some green spreading foliaceous outer bracts occur, but they are usually few or inconspicuous.—Swamps, especially in pinelands, Coastal Plain and adj. provinces, N. C. to Mass.—Sum.–fall.

60. A. sericeus Vent. Stem 3–6 dm. high, slender, paniculately or corymbosely branched, stiff, glabrous, leafy: basal and lowest leaves oblanceolate, narrowed into margined petioles; cauline leaves sessile, with a broad base, elliptic, entire, mucronate, 1–4 cm. long, erect or ascending, with a dense silvery-white silky pubescence on both sides: heads numerous, about 35 mm. broad: involucre turbinate; bracts elliptic, or the inner lanceolate, canescent, imbricate in 3 or 4 series, their tips green, acute, spreading: ray-flowers 15–25; ligules reddish-violet, becoming violet-blue, 12–16 mm. long: pappus tawny: achene glabrous.—Dry, open soil, various provinces N of Coastal Plain, Tenn. to Tex., Man., and Ill.—Late sum.–fall.

61. A. concolor L. Stem 3–7 dm. high, leafy, simple, or with few erect branches: leaf-blades elliptic or linear-elliptic, finely and densely canescent on both sides, or the lower glabrate, sessile, obtuse or mucronate, 4–5 cm. long: heads in an elongated narrow raceme resembling that of species of *Laciniaria*: involucre broadly turbinate; bracts linear or linear-elliptic, appressed, canescent, imbricate in 4 or 5 series, their tips green, acute, the outer shorter: ray-flowers 10–15; ligules lilac, drying violet-blue, 6–8 mm. long: pappus tawny: achene villous.—Dry sandy, often acid, soil, Coastal Plain and adj. provinces, Fla. to La., Tenn., and Mass.—Late sum.–fall.—Resembles *A. sericeus*, but more wand-like and spicate, and more canescent than silky.

62. A. simulatus Small. Stem 2–15 dm. tall, wand-like or with few virgate branches, pale-pubescent, the branches, especially near the tips, villous-silky: leaf-blades linear-elliptic to lanceolate or linear-lanceolate, 1–2.5 mm. long or somewhat scale-like and smaller above, more or less silky, acute, entire, sessile; heads in virgate racemes or panicles, showy: involucre turbinate-campanulate: bracts broadly linear to linear-lanceolate, imbricate in several series, the outer with deltoid green tips, the inner 6–7 mm. long, with lanceolate green acute tips, all appressed, copiously pubescent with appressed white hairs; ray-flowers 10–13; ligules violet, 6–7 mm. long: pappus whitish: achene copiously silky.—Pinelands, Everglade Keys, Fla.—Fall–wint.

63. A. plumosus Small. Stem 1 m. tall or less, branched above, finely pubescent, the branches more closely pubescent than the stem, villous-hirsute near the tips: leaf-blades various, those of the lower part of the stem not seen, those above linear or nearly so, those of the branches linear-elliptic to lanceolate, mostly 1 cm. long or less, acute, all sessile, finely pubescent on both sides: heads showy, in loose racemes; involucre turbinate-campanulate; bracts linear-acuminate to narrowly linear-lanceolate, imbricate in several series, the inner 6.5–7.5 mm. long, the loosely spreading or recurved green tip with copious long white hairs: ray-flowers about 10; ligules violet, 7–8 mm. long; pappus tawny: achene silky-villous.—Dry woods, Apalachicola River region, Fla.—Fall.

64. A. Curtisii T. & G. Stem 4–18 dm. tall, glabrous, at least below the inflorescence, angled, corymbose or paniculate above, the panicle sometimes raceme-like: leaves various, sometimes all with linear or nearly linear blades and entire or partly serrate, sometimes the lower cauline with lanceolate, elliptic, oval or ovate sharply serrate blades and petiole-like base and the upper cauline linear and less toothed, occasionally all of them relatively broad, all thickish, dark-green and glabrous: heads solitary or clustered at the end of the stem or its branches: involucre hemispheric, 6–9 mm. high, conspicuous; bracts often slightly ciliolate, pale below the more or less dilated dark-green spreading, or reflexed tips: ray-flowers 18–28; ligules violet-purple, often brilliant, 1–3 cm. long: achene glabrous, shorter than the sordid pappus.—Mountain woods, Blue Ridge and Appalachian provinces, Ga. to Tenn. and N. C.—Fall.—Resembles *A. spectabilis*, but leaves more polymorphous: stem taller: head more diffused: glands lacking.

65. A. Smallii Alexander. Stem 5–6 dm. tall, glandular-pubescent, especially above, unbranched below the rather compact inflorescence; leaves rather numerous 5–12 cm. long; blades glabrous but rough-margined, oblanceolate, the cauline ones tapering to a wing-petioled base, the upper ones sessile at the broad base, all, even the floral bracts sharp-serrate and acutish: heads borne in a dense, somewhat corymbose cluster: involucre campanulate: bracts glandular, especially the outer, broadly linear, abruptly mucronate or obtuse, the tips recurved: ray-flowers purplish: pappus pale-tawny: achene pubescent.—Dry woods, Blue Ridge, N. C.—Fall.—Resembles *A. surculosus*, but differs mainly in its glandular involucral bracts and numerous approximate leaves.

66. A. spectabilis Ait. Stem stiff, 3–6 dm. tall, simple, or corymbosely branched above, puberulent, or rough below, more or less glandular above: leaf-blades firm, thickish, those of the basal and lower cauline leaves oval, acute or acutish, 7–12 cm. long, 2–4 cm. wide, sparingly serrate with low teeth, narrowed at the base into slender petioles; blades of the upper cauline leaves sessile, entire or very nearly so, acute, linear-elliptic: heads several or numerous, about 35 mm. broad, corymbose, very showy: involucre nearly hemispheric; bracts linear-elliptic or slightly spatulate, glandular, imbricate in about 5 series, the acute or acutish tips spreading: ray-flowers 15–30; ligules bright-violet, 12–20 mm. long: pappus whitish: achene slightly pubescent.—Dry, often acid, sandy soil, Coastal Plain and N. E. Coast, N. C. to Mass.—Late sum.–fall.

67. A surculosus Michx. Stem 2.5–4.5 dm. tall, slender, from elongate-filiform rootstocks, minutely scabrous-pubescent, corymbosely branched above: leaf-blades firm, lanceolate or linear, those of the lower cauline petioled, 5–7 cm. long, rough-margined, slightly scabrous above, sparingly dentate, those of the upper narrower, sessile, entire: heads few, or sometimes solitary, about 3 cm. broad: involucre turbinate-hemispheric; bracts coriaceous, imbricate in about 5 series, ciliate, but scarcely glandular, their green tips spreading: ray-flowers 15–30; ligules violet: pappus whitish: achene nearly glabrous.—Sandy or gravelly soil, various provinces, Ga. to Ala., Ky., and N. C.—Sum.–fall.

68. A. gracilis Nutt. Stem slender, 3–4 dm. highly, finely puberulent and scabrous, corymbosely branched above: leaf-blades minutely scabrous, those of the basal and lower cauline leaves elliptic, acute or obtusish, 5–7 cm. long, toothed, narrowed into slender petioles, those of the upper leaves linear, linear-elliptic, or slightly oblanceolate, acute, entire, sessile or a little clasping: heads usually numerous, 12–20 mm. broad: involucre narrowly turbinate; bracts coriaceous, glabrous or very nearly so, imbricate in about five series, their tips green and spreading, obtusish: ray-flowers 9–15; ligules violet, 6–9 mm. long: pappus nearly white: achene minutely pubescent.—Dry, often acid, sandy soil, various provinces, N. C. to Tenn., Ky., and N. J.—Sum.–fall.

69. **A. Lamarckianus** Nees. Stem 6–25 dm. high, glabrous or nearly so, paniculately much-branched: leaf-blades lanceolate to elliptic-lanceolate, 7–15 cm. long, acuminate at the apex, narrowed to a sessile or slightly clasping base, glabrous, thin, roughish margined, those of the cauline leaves sparingly serrate in the middle, or sometimes very nearly entire, the upper and those of the branches gradually smaller: heads numerous, 16–20 mm. broad: involucre nearly hemispheric, 6–8 mm. high; bracts narrowly linear-lanceolate, acute or acuminate, appressed, green-tipped, imbricate in 4 or 5 series: ray-flowers numerous; ligules white (or faintly tinged with violet), 6–8 mm. long: pappus white or nearly so: achene minutely pubescent. [*A. paniculatus* Lam.]—Moist soil, various provinces, Fla. to La., Mont., Ont., and Va.—Late sum.–fall.—A very variable species. A form ranging from N. C. and Tenn. to Kans., and Man., with narrowly linear entire or remotely appressed-serrate leaf-blades acuminate at both ends and numerous rather densely clustered heads on ascending inflorescence-branches, is *A. Lamarckianus bellidiflorus*.

70. **A. missouriensis** Britton. Whole plant pubescent, much-branched: stem 6 dm. high or more: leaf-blades thin, oblanceolate and acute in type, dull or cinereous-green, sharply serrate above the middle, with long-tapering entire sessile base, finely pubescent beneath: heads irregularly panicled or scattered along leafy branches: bracts of the involucre linear, acute, closely imbricate.—Moist places, various provinces, Tenn. to Tex., S. D., and Mich.—Fall.—Differs from *A. Lamarckianus* Nees. especially in its pubescence.

71. **A. salicifolius** Lam. Stem 6–15 dm. high, rather slender, paniculately much-branched, usually very leafy, glabrous, or somewhat pubescent above: leaf-blades somewhat firm, lanceolate or linear-lanceolate, 5–10 cm. long, rough-margined, acute or acuminate, narrowed and sessile or slightly clasping at the base, entire or sparingly dentate with low teeth, glabrous or nearly so, those of the lower leaves sometimes with petiole-like bases, those of the branches gradually smaller: heads numerous, 16–25 mm. broad: involucre broadly turbinate; bracts linear-elliptic, appressed, imbricate in 4 or 5 series, their green tips acute or obtusish: ray-flowers numerous; ligules violet, or violet-purple, or sometimes white, 6–8 mm. long: pappus white: achene minutely pubescent.—Moist soil, various provinces, Miss. to Tex., Mont., Ont. and Me.—Late sum.–fall.—The following form may be distinguishable: *A. salicifolius subasper*, with scabrous stem and leaves, ranges from La. to Tex., Mo., and Md.

72. **A. Simmondsii** Small. Stem 1–12 dm. tall, minutely pubescent, usually with erect or spreading branches: leaf-blades linear, oblanceolate, or elliptic, glabrous, sessile; those of the lower leaves serrate; those of the upper serrate or entire, the rameal ones narrowly linear, entire: head solitary or paniculate: involucre campanulate to campanulate-turbinate; bracts linear with spatulate green tips and scarious margins below, acute or acutish, the inner 4–7 mm. long: ligules of the ray 7–11 mm. long, pale-lilac or pink-purple: achene finely pubescent: pappus cream-color. [*A. Sulznerae* Small.]—Moist or dry soil, pen. Fla.—Fall.–wint.—A very variable species which may contain one or more distinct species.—As in the case of related species the Seminoles use an infusion of the plant to bathe victims of sunstroke.

73. **A. spatelliformis** Burgess. Stem much-branched, glabrous, 6 dm. high or more: leaf-blades dull-green and crenate, thickish, glabrous, the upper surface usually finely impressed with reticular veins: leaf-form suggesting a small rounded spatula, oval with a rounded apex, tapering into a short entire cuneate-winged petiole; basal and rameal leaves as well as cauline all of nearly the same type, 5 x 3 cm. or less; the axiles half as large and oval-elliptic, with a short cuneate base; the rameals half as large as the axiles, but very uniform, numerous and characteristic: heads small, scattered along the prolonged or

sarmentose branches, usually short-pedicelled: bracts of the involucre rigid, linear, with whitish sides and acute apex, the narrow dark-green tips lance-triangular.—Swamp margins, Jacksonville, Fla.—Fall.

74. A. Tradescanti L. Stem 6–15 dm. tall, slender, paniculately branched, the branches usually ascending and often pubescent in lines: cauline leaves numerous; blades linear-lanceolate or lanceolate, 7–15 cm. long, acuminate, narrowed to the sessile base, glabrous or nearly so on both sides, commonly thin, sharply serrate in the middle with low teeth, or sometimes entire: heads very numerous, racemose but not secund on the branches, 10–16 mm. broad: involucre hemispheric to broadly turbinate, 4–6 mm. high; bracts linear, acute, appressed, green-tipped, imbricate in 4 or 5 series: ray-flowers numerous; ligules white or nearly so, 4–6 mm. long: pappus white: achene minutely pubescent.—Fields and swamps, various provinces, Fla. to Miss., Minn., N Y Terr., and Ont.—Late sum.–fall.

75. A. agrostifolius Burgess. Stem terete, greenish or stramineous, 6 dm. or often 8 dm. high, slender, erect or straggling, sparingly but widely branched: leaves grass-like, dull-green above and beneath; blades very thin, chiefly entire, linear-acuminate, tapering to the sessile base and especially to the apex, 10 cm. or even 15 cm. long, by 1 cm. wide; some lower cauline leaves become broader, lanceolate or oblong and slightly appressed-serrulate; axils generally corrigiate or occupied by two little divaricate branch-leaves: heads very small and pale, about 1.5 cm. broad: bracts of the involucre linear-acuminate, very pale, with narrow linear green tips: ligules of the rays whitish.—Low grounds under light shade and about copse-borders, Coastal Plain and adj. provinces, Fla. to Ark., and S E Mass.; also river banks, Knoxville, in the Appalachian valley of Tenn.—Fall.

76. A. pinifolius Alexander. Stem 6–12 dm. tall, glabrous or sparingly pubescent, with more or less erect branches: leaf-blades linear to subulate, glabrous, sessile; those of the lower leaves narrowly linear, entire or sparingly hack-serrate; those of the upper linear-subulate, the rameals subulate: heads few or many, paniculate: involucre campanulate-turbinate to turbinate; bracts linear, acutish, the inner 5–7 mm. long: ligules of the ray 7–11 mm. long, pale-violet: pappus cream-color: achene finely pubescent.—Moist soil, Fla.—Fall.–wint.—A variable species which may contain one or more distinct species.

77. A. ramosissimus Mill. Stem 3–9 dm. tall, usually glabrous, paniculately branched, usually bushy, the branches racemose, and the branchlets often somewhat secund: leaf-blades firm or rigid; those of the basal leaves spatulate, obtuse, dentate, narrowed into margined petioles, glabrous or ciliate; those of the cauline leaves narrowly linear, acute, entire, 2–7 cm. long, those of the branches linear-subulate, numerous: heads usually very numerous, 8–12 mm. broad: involucre campanulate to hemispheric; bracts coriaceous, closely appressed, lanceolate or linear-lanceolate, abruptly acute or acuminate, green-tipped, imbricate in about 3 series: ray-flowers 15–25; ligules white or purplish-tinged: pappus white: achene finely pubescent. [*A. ericoides* (Fl. SE. U. S.)].—(SPRAY-ASTER.)—Dry soil, various provinces, Fla. to Miss., Wis., Ont., and Me.—Fall.–wint.

78. A. pilosus Willd. Stem up to 1 m. tall, pubescent, very much branched and bushy, the branchlets somewhat secund: leaf-blades firm, typically with long scattered hairs on both surfaces; those of the basal leaves spatulate or oblanceolate, obtuse, somewhat dentate, pubescent; those of the cauline leaves linear to elliptic, acute, entire, 2–8 cm. long; those of the branches linear to narrowly elliptic: heads typically numerous, 10–15 mm. broad: involucre campanulate to hemispheric; bracts linear to linear-lanceolate, with coriaceous,

acuminate, green tips: ray-flowers with ligules typically white, but sometimes pink or purplish-tinged: pappus white: achene pubescent. [*A. ericoides pilosus* (Willd.) Porter, *A. ericoides villosus* (Michx.) T. & G., *A. ericoides platyphyllus* T. & G.]—Dry soil, various provinces, Ga. to Miss., Mo., Ia., and Pa.

79. **A. juniperinus** Burgess. Stem robust, brittle, glabrous, pale brown, about 6 dm. high, the branches numerous, prolonged, chiefly horizontal and parallel, sometimes 4 dm. long: cauline leaves dull-green; blades thin, linear-acuminate, 10 x 1 cm.; rameal and ramular leaves subulate and all nearly alike, wide-spreading, juniper-like, greatly reduced and very numerous and crowded, diminishing rapidly on the elongate pedicels and passing insensibly into the small spreading green outer bracts of the broad hemispherical head; the other bracts longer and broader, linear with triangular-acuminate summit, coriaceous and very smooth, bright-white except the broadly deltoid, sharp-angled, green tip: heads small: ligules of the ray white: disk turning reddish-brown.—Loose sandy soil, in sunny places, various provinces, Ala. to Md.—Late sum.–fall.—Unlike *A. Faxoni* in its tendency to divaricate, not corymbose, branching. Unlike its congener *A. ramosissimus* in its numerous heads solitary on long branches or branchlets.

80. **A. Faxoni** Porter. Stem 6–15 dm. high, glabrous throughout, paniculately or corymbosely branched, rather stout: cauline leaves various; blades lanceolate or linear-lanceolate, 5–12 cm. long, acute or acuminate, narrowed to a sessile base or those of the lower ones into margined petioles, entire or nearly so, firm, those of the branches gradually smaller: basal leaves with elliptic to spatulate, obtuse, dentate blades: heads 12–18 mm. broad: involucre hemispheric, nearly 8 mm. high; bracts linear-lanceolate, acute or subulate, green-tipped or green on the back, imbricate in about 3 series, the outer shorter: ray-flowers numerous; ligules bright-white, 6–8 mm. long: pappus white: achene minutely pubescent.—Rocky river banks, and moist cliffs, Blue Ridge and more N provinces, Ala. to Wis., Vt., and Mass.—Late sum.–fall.—*A. ericoides Reevesii* A. Gray is probably best considered as the southern form of this species.

81. **A. Priceae** Britton. Stem 3–7 dm. high, pubescent, widely branched: basal leaves with oblanceolate obtuse or acutish entire petioled blades, 3–7 cm. long, the petioles ciliate, broad: cauline leaves relatively few; blades linear-lanceolate, sessile, ciliate, acuminate, 2–5 cm. long, those of the branches similar but smaller: involucre nearly hemispheric, about 6 mm. high; bracts linear, the outer gradually acuminate, green, the inner a little broader, abruptly acuminate, acute, or obtusish: heads about 2.5 cm. broad: ray-flowers numerous; ligules bright crimson-purple or pink.—Dry soil, Blue Ridge to Appalachian Plateau, N. C. to Ky.—Fall.

82. **A. dumosus** L. Stem 3–9 dm. high, glabrous or very nearly so throughout, paniculately much-branched: leaf-blades firm, those of the stem linear or linear-lanceolate, 2–7 cm. long, entire, acute or obtusish, roughly margined, often reflexed, those of the branches very numerous, small and scale-like, those of the basal leaves spatulate, dentate: heads 8–14 mm. broad, terminating the usually divergent slender branches and branchlets, usually numerous: involucre broadly campanulate; bracts linear-subulate, appressed, imbricate in about four series, obtuse in type, with green spatulate tips tapered at their apex: ray-flowers 15–30; ligules white (rarely pale-pink or pale-violet), 4 mm. long: pappus white: achene minutely pubescent.—Sandy woods or swamps, often acid, various provinces, Fla. to La., Mo., Ont., and Me.—Late sum.–fall.—The following forms may be distinguished: *A. dumosus subulaefolius*, more rigid and long straggling branches: heads somewhat larger: rameal leaves with linear blades subulate at the apex, rigid and sharp, even pungent, erect or slightly spreading: bracts acute, their narrow green bracts lanceolate to spatulate,

ranging in pinelands and copse borders from Fla. to Tex. and S. C.: *A. dumosus strictior,* with few ascending branches often aggregated above: leaf-blades acuminate and entire, ranges in moist thickets from Tenn. to Mass.

83. A. coridifolius Michx. Resembles *A. dumosus,* but the stem more rigid, diffusely decompound with slender flagellate branches and branchlets; cauline leaves as in *A. dumosus;* rameal and ramular leaves uniform, and minute, greatly and abruptly reduced from the cauline, spreading or divaricate or reflexed, linear, usually not over 1 cm. long, very numerous, crowded and bract-like, giving the plant its characteristic aspect: heads small, many of them solitary on prolonged branchlets: bracts of the involucre more rigid, obtusish, their tips broad-spatulate, rounded and then apiculate.—Pinelands and sandy barrens, Coastal Plain and adj. provinces, Fla. to La. and Mass.—Sum.–fall.

84. A. gracilipes (Wiegand) Alexander. Stem 3–8 dm. tall, glabrous or nearly so, with erect-spreading branches and branchlets: leaf-blades firm, those of the stem narrowly linear, 2–15 cm. long, entire and rough-margined, the margins usually inrolled, those of the long, spreading branchlets not very numerous, but short, erect or appressed, acute or acutish, those of the basal leaves spatulate, often sparingly dentate: heads 10–15 mm. broad, solitary at the ends of the long branchlets, fairly numerous: involucre broadly campanulate; bracts linear-spatulate, appressed, acute or acutish with spatulate green tips: ray-flowers 14–20; ligules white, or rarely pale-violet or pinkish, 5–7 mm. long: pappus stramineous: achene sparingly pubescent or nearly glabrous. [*A. dumosus gracilipes* Wiegand].—Pinelands, sandy barrens, and moist places, Fla. (to La.?).—Fall.

85. A. ericoides L. Stem 3–20 dm. high, strict, much branched and bushy, the branches ascending or spreading: leaf-blades rigid, linear, entire, mostly obtuse, sessile or slightly clasping at the base, strigose or glabrate, those of the cauline leaves 1–2.5 cm. long; those of the branches very small and crowded: heads 6–8 mm. broad, densely crowded, nearly sessile: involucre turbinate, 4–6 mm. high; bracts coriaceous, pubescent, in 3 or 4 series, their short green tips obtuse or mucronate, spreading: ray-flowers 10–20; ligules white, 3–4 mm. long: pappus becoming brownish-white: achene puberulent. [*A. multiflorus* Ait.].—Dry, open places, various provinces, Ga. to Tex., S. Dak., Ont., and Me.—Late sum.–fall.

86. A. brachypholis Small. Stem 5–6 dm. high, finely pubescent especially above, with few, spreading branches: leaf-blades thin and fragile, as is the entire plant: those of the stem linear, fairly numerous, 2–7 cm. long, blades entire, those of the branchlets exceedingly numerous, mostly reflexed, acute, those of the basal leaves narrowly elliptic-spatulate, dentate: heads 8–10 mm. broad, secund on long, spreading branches, numerous: involucre narrowly campanulate: bracts linear, very short (no longer than the achenes), 0.5–1 mm. long, obtuse, ciliate, without green tips: ray-flowers about 12: ligules white or whitish, 3–4 mm. long: disk-flowers becoming purple: pappus white: achene elliptic, pubescent, about 1 mm. long.—Wooded slopes, often on damp rocks, Apalachicola River bluffs, Fla.—Fall.

87. A. racemosus Ell. Stem apparently tall, somewhat scabrous-pubescent on the ascending rather slender branches: leaves firm; blades linear or nearly so, relatively small, acute, the upper entire: heads not very numerous, racemosely or spicately disposed, rather crowded toward the ends of the branches, distant below: involucre about 4 mm. high; bracts firm, subulate to narrowly linear, acuminate: ray-flowers few; ligules purplish, 2–3 mm. long: achene minutely pubescent.—Beaches and sandy woods, Coastal Plain, Fla. to La. and S. C.—Sum.–fall.

88. **A. vimineus** Lam. Stem 6–15 dm. high, glabrous or nearly so, slender, divergently branched: cauline leaves linear-acuminate, 7–12 cm. long, regularly minutely hack-serrate, slightly narrowed at the sessile base, those of the branches much smaller: heads very numerous, 6–10 mm. broad, generally densely racemose-secund, short-peduncled: involucre broadly turbinate; bracts linear, acute or acutish, green-tipped, appressed: ray-flowers numerous: ligules about 4 mm. long, narrowly linear, white, often roseate in fading: pappus white: achene minutely pubescent.—Moist soil, various provinces, Fla. to Ark., Kans., Minn., and Mass.—Late sum.–fall.

89. **A. lateriflorus** (L.) Britton. Stem 3–15 dm. tall, puberulent or nearly glabrous, slender, divergently branched, often bushy: basal leaves few; blades ovate, short-petioled; cauline leaves numerous; blades broadly lanceolate or elliptic-lanceolate, 5–12 cm. long, mostly acuminate, serrate, those of the branches smaller, elliptic or linear-elliptic: heads 6–10 mm. broad, racemosely unilateral on the branches, short-peduncled or sessile, usually numerous and crowded: involucre turbinate; bracts linear-elliptic, obtuse or acutish, imbricate in about 4 series, their short green tips appressed or slightly spreading: ray-flowers numerous; ligules short, whitish or pale-purple, rounded at the apex: disk-flowers purple: pappus white: achene minutely pubescent. [*A. diffusus* Ait.]—Dry or moist soil, various provinces, Ala. to Tex., Ark., Ont., N. S., and N. C.—Late sum.–fall.—The following forms may be distinguished: *A. lateriflorus glomeratus*, with the stem chiefly unbranched: leaves hispidulous above, the blades elliptic-lanceolate, dull green, with sharp straight teeth: heads glomerate in the axils or spicate above, or scattered on short branches, ranges in woodlands, from N. C. to N. Y.: *A. lateriflorus thyrsoideus* with ashy-puberulent ascending branches which bear crowded or thyrsoid-paniculate heads: leaf-blades ovate to lanceolate, ranges in open thickets from Tenn. to Ill., Ont., and N. Y.: *A. lateriflorus horizontalis*, with long divaricate branches: leaves firm succulent, those of the branches very small, mostly entire: heads very numerous, ranges from Va. to Ark., and S N. Y.: *A. lateriflorus pendulus*, with long slender, horizontal or drooping branches and drooping leaves, the blades narrowly linear-elliptic, remotely appressed-serrulate: heads long-peduncled, ranges in thickets from Ala. to N. C. and N. Y.

90. **A. hirsuticaulis** Lindl. Stem 4–9 dm. tall, slender, erect, pubescent, nearly or quite to the base; branches usually short spreading or ascending: leaf blades thin, glabrous above, usually densely pubescent on the midvein beneath, serrate with a few appressed teeth, or entire, of linear type, sometimes 15 cm. long, sessile or the basal ones spatulate and petioled: heads more or less secund on the branches, chiefly loosely clustered, often also solitary or few in the lower axils: involucre narrow; bracts in 3 or 4 series, linear-lanceolate, acuminate or acute: ray-flowers several; ligules white, about 4 mm. long, narrow.—Woods and thickets, various provinces N of Coastal Plain, Tenn. to Pa. and Me.—Late sum.–fall.—Unlike *A. lateriflorus* in its hirsute stem and its long linear straight-sided leaf-blades which are hirsute on the midrib beneath.

91. **A. ptarmicoides** (Nees) T. & G. Stem tufted, 3–6 dm. high, slender, rigid, usually rough above, corymbosely branched near the summit: leaf-blades linear-lanceolate, 3-ribbed, entire, or with a few distant teeth, firm, shining, rough-margined or ciliate, sometimes scabrous, acute, narrowed to a sessile base, or those of the lower leaves petioled; the lowest and basal ones 7–15 cm. long, the upper smaller, those of the branches linear subulate: heads 16–25 mm. broad, terminating the branches of the corymb: involucre nearly hemispheric, 4–6 mm. high; bracts linear-oblong, obtuse, appressed, nearly green, imbricated in about 4 series: ray-flowers 10–20; ligules snow-white, narrow, 6 mm. long: pappus white, achene glabrous.—Dry or rocky soil, various provinces, Ga. to Ark., Colo., N W Terr., Ont., and Mass.—Sum.–fall.—Remarkable among asters for

its profuse linear shining, rough-edged leaf-blades and small level-topped white heads.—A usually taller form from Ga. and Ark., with lower leaves 15–18 cm. long, and often denticulate, and smaller heads, is *A. ptarmicoides georgianus.*

92. **A. acuminatus** Michx. Stem 3–9 dm. high, pubescent or puberulent zigzag, corymbosely branched, often leafless below: leaf-blades thin, broadly oblong or elliptic, 7–15 cm. long, acuminate at the apex, narrowed to a cuneate sessile base, sharply and coarsely dentate, strongly pinnately veined, glabrous or pubescent above, pubescent at least on the veins beneath, in low shaded plants often approximate above, and appearing whorled: heads several or numerous, 25–37 mm. broad: involucre nearly hemispheric; bracts subulate-linear, acuminate, the outer much shorter: ray-flowers 12–18; ligules narrow, 12–16 mm. long, white or slightly purplish: pappus copious, soft and fine, very white: achene pubescent.—Moist woods, often in acid soil, Blue Ridge and more N provinces, Ga. to Ont. and Lab.—Sum.–fall.—Remarkable for its soft-pubescent, limp subviscid leaves and its decurved buds becoming erect and fragrant in flower. The rootstocks are very slender.

93. **A. paludosus** Ait. Stem 3–7 dm. tall, roughish or rough-pubescent, especially above, slender, virgate and simple, or somewhat branched above, pale or purplish: leaf-blades linear-acuminate or nearly so, 5–15 cm. long, entire or sparingly hack-serrate, glabrous or nearly so, rather rigid, mostly 1-veined, acute, the lower part either narrowed and sheathing or somewhat auriculate, the margins rough or ciliate: heads few or several, paniculate, 3–5 cm. broad: involucre broadly campanulate; bracts imbricate in about 3–4 series, ciliate and pubescent, the upper half more or less foliaceous; the inner bracts very thin, varying from linear to spatulate, sometimes on the same plant; the outer bracts lanceolate, acute, usually exceeding the inner, often thickened-subulate at the tip: ray-flowers 20–30; ligules deep blue-violet, 10–15 mm. long: pappus tawny: achene glabrous or nearly so.—Moist, sandy soil, Coastal Plain and Piedmont, Ga. to N. C.—Fall.

94. **A. pedionomus** Alexander. Stem 3–8 dm. (rarely 1 m.) tall, from a woody corm-like rootstock, glabrous or sparingly short-pubescent above, slender and simple, but branched above, pale or purplish: leaf-blades linear to narrowly elliptic, glabrous, scabrate-margined, rigid, mostly 1-veined, acute, but slightly narrowed at the sessile or sheathing base: heads few or several, paniculate, 3.5 cm. broad: involucre nearly hemispheric; bracts imbricate in several series, the upper half squarrose, somewhat leathery in texture, the outer very long and linear-lanceolate, the inner linear or slightly spatulate: ray-flowers 20–30; ligules deep-violet, 10–20 mm. long: pappus tawny: achene somewhat pubescent. —Hard, dry soil, prairies, hillsides and woods, various provinces, Fla. and Ga. to Tex., Kans., and Tenn.—Fall.

95. **A. Gattingeri** Alexander. Stem 3–6 dm. tall, from a woody corm-like rootstock, glabrous, or sparingly short-pubescent above, slender and simple, pale or purplish: leaf-blades linear, 4–12 cm. long, entire, glabrous, scabrate margined, rather rigid, 1-veined, acute, narrowed to a sheathing base: heads sessile or short-peduncled, in a racemiform inflorescence, 3–4 cm. broad: involucre nearly hemispheric; bracts imbricate in 4–5 series, the tips spreading scabrous-ciliolate, the outer foliaceous above, somewhat shorter than the inner, the inner very thin, purple tipped, as wide as the outer: ray-flowers 20–30; ligules violet, 10–12 mm. long: pappus tawny: achene slightly pubescent.—Dry, sandy soil, Coastal Plain and adj. provinces, Ala., and Miss. to Tenn.—Early fall.

96. **A. hemisphericus** Alexander. Stem 1–7 dm. tall, from a long-stoloniferous, wiry or woody rootstock, which usually forms colonies; glabrous, or sparsely pubescent above; slender, simple or sometimes branched in the inflorescence,

pale or purplish: leaf-blades linear, linear-elliptic or oblanceolate, usually scabrate on both sides, the margin especially so, acute, somewhat narrowed to a half-clasping base: heads few to several, somewhat racemiform (rarely spiciform or racemo-paniculiform), 3–6 cm. broad: involucre hemispheric or nearly so; bracts imbricate in several to many series, only the tips spreading, leathery or foliaceous, the inner much the longer, each outer series gradually becoming shorter, the outermost linear, acute, the remainder abruptly acute, the innermost very narrow: ray-flowers 15–30; ligules blue-violet or violet, 15–25 mm. long: pappus tawny: achenes somewhat pubescent.—Dry soil, hillsides, woods and prairies, various provinces, Ala. to Tex., Kans., and Mo.—Fall.—Markedly distinct from *A. pedionomus* in its gregarious habit.

97. A. verutifolius Alexander. Stem up to 9 dm. tall, glabrous or nearly so, slender and sparingly branched, purplish: leaf-blades most unusual for an *Aster*, with a triangular, half-sheathing base, abruptly contracted to a nearly filiform, rapier-shaped blade, 8–10 cm. long, or longer, glabrous, entire, not very rigid: heads principally on long peduncles in a loose panicle whose branches begin far down the stem, with a few short-peduncled heads in the leaf-axils, 3–4 cm broad: involucre nearly hemispheric; bracts imbricate in about 5 series, scabrose-ciliolate, the outer narrowly linear-acuminate from a broad base, the inner rather oblong or narrowly elliptic with acuminate tips: ray-flowers 20–25; ligules violet, 12–15 mm. long: pappus tawny: achene not seen mature, but probably slightly pubescent.—Moist soil near Ocean Springs, Miss.—Fall.

98. A. spinulosus Chapm. Plant nearly or quite smooth to the touch, and almost without hair: stem pale, slender, 5–6 dm. high, from a short erect tuberous rootstock shaggy with marcescent leaf-bases: basal leaves tufted, very numerous, long and slender, linear and attenuate below, often 3 dm. long, with occasional long slender teeth; stem-leaves bract-like, erect, 4 cm. long or commonly half that: axile leaves upcurved, stiff and pungent: heads sessile and subremote in the upper axils, each subtended by an upturned carinate pungent involucral leaf: ligules of the ray violet, little over 1 cm. long, broader, the disk-flowers fewer and the bracts paler-margined than in *A. paludosus*, which this otherwise resembles: pappus tawny, becoming ferruginous.—Wet pinelands, Apalachicola River region, N Fla.—Sum.—Unlike *A. paludosus* in its smaller spicate heads, longer narrower basal leaves, more pungent upper cauline leaves and less conspicuous teeth.

99. A. eryngiifolius T. & G. Plant nearly smooth to the touch, sparsely villous above: rootstock tuberous-thickened: stem rigid, erect, 3–7 dm. high, unbranched, with one terminal head or sometimes several large heads closely approximate: leaves grass-like, linear-acute with narrowed base, the numerous basal leaves spreading chiefly 1 dm. long or less, the others soon reduced to one-third the length, suberect, subulate-linear, sessile and bract-like; both set below the middle with long slender subremote subulate teeth: involucre broadly hemispheric; bracts nearly of the same length but of many series, linear-subulate, flat, and appressed, the upper third slender, bristle-like and spreading: ligules of the ray 3 cm. long, tapering below, light violet, blue or white: disk-flowers very numerous: pappus becoming ferruginous in the herbarium: alveolae deep and pronounced.—Low pinelands, M Fla., and adj. Ga.—Sum.

100. A. Bracei Britton. Plant perennial: stem rather wiry, 2–9 dm. tall: upper leaves more or less spreading; blades narrowly linear to linear-subulate: heads corymbose: involucre campanulate-turbinate; bracts stout, the inner ones not reaching to the top of the disk—Low hammocks, Florida Keys.—Fall to Spr.—(*W. I.*)

101. A. Chapmanii T. & G. Plant perennial: stem rigid, arising from a short caudex, glabrous, usually with few slender or nearly filiform branches above: leaves mainly crowded on the caudex, 1–3 dm. long, glabrous, the linear or linear-spatulate blades longer or shorter than the slender petiole-like base, entire, obscurely veined in drying; lower cauline-leaves nearly like the basal, the upper gradually reduced to subulate-filiform erect scales, and subulate on the branches: heads few, solitary at the ends of the branches; involucre campanulate, 7–8 mm. high; bracts firm, elliptic-lanceolate to broadly linear and linear-oblanceolate, erect, acute, sometimes abruptly pointed: ray-flowers numerous; ligules 1.5–2 cm. long, violet: achene glabrous.—Pineland swamps, Apalachicola River region, N Fla. and fare in peninsular Fla.—Fall.

102. A. tenuifolius L. Plant perennial, glabrous and fleshy. Stem 3–6 dm. tall, flexuous, striate, at least when dry, sparingly and loosely branched: cauline leaves linear, 5–15 cm. long, entire, sessile, or slightly clasping at the base, the lowest lanceolate-linear, those of the branches minute, scale-like, appressed: heads rather few, 12–25 mm. broad, terminating the branches: involucre turbinate, about 8 mm. high; bracts lanceolate, acuminate or mucronate, glabrous, green on the back or tips, appressed, imbricate in about 5 series, the outer shorter: ray-flowers numerous; ligules longer than the pappus, pale-purple or nearly white: pappus tawny; achene hispid-pubescent, 5-nerved.—Salt marshes, coast of Fla. to Miss. and Mass.—Sum.–fall.

103. A. exilis Ell. Plant annual, glabrous, fleshy: stem 3–12 dm. tall, slender, usually much-branched, the branches usually divergent: cauline leaves linear to linear-lanceolate, 2–10 cm. long, entire, sessile, acute or acuminate, or the lower narrowly elliptic, 6–8 mm. wide, usually petioled, those of the branches subulate: heads numerous, panicled, about 1 cm. broad: involucre campanulate, about 6 mm. high; bracts linear-subulate, appressed, imbricate in 3 or 4 series: ray-flowers mostly fewer than those of the disk; ligules purplish, about 4 mm. long, longer than the pappus: achene somewhat pubescent.—Moist or wet soil, especially in saline situations, various provinces, Fla. to Tex., Kans., and S. C.—Sum.–fall.

104. A. inconspicuus Less. Plant annual, glabrous or obscurely glandular in the inflorescence: stem mostly 1 m. tall or less, rather copiously branched above, the stem and branches flexuous: cauline leaves mostly 1–1.5 dm. long; blades elliptic or nearly so, varying to broadest above or below the middle, acute, shallowly toothed, those of the branches much narrower: heads much smaller than those of *A. exilis* and *A. subulatus:* involucre campanulate, 3.5–5 mm. high; bracts linear-lanceolate to narrowly linear: ray-flowers 20–30, more numerous than the disk-flowers; ligules mostly pale-lilac, about 2 mm. long.—Edges of hammocks or salt-marshes, Key West, Fla.—(*W. I.*)—Fall–wint.—Differs from *A. exilis* in the numerous ray-flowers with small ligules and from *A. subulatus* in the broad toothed blades of the cauline leaves.

105. A. subulatus Michx. Plant annual, glabrous and fleshy: stem 3–18 dm. tall, paniculately branched, flexuous above, slightly angled, sometimes 25 mm. in diameter at the base, but usually smaller: cauline leaves linear-lanceolate, 5–8 cm. long, acute, entire, sessile by a broad or slightly clasping base, those of the branches very small and subulate: heads numerous, 6–10 mm. broad: involucre cylindric to narrowly turbinate, 4–6 mm. high; bracts linear-subulate, green, imbricate in 3 or 4 series, the outer shorter: ray-flowers 20–30, more numerous than the disk-flowers; ligules purplish, scarcely exceeding the nearly white, soft, copious pappus: achene compressed, minutely pubescent.—Salt marshes, coast of Fla. to Ala., and N. H.—Sum.–fall.

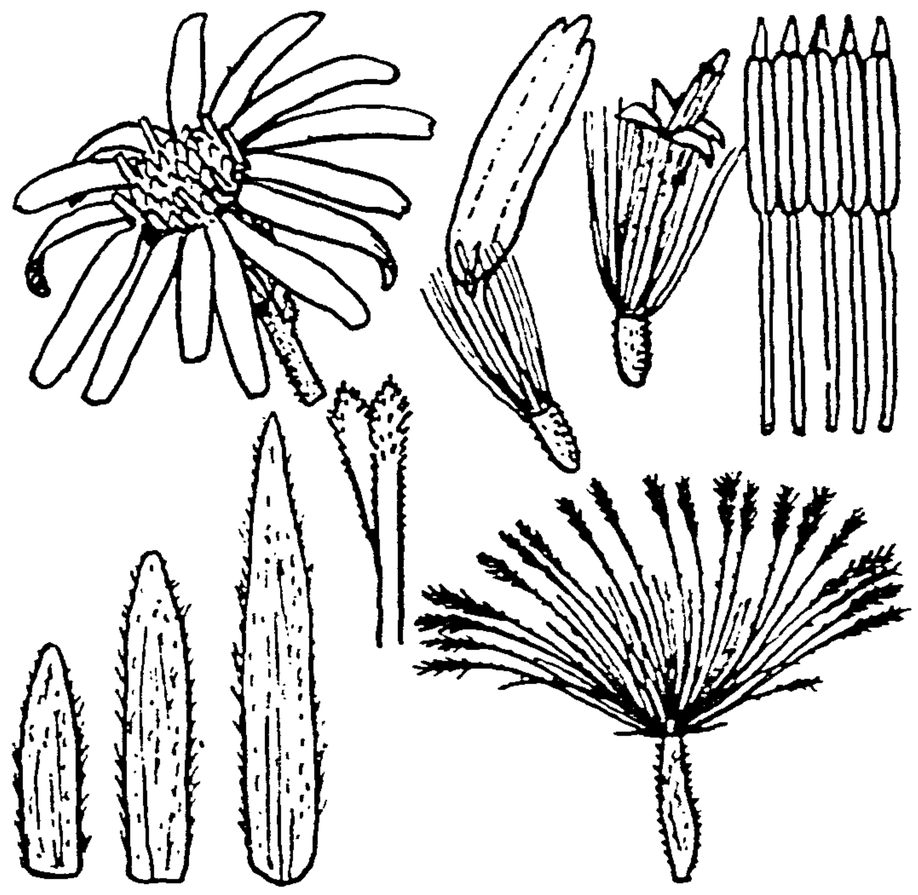
106. A. spinosus Benth. Stem woody at the base, divided into striate pliable bright-green branches, 1–2.5 m. tall, these branches paniculate: leaves incon-

spicuous, those of the main branches linear or linear-spatulate, mainly 2–4 cm. long, those of the branchlets reduced to subulate scales or obsolete, all or some of them with soft subulate spines in or above their axils: heads scattered: involucre turbinate, 4–4.5 mm. high; bracts lanceolate-subulate, attenuate: ray-flowers few; ligules about 4 mm. long, white: achene glabrous.—Sand flats, river valleys and moist soil, various provinces, La. to Tex., and Calif.—Late sum.–wint.—(*Mex.*)

39. **DOELLINGERIA** Nees. Perennial, relatively tall, aster-like herbs. Leaves alternate: blades relatively broad, veiny, entire or nearly so. Heads in a terminal corymb. Involucres campanulate to hemispheric, several–many-flowered: bracts various, the inner scarcely wider than the outer but much longer. Ray-flowers few or several: corollas with a long tube and a white or cream-colored ligule. Disk-corollas with a funnelform throat and a long tube: lobes lanceolate. Pappus of 2 distinct series, the outer series of short bristles or scales, the inner of elongate capillary bristles.—About 5 species, eastern North American.—WHITE-TOPPED ASTERS.

Ray-flowers with linear ligules over 10 mm. long: inner bracts of the involucre acuminate. 1. *D. reticulata.*
Ray-flowers with oblong ligules less than 10 mm. long: inner bracts of the involucre merely acute or obtuse.
  Achene nearly terete, ribless, less than 1 mm. wide.
    Involucral bracts acute or acutish, the inner linear, ciliate at the tip. 2. *D. umbellata.*
    Involucral bracts obtuse, the inner elliptic, eciliate. 3. *D. humilis.*
  Achene much flattened, ribbed, over 1 mm. wide. 4. *D. infirma.*

1. D. reticulata (Pursh) Greene. Stem 3–12 dm. tall, fastigiate-corymbose above: blades of the upper leaves elliptic to obovate, obtuse or merely acutish, reticulate: inner bracts of the involucre 6–7 mm. long. [*Aster reticulatus* Pursh.]—Low pinelands, Coastal Plain, Fla. to S. C.—Spr.–sum.

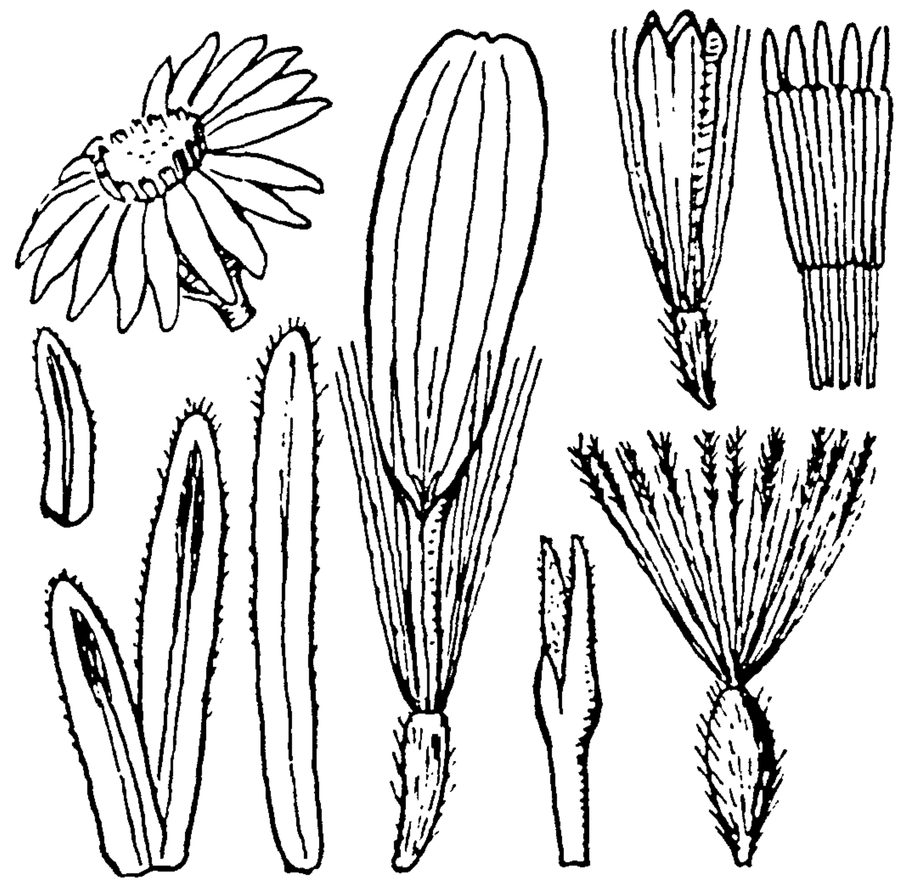


2. D. umbellata (Mill.) Nees. Stem 6–25 dm. tall, corymbose above: blades of the upper leaves membranous, elliptic, usually narrowly so, or linear-lanceolate, usually acuminate: inner bracts of the involucre 3–4 mm. long: pappus soft. [*Aster umbellatus* Mill.]—Shaded banks and in thickets, various provinces, Ga. to Ia., Sask., and Newf.—Sum.–fall.

3. D. humilis (Willd.) Britton. Similar to *D. umbellata* in habit, but more stocky: blades of the upper leaves shorter, firm, elliptic, ovate, or oval, acute: inner bracts of the involucre 4–5 mm. long: pappus soft. [*Aster amygdalinus* T. & G.]—Stream-banks and acid swamps, Coastal Plain and adj. provinces, Fla. to Tex., Pa., and N. J.—Sum.–fall.

4. D. infirma (Michx.) Greene. Stem 4–12 dm. tall, often widely branched: blades of the upper leaves elliptic to oval, varying to broadest above or below the middle, short-acuminate: inner bracts of the involucre 3–4 mm. long: disk-corollas 3–4 mm. long: pappus rigid. [*Aster infirmus* Michx.]—Dry woods and banks, various provinces, rarely Coastal Plain, La. to Ala., Tenn., and Mass.—Sum.–fall.

40. **IONACTIS** Greene. Perennial, low, rigid, widely creeping herbs. Leaves alternate: blades narrow, entire. Heads few in a corymb or rarely solitary, conspicuously radiate. Involucres campanulate to turbinate, many-flowered: bracts narrow, the inner ones several times longer than the outer. Ray-flowers several, with bright-colored elongate ligules. Disk-corollas yellow, with a slender tube and a longer funnelform throat, the lobes deltoid. Pappus of slender bristles in 2 indistinct series, the outer bristles the shorter.—Three species, North American.



1. **I. linariifolius** (L.) Greene. Stems tufted, 1.5–6 dm. tall, rough-pubescent: leaf-blades linear-spatulate to linear, 1.5–3 cm. long, scabrous-margined: inner bracts of the involucre narrowly linear, 6–8 mm. long: ligules bright-violet or rarely white, 8–15 mm. long. [*Aster linariifolius* L.]—Exposed hillsides, dry acid woods, sand-plains, and pinelands, various provinces, Fla. to Tex., Minn., and Me.—Sum.–fall.

41. **ERIGERON** L. Annual, biennial, or perennial, caulescent, aster-like herbs. Leaves alternate, sometimes mostly basal: blades entire or toothed. Heads solitary or numerous, conspicuously radiate. Involucres broad, many-flowered: bracts narrow, the inner broader than the outer ones. Ray-flowers numerous: corollas with a slender tube and a narrow pink, violet, purple, or white ligule. Disk-corollas with a funnelform throat and a usually shorter tube: lobes deltoid. Anthers usually as long as the filaments. Stigma short. Pappus of numerous capillary bristles or bristles and scales.—About 130 species, widely distributed, but most abundant in America.—FLEABANES.

Plant perennial often with rosulate offsets; pappus single.	
Heads with 30 ray-flowers or fewer: stem scape-like.	I. VERNI.
Heads with 50 ray-flowers or more: stem leafy.	
Ray-flowers less than 75; ligules narrowly linear.	II. PULCHELLI.
Ray-flowers over 100; ligules linear-filiform.	III. PHILADELPHICI.
Plant annual or biennial: pappus double.	IV. ANNUI.

I. VERNI

Plant glabrous, with a corymb terminating the scape.	1. *E. vernus.*

II. PULCHELLI

Plant pubescent, with one or several large heads terminating the stem.	2. *E. pulchellus.*

III. PHILADELPHICI

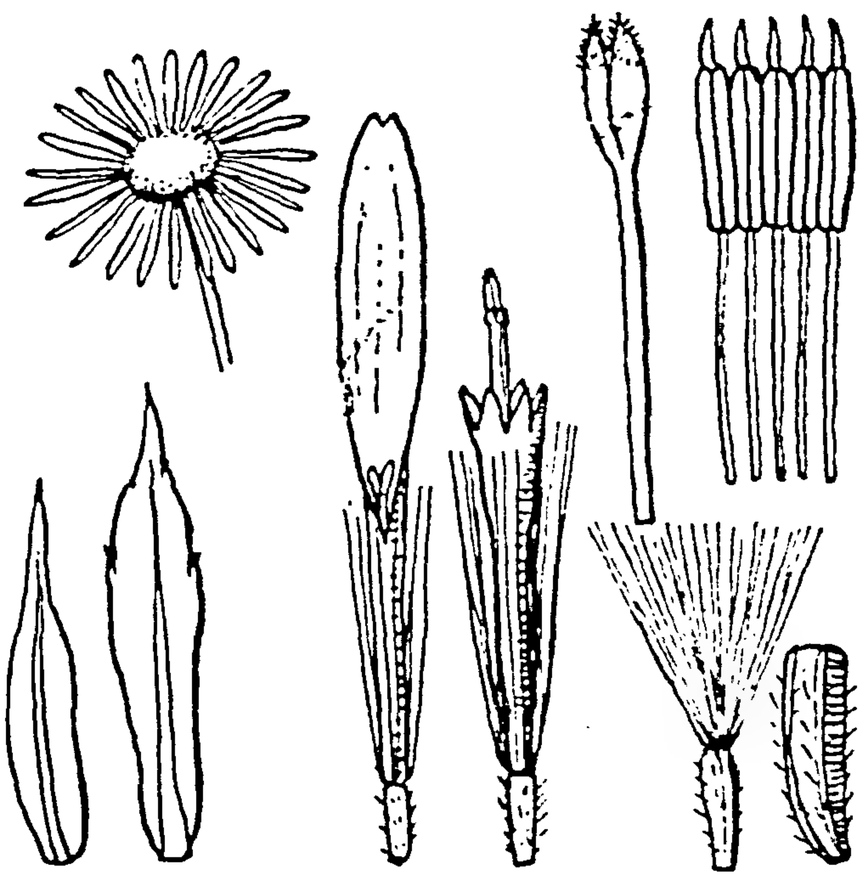
Longer involucral bracts less than 4 mm. long: ligules of the ray-flowers less than 5 mm. long.	3. *E. quercifolius.*
Longer involucral bracts over 4 mm. long: ligules of the ray-flowers over 5 mm. long.	4. *E. philadelphicus.*

IV. ANNUI

Upper stem-leaves with sharply toothed blades: ray-flowers with pink, or rarely purplish or white ligules.	5. *E. annuus.*
Upper stem-leaves with entire blades: ray-flowers with white or rarely pale pink ligules.	6. *E. ramosus.*

1. **E. vernus** (L.) T. & G. Stem 1–6 dm. tall, glabrous or nearly so: blades of the basal leaves spatulate, elliptic or oval: ray-flowers 20–30, white or

pink. [*E. nudicaulis* Michx.]—Moist pinelands and shallow ponds, Coastal Plain, Fla. to La. and Va.—Spr.–sum.



2. E. pulchellus Michx. Stem 1–5 dm. tall, villous or hirsute-villous: blades of the basal leaves obovate, spatulate or elliptic: outer bracts of the involucre finely pubescent; inner bracts acuminate, 5–5.5 mm. long: ray-flowers 50–65; ligules violet or bluish-purple: disk-corollas 4–4.5 mm. long. [*E. bellidifolius* Muhl.] — (ROBIN'S-PLANTAIN.)—Woods and banks, various provinces, Fla. to La., Ont., and N. S.—Spr.

3. E. quercifolius Lam. Stem 1–7 dm. tall, pubescent: blades of the basal leaves spatulate, oblanceolate, or oblong, pinnatifid or sinuate-pinnatifid: involucres manifestly pubescent; inner bracts prolonged into slender tips: ray-flowers numerous: disk-corollas 3.5–4 mm. long.—Pinelands, grassy banks, and open woods, Coastal Plain and adj. provinces, Fla. to Tex., Tenn., and S. C.—(*W. I.*)—Spr.–sum.

4. E. philadelphicus L. Stem 1–12 dm. tall, softly hirsute: blades of the basal leaves spatulate to oblong, coarsely toothed: outer bracts of the involucre minutely hispidulous; inner bracts acute, 2.5–3 mm. long: ray-flowers 100 or more; ligules pink or rose-purple: disk-corollas 1.5–2 mm. long.—Thickets, fields, and low pastures, various provinces, Fla. to Tex., Calif., B. C., Ont., and Lab.—Spr.–sum.

5. E. annuus (L.) Pers. Stem 3–12 dm. tall, loosely pubescent: blades of the basal leaves oval, elliptic, or lanceolate, coarsely toothed or incised: bracts of the involucre with few long hairs: ligules of the ray pink, purplish or rarely white: disk-corollas less than half the length of the larger involucral bracts.—(DAISY-FLEABANE. SWEET-SCABIOUS.)—Waste-places, in fields, and thickets, various provinces, Ga. to Miss., Mo., Man., and N. S.—(*W. I.*)—Sum.—Often a weed.

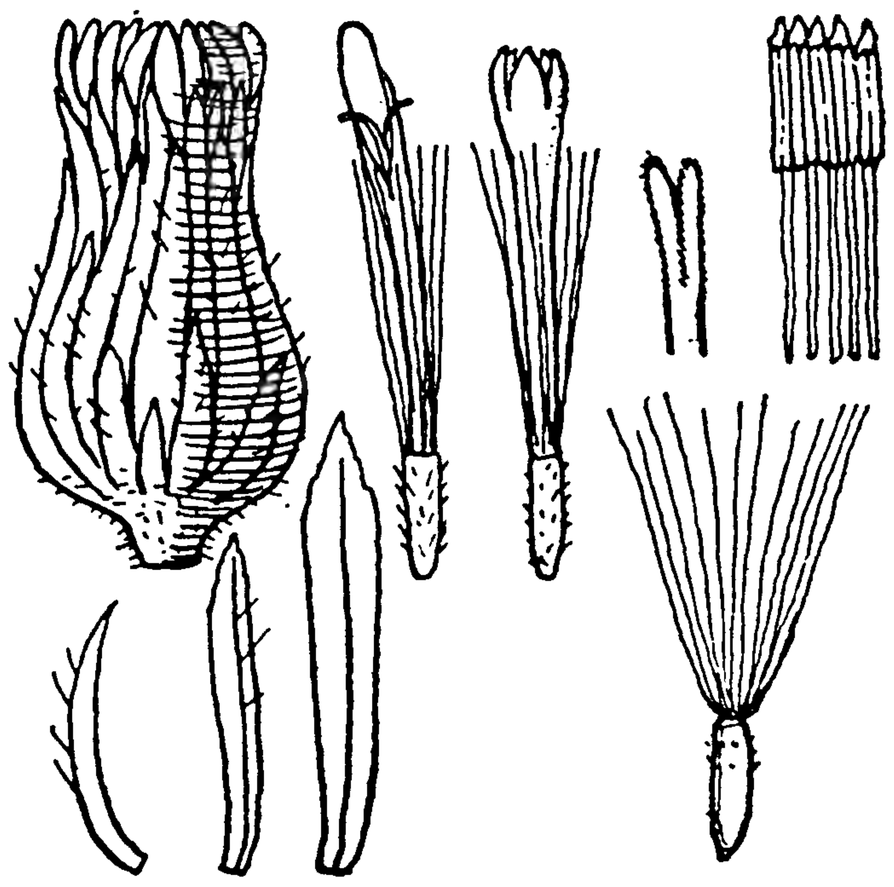
6. E. ramosus (Walt.) B.S.P. Stem elliptic, 2–10 dm. tall, appressed-pubescent: blades of the basal leaves spatulate to elliptic, shallowly toothed: bracts of the involucre with many short hairs: ligules of the ray white or rarely pale-pink: disk-corollas over half the length of the larger involucral bracts. [*E. strigosus* Muhl. *E. strigosus Beyrichii* A. Gray.]—(DAISY-FLEABANE.)—Woods, fields, and roadsides, nearly throughout N. A.—Spr.–sum.—Commonly a weed.

42. LEPTILON Raf. Annual or biennial, weedy herbs. Leaves alternate: blades narrow, entire or sparingly toothed. Heads several or numerous, inconspicuously radiate or discoid. Involucres usually campanulate or cylindric, few-flowered: bracts very narrow, the inner much longer than the outer ones. Ray-flowers few: corollas with a very slender tube and a minute ligule. Disk-corollas with a campanulate or a cylindraceous throat and a long tube: lobes deltoid. Pappus of many brittle capillary bristles in 1 series.—About 20 species, American and Asiatic.

Inner bracts of the involucre glabrous or nearly so.
  Stem usually simple below the inflorescence: ray-flowers with white ligules.
    Stem-leaves with mainly entire or merely few-toothed blades.
      Plant glabrate or hirsute: involucral bracts green throughout. 1. *L. canadense.*

Plant glabrous or nearly so: involucral bracts purple tipped. — 2. *L. pusillum.*
Stem-leaves with mainly pinnatifid or pinnatifid-toothed blades. — 3. *L. bonariense.*
Stem diffusely branched at the base: ray-flowers with purplish ligules. — 4. *L. divaricatum.*
Inner bracts of the involucre copiously pubescent. — 5. *L. linifolium.*

1. L. canadense (L.) Britton. Stem 3–20 dm. tall, paniculate above, pubescent or sparingly hirsute: leaf-blades spatulate to linear or nearly so, ciliate near the base: longer bracts of the involucre 3–3.5 mm. long: disk-corollas 2.5–3 mm. long. [*Erigeron canadensis* L.]—(HORSE-WEED. BUTTER-WEED.)—Common, fields and waste-places, nearly throughout the U. S.—Sum.–fall.



2. L. pusillum (Nutt.) Britton. Stem as in *L. canadense*, but glabrous or nearly so: leaf-blades narrowly spatulate to linear; petioles sometimes ciliate: longer bracts of the involucre 3–4 mm. long: disk-corollas 2.5–3 mm. long.—Fields, roadsides, and waste-places, Fla. to La., Tenn., and Mass.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.

3. L. bonariense (L.) Small. Similar to *L. canadense* in habit: leaf-blades finely pubescent: longer bracts of the involucre 5–6 mm. long: disk-corollas 3.5–4 mm. long.—Waste-places, Fla.—Nat. of S. Am.—Spr.–fall.

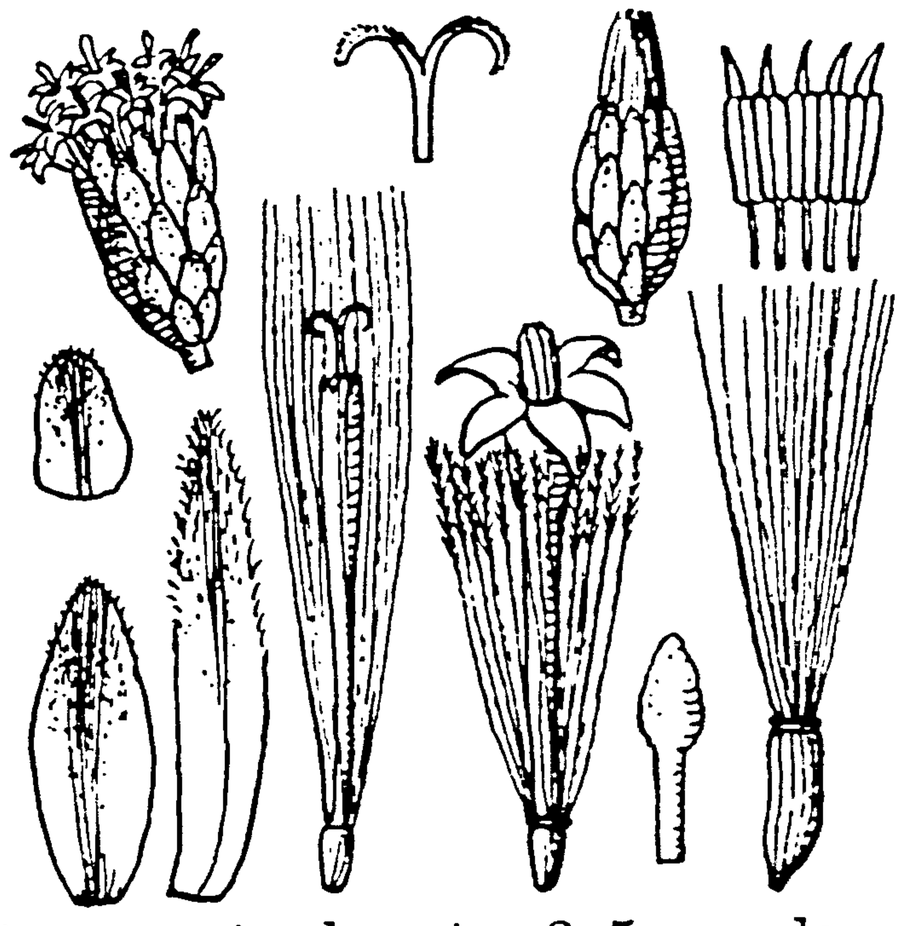
4. L. divaricatum (Michx.) Raf. Stem 1–3 dm. tall, diffuse, hirsute and somewhat cinereous: leaf-blades narrowly linear to subulate, 1–4.5 cm. long, entire: disk-corollas less than 3 mm. long. [*Erigeron divaricatus* Michx.]—Dry soil, waste-places, meadows, and fields, various provinces, Ala. to Tex., Minn., and Ill.—Sum.–fall.

5. L. linifolium (Willd.) Small. Stem racemose or paniculate above, 2–7 dm. tall, hirsute: leaf-blades narrowly spatulate to linear, 1.5–10 cm. long, those of the lower ones incised or laciniate: disk-corollas mostly over 3 mm. long. [*Erigeron linifolius* Willd.]—Waste-places, Coastal Plain, Fla. to Miss. and S. C.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall.

43. **BACCHARIS** L. Shrubs with much-branched, sometimes fastigiate stems. Leaves alternate: blades leathery, entire or toothed. Heads dioecious, often clustered, discoid. Involucres ovoid to campanulate, many-flowered: bracts of the staminate involucre smaller than those of the pistillate. Corollas greenish, various, those of the staminate with a funnelform throat and a long tube, the lobes lanceolate: those of the pistillate flowers filiform or slightly enlarged upward. Pappus of the staminate flowers shorter than that of the pistillate. Achenes nearly terete, many-ribbed, glabrous.—About 300 species, American.

Leaf-blades broadest above the middle.
Leaf-blades entire. — 1. *B. dioica.*
Leaf-blades mostly toothed.
Inner bracts of the pistillate involucres acute: heads in peduncled panicled clusters. — 2. *B. halimifolia.*
Inner bracts of the pistillate involucres obtuse: heads in sessile or nearly sessile axillary clusters. — 3. *B. glomeruliflora.*
Leaf-blades narrowly linear. — 4. *B. angustifolia.*

1. **B. dioica** Vahl. Shrub 8–25 dm. tall: leaf-blades spatulate, often broadly so, to obovate-spatulate, 1–3 cm. long: pistillate involucres with ovate-obtuse outer bracts and linear-lanceolate acuminate inner bracts: achene 1–1.5 mm. long.—Hammocks, Everglade Keys, Fla.—(*W. I.*)—All year.



2. **B. halimifolia** L. Shrub 9–40 dm. tall, resinous: leaf-blades suborbicular to elliptic or linear-elliptic, some of them, at least, coarsely toothed: pistillate involucres about 6 mm. long; inner bracts linear: achenes 1.5 mm. long.—(GROUNDSEL-TREE. SILVERLING.)—Shore-hammocks, sea-beaches, and salt-marshes, and low grounds inland, Coastal Plain and rarely adj. provinces, Fla. to Tex. and Mass.—(*W. I., Mex., C. A.*)—Sum.–fall.

3. **B. glomeruliflora** Pers. Shrub 8–30 dm. tall, barely resinous: leaf-blades spatulate to cuneate-obovate, 2–5 cm. long, often sharply toothed: pistillate involucres 5–6 mm. long; inner bracts oblong-spatulate: achene 1.5 mm. long.—Salt-marshes and swamps, Coastal Plain, Fla. to N. C. and hammocks in the interior of the Fla. peninsula.—(*W. I.*)—Fall–wint. or all year S.

4. **B. angustifolia** Michx. Shrub 5–25 dm. tall, resinous: leaf-blades narrowly linear, 1–8 cm. long, entire or nearly so: pistillate involucres 4–5 mm. long; inner bracts elliptic: achene 1–1.5 mm. long.—(FALSE-WILLOW.)—Salt marshes, brackish swamps, and low hammocks, Coastal Plain, Fla. to Tex. and N. C.—(*W. I.*)—Fall or all year S.

44. PLUCHEA Cass. Herbs with often conspicuously pubescent and camphor-scented foliage, or shrubs. Leaves alternate: blades usually toothed, often prominently veined. Heads borne in corymb-like or glomerate cymes. Involucres turbinate, campanulate, or hemispheric, rather many-flowered: bracts unequal, the inner much longer and much narrower than the outer. Flowers pink to rose-purple. Pistillate flowers marginal: corollas filiform. Perfect flowers central: corollas with a funnelform or campanulate throat: lobes triangular lanceolate. Pappus a single series of capillary bristles.—About 35 species, in warm and temperate regions.—MARSH-FLEABANES.

Plant perennial.	
Leaf-blades entire: stem woody.	I. ODORATAE.
Leaf-blades toothed: stem herbaceous.	II. FOETIDAE.
Plant annual.	
Leaves not decurrent, the stem terete, not winged.	III. CAMPHORATAE.
Leaves decurrent, the stem thus winged.	IV. SUBDECURRENTES.

I. ODORATAE

Shrubby much-branched plant with heads in erect rather dense corymbs.	1. *P. odorata.*

II. FOETIDAE

Outer bracts of the involucres acuminate.	
Leaf-blades broad at the base, and cordate-clasping.	2. *P. foetida.*
Leaf-blades acute or merely rounded at the base, not clasping.	3. *P. tenuifolia.*
Outer bracts of the involucres obtuse or merely acute.	
Pappus white: upper stem-leaves little shorter than the lower.	4. *P. longifolia.*
Pappus buff: upper stem-leaves much shorter than the lower.	5. *P. imbricata.*

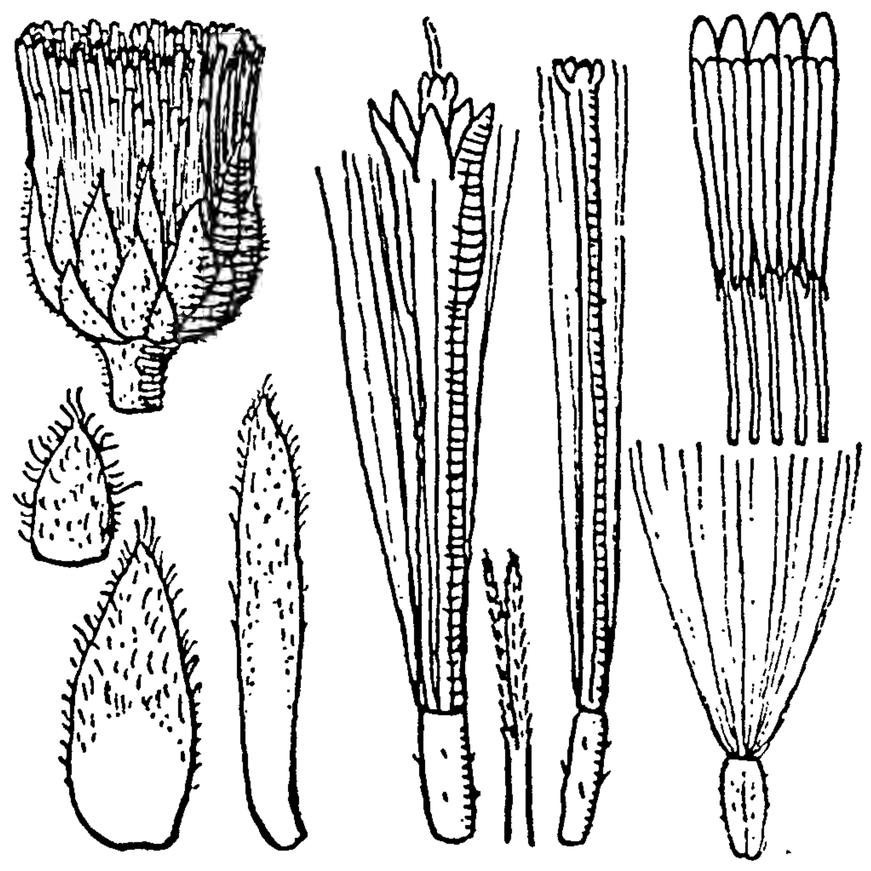
III. CAMPHORATAE

Bracts of the involucre thin, sparingly pubescent. 6. *P. petiolata.*
Bracts of the involucre thick, densely pubescent.
  Involucres 4–5 mm. high; inner bracts abruptly acuminate. 7. *P. purpurascens.*
  Involucres 6–8 mm. high; inner bracts long-acuminate. 8. *P. camphorata.*

IV. SUBDECURRENTES

Erect herb with corymbosely branched stem, the branches winged as well as the stem: leaf-blades shallowly toothed. 9. *P. Quitoc.*

1. **P. odorata** Cass. Plant mostly 1 m. tall or less: leaf-blades elliptic or nearly so, 8–15 cm. long: inner bracts of the involucres 3.5–4 mm. long, obtuse. Hammocks and waste-grounds, S Pen. Fla. and the Keys. Nat. of Tr. Am.—(*W. I., Mex., C. A., S. A.*)—Spr.–sum.



2. **P. foetida** (L.) DC. Plant 3–10 dm. tall, the stem usually scurfy-tomentulose: leaf-blades cuneate to elliptic, ovate-elliptic or ovate, 3–8 cm. long, thick, rather coarsely veined, denticulate or serrulate with prominently gland-tipped teeth: inner bracts of the involucre mostly 4–5 mm. long. [*P. bifrons* DC.]—Low grounds and shallow ponds, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and N. J.—(*W. I., Mex.*)—Spr.-sum. or all year S.

3. **P. tenuifolia** Small. Plant 4–11 dm. tall, the stem thinly pubescent: leaf-blades elliptic to elliptic-lanceolate, 4–12 cm. long, thin, finely veined, sharply and coarsely serrate with slightly glandular teeth: inner bracts of the involucre 5–6 mm. long.—Pinelands, Coastal Plain, Fla. to La.—Sum.–fall.

4. **P. longifolia** Nash. Plant 6–10 dm. tall: leaf-blades elliptic, 5–16 cm. long: inner bracts of the involucre 7–19 mm. long: staminate corollas 6.5–7.5 mm. long.—Swamps, Fla.—Sum.

5. **P. imbricata** (Kearney) Nash. Plant 9–25 dm. tall: leaf-blades ovate-elliptic to triangular-ovate, 3–6 cm. long: inner bracts of the involucre 6–7 mm. long: staminate corollas 5–6 mm. long.—Swamps and pond-borders, Coastal Plain, Fla. to Ga. and S. C.—Sum.–fall.

6. **P. petiolata** Cass. Plant 5–12 dm. tall: leaf-blades mainly elliptic, 8–25 cm. long: outer bracts of the involucre ovate; intermediate bracts acuminate. [*P. foetida* DC.]—Stream-banks, swamps and ditches, various provinces, Fla. to Miss., Kans. and S Va.—Sum.–fall.

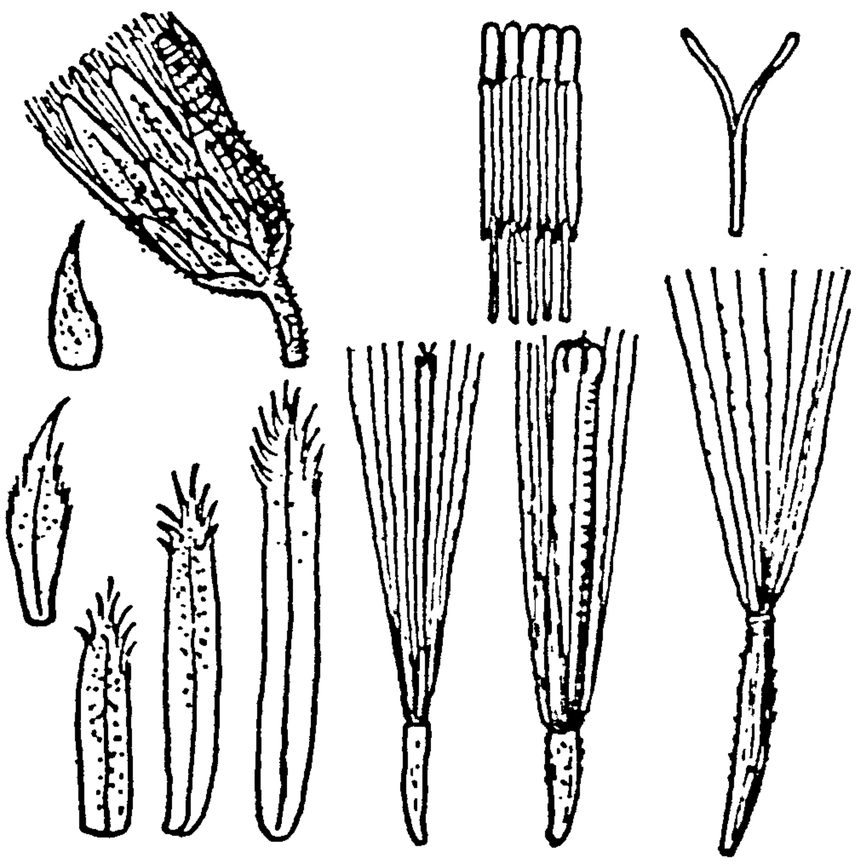
7. **P. purpurascens** (Sw.) DC. Plant 3–14 dm. tall: leaf-blades ovate-lanceolate to elliptic, 4–10 cm. long: outer bracts of the involucre ovate, acute; intermediate bracts abruptly pointed.—Hammocks and moist sandy thickets, Coastal Plain, Fla. to Tex. and Ga.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.

8. **P. camphorata** (L.) DC. Plant 3–15 dm. tall: leaf-blades elliptic or lanceolate, 3–15 cm. long: outer bracts of the involucre elliptic, acute: intermediate bracts acuminate.—Salt marshes, Coastal Plain and adj. provinces, Fla. to Tex. and Mass.—(Mex.)

9. **P. Quitoc** DC. Plant 7–20 dm. tall: leaf-blades oblong, elliptic, lanceolate or linear-lanceolate, 4–16 cm. long: outer bracts of the involucre obtuse.—Marsh places, W Fla.—Nat. of trop. Am.—Spr.–fall.

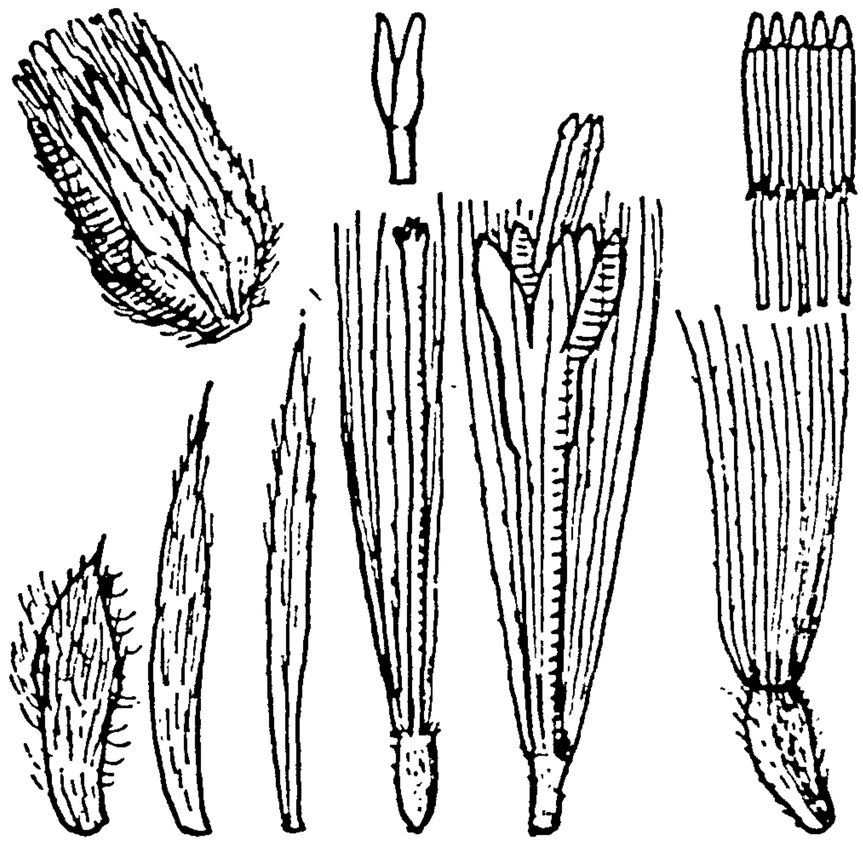
P. adnata (H. & B.) C. Mohr, Mexican, with winged stem and branches: narrowly lanceolate leaf-blades; lanceolate-acuminate involucral bracts; and said to have a perennial rootstock has been reported as adventive on ballast in Ala.

45. SACHSIA Griseb. Perennial, inconspicuously pubescent, slender herbs. Leaves alternate, mostly basal: blades toothed. Heads scattered in open corymbs. Involucres campanulate: bracts very unequal, the inner much longer and somewhat narrower than the outer. Flowers yellow, the pistillate marginal: corollas filiform. Perfect flowers central: corollas narrowly tubular-funnelform: lobes ovate. Pappus a single series of very slender bristles. —Four species, West Indian.



1. S. bahamensis Urban. Plant 1–6 dm. tall: blades of the basal leaves firm, spatulate, 3–7 cm. long, those of the stem-leaves much smaller: involucres peduncled; bracts various, the outer membranous, the inner chaffy, 5–6 mm. long, very narrowly linear: achene 2.5 mm. long.—Pinelands, Everglade Keys, Fla. and Florida Keys.—(*W. I.*)—Spr.-sum.

46. PTEROCAULON Ell. Perennial, tomentose or woolly, stout herbs. Leaves alternate: blades entire or shallowly toothed, decurrent. Heads borne in contiguous or separated glomerate cymes. Involucres rather narrow, densely flowered: bracts unequal, the inner narrower than the outer. Pistillate flowers marginal: corollas filiform. Perfect flowers central: corollas with a funnelform throat and a long tube; lobes linear or lanceolate. Anthers shorter than the filaments. Pappus a single series of capillary bristles. [*Chlaenobolus* Cass.] —About 12 species, mostly American.



1. P. undulatum (Walt.) C. Mohr. Plant 2–7 dm. tall: leaf-blades elliptic to lanceolate, 4–12 cm. long, undulate: involucre 3.5–4 mm. high: flowers whitish or cream, lobes of the staminate corollas linear.—[*P. pycnostachya* (Michx.) Ell.]—(BLACK-ROOT.)—Pinelands, Coastal Plain, Fla. to Miss. and N. C.—Spr.–fall.—The thick black root gives this plant its common name.

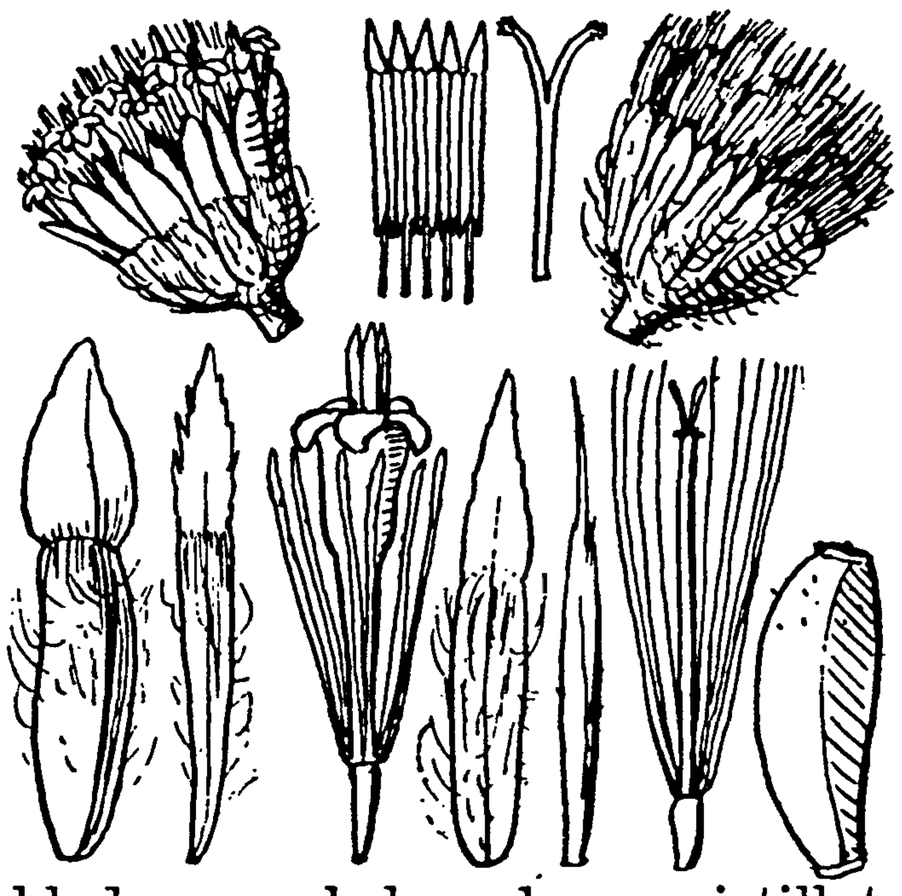
47. ANTENNARIA Gaertn. Perennial woolly, stoloniferous herbs. Leaves alternate, those of the short caudex different from those of the flowering stem: blades entire. Heads in a terminal cluster, or rarely solitary. Involucres turbinate to campanulate, many-flowered: bracts with petaloid tips, those of the staminate involucres larger than those of the pistillate. Flowers whitish, dioecious or polygamo-dioecious. Pappus-bristles united at the base.—

About 50 species, natives of the north temperate zone and southern South America.—Spr.—EVERLASTINGS. LADIES'-TOBACCOS.

Heads corymbose or racemose: stolons more or less ascending and distantly leafy, their leaves gradually increasing in size towards the ends, with oblanceolate or spatulate blades.
- Pistillate heads 6–8 mm. high: staminate heads 5–7 mm. high.
  - Blades of the basal leaves obovate or oval. — 1. *A. plantaginifolia.*
  - Blades of the basal leaves oblanceolate. — 2. *A. caroliniana.*
- Pistillate heads 9–12 mm. high: staminate heads 6–8 mm. high.
  - Blades of the basal leaves broadest below the middle, in age subcoriaceous: pistillate heads rather long-peduncled, in age often racemose. — 3. *A. calophylla.*
  - Blades of the basal leaves mostly broadest above the middle, thin: pistillate heads short-peduncled, corymbose. — 4. *A. fallax.*

Heads solitary: stolons prostrate, their leaves, except those of the terminal rosette, with small or inconspicuous linear blades. — 5. *A. solitaria.*

1. A. plantaginifolia (L.) Richards. Basal leaves 5–9 cm. long; blades about equalling the petioles, 1.5–4 cm. wide, loosely floccose, but in age glabrate above, white-tomentose beneath, obovate or nearly oval, distinctly 3-ribbed: blades of the stem leaves linear-lanceolate, acuminate: flowering stem of pistillate plants 6–20 cm. tall, of the staminate 5–12 cm. tall: pistillate heads corymbose, 6–8 mm. high, floccose at the base; bracts linear-lanceolate, acute, bright olive-green or brownish at the base, white at the tip; staminate heads more loosely clustered, 5–7 mm. high, their bracts somewhat darker at the base with elliptic, obtuse, white tips. [*A. plantaginea* R. Br. *A. decipiens* Greene *A. arkansana* Greene] —Dry soil, various provinces, Fla. to Tex., Minn., and Me.—Spr.—*A. nemoralis* Greene from E Tenn. with thinner more rounded leaf-blades may belong here; pistillate plant unknown.



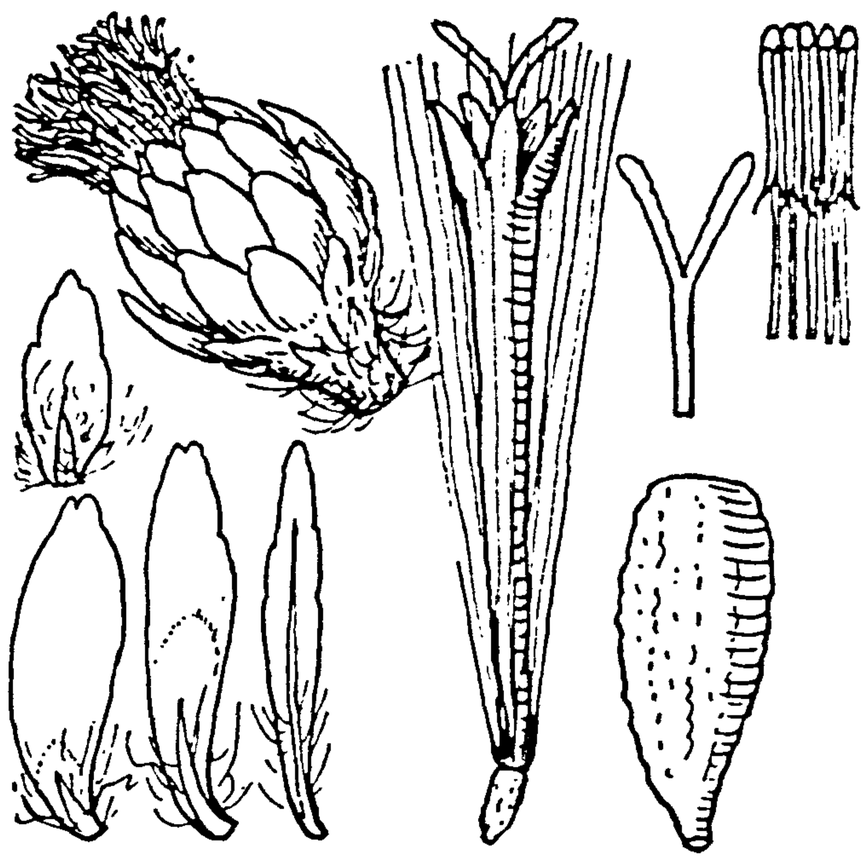
2. A. caroliniana Rydb. Basal leaves 4–8 cm. long; blades often longer than the petioles, 1–2 cm. wide, loosely floccose, but soon glabrate above, white-tomentose beneath, oblanceolate, rounded to acutish at the apex, gradually tapering at the base, distinctly 3-ribbed; blades of the stem-leaves linear-lanceolate, acuminate: flowering stem 1–1.5 dm. tall: heads corymbose, short-peduncled; the pistillate 6–7 mm. high, their bracts linear-lanceolate, acute, greenish or brownish below, white at the tip; staminate heads about 5 mm. high, their bracts yellowish, with elliptic, obtuse, white tips.—Dry soil, Coastal Plain and Piedmont, Ala. to S. C.—Spr.

3. A. calophylla Greene. Basal leaves 5–10 cm. long: blades usually as long as the petioles, 2–5 cm. long, loosely floccose above, but glabrate in age, finely and densely white-tomentose beneath, broadly ovate or oval, usually broadest a little below the middle, rounded or mucronate at the apex, abruptly contracted at the base, subcoriaceous in age, distinctly 3–5-ribbed: blades of the stem-leaves linear-lanceolate, acuminate: flowering stems of pistillate plants 3–4 dm. tall: heads 10–12 mm. high, corymbose or in age often racemose, the peduncles 1–3 cm. long: bracts of the involucre linear-lanceolate, acuminate, brownish at the base, white at the tip: staminate heads densely corymbose, 7–8 mm. high, dark-brown below, with elliptic or oval white tips.—Wooded hills, various provinces, La. (or Ga.?) to Okla., Ill., and Ky.—Spr.

4. **A. fallax** Greene. Basal leaves 5–9 cm. long; blades sometimes shorter than the petioles, 2–4 cm. wide, loosely floccose and glabrate above, densely and closely white tomentose beneath, obovate-spatulate, rounded and mucronate or acutish at the apex, abruptly narrowed at the base, distinctly 3–5-ribbed: blades of the stem-leaves linear-lanceolate, acuminate: flowering stem of pistillate plants 2–4 dm. tall, that of the staminate 1–1.5 dm. tall: pistillate heads 9–12 mm. high, corymbose, the peduncles rarely 2 cm. long; bracts of the involucre linear-lanceolate, acuminate, brownish below, white at the tip: staminate heads 6–7 mm. high, corymbose, their bracts light-brown or greenish-brown below the elliptic obtuse white tips. [*A. ambigens* (Greene) Fernald.]—Woods and fields, various provinces, rarely Coastal Plain, Ga. to Mo., Minn., and Me.—The leaf-blades are broader and more rounded at the apex in the southern form than in the northern.

5. **A. solitaria** Rydb. Basal leaves 4–10 cm. long; blades much longer than the petioles, 1.5–4 cm. wide, somewhat floccose above when young, in age minutely tomentulose beneath, obovate to oblanceolate-spatulate, rounded at the apex, distinctly 3–ribbed; blades of the stem-leaves linear to elliptic: flowering stem of the pistillate plant 1–2 dm. tall, that of the staminate 0.5–1 dm. tall: heads solitary, the pistillate one about 1 cm. high; bracts linear-lanceolate, attenuate, purplish-brown except the very tips: staminate heads smaller; bracts often wine-colored, except the brownish-white spatulate tips.—Wooded slopes, often in rather acid soil, Coastal Plain and adj. provinces, Ga. to La., Ind., and Pa.—Spr.

48. **ANAPHALIS** DC. Perennial, conspicuously pubescent, erect herbs. Leaves alternate: blades narrow, entire. Heads in a terminal corymb. Involucres broad, turgid, many-flowered: bracts pearly-white, obtuse. Flowers whitish, dioecious, the staminate with a slender or filiform corolla. Pappus-bristles of the fruit-producing flowers distinct, that of the sterile flowers not thickened at the apex.—About 35 species, natives of the north temperate zone.



1. **A. margaritacea** (L.) Benth. & Hook. Plant woolly, 2–8.5 dm. tall: leaf-blades linear or nearly so, 5–15 cm. long, attenuate: involucres pearly white; outer bracts elliptic, the inner spatulate: staminate corollas 3.5–4 mm. long.—(PEARLY-EVERLASTING.)—Dry woods, hillsides, and clearings, in sterile and often somewhat acid soil, various provinces, in Coastal Plain only N, N. C. to Alas., Ont., and Newf.

49. **GNAPHALIUM** L. Annual, biennial, or perennial, pubescent herbs. Leaves alternate: blades entire, sometimes decurrent. Heads in open or glomerate cymes, panicles, or corymbs. Involucres ovoid to cylindric, several–many-flowered: bracts various, the inner longer and usually narrower than the outer. Flowers white or cream. Pistillate flowers marginal: corollas filiform. Perfect flowers central: corollas with a cylindric-funnelform throat and a slender tube: lobes ovate to deltoid. Anthers mostly longer than the filaments. Pappus a series of capillary bristles.—About 120 species, widely distributed.—Sum.—CUDWEEDS. EVERLASTINGS.

Pappus-bristles distinct, falling away separately : achene glabrous. I. ORTUSIFOLIA.
Pappus-bristles united at the base, falling away together : achene pubescent. II. PURPUREA.

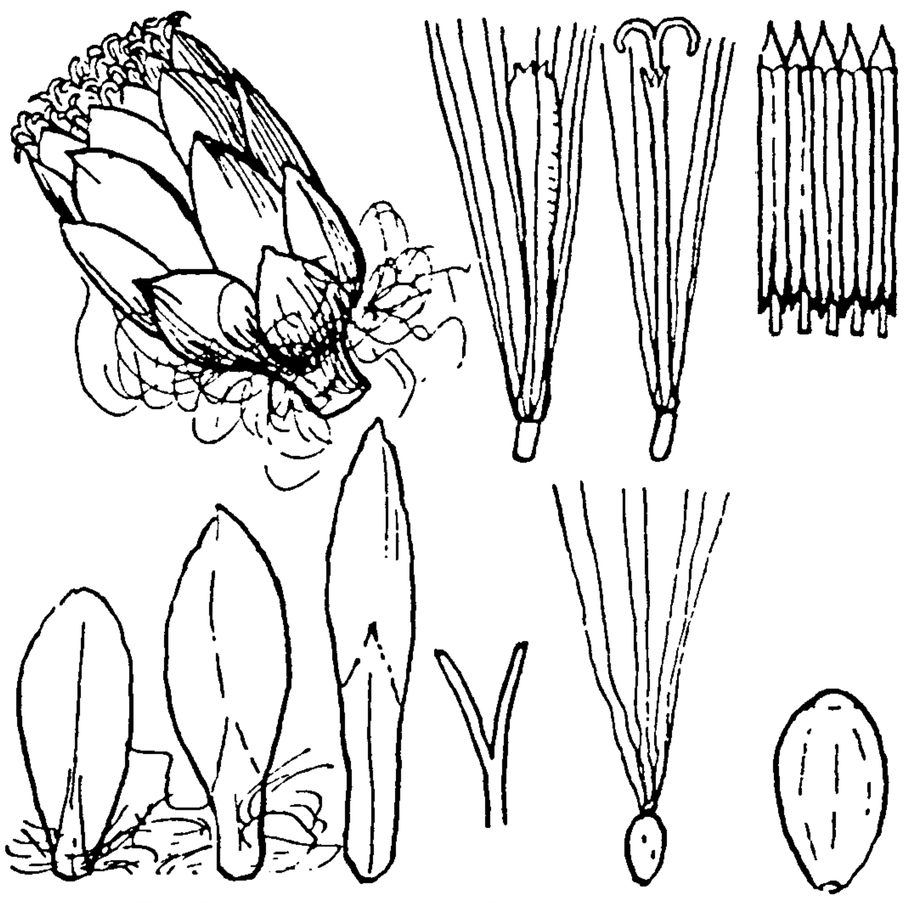
I. OBTUSIFOLIA

Leaf-blades merely sessile.
  Foliage pubescent, not viscid. 1. *G. obtusifolium.*
  Foliage glandular-viscid. 2. *G. Helleri.*
Leaf-blades decurrent on the stem. 3. *G. Macounii.*

II. PURPUREA

Leaf-blades manifestly more pubescent beneath than above, spatulate, sometimes broadly so.
  Leaf-blades thin: stem cobwebby: involucre-clusters copiously woolly. 4. *G. spathulatum.*
  Leaf-blades thick: stem densely woolly or felty: involucre-clusters sparingly woolly. 5. *G. purpureum.*
Leaf-blades almost equally pubescent on both sides, linear-spatulate below, linear or mostly so above. 6. *G. falcatum.*

1. G. obtusifolium L. Plant 2–6 dm. tall: cauline leaves 2–10 cm. long; blades elliptic-linear to linear, the upper surface glabrous or glabrate: heads corymbose-paniculate: involucre 6–7 mm. high; inner bracts glabrous. [*G. polycephalum* Michx.] — (RABBIT-TOBACCO.)—Woods, fields, and thickets, various provinces, Fla. to Tex., Man., and N. S.—Sum.–fall.



2. G. Helleri Britton. Plant 2–9 dm. tall: leaf-blades linear to elliptic, 3–11 cm. long: involucre 5–6 mm. high; outer bracts obtuse.—Sandy woods, various provinces, Ga. to Miss., Ky., and N. J.—Sum.–fall.

3. G. Macounii Greene. Plant 2–9 dm. tall: leaf-blades linear or slightly broadened upward, 6–12 cm. long: involucre 4–5 mm. high; outer bracts acute. [*G. decurrens* Ives,, not L.].—Dry soil, edges of woods and clearings, Blue Ridge and more N provinces, Tenn. to Tex., Ariz., B. C., N. S., and Pa.—Sum.–fall.

4. G. spathulatum Lam. Plant thinly gray-pubescent, 2–4 dm. tall: leaf-blades spatulate, 2–8 cm. long: outer bracts of the involucre broadly linear.—Waste-places, cult. grounds, roadsides, and pastures, Coastal Plain and Piedmont, Fla. to Tex.—(*W. I.*)—Spr.–fall.

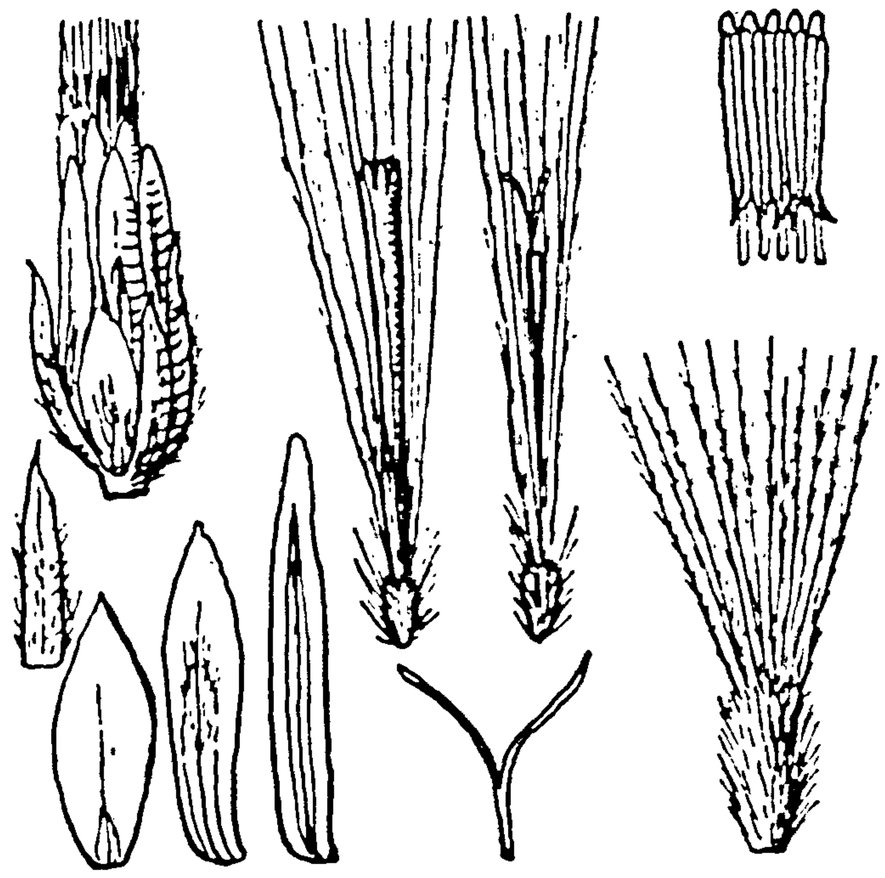
5. G. purpureum L. Plant white-woolly or silvery, 1–4 dm. tall: leaf-blades spatulate to linear, 2–8 cm. long: heads in sessile axillary clusters, these in virgate panicles: outer bracts of the involucre elliptic.—Woods, cult. grounds, and waste-places, various provinces, Fla. to Tex., Kans., and Me.—(*W. I., Mex., C. A., S. A.*)—Spr.–fall

6. G. falcatum Lam. Plant more slender than in *G. purpureum,* densely white-woolly, 1–4 dm. tall: leaf-blades linear-spatulate to linear, 2–6 cm. long: outer bracts of the involucre elliptic-ovate.—Pinelands and cult. grounds, Coastal Plain and adj. provinces, Fla. to Tex. and Tenn.—(*S. A.*)—All year.

G. uliginosum L. related to the species of group I in its distinct pappus-bristles; differing from them in its low diffuse habit and the congested or capitate inflorescence, has been reported from Tenn.

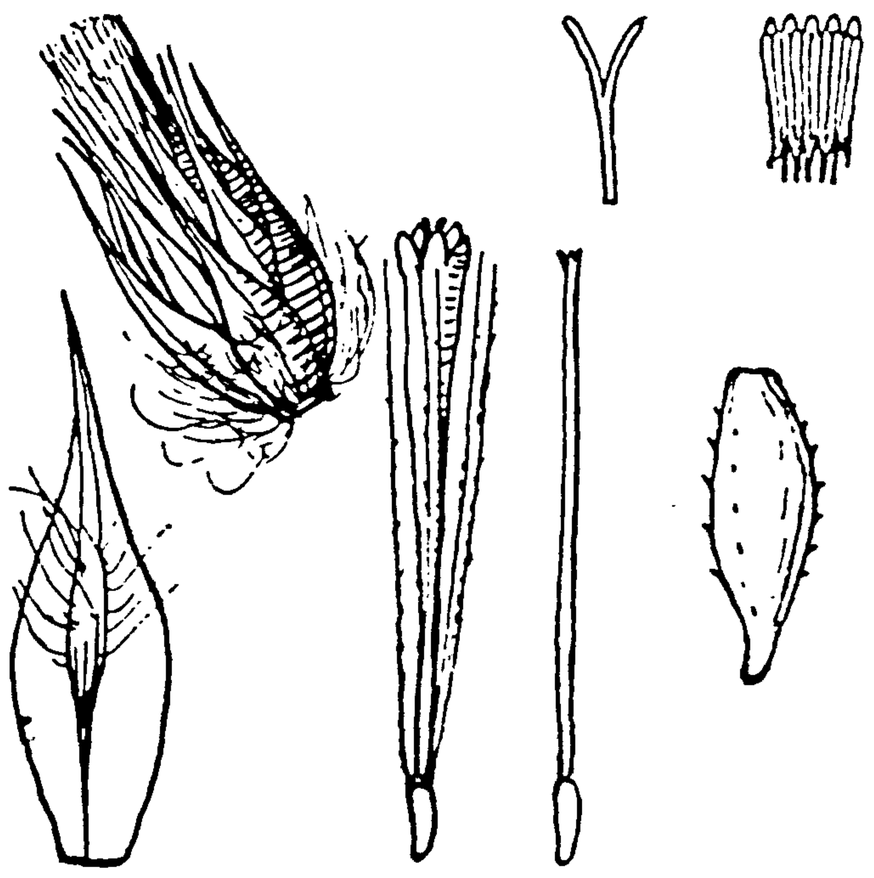
50. **FACELIS** Cass. Annual, small, pubescent herbs. Leaves alternate: blades narrow, entire. Heads borne in the axils or in terminal clusters. In-

volucres ellipsoid to ovoid, few-flowered: inner bracts much narrower and longer than the outer. Flowers whitish, the pistillate flowers marginal: corollas slender, truncate or nearly so. Perfect flowers central: corollas with a cylindric throat and a long tube. Anthers longer than the filaments. Pappus of numerous very long capillary bristles concreted at the base.—About 3 species, South American.



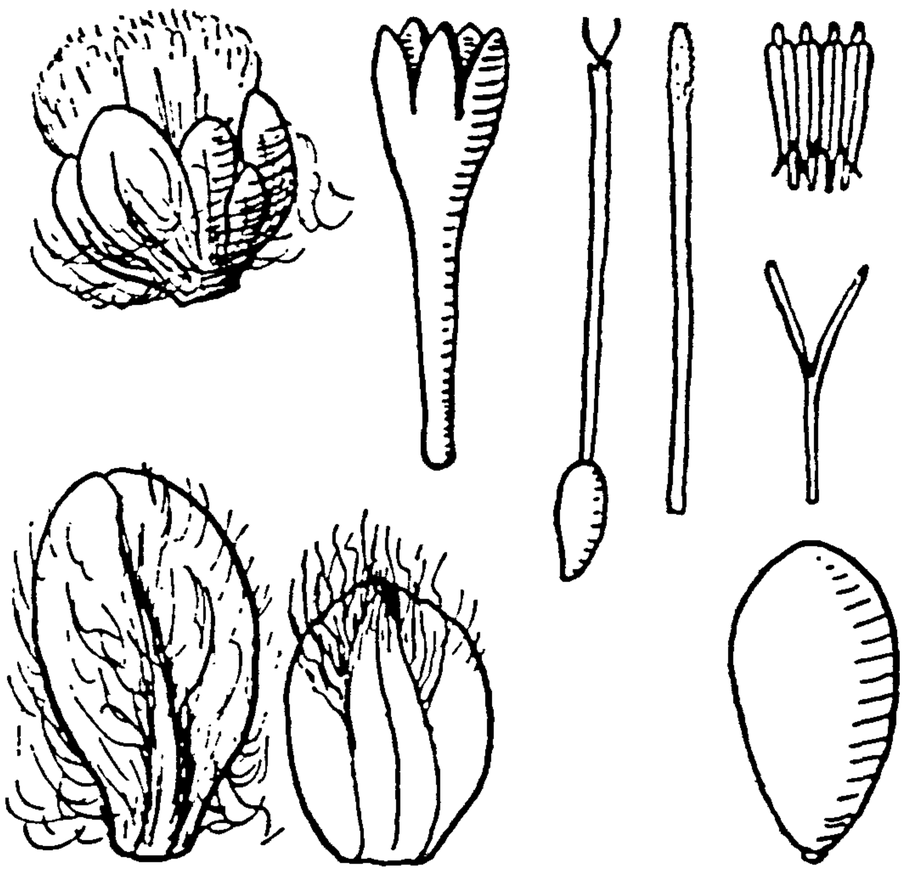
1. **F. apiculata** Cass. Plant 2–20 cm. tall, lanate: leaf-blades linear-spatulate to linear, 0.5–1 cm. long: involucre narrow; inner bracts 5–7.5 mm. long: achene long-hairy.—Roadsides and waste-places, Coastal Plain and Piedmont, Fla., Ala., and Ga.—Nat. of S S. Am.—Sum.–fall.

51. **GIFOLA** Cass. Annual, caulescent herbs resembling *Gnaphalium*. Leaves alternate: blades narrow, entire. Heads discoid, in small dense, sometimes proliferous, clusters. Involucres narrow, sessile: bracts scarious, in several series. Receptacle subulate to conic, chaffy. Flowers whitish, the pistillate marginal, fruit-producing, with filiform corollas and rudimentary or no pappus. Perfect flowers central, few, with tubular corollas and capillary pappus. Anthers sagittate at the base. Achene terete or slightly flattened.—About 10 species, in warm and temperate regions.



1. **G. germanica** (L.) Dumort. Plant silvery-pubescent, 5–35 cm. tall, the stem or branches usually proliferous above: leaves numerous, erect; blades lanceolate to linear, 1–2 cm. long, acute: involucre 3–3.5 mm. high; bracts ovate-lanceolate to elliptic-lanceolate, acuminate or cuspidate: achene about 0.8 mm. long.—(HERBA-IMPIA. COTTON-ROSE.)—Dry fields and waste-places, various provinces, Ga. to N. Y.—Nat. of Eu.—Spr.–fall.

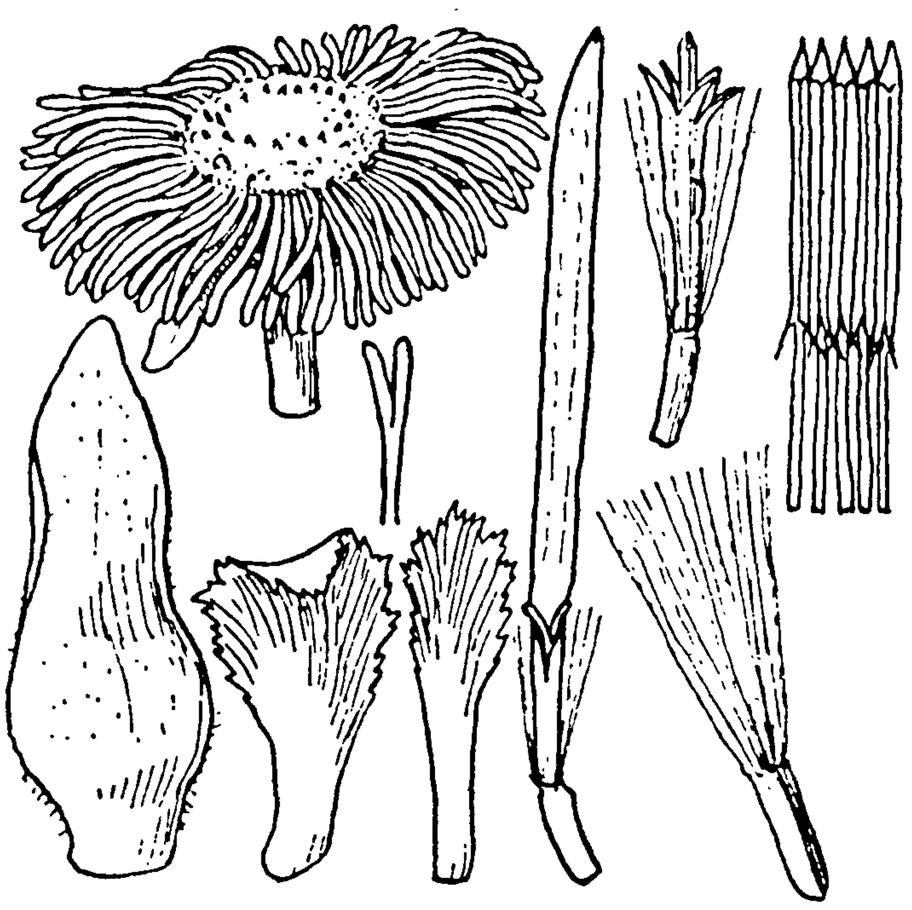
52. **FILAGINOPSIS** T. & G. Annual or sometimes perennial woolly herbs. Leaves alternate: blades entire, commonly narrow. Heads in dense involucrate clusters, discoid. Involucre broad: inner bracts longer than the outer ones. Flowers whitish, the pistillate marginal, with filiform corollas. Perfect flowers few: corollas with a cylindraceous or narrowly funnelform throat and a narrow tube. Pappus wanting.—About 12 species, natives of warm and temperate regions.



1. **F. nivea** Small. Plant 2–15 cm. tall, whitish: leaf-blades oblong to oblong-lanceolate, 5–12 mm. long: bracts of the involucre barely 2 mm. long or less: staminate corollas less than 1.5 mm. long. [*Filago nivea*

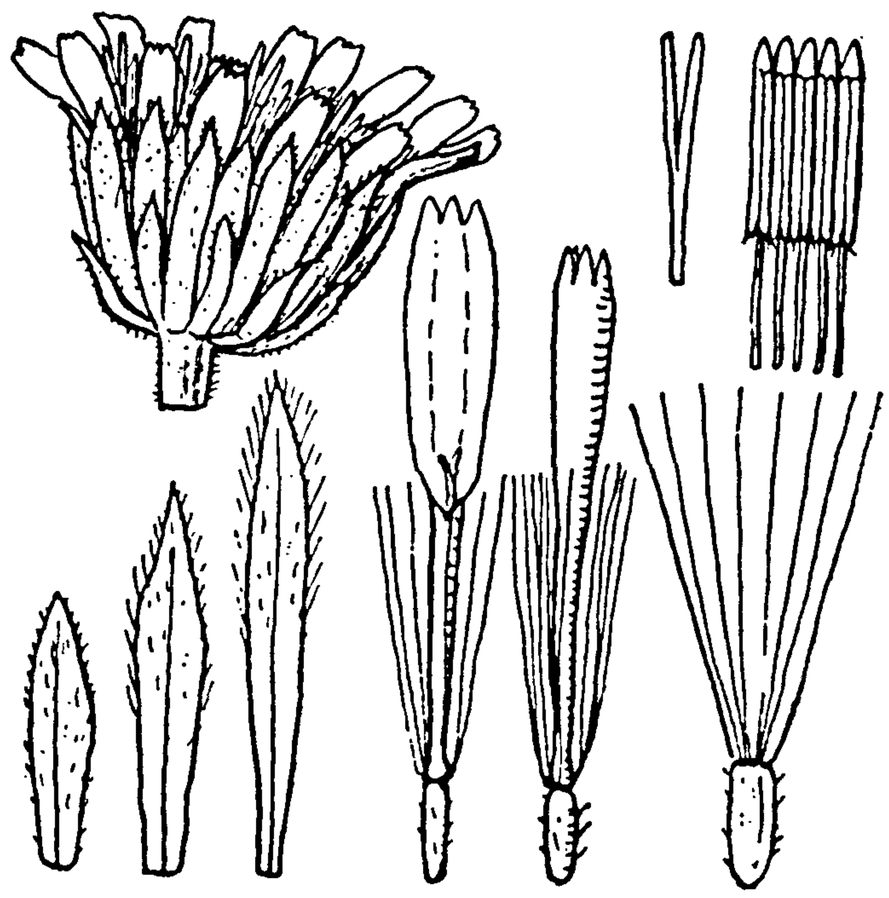
Small.]—(POVERTY-WEED. RABBIT-TOBACCO.)—Dry plains or stony soil, Coastal Plain and adj. provinces, Ga. to Tex. Naturalized E.—Spr.–sum.

53. **INULA** L. Perennial, often large, pale-pubescent herbs. Leaves alternate: blades broad, toothed, often clasping. Heads in open panicles or corymbs, terminating long peduncles, usually showy. Involucre hemispheric, very many-flowered: bracts, at least the outer ones broad, somewhat foliaceous. Ray-flowers numerous: corollas with a long tube and a narrow elongate yellow ligule. Disk-flowers numerous: corolla with narrowly funnelform throat above a narrow tube with a dilated base: lobes lanceolate. Anthers longer than the filaments. Achene columnar, ribbed. Pappus of several or many capillary scabrous bristles.—About 90 species, Eurasian and African.



1. **I. Helenium** L. Stem, 2 m. tall or less, softly pubescent: leaf-blades pale beneath, those of the basal leaves lanceolate to elliptic-lanceolate, 1–3 dm. long, petioled, those of the cauline leaves elliptic, oval, or ovate, sessile and clasping, mostly 9–20 cm. long, all toothed: involucre hemispheric, 1.5–1.7 cm. high; bracts various, the outer ovate or oval, the inner narrowly linear, about 2 cm. long: ligules yellow, narrowly linear, 2–3 cm. long: achene 4–5 mm. long, finely ribbed.—(ELECAMPANE.)—Roadsides, fence-rows, and fields, various provinces N of Coastal Plain, N. C. to Mo., Ont., and N. S. Nat. of Eu.—Sum.

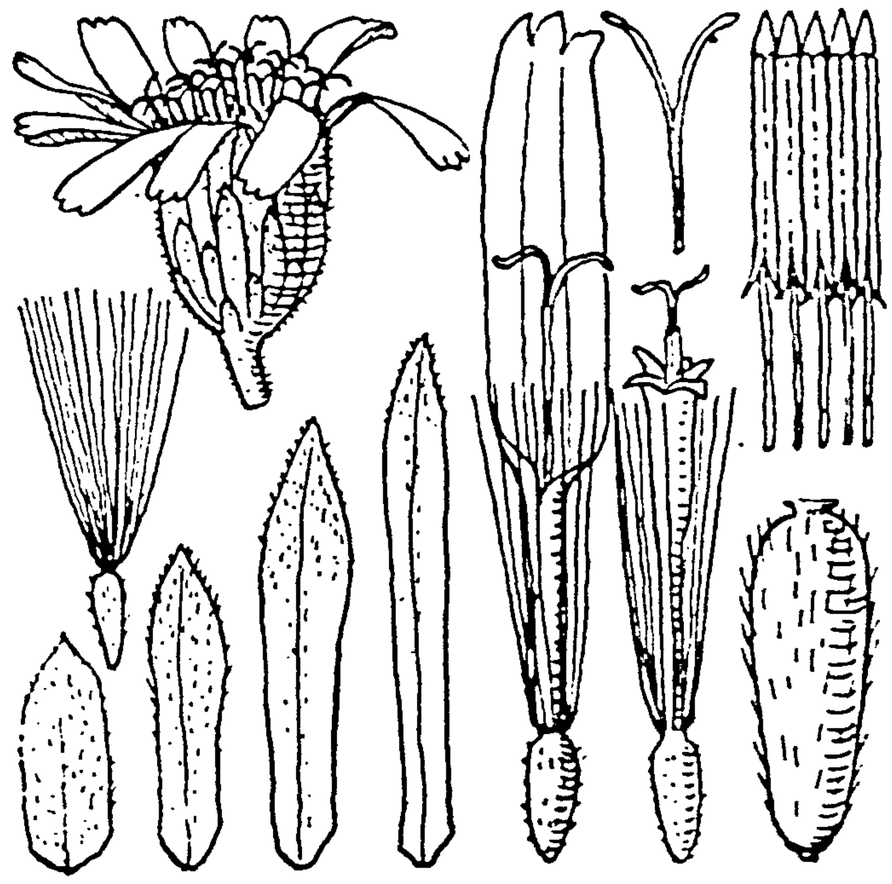
54. **VICOA** Cass. Annual or perennial herbs with much-branched stems. Leaves alternate: blades narrow, shallowly toothed, at least the upper ones auricled at the base and clasping. Heads several or numerous, often radiate, rather slender-peduncled. Involucre hemispheric-campanulate, many-flowered: bracts very narrow, numerous. Ray-flowers few: corolla with a very slender tube and a short rather broad ligule. Disk-flowers numerous: corolla with a slender tube and an elongate cylindric throat: lobes triangular-lanceolate. Anthers longer than the filaments. Achene cylindric, not ribbed. Pappus of few capillary bristles.—About 8 species, Asiatic and African.



1. **V. auriculata** Cass. Annual, 1 m. tall or less, widely branched, finely pubescent and partly viscid: leaf-blades lanceolate to elliptic-lanceolate, 3–11 cm. long or much reduced on the branchlets, acute, sometimes toothed: heads erect: involucre 4–4.5 mm. high; bracts linear-lanceolate to narrowly linear, the inner ones about 5 mm. long, acuminate, sparingly glandular-pubescent, ciliate: ligules yellow, rather obcuneate, about 3 mm. long: achene about 0.8 mm. long, pubescent: pappus-

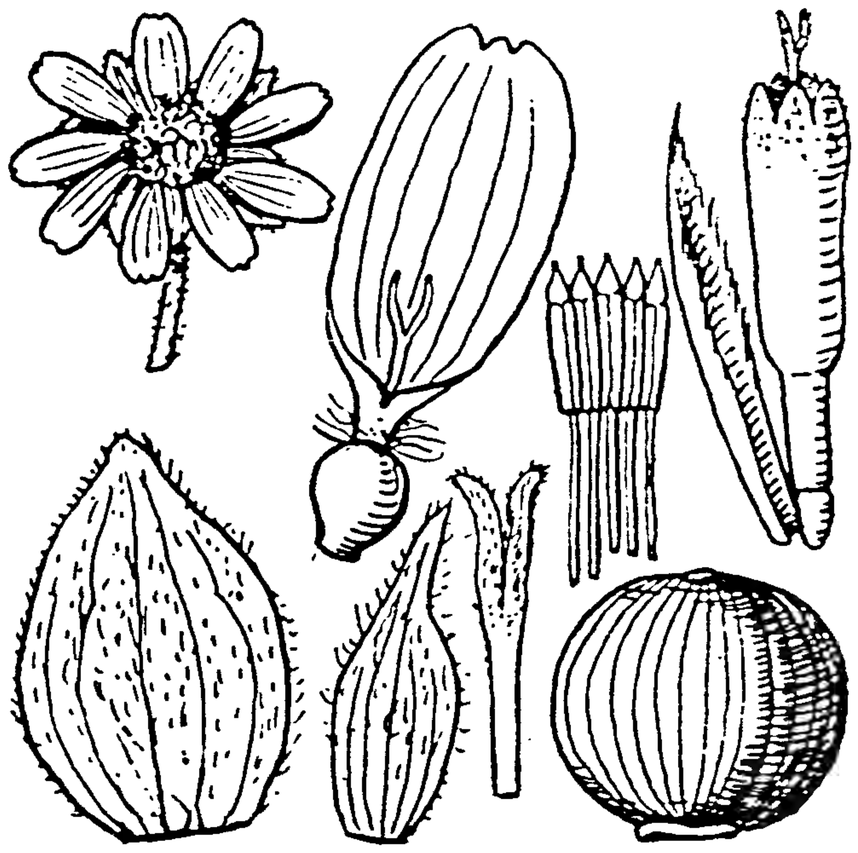
bristles several times longer than the achene.—Waste-places and roadsides, W Fla. Nat. of E. I.—Sum.

55. **CUPULARIA** Godr. & Gren. Perennial, much-branched, partly woody plants. Leaves alternate: blades rather narrow, toothed, clasping, more or less auricled at the base. Heads numerous, panicled, short-peduncled. Involucre campanulate, many-flowered: bracts narrow, not foliaceous. Ray-flowers few: corolla with slender tube and a short rather broad ligule. Disk-flowers rather numerous: corolla with a slender tube and a narrowly funnelform throat; lobes triangular-lanceolate. Anthers longer than the filaments. Achene of a cylindric-ellipsoid type, not ribbed. Pappus of several capillary scabrous bristles. —About 3 species, Eurasian and African.



1. **C. viscosa** (Ait.) Godr. & Gren. Stem 1 m. tall or less, glandular-pubescent: leaf-blades elliptic to lanceolate or linear-lanceolate, 2–12 cm. long, serrate, sessile: involucre 8–9 mm. high, glandular; bracts ovate to linear or linear-spatulate, the inner 6–7 mm. long, short-acuminate: ligules yellow, elliptic, 5–7 mm. long: achene narrowly ellipsoid or slightly broadened upward, about 2 mm. long, finely pubescent.—Roadsides and waste-places, W Fla. Nat. of Eu.—Sum.–fall.

56. **SMALLANTHUS** Mackenzie. Perennial herbs. Leaves opposite: blades very broad, palmately veined. Heads conspicuously radiate. Involucre large, the outer series of bracts foliaceous, the inner narrower. Ray-flowers conspicuous, the corollas with pubescent tubes and long yellow ligules. Disk-flowers with short abortive ovaries, the corollas with cylindraceous throats and short, ciliate lobes. Stigma slender, not thickened under the appendage. Achene somewhat laterally compressed, oblique, finely striate. —One species.



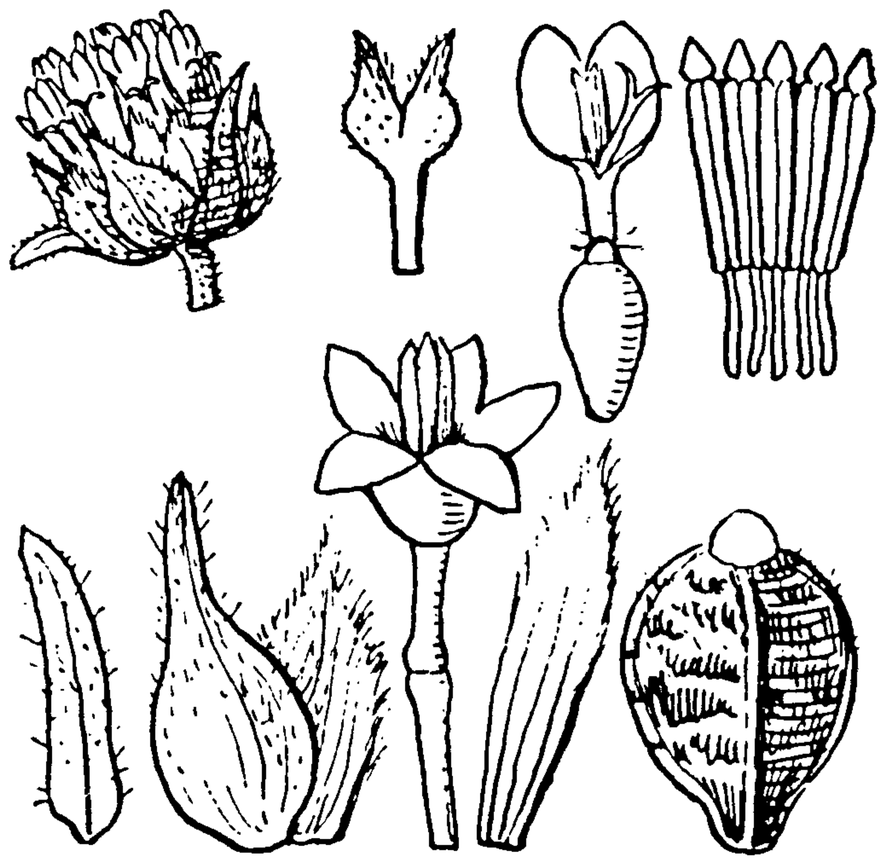
1. **S. Uvedalia** (L.) Mackenzie. Stem 1–3 m. tall: leaves 1–5 dm. long; blades 3–5-lobed or angled: outer bracts of the involucre ovate to elliptic, 9–14 mm. long: ray-flowers with yellow ligules 15–20 mm. long: achene 5–6 mm. long. [*Polymniastrum Uvedalia* (L.) Small]—(BEARFOOT.)—Rich soil, edges of woods, thickets, and stream-banks, various provinces, Fla. to Tex., Mo. and N. Y.—Sum.–fall.

57. **POLYMNIA** L. Perennial, widely branched herbs. Leaves opposite or mainly so: blades broad, pinnately veined. Heads inconspicuously radiate. Involucre small, double, the outer series of bracts loose, the inner ones variously shaped. Ray-flowers inconspicuous, the corollas with pubescent

tubes and white, greenish, or pale-yellow, wide ligules. Disk-flowers with long abortive ovaries, the corollas with broadly funnelform throats and relatively long, ciliate lobes. Stigma stout, thickened under the tip. Anther-body broader than the appendage. Achene slightly obcompressed, not oblique, 3- or 5-ribbed, with a rounded tip. Pappus wanting.—About 10 species, American.—Sum.–fall.—LEAF-CUPS.

Foliage manifestly or copiously pubescent: achene 3-ribbed or angled.	
Ray-flowers evident; ligules 5–10 mm. long.	1. *P. radiata.*
Ray-flowers inconspicuous; ligules 1–2 mm. long.	2. *P. canadensis.*
Foliage glabrous or the stem with merely puberulent nodes: achene 5-ribbed.	3. *P. laevigata.*

1. P. radiata (A. Gray) Small. Stem 5–15 dm. tall: leaves 1.5–3 dm. long; blades elliptic to oval or elliptic-ovate: intermediate bracts of the involucre rather long-acuminate: ligules of the ray white, conspicuous cuneate to oval-cuneate: achene about 5 mm. long, sharp-angled.—Rich woods, often over calcareous rocks, various provinces N of Coastal Plain, Ga. to Mo., Wis., and N. Y.



2. P. canadensis L. Stem 5–15 dm. tall: leaves 1–2 dm. long; blades elliptic, oval, or ovate: intermediate bracts of the involucre short-acuminate: ligules of the ray greenish or whitish, inconspicuous, or obsolete: achene about 3 mm. long, obtuse-angled.—Stream-banks, ravines, hillsides, and thickets, various provinces, rarely Coastal Plain, La. to Mo., Ont., and Vt.

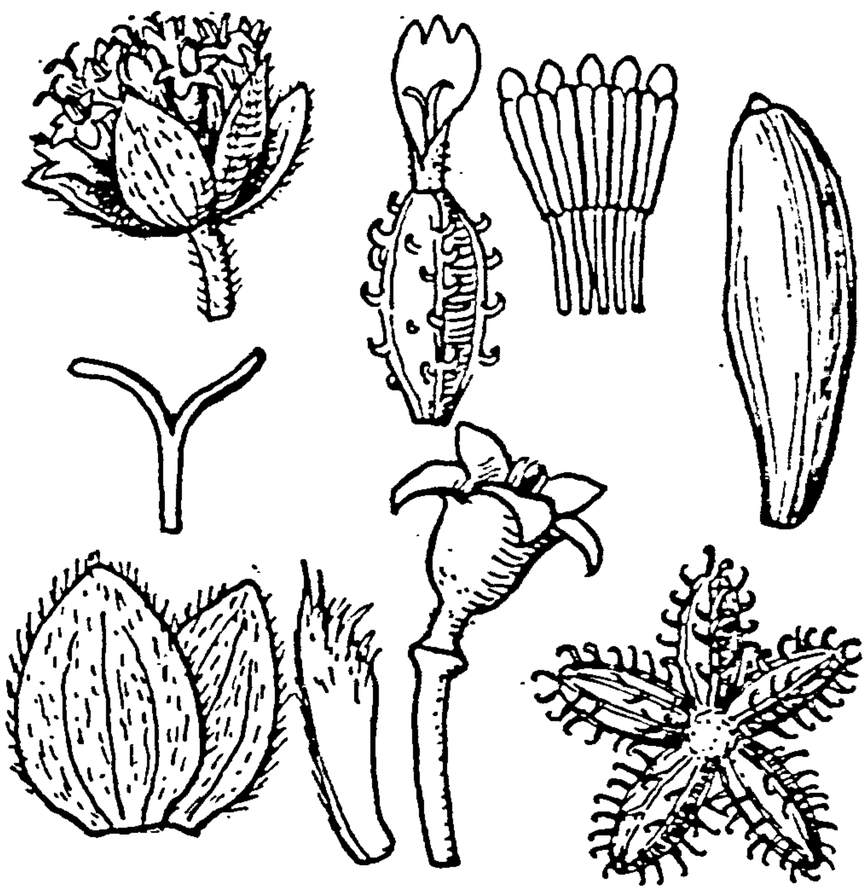
3. P. laevigata Beadle. Stem 5–12 dm. tall: leaves 1–2.5 dm. long; blades oval to ovate or deltoid: intermediate bracts of the involucre acute: ligules of the ray, white, broad: achene barely 3 mm long.—Mt. slopes, often in somewhat acid soil over siliceous rocks, Appalachian Plateau, Ga. and Tenn.

58. ACANTHOSPERMUM Schrank. Annual, coarse herbs. Leaves opposite: blades broad, toothed. Heads inconspicuously radiate. Involucre double: bracts of the inner series becoming bur-like, each one surrounding an achene. Ligules of the ray-corollas concave or hooded, yellowish, inconspicuous with short pubescent tubes. Disk flowers with long abortive ovaries, the corollas with campanulate throats, short tubes, and lobes. Achene slightly flattened, fusiform or obovoid, smooth. Pappus wanting.—About 3 species, tropical American.—Spr.–fall.

Involucral bracts uniformly prickly: petioles not broadly winged.	1. *A. australe.*
Involucral bracts with 2 large spines in addition to the prickles: petioles broadly winged or leaf-blades cuneately sessile.	
Leaf-blades wing-petioled, incised: involucral bracts 3–4 mm. long.	2. *A. humile.*
Leaf-blades sessile by a cuneate base: involucral bracts 4–5 mm. long.	3. *A. hispidum.*

1. A. australe (L.) Kuntze. Stem branched at the base, the branches prostrate or creeping: leaf-blades ovate, oval, or rhombic, 1–2.5 cm. long: disk-

corollas about 2 mm. long: mature involucre starfish-like.—Pinelands, waste-grounds, and roadsides, Coastal Plain and Piedmont, Fla. to La., and Va. Nat. of trop. Am.



2. **A. humile** (Sw.) DC. Stem or branches erect or ascending: leaf-blades deltoid-ovate to pandurate, 1–3 cm. long: disk-corollas about 1 mm. long: mature involucre spinescent.—Sandy roadsides and pinelands, Fla. to Ala., and at Atlantic seaports. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A.*).

3. **A. hispidum** DC. Stem erect, 1 m. tall or less, widely branched: leaf-blades ovate, elliptic, or oval, 3–5 cm. long, obtuse, shallowly toothed, copiously pubescent, more or less cuneate at the base, sessile: involucre campanulate: bracts (outer) elliptic to ovate, long-ciliate: mature inner bracts of the involucre similar to those of *A. humile*.—Roadsides, pinelands, and oak-woods, Coastal Plain, Fla. to Ala., and Ga. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A.*).

59. **SILPHIUM** L. Perennial, erect, usually large herbs. Leaves alternate or opposite: blades entire, toothed, or pinnately or pedately parted, sometimes connate-perfoliate. Heads erect. Involucre campanulate or hemispheric, many-flowered: bracts distinct, relatively broad. Ligules of the ray-corollas yellow or rarely white, conspicuous, the tube short. Disk-flowers with long abortive ovaries, the corollas with short tubes, tubular throats, and short lobes. Achene conspicuously flattened, winged. Pappus of two awns beside the apical teeth of the wings, which usually form a U- or V-shaped sinus, or wanting. —More than 30 species, North American.—ROSIN-WEEDS. ROSIN-PLANTS.

Leaf-blades or their petiole-like bases connate-perfoliate: stem square, sharply angled. I. PERFOLIATA.
Leaf-blades not connate-perfoliate: stem terete or obtusely quadrangular.
  Plants with scape-like flower-stems, the leaves basal or near the base of the stem: leaf-blades pinnately or pedately parted or lobed, or very coarsely toothed.
    Heads borne in a raceme at the top of the stem, very large, the involucre 3–4 cm. wide. II. LACINIATA.
    Heads borne in terminal effuse or diffuse panicles, or individually solitary, relatively small, the involucre 1–3 cm. wide. III. COMPOSITA.
  Plants with leafy flower-stems: leaf-blades toothed or entire.
    Bracts of the involucre ciliate, otherwise glabrous or nearly so. IV. DENTATA.
    Bracts of the involucre with pubescent surfaces as well as ciliate margins. V. INTEGRIFOLIA.

I. PERFOLIATA

Tall often much-branched plant, with a square stem and finely rough-pubescent toothed leaf-blades. 1. *S. perfoliatum.*

II. LACINIATA

Ray-flowers with yellow ligules: wings of the achene prolonged into short lacerate teeth. 2. *S. laciniatum.*

III. COMPOSITA

Heads relatively small, the involucre less than 2 cm. broad.
  Blades of the basal leaves coarsely toothed or sometimes also shallowly lobed. 3. *S. reniforme.*

Blades of the basal leaves deeply lobed or parted:
Blades mostly pedately lobed: involucre about 1 cm. wide. — 4. *S. compositum.*
Blades pinnately lobed or pinnate: involucre 1–1.5 cm. wide.
Heads small; involucre about 1 mm. broad.
Leaf-blades very scabrous: bracts of the involucre with spreading or recurved tips. — 5. *S. lapsuum.*
Leaf-blades smooth or nearly so: bracts of the involucre with erect or appressed tips. — 6. *S. orae.*
Heads rather large: involucre about 2 cm. broad.
Basal leaves with petioles as long as the blades or longer: apical tips of the achene-wings obtuse. — 7. *S. ovatifolium.*
Basal leaves with petioles scarcely half as long as the blades: apical tips of the achene-wings acute. — 8. *S. venosum.*
Heads large, the involucre over 2 cm. broad: ligules of the ray-flowers 1.5–3 cm. long.
Leaf-blades merely toothed.
Outer bracts of the involucre broader than long: leaf-blades narrowed at the base. — 9. *S. rumicifolium.*
Outer bracts of the involucre longer than broad: leaf-blades cordate. — 10. *S. terebinthinaceum.*
Leaf-blades pinnatifid, except a form with narrow undulate-toothed or undulate leaf-blades. — 11. *S. pinnatifidum.*

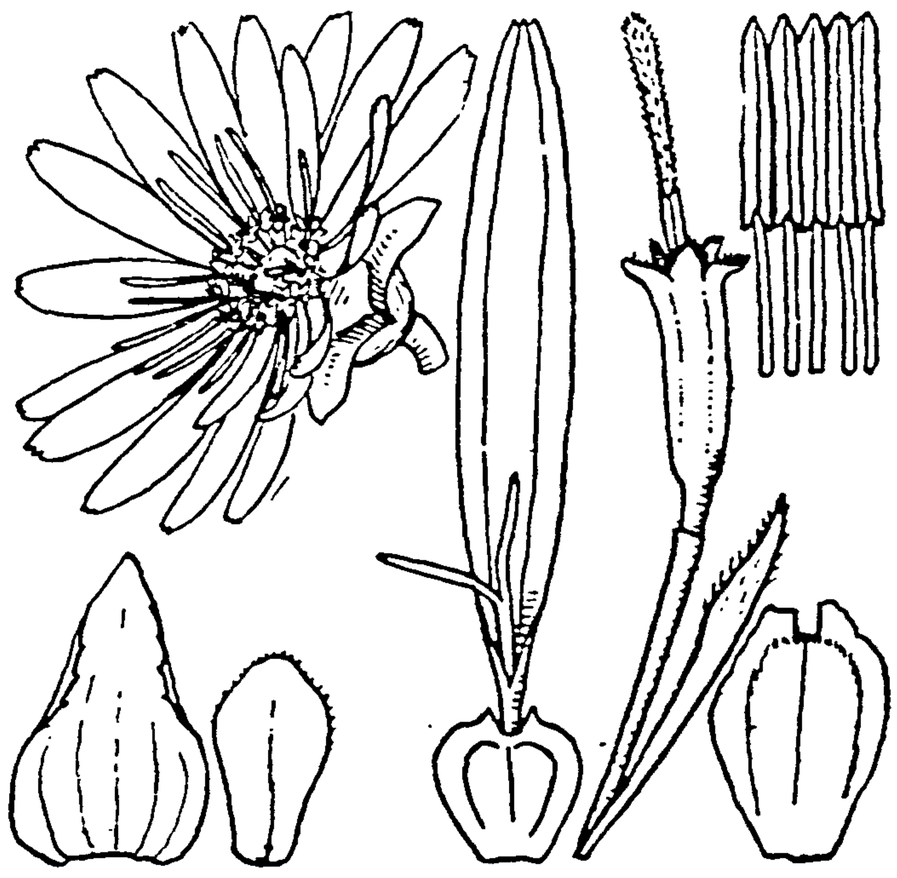
IV. Dentata

Leaves, at least on the lower part of the stem, whorled in threes. — 12. *S. trifoliatum.*
Leaves alternate or opposite, often both on the same plant.
Blades of the basal and lower cauline leaves narrowed at the base; those of the upper cauline leaves short-petioled or sessile.
Stem smooth and glabrous or essentially so, except sometimes near the top.
Leaf-blades smooth except the margins, or slightly scabrous.
Leaves regularly disposed along the stem; blades smooth. — 13. *S. glabrum.*
Leaves mainly crowded at the base of the stem; blades scabrous near the edges. — 14. *S. confertifolium.*
Leaf-blades very rough-pubescent.
Leaf-blades entire. — 15. *S. Elliottii.*
Leaf-blades coarsely toothed. — 16. *S. dentatum.*
Stem rough-pubescent.
Leaves mainly cauline, often numerous on the stem, opposite or alternate or both.
Achene with a U-shaped sinus at the top, the wings produced into two teeth above the apex.
Leaves several or numerous, usually scattered along the stem, often rather close together; blades short-petioled or sessile. — 17. *S. Asteriscus.*
Leaves few, usually remote on the stem; blades of the upper ones, and petiole-like bases of the lower ones more or less clasping. — 18. *S. Simpsonii.*
Achene truncate at the apex, the very narrow wings not produced into teeth at the apex. — 19. *S. nodum.*
Leaves mainly basal or approximate at the base of the stem, the stem with few remote opposite or alternate leaves, often scape-like: achenes with large apical teeth.
Blades of the basal leaves very coarsely toothed: achenes 7–8 mm. long. — 20. *S. incisum.*
Blades of the basal leaves shallowly toothed: achenes 9–10 mm. long. — 21. *S. gracile.*
Blades of the basal and lower cauline leaves cordate or truncate at the base; those of the upper cauline leaves manifestly petioled. — 22. *S. brachiatum.*

V. INTEGRIFOLIA

Stem pubescent with short, stiff hairs, often very rough.
  Upper leaves sessile, cordate or clasping.
    Achenes with very short apical teeth, the sinus broadly U-shaped. 23. *S. asperrimum.*
    Achenes with long apical teeth, the sinus narrowly U-shaped. 24. *S. integrifolium.*
  Upper leaves narrowed or rounded at the base, short petioled. 25. *S. scaberrimum.*
Stem at least above, and involucral bracts shaggy-hispid or hispid.
  Involucral bracts appressed towards the base: leaf-blades relatively narrow. 26. *S. Gatesii.*
  Involucral bracts loose and spreading: leaf-blades relatively broad. 27. *S. Mohrii.*

1. S. perfoliatum L. Stem 8–26 dm. tall, often branched above, smooth and glabrous: leaf-blades lanceolate to ovate, 2–6 dm. long, dentate-serrate, the lower ones narrowed into broad petiole-like bases: heads showy: involucre 1–2 cm. high, broader than high; bracts ovate-lanceolate to ovate or oval, subreniform, or the inner broadly spatulate or cuneate: ray-flowers mostly 15–25; ligules bright-yellow, 2.5–3 cm. long: achene obovate, narrowly winged, 11–14 mm. long, emarginate by slight projections of the wings at the apex.—(CUP-PLANT.)—Prairies and moist soil, various provinces, Ga. to La., Ont., and Neb. Also naturalized E.—Sum.



2. S. laciniatum L. Stem 10–35 dm. tall, coarsely hispid: blades of the basal leaves ovate to elliptic in outline, 10–40 cm. long, the segments lanceolate to linear, entire or pinnatifid, the dilated bases of the petioles often pinnatifid: heads showy: involucre 2.5–3 cm. high; bracts broadly lanceolate or ovate-lanceolate, or with ovate or orbicular-ovate bases and involute curved tips, 2.5–4 cm. long, the outer more or less shaggy-pubescent: ray-flowers numerous; ligules yellow, 3–5.5 cm. long: achene oval-obovate to suborbicular, 12–15 mm. long, the wings erose, forming a shallow apical sinus.—(COMPASS-PLANT. ROSIN-WEED.)—Prairies, various provinces, Ala. to Tex., S. Dak., and Ohio.—Sum.

3. S. reniforme Raf. Stem 8–20 dm. tall, glabrous or nearly so: blades of the basal leaves ovate to reniform, 10–35 cm. long, obtuse, coarsely dentate, deeply cordate at the base; petioles longer than the blades on the lower part of the stem: involucre campanulate, 6–8 mm. high; bracts ovate or broadly elliptic to elliptic, ciliate, otherwise glabrous, the obtuse tips spreading or recurved: ray-flowers several; ligules yellow, 1–1.5 cm. long: achene suborbicular or orbicular-obovate, 7–8 mm. long; wing-tips forming a shallow apical sinus.—Dry or stony soil, Blue Ridge, N. C. and Appalachian shale slopes, Va.—Sum.

4. S. compositum Michx. Stem 9–20 dm. tall, glabrous, glaucous: blades of the basal leaves 10–30 cm. long, not conspicuously veined, mostly somewhat pedately parted, the segments broad; petioles longer than the midribs: heads often numerous: involucre campanulate, 7–8 mm. high; bracts ovate to broadly elliptic or oval, obtuse, ciliolate, otherwise glabrous, the tips erect: ray-flowers several; ligules bright-yellow, 14–20 mm. long: achene cuneate or cuneate-obovate, 7–9 mm. long, the wing-tips broad, erose, forming a U-shaped apical sinus.—Dry woods and pinelands, Coastal Plain and adj. provinces, Ga. to Ala., Tenn., and N. C.—Sum.–fall.

5. S. lapsuum Small. Stem 9–22 dm. tall, glabrous, green or glaucescent: blades of the basal leaves pinnatifid or pinnately parted, the segments coarsely toothed or pinnatifid, usually very scabrous on both sides, the lower ones often long-stalked: heads few to several: involucre hemispheric, 8–10 mm. high; bracts orbicular-ovate to obovate or orbicular-obovate, obtuse, ciliolate, often veiny, the tips spreading or recurved: ray-flowers mostly 6–8; ligules 8–10 mm. long: achene obovate, 8–9 mm. long, the wing-tips coarsely toothed forming a U-shaped sinus.—Sandhills and oak-woods, Coastal Plain and Piedmont, near the Fall Line, Ga., and S. C.—Sum.

6. S. orae Small. Stem 6–21 dm. tall, glabrous, glaucescent: blades of the basal leaves 8–16 cm. long, more or less pinnately parted, ciliate, with scattered hairs, but not rough, the lower segments sometimes long-stalked: heads rather numerous: involucre campanulate, 8–9 mm. high; bracts ovate to obovate, obtuse, ciliolate, the tips erect or appressed: ray-flowers mostly 6–9; ligules yellow, 11–16 mm. long: achene obovate to orbicular-obovate, 6–7 mm. long, the wing-tips toothed, forming a small U-shaped sinus at the top.—Sandy woods, Coastal Plain, S. C. to N. C.—Sum.

7. S. ovatifolium (T. & G.) Small. Stem 5–20 dm. tall, glabrous or nearly so, glaucescent: blades of the basal leaves ovate to elliptic-ovate, 10–30 cm. long pinnately lobed or pinnately parted, the lobes coarsely toothed, rounded or acute; petioles longer than the midribs on the lower part of the stem: involucre campanulate, or hemispheric-campanulate, about 1 cm. high; bracts ovate to elliptic, oval, or elliptic-obovate, ciliolate, rounded at the apex, the tips erect or nearly so: ray-flowers several; ligules yellow, 1–1.5 cm. long: achene suborbicular, about 10 mm. broad; the wing-tips irregularly toothed forming a usually V-shaped sinus.—Sandy woods, Coastal Plain, Fla. to Ga.—Spr.–sum.

8. S. venosum Small. Stem 8–12 dm. tall, glabrous or nearly so, glaucous: blades of the basal leaves ovate to elliptic, 9–30 cm. long, conspicuously red-veined, deeply pinnatifid or pinnately parted, the segments linear to linear-elliptic, coarsely and irregularly toothed or incised; petioles about ½ as long as the blades, dilated at the base: heads few, showy, corymbose: involucre campanulate, about 1 cm. high; bracts ovate or broadly elliptic to orbicular-oval, or spatulate, rounded at the apex, ciliolate: ray-flowers several; ligules yellow, 1–1.5 cm. long: achene suborbicular or rhombic-orbicular about 10 mm. long, the wing-tips forming a narrow U-shaped sinus, nearly entire.—Pinelands, Coastal Plain, Ga.—Spr.–sum.

9. S. rumicifolium Small. Stem 4–8 dm. tall: blades of the basal leaves elliptic to elliptic-ovate or obovate, 9–15 cm. long, rounded at the apex, repand-undulate, smooth, red-veined above, rather cuneate at the base; petioles shorter than the blades, dilated and sheathing at the base: involucre hemispheric, fully 2 cm. broad; bracts various, the outer suborbicular, broader than long, the inner broadly elliptic to cuneate or spatulate, rounded at apex: ray-flowers several; ligules yellow, 1.5–2 cm. long: achene cuneate to elliptic-obovate, 9–10 mm. long, narrowly winged, nearly truncate or slightly notched at the top.—Dry, sterile soil, in the Appalachian Valley near Knoxville, Tenn.—Sum.–fall.

10. S. terebinthinaceum Jacq. Stem 9–30 dm. tall: blades of the basal leaves ovate to elliptic, 9–60 cm. long, coarsely dentate, with more or less prolonged teeth, usually cordate at the base: heads showy, relatively few: involucre broadly campanulate, 2–3 cm. broad; bracts various, the outer ovate, oval, or obovate, the inner elliptic, much broader than the outer, all obtuse and longer than broad: ray-flowers 15–25; ligules yellow, 2–3 cm. long: achene obovate-cuneate, 9–11 mm. long, narrowly thick-winged, truncate or notched at the top.—Dry hills and prairies, various provinces, Ga. to La., Ia., and Mich.—Sum.–fall.

11. S. pinnatifidum Ell. Stem 5–30 dm. tall, pubescent: blades of the basal leaves pinnatifid or pinnately parted, the segments entire or incised, or rarely some of them merely undulate; petioles shorter than the blades: heads showy: involucre hemispheric, 2–3 cm. broad; bracts various, the outer suborbicular, the inner elliptic to elliptic-lanceolate, about twice as long as the outer, all obtuse: ray-flowers 12–20; ligules yellow, 1.5–2 cm. long: achene cuneate to obovate-cuneate or cuneate, 9–10 mm. long, with a small notch at the top.—Open grounds, Appalachian provinces and Interior Low Plateaus, Ga. to Ala., and Ohio.—Sum.—An apparent extreme form with narrow (lanceolate) undulate-toothed or undulate leaf-blades is *S. chickamaugense* Canby (*S. lanceolatum* Canby, not Nutt.).

12. S. trifoliatum L. Stem 9–22 dm. tall, glabrous, glaucous: leaves in whorls of 3, or rarely opposite or alternate above; blades lanceolate to ovate-lanceolate or linear-lanceolate, 8–20 cm. long, remotely serrate or nearly entire, acute or slightly acuminate, scabrous on both sides: heads several or numerous, rather showy: involucre campanulate, 10–12 mm. high; bracts ovate to ovate-lanceolate and elliptic, the tips often lax or somewhat spreading, ciliate, the outer acutish, the inner obtuse: ray-flowers few; ligules yellow, 2–2.5 cm. long: achene obovate or elliptic-obovate, 8–10 mm. long, narrowly winged, the wing-tips often toothed.—Hillsides, in sterile soil, various provinces, rarely Coastal Plain, Ala. to Ohio, Pa., and Md.—A form with scabrous-pubescent stems occurs in S. C.

13. S. glabrum Eggert. Stem 9–15 dm. tall, smooth, often glaucescent: leaves opposite or the upper ones sometimes alternate; blades ovate-lanceolate, 8–20 cm. long, acute or short-acuminate, remotely dentate, smooth and glabrous except along the margins: heads few to several: involucre campanulate, 9–12 mm. high; bracts elliptic-lanceolate to ovate or elliptic, obtuse, ciliate, spreading at the tip or slightly recurved: ray-flowers several; ligules yellow, 2–2.5 cm. long: achene obovate, 7–9 mm. long, rather narrowly winged, the wing-tips short with acute or lacerate teeth.—Dry soil, various provinces, rarely Coastal Plain, Ga. to Miss., Tenn., and N. C.—Sum.–fall.

14. S. confertifolium Small. Stem 1–6 dm. tall, glaucous, smooth and glabrous: leaves mainly on the lower part of the stem, and there approximated or crowded at the base; blades firm, elliptic to ovate-lanceolate, 6–12 cm. long, acute or cuspidate, ciliate, nearly entire or shallowly toothed, slightly scabrous except near the center: involucre campanulate, 7–10 mm. high; bracts broadly ovate, elliptic or elliptic-obovate to somewhat cuneate, obtuse, merely ciliate, with spreading or recurving tips at maturity: ray-flowers several; ligules yellow, 1.5–2 cm. long: achene orbicular-cuneate to orbicular-obovate, 6–8 mm. long, margined, the wings-tips ascending.—Dry soil, Choctaw Co., on the Coastal Plain of Ala.; also Ga.(?)—Sum.

15. S. Elliottii Small. Stem 8–13 dm. tall, glabrous, often red or reddish: leaves alternate, or few sometimes opposite; blades lanceolate to broadly elliptic-lanceolate elliptic ovate or rarely oval, 6–12 cm. long, entire, or occasionally with few indistinct teeth, conspicuously ciliate; petioles of the lower leaves more conspicuously ciliate than the blades: heads showy, often in terminal clusters: involucre 10–12 mm. high; bracts ovate or ovate-elliptic to suborbicular and obovate, merely ciliate, obtuse, or the outer sometimes acutish: ray-flowers several; ligules 1.5–2 cm. long, yellow: achene obovate or cuneate-obovate, 7–10 mm. long, narrowly winged, the wing-tips short, broad, rather widely separated.—Dry soil, woods and river-banks, Coastal Plain and adj. provinces, Ga. to Ala., and N. C.—Sum.

16. S. dentatum Ell. Stem 6–15 dm. tall, glabrous, or sparingly pubescent near the top: leaves opposite or the upper rarely alternate, or in whorls of 3;

blades elliptic to lanceolate or ovate-lanceolate, 5–15 cm. long, acute, commonly coarsely dentate or dentate-serrate; heads corymbose: involucre about 1 cm. high; bracts ovate-lanceolate to suborbicular, oblong or oblong-cuneate, merely ciliate, the outer ones acute, the inner obtuse: ray-flowers several; ligules yellow, 2–3 cm. long: achene obovate to oval, 6–8 mm. long, narrowly winged, the wing-tips rounded, or the sinus nearly obsolete.—Sandy soil, Coastal Plain, Fla. to Ala., and S. C.—Sum.–fall.

17. **S. Asteriscus** L. Stem 6–15 dm. tall, scabro-pubescent: leaves mostly alternate, approximate or scattered; blades elliptic to elliptic-lanceolate, ovate-lanceolate, 4–15 cm. long, more or less distinctly serrate, those of the lower leaves petioled: heads showy, solitary or few: involucre campanulate, about 1 cm. high: bracts ovate, elliptic-lanceolate to oval and elliptic, obtuse, or the outer ones acutish, merely ciliate: ray-flowers 11–15; ligules 1.5–2 cm. long: achene oval or obovate-oval, 8–9 mm. long, the wing-tips rather broad forming a rather broad sinus.—Dry soil, various provinces, Fla. to Miss., Ohio, and Va.—Sum.–fall.

18. **S. Simpsonii** Greene. Stem 9–12 dm. tall, less densely pubescent above than below: leaves opposite, the pairs rather remote; blades various, those of the basal leaves spatulate to spatulate-elliptic, 10–15 cm. long, on short-margined petioles, those of the upper part of the stem elliptic to lanceolate or ovate, 3–10 cm. long, sessile and clasping by broad bases, all coarsely crenate-serrate or slightly repand: heads few or solitary: involucres 1–1.5 cm. high ovate-orbicular or sub-orbicular or ovate to orbicular-obovate, merely ciliolate: ray-flowers 12–16; ligules yellow, 2.5–3 cm. long; achene broadly obovate or orbicular-obovate, 10–13 mm. long, broadly winged, the wing-tips erect, blunt, forming a deep U-shaped sinus.—Sandy pinelands, S pen. Fla.—Sum.

19. **S. nodum** Small. Stem mostly less than 1 m. tall, hispid: leaves opposite, the pairs distant; blades elliptic, oval, or broadly ovate, 5–8 cm. long, shallowly and remotely dentate-serrate, obtuse or sometimes abruptly pointed, of the lower ones with short petiole-like bases: heads solitary or few together: involucre broadly campanulate, about 1 cm. high; bracts ovate or orbicular-ovate to obovate, obtuse, ciliate: ray-flowers few, ligules 1.5–2 cm. long: achene obovate or oval, 7–8 mm. long, narrowly winged, contracted into more or less of a neck at the top and truncate, the wing-tips obsolete or obscure.—Sandy soil, about Charleston, S. C.—Sum.

20. **S. incisum** Greene. Stem about 6 dm. tall, perhaps up to 1 m., hirsute: leaves opposite and alternate; blades of the basal ones ovate to ovate-lanceolate, 9–21 cm. long, coarsely dentate-serrate, abruptly narrowed or truncate at the base, on long hirsute petioles, those of the remote cauline leaves lanceolate or elliptic-lanceolate, somewhat acuminate, coarsely few-toothed, short-petioled or sessile: heads usually few: involucre broadly campanulate, about 1 cm. high; bracts elliptic-ovate to broadly ovate, ciliate, sparingly pubescent, obtuse or merely acutish, with more or less recurved tips: ray-flowers few; ligules yellow: achene obovate, 7–8 mm. long, narrowly winged, the wing-tips broad, forming a rather broad U-shaped sinus.—Appalachian provinces, Ga.—Sum.

21. **S. gracile** A. Gray. Stem 3–9 dm. tall, hirsute: leaves opposite; blades of the basal leaves elliptic-lanceolate to ovate-laneolate, 5–30 cm. long, acute at both ends or slightly acuminate or rarely obtuse, remotely dentate-serrate, those of the remote cauline leaves elliptic to lanceolate: heads solitary or few, showy: involucre 1–1.5 cm. high; bracts ovate or orbicular-ovate to elliptic-ovate, oval, or obovate, ciliolate, obtuse, or the often inconspicuously pubescent outer ones acutish, ciliolate: achene suborbicular or orbicular-oval, 9–10 mm. long, or rarely larger, very broadly winged, the wing-tips broad, forming a rather shal-

low sinus.—Rocky soil, woods or prairies, Coastal Plain and adj. provinces, Ala. to Tex.—Sum.

22. **S. brachiatum** Gattinger. Stem 8–20 dm. tall, glabrous: blades of the basal leaves triangular-hastate, 8–15 cm. long, repand, the lower cauline ones triangular-hastate, truncate subcordate, or cordate at the base, repand-toothed or coarsely dentate-serrate, acute, with petioles sometimes half as long as the blades, conspicuously ciliate, blades of the upper leaves ovate-lanceolate to lanceolate, entire or nearly so: heads several or numerous, usually on long, slender, glaucous peduncles: involucre campanulate, about 1 cm. high; bracts ovate, orbicular-ovate to elliptic, or ovate-elliptic obtuse, ciliate, the tips often somewhat spreading: ray-flowers several; ligules yellow, 1–1.5 cm. long: achene suborbicular, 7–8 mm. long, narrowly winged, emarginate at the apex, the wing-tips very short and broad.—Hillsides, Appalachian Plateau, Tenn.—Sum.

23. **S. asperrimum** Hook. Stem 6–15 dm. tall, scabro-pubescent: leaves opposite or sometimes alternate, especially above; blades ovate, ovate-lanceolate, elliptic-lanceolate, or lanceolate, 4–14 cm. long, acute or somewhat acuminate, entire or shallowly toothed, rounded at the base, sessile and more or less clasping: heads few or several, showy: involucre hemispheric 1.5–2 cm. high; bracts pubescent, the outer ovate or lanceolate, the inner broadly ovate, acute or obtuse, ciliate, the tips often lax or recurved: ray-flowers several or numerous; ligules 2.5–3.5 cm. long, yellow: achene obovate or oval-obovate, 9–14 mm. long or rarely smaller, the wing-tips forming a broadly U-shaped sinus.—Woods, prairies, and old fields, various provinces, Ala. to N. M., Okla., and Mo.—Sum.–fall.

24. **S. integrifolium** Michx. Stem 8–15 dm. tall, scabro-pubescent: leaves opposite or mainly so; blades ovate to broadly lanceolate, often nearly uniform in size, 7–12 cm. long, scabrous on both sides, acute, often shallowly toothed, especially on the lower part of the stem, mostly entire above: heads in rather open corymbs: involucre 1–1.5 cm. high; bracts more or less pubescent, the outer triangular-ovate to lanceolate, acute, the inner broader, obtuse, all often with recurved tips: ray-flowers 15–23; ligules bright-yellow, 2–3 cm. long: achene narrowly obovate, about 1 cm. long, broadly winged only near the top, the wing-tips broad, long, forming a narrowly U-shaped sinus.—Plains and prairies, various provinces, Miss. to Tex., Wis., and Ill.—Sum.–fall.

25. **S. scaberrimum** Ell. Stem 9–15 dm. tall, pubescent, sometimes sparingly so: leaves opposite or alternate: blades elliptic-lanceolate, ovate-lanceolate or narrowly ovate, or those of the basal leaves lanceolate, 8–20 cm. long, or rather shorter high up on the stem, acute or somewhat acuminate, sharply serrate, scabrous on both sides; heads usually few, showy: involucre campanulate, about 1 cm. high; bracts ovate-lanceolate to ovate or elliptic, not conspicuously pubescent, but ciliate, obtuse or the outer ones acutish, the inner with recurved tips: ray-flowers several; ligules about 1.5 cm. long, yellow: achene suborbicular, 5–7 mm. broad, broadly winged, the wing-tips forming a deep apical notch.—Open woods, fields, and pinelands, Coastal Plain and adj. provinces, Ga. to Miss., Tenn., and S Va.—Sum.

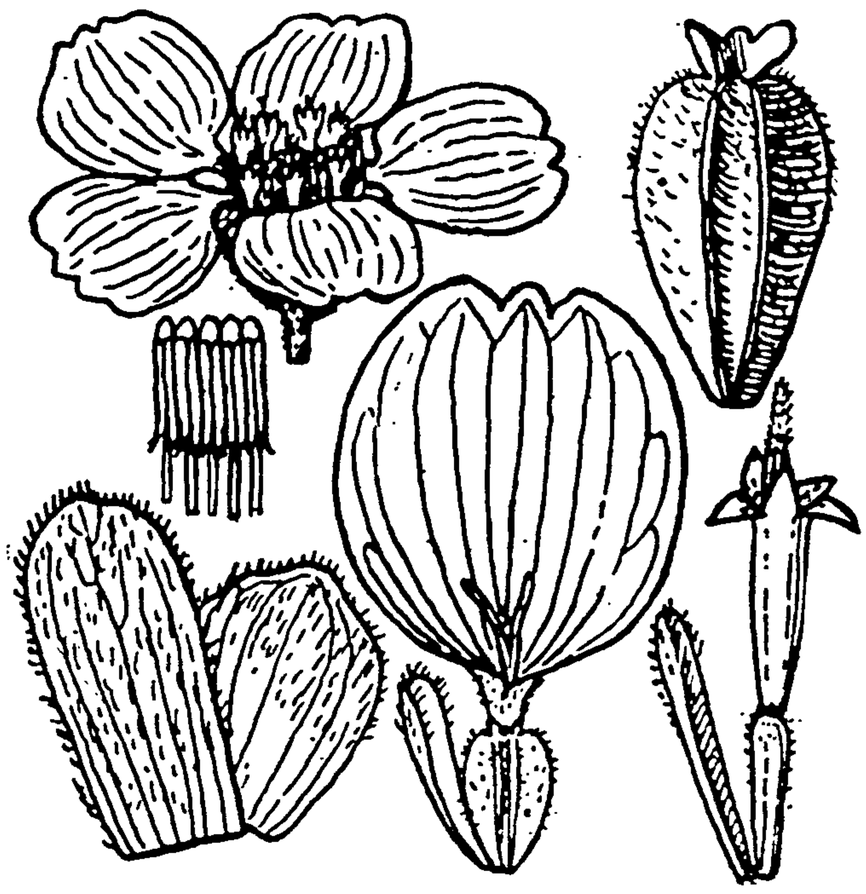
26. **S. Gatesii** C. Mohr. Stem 6–15 dm. tall, hispid: leaves alternate, often rather numerous; blades broadly linear to elliptic-lanceolate or lanceolate, 5–14 cm. long, acute, entire or remotely shallowly toothed, scabrous-pubescent, the lower ones petioled: heads showy; involucre campanulate, about 1 cm. high; bracts ovate-lanceolate to ovate, hispid, the outer acute and short-acuminate, coarsely hairy, the inner obtuse: ray-flowers several; ligules yellow, 12–20 mm. long: achene suborbicular or broader than high, the wing-tips forming a broad sinus.—Dry soil, various provinces N of Coastal Plain, Ala., and Tenn., to Mo.—Spr.–sum.

27. **S. Mohrii** Small. Stem 6–12 dm. tall, shaggy-hispid: leaves alternate; blades ovate-lanceolate to narrowly ovate, 5–28 cm. long, acuminate, remotely serrate with prominent teeth except near the base, or merely undulate: heads showy, but relatively few: involucre campanulate or hemispheric, 1–1.5 cm. high; bracts lanceolate to ovate-lanceolate, acute or slightly acuminate, densely hispid and conspicuously long-ciliate: ray-flowers several; ligules yellow, 10–14 mm. long: achene obovate, about 7–9 mm. long, the wing-tips acutish or blunt, widely separated.—Dry soil, Interior Low Plateaus and Appalachian Provinces, Ga. to Ala., and Tenn.—Sum.–fall.

60. **CHRYSOGONUM** L. Perennial, depressed, stoloniferous herbs. Leaves opposite: blades toothed. Heads erect. Involucre hemispheric: bracts distinct, the outer foliaceous. Ligules of the ray yellow. Disk-flowers with short abortive ovaries and corollas with a very short tube and funnelform throat. Filaments less than half as long as the anthers. Style glabrous. Achene wingless. Pappus a half cup-shaped crown.—Two or three species.

Leaf-blades truncate or abruptly cuneate at the base, deltoid-ovate: plant eventually caulescent. 1. *C. virginianum.*
Leaf-blades gradually tapering at the base, elliptic: plant acaulescent. 2. *C. australe.*

1. **C. virginianum** L. Stem hirsute, prostrate, sometimes 6 dm. long: leaf-blades light-green, deltoid-ovate, 2.5 cm. long, long-petioled, short-pubescent on both surfaces: involucre hirsute: outer bracts 7–10 mm. long: ligules of the ray mostly 9–11 mm. long: achene 4–4.5 mm. long.—Dry woods and hillsides, Coastal Plain to Blue Ridge, Fla. to La., Tenn., and Pa.—Spr.



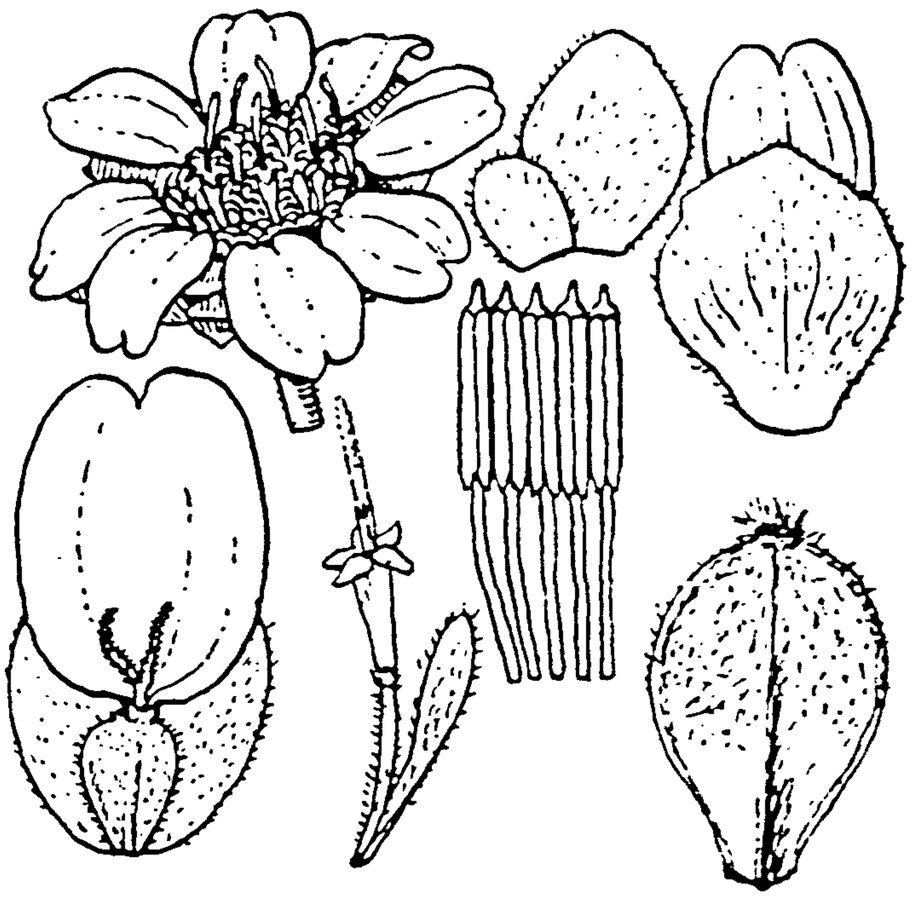
2. **C. australe** Alexander. Stem a mere caudex, giving off hirsute stolons which form new plants at their tips: leaf-blades dark-green, elliptic, 3–7 cm. long, tapering at the base to a long petiole, hirsute on both surfaces: involucre hirsute; outer bracts 8–9 mm. long: ligules of the ray 10–15 mm. long: mature achene not seen.—Dry woods, various provinces Fla. to Ala. and N. C.—Spr.

61. **BERLANDIERA** DC. Perennial, erect herbs, with large roots. Leaves alternate: blades toothed or pinnatifid. Heads more or less nodding. Involucre somewhat depressed: bracts broad, often veiny. Ligules of the ray-corollas yellow. Disk-flowers with long abortive ovaries and corollas with a very short tube and a funnelform throat. Filaments nearly as long as the anthers. Style pubescent. Achene wingless, 1 ribbed within. Pappus obsolete or of 2 caducous-awns.—About 8 species, North American.—Sum.–fall, or all year S.—GREEN-EYES.

Leaf-blades merely toothed or slightly pinnatifid near the base, often gray-woolly or tomentose.
Plants with stem leafy to near the inflorescence. 1. *B. pumila.*
Plants with scapes. 2. *B. humilis.*
Leaf-blades pinnatifid throughout: stem hispidulous. 3. *B. subacaulis.*

1. **B. pumila** (Michx.) Nutt. Stem 2–9 dm. tall, gray-woolly: leaf-blades elliptic, ovate, or oval, 4–10 cm. long, obtuse, crenate, truncate or subcordate

at the base or rarely narrowed, pubescent with gray wool beneath, the upper ones sessile or nearly so: involucre flattish, 2–2.5 cm. broad; bracts elliptic, oval, or obovate, obtuse, ciliolate: ligules of the ray yellow, 1–1.5 cm. long: disk-corolla 3–3.5 mm. long: achene 6 mm. long, ciliate. [*B. tomentosa* Nutt.]—Sandy soil, Coastal Plain, Fla. to Ala., and N. C.



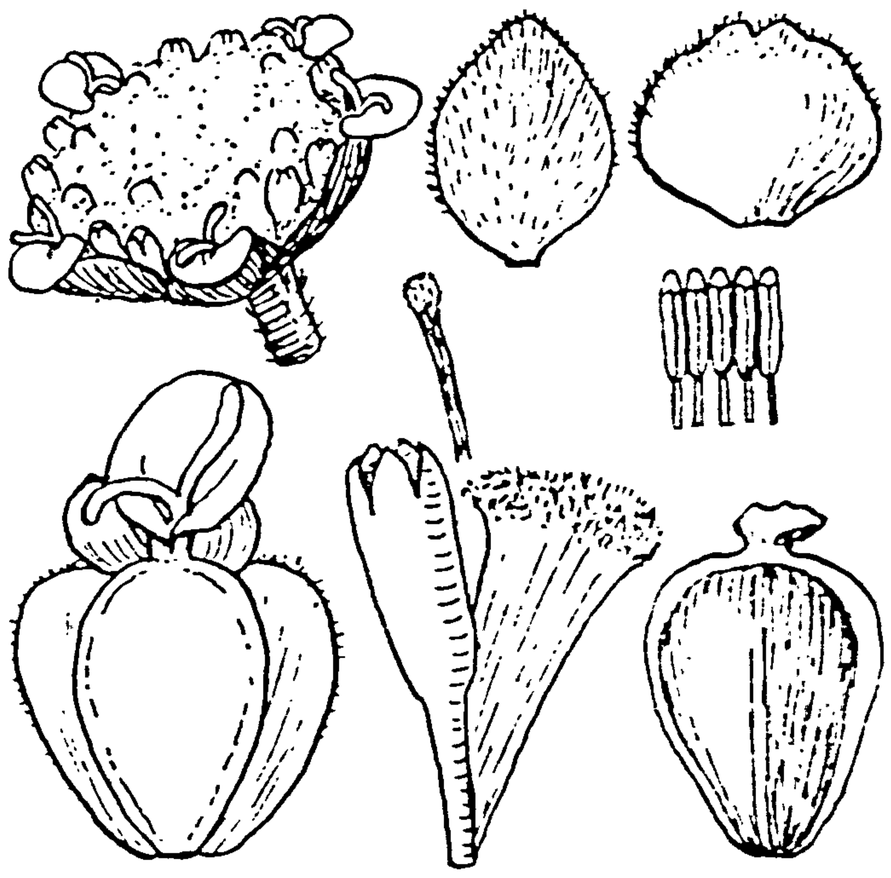
2. **B. humilis** Small. Plant 1–2 dm. tall, tomentose: leaf-blades elliptic to ovate, 3–8 cm. long, rounded at the apex, unevenly crenate, pale beneath, more or less lyrate-pinnatifid near the base, or some of them merely cordate: scape simple or corymbosely branched, the heads thus solitary or several together: involucre 1.5–2 cm. broad; bracts elliptic or lanceolate to ovate or orbicular, closely soft-pubescent: ligules of the ray 1.5–2 cm. long: achene obovate, 5–6 mm. long, woolly.—Pinelands and sandy woods, Fla.

3. **B. subacaulis** Nutt. Plant 1–5 dm. tall, hispidulous: leaf-blades deeply sinuate-pinnatifid or lyrate-pinnatifid, elliptic to oblanceolate, 4–12 cm. long, the lobes obtuse, entire or toothed: involucre about 2 cm. broad; bracts elliptic or elliptic-spatulate to obovate and cuneate, obtuse, ciliolate: ligules of the ray 1–1.5 cm. long: disk-corollas 3–3.5 mm. long: achene elliptic or nearly so, 5–6 mm. long, ciliolate.—Dry pinelands, Fla.

62. **PARTHENIUM** L. Coarse herbs, or shrubs, usually pale-pubescent. Leaves alternate: blades toothed, pinnatifid, or dissected. Heads inconspicuously radiate. Involucre depressed to globular: bracts appressed, broad. Ray-flowers usually 5: ligules inconspicuous, white or whitish. Lobes of the disk-corollas ovate, ciliate. Anthers longer than the filaments. Achene flattened. Pappus of 2 or 3 scales or awns.—About 12 species, American.

Leaf-blades 1–2-pinnatifid: heads not firm at maturity. 1. *P. Hysterophorus.*
Leaf-blades merely toothed: heads very firm at maturity. 2. *P. integrifolium.*

1. **P. Hysterophorus** L. Plant annual, 3–7 dm. tall: leaf-blades elliptic to ovate in outline: involucre saucer-like, 4–5 mm. broad: disk-corollas, 1–1.5 mm. long: achene 1–1.5 mm. long.—(RAGWEED.) — Pinelands, waste-places, cult. grounds, and roadsides, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and Pa.



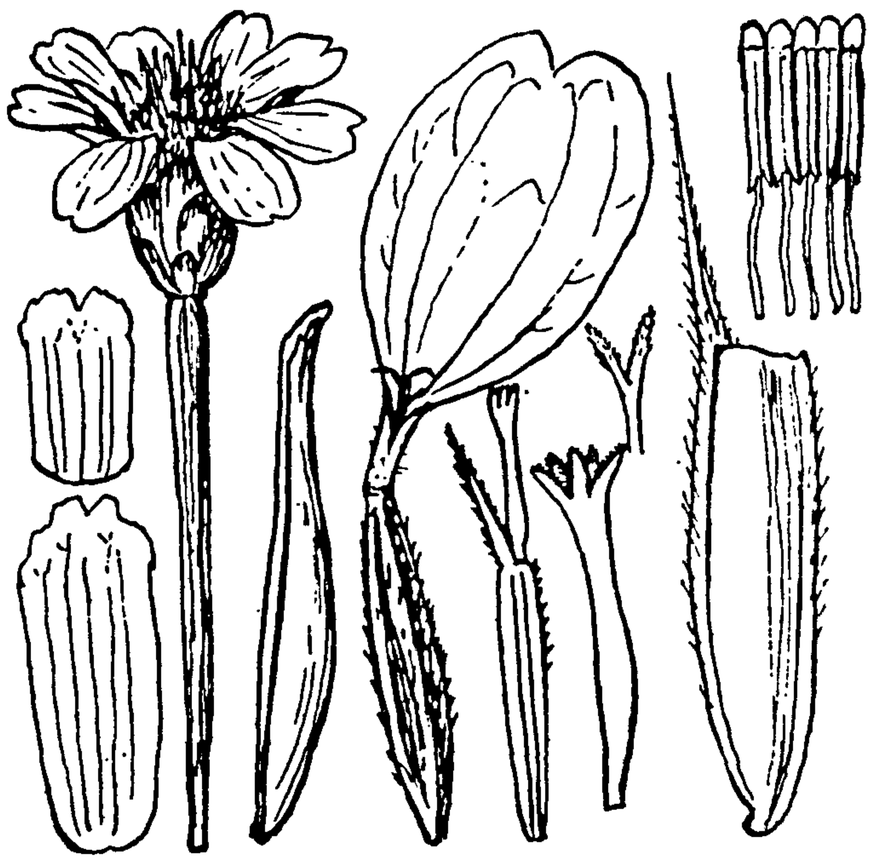
2. **P. integrifolium** L. Plants perennial, 4–12 dm. tall: blades of the basal leaves elliptic to lanceolate: involucre campanulate, becoming globular, 4–6 mm. broad: disk-corollas, 2.5–3 mm. long: achene 3.5–4 mm. long.—Dry soil, woods and hillsides, various provinces, Ga. to Tex., Minn., and Md.—Spr.–sum.—*P. hispidum* Raf., with rough-pubescent foliage and coarsely toothed or incised leaf-blades, known to range from Tex. to Kans. and Mo. is to be expected from W. Tenn.

63. **ZINNIA** L.[1] Annual or perennial, erect herbs, or shrubby plants. Leaves opposite: blades entire or sparingly toothed, 3-ribbed. Heads showy, on usually clavate peduncles. Involucre hemispheric to somewhat cylindric: bracts broad except the inner elongate ones. Ray-flowers few: ligules red, purple, yellow, or variegated, conspicuous. Lobes of the disk-corollas lanceolate to linear, ciliate. Anthers shorter than the filaments, the appendages deltoid or lanceolate. Achene of the ray 3-angled. Pappus of 1-few awns, or wanting.—About 15 species, natives of western America.

Involucre cylindric-campanulate: chaff of the receptacle with erose or lacerate tips. 1. *Z. pauciflora.*

Involucre hemispheric: chaff of the receptacle with long-fringed, appendage-like tips. 2. *Z. elegans.*

1. Z. pauciflora L. Stem 1–6 dm. tall: leaf-blades linear-elliptic to ovate, 2–5 cm. long: outer bracts of the involucre ovate, the inner bracts linear-elliptic to slightly broadened upward, 11–13 mm. long: ligules of the ray 10–15 mm. long: lobes of the disk-corollas linear. [*Z. multiflora* L.]—Dry soil, Fla. to Ariz. and N. C. Nat. of trop. Am., but possibly native in the SW U. S.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall.



2. Z. elegans Jacq. Stem 1–6 dm. tall: leaf-blades elliptic to ovate, 2–10 cm. long: outer bracts of the involucre broadly obovate, the inner bracts elliptic, slightly broadened upward, 9–12 mm. long: ligules of the ray, 10–20 cm. long: lobes of the disk-corollas linear.—Waste-places, roadsides and cult. grounds, Fla. Native of Mex. and S. A., and widely cult. (*W. I., Mex., S. A.*)—Sum.–fall. The common zinnia of gardens is a cultivated form of *Z. elegans*, sometimes hybridized with *Z. pauciflora* and other species, as is shown by the varying shape of the involucre as well as the color of the ray-flowers.

64. **HELIOPSIS** L. Perennial or rarely annual, *Helianthus*-like herbs. Leaves opposite: blades serrate, petioled. Heads showy. Involucre flattish: bracts in 2 or 3 series, the outer more or less spreading. Ray-flowers several: ligules yellow, conspicuous. Disk-corollas longer than the ovaries. Stigmas long. Achene of the ray with a pappus of 2–4 teeth or a crown, or the pappus obsolete.—About 6 species, American.—Spr.–fall.—OX-EYES.

Foliage, especially the leaf-blades, very scabrous. 1. *H. scabra.*

Foliage, especially the leaf-blades, smooth or very slightly scabrous.

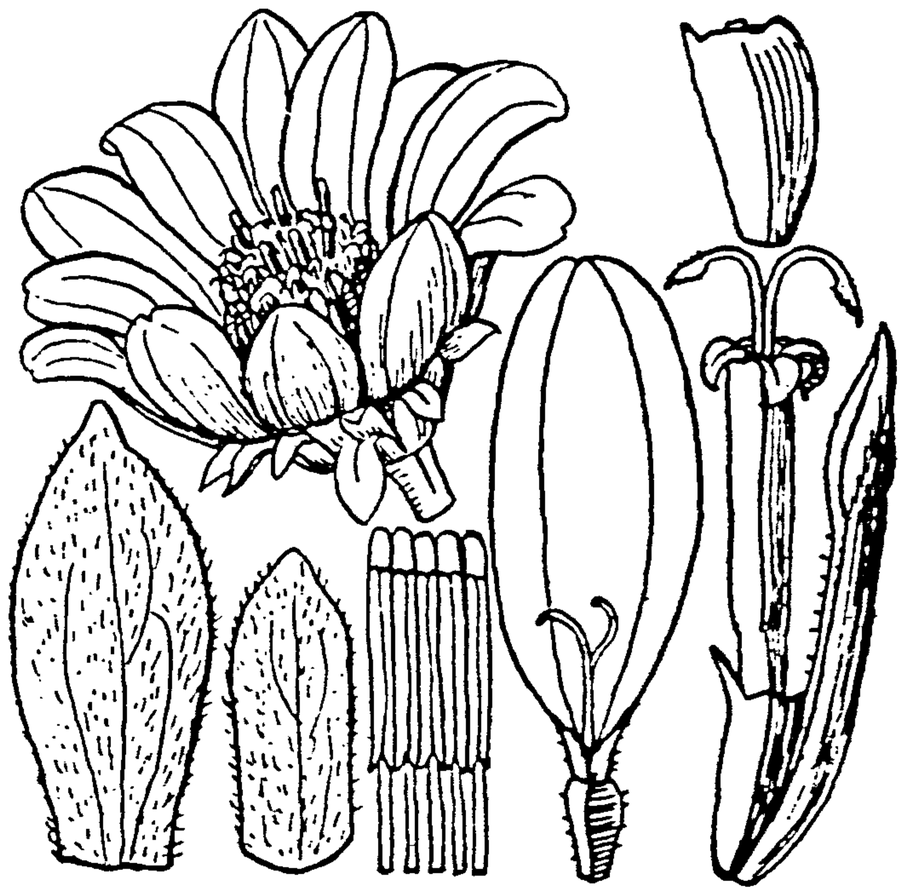
Heads usually over 1 cm. high: achene glabrous. 2. *H. helianthoides.*

Heads usually less than 1 cm. high: achene pubescent above. 3. *H. minor.*

1. H. scabra Dunal. Stem 8–14 dm. tall: leaf-blades thick, deltoid or broadly lanceolate, 5–15 cm. long, serrate, cuneate to truncate at the base:

[1] Revised by Edward Johnston Alexander.

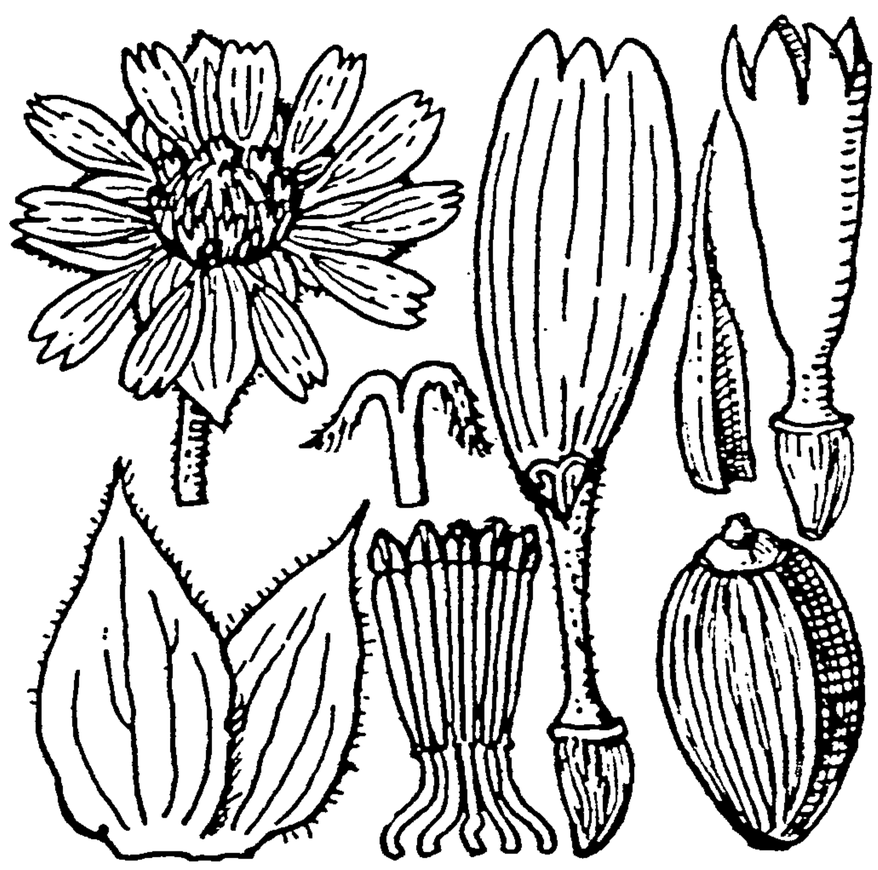
heads showy, with broadly conic disks: bracts of the involucre linear-elliptic to elliptic, acutish or obtuse: ray-flowers several; ligules of the ray 2–2.5 cm. long, bright-yellow: bractlets slightly dilated and barely erose at the tip: achene pubescent on the margins, at least when young, each with a pappus of 1–3 short awns, or a laciniate crown.—Fields, roadsides, and woods, various provinces, Tenn. to Ark., B. C., Ont., Me., and N. J.



2. H. helianthoides (L.) B. S. P. Stem 3–15 dm. tall: leaf-blades thinnish, ovate to lanceolate, 8–20 cm. long, sharply serrate, cuneate to truncate at the base: heads showy, with a rounded disk usually over 1 cm. high: bracts of the involucre elliptic-lanceolate to elliptic, ciliate, acute or acutish, the outer with spreading or reflexed tips: ray-flowers several; ligules of the ray bright-yellow, 2–3 cm. long: bractlets dilated and erose at the apex: achene glabrous, truncate or obscurely 2–4-toothed at the apex. [*H. laevis* Pers.]—Banks, thickets, and open woods, various provinces, Fla. to Miss., Ont., and N. Y.

3. H. minor (Hook.) C. Mohr. Stem 2–7 dm. tall: leaf-blades thinnish, lanceolate, elliptic or elliptic-lanceolate, 3–10 cm. long, sharply serrate, cuneate, rounded, or truncate at the base: heads with disks usually less than 1 cm. high: bracts of the involucre ovate or lanceolate to elliptic, rather obtuse, the outer, at least, with spreading or reflexed tips: ray-flowers few; ligules bright-yellow, 1–2 cm. long: achene 2.5–3 mm. long: pappus short. [*H. gracilis* Nutt.]—Pinelands, woods, and hillsides, Coastal Plain and adj. provinces, Fla. to Ark. and Ga.

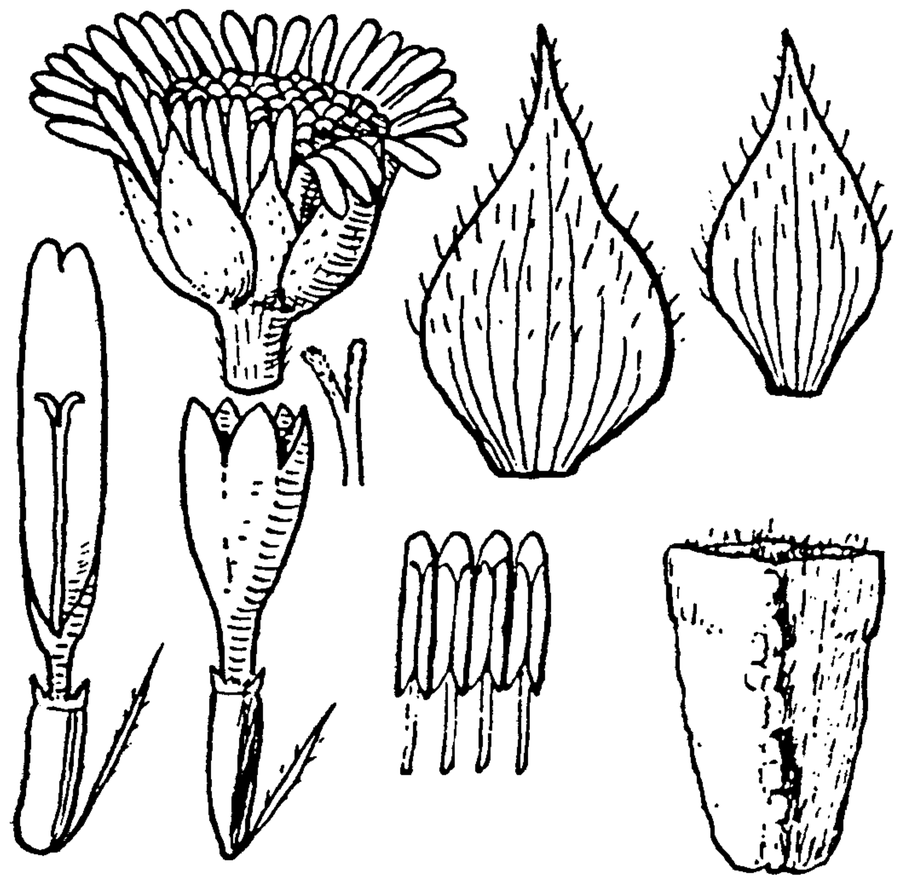
65. **TETRAGONOTHECA** L. Perennial, erect, stout herbs. Leaves opposite: blades broad, repand, saliently toothed or pinnatifid, sessile or connate-perfoliate. Heads large, resembling those of *Silphium*. Involucre with thin partially united foliaceous outer bracts, and narrower and shorter inner ones. Ray-flowers several: ligules narrow, yellow. Disk-flowers numerous: corollas with a short tube and a longer throat: lobes deltoid or triangular. Anthers mostly longer than the filaments, the appendages ovate. Stigmas slender. Achene very thick, broadened upward, striate or angled. Pappus wanting.—About 5 species, American.



1. T. helianthoides L. Stem 3–10 dm. tall, pubescent: blades of the upper leaves elliptic to oval, 8–15 cm. long, remotely toothed: outer involucre 4–6 cm. broad; inner bracts slenderly acuminate: ligules 3–4 cm. long: achene 5–6 mm. long.—(PINELAND-GINSENG).—Dry soil, pinelands and woods, Coastal Plain and adj. provinces, Fla. to Miss. and Va.—Spr.–fall.

66. **VERBESINA** L. Annual diffuse herbs. Leaves opposite, blades narrow, entire or sparingly toothed. Heads small, inconspicuously radiate.

Involucre hemispheric or campanulate: bracts broad, those of the outer series scarcely larger than those of the inner. Ray-flowers several: ligules white, inconspicuous. Disk-flowers numerous: corollas with a short tube and a longer funnelform throat: lobes deltoid. Anthers ellipsoid, longer than the filaments, the appendages ovate. Stigmas broad. Achene stout, 3–4-angled, or somewhat flattened in the disk. Pappus wanting or minute.—About 4 species, tropical.

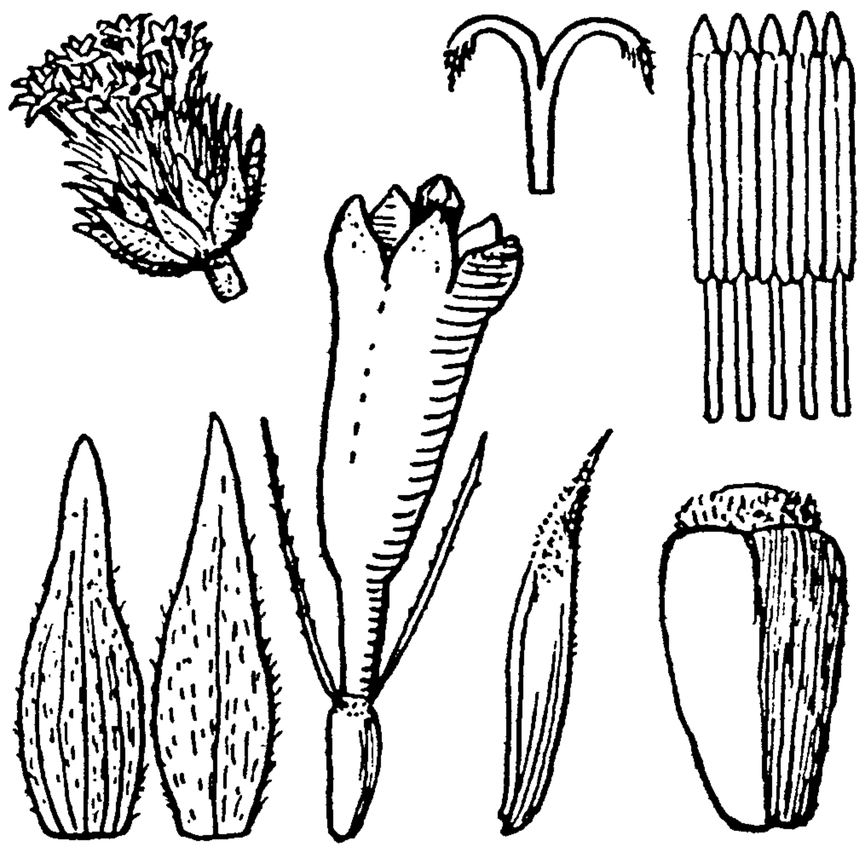


1. V. alba L. Stem and branches 2–9 dm. long, finely pubescent: leaf-blades elliptic, or lanceolate, or narrower, 3–10 cm. long, sessile: involucre broadly campanulate, the larger bracts about 4.5 mm. long: achene about 2.5 mm. long. [*Eclipta alba* (L.) Hassk.]—Waste-places, stream-banks, and low grounds, various provinces, Fla. to Tex., N. M., Neb., and Mass. Introd. NE.—(*W. I., Mex., C. A., S. A.*)—Sum.–fall or all year S.

67. MELANTHERA Rohr.[1] Perennial, erect herbs. Leaves opposite: blades entire, toothed, or hastate-lobed. Heads discoid, appearing gray on account of the dark anthers. Involucre hemispheric or depressed: bracts often broad, in 2 or 3 series. Throat of the white corolla much longer than the tube. Filaments generally as long as the black-tipped anthers or nearly so. Stigmas often flattened, mostly subulate. Achene compressed-quadrangular, somewhat obpyramidal, truncate.—About 12 species, tropical American.

Leaf-blades ovate to deltoid in outline.
  Involucral bracts and chaff acute, obtusish, or merely short-acuminate.
    Leaf-blades less than 5 cm. long: chaff short-acuminate.
      Middle lobe of the leaf-blade very narrow and long with a roundish few toothed tip. 1. *M. parvifolia.*
      Middle lobe of the leaf-blade, if present, broad and short with an expanded many toothed tip. 2. *M. radiata.*
    Leaf-blades over 5 cm. long: chaff acute or bluntly tipped. 3. *M. deltoidea.*
  Involucral bracts and chaff long-acuminate. 4. *M. hastata.*
Leaf-blades elliptic to linear in outline.
  Involucral bracts fully as long as the disk, linear-lanceolate. 5. *M. ligulata.*
  Involucral bracts shorter than the disk, rhombic-ovate. 6. *M. angustifolia.*

1. M. parvifolia Small. Stems often several together, 3–8 dm. tall, very rough-hispidulous, slender, sparingly branched: leaf-blades prominently hastate, 2–5 cm. long, or longer, the lateral lobes prominent, coarsely toothed or entire, the middle lobe elongate, contracted between the lateral lobes and the dilated apex, usually coarsely few-toothed above, the petioles rather short: heads few, usually very long-peduncled: larger bracts of the involucre 5–7 mm. long.—Pinelands and coastal sand-dunes, S pen. Fla. and the Keys.—All year.



2. M. radiata Small. Stems radially spreading from a woody root, 1–4 dm. long: leaf-blades ovate, 1–4 cm. long, entire and coarsely serrate, or hastately lobed and irregularly toothed, the middle lobe often obovate: larger bracts of the involucre ovate,

[1] Contributed by Edward Johnston Alexander.

5.5–6.5 mm. long, obtuse: corolla mostly about 6 mm. long.—Pinelands, Everglade Keys, Fla. and Florida Keys.—All year.

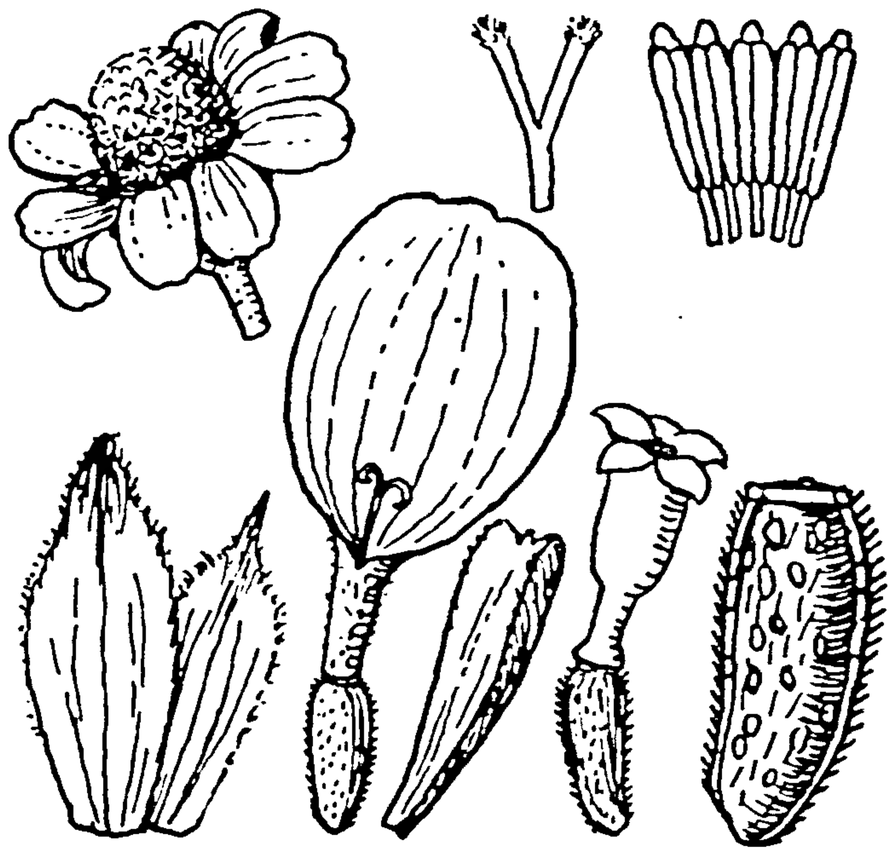
3. **M. deltoidea** Michx. Stem 8–24 dm. tall, somewhat rough-pubescent, often stout, considerably branched: leaf-blades ovate to deltoid or ovate-hastate or deltoid-hastate, 5–15 cm. long, obtuse or acute, crenate, or serrate, the petioles rather long: heads several or numerous, mostly rather short-peduncled: larger bracts of the involucre 3.5–5 cm. long: pappus of 2–3 bristles with a shorter fringe-like crown at their base.—Hammocks and coastal sand-dunes, S pen. Fla. and the Keys.—(*W. I.*)—All year.

4. **M. hastata** Michx. Stem 8–18 dm. tall, scabrous or hispidulous: leaf-blades 8–15 cm. long, ovate to deltoid in outline, often hastate or hastately lobed, crenate to serrate: larger bracts of the involucre 8–10 mm. long, acuminate as is also the receptacle chaff: corollas 3–4 mm. long. [*M. nivea* (Fl. SE. U. S.) *M. lobata* Small.]—Along lake and stream shores and in damp soil, Coastal Plain, Fla. to La. and S. C.—Sum.

5. **M. ligulata** Small. Stem erect, 4–7 dm. tall, finely pubescent: leaf-blades elongate-linear, mainly 8–16 cm. long, irregularly toothed, sometimes saliently so at the base: larger bracts of the involucre linear-lanceolate, 9–13 mm. long, acuminate: corolla 5–6 mm. long.—Pinelands, S pen. Fla.—Spr.

6. **M. angustifolia** A. Rich. Stem 2–8 dm. tall, strigillose: leaf-blades linear to linear-oblanceolate, 4–8 cm. long: larger bracts of the involucre rhombic-ovate, acute, 4–5 mm. long: corolla about 4 mm. long. [*M. lanceolata* (Fl. SE. U. S.)]—Everglades and low pinelands, pen. Fla.—(*W. I.*)—Spr.–fall.

68. **SPILANTHES** Jacq. Annual or perennial (ours), diffuse or creeping herbs, or partly woody plants. Leaves opposite: blades relatively broad, often toothed. Heads radiate, often inconspicuous, long-peduncled; the disk protruding high above the involucre by the elongation of the receptacle. Involucre campanulate or flat: bracts broad, narrowed to the apex. Ligules of the ray-corollas white or yellow. Disk-flowers inflated by the bractlets: corollas yellow, the throat often somewhat inflated: lobes deltoid. Filaments very short. Achene of the disk flattened, margined. Pappus one or several awns.—About 30 species, of warm and tropical regions.



1. **S. Americana** (Mut.) Hieron. Stem 2–8 dm. long, often creeping: leaf-blades ovate to lanceolate, 2–6 cm. long, toothed: bracts of the involucre lanceolate to elliptic or ovate-lanceolate, 4–5 mm. long: ligules of the ray about 5 mm. long: disk ovoid: achene 1.5 mm. long. [*S. repens* (Walt.) Michx.]—Low grounds, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and N. C.—Spr.–fall or all year S.

69. **ECHINACEA** Moench. Perennial, caulescent herbs. Leaves normally alternate: blades simple, entire or toothed. Heads radiate, solitary or few, conspicuous. Involucres many-flowered, rather flat: bracts in 2–4 series, narrow. Receptacle depressed, hemispheric, chaffy. Ray-flowers several, neutral, often with imperfect styles: ligules spreading or drooping, purple or rose, rarely yellow or white. Disk-flowers perfect, fruit-producing: chaff awned, surpassing the flowers, persistent. Achene acutely 4-angled, stout.

Pappus a crown, more or less produced into triangular teeth at the angles. [*Brauneria* Neck.]—Six species, North American.—CONE-FLOWERS.

Awn of the chaff about as long as the body: root horizontal or horizontally inclined, fibrous. I. PURPUREAE.
Awn of the chaff shorter than the body: root vertical, fusiform. II. ANGUSTIFOLIAE.

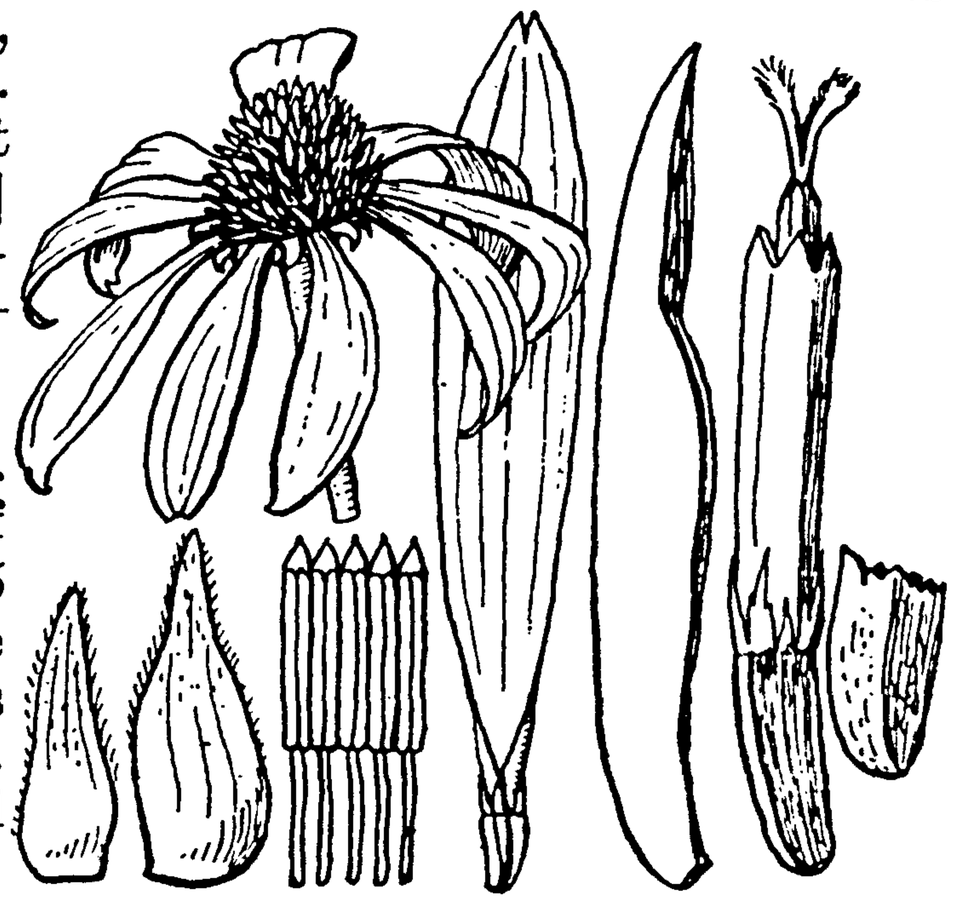
I. PURPUREAE

Rather coarse herb, with leaf-blades ovate lanceolate. 1. *E. purpurea.*

II. ANGUSTIFOLIAE

Plant glabrous or glabrate. 2. *E. laevigata.*
Plant hirsute or hispid.
  Ray-flowers with drooping ligules 4–8 cm. long. 3. *E. pallida.*
  Ray-flowers with spreading ligules 1.5–2.5 cm. long. 4. *E. tennesseensis.*

1. E. purpurea (L.) Moench. Stem scabrous-pubescent, 6–12 dm. tall: leaf-blades ovate to lanceolate, 5–12 cm. long, serrate or dentate-serrate: bracts of the involucre linear to linear-lanceolate, hispidulous: ligules of the ray 2.5–5 cm. long, or rarely shorter, purple or somewhat crimson or whitish. [*B. purpurea* Britton.] Rich soil, woods, and fields, various provinces, Ala. to La., Mo., S Va., and N. C.—Sum.–fall.

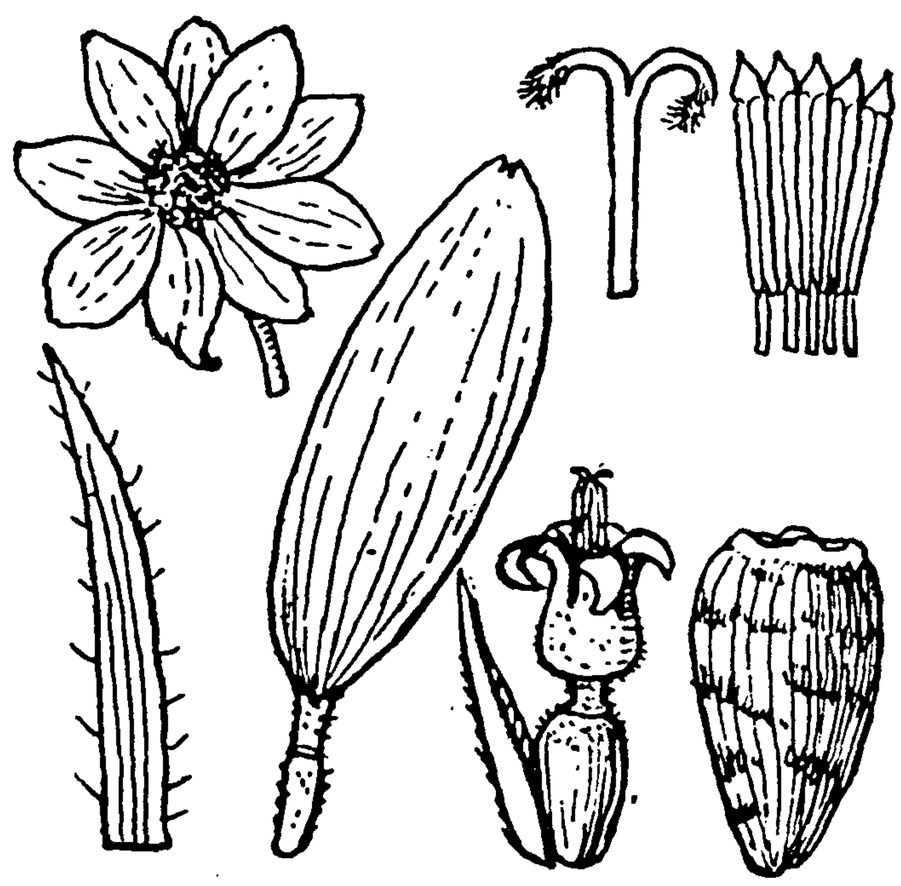


2. E. laevigata (Boynton & Beadle) Small. Stem glabrous, about 10 dm. tall: blades of the basal and lower cauline leaves 1.5–3.5 cm. wide: bracts of the involucre lanceolate to elliptic-lanceolate, merely ciliate: ligules of the ray 3–6 cm. long, rose-color. [*B. laevigata* Boynton & Beadle.]—Woods and fields, Piedmont of S. C.—Sum.–fall.

3. E. pallida Nutt. Stem hispid, 5–10 dm. tall: leaf-blades broadly linear to narrowly elliptic, 5–20 cm. long: bracts of the involucre lanceolate, hispid: ligules of the ray 4–8 cm. long, pale or deep rose-color. [*B. pallida* Britton.] —Dry soil, prairies, barrens, and hillsides, various provinces, Ala. to Tex., Minn., and Mass.—Spr.–sum.

4. E. tennesseensis (Beadle) Small. Stem shaggy-hispid, 2–3 dm. tall: leaf-blades linear, 5–18 cm. long: bracts of the involucre lanceolate, bristly: ligules of the ray 1.5–2.5 cm. long, purplish. [*B. tennesseensis* Beadle.]—Gravelly hillsides, Interior and Ozark Plateaus, Tenn. and Ark.—Spr.–sum.

70. VIGUIERA H.B.K. Annual herbs. Leaves alternate: blades narrow, entire. Heads conspicuously radiate, the disk elongating in age. Involucre campanulate or hemispheric: bracts lax, narrow, unequal. Receptacle conic, becoming columnar. Ray-flowers several: ligules yellow. Disk-corollas with a very short tube and a broadly campanulate throat: lobes lanceolate, longer than the throat. Anthers slightly longer than the filaments. Achene turgid. Pappus obsolete or wanting.—About 150 species, natives of the Western Hemisphere.



1. V. Porteri (A. Gray) Blake. Annual, 2–12 dm. tall, hispid: leaf-blades narrowly linear to narrowly linear-lanceolate, 3–15

cm. long: heads showy: outer bracts of the involucre linear or linear-lanceolate, 6–10 mm. long, acuminate: ligules 1–2 cm. long: achene 2.5–3 mm. long. [*Gymnolomia Porteri* A. Gray.]—Granite outcrops, Stone Mt. and vicinity in the Piedmont of Ga.—Sum.–fall.

71. RUDBECKIA L.[1] Perennial or sometimes annual or biennial, often pubescent herbs. Leaves alternate: blades entire, toothed, or pinnatifid. Heads erect. Involucre hemispheric or depressed, many-flowered: bracts spreading or reflexed, often unequal. Receptacle conic or convex. Ray-flowers several: ligules yellow, rarely discolored or crimson, spreading or drooping. Disk-flowers crowded: corollas with a short tube and a longer throat: lobes deltoid or ovate. Anthers longer than the filaments. Achene 4-angled, flat-topped. Pappus merely a low crown or obsolete.—About 40 species, North American.—CONE-FLOWERS.

Stigmas with short obtuse tips: pappus present except in *R. mollis*.
  Chaff of the receptacle acute, mucronate or obtuse.
    Chaff canescent or pubescent at the apex.
      Leaf-blades, at least those of the lower leaves, deeply lobed or divided. — I. LACINIATAE.
      Leaf-blades entire or merely toothed.
        Disk globose-ovoid, ovoid-conic, or hemispheric: plant pubescent: corolla-lobes reflexed after anthesis. — II. HELIOPSIDES.
        Disk cylindric or conic-cylindric at maturity: plant glabrous: corolla-lobes erect after anthesis. — III. LAEVIGATAE.
    Chaff ciliate or fimbriate, denticulate or entire at the apex.
      Chaff ciliate or fimbriate. — IV. FULGIDAE.
      Chaff with entire, hyaline, or erose-denticulate tips.
        Leaf-blades various, but not elongate-linear. — V. SPECIOSAE.
        Leaf-blades elongate-linear. — VI. GRAMINIFOLIAE.
  Chaff of the receptacle aristate or subulate. — VII. TRILOBAE.
Stigmas with slender subulate tips: pappus wanting.
  Plant annual or biennial. — VIII. BICOLORES.
  Plant perennial. — IX. HIRTAE.

I. LACINIATAE

Plant glabrous or glabrate. — 1. *R. laciniata.*
Plant cinereous-pubescent.
  Disk greenish-yellow. — 2. *R. heterophylla.*
  Disk brown-purple, anise-scented. — 3. *R. subtomentosa.*

II. HELIOPSIDES

Cauline leaves with petioled blades.
  Heads small, the disk about 1 cm. in diameter. — 4. *R. Heliopsidis.*
  Heads large, the disk 1.5–2.5 cm. in diameter.
    Stem glabrous or glabrate. — 5. *R. alismaefolia.*
    Stem hispid or scabrous. — 6. *R. grandiflora.*
Cauline leaves with closely sessile or partly clasping blades. — 7. *R. mollis.*

III. LAEVIGATAE

Leaves glaucous; blades oval, broadly ovate, or elliptic. — 8. *R. maxima.*
Leaves lustrous; blades narrower.
  Leaf-blades ovate-spatulate to lanceolate-elliptic. — 9. *R. nitida.*
  Leaf-blades elongate-lanceolate to linear-lanceolate, attenuate at both ends. — 10. *R. glabra.*

IV. FULGIDAE

Blades of the basal and lower cauline leaves cordate or truncate.
  Chaff of the disk 1.5–2.5 mm. wide, densely ciliate at the tip. — 11. *R. umbrosa.*
  Chaff of the disk narrower, sparsely ciliate at the tip. — 12. *R. Chapmanii.*

[1] Contributed by Charles Lawrence Boynton and Chauncy Delos Beadle.

Blades of the basal and lower cauline leaves not cordate or truncate.
Involucral bracts ciliate, glabrous above: leaves larger, with long-acuminate blades.
Stem glabrate or glabrous. 13. *R. palustris.*
Stem strigose. 14. *R. acuminata.*
Involucral bracts ciliate, pubescent above: leaves small or medium, with acute or short-acuminate blades.
Upper leaves with cuneiform or elliptic-lanceolate blades.
Well-developed disks 1–1.5 cm. in diameter: ligules of the ray relatively short. 15. *R. fulgida.*
Well-developed disks smaller: ligules relatively large. 16. *R. foliosa.*
Upper leaves with conspicuously dilated blade. 17. *R. spathulata.*

V. Speciosae

Ligules of the ray large and showy, much exceeding the diameter of the disk.
Leaf-blades laciniate or very coarsely dentate.
Prevailing leaves with blades of an ovate type. 18. *R. Sullivantii.*
Prevailing leaves with blades of a narrower type. 19. *R. speciosa.*
Leaf-blades remotely and shallowly dentate or entire.
Plant glabrous or nearly so. 20. *R. truncata.*
Plant densely hirsute. 21. *R. missouriensis.*
Ligules short, often less than the diameter of the disk. 22. *R. tenax.*

VI. Graminifoliae

Plant pubescent: ligules of the ray crimson. 23. *R. graminifolia.*
Plant glabrous: ligules yellow. 24. *R. Mohrii.*

VII. Trilobae

Blades of the lower cauline leaves, or some of them palmately 3-lobed.
Disk 5–13 mm. wide: ray-flowers with ligules 1.5–2.5 cm. long. 25. *R. triloba.*
Disk 15–20 mm. wide: ray-flowers with ligules 2–3.5 cm. long. 26. *R. rupestris.*
Blades of the lower cauline leaves, or some of them pinnately 5–7 lobed.
Bracts of the involucre, or most of them, as long as the ligules of the ray: Alleghenian species. 27. *R. Beadlei.*
Bracts of the involucre, or most of them, not half as long as the ligules: Floridian species. 28. *R. pinnatiloba.*

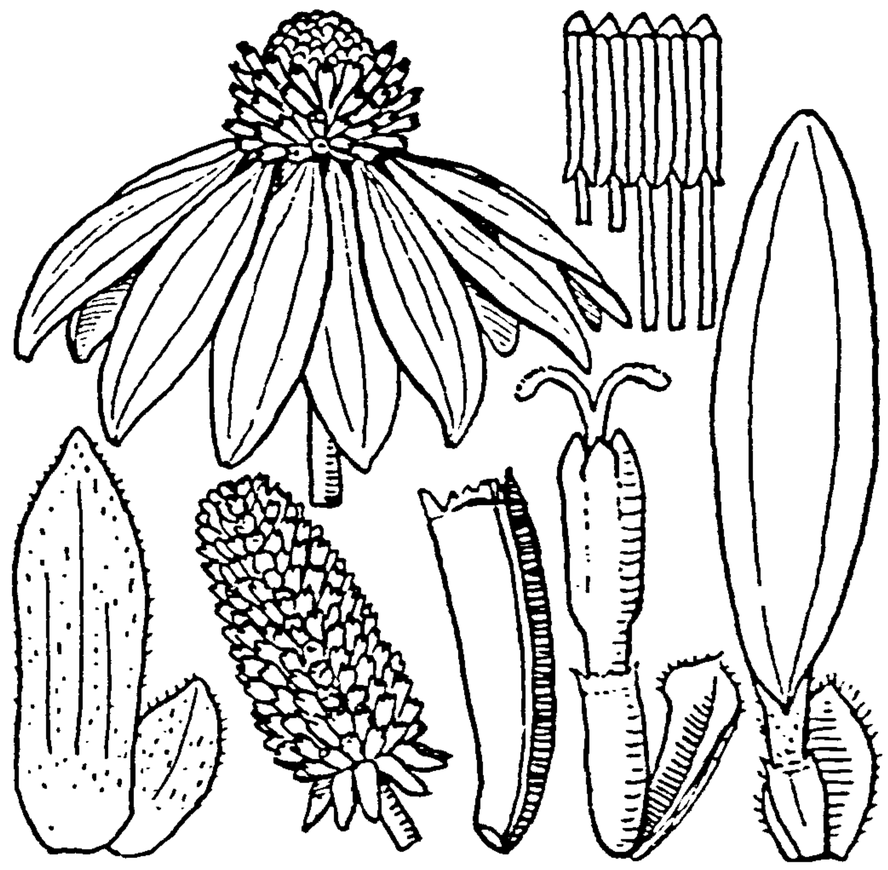
VIII. Bicolores

Plant hispid: ligules of the ray brown-purple at the base. 29. *R. bicolor.*

IX. Hirtae

Well-developed disks 1 cm. in diameter or more: ligules of the ray large and showy.
Blades of the upper cauline leaves not of an ovate type.
Petioles of the basal leaves not exceeding 1 dm. in length.
Leaf-blades broader than linear.
Main axis or stem not divergently branched.
Upper cauline leaves elliptic-lanceolate or lanceolate, or narrower. 30. *R. hirta.*
Upper cauline leaves elliptic, subcordate-clasping. 31. *R. amplectens.*
Main axis or stem divergently branched, usually from near the base. 32. *R. divergens.*
Leaf-blades linear or linear-lanceolate, elongate. 33. *R. sericea.*
Petioles of the basal leaves, or some of them, conspicuously elongate. 34. *R. longipes.*
Blades of the upper cauline leaves, or some of them, of an ovate type.
Blades of the basal leaves 5–6 cm. wide: involucral bracts often foliaceous. 35. *R. Brittonii.*
Blades of the basal leaves narrower: involucral bracts not foliaceous. 36. *R. monticola.*
Well-developed disks smaller: ligules of the ray short. 37. *R. floridana.*

1. R. laciniata L. Stem 6–20 dm. tall, glabrous or nearly so: blades of the upper leaves less deeply lobed than those of the lower, or merely cleft: bracts of the involucre elliptic to lanceolate: ligules of the ray 2–4 cm. long: disk becoming cylindric or long-conic.—Rich woods, thickets, and meadows, various provinces, N. Fla. to La., Man., and Que.—Sum.–fall.—Cult. in several forms.—A full double form is common in cultivation under the name *Golden-glow*.



2. R. heterophylla T. & G. Stem 4–16 dm. tall, cinereous-pubescent: blades of the upper leaves coarsely toothed, or lobed: bracts of the involucre elliptic to elliptic-lanceolate: ligules of the ray 1–2.5 cm. long: disk subglobose.—Swamps, woods, and damp places, N. Fla.—Sum.

3. R. subtomentosa Pursh. Stem 6–15 dm. tall, cinereous-pubescent: blades of the upper leaves mostly undivided: bracts of the involucre linear or nearly so: ligules of the ray 2–3 cm. long: disk hemispheric to ovoid-conic.—Dry soil and low grounds, various provinces, Tenn. to Miss., Tex., Kans., Ia., and Ill.—Sum.–fall.

4. R. Heliopsidis T. & G. Stem 3–7 dm. tall, glabrate or softly pubescent: leaf-blades elliptic-ovate to ovate-lanceolate, 3–10 cm. long, serrate: bracts of the involucre elliptic to linear-lanceolate: ligules of the ray 1.5–2.5 cm. long: disk subglobose, about 1 cm. in diameter: pappus nearly obsolete.—Woods and low grounds, Piedmont to Appalachian Plateau, Ga. and Ala.—Sum.–fall.

5. R. alismaefolia T. & G. Stem 5–9 dm. tall, hispidulous or scabrous above: leaf-blades oval or elliptic, 5–12 cm. long, repand-denticulate to nearly entire: bracts of the involucre linear to elliptic: ligules of the ray 3–4 cm. long: disk subglobose, 1.5–2 cm. in diameter: pappus prominent.—Pine-woods and prairies, Coastal Plain and adj. provinces, La. to Tex. and Ark.—Sum.–fall.

6. R. grandiflora C. G. Gmel. Stem scabrous or hispid throughout: leaf-blades ovate-elliptic to lanceolate, 6–15 cm. long, usually shallowly toothed: bracts of the involucre linear: ligules of the ray 3–4 cm. long: disk ovoid or ovoid-globose, 1.5–2.5 cm. in diameter: pappus prominent.—Dry prairies, Coastal Plain and adj. provinces, La. to Tex. and Mo.—Sum.

7. R. mollis Ell. Stem 3–10 dm. tall, gray-hirsute: leaf-blades elliptic-spatulate to elliptic, 1.5–6 cm. long, crenate or nearly entire: bracts of the involucre linear to linear-lanceolate: ligules of the ray 2–3.5 cm. long: disk hemispheric, 1.5–2 cm. in diameter: pappus wanting.—Pinelands and dry soil, Coastal Plain, Fla., also E Ga.—Spr.–sum.—Little known.

8. R. maxima Nutt. Stem 9–30 dm. tall, glaucous: leaf-blades elliptic, oval, or ovate, or sometimes pandurate, 6–30 cm. long, dentate or repand-dentate: bracts of the involucre linear to linear-lanceolate: ligules of the ray 1.5–4 cm. long: disk ellipsoid to conic-cylindric, 3–4.5 cm. long: pappus conspicuous.—Moist soil, various provinces, La. to Tex., Okla., and Mo.—Spr.–sum.

9. R. nitida Nutt. Stem 6–12 dm. tall, glabrous: leaf-blades ovate-spatulate to lanceolate-elliptic, 8–15 cm. long, nearly entire to repand-dentate: bracts of the involucre linear to linear-lanceolate: disk cylindric to conic-cylindric, 3–4.5

cm. long.—Low pinelands and pond-margins, Coastal Plain, Fla. to Tex. and Ga.—Spr.–fall.

10. R. glabra DC. Stem 6–12 dm. tall, glabrous: leaf-blades elongate-lanceolate to linear-lanceolate, 9–30 cm. long, repand-dentate or undulate, veiny: bracts of the involucre linear: ligules of the ray 3–5 cm. long: disk cylindric or conic-cylindric, 2–4 cm. long.—Low grounds, Coastal Plain, Fla. to Tex. and Ga.—Spr.–fall.

11. R. umbrosa Boynton & Beadle. Stem 4–10 dm. tall, pubescent: blades of the lower leaves ovate, coarsely serrate: bracts of the involucre elliptic to linear-elliptic, 10–15 mm. long: ligules of the ray 1.5–2 cm. long.—Moist soil, Appalachian provinces and Interior Low Plateaus, Ga. to Ky.—Sum.

12. R. Chapmanii Boynton & Beadle. Stem 4–10 dm. tall, glabrous or glabrate: blades of the lower leaves ovate-lanceolate, dentate or coarsely crenate-dentate: bracts of the involucre linear or linear-elliptic, 6–12 mm. long: ligules of the ray 1.5–2.5 cm. long.—Mt. slopes, Blue Ridge, Ga. and Ala.—Sum.

13. R. palustris Eggert. Stem 5–7 dm. tall, glabrous or glabrate, at least below: blades of the lower leaves ovate-lanceolate, remotely serrate or dentate, or nearly entire: bracts of the involucre linear to linear-oblong, mostly obtuse: ligules of the ray 1–2 m. long—Low grounds, wet banks, and cedar-glades, Interior and Ozark Plateaus, Tenn. to Mo. and Ky.—Sum.–fall.

14. R. acuminata Boynton & Beadle. Stem 5–8 dm. tall, strigose: blades of the lower leaves lanceolate, remotely serrate with low teeth or entire: bracts of the involucre lanceolate, acute: ligules of the ray 1–2.5 cm. long.—Woods, Interior Low Plateau, Tenn.—Sum.

15. R. fulgida Ait. Stem 3–7 dm. tall, hirsute or somewhat hispid: blades of the lower leaves lanceolate, elliptic-lanceolate, or cuneiform, remotely toothed or entire: bracts of the involucre linear to linear-lanceolate: ligules of the ray 9–15 mm. long: disk 1–1.5 cm. wide.—Woods, thickets, meadows, low grounds, and swamps, various provinces, rarely Coastal Plain, Ala. to Miss., Tenn., W. Va., Pa., and N. C.—Fall.

16. R. foliosa Boynton & Beadle. Stem 3–7 dm. tall, pubescent or somewhat hispid: leaf-blades lanceolate, elliptic-lanceolate, elliptic or cuneiform, sparingly serrate or entire: bracts of the involucre linear to elliptic-linear: ligules of the ray 1–1.5 cm. long: disk mostly less than 1 cm. wide.—Woods and thickets, mostly in marly places, Coastal Plain and Piedmont, Fla. to N. C.—Sum.–fall.

17. R. spathulata Michx. Stem 3–7 dm. tall, minutely pubescent: blades of the lower leaves lanceolate, elliptic, or oblanceolate, entire, or minutely and remotely toothed: bracts of the involucre linear, mostly acute: ligules of the ray 1–2 cm. long; disk about 1 cm. wide.—Woods, and along streams, various provinces, rarely Coastal Plain, Ga. to Ala., Tenn., and N. C.—Sum.–fall.

18. R. Sullivantii Boynton & Beadle. Stem 5–10 dm. tall, hispid or glabrate: blades of the lower leaves oval, ovate, or ovate-lanceolate, irregularly coarse-toothed: bracts of the involucre linear-elliptic, obtuse: ligules of the ray 2–4 cm. long: disk 12–18 mm. wide.—Low grounds, various provinces N of Coastal Plain, Ala. to Mich.—Sum.–fall.

19. R. speciosa Wenderoth. Stem 5–10 dm. tall, hirsute or somewhat hispid: blades of the lower leaves elongate-lanceolate, often falcate, irregularly coarse-

toothed: bracts of the involucre linear to linear-lanceolate: ligules of the ray 2–3.5 cm. long: disk 13–20 mm. wide.—Woods and low grounds, various provinces N of Coastal Plain, Ga. to Ala., Mo., and Pa.—Sum.–fall.

20. **R. truncata** Small. Stem 3–8 dm. tall, glabrous or nearly so: blades of the lower leaves narrowly lanceolate to elliptic or elliptic-linear, remotely and shallowly dentate or entire: bracts of the involucre linear to linear-lanceolate: ligules of the ray 1.5–2 cm. long: disk 10–15 mm. wide.—Woods and low grounds, Blue Ridge to Appalachian Plateau, Ga. to Ala. and Tenn.—Fall.

21. **R. missouriensis** Engelm. Stem 4–6 dm. tall, hirsute: blades of the lower leaves linear-lanceolate to linear, entire: bracts of the involucre linear to linear-elliptic: ligules of the ray 1.5–2.5 cm. long: disk 10–15 mm. wide.—Dry hills and rocky soil, La. to Mo.—Sum.–fall.

22. **R. tenax** Boynton & Beadle. Stem 4–8 dm. tall, sparingly pubescent, often hirsute: blades of the lower leaves ovate-lanceolate to lanceolate, remotely shallow-dentate or entire: bracts of the involucre elliptic to lanceolate: ligules of the ray 6–12 mm. long; disk 10–18 mm. wide.—Woods and fields, Interior Low Plateau, Ala. and Tenn.—Sum.–fall.

23. **R. graminifolia** (T. & G.) Boynton & Beadle. Stem 6–8.5 dm. tall, pubescent: blades of the lower leaves elongate-linear, grass-like, entire, the midrib alone prominent: bracts of the involucre mostly lanceolate: ligules of the ray 8–12 mm. long: disk hemipheric to elliptic-ovoid. [*Echinacea? atrorubens graminifolia* T. & G.]—Pineland ponds, Coastal Plain, N Fla. and Ga.—Spr.–sum.

24. **R. Mohrii** A. Gray. Stem 4–12 dm. tall, glabrous: blades of the lower leaves linear or elongate-linear, several-ribbed: bracts of the involucre linear to linear-lanceolate: ligules of the ray 15–30 mm. long: disk ovoid-conic to conic-cylindric. [*R. bupleuroides* Shuttlew.]—Pineland ponds and moist pinelands, Coastal Plain, N Fla. and Ga.—Sum.

25. **R. triloba** L. Stem 6–15 dm. tall, hispid or hirsute: blades of the upper leaves ovate-lanceolate to lanceolate: bracts of the involucre linear to linear-lanceolate: ligules of the ray 15–25 mm. long: disk subglobose to conic-globose, 5–13 mm. broad.—Moist soil, rocky woods, old fields, and thickets, various provinces, Ga. to Tex., Kans., Mich., and N. J.—Sum.–fall.

26. **R. rupestris** Chickering. Stem 7–15 dm. tall, sparingly pubescent: blades of the upper leaves ovate: bracts of the involucre lanceolate to elliptic-lanceolate: ligules of the ray 20–35 mm. long: disk hemispheric to ovoid-conic, 15–20 mm. broad. [*R. triloba rupestris* A. Gray.]—Rocky slopes, Roan Mt. and adj. peaks, in the Blue Ridge of N. C. and Tenn.—Sum.–fall.

27. **R. Beadlei** Small. Stem 6–15 dm. tall, hirsute: blades of the upper leaves lanceolate: bracts of the involucre linear to linear-lanceolate: ligules of the ray 11–20 mm. long: disk 5–10 mm. wide.—Rocky slopes, above 1,000 m., in the Blue Ridge of N. C.—Sum.

28. **R. pinnatiloba** (T. & G.) Beadle. Stem 6–12 dm. tall, softly hirsute: blades of the upper leaves ovate-lanceolate: bracts of the involucre linear to linear-lanceolate: ligules of the ray 10–15 mm. long: disk 6–9 mm. broad. [*R. triloba pinnatiloba* T. & G.]—Calcareous soil, W Fla.—Sum.–fall.

29. R. bicolor Nutt. Stem 3–9 dm. tall, hispid: blades of the upper leaves elliptic to lanceolate, sometimes narrowly so: bracts of the involucre elliptic-lanceolate to linear: ligules of the ray 15–25 mm. long, brown-purple at the base.—(NIGGER-TEATS. THIMBLE-FLOWER.)—Woods, dry hills, and sandy soil, various provinces, Ala. to Tex., Ark., and Tenn.—Spr.–sum.

30. R. hirta L. Stem 3–7 dm. tall, hirsute or hispid: blades of the upper leaves elliptic, oblong, or lanceolate, or nearly linear: bracts of the involucre linear-lanceolate or linear-elliptic: ligules of the ray 20–35 mm. long: disk 10–18 mm. wide.—(YELLOW-DAISY. BLACK-EYED SUSAN.)—Fields, roadsides, and woods, various provinces, Fla. to Okla., S. Dak., and Que. Native mainly W.—Sum.

31. R. amplectens T. V. Moore. Stem 3–6 dm. tall, hispidulous: blades of the upper leaves elliptic: bracts of the involucres linear-elliptic to linear-lanceolate: ligules of the ray 10–20 mm. long.—Dry soil, Piedmont, Ga., and S. C.—Sum.

32. R. divergens T. V. Moore. Stem 3–10 dm. tall, hirsute or hispid: blades of the upper leaves elliptic to lanceolate or almost linear: bracts of the involucre linear or linear-lanceolate: ligules of the ray 15–30 mm. long: disk 12–18 mm. wide.—Pinelands and fields, Coastal Plain, Fla. to S. C.—Spr.—sum.—This and related species are used by the Seminoles as a cold infusion in cases of fever and headache.

33. R. sericea T. V. Moore. Stem 5–12 dm. tall, hispid: blades of the upper leaves linear-lanceolate to linear, shallowly toothed: bracts of the involucre linear to elliptic-linear or lanceolate: ligules of the ray 20–40 mm. long: disk 12–20 mm. long.—Dry woods and fields, various provinces N of Coastal Plain, Ga. to Ala., Mo., and S. Dak.—Sum.

34. R. longipes T. V. Moore. Stem 3–10 dm. tall, hispid: blades of the upper leaves lanceolate to elliptic-lanceolate, entire or toothed bracts of the involucres linear-lanceolate to elliptic-lanceolate: ligules of the ray 20–35 mm. long: disk about 15 mm. wide.—Woods and fields, various provinces, rarely Coastal Plain, Ala. to Miss., Ia., and N. Y.—Sum.–fall.

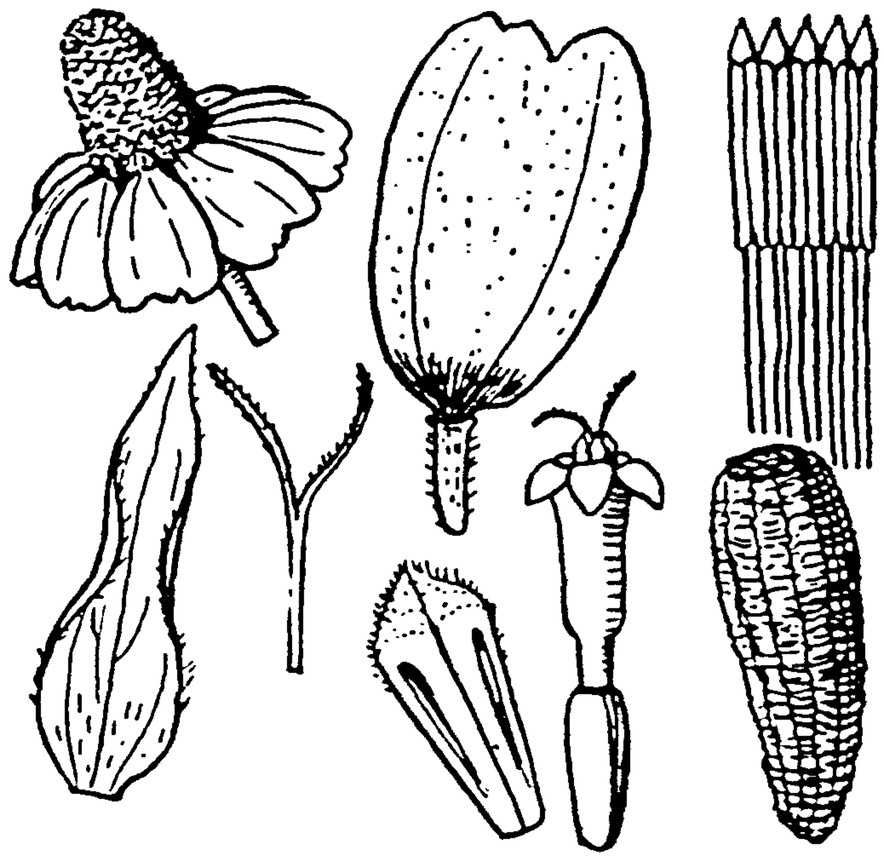
35. R. Brittonii Small. Stem 5–8 dm. tall, hispid or hirsute-hispid: blades of the upper leaves mostly ovate to elliptic-ovate, rather coarsely toothed or shallowly crenate: bracts of the involucre elliptic to lanceolate: ligules of the ray 25–35 mm. long.—Wooded hill-sides, various provinces N of Coastal Plain, Ala. to Tenn.—Sum.

36. R. monticola Small. Stem 3–10 dm. tall, hirsute or hispid: blades of the upper leaves ovate or ovate-lanceolate, mostly serrate: bracts of the involucre linear to linear-lanceolate, 10–14 mm. long; ligules of the ray 20–35 mm. long.—Woods, Blue Ridge to Appalachian Plateau, Ga. to Ala., Tenn., and Pa.—Sum.–fall.

37. R. floridana T. V. Moore. Stem 3–6 dm. tall, hispid: blades of the upper leaves elliptic, lanceolate, or narrowly pandurate (very narrow in *R. floridana angustifolia*): bracts of the involucre elliptic to linear-elliptic, 6–10 mm. long: ligules of the ray 10–20 mm. long, yellow, fading greenish.—Sandy soil, Coastal Plain, Fla. to Tex. and Ark.—Spr.–fall.

72. DRACOPIS Cass. Annual, glaucous herbs. Leaves alternate: blades entire or slightly toothed, clasping. Heads erect. Involucre of few

somewhat foliaceous bracts which are ultimately reflexed. Ray-flowers few: ligules yellow, drooping, often discolored. Disk-flowers crowded: corollas relatively long with a short tube and a longer throat, ultimately deciduous, leaving the erect cone-like disk. Anthers usually about as long as the filaments. Stigmas slender. Achene terete, striate and transverse-wrinkled. Pappus wanting.—One species.

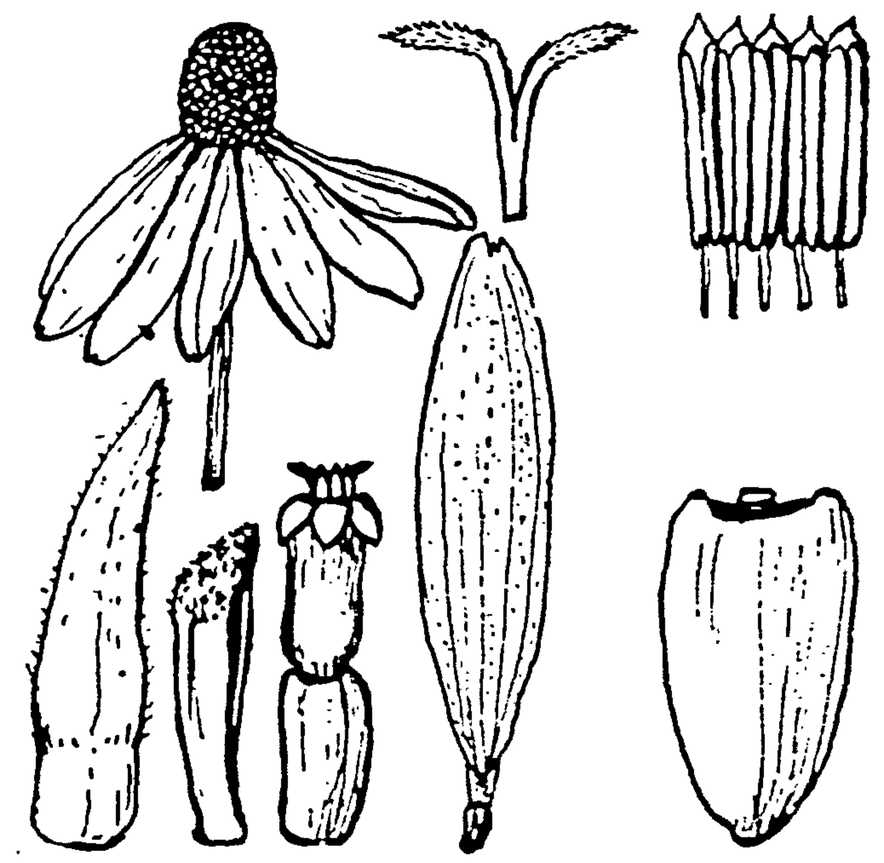


1. D. amplexicaulis (Vahl.) Cass. Stem 3–7 dm. tall: stem-leaves 4–10 cm. long, the blades of the upper ones ovate to ovate-lanceolate, sometimes shallowly toothed: bracts of the involucre 6–10 mm. long: ligules of the ray-flowers broad, 10–25 mm. long: disk-corollas 3.5–4 mm. long: achene 2 mm. long.—Moist, rich soil, Coastal Plain, Ga. to Tex. Introduced eastward.—Spr.–sum.

73. RATIBIDA Raf. Annual, biennial, or perennial, pubescent herbs. Leaves alternate: blades pinnately parted or divided, or lyrate. Heads erect, usually showy. Involucre flat: bracts mostly spreading or reflexed, narrow. Ray-flowers several: ligules broad or narrow, often discolored. Disk-flowers crowded on the elongate receptacle: corollas stout, with a very short tube and a longer relatively wide throat; lobes ovate or deltoid. Anthers longer than the filaments. Stigmas stout or slender. Achene flattened, margined or winged, deciduous with bractlets. Pappus of 2 awns or wanting.—About 6 species, North American.

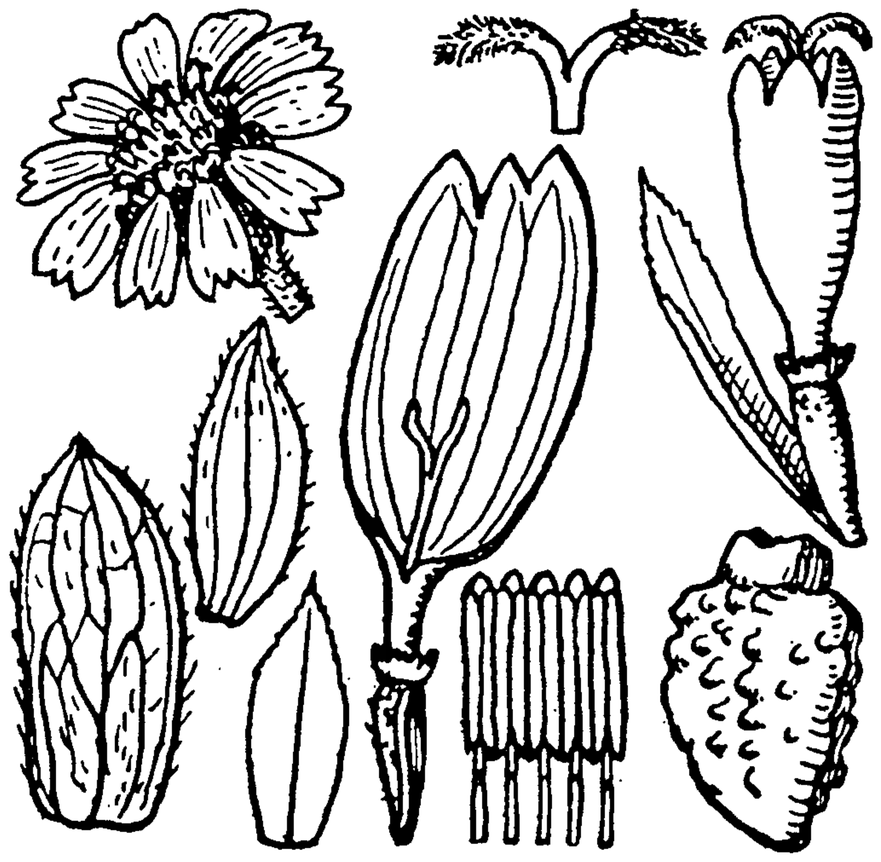
Stigmas with lanceolate-subulate tips: ligules of the ray elongate, linear to linear-spatulate. 1. *R. pinnata.*
Stigmas with short obtuse tips: ligules of the ray relatively short, elliptic to oval. 2. *R. columnaris.*

1. R. pinnata (Vent.) Barnhart. Stem strigillose and scabrous, 6–15 dm. tall, often with elongate branches: leaves 5–20 cm. long; blades pinnately 3–7-foliolate or -parted, the segments linear to lanceolate, entire or toothed: heads showy: disk subglobose to oval, 1–2 cm. long: ray-flowers few; ligules bright yellow, 3–5 cm. long, early drooping: achene 2–2.5 mm. long.—Dry, often calcareous soil, various provinces, Fla. to Tex., Ia., and N. Y.—Sum.–fall.



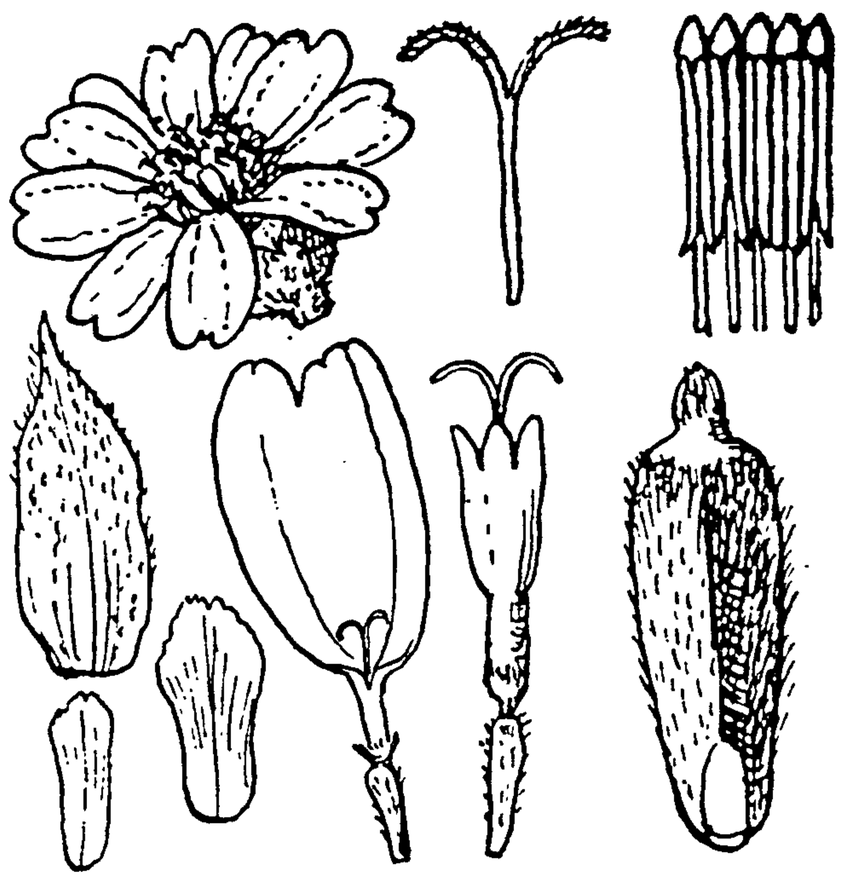
2. R. columnaris (Sims) D. Don. Stem 3–7 dm. tall, scabrous-strigose, often branched at the base and sometimes above: leaves 5–12 cm. long; blades pinnately parted, the segments mostly linear, lanceolate, or oblanceolate, often pinnatifid or 2–3-cleft: heads showy: disk cylindric or columnar, 2.5–4 cm. long: ray-flowers few; ligules yellow (or brown-purple at the base in *R. columnaris pulcherrima*), 2–4 cm. long, drooping: achene 2–2.5 mm. long.—(NIGGER-HEAD)—Dry soil, prairies, plains, and hills, Tenn. to Tex., Ariz., Sask., and Minn.—Sum.–fall.—Often cult.

74. **WEDELIA** Jacq. Perennial, caulescent, diffusely branching and creeping herbs. Leaves opposite: blades typically or predominantly of a cuneate type, coarsely few-toothed or -lobed. Heads erect, peduncled, radiate. Involucre broad, somewhat foliaceous: bracts in 2 or 3 unequal series, the outer mostly longer than the inner. Ray-flowers few: corollas with broad yellow, 3-lobed ligules. Disk-corollas with a cylindric-funnelform throat longer than the tube; lobes deltoid. Anthers sagittate at the base, with deltoid appendages. Stigmas stout-tipped. Achene of the ray 3-angled, turgid, tuberculate. Pappus a fimbriate crown, deciduous.—About 40 species, of warm and tropical regions.



1. **W. trilobata** (L.) A. Hitchc. Stem and branches creeping, fleshy: leaf-blades cuneate or elliptic and cuneate at the base, 3–10 cm. long, coarsely few-toothed, or 3–5-lobed, more or less auricled at the base, or abruptly narrowed into a short petiole-like base: outer bracts of the involucre elliptic to ovate, lax: ligules of the ray mostly broadly elliptic, 8–12 mm. long: anthers about 2 mm. long: achene of the ray obovoid, 4–4.5 mm. long, coarsely tuberculate.—Shores of Bay Biscayne, Fla.—(*W. I.*)—All year.

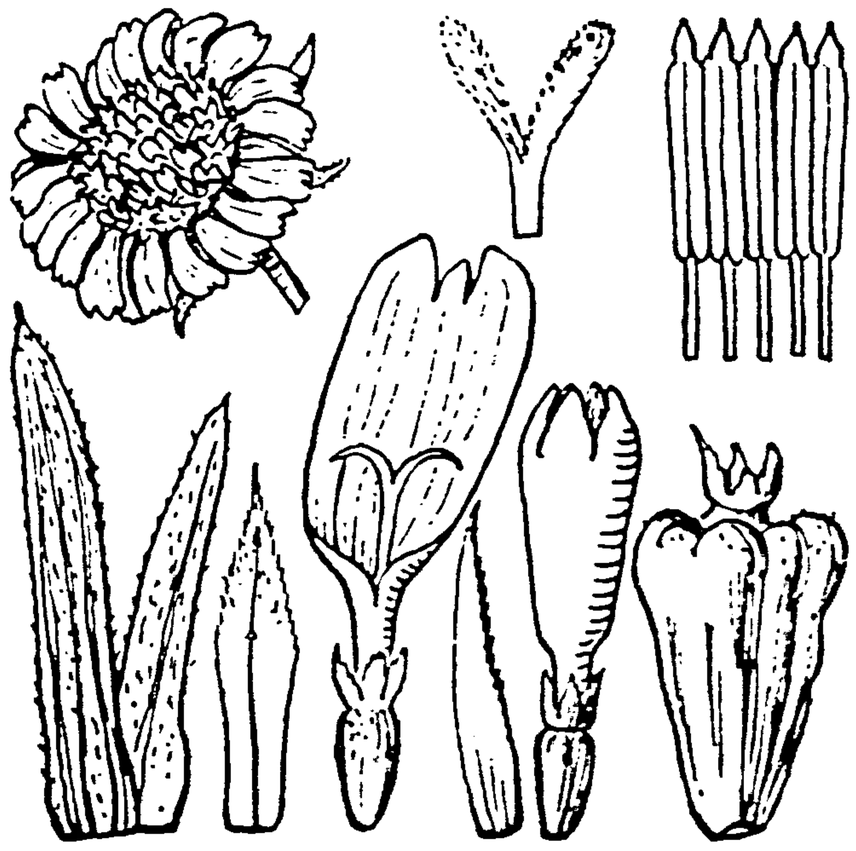
75. **STEMMODONTIA** Cass. Perennial, caulescent, *Helianthus*-like herbs or partly woody plants. Leaves opposite: blades of a lanceolate or an ovate type, entire or shallowly toothed. Heads erect, peduncled, radiate. Involucre rather broad, somewhat foliaceous: bracts in 3 or 4 unequal series, the outer mostly longer than the inner. Ray-flowers few: corolla with broad yellow, often 2-lobed ligules. Disk-corollas with a nearly cylindric throat much longer than the tube; lobes ovate-lanceolate. Anthers sagittate at the base, with ovate appendages. Stigmas capillary-tipped. Achene of the ray flattened, thick-margined, pubescent. Pappus a fimbriate crown, persistent. —About 6 species, tropical American.



1. **S. calycina** (L. C. Rich.) O. E. Schulz. Stem and branches erect, mostly 2 m. tall or less, partly woody: leaf-blades lanceolate to ovate-lanceolate, 4–15 cm. long, serrate or crenate-serrate, rough-pubescent, gradually narrowed or rounded at the base: outer bracts of the involucre mostly elliptic to lanceolate, lax: ligules of the ray narrowly elliptic: anthers about 3 mm. long: achene of the ray elliptic-cuneate, about 4 mm. long, appressed-pubescent.—Waste-places, Coastal Plain, Ala. Nat. of W. I.—Sum.–fall.

76. **PASCALIA** Ortega. Perennial, caulescent herbs. Leaves opposite: blades entire, toothed, or somewhat lobed. Heads erect, radiate. In-

volucre hemispheric: outer bracts herbaceous, the inner membranous. Ray-flowers pistillate: ligules yellow, spreading. Disk-flowers perfect: corollas with a very short tube, a long throat and deltoid lobes. Anthers much longer than the filaments. Achene various, those of the ray 3-angled, those of the disk 4-angled. Pappus of scales, which are often accompanied by awns.—One species.

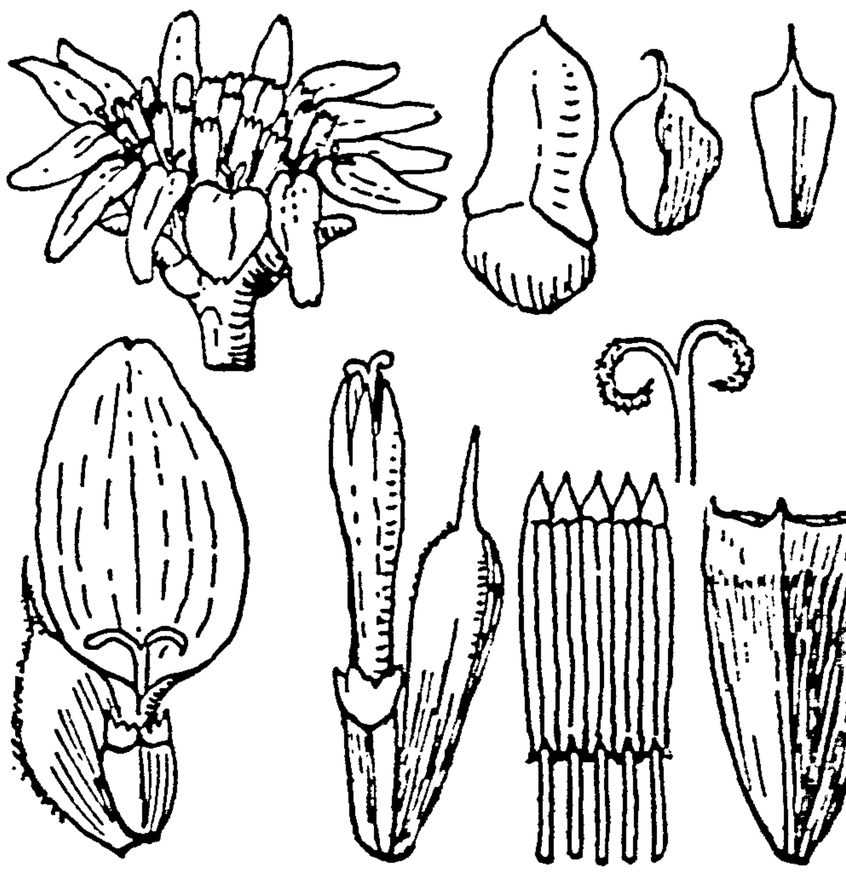


1. **P. glauca** Ortega. Stem mostly 1 m. tall or less, glaucous: leaf-blades 3-ribbed, 1 dm. long or shorter on the upper part of the stem, those of the lower cauline leaves ovate-lanceolate or narrowly ovate, shallowly toothed, those of the upper cauline often linear-lanceolate or narrowly lanceolate, repand or entire: involucre 1.5–2 cm. wide; bracts lanceolate to linear, the larger ones 8–15 mm. long: ligules of the ray-flowers bright-yellow, 1–1.5 cm. long: achene 5–6 mm. long.—Waste-places and roadsides, coast of N Fla. Nat. of Chile.—Spr.–fall.

77. **BORRICHIA** Adans. Fleshy, maritime, erect herbs or shrubs. Leaves opposite: blades thick, entire, or toothed. Heads erect, on stiff peduncles. Involucre hemispheric or flattish: bracts fleshy or leathery. Ray-flowers yellow, few. Disk-corollas with a cylindric-funnelform throat and a very short tube: lobes eciliate. Free portions of the filaments much longer than the corolla-tube. Pappus crown-like.—About 5 species, American.—SEA OX-EYES.

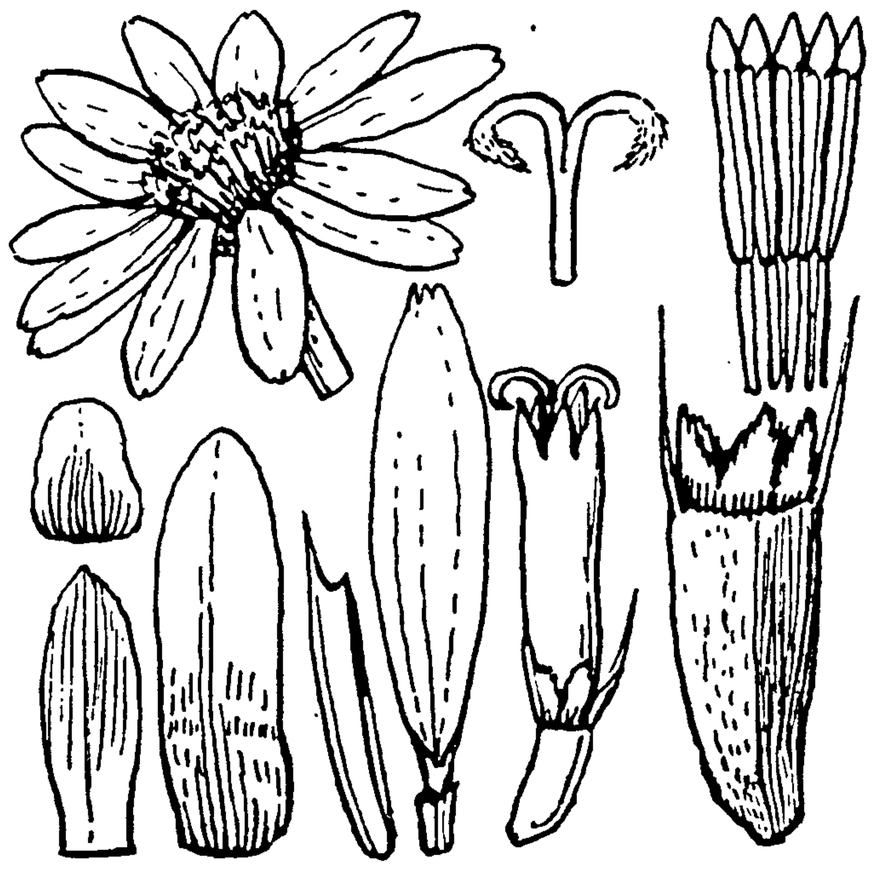
Outer bracts of the involucre spreading or reflexed at maturity: bractlets of the receptacle spine-tipped. 1. *B. frutescens.*
Outer bracts of the involucre appressed at maturity: bractlets of the receptacle obtuse or barely mucronate. 2. *B. arborescens.*

1. **B. frutescens** (L.) DC. Plant 2–7 dm. tall: leaf-blades linear-spatulate to obovate, 2–6 cm. long: outer bracts of the involucre acute, the inner ones subulate-tipped.—Shores, sand-dunes, prairies, and salt-marshes, Coastal Plain, Fla. to Tex. and S Va.—(*W. I., Mex.*)—Sum.–fall, or all year S.



2. **B. arborescens** (L.) DC. Plant 2–12 dm. tall: leaf-blades oblanceolate or spatulate-oblanceolate, 3–6 cm. long: outer bracts of the involucre acute, the inner ones rounded at the apex.—Shores, sand-dunes, and low waste hammocks, pen. Fla. and Fla. Keys.—(*W. I., Mex., C. A., S. A.*)—All year.—This species is much more variable than the preceding one. The plants become very robust and succulent in strictly saline localities. The foliage various from glabrous and glossy green to densely pale silky-canescent. The glabrous form has been described as *B. glabrata* Small and may be specifically distinct from the pubescent and larger form.

78. **TITHONIA** Desf. Annual, *Helianthus*-like herbs. Leaves alternate: blades entire or three lobed. Heads large, erect, on peduncles swollen just below the involucre. Involucre hemispheric or broadly campanulate: bracts in two series, the other short and appressed, the inner long, appressed at the base and somewhat foliaceous above. Ray flowers several, neutral: ligules yellow, showy. Disk flowers perfect: corollas yellow, with a short villous tube dilated into a long throat: lobes lanceolate. Stigmas slender, hirsute. Achene broadened upward, flattened, four-angled, wingless, embraced by the bractlets. Pappus of 2 awns or scales, caducous or persistent, accompanied by several shorter, always persistent, scales.—Four or five species, native of Mexico, Central America and the West Indies.



1. **T. diversifolia** (Hemsl.) Gray. Plant up to 4.5 m. tall, with a branching, woody stem, slightly pubescent or glabrate: leaf-blades ovate in outline, 3–5 lobed, or entire on the upper stem, serrate, pubescent beneath, pubescent, scabrous, or glabrate above, tapering abruptly to a cuneate-winged petiole: involucral bracts of two kinds, the outer short, ovate, striate and appressed, usually acute, the inner long, ligule-like, striate, somewhat foliaceous above, usually obtuse or rounded, appressed at the base, 18–25 mm. long: ligules 4–6 cm. long, bidentate at the apex: achene pubescent, about 6 mm. long.—Pinelands, roadsides, and about gardens, pen. Fla. Nat. of Mex. and cult.—All year.

77. **HELIANTHUS** L.[1] Annual or perennial, coarse, erect or diffuse herbs. Leaves various, the first ones opposite, sooner or later the succeeding ones becoming alternate, or in a few species very rarely all alternate: blades simple, 3-veined, but sometimes obscurely so. Flowers in involucrate, radiate heads, the rays usually conspicuous, the ligules always yellow, sterile and in one series; flowers of the disk perfect, with tubular corollas and the corolla 5-lobed, the tube short, the lobes yellow, red-purple, or brownish. Achene obovate, slightly compressed, surmounted by a pappus of two scale-like awns on the long diameter, the bases of the awns expanded and often lacerate, sometimes with accessory and intermediate scales, the whole pappus readily caducous; each flower subtended by a conduplicate, chaffy bractlet on the receptacle. Bracts of the involucre in 3 or 4 series, green.—About 100 species, American.—Sum.–fall, unless otherwise stated.—SUNFLOWERS.

Disk-corollas with red, purple, or brown lobes. I. RUBRI.
Disk-corollas with yellow lobes. II. FLAVI.

I. RUBRI

Ray-flowers with ligules more than 5 mm. long.
  Leaves more or less pubescent, but not densely white-hairy.
    Blades of the cauline leaves of a long-linear type, 2–8 mm. wide.
      Heads many: leaves alternate. 1. *H. angustifolius.*
      Head solitary: leaves opposite. 2. *H. heterophyllus.*

[1] Contributed by Elba Emanuel Watson.

Blades of the cauline leaves of a lanceolate to ovate type.
Leaves opposite.
Bracts of the involucre linear, mucronate: leaves chiefly basal. 3. *H. atrorubens.*
Bracts of the involucre lanceolate, not mucronate: leaves cauline. 4. *H. rigidus.*
Leaves alternate.
Disk more than 3 cm. in diameter. 5. *H. annuus.*
Disk less than 3 cm. in diameter.
Chaff toward center of disk, conspicuously white-bearded. 6. *H. petiolaris.*
Chaff not thus bearded.
Leaf-blades decurrent on the petiole nearly or quite to its base:
Blade conspicuously bristly ciliate toward the base: annual. 7. *H. agrestis.*
Blade not thus ciliate (often undulate): perennial. 8. *H. floridanus.*
Leaf-blades obviously petioled.
Stem, especially the branches, conspicuously white-villous. 9. *H. vestitus.*
Stem more or less pubescent, but not as above.
Plant erect: stems more or less mottled. 10. *H. cucumerifolius.*
Plant prostrate: stems not conspicuously mottled. 11. *H. debilis.*
Leaves densely white-pubescent, especially beneath. 12. *H. argophyllus.*
Ray-flowers wanting or minute, the ligules less than 3 mm. long. 13. *H. radula.*

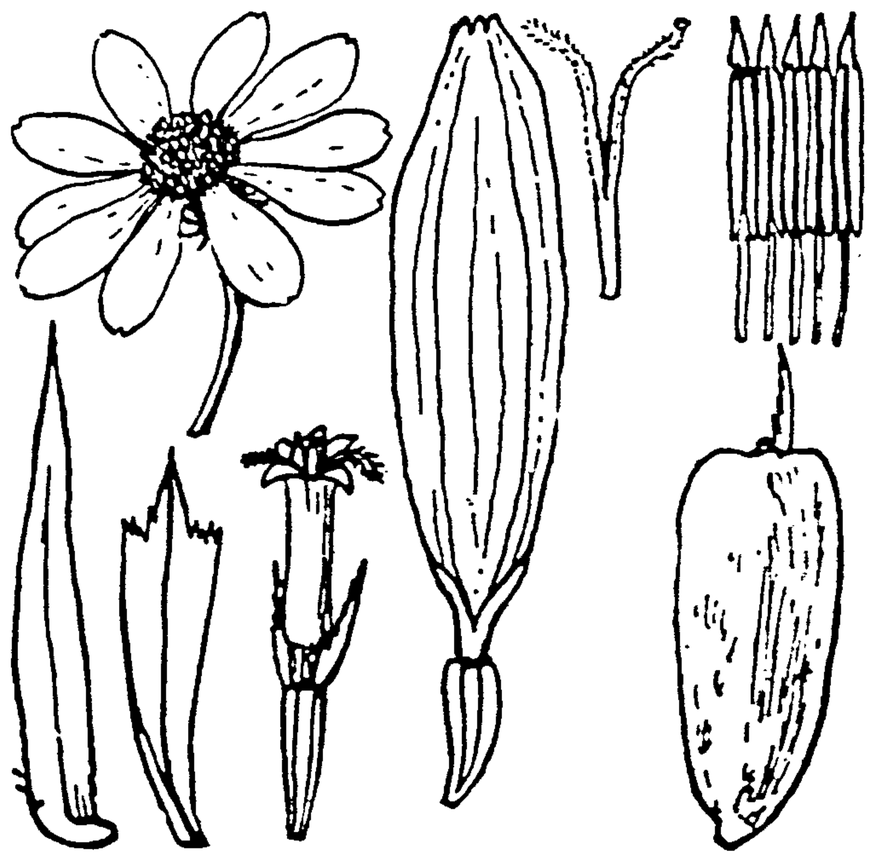
II. Flavi

Leaves verticillate. 14. *H. verticillatus.*
Leaves not verticillate.
Leaf-blades of a linear type, some or all more than 10 times as long as broad.
Leaves cauline; blades usually less than 5 mm. wide, revolute and pubescent. 15. *H. simulans.*
Leaves mostly basal; blades usually more than 7 mm. wide.
Head solitary: disk about 1.5 cm. wide. 16. *H. carnosus.*
Heads several: disk about 1 cm. wide. 17. *H. longifolius.*
Leaf-blades of a linear, lanceolate or ovate type, less than 10 times as long as broad.
Leaf-blades linear to lanceolate, never broadly so.
Leaf-blades densely white-pubescent both sides. 18. *H. Schweinitzii.*
Leaf-blades more or less pubescent but not as above.
Branches of the inflorescence and leaves below it opposite.
Leaves strumose-hispid: bracts hispidulous, longer than the disk and recurved. 19. *H. stenophyllus.*
Leaves and bracts almost or quite glabrous, latter about equal to disk and erect, or leaf-blades strumose-setose above. 20. *H. Eggertii.*
Branches of the inflorescence and leaves below it alternate.
Mature cauline leaf-blades deeply and irregularly serrate. 21. *H. grosse-serratus.*
Cauline leaf-blades entire or serrate, but not as above.
Bracts longer than the disk, very loose.
Leaves evenly tomentulose; blades copiously resin-dotted and much lighter beneath. 22. *H. tomentosus.*
Leaves not tomentulose; blades not copiously resin-dotted beneath.
Leaf-blades firm, conduplicate, densely scabrous-hispidulous: ligules of the ray deep-yellow. 23. *H. Maximiliani.*
Leaf-blades thinnish, flat, remotely pubescent: ligules of the ray light-yellow. 24. *H. giganteus.*
Bracts about as long as the disk, not conspicuously loose.
Leaf-blades with revolute margins, usually undulate, fine-tomentose beneath. 8. *H. floridanus.*

- Leaf-blades not revolute-margined, not undulate, not tomentulose beneath.
  - Leaf-blades serrate, the lower surface glabrous except on the nerves. — 25. *H. montanus.*
  - Leaf-blades entire, at most, obscurely denticulate, long-hispid beneath. — 26. *H. alienus.*
- Leaf-blades of a broadly lanceolate to ovate type.
  - Heads small: disk less than 8 mm. wide.
    - Leaves, stems, and bracts entirely glabrous. — 27. *H. laevigatus.*
    - Some or all of these parts more or less pubescent.
      - Leaf-blades firm, copiously resin-dotted beneath: stem dark and conspicuously glaucous. — 28. *H. glaucus.*
      - Leaf-blades thin, remotely if at all resin-dotted beneath: stem light, at most faintly glaucous.
        - Bracts of the involucre linear, abruptly curled: peduncles short. — 29. *H. decapetalus.*
        - Bracts of the involucre loose but not reflexed: peduncles long and very slender. — 30. *H. microcephalus.*
  - Heads larger: disk more than 8 mm. wide.
    - Leaf-blades broadly decurrent on the petiole, lateral nerves confluent only a little below the middle of the blade, the petiole from the confluence often as long as the blade.
      - Basal leaves numerous, approximate and persistent; cauline leaves few and greatly reduced. — 31. *H. occidentalis.*
      - Basal leaves often fugacious; cauline leaves more evenly disposed on the stem and not greatly reduced. — 32. *H. Dowellianus.*
    - Leaf-blades sessile or petiolate; if decurrent, the petiole (from the confluence of the lateral nerves) much less than half the length of the leaf.
      - Bracts of the involucre about as long as the disk.
        - Leaves opposite; blades sessile and often clasping: branches conspicuously erect. — 33. *H. mollis.*
        - Leaves opposite or alternate; blades not clasping: branches spreading.
          - Base of leaf-blade obtuse, cordate or roundish; petiole distinct or blade only briefly decurrent.
            - Leaves opposite and divaricate. — 34. *H. divaricatus.*
            - Leaves alternate (rarely opposite), not divaricate. — 35. *H. saxicola.*
          - Base of leaf-blade more pointed, decurrent, but petiole partly distinct.
            - Leaves mostly or all alternate, light green, evenly, short-hispid above, short-hirsute beneath, not glaucous beneath. — 36. *H. tuberosus.*
            - Leaves mostly opposite, dark green above, glabrous beneath, except on the nerves, and glaucous. — 37. *H. strumosus.*
      - Bracts of the involucre longer than the disk.
        - Leaves opposite (sometimes alternate above in *H. decapetalus* and *H. reindutus*);
          - Blade decurrent to the base of the petiole. — 38. *H. reindutus.*
          - Blade not decurrent to the base of the petiole, distinctly petiolate.
            - Leaf-blades thin, ovate, very sparingly pubescent: branches of the inflorescence and rarely the uppermost leaves alternate. — 29. *H. decapetalus.*
            - Leaf-blades firm, broadly lanceolate, densely rough-pubescent: branches of the inflorescence opposite. — 39. *H. hirsutus.*
        - Leaves alternate (lower cauline rarely opposite in *H. doronicoides*);
          - Blades densely tomentose beneath.
            - Leaf-blades sessile, broadly decurrent to the base of the petiole. — 40. *H. doronicoides.*
            - Leaf-blades apparently short-petiolate, less broadly decurrent and not quite to the base of the petiole. — 22. *H. tomentosus.*

Blades more or less pubescent, but not densely tomentose or tomentulose.
Leaf-blades conspicuously resin-dotted beneath, finely tomentulose.
Leaf-blades thin, lower surface little if any lighter than the upper. 41. *H. resinosus.*
Leaf-blades firm, lower surface lighter than the upper. 22. *H. tomentosus.*
Leaf-blades not conspicuously resin-dotted beneath.
Leaf-blades tapering at the base, decurrent almost to the base of the petiole: bracts loose. 42. *H. validus.*
Leaf-blades roundish, or at least broad toward the base, not decurrent to the base of the petiole: bracts erect. 43. *H. laetiflorus.*

1. H. angustifolius L. Perennial: stem 1–2 m. high, slender, simple to the inflorescence, hispid: leaves alternate: blades varying in width from 2–4 mm. in sunny, exposed places to about 1 cm. in moist, shady habitats, usually 8–15 cm. long, revolute except when very wide: ray-flowers with bright yellow ligules: lobes of the disk-corollas red-purple.—Moist ground, wet pinelands, woods, and prairies, Coastal Plain and adj. provinces, Fla. to Tex., Mo., and N. Y.—A showy plant, often in large masses.



2. H. heterophyllus Nutt. Perennial: stem slender, simple, about 1 m. high, rarely with long, ascending branches, usually rough: leaves of two kinds, the basal with broadly ovate to elongate, narrowly oblanceolate blades, the cauline narrowly linear, all very coarse in texture and scabrous-hispid, the hairs often very long: heads solitary on the stem and branches, large, disk often 2 cm. wide, corollas of the disk very dark.—Wet clay soil, low pinelands, edges of swamps, and marshes, Coastal Plain, Fla. to La. and N. C.—There are no crown buds nor rhizomes; the longer of the fibrous roots produce a bud about 2 cm. from the tip, which grows at once, the daughter plants often blooming the same season.

3. H. atrorubens L. Perennial: stem about 1.5 m. high, slender, very coarsely hispid, simple to the inflorescence: basal leaves large, approximate, opposite: blades mainly ovate, oval, or elliptic; the cauline leaves alternate, broadly ovate, obtuse, the blades abruptly contracted below to a long, winged petiole, often as long as the blade, rough, coarse, hispid: heads few, rarely more than 6–7: bracts of the involucre oblong, glabrous: ray-flowers with short, deep yellow ligules: disk-flowers with very dark-red corollas.—Open woods, creek-banks, and shaded mountain sides, various provinces, Fla. to La., Mo., and Va.—Vegetative propagation is from axillary buds at the base of the stem.

4. H. rigidus (Cass.) Desv. Perennial: stem 0.7–1.75 m. high, rough, simple or branched, mostly purple: leaves opposite: blades lanceolate, rarely ovate, obtuse, mostly entire, thick, firm, rough both sides, dark-green: heads large, very compact, solitary on the stem and branches: bracts of the involucre ovate, appressed, obtuse, glabrous, ciliate: disk-corollas with red-purple lobes: the pappus usually with many small intermediate scales. [*H. scaberrimus* Ell. *H. subrhomboideus* Rydb.]—Dry sandy soil, usually on prairies, various provinces, Ga. to Tex.—The root stocks have swollen tips which bear abundant rootlets.

5. **H. annuus** L. Annual, similar to the preceding, but taller, more branched, and less pubescent: disk-corollas shorter than in the preceding, and the lobes brownish-red rather than magenta-colored or in cultivated forms the lobes of the disk-corollas frequently yellow.—Dry plains, various provinces, Tex. to Sask. and Minn.; also cult. grounds, waste-places, and fields throughout the E U. S.

6. **H. petiolaris** Nutt. Annual: stem simple or, in vigorous plants, much branched, rough: leaves alternate; blades lanceolate to ovate, mostly entire, distinctly petiolate, very variable in size, 4–15 cm. long, in normal plants about 7 cm. long, densely appressed-scabrous on both sides, blue-green: inflorescence terminal and axillary, profuse, the heads very showy: bracts of the involucre broadly lanceolate, about as long as the disk, erect, densely hispidulous, often without cilia: ray-flowers with oval ligules, about 2 cm. long: disk 1–2.5 cm. wide: lobes of disk corollas red-purple.—Plains, hills, river-bottoms, and rocky banks, various provinces, Tex. to Ariz., Ore., Sask., and Minn.; also waste-places and cult. grounds in the E U. S.

7. **H. agrestis** Pollard. Annual: stem 1–2 m. high, light-green, glabrous, sulcate, in vigorous plants much branched: leaves alternate; blades broadly elliptic-lanceolate, very light-green, hispid on both sides, the midrib beneath and the margin toward the base with long, rather remote bristly cilia: heads few but very showy: bracts of the involucre lanceolate, glabrous, erect: ray-flowers with bright-yellow ligules: disk-corollas deep-violet. [*H. Curtissii* Fernald.]—Pinelands, scrub, and prairies, often along ditches, pen. Fla.

8. **H. floridanus** Gray. Perennial: stem 1–2 high, hispid, simple: leaves alternate toward the top of the stem (opposite in small individuals); blades lanceolate, sessile or subsessile, scabrous above, mostly fine-tomentose beneath, revolute, often unevenly so and apparently undulate, mostly 6–8 cm. long: inflorescence one to four or five heads in a loose panicle: bracts of the involucre about as long as the disk: disk-corollas mostly with red-brown lobes, rarely yellow. [*H. undulatus* Chapm.]—Woods, thickets, and edges of fields, Coastal Plain, Fla. to La.

9. **H. vestitus** E. E. Watson. Annual: stem 6–7.0 dm. high, lax, densely white-villous, profusely branched: leaves alternate, crowded; blades deltoid-lanceolate, mostly about 6 cm. long, deeply irregularly serrate, or lobed, hispid-hirsute beneath, especially on the veins appressed-hispid above, distinctly petioled, the petioles long, slender, very hirsute: heads terminal on the stem and branches: bracts of the involucre linear-lanceolate, attenuate, longer than the disk, densely hispidulous, very loose; ray-flowers with oval ligules 1.5 cm. long; disk 1 cm. wide; lobes of the disk-corollas purple: achene villous.—Sandy places, Hog Island, Fla.

10. **H. cucumerifolius** T. & G. Annual: stem erect, 1–2 m. tall somewhat rough above, with ascending branches mostly above the middle: leaves alternate; blades deltoid-ovate, 5–8 cm. long, acute, irregularly serrate, strumose-setose above, scabrous-hispid beneath, cordate; petioles about as long as the blades: heads 1–3 terminating the stem and the branches: bracts of the involucre narrowly lanceolate, longer than the disk, scabrous, scarcely ciliate: disk about 2 cm. wide, its corollas with red-purple lobes.—Sandy places near the coast, La. and Tex.; naturalized in Fla. through cult.—Sum.–fall.—Cult. forms have yellow disks.

11. **H. debilis** Nutt. Annual: stem more or less branched at the base, the branches decumbent or horizontal, up to 1 m. long, subglabrous to hispid: leaves alternate; blades deltoid-ovate, acute, 5–8 cm. long, irregularly serrate, scabrous-setose and deep-green on both sides, broadly cuneate to cordate; petioles sca-

brous, about one-third as long as the blades: heads terminating the stem and the branches: peduncles hispid: bracts of the involucre narrowly lanceolate, longer than the disk, scabrous, scarcely ciliate: ray-flowers with light-yellow ligules about 1.5 cm. long: disk about 1.5 cm. wide, its corollas with red-purple lobes.—Coastal sand-dunes and rarely introduced into sandy places inland, Coastal Plain, Fla. to Tex. and Ga.—All year.

12. H. argophyllus T. & G. Annual: stem 1–2 m. high, branched, densely white-tomentose, especially on younger parts: leaves alternate: blades ovate, mostly entire, 1–2 dm. long, the petiole a little shorter, densely pubescent: heads large, very showy: bracts of the involucre ovate-acuminate, white-tomentose: disk 2–3 cm. in diameter; lobes of the disk-corollas magenta-red.—Sandy places, wood and chaparral, various provinces, Tex., often cultivated and readily escaping and persistent through the southeast.—Similar to *H. annuus*, but shorter and less branched. The leaf-buds are densely long, white-pubescent.

13. H. radula (Pursh) T. & G. Perennial: stem erect from an ascending base, about 0.5–1 m. high, hirsute below, simple to the inflorescence: leaves opposite, the basal ones crowded into a rosette, with obovate or suborbicular blades 5–21 cm. in diameter; cauline leaves much reduced, rough-hispid: flower-stem rising from beneath the basal rosette: peduncles 1-flowered, heads large: ray-ligules minute, 1–2 mm. long: disk 2–3 cm. in diameter, like the whole head, often including the glabrous involucral bracts, suffused with purple.—Sandy pinelands, flat-woods, and oak-ridges, Coastal Plain, Fla. to Ala. and Ga.—There are no rootstocks, and vegetative propagation is by crown-buds.

14. H. verticillatus Small. Perennial: stem slender, less than 2 m. high, glabrous: leaves verticillate in 4's, blades lanceolate, narrowly sessile, about 9 cm. long, scabrous above, finely short-pubescent and paler beneath: inflorescence a cyme: bracts of the involucre lanceolate, sub-glabrous, a little longer than the disk: disk-corollas yellow.—Wet sandy soil, Interior Low Plateaus, Tenn.

15. H. simulans E. E. Watson. Perennial: stem erect, simple to the inflorescence, scabrous-strigose: leaves alternate, crowded; blades linear, mostly about 14 cm. long, revolute, rough-scabrous above, tomentulose beneath: heads showy: bracts of the involucre linear-lanceolate, longer than the disk, thinly pubescent, scarcely ciliate: the ray-flowers with ligules deeply 2–3-dentate at the apex, 2–3 cm. long: corollas of the disk yellow.—Wet muck, low woods, and pinelands, Coastal Plain, Fla. to La.—Differs from *H. angustifolius*, with which it is often confused, by its yellow disk.

16. H. carnosus Small. Perennial: stem 0.8–1 m. high, slender, glabrous, arising from a mass of basal leaves surmounting a bulbous base: basal leaves with blades varying from ovate-spatulate to narrowly linear-oblanceolate, 4–17 cm. long; cauline leaves alternate; blades glabrous, succulent: inflorescence a single terminal head on the main stem: bracts of the involucre oblong-lanceolate 4–5 mm. wide, a little longer than the disk and glabrous: ray-flowers with ligules about 2 cm. long and 2–3-dentate at the apex: disk 1.5 cm. wide; corollas yellow.—Wet sandy soil, mostly about ponds, N Fla.—The main stem arises from one side of the bulbous base and the basal clump of leaves from the other side; rootstocks none, propagation is from crown buds.

17. H. longifolius Pursh. Perennial, similar to the preceding species: stem simple to the much branched inflorescence, often purplish: leaves opposite or the upper alternate; blades narrowly linear-oblanceolate, the longest being 25 cm. long, chiefly basal and sheathing the stem: inflorescence an open panicle: heads smaller than in *H. carnosus;* bracts of the involucre narrowly lanceolate,

about as long as the disk, glabrous, scarcely ciliate: disk rarely more than 1 cm. wide, its corollas yellow: ray-flowers with ligules about 1.5 cm. long.—Wet sandy or rocky glades and sandhill bogs, Coastal Plain and adj. provinces, Ga. and Ala.

18. **H. Schweinitzii** T. & G. Perennial: stem erect, branched, 1–2 m. high, strigose or glabrescent in age, purple: leaves alternate above; blades lanceolate, acuminate, revolute, narrowly sessile, scabrous above, densely white-pubescent beneath: heads few, on short, slender peduncles, small: bract of the involucre lanceolate, a little shorter than the disk, pubescent: disk about 6 mm. wide, the corollas yellow.—Dry, often sandy and rocky woods, various provinces, Ga. to Ala. and N. C.

19. **H. stenophyllus** (T. & G.) E. E. Watson. Perennial, with stout branched rootstocks 1–3 dm. long: stem 0.5–1 m. high, slender, simple, scabrous-hispid, light-green; leaves opposite; blades narrowly lanceolate, attenuate, acute, 10–15 cm. long, pointed at the base, thick, densely strumose-hispid above, scabrous-hispid beneath, the petioles more or less winged by the decurrence of the blade: inflorescence cymose, bracts of the involucre linear-lanceolate, longer than the disk, loose, recurved, densely hispidulous; ray-flowers with ligules deep-yellow, 2.5 cm. long, disk 1–2 cm. wide, its corollas yellow, the lobes pubescent.—La. to Tex., and Okla. Perhaps not east of the Mississippi River.

20. **H. Eggertii** Small. Perennial: stem erect, slender, purplish, glabrous, glaucous, 1–2 m. high: leaves opposite, or the uppermost alternate in vigorous plants; blades lanceolate, acute, thinnish, glaucous on both sides, conspicuously so beneath, strumose-setose above, glabrous beneath, obscurely serrulate broadly decurrent to the base of the petiole, about 12 cm. long: inflorescence a few heads on short peduncles from the axils of the alternate upper leaves; involucre cylindrical; bracts broadly lanceolate, acuminate, not very loose, a little longer than the disk, glabrous: ray-flowers with ligules about 1.5 cm. long: disk about 1.2 cm. wide, its corollas yellow.—Dry, often rocky hills, Interior Low Plateau, Tenn.

21. **H. grosse-serratus** Martens. Perennial, with abundant, often branched rootstocks and woody roots: stem 1–3.5 m. high, simple to the inflorescence, glabrous, glaucous; leaves alternate; blades broadly linear-lanceolate, grossly and saliently serrate, often very large, 15–25 cm. long, thinly strumose-setulose above, with fine, soft, short, straight hairs beneath, abruptly contracted to a stout petiole which is 4–8 cm. long, the upper leaves smaller and less deeply serrate: inflorescence a many headed-panicle: heads large and showy: involucre campanulate; bracts linear-lanceolate, attenuate, longer than the disk, loose but not reflexed, very dark green, subglabrous; ray-flowers with bright yellow ligules, 2.5–4 cm. long: disk 1–2 cm. wide, its corollas yellow.—Rich soil, fields, pastures, meadows, and waste-places, various provinces, Tenn. to Tex., N. M., Wyo., Sask., Me., and Va.

22. **H. tomentosus** Michx. Perennial, with rootstocks 3--4 cm. long and numerous crown-buds: stems 1–2 m. high, usually 3–5 together, very variable in pubescence, always more or less hispid, rarely subglabrous or tomentose: leaves alternate toward the inflorescence; blades usually broadly lanceolate, often very narrowly so, and rarely ovate, decurrent to the base of the petiole, dark-green and hispid above, subglabrous to densely tomentose beneath, usually sparingly tomentose, always resin-dotted: inflorescence a small panicle, the peduncles slender; heads showy: bracts of the involucre linear-lanceolate, loose, reflexed, hispidulous, resin-dotted, longer than the disk: ray-flowers with ligules about 2 cm. long, bright-yellow, pubescent and resin-dotted on lower surface: disk 1–2.5 cm. wide, its corollas yellow, pubescent, resin-dotted.—Woods and hillsides, Piedmont and adj. Blue Ridge, Ga. to Ala., and Va.

23. H. Maximiliani Schrad. Perennial: stem 1–2 m. high, very scabrous, often several from one root: leaves alternate; blades lanceolate, conduplicate, densely scabrous-hispidulous on both sides, both stem and leaves light gray-green: inflorescence normally racemose, with 2 or 3 heads on very short peduncles in the axils of the upper leaves, occasionally the peduncles are 1–1.5 dm. long, and bear 1–3 heads: heads showy: bracts of the involucre narrowly linear-lanceolate, densely scabrous-hispidulous, attenuate, longer than the disk, loose, but not reflexed: ray-flowers with many, but short ligules, distinctly cupped: disk large, often 2 cm. wide, its corollas yellow.—Rather dry and rocky soil, plains and prairies, various provinces, Tex. to Man., and Minn.; also adv. in the E U. S.—The Texan specimens are often coarsely hispid-scabrous.

24. H. giganteus L. Perennial with numerous short rootstocks and crown-buds: stem stout, simple to the inflorescence, usually rough-hispid, 1.5–3.5 m. tall: leaves alternate; blades lanceolate, pointed at both ends, but very narrowly sessile, rather thin, serrate, sharply scabrous above, the lower surface paler, with remote, long, ascending hairs: inflorescence a many-flowered panicle: heads showy: bracts of the involucre linear or linear-lanceolate, much longer than the disk, dark green, glabrous, but conspicuously ciliate: ray-flowers with ligules about 1.5 cm. long, oval, light-yellow: disk relatively large, about 1.5 cm. wide, its corollas yellow.—Swamps and wet thickets, various provinces, N. C. to Colo., Sask., Ont., and Me.

25. H. montanus E. E. Watson. Perennial: stem 1–2 m. high, glabrous, purple, striate, more or less glaucous, branching above: leaves alternate, blades lanceolate, about 12 cm. long, serrate, slightly revolute, upper surface strumose-scabrous, lower surface paler and glabrous except on the hispid nerves, the petiole narrowly winged almost to its base: inflorescence of 2 or 3 heads on slender branches from the upper axils: involucral bracts lanceolate, nearly or quite glabrous, erect but loose, about as long as the disk: disk about 1 cm. wide, its florets yellow, the rays about 2 cm. long, the achene slender and glabrous, chaff 3-cuspidate.—Stony or sandy soil, various provinces, Fla. and Ga.

26. H. alienus E. E. Watson. Perennial, with coarse woody roots: stem 1–1.5 m. high, stout, scabrous toward the apex, purplish, sulcate: leaves alternate; blades lanceolate, obscurely denticulate, very narrowly sessile, 11–15 cm. long, thickish, densely scabrous above, sparingly but long-hispid beneath, the veins prominent: inflorescence few-flowered: heads showy: bracts of the involucre linear-lanceolate, about as long as the disk, densely hispidulous, spreading-ciliate: ray-flowers with ligules about 1.7 cm. long: disk about 1.3 cm. wide, its corollas yellow, the chaff entire.—Woods, Blue Ridge, N. C. to Va.

27. H. laevigatus T. & G. Perennial, with rootstocks rarely more than 3 cm. long: stem slender, erect, glabrous, 1–2 m. high: leaves mostly opposite, or alternate above in vigorous plants; blades narrowly, or often very broadly, lanceolate, pointed at both ends, glabrous on both sides: inflorescence a few-flowered panicle: heads small: bracts of the involucre lanceolate, glabrous, a little longer than the disk; disk rarely exceeding 8 mm. in diameter: ray-flowers with ligules 1–2 cm. long: disk-corollas yellow.—Woods, Blue Ridge and adj. provinces, N. C. to Ky. and Va.

28. H. glaucus Small. Perennial, with rootstocks 2–5 cm. long: stem purple, branched, glabrous, glaucous, up to nearly 2 m. high; leaves alternate above, though often all opposite: blades ovate to lanceolate, firm, scabrous above, tomentulose and very resin-dotted beneath, the veins conspicuously brown: heads many, small: bracts of the involucre lanceolate, about as long as the disk: disk about 7 mm. wide, the corollas yellow.—Dry woods, various provinces, Fla. to Miss., Ark. (?), and N. J.

29. **H. decapetalus** L. Perennial, with long rootstocks: stem slender, light-green, glabrous, simple to the inflorescence: leaves opposite to the inflorescence (branches of the latter mostly alternate); blades ovate, serrate, broadly decurrent on the usually long petiole, very thin, dark-green, remotely setose above, sparingly pubescent beneath: heads very showy: bracts of the involucre linear or linear-lanceolate, longer than the disk, very loose, often curling about, subglabrous: ray-flowers with ligules often 2.5 cm. long: disk 0.7 to 1.5 cm. wide; corollas yellow.—Rich woods, river-banks, and roadsides, various provinces, Ga. to Tenn., Mich., and Que.

30. **H. microcephalus** T. & G. Perennial, with rootstocks about 1 dm. long, the crown buds numerous: stem very slender, light-green, glabrous, simple: leaves opposite, or sometimes the upper alternate: blades very thin and delicate, light-green, broadly oblong-lanceolate, thinly pubescent beneath, remotely short-hispid above: heads few, very small: disk rarely exceeding 5 mm. in diameter: bracts of the involucre lanceolate, subglabrous, a little longer than the disk.—Woods, thickets, and fence-rows, various provinces, Ga. to Ky. and Pa.

31. **H. occidentalis** Riddell. Perennial, with rootstocks 2–3 dm. long, the terminal bud producing a daughter plant during the season, and numerous fine-fibrous roots: stem arising from a basal rosette which is not always persistent, simple to the inflorescence, scabrous; leaves opposite, crowded toward the base of the stem; blades oval in outline, either very narrowly or very broadly so, exceedingly variable in size, obtuse, entire or serrulate, rough above, hispid beneath, the base gradually contracted into a long, margined petiole which is as long as or often longer than the blade: inflorescence a panicle, or often only a single head in small plants; heads showy: bracts of the involucre narrowly lanceolate, acute, not longer than the disk, sparingly pubescent, ciliate: ray-flowers with ligules about 1.8 cm .long: disk about 1 cm. wide, its corollas yellow.—Dry or moist clay or sandy soil, woods, plains, and prairies, various provinces, Fla. to Tex., Minn., Ohio, and N. C.—The plants are large and vigorous in black, rich soil, smaller, but no less abundant in dry, sandy soil.

32. **H. Dowellianus** M. A. Curtis. Perennial, with rootstocks 1–3 dm. long and fibrous roots: stem 1–2.5 m. high, usually simple, rarely branched, appressed-pubescent or subglabrous: leaves more numerous and more approximate towards the base of stem, opposite below, alternate above; blades ovate, acute, rather densely short-hispid beneath, dark-green, concolor, contracted at the base to a long, margined petiole, the latter about as long as the blade: bracts of the involucre lanceolate, acuminate, a little longer than the disk, finely appressed-pubescent, the cilia short and very fine: ray-flowers with light yellow ligules about 2 cm. long: disk about 1 cm. wide, its corollas yellow: achene pubescent at the apex and on the angles.—Open woods, rocky banks, and sandy bottoms, various provinces, Ga. to Ill., and D. C.

33. **H. mollis** Lam. Perennial, with stout rootstocks about 15 cm. long, the terminal bud very large, and numerous crown-buds, the roots fine-fibrous: stems 0.5–1 m. high, more or less tufted, scabrous-hirsute, usually simple, if branched, the branches closely ascending, even parallel to the main stem, the pubescence of two kinds, long, scabrous, spreading hairs, and short, closely appressed hairs: leaves opposite, or in very vigorous plants the upper sometimes alternate: blades ovate, sessile, often clasping, 7–9 cm. long, densely pubescent on both sides: inflorescence a single terminal head, or else racemose in the upper axils, in the latter case, the peduncles short: heads very showy: bracts of the involucre broadly linear-lanceolate, about as long as the disk, densely pubescent: ray-flowers numerous, with ligules 2–3 cm. long: disk 2–3 cm. wide, its corollas yellow.—Prairies, barrens, woods, and fields, various provinces, Ga. to Tex., Kans., Ia., and Mass.—Frequently cultivated.

34. H. divaricatus L. Perennial, with numerous rootstocks 1–7 dm. long and few roots: stem simple to the inflorescence, or very vigorous plants often branched, subglabrous, usually purple if exposed to the sun, enlarged and woody at the base: leaves opposite; blades lanceolate, usually broadly so, rarely very narrow or very broad, round at the base, subsessile, rough above, sparingly pubescent beneath, with remote, long, ascending hairs, divaricate: inflorescence a single, terminal head or else a cyme: heads not very showy; bracts of the involucre lanceolate, a little longer than the disk, subglabrous, erect with very loose tips: ray-flowers with narrow ligules about 2.0 cm. long: disk about 1 cm. in width, its corolla yellow.—Dry woods and old fields, various provinces, Fla. to La., Man., Ont., and Me.

35. H. saxicola Small. Perennial: stem slender, 0.8–1.5 m. high, glabrous, glaucous, reddish, simple; leaf arrangement unstable, alternate or opposite; blades ovate, acuminate, serrulate, rounded at the base to a short distinct petiole 2–3 cm. long, dark-green and rough above, paler and glabrous beneath, the main veins sometimes slightly short-hispid: inflorescence solitary or few-flowered: heads showy; bracts of the involucre broadly lanceolate, a little longer than the disk, glabrous or subglabrous, somewhat reflexed: ray-flowers with ligules 2–2.5 cm. long: disk about 1.5 cm. wide, its corollas yellow.—Rocky and sandy soil, Blue Ridge, Ga. to N. C.

36. H. tuberosus L. Tall, perennial, with tuber-bearing rootstocks: stem simple or branched, robust, hispid, rough, often 2–3 cm. thick at the base, light-green: leaves alternate above the middle of the stem, in plants often all opposite: blades ovate, thinnish, short-hispid above, short-hirsute beneath, soft to the touch, abruptly contracted below to a margined petiole, 10–20.0 cm. long inflorescence paniculate: heads very showy: bracts of the involucre lanceolate or linear-lanceolate, sparingly pubescent, often glabrous, erect, the tips recurving slightly, very dark green: ray-flowers with ligules 2.5–4 cm. long: disk relatively small, rarely more than 1 cm. wide, the disk-corollas yellow.—(ARTICHOKE. JERUSALEM-ARTICHOKE.)—Moist or dry rich soil, various provinces, Fla. to Tex., Sask., Ont., and N. S.—The plant is commonly cultivated for its edible tubers, which accounts for its wide distribution, as it is native only in the western part of its range.

37. H. strumosus L. Perennial, with an often very long branched rootstock, the roots coarse: stem tall, erect, glabrous or subglabrous, sometimes a little pubescent toward the apex, mostly simple, sometimes, when very vigorous, a little branched: leaves mostly opposite: blades broadly lanceolate, rarely ovate, acuminate at the apex, serrate or serrulate, rounded at the base, the petiole partly distinct, 10–15 cm. long, strumose-setose above, the strumae becoming conspicuously white in dry specimens, much paler beneath, and (in the southern states) pubescent beneath only on the main veins: inflorescence cymose, the main branches opposite, usually all opposite: ray-flowers with ligules 2–3 cm. long: disk 1–2 cm. wide, its corollas yellow: bracts of the involucre broadly lanceolate; bracts usually glabrous, never more than very sparingly pubescent, ciliate, loose but erect.—Dry woods, hillsides, and fields, various provinces, Ga. to Ark., Minn., and Me.

38. H. reindutus (Steele) E. E. Watson. Perennial with rootstocks 7–8 cm. long, the crown buds numerous: stem reddish, especially above, glabrous, rarely a little rough, 1–2 m. high: leaves opposite or sometimes alternate above; blades lanceolate, serrulate, narrowly sessile, firm, glabrous or remotely setose above, very remotely scabrous beneath, the scabra usually large and blunt, the margins usually appressed hispid-ciliate below: inflorescence a profusely branched, open panicle, the branches very slender: heads showy: bracts of the involucre lanceolate, longer than the disk, loose, often reflexed, scarcely ciliate:

disk 1–1.5 cm. wide, its florets yellow.—Woods and shale-barrens, Blue Ridge and Appalachians, N. C. and Va.—Similar to *H. laevigatus*, but differs by its profuse inflorescence, and its pubescent leaves.

39. **H. hirsutus** Raf. Perennial, with stout abundant profusely branched rootstocks 1–3 dm. long: stem stout, 0.5–1.7 m. high, hispid, often branched, the pubescence spreading or retrorse: leaves opposite; blades ovate to ovate-lanceolate, thick, rounded or obtuse at the base, on short, stout petioles 1–2 cm. long, densely scabrous above, hispid-hirsute, often densely beneath: inflorescence cymose, its branches rarely more than 10–15 cm. long: bracts of the involucre lanceolate attenuate, very loose, longer than the disk, recurved, densely hispidulous: ray-flowers with oval ligules 2 cm. long: disk 1–2 cm. wide, its corollas yellow.—Open, often rocky woods, river-banks, prairies, and old fields, various provinces, Ga. to Tex., Kans., Wisc., and Pa.

40. **H. doronicoides** Lam. Perennial, with short stout rootstocks with woody roots: stem stout, 1–2 m. high, usually densely, softly pubescent: leaves opposite below the middle of stem, alternate above, or all opposite in weak plants; blades broadly oval-lanceolate, serrate, obtuse, narrowly sessile, densely tomentose both sides, but more so beneath: inflorescence a lax, open panicle, the peduncle 1–4-flowered: bracts of the involucre linear-lanceolate, loose, reflexed, longer than the disk, densely pubescent: ray-flowers with oval ligules, 2–3 cm. long, light-yellow: disk about 1.7 cm. wide, its corollas yellow, the lobes puberulent.—River bottoms, prairies, and woods, various provinces, Ala. to Ark. (?), Mo., and Ohio.

41. **H. resinosus** Small. Perennial: stem 1–2 m. high, slender retrorsely hispid: leaves opposite below but alternate above, or in small plants all opposite; blades ovate or oblong-ovate, narrowly sessile, hispid with rather long hairs above, tomentulose, but not densely so, and copiously resin-dotted beneath. thin in texture: heads few on long peduncles, either cymose or paniculate: bracts of the involucre linear-lanceolate, longer than the disk, reflexed, pubescent, resin-dotted: ray-flowers with ligules 2–2.5 cm. long: disk 1–1.6 cm. wide, its corollas yellow, both rays and disk florets copiously resin-dotted.—Woods, N Fla.—Very similar to *H. tomentosus* but more delicate.

42. **H. validus** E. E. Watson. Perennial: stem slender, 1–2 m. high, branched toward the apex, rough with very fine scabra: leaves alternate; blades broadly lanceolate-elliptic, obscurely serrulate, acute at both ends, 10–12 cm. long, scabrous-setose above, sparingly hispid and resin-dotted beneath: inflorescence of 3–4 rather large heads which are solitary on leafy peduncles on the stem and branches: bracts of the involucre linear-lanceolate, sparingly short-pubescent or puberulent, scarcely ciliate, longer than the disk, loose but erect: ray-flowers with ligules 1.5 cm. long: disk 1.5–2 cm. wide, its corollas yellow.—Blue Ridge, N. C.

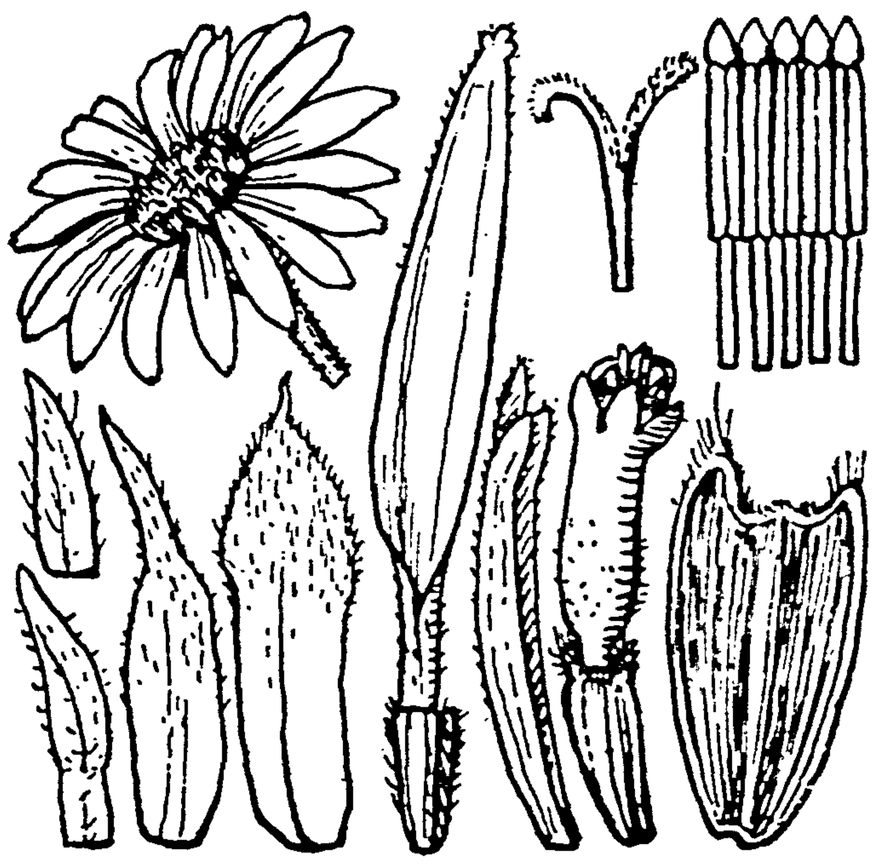
43. **H. laetiflorus** Pers. Perennial, with numerous profusely branched rootstocks: stem erect, rough but shining, 1–2 m. high, simple to the inflorescence: leaves opposite, or alternate on the upper part of stem in vigorous plants: blades broadly lanceolate, narrowly decurrent to the base of the petiole, usually thick, firm, shining, very rough, very variable in size: heads on very long, stout, ascending, not very leafy branches, very handsome: bracts of the involucre linear-lanceolate, subglabrous, usually with 2–3 dark brown lines: ray-flowers with ligules 2–3 cm. long, deep-yellow: disk 1.5–2.5 cm. wide, its corollas yellow.—Creek-bottoms, woods, and banks, various provinces, Ga. to Mo., and Ill.

80. **PHOEBANTHUS** Blake. Perennial, *Helianthus*-like herbs, the stems arising from horizontal tubers. Leaves alternate or opposite: blades typically

narrow. Heads erect or nearly so, radiate. Involucre hemispheric or depressed: bracts narrow or broad, ultimately lax. Ray-flowers several: corolla with a very short tube and a long yellow ligule. Disk-corollas with a cylindric-funnelform throat abruptly narrowed into the short tube. Filaments slightly shorter than the anthers. Stigmas linear-lanceolate. Pappus sometimes of several scales between chaffy awns or teeth.—Two species, as follows:

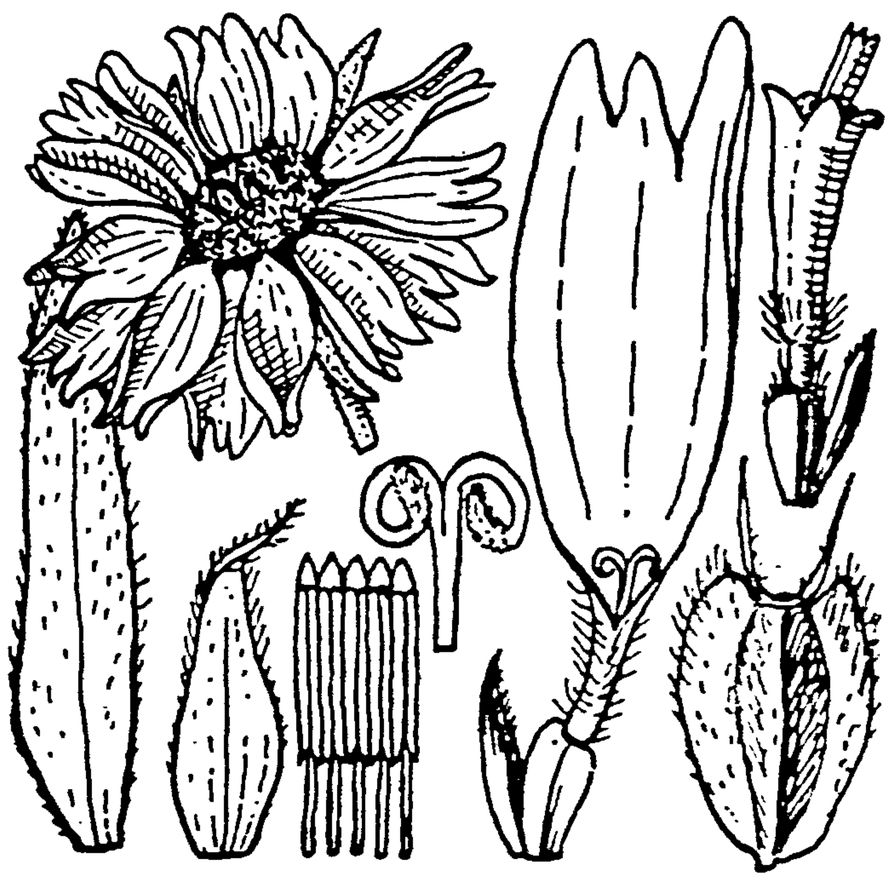
Leaf-blades linear or linear-lanceolate: involucral bracts appressed: ray-flowers 16–20. 1. *H. grandiflora.*
Leaf-blades linear-filiform: involucral bracts spreading: ray-flowers 10–15. 2. *H. tenuifolia.*

1. P. grandiflora (T. & G.) Blake. Stem 6–13 dm. tall, simple or sparingly branched above: leaves mostly alternate; blades linear to linear-lanceolate, 2–6 cm. long, acute, entire, somewhat revolute: heads showy: involucral bracts linear-subulate to lanceolate or cuneate, or oblong with lanceolate or ovate tips, hispidulous, the tips rather lax: ray-flowers 16–20; ligules yellow, 3–4.5 cm. long: disk 1.5–2 cm. broad: achene 5–6 mm. long, narrowly margined or wing-margined, strongly ribbed, pubescent about the upper edge, each side surmounted by a tooth, and one or both sometimes prolonged into an awn. [*Helianthella grandiflora* T. & G.]—Pinelands, oak-woods, and stream-banks, pen. Fla.—Spr.–fall.



2. P. tenuifolia (T. & G.) Blake. Stem 3–11 dm. tall, simple or sparingly branched above: leaves alternate or opposite or whorled on the lower part of the stem; blades linear-filiform, 3–8 cm. long, acute, entire, revolute, very scabrous: heads showy: involucral bracts linear-subulate to linear-lanceolate, attenuate, spreading: disk 1–2 cm. wide: achene unequally 4-angled, 3–4 mm. long, often minutely pubescent, the margins prolonged into triangular scales. [*Helianthella tenuifolia* T. & G.]—Sandhills and pinelands, N Fla.—Spr.–Fall.

81. XIMENESIA Cav. Annual, caulescent herbs. Leaves alternate or sometimes opposite: blades toothed or somewhat laciniate. Heads peduncled, often showy. Involucre flat, or flattish. Bracts rather narrow and elongate. Ray-flowers numerous: corollas with a slender tube and yellow ligules. Disk-corollas with a narrowly funnelform throat and a short tube: lobes triangular or lanceolate-triangular. Filaments nearly as long as the anthers. Pappus of short awns.—About 4 species, American.

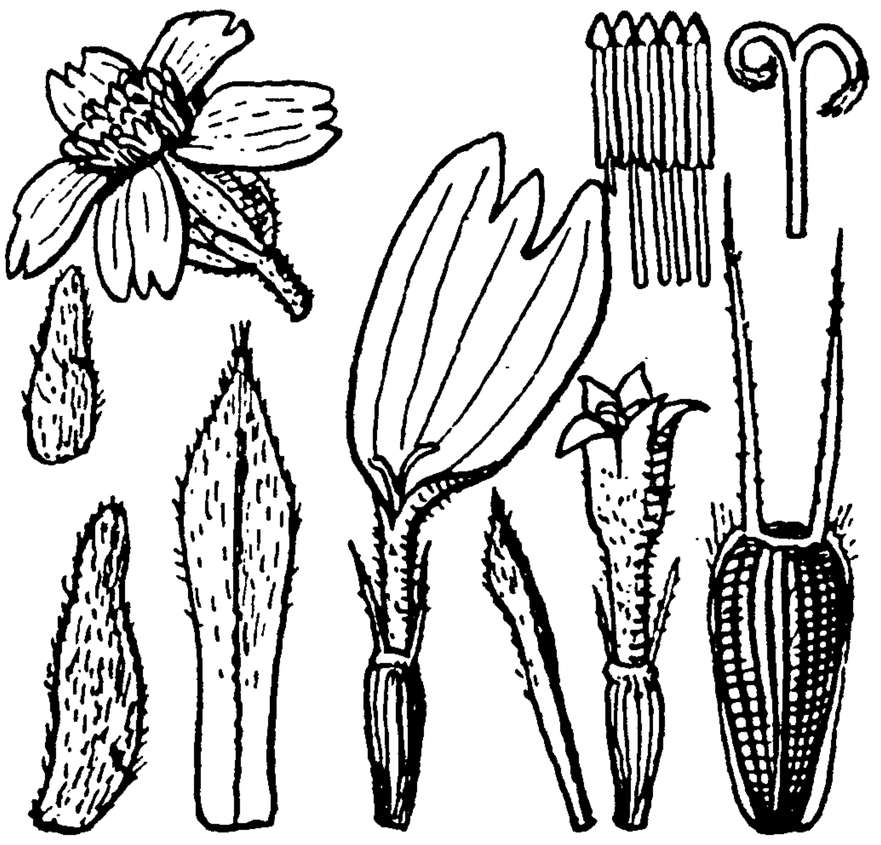


1. X. encelioides Cav. Plant 3–7 dm. tall, pale-pubescent: leaf-blades deltoid or lanceolate, 5–10 cm. long, serrate or incised, the broader petiole-bases appendaged at the base: larger bracts of the involucre linear to linear-lanceolate, 15–20 mm. long: ligules cuneate, 1–2 cm. long: achene 6–7 mm. long, broadly winged.—(SKUNK-DAISY.)—Hammocks and waste-places, Key West, Fla., and several points in Ala. Nat. from Tex. to Ariz., and Colo.

82. PHAETHUSA Gaertn. Perennial herbs or shrubby plants. Leaves alternate or opposite: blades entire or toothed, more or less decurrent. Heads numerous and clustered. Involucre narrow or broad: bracts not slender-tipped. Ray-flowers 4 or 5, pistillate and fertile, with an often short or obsolete corolla-tube, the ligules white or yellow, or wanting. Disk-corollas with a campanulate throat, contracted into a shorter tube: lobes lanceolate to triangular-lanceolate. Filaments slightly shorter than the anthers. Pappus of 1–3 awns.—About 35 species, American.—CROWNBEARDS.—The stem is ridged or winged.

Leaves alternate: ray-flowers with white ligules.
  Leaf-blades undulate, sinuate, or serrate. 1. *P. virginica.*
  Leaf-blades pinnatifid or pinnately lobed. 2. *P. laciniata.*
Leaves opposite: ray-flowers with yellow ligules. 3. *P. occidentalis.*

1. P. virginica (L.) Small. Stem 6–18 dm. tall, tomentulose or puberulent: leaf-blades membranous, lanceolate to oval or ovate, 5–21 cm. long: larger bracts of the involucre about 7 mm. long: disk-corollas about 5 mm. long: achene winged, 5 mm. long. [*Verbesina virginica* L.]—(FROST-WEED. TICKWEED. INDIAN-TOBACCO.)—Dry soil, various provinces, Fla. to Tex., Mo., and Pa.



2. P. laciniata (Poir.) Small. Stem 7–16 dm. tall, tomentulose: leaf-blades ovate to elliptic-ovate in outline, 5–22 cm. long, the segments sometimes repand: larger bracts of the involucre about 6 mm. long: disk-corollas about 5 mm. long: achene obovate, 5–6 mm. long: achene with wings as broad as the body, 5–7 mm. long. [*Verbesina laciniata* (Poir.) Nutt.] — Pineland and sandy hammocks, Coastal Plain, Fla. to S. C.

3. P. occidentalis (L.) Small. Stem 9–20 dm. tall, smooth and glabrous: leaf-blades ovate to elliptic-lanceolate, 5–20 cm. long: larger bracts of the involucre about 6 mm. long, broadly linear: ligules 10–15 mm. long: achene with very long pappus bristles and wingless or nearly so, 5–6 mm. long. [*Verbesina occidentalis* (L.) Walt.]—Rich soil, various provinces, Fla. to Miss., Ill., and Pa.

83. PTEROPHYTON Cass.[1] Perennial caulescent herbs. Leaves alternate or opposite: blades entire or toothed, decurrent or sessile. Heads solitary or few together, long-peduncled. Involucre broad: bracts shorter than the disk. Ray-flowers when present 5–10 pistillate or neutral, but always sterile, the ligules yellow or whitish. Disk corollas with a campanulate throat, contracted into a shorter tube: lobes triangular-lanceolate to lanceolate. Filaments shorter than the anthers. Pappus of 1–3 very short, slender awns or wanting.—About 15 species, American.

Stem winged: leaves decurrent. I. HETEROPHYLLA.
Stem wingless: leaves merely sessile. II. NUDICAULIA.

I. HETEROPHYLLA

Leaf-blades hirsute beneath, very acute: stem leafy to the inflorescence. 1. *P. helianthoides.*

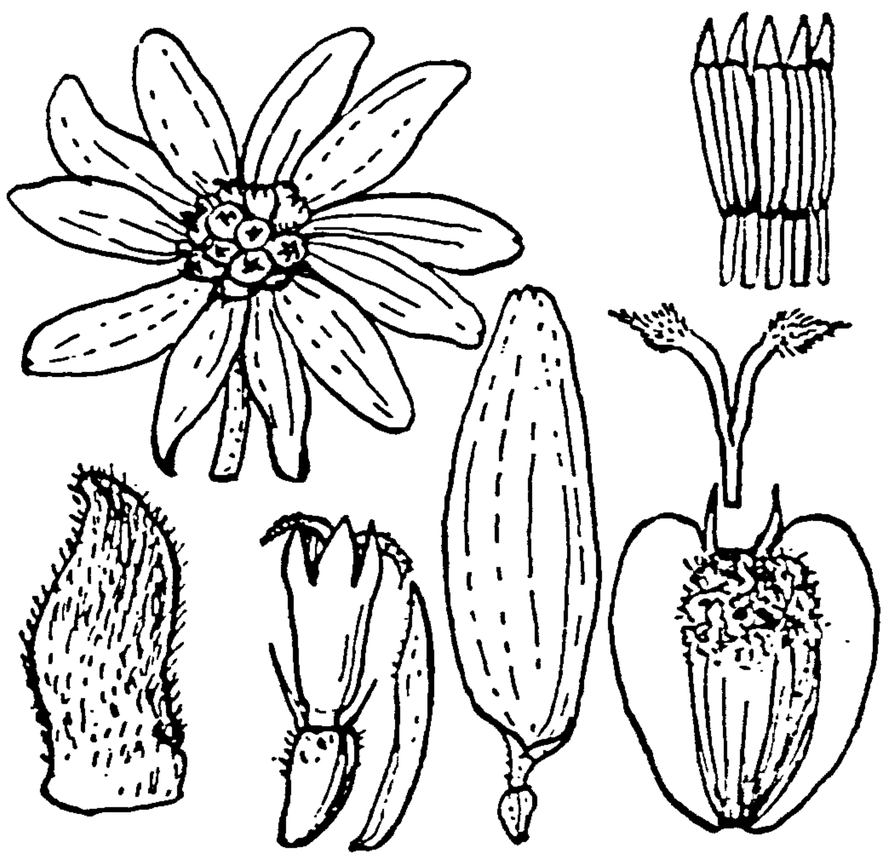
[1] Contributed by Edward Johnston Alexander.

Leaf-blades hispidulous beneath, somewhat blunt: stem sparingly scaly above the middle. 2. *P. heterophyllum.*

II. NUDICAULIA

Foliage scabrous: leaf-blades elliptic or broadest slightly above the middle: heads rayless. 3. *P. pauciflorum.*
Foliage hirsute or hispid: leaf-blades broadest at or below the middle: heads with rays. 4. *P. aristatum.*

1. **P. helianthoides** (Michx.) Alexander. Stem 5–11 dm. tall, finely pubescent: leaves mostly alternate; blades lanceolate to elliptic, 4–12 cm. long: larger bracts of the involucre about 8 mm. long, linear: ligules 20–30 mm. long: achene with short, slender pappus-bristles, usually narrowly winged, 5 mm. long. [*Verbesina helianthoides* Michx.]—Open woods and thickets, various provinces, Ga. to Tex., Ia., and Ohio.



2. **P. heterophyllum** (Chapm.) Alexander. Stem 5–12 dm. tall, scabro-hispidulous: leaves mostly opposite; blades elliptic, or elliptic-lanceolate, 2–6 cm. long, serrate-dentate: larger bracts of the involucre about 7 mm. long, elliptic-lanceolate: ligules 15–20 mm. long: achene with short pappus-bristles, broadly winged, 5–6 mm. long. [*Verbesina heterophylla* (Chapm.) A. Gray.]—Dry pinelands, Fla.

3. **P. pauciflorum** (Nutt.) Alexander. Stem 3–7 dm. tall, scabrous: leaves scattered; blades elliptic or slightly broadest above the middle, 3–9 cm. long, lucid: involucre about 1 cm. high: ray-flowers wanting: achene with no pappus, narrowly winged, 5–6 mm. long. [*Actinomeris pauciflora* Nutt. *Verbesina Warei* A. Gray.]—Low pinelands, W Fla.

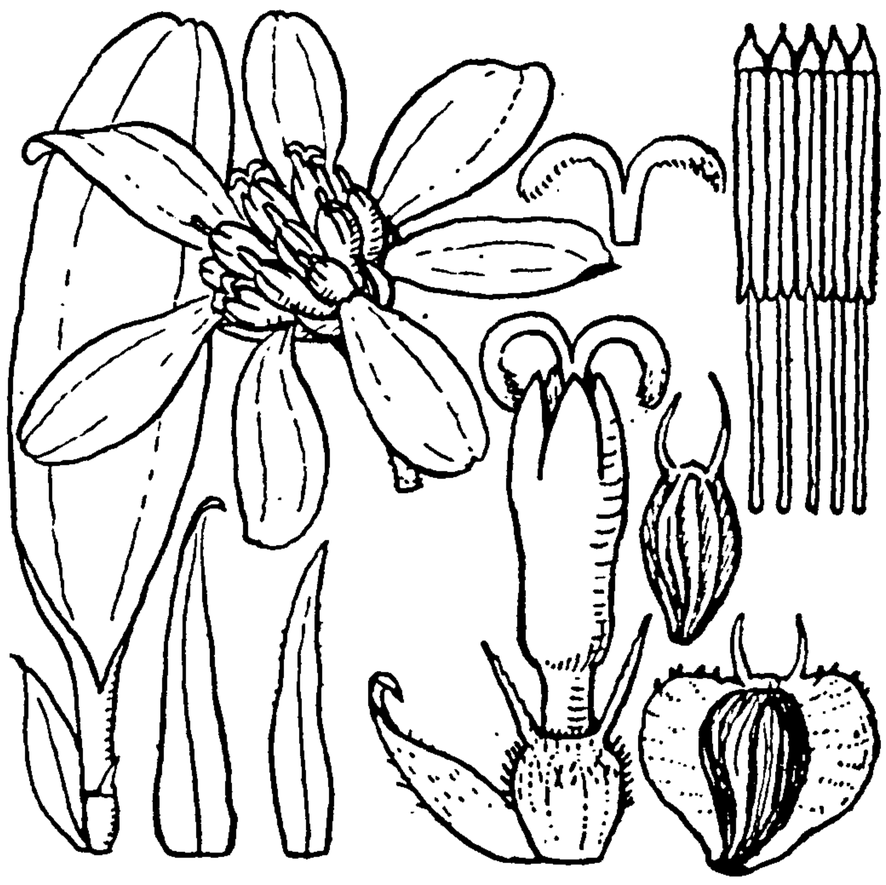
4. **P. aristatum** (Ell.) Alexander. Stem 5–12 dm. tall, hirsute to hispid: leaves remote; blades elliptic to elliptic-ovate or elliptic-lanceolate, 3–10 cm. long, scabrous: involucre 5–6 mm. high: ray-flowers 7–12: achene with short pappus-bristles, very broadly winged, 4–5 mm. long. [*Verbesina nudicaulis* (Nutt.) A. Gray. *V. aristata* (Ell.) Heller.]—Pinelands, Coastal Plain and adj. provinces, Fla. to Ala., and Ga.

84. **RIDAN** Adans. Perennial, rather coarse, tall herbs. Leaves alternate or opposite: blades usually toothed and decurrent. Heads several or numerous. Involucre narrow: bracts few, spreading or recurving, becoming lax. Ray-flowers few: ligules yellow or wanting. Disk-corollas many, with a funnelform throat rather abruptly contracted into the shorter tube: lobes lanceolate. Filaments slightly shorter than the anthers. Pappus of 2 more or less spreading awns, accompanied by 2 or 3 smaller awns, or scales. [*Actinomeris* Nutt.]—Sum.–fall.—Two species, as follows:

Ray-flowers 2–8: disk-corollas yellow. 1. *R. alternifolia.*
Ray-flowers wanting: disk-corollas white. 2. *R. paniculata.*

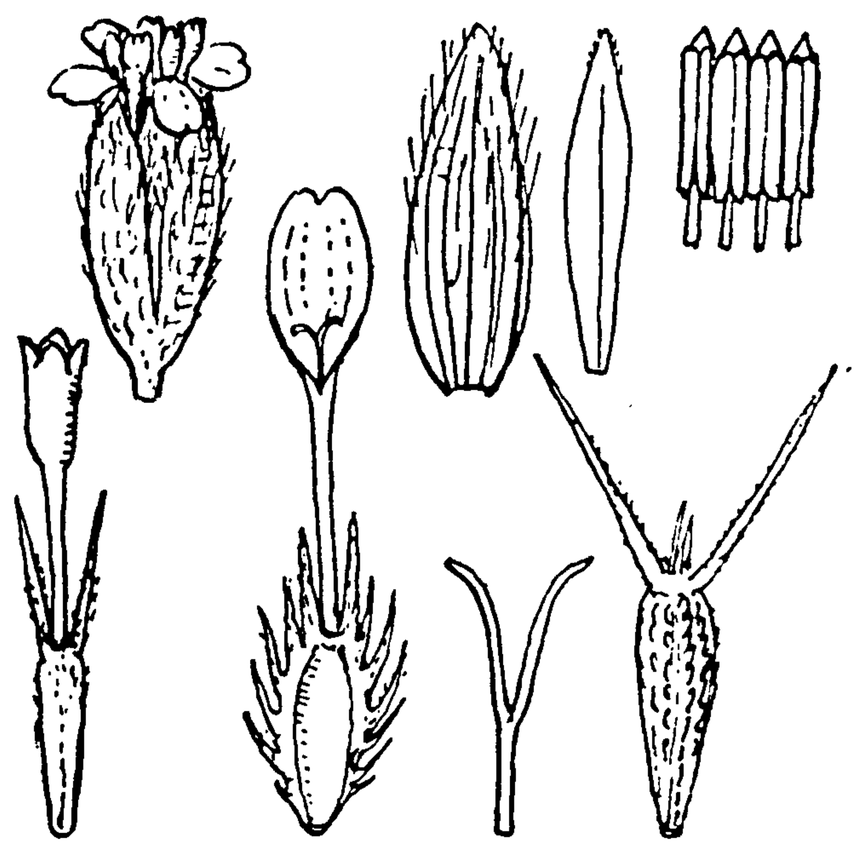
1. **R. alternifolia** (L.) Britton. Plant 6–25 dm. tall: leaf-blades elliptic, 9–30 cm. long: disk-corollas 5 mm. long: achene-body with ciliate wings.

[*Actinomeris alternifolia* (L.) DC.]—Rich woods, moist thickets, and roadsides, various provinces, Fla. to La., Ia., and N. J.



2. R. paniculata (Walt.) Small. Plant 6–24 dm. tall: leaf-blades linear to elliptic or narrowly elliptic, 8–31 cm. long: disk-corollas 4 mm. long: achene-body with toothed wings. [*Athanasia paniculata* Walt.]—Alluvial soil, Coastal Plain, Fla. to La. and S. C.—The typical habitat of these species is the alluvial flood-plains of creeks and river. There the plants grow very tall and in dense colonies.

85. SYNEDRELLA Gaertn. Annual, pubescent, erect herbs. Leaves opposite: blades usually toothed. Heads inconspicuous. Involucre simple, narrow, several-flowered, with 1 or 2 herbaceous and several chaffy bracts. Ray-flowers few: corolla with a very slender tube and a yellow ligule. Disk-corollas with a cylindraceous throat and a slender tube nearly or quite as long: lobes broad. Filaments much shorter than the linear anthers. Pappus of 2 or 3 awns becoming longer than the corolla in the disk.—Two species, tropical American.



1. S. nodiflora (L.) Gaertn. Plant 3–8 dm. tall: leaf-blades ovate to elliptic, 5–10 cm. long, serrate, the petiole-like bases hispid-ciliate: involucre 7–9 mm. high; larger bracts narrow: disk-corollas about 4 mm. long: achene 4–5 mm. long, those of the ray elliptic, with ascending marginal bristles, those of the disk columnar or clavate.—Sandy soil and wet places, Fla. Nat. of trop. Am.—(*W. I., Mex., C. A., S. A., O. W.*)—All year.

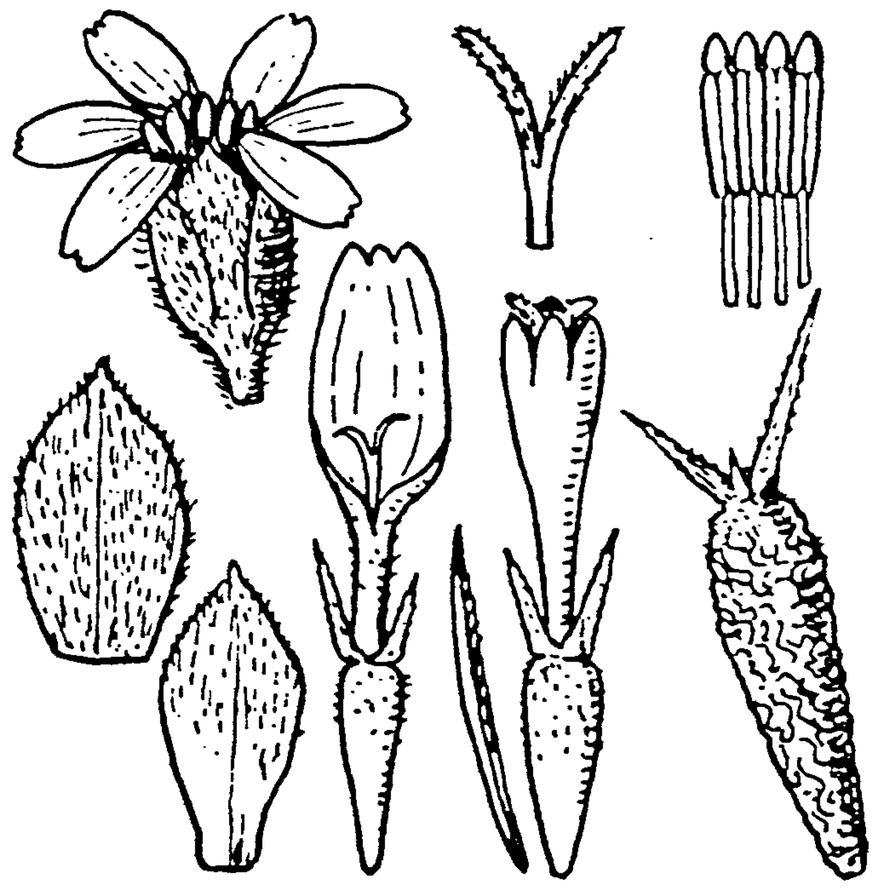
85a. CALYPTOCARPUS Less. Annual, pubescent, erect, herbs. Leaves opposite: blades toothed. Heads inconspicuous radiate. Involucre several-flowered: bracts various, with 3 herbaceous and several chaffy. Ray-flowers few: corolla with a tube shorter than the yellow ligule. Disk-corollas with a funnelform throat and tube: lobes narrow. Anthers somewhat longer than the filaments. Pappus of 2 or 3 awns with a rim at the base.—The following species:

Involucral bracts not ciliate: leaf-blades abruptly tapering at the cuneate or subcordate base, broadest below the middle.	1. *C. vialis.*
Involucral bracts long-ciliate: leaf-blades long-tapering to a cuneate base, broadest above the middle.	2. *C. blepharolepis.*

1. C. vialis Less. Stem 1–4 dm. long, branched at the base, the branches erect or prostrate: leaf-blades ovate, 1–3 cm. long, serrate, the petiole-like bases

shorter than the blade, hispid: involucre 5–7 mm. high; larger bracts broad: disk-corollas about 4 mm. long: achene 4–5 mm. long, those of the ray and disk alike wingless, minutely muricate.—Dry soil and waste-places, S La. to S Tex. (*W. I., Mex., C. A.*) —All year.

2. **C. blepharolepis** B. L. Robinson. Stem branched at the base, branches opposite, spreading: leaf-blades 2–3 cm. long, obovate, entire or nearly so: involucre about 5 mm. high: ligules of the ray corollas very short: achenes of the ray apparently glabrous and smooth, those of the disk muricate.—Ten-saw, Ala. — Sum.–fall. — Apparently introduced, but nativity unknown.



86. **COREOPSIS** L.[1] Annual, or perennial herbs. Leaves various. Heads conspicuously radiate. Involucre campanulate to hemispheric: bracts distinct or nearly so, the outer narrow. Ray-flowers several: corollas with yellow, discolored, or pink ligules. Disk-corollas with a funnelform throat and a stout or slender tube. Filaments mostly shorter than the anthers. Achene with entire or pinnate wings, or wingless.—About 5 species, American, African, and Australian.—DYE-FLOWERS. TICKWEEDS.

Stigmas with acute or cuspidate tips.
  Leaf-blades or their divisions with entire margins.
    Stigma-tips cuspidate: chaff of the receptacle with broad bases and attenuate filiform tips: leaf-blades simple or pinnately lobed. —Subgenus EUCOREOPSIS. I. LANCEOLATAE.
    Stigma-tips acutely conic: chaff of the receptacle linear or with slightly dilated tips: leaf-blades palmately lobed.—Subgenus ANACIS. II. PALMATAE.
  Leaf-blades evenly toothed.—Subgenus SILPHIDIUM. III. LATIFOLIAE.
Stigmas with truncate or obtusely conic tips.—Subgenus CALLIOPSIS.
  Achene wingless. IV. TINCTORIAE.
  Achene winged.
    Leaves with flat blades or divisions, not rush-like. V. ANGUSTIFOLIAE.
    Leaves thick, rush-like. VI. NUDATAE.

I. LANCEOLATAE

Achene with broad outspread wings (entire or fimbriate).
  Stem leafy near the base, bearing long, naked, peduncle-like branches.
    Ligules uniformly yellow.
      Plant glabrous except the ciliate bases of the leaves. 1. *C. lanceolata.*
      Plant pubescent except near the inflorescence. 2. *C. crassifolia.*
    Ligules with dark markings near the base. 3. *C. nuecensis.*
  Stem leafy to near the summit: peduncle short. 4. *C. pubescens.*
    Leaf-blades of the main stem broad, simple or with 1–5 small lateral lobes.
    Leaf-blades of the main stem pinnately parted into narrow divisions.
      Achenes with entire wings: petioles ciliate near the base. 5. *C. grandiflora.*
      Achenes with fimbriate wings: petioles and entire plant glabrous. 6. *C. saxicola.*
Achene with strongly incurved entire wings, which become callous-thickened at maturity. 7. *C. auriculata.*

II. PALMATAE

Leaves with petioled blades. 8. *C. tripteris.*
Leaves with sessile blades.

[1] Contributed by Frank Ellis Boynton.

Disk-flowers with yellow corollas.
  Leaf-segments entire, elliptic-lanceolate or lanceolate. 9. *C. major.*
  Leaf-segments 1–2-pinnately parted, very narrowly linear or filiform. 10. *C. verticillata.*
Disk-flowers with purple-brown corollas.
  Divisions of the leaf-blades comparatively few, 2–4 mm. broad: internodes longer than the leaves. 11. *C. delphinifolia.*
  Divisions of the leaf-blades very numerous, appearing in dense fascicles, 1–2 mm. broad: internodes mostly shorter than the leaves. 12. *C. pulchra.*

III. Latifoliae

Plant with ovate or ovate-lanceolate leaf-blades. 13. *C. latifolia.*

IV. Tinctoriae

Ligules of the ray yellow with crimson-brown base: flowers of the disk with dark-red corollas.
  Outer involucral bracts much shorter than the inner: achene linear-elliptic, thin, flat. 14. *C. tinctoria.*
  Outer involucral bracts mostly about as long as the inner: achene obovate, thick, convex. 15. *C. Drummondii.*
Ligules of the ray pink: flowers of the disk with yellow corollas. 16. *C. rosea.*

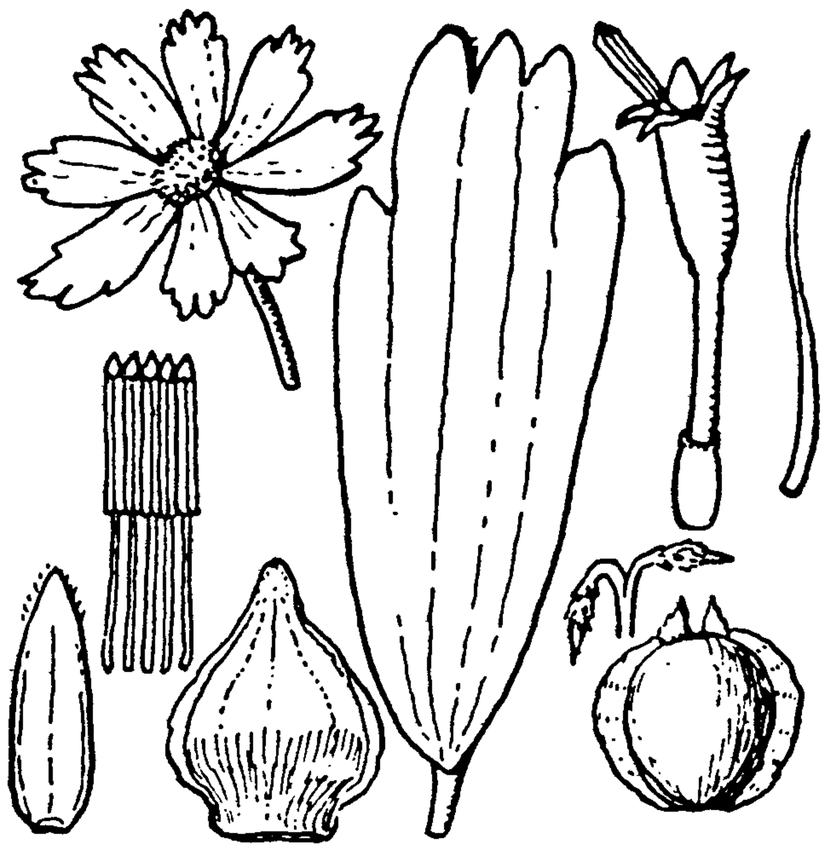
V. Angustifoliae

Achenes with entire scarious margins.
  Pappus of minute teeth or wanting.
    Ligules of the ray discolored. 17. *C. cardaminefolia.*
    Ligules of the ray uniformly yellow. 18. *C. stenophylla.*
  Pappus of conspicuous awns.
    Leaf-blades, or some of them, lobed: internodes mostly shorter than the leaves. 19. *C. Leavenworthii.*
    Leaf-blades simple and entire: internodes mostly much longer than the leaves. 20. *C. Lewtonii.*
Achenes with fimbriate or dissected winged margins.
  Blades of the larger leaves of an elliptic, lanceolate, or narrower type.
    Lower leaves little longer than the internodes. 21. *C. angustifolia.*
    Lower leaves much longer than the internodes.
      Blades of the basal leaves linear, lanceolate, or linear-elliptic, mostly pointed.
        Leaf-blades simple and entire: achene obovate or spatulate, about 4 mm. long, the wing about one-third as wide as the body. 22. *C. longifolia.*
        Leaf-blades often lobed: achenes elliptic, about 5 mm. long, the wing as wide as the body. 23. *C. falcata.*
      Blades of the basal leaves elliptic or oblanceolate, obtuse. 24. *C. gladiata.*
  Blades of the larger leaves of an ovate or ovate-lanceolate type.
    Leaves opposite; petioles and blades (when young) ciliate-margined. 25. *C. integrifolia.*
    Leaves alternate; margins naked. 26. *C. helianthoides.*

VI. Nudatae

Plant with long-tapering leaves and pink-purple ligules. 27. *C. nudata.*

1. C. lanceolata L. Plant 2–6 dm. tall: blades of the lower leaves spatulate to linear-oblanceolate, and rarely with 1 or 2 lateral lobes (in *C. lanceolata glabella* the leaves with narrow blades or crowded at the base of the stem): outer involucral bracts lanceolate: achene orbicular, 2.5–3 mm. long.—Dry soil, pinelands, barrens, woods, and stony fields, various provinces, Fla. to La. and Ont.—Spr.–sum.



2. C. crassifolia Ait. Plant 2–4 dm. tall: blades of the lower leaves obovate-spatulate to elliptic, entire, usually pubescent at least beneath: outer involucral bracts lance-ovate: achene elliptic-orbicular, 2.5–3 mm. long.—Dry soil, woods, and old fields, Coastal Plain and adj. provinces, Ga. to La., Ill., and N. C.—Spr.–sum.

3. C. nuecensis Heller. Plant up to 1 m. tall, usually glabrous: blades of the lower leaves ovate to elliptic in outline, usually pinnately lobed, the lobes elliptic: outer involucral bracts lanceolate: ligules cuneate, with several dark markings near the base of each, together appearing as a corona: achene suborbicular, about 5 mm. long, the body with a reniform callosity at either end within, the wings nearly as broad as the body.—Moist soil, Coastal Plain, S Tex., also escaped from cultivation eastward.

4. C. pubescens Ell. Plant 6–12 dm. tall, pubescent: leaf-blades ovate to elliptic-lancolate, the lobes small when present: outer involucral bracts linear-lanceolate: achene orbicular, about 3 mm. long.—Dry woodlands, thickets, and old fields, various provinces, Fla. to Miss., Ill., and Va.—Sum.–fall.

5. C. grandiflora Hogg. Plant 3–6 dm. tall, glabrous except the leaf-bases: blades of the lower leaves spatulate or lanceolate, sometimes lobed: outer bracts of the involucre lanceolate, 6–9 mm. long: achene orbicular, 2.5 mm. long.—Dry soil, woods and fields, various provinces, rarely Coastal Plain, Ga. to Tex., N. Mex., and Md.—Spr.–sum.

6. C. saxicola Alexander. Plant up to 1 m. tall, glabrous throughout: leaf-blades pinnately dissected into linear-elliptic segments: outer bracts of the involucre ovate-lanceolate to lanceolate 7–10 mm. long: achene suborbicular, 2–3 mm. long, with stalked glands on the inner face, the wings more or less fimbriately dissected.—Dry soil, on and about Stone Mtn. in the Piedmont of Ga., also Tallapoosa Co., in the Piedmont of Ala.—Sum.

7. C. auriculata L. Plant 2–5 dm. tall, more or less pubescent: leaf-blades round-oval to elliptic-ovate, sometimes with 1 or 2 small basal lobes: outer involucral bracts linear-elliptic, 7–9 mm. long: achene oval, 2–2.5 mm. long.—Dry soil, woods, thickets, and waste-places, various provinces, Fla. to Miss., Tenn., W. Va., and Va.—Spr.–sum.

8. C. tripteris L. Plant 8–30 dm. tall, glabrous or nearly so: leaf-blades deeply 3–5-divided, the divisions elliptic-lanceolate or lanceolate, or those of the upper leaves entire: outer involucral bracts linear, 2–3 mm. long: ligules elliptic, yellow: achene elliptic, 5–6 mm. long.—Woods, river-shores, and old fields, various provinces, Fla. to La., Tenn., and Pa.—Sum.–fall.

9. C. major Walt. Plant 5–9 dm. tall, pubescent (or glabrous in *C. major Oemleri*); leaf-blades with elliptic-lanceolate or lanceolate lobes (or lobes very long and narrow in *C. major rigida*): outer involucral bracts linear-elliptic, 5–6 mm. long: achene elliptic, 5–6 mm. long. [*C. senifolia* Michx.]—Dry woods, various provinces, Fla. to Miss., Tenn., W. Va., and Va.—Sum.–fall.

10. C. verticillata L. Plant 5–9 dm. tall, glabrous: leaf-blades with the divisions once or twice pinnately parted into linear-filiform lobes: outer involucral bracts linear, 5–6 mm. long: achene elliptic-obovate, 4–5 mm. long.—Dry acid soil, rocky places, woods, and pinelands, various provinces, rarely Coastal Plain, Ala. to Kans., Nebr., Ont., N. J., and N. C.—Sum.–fall.

11. C. delphinifolia Lam. Plant 8–15 dm. tall, glabrous: leaf-blades with the middle division parted into 3–5 linear lobes: outer involucral bracts linear, 5–6 mm. long: achene elliptic, 5–6 mm. long.—Dry woods, pinelands, and low grounds, various provinces, Ga. to Ala. and Va.—Sum.

12. C. pulchra F. E. Boynton. Plant 4–7 dm. tall, glabrous: leaf-blades with the primary divisions parted into linear lobes: outer involucral bracts linear,

5–6 mm. long: achene narrowly winged, elliptic-obovate, about 4 mm. long.—Rocky woodlands, N Ala.—Sum.

13. C. latifolia Michx. Plant 9–15 dm. tall, pubescent or glabrate: leaf-blades ovate to ovate-lanceolate, coarsely toothed: outer involucral bracts narrowly linear, about 5 mm. long: achene wingless, narrowly elliptic, about 7 mm. long.—Wooded slopes, Blue Ridge, N. C. and Tenn.—Sum.

14. C. tinctoria L. Plant 6–12 dm. tall, glabrous: blades of the lower leaves twice pinnately parted, the lobes linear-lanceolate or linear: outer involucral bracts triangular-lanceolate, about 2 mm. long: achene linear-elliptic about 2 mm. long.—Moist soil, prairies, and fields, various provinces, La. to Ariz., Sask., and Minn.; also cult. and naturalized eastward.—Sum.–fall.

15. C. Drummondii (D. Don) T. & G. Plant 2–4 dm. tall, pubescent or nearly glabrous: blades of the lower leaves ovate, oval, or lanceolate, frequently entire, or like the upper ones with elliptic or linear-lanceolate lobes (or with very narrow lobes in *C. Drummondii Wrightii*): outer involucral bracts linear-lanceolate, 5–9 mm. long: achene obovate, about 2 mm. long.—Dry soil, and sandy prairies, Tex., also escaped from cultivation eastward.—Sum.

16. C. rosea Nutt. Plant 2–5 dm. tall, glabrous: leaf-blades linear and entire, or with 2 or 3 linear lobes: outer bracts of the involucre lanceolate, 2–3 mm. long: achene wingless, narrowly elliptic, about 2 mm. long.—Moist, or wet, acid soil, Coastal Plain, and occasionally other provinces, Ga. to Mass. and E Tenn.—Sum.

17. C. cardaminefolia (DC.) T. & G. Plant 2–5 dm. tall, glabrous: blades of the lower leaves once or twice pinnately divided into elliptic or linear-lanceolate lobes; blades of the upper leaves few-lobed or entire and linear: outer involucral bracts lanceolate, 3–4 mm. long: achene elliptic, 2.5–3 mm. long.—Low grounds, various provinces, Miss. to Tex., Ariz., and Kans.—Sum.

18. C. stenophylla F. E. Boynton. Plant 4–8 dm. tall, glabrous: blades of the lower leaves entire and sometimes 2 mm. wide, or with 1 or 2 narrow lobes, those of the upper leaves narrowly linear to filiform, and sometimes with filiform lobes: outer involucral bracts lanceolate, 1–2 mm. long: achene elliptic, 1.5–2 mm. long, the wing ⅓ as wide as the body.—Pinelands, La.—Sum.–fall.

19. C. Leavenworthii T. & G. Plant 5–15 dm. tall, glabrous: blades of the lower leaves mostly with 2 or more narrow lobes, usually very narrow, (or broad in *C. Leavenworthii Garberi*), those of the upper leaves mostly entire and narrow: outer involucral bracts subulate-lanceolate, 1–2 mm. long: achene roundish oval, 2.5–3 mm. long, the wing as broad as the body.—Pinelands and moist prairies, pen Fla. and the Keys.—All year.—A hot infusion of this plant is used externally by the Seminoles in cases of heat prostration.

20. C. Lewtonii Small. Plant 3–5 dm. tall: blades of the lower leaves linear or narrowly cuneate, entire: outer involucral bracts suborbicular, about 2 mm. long: achene not seen.—Low grounds, pen. Fla.—Sum.

21. C. angustifolia Ait. Plant 5–7 dm. tall: blades of the lower leaves spatulate or oblanceolate, entire: outer involucral bracts ovate, 2–3 mm. long: achene oval, 2.5–3 mm. long.—Low pinelands and swampy places, Coastal Plain, Fla. to Tex. and N. C.—Sum.–fall.

22. C. longifolia Small. Plant 7–10 dm. tall: blades of the lower leaves linear-elliptic, linear-lanceolate, or linear, entire: outer involucral bracts lanceolate, 2–4 mm. long: achene obovate or spatulate in outline, about 4 mm. long.—Low woods and thickets, Coastal Plain, Fla. and Ga.—Fall.

23. C. falcata F. E. Boynton. Plant 8–12 dm. tall: blades of the lower leaves scythe-shaped, entire or with 1 or 2 narrow lobes: outer involucral bracts lanceolate, 5–7 mm. long: achene elliptic, about 5 mm. long.—Swamps and pineland ponds, Coastal Plain, N. C.—Early sum.

24. C. gladiata Walt. Plant 6–12 dm. tall: blades of the lower leaves elliptic or oblanceolate, entire: outer involucral bracts broadly triangular, 3–4 mm. long: achene elliptic, about 3.5 mm. long.—Swamps and low pinelands, Coastal Plain, Fla. to Miss. and N. C.—Fall.

25. C. integrifolia Poir. Plant 6–9 dm. tall: blades of the lower leaves ovate, entire: outer involucral bracts elliptic, 4–6 mm. long: achene not seen.—Moist soil, Coastal Plain, Fla. and Ga.—Fall.

26. C. helianthoides Beadle. Plant 5–12 dm. tall: blades of the lower leaves ovate to ovate-lanceolate, entire: outer involucral bracts lanceolate, 5–9 mm. long: achene spatulate, about 3 mm. long.—Low grounds, bogs, and woods, Coastal Plain, N Fla. and Ga.—Fall.

27. C. nudata Nutt. Plant 6–12 dm. tall: leaves terete: outer involucral bracts lanceolate, 4–6 mm. long: rays pink-purple: achene elliptic, about 3 mm. long.—Wet pinelands and cypress ponds, Coastal Plain, Fla. and Ga.—Spr.–sum.

87. BIDENS L.[1] Annual or biennial, or rarely perennial, herbs. Leaves opposite or the upper ones sometimes alternate: blades entire, toothed, or divided. Heads erect or nodding. Involucre double, the outer bracts foliaceous, the inner appressed. Ray-flowers few and with white or yellow ligules, or wanting. Disk-corollas with a short tube and a longer throat: lobes mostly deltoid. Achene flat, terete, or 4-angled. Pappus of 2–4 rigid barbed awns or these much reduced and tooth-like.—About 75 species, of wide geographic distribution.—BUR-MARIGOLDS. BEGGAR-TICKS.

Achene spindle-shaped, gradually tapering above: ligules of the ray white or yellowish white. — I. LEUCANTHAE.
Achene flattened, broadest above the middle: ligules of the ray, when present, yellow.
  Ray-flowers inconspicuous and caducous or wanting. — II. VULGATAE.
  Ray-flowers showy or conspicuous.
    Leaf-blades undivided: pappus-awns 2–4, retrorsely barbed. — III. CERNUAE.
    Leaf-blades pinnately divided or individually simple: pappus-awns 2 or none. — IV. AUREAE.

I. LEUCANTHAE

Leaves 1–3-pinnately dissected, the divisions incised or lobed: ray-flowers with inconspicuous, mostly entire ligules. — 1. *B. bipinnata.*
Leaves 1-pinnate or undivided, the segments evenly crenate-serrate: ray-flowers with showy and lobed ligules. — 2. *B. pilosa.*

II. VULGATAE

Leaves usually undivided: pappus awns 3 or 4.
  Disk-corollas pale, 4-lobed: achene-margins strongly, retrorsely barbed throughout; involucre long. — 3. *B. comosa.*

[1] Contributed by Karl McKay Wiegand.

Disk-corollas orange, 5-lobed: barbs of the achene-margins few, directed both ways: involucre short. 4. *B. connata.*
Leaves 3–5-divided: pappus-awns 2.
Awns long, usually retrorsely barbed: achene-body 5–11 mm. long.
Outer involucral bracts 10–16, ciliate, the inner constricted at the tip: disk-corollas pale. 5. *B. vulgata.*
Outer bracts 6–8, nearly glabrous, the inner not constricted: disk-corollas orange. 6. *B. frondosa.*
Awns short, erect-barbed: achene-body 4–5.5 mm. long: leaf-blades long-acuminate. 7. *B. discoidea.*

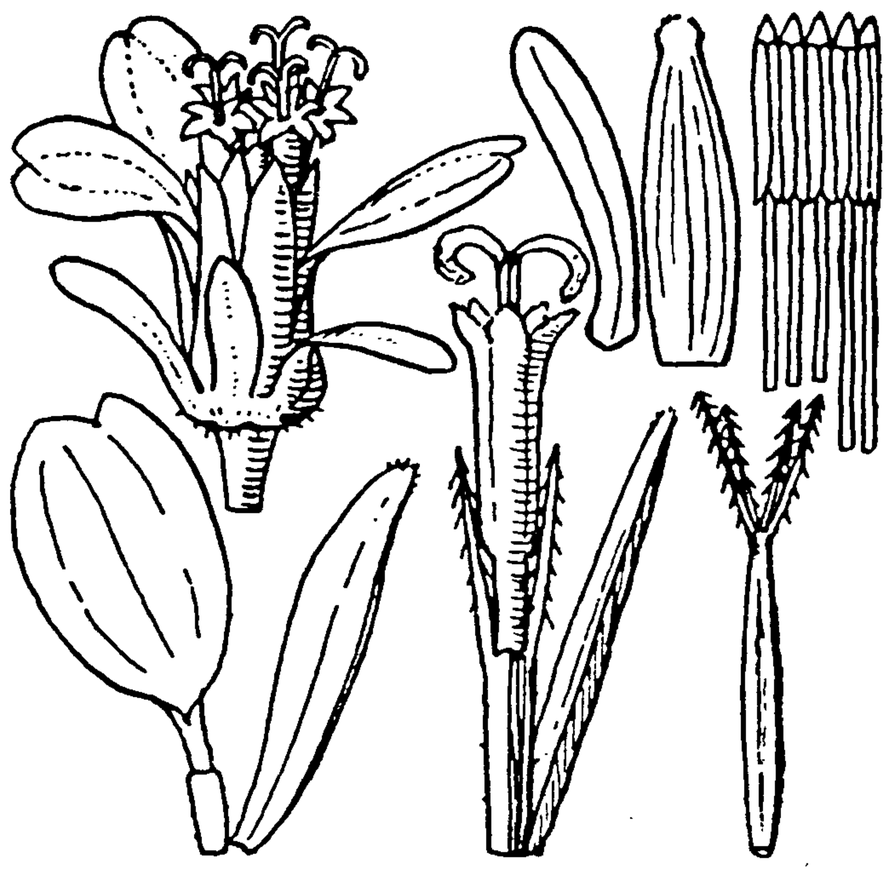
III. CERNUAE

Outer involucral bracts exceeding the disk, foliaceous: ray-flowers with ligules twice the length of disk or less: achene dilated at the summit. 8. *B. cernua.*
Outer bracts rarely exceeding the disk: ray-flowers with ligules 2–4 times the length of disk: achene not dilated above.
Blades of the upper cauline leaves elliptic-lanceolate to lanceolate, acuminate, mostly sharply serrate. 9. *B. laevis.*
Blades of the upper cauline leaves spatulate, obovate, oval or elliptic, obtuse, abruptly pointed or acutish, nearly entire, shallowly serrate, or crenate-serrate. 10. *B. Nashii.*

IV. AUREAE

Achene 6–8 mm. long, ciliate,
In fruit obovate.
Involucre nearly glabrous: pappus-awns slender or wanting. 11. *B. aristosa.*
Involucre hispid: achene bidentulate. 12. *B. involucrata.*
In fruit narrowly cuneate, 2–2.5 mm. wide, short-awned. 13. *B. coronata.*
Achene 2–4 mm. long, not ciliate, the awns very short. 14. *B. mitis.*

1. B. bipinnata L. Stem 3–17 dm. tall, glabrous or nearly so, 4-angled, branched and rather slender: primary leaf-segments thin, deltoid, the ultimate one lanceolate, incised or lobed: outer involucral bracts 7–10, linear, shorter than the acute inner ones: rays few, the ovaries awnless and glabrous, the ligules yellowish-white, about equaling the disk, nearly entire: disk-corolla 5-lobed: stamens included: achenes spindle-shaped, much longer than the involucre, the outer slightly shorter; awns 3–4, yellow, retrorsely barbed.—(SPANISH-NEEDLES.)—Rich soil, and a weed in waste-places, various provinces, Fla. to Ariz., Nebr., and R. I.—(*W. I.*, *Mex.*, *C. A.*, *S. A.*)—Sum.–fall.



2. B. pilosa L. Stem 4–12 dm. tall, branched, 4–10 dm. high, nearly or quite glabrous: leaf-segments ovate or ovate-lanceolate, 2–8 cm. long, evenly crenate-serrate: outer bracts of the involucre about 8, linear-elliptic, usually shorter than the inner: rays white, the ligules 1–2 cm. long, broadly cuneate, 2–3-lobed, the ovaries awnless, few-barbed toward summit: disk-corollas 5-toothed: stamens barely exserted: achene spindle-shaped, very unequal, the inner much longer than the involucre; awns 2–4, short, yellow, retrorsely barbed. [*B. leucantha* L.]—(SHEPHERD'S-NEEDLE.)—Sandy soil, cult. grounds, roadsides, and waste-places, Coastal Plain, Fla. and sporadically in S Ga. and Ala.—(*W. I.*, *Mex.*, *C. A.*, *O. W.*)—All year.

3. B. comosa (A. Gray) Wiegand. Stem 3–8 dm. tall, pale throughout, stout, glabrous, the branches short, stout: leaves undivided, 8 cm. long: blades elliptic-lanceolate, regularly serrate, acute, each attenuate into a margined petiole, or the upper sessile: heads large: peduncles short and stout: outer

bracts of the involucre 6–8, often 2–5 times the length of the disk, erect: rays wanting: disk-corollas funnelform, pale-yellow, 4-lobed: stamens included: achene large, flat, 8–10 mm. long, 3 mm. wide, brown or olive, nearly smooth and glabrous, margined to the base, the 3 long awns retrorsely barbed.—Damp soil, rich banks, and sandy shores, various provinces, Ga. to La., Minn., and Me.—Fall.

4. B. connata Muhl. Stem 3–14 dm. tall, sparingly branched, glabrous, bright-green: leaf-blades undivided or some of the lower deeply parted, lanceolate to elliptic, acuminate, tapering to the petiole, coarsely and saliently serrate: heads medium; outer bracts of the involucre 4–5, linear-spatulate, rarely exceeding the disk, glabrous: rays rarely present, the ligules one-half longer than the disk, the ovaries awnless, and hairy: disk-corollas campanulate above, 5-lobed, orange: achene 4–6 mm. long, rather narrow and thick, nearly black, covered with yellowish warts; some or all marginal barbs erect; awns 4, slender, with retrorse, nearly erect barbs.—(SWAMP BEGGAR-TICKS.)—Swamps and ditches, various provinces, N. C. to Mo., Minn., and N. H.—Fall.

5. B. vulgata Greene. Stem 7–15 dm. tall, much branched, nearly glabrous: leaf-blades commonly 5-divided, the segments lanceolate, straight-veined, acute, serrate with numerous regular sharp or bluntish teeth: heads large, 15–25 mm. wide: outer bracts of the involucre 10–16, unequal, usually longer than the disk, ciliate, the inner with abruptly narrowed tips: rays pale-yellow, the ligules equaling the disk, the ovaries awnless and nearly glabrous: disk-corollas funnelform, pale, 4–5-lobed: stamens included: achene large; body 6–11, 7.5–9 mm. long, 3.5–5 mm. wide, very flat, brown or olive, nearly smooth, the 2 long awns and the upper part of the achene-margins retrorsely barbed.—(STICK-TIGHT.)—Damp soil, waste-places, and roadsides, various provinces, rarely Coastal Plain, N. C. to Mo., Calif., B. C., and Ont.—Fall.

6. B. frondosa L. Stem 5–12 dm. tall, slender, bushy-branched, nearly glabrous: leaf-blades pinnately 3-divided or rarely 5-divided, the segments lanceolate, serrate with sharp spreading teeth, acuminate: heads not large: outer bracts of the involucre 6–8, subequal, spatulate, sparsely ciliate, usually exceeding the disk: rays usually present, golden-yellow, the ligules equaling the disk, the ovaries hairy and with 2 short retrorsely barbed awns: disk-corollas orange, 5-lobed: stamens exserted: achene black; body 5–9 mm. long, 2–4.5 mm. wide, cuneate, flattish, sparsely hairy and often tuberculate, the barbs on the margins erect, those on the 2 awns reflexed or rarely erect.—Damp soil, often a weed, various provinces, Fla. to Tex., Nebr., and N. B.—Sum.–fall.

7. B. discoidea (T. & G.) Britton. Stem 3–15 dm. tall, slender, diffusely branched, nearly or quite glabrous: leaf-blades 3-divided, the segments lanceolate or ovate-lanceolate, 4–9 cm. long, sharply and coarsely serrate below the entire long-acuminate tip: heads very small and numerous, 8–10 mm. broad: outer bracts of the involucre mostly 4, spatulate-linear, rarely exceeding the disk, glabrous: rays none: disk-corollas orange, 5-lobed: achene small body 4–5.5 mm. long, black, cuneate, thickish, tuberculate or nearly smooth, hairy, the margins and the 2 short awns erect-barbed.—Swamps, wet banks, and low woods, various provinces, Ala. to Tex., Mich., Mass., and N. C.—Late sum.–fall.

8. B. cernua L. Stem 2–7 dm. tall, low, pale-green, nearly glabrous; the branches very short, decreasing down the stem: leaf-blades undivided, 6–16 cm. long, lanceolate or linear-lanceolate, more or less connate by the broad bases, acuminate, serrate with coarse distant teeth: heads very large, broader than high, nodding in fruit: outer bracts of the involucre 7–8, unequal, exceeding the disk and spreading: rays usually present, bright-yellow, the ligules

about one-half longer than the disk, the ovaries glabrous except the margin, and awnless: disk-corollas orange, 5-lobed: achene narrowly cuneate, slightly dilated at the summit, 4-angled, the margins retrorsely barbed and tuberculate, the awns 4, slender, retrorsely barbed.—(STICK-TIGHT.)—Swamps and wet meadows, various provinces, rarely Coastal Plain, N. C. to Mo., Ore., and N. S.—(*O. W.*)—Sum.–fall.

9. **B. laevis** (L.) B. S. P. Stem 5–14 dm. tall, glabrous, 5–10 mm. high, the branches all toward the summit of the stem, slender, ascending: leaf-blades undivided, 7–13 cm. long; blades elliptic-lanceolate, serrate with small inconspicuous teeth, acute, contracted toward the sessile base: heads medium, nearly globular, erect or nodding in fruit: outer bracts of the involucre 7–8, rarely longer than the disk: rays very large, the ligules 2–3 cm. long, golden-yellow, the ovaries as in the next preceding species: disk-corollas orange, 5-lobed: achene cuneate, neither dilated nor contracted at the top, not tuberculate, the margins and 2–4 awns retrorsely barbed. [*B. chrysanthemoides* Michx.]—(WILD-GOLDENGLOW.)—Swamps and low woods, Coastal Plain and adj. provinces, Ga. to Ala., Tenn., N. Y., and Pa.—Sum.–fall.

10. **B. Nashii** Small. Similar to the next preceding species but slightly succulent, less branched: leaves ascending; blades broader and thicker, elliptic-lanceolate or oblanceolate, with very broad but scarcely connate bases, finely serrate or entire: achene slightly contracted at the summit.—Swamps, Coastal Plain, Fla. to Tex.—Sum.–fall. The plants of this and of the next preceding species are slightly fleshy.

11. **B. aristosa** (Michx.) Britton. Stem 3–10 dm. high, much-branched: leaf-blades pinnately 5–7-divided, the segments lanceolate, acuminate, serrate, incised or pinnatifid, slightly pubescent beneath: heads numerous, 2–5 cm. broad: outer bracts of the involucre 8–10, linear-spatulate, rarely ciliate, not surpassing the inner: rays 6–10, the ligules golden-yellow, the ovaries ciliate and awnless: achene obovate, flat, strigose and hispid-ciliate; awns 2, slender, as long as the achene-body or shorter, the barbs erect or reflexed (or the pappus-awns wanting in *B. aristosa mutica*).—Swamps, various provinces, rarely Coastal Plain, Tex. to Kans., Minn., and Ohio, and adv. eastward.—Sum.–fall.

12. **B. involucrata** (Nutt.) Britton. Stem 3–10 dm. high, much-branched, minutely pubescent: leaf-blades pinnately divided, the segments narrow, linear-lanceolate, incised or pinnatifid, long-acuminate: heads 3–5 cm. broad: outer bracts of the involucre 12–20, linear, acutish, hispid on back and margins, mostly surpassing the inner: rays several, the ligules golden-yellow, the ovaries awnless, ciliate throughout: disk-corollas 5-lobed: stamens exserted: achene very flat, obovate, slightly contracted at the top, strigose-ciliate, bidentulate.—Swamps, various provinces, Tex. to Kans. and Ill., and adv. eastward.—Sum.–fall.

13. **B. coronata** (L.) Britton. Stem 9–20 dm. tall, glabrous, much-branched: leaf-blades pinnately divided, with 4–8 narrowly lanceolate, serrate or incised, acute or acuminate segments: heads 4–6 cm. broad: outer bracts of the involucre linear-spatulate, rarely ciliate, equaling the disk: rays several, the ligules bright-yellow, 12–25 mm. long, the ovaries bidentulate at the summit: disk-corollas deep yellow, 5-lobed: stamens exserted: achene narrowly cuneate, slightly strigose-ciliate above; awns 2, about equaling the breadth of the achene, erect-barbed. [*B. trichosperma* (Michx.) Britton.]—Swamps, various provinces, Fla. to Miss., Ill., and Mass.—Sum.–fall.

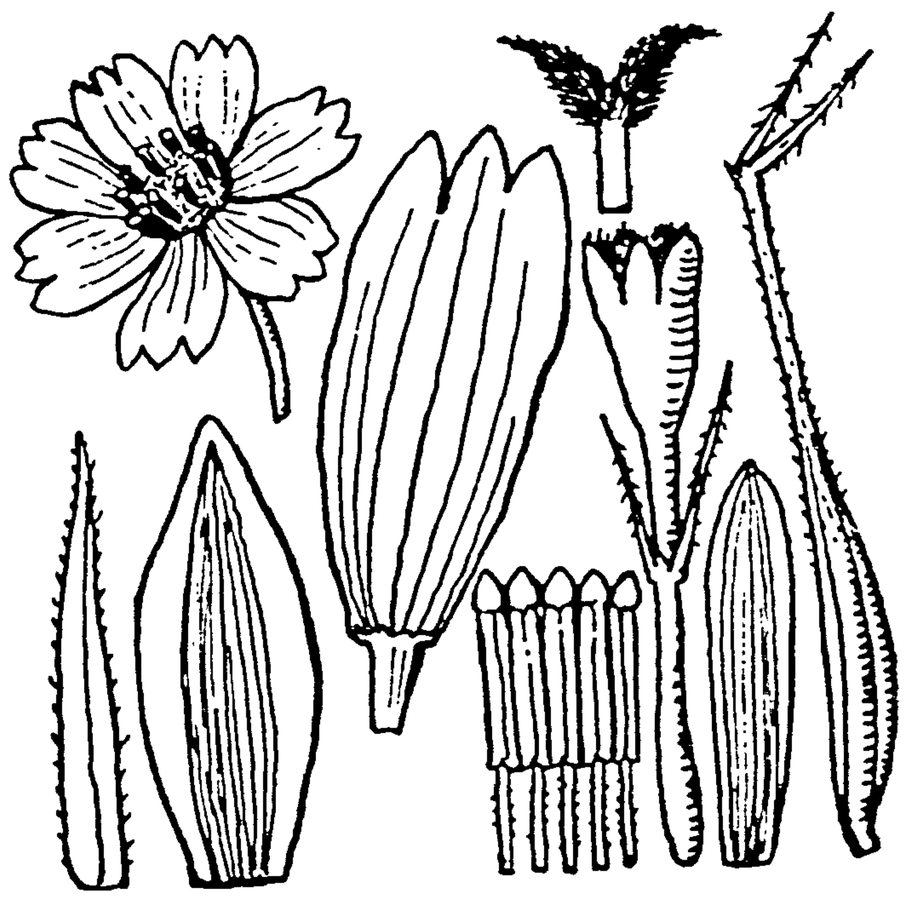
14. **B. mitis** (Michx.) Sherff. Stem 3–10 dm. tall, glabrous or nearly so, branched: leaf-blades 7–12 cm. long, 3–5-divided or rarely mostly simple, the

segments lanceolate, acuminate, serrate (narrowly linear and almost or quite entire, and achenes awnless, in *B. mitis leptophylla*), the lateral much smaller: heads 2–5 cm. broad: outer bracts of the involucre linear-spatulate, equaling the disk, glabrous, the inner usually black-punctate: rays-several, the ligules 1–3 cm. long, golden-yellow, the ovaries glabrous and awnless: disk-corollas 5-lobed: stamens exserted: achene very small, 2–4 mm. long, glabrous; awns very short, tooth-like. [*B. coronata* (L.) Britton.]—Wet soil, often in brackish marshes, Coastal Plain, Fla. to Miss. and Va.—Sum.–fall.

88. **COSMOS** Cav.[1] Annual or perennial, usually tall, widely branched herbs. Leaves opposite: blades entire, lobed, or 2–3-pinnately dissected. Heads peduncled, showy. Involucre nearly hemispheric: bracts unequal, the outer sometimes smaller than the inner. Ray-flowers few: corollas with pink, purple, yellow, or orange-yellow ligules. Disk-corollas yellow in our species, with a funnelform throat and a shorter tube. Filaments as long as the anthers or nearly so, sometimes pubescent. Achene beaked. Pappus of 2–4 barbed awns, or a crown.—About 20 species, tropical American.—Spr.–fall or all year S.

Leaf-segments broad, elliptic, lanceolate, or linear.
  Ligules pink or rose, mostly less than 2 cm. long. 1. *C. caudatus.*
  Ligules orange-yellow, mostly over 2 cm. long. 2. *C. sulphureus.*
Leaf-segments filiform or linear-filiform. 3. *C. bipinnatus.*

1. **C. caudatus** H. B. K. Stem 7–14 dm. tall: leaf-blades 2-pinnately parted, the segments lanceolate or linear: involucral bracts linear or nearly so: ray-flowers 7–12; ligules pink or rose-colored, 1–2 cm. long: achene fusiform, about 2 cm. long, the beak nearly or quite as long as the body.—Waste-places and cult. grounds, Key West, Fla. Nat. of trop. Am. and cult.



2. **C. sulphureus** Cav. Stem 2–21 dm. tall, often pubescent, much-branched: leaf-blades 2-pinnately parted, the segments elliptic or lanceolate: involucral bracts linear: ray-flowers 8–10; ligules orange-yellow, 2–3 cm. long: achene fusiform, 2–2.5 cm. long, the beak as long as the body or nearly so.—Pinelands, edges of hammocks, and waste-places, pen. Fla. Nat. of trop. Am. and cult.

3. **C. bipinnatus** Cav. Stem 3–30 dm. tall, usually glabrous or nearly so: leaf-blades 2-pinnately divided, the segments remote and filiform or linear-filiform: involucral bracts of two kinds, the outer ovate-acuminate, the inner elliptic: ray-flowers 8–10; ligules pink crimson or white, 2–4 cm. long: achene fusiform, 1–1.5 cm. long, the beak shorter than the body.—Pinelands, waste-places, and cult. grounds, Fla. Nat. of trop. Am. and cult.

89. **ENDORIMA** Raf. Perennial or biennial, usually simple-stemmed herbs. Leaves alternate, few: blades narrow, entire. Involucre thick: bracts herbaceous, the outer ones broad, the inner ones longer and narrower. Ray-flowers numerous: corollas with narrow yellow or purple ligules. Disk-corollas

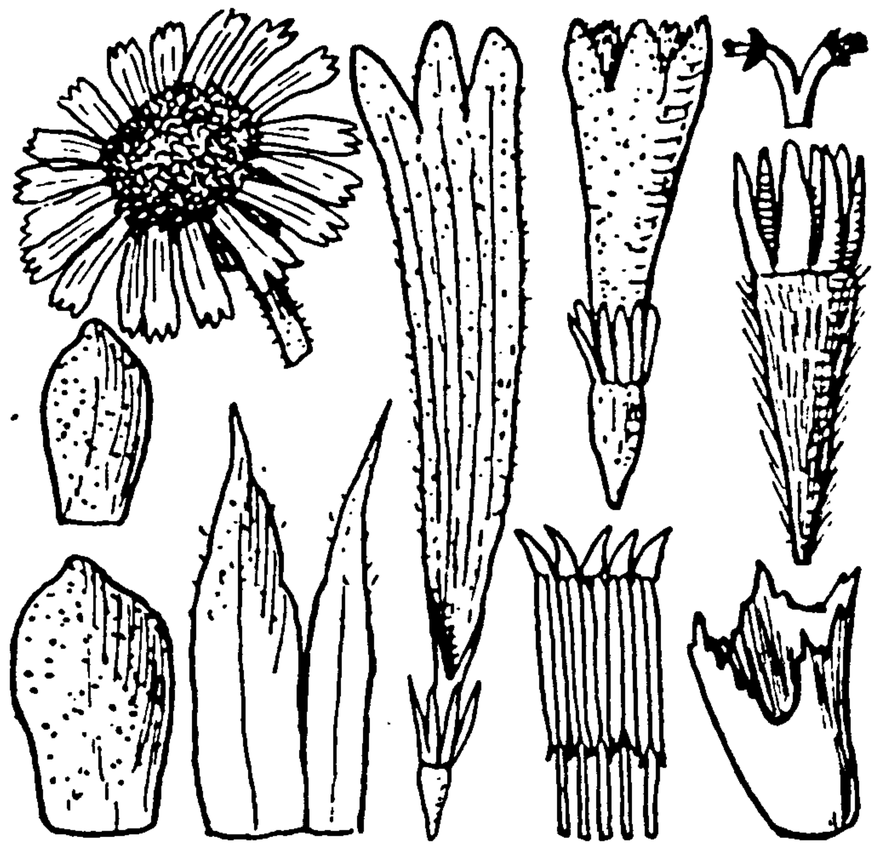
[1] Revised by Edward Johnston Alexander.

with a narrowly funnelform throat and a shorter tube. Filaments nearly as long as the anthers. Pappus of 7–9 elliptic or lanceolate scales. Achene pubescent.—Two species; as follows:

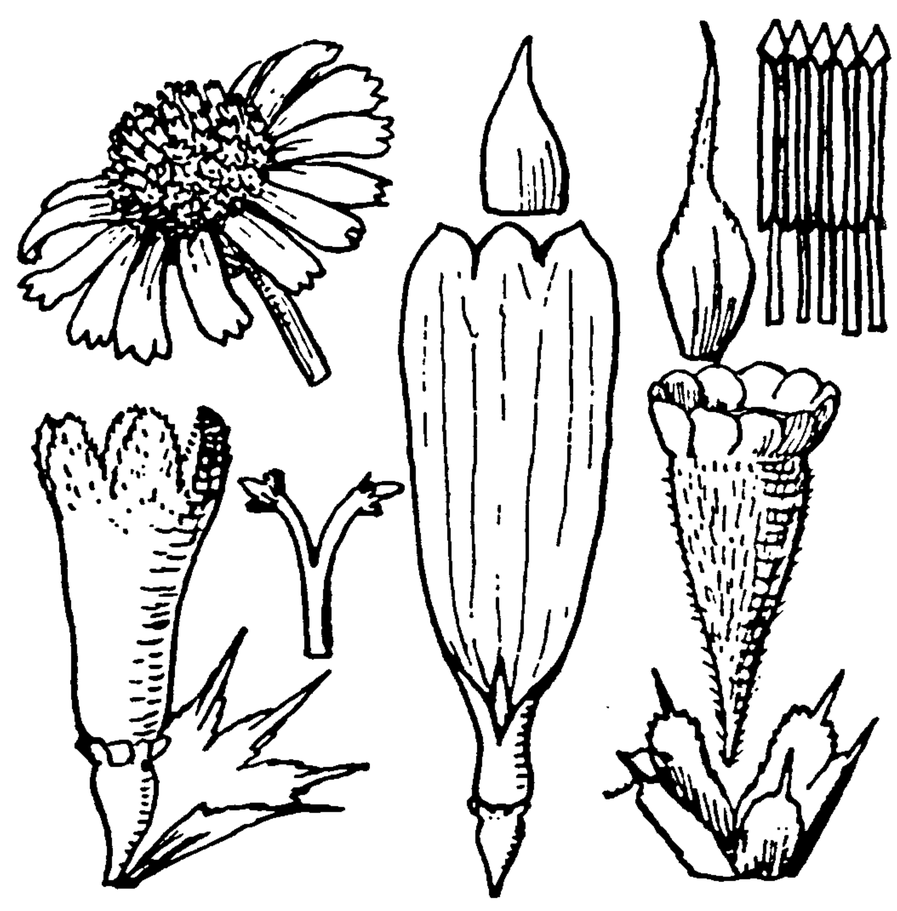
Disk dark-purple: lower cauline leaves 10–12 cm. long. 1. *E. atropurpurea.*
Disk yellow: lower cauline leaves 4–6 cm. long. 2. *E. uniflora.*

1. **E. atropurpurea** (Harper) Small. Plant 6–8 dm. tall: leaf-blades linear-spatulate; narrower bracts of the involucre 8–9 mm. long: ligules linear-cuneate: corollas of the disk mostly less than 6.5 mm. long: filaments much shorter than the anthers. [*Baldwina atropurpurea* Harper] Moist pinelands, Coastal Plain, S. Ga.—Fall.

2. **E. uniflora** (Nutt.) Barnhart. Plant 3–9 dm. tall: leaf-blades spatulate to linear: narrower bracts of the involucre 10–11 mm. long: ligules spatulate: corollas of the disk mostly over 6.5 mm. long: filaments nearly as long as the anthers. [*Balduina uniflora* Nutt.]—Low pinelands, Coastal Plain, Fla. to La. and N. C.—Sum.–fall.—*Endorima* and *Actinospermum* are peculiar in having the bractlets of the receptacle partly concreted into honeycomb-like structure which partly surrounds the achenes.



90. **ACTINOSPERMUM** Ell. Annual or biennial, branching herbs. Leaves alternate, often numerous: blades very narrow, entire. Involucre thick: bracts in several series, in the inner narrower and longer than the outer. Ray-flowers numerous: corollas with rather broad yellow ligules. Disk-corollas with a cylindric-campanulate throat and a very short or obsolete tube: lobes lanceolate. Filaments shorter than the anthers. Pappus of 7–12 obovate-orbicular scales. Achene pubescent.—One species.



1. **A. angustifolium** (Pursh) T. & G. Plant 2–5 dm. tall: leaf-blades narrowly linear or slightly broadened upward: heads showy: involucral bracts acuminate: ray-flowers 8–18; ligules cuneate, bright-yellow, less than 2 cm. long: disk-corollas 4–5 mm. long; lobes lanceolate: achene turbinate, about 2 mm. long.—Sandhills, pinelands, and scrub, Coastal Plain, Fla. to Miss. and Ga.—Spr.–fall or locally all year.

91 **MARSHALLIA** Schreb. Perennial, rigid herbs. Leaves alternate: blades entire. Heads discoid. Involucre campanulate or hemispheric: bracts broad or narrow. Ray-flowers wanting. Disk-corollas white, pink, or purple, with a campanulate or obsolete throat and a long slender tube: lobes linear or nearly so. Filaments somewhat shorter than the anthers. Pappus of 5 or 6 nearly equal scales.—About 10 species, natives of the southeastern United States.—BARBARA'S-BUTTONS.

Bracts of the involucre attenuate or subulate-tipped. I. GRAMINIFOLIAE.
Bracts of the involucre obtuse or merely acute or apiculate. II. OBOVATAE.

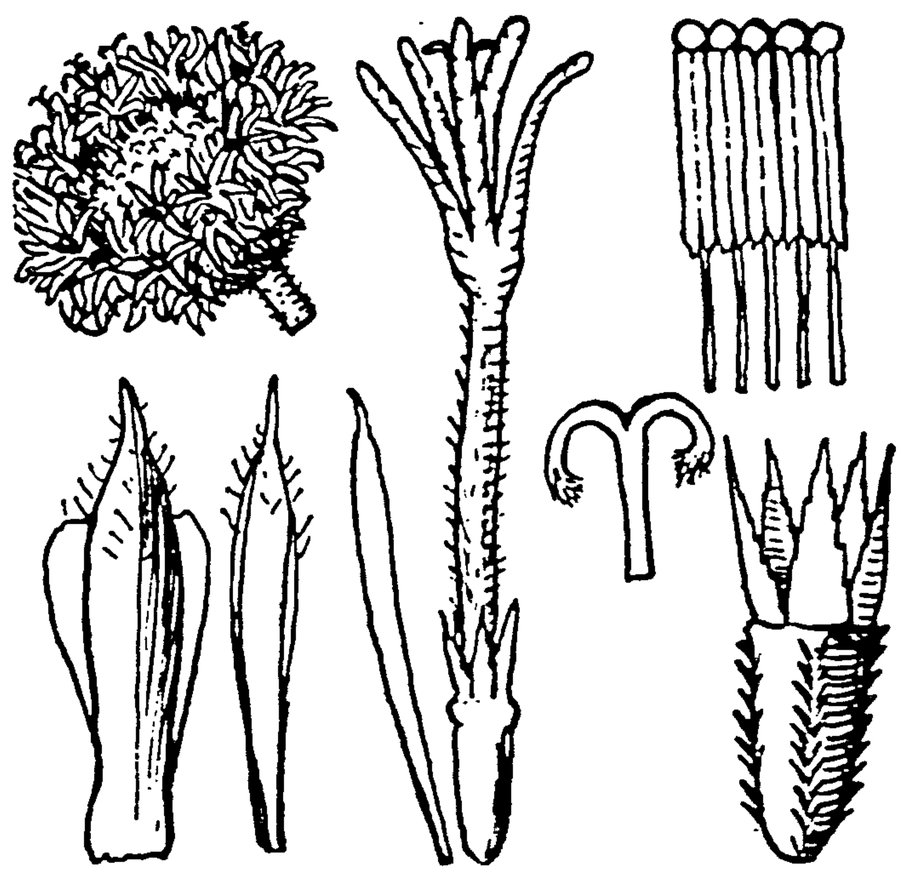
I. GRAMINIFOLIAE

Basal and lower cauline leaves with spatulate, elliptic to elliptic-ovate, obtuse blades. 1. *M. graminifolia.*
Basal and lower cauline leaves with elongate linear-attenuate 3-ribbed blades.
  Heads few-flowered: longer involucral bracts less than 6 mm. long: pappus-scales ovate. 2. *M. laciniarioides.*
  Heads many-flowered: longer involucral bracts over 6 mm. long: pappus-scales lanceolate. 3. *M. Williamsonii.*

II. OBOVATAE

Corolla-throat long (3–3.5 mm.), half as long as the tube or nearly so.
  Outer bracts of the involucre acute: upper cauline leaves broad, markedly acuminate. 4. *M. trinervia.*
  Outer branches of the involucre obtuse or abruptly pointed: upper cauline leaves narrow acute or slightly acuminate. 5. *M. grandiflora.*
Corolla-throat very short (1–1.5 mm.).
  Bractlets of the receptacle spatulate or markedly clavate-spatulate, spine-tipped. 6. *M. obovata.*
  Bractlets of the receptacle linear, or sometimes slightly enlarged near the tip, not spine-tipped.
    Blades of the upper cauline leaves linear, thick: bracts of the involucre obtuse or abruptly acutish. 7. *M. ramosa.*
    Blades of the upper cauline leaves lanceolate or elliptic-lanceolate, thinnish: bracts of the involucre somewhat acuminate. 8. *M. Mohrii.*

1. M. graminifolia (Walt.) Small. Plant 2–11 dm. tall, the stem simple or with few erect branches: basal and lower cauline leaves 3–12 cm. long, with narrowly spatulate or linear-spatulate mostly obtuse blades: upper cauline leaves much smaller, with linear blades: outer bracts of the involucre linear or linear-lanceolate, 4–6 mm. long, with narrow margins, acuminate: corolla-tube 5–6 mm. long: achene 2.5–3 mm. long: pappus-scales ovate, very short. [*M. angustifolia* Pursh *M. angustifolia cyananthera* Ell.] Moist pinelands and prairies, Coastal Plain, Fla. to La. and N. C.—Sum.



2. M. laciniarioides Small. Plant 3–4 dm. tall, the stem usually with few erect branches above: basal and lower cauline leaves 3–17 cm. long, with spatulate to linear, mostly acute or acuminate blades; upper cauline leaves smaller, several or many, with narrowly linear blades: outer bracts of the involucre ovate-lanceolate, 5–6 mm. long, with broad margins, rather abruptly narrowed to a long tip: corolla-tube less than 5 mm. long: achene 1–1.5 mm. long. Sandy soil, Coastal Plain, Ga. to S. C.—Sum.

3. M. Williamsonii Small. Plant similar to that of *M. laciniarioides* but larger, and leaves fewer: blades of the basal and lower cauline leaves 8–21 cm. long, with linear-spatulate to linear acuminate blades: upper cauline leaves few, with narrowly linear blades: outer bracts of the involucre lanceolate, 7–8 mm. long, with rather wide margins, acuminate: corolla-tube 6–7 mm. long: achene 2.5–3 mm. long.—Sandy pine woods, Coastal Plain, S. C. and N. C.—Spr.–fall.

4. M. trinervia (Walt.) Porter. Plant 3–9 dm. tall, the stem typically simple, rarely with one or few erect branches: basal and lower cauline leaves 5–14 cm. long with spatulate or elliptic obtuse or acute 3-veined blades narrowed into long petiole-like bases; upper cauline leaves with elliptic, elliptic-ovate or lanceolate markedly acuminate blades: outer bracts of the involucre ovate-

lanceolate or lanceolate, acute or acuminate, 7–10 mm. long, strongly ribbed: corolla-tube 7–8 mm. long: achene 3–4 mm. long, the pappus scales subulate-tipped, about half as long as the achene.—Pinelands and damp woods, Coastal Plain and adj. provinces, Ala. to Miss., Tenn., and Va.—Spr.–sum.

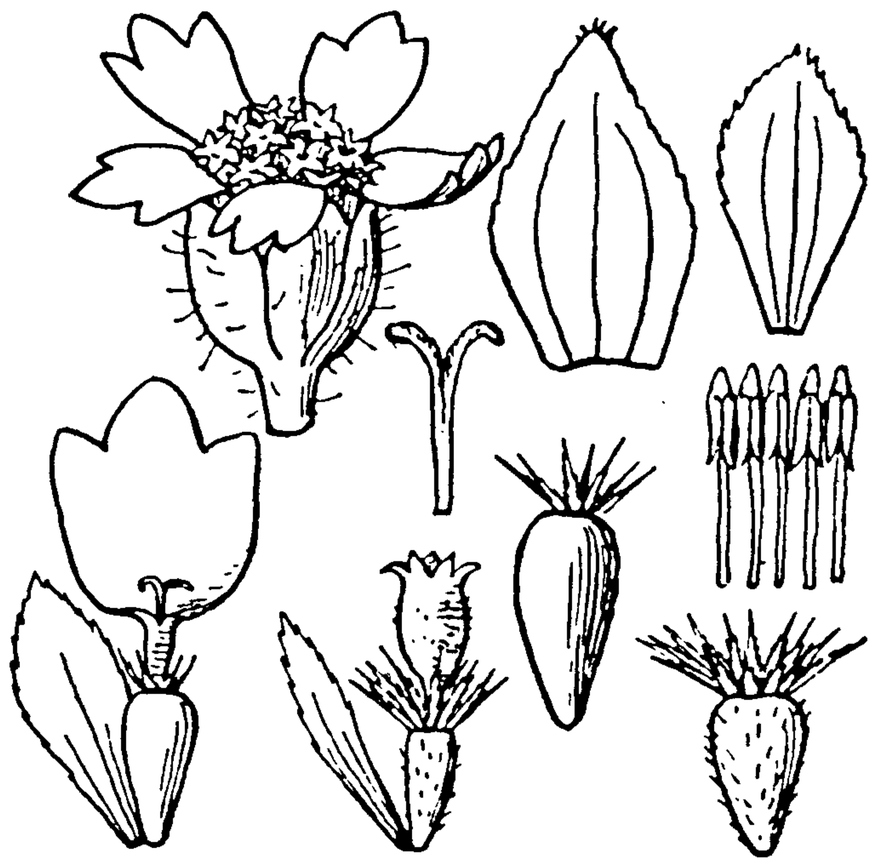
5. **M. grandiflora** Beadle & Boynton. Plant 2–10 dm. tall, thirteen typically simple basal and lower cauline leaves 3–19 cm. long, with elliptic, spatulate, or oval obtuse blades; upper cauline leaves with linear-elliptic to lanceolate-acute or slightly acuminate blades: outer bracts of the involucre linear lanceolate to elliptic, obtuse or abruptly pointed, 8–11 mm. long, narrowly margined: corolla-tube 8–11 mm. long: achene 3.5–4 mm. long, the pappus-scales fully half as long as the achene.—Sandy river-banks and open woods, Blue Ridge and Appalachian Plateau, N. C. to W. Va. and Pa.—Spr.–sum.

6. **M. obovata** (Walt.) Beadle & Boyton. Plant 1–7 dm. tall, the stem typically simple: basal and loweral cauline leaves 2–12 cm. long, with linear, spatulate, elliptic-ovate or obovate mostly obtuse blades; upper cauline leaves rarely present: outer bracts of the involucre elliptic or linear-elliptic, 6–8 mm. long, obtuse or abruptly pointed, very narrowly margined: corolla-tube 7–8 mm. long: achene 3–3.5 mm. long, the pappus-scales less than half as long as the achene. [*M. obovata platyphylla* (M. A. Curtis) Beadle & Boynton]—Pinelands and dry woods, Coastal Plain and adj. provinces, Fla. to Ala. and N. C.—Spr.–sum.

7. **M. ramosa** Beadle & Boynton. Plant 1.5–6 dm. tall, the stem corymbosely branched above: leaves many; blades of the basal and lower cauline 3–21 cm. long, narrowly spatulate to linear, obtuse or acutish, those of the upper cauline linear or narrowly linear-lanceolate: outer bracts of the involucre linear, lanceolate, or narrowly elliptic, 5–7 mm. long, obtuse or acutish, narrowly margined: corolla-tube about 5 mm. long: achene about 4 mm. long, the pappus-scales about half as long as the achene.—Pinelands and moist rocks, Coastal Plain and Piedmont, Ga.—Spr.–sum.

8. **M. Mohrii** Beadle & Boynton. Plant 2–7 dm. tall, the stem sparingly corymbosely branched above: leaves few, blades of the basal and lower cauline spatulate to narrowly elliptic, those of the upper cauline elliptic-lanceolate to lanceolate: outer bracts of the involucre elliptic to lanceolate, 5–9 mm. long, acute, rather obscurely margined: corolla-tube 6–8 mm. long: achene about 4 mm. long, the pappus scales fully half as long as the achene.—Low grounds and pine-woods, Appalachian Plateau, Ga. and Ala.—Spr.–sum.

92. GALINSOGA R. & P. Annual, tender herbs. Leaves opposite: blades toothed. Heads radiate. Involucre campanulate or hemispheric: bracts relatively broad. Ray-flowers 4 or 5: corollas with a pubescent tube and broad white to purple ligule. Disk-corollas with a campanulate throat and a tube of about the same length. Anthers ellipsoid. Achene nearly or quite as long as the corolla. Pappus of the ray of several bristles or wanting, of the disk of lacerate or fimbriate bristles.—About 5 species, of tropical and temperate America.

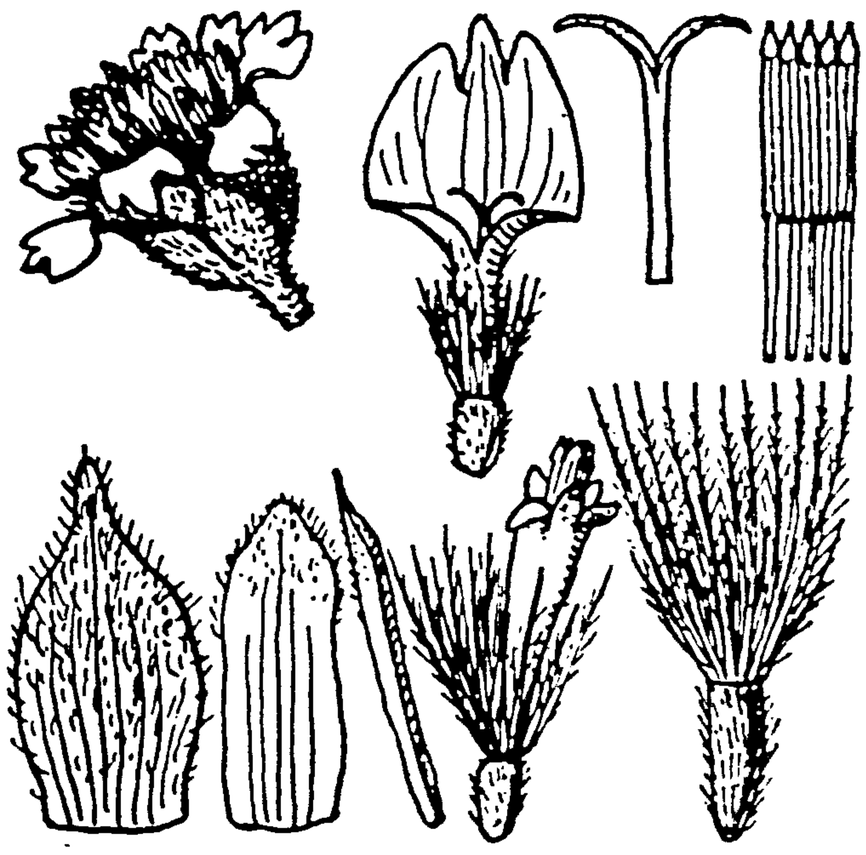


1. **G. ciliata** (Raf.) Blake. Plant 1–7 dm. tall, often branched, the pubescence coarse and spreading, often glandular: leaf-blades

ovate to ovate-lanceolate, 2–5 cm. long, petioled: involucre 2–2.5 mm. high; outer bracts ovate, obtuse: ligules white, 1–1.5 mm. wide: disk-corollas about 1.5 mm. long: achene less than 2 mm. long: pappus scales minutely fimbriate and aristate. [*G. parviflora* (Fl. SE. U. S.)]—Roadsides, cult. grounds, and waste-places, throughout U. S. and S Can. Nat. of S. Am.—(*W. I., Mex., C. A.*)—Sum.–fall.—A particularly pestiferous weed of such rapid growth and seeding as to make eradication extremely difficult.

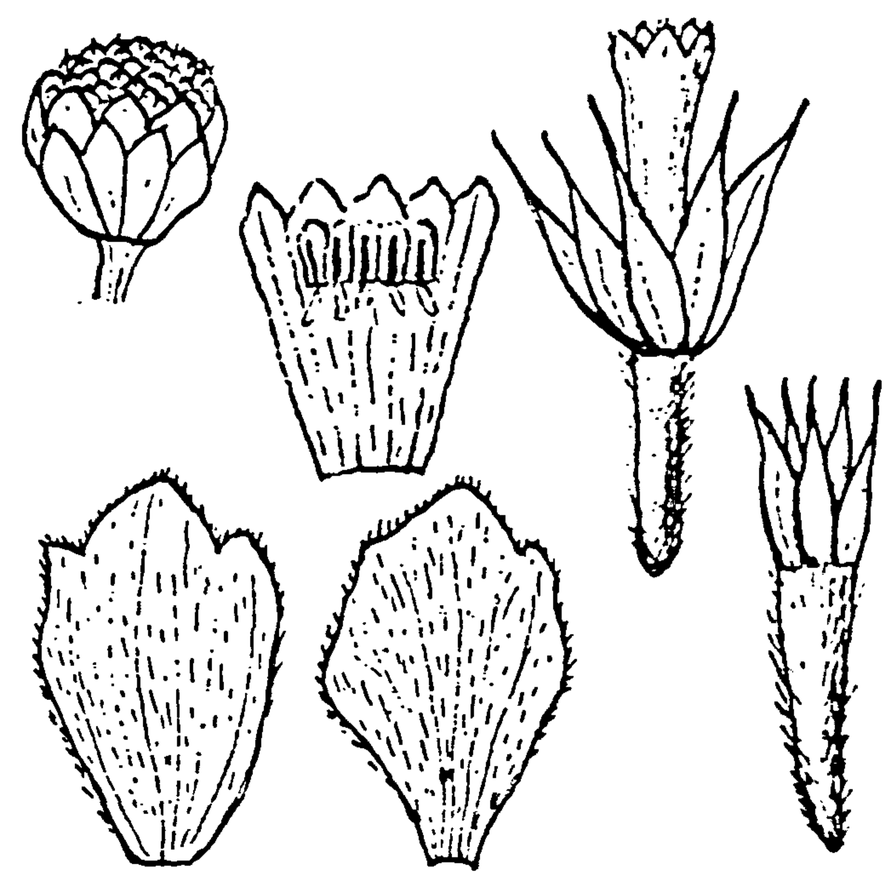
G. parviflora Cav. with much smaller ray-flowers, appressed pubescence, and pappus scales fimbriate, but not aristate, often occurs with *G. ciliata* north of our range, and may be looked for in N. C. and Tenn. or further S.

93. **TRIDAX** L. Perennial, caulescent, decumbent herbs. Leaves opposite: blades incised-toothed or pinnately dissected. Heads radiate. Involucre ovoid to campanulate: bracts various, the inner broader than the outer. Ray-flowers few: corollas with a slender glabrous tube and a broad yellow or pale ligule. Disk-corollas with a narrowly funnelform throat and a short tube. Anthers linear. Achene much shorter than the corolla. Pappus of numerous plumose-ciliate scales.—About 12 species, tropical American.



1. T. procumbens L. Plant branched at the base, the branches hirsute: leaf-blades ovate to ovate-lanceolate, 2–5 cm. long, incised or incised-lobed: involucres 6–7 mm. high; bracts hispidulous, the outer lanceolate, the inner broad and abruptly pointed: ligules as broad as long: achene of the disk about 2 mm. long.—Pinelands, hammocks, and cult. grounds, S pen. Fla. and the Keys. Nat. of (*W. I.*)

94. **HYMENOXYS** Cass. Annual, biennial, or perennial, erect, caulescent herbs. Leaves alternate: blades pinnatifid or pinnatisect, the segments usually narrow. Heads radiate, or (in ours) discoid, peduncled. Involucre often campanulate or hemispheric: bracts in 2 series, the outer smaller than the inner, firm and more or less united at the base. Ray-flowers, when present yellow or orange, few or several, pistillate, fruit-producing: ligules 3-lobed. Disk-flowers numerous, perfect, fruit-producing: corollas yellow, with a short tube and a cylindric or funnelform throat of equal length or longer; lobes deltoid. Anthers very minutely appendaged at the base. Stigmas blunt. Achene obpyramidal, 5-angled, pubescent. Pappus of 5 scales.—Seven species, North American.



1. H. anthemoides (Juss.) Cass. Stem branched throughout, the branches ascending or diffuse: leaf-segments narrowly linear or linear-filiform: peduncles erect, fluted, enlarged under the head: involucre broadly

campanulate; bracts finely pubescent, the outer ovate, tubercled at the base, the inner elliptic or elliptic-obovate, 4–5 mm. long, longer than the outer: achene 2–2.5 mm. long, densely appressed-pubescent: pappus-scales acuminate, shorter than the achene.—Waste-places, Coastal Plain, Ala. Nat. of S. A.—Sum.

95. **HELENIUM** L. Annual, biennial, or perennial, bitter, caulescent herbs. Leaves alternate: blades entire, toothed, or pinnatifid, often decurrent. Heads solitary, few, or numerous. Involucre flattish: bracts spreading or reflexed. Receptacle conic, ellipsoid, or subglobose. Ray-flowers several, the corollas with cuneate yellow or red-stained ligules. Disk-corollas with broadly ovate lobes. Achene ribbed. Pappus of 5–8 acuminate or awn-tipped scales. —About 25 species, North American.—SNEEZEWEEDS.

Ray-flowers pistillate, or wanting.	
Plant annual or rarely biennial.	
Leaves with narrowly linear or linear-filiform blades, not decurrent.	I. TENUIFOLIA.
Leaves with broader blades, more or less decurrent.	II. QUADRIDENTATA.
Plant perennial.	III. AUTUMNALES.
Ray-flowers neutral or sterile.	
Heads corymbose.	IV. NUDIFLORA.
Heads solitary or 2 or 3 on long peduncles.	V. HELENIA.

I. TENUIFOLIA

Leaves numerous; blades entire: pappus-scales awn-tipped.	1. *H. tenuifolium.*

II. QUADRIDENTATA

Leaves few; blades of the lower ones pinnately lobed: pappus-scales rounded.	2. *H. quadridentatum.*

III. AUTUMNALES

Disk mostly over 1 cm. wide: disk-corollas about 3 mm. long.	3. *H. latifolium.*
Disk mostly less than 1 cm. wide: disk-corollas about 2.5 mm. wide.	4. *H. parviflorum.*

IV. NUDIFLORA

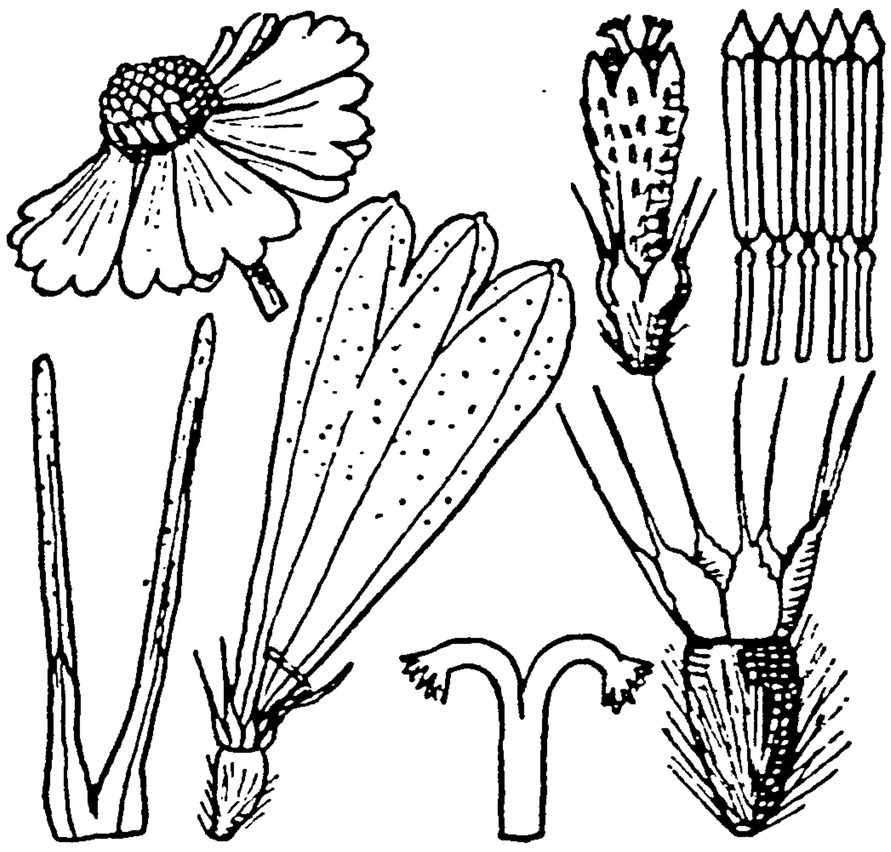
Disk yellow.	4. *H. parviflorum.*
Disk purplish or dark-brown.	
Upper part of the stem and branches with wings 1 mm. wide or less: upper cauline-leaves much smaller than the lower ones.	5. *H. nudiflorum.*
Upper part of the stem and branches with wings 2 mm. wide or more: upper cauline leaves not conspicuously smaller than the lower ones.	6. *H. polyphyllum.*

V. HELENIA

Disk yellow.	
Receptacle ovoid or ovoid-conic: disk subglobose to hemispheric: bracts of the involucre early reflexed.	
Pappus-scales dissected into bristle-like segments: disk about 1.5 cm. wide.	7. *H. fimbriatum.*
Pappus-scales entire or merely erose: disk about 2 cm. wide.	8. *H. Curtisii.*
Receptacle and disk depressed-hemispheric or convex: bracts of the involucre spreading or tardily recurved.	
Achene glabrous or merely glandular-granular.	9. *H. Helenium.*
Achene pubescent on the ribs.	10. *H. vernale.*
Disk purplish or brown.	11. *H. brevifolium.*

1. **H. tenuifolium** Nutt. Plant 2–4 dm. tall: leaves numerous; blades 1–5 cm. long: involucral bracts linear-subulate to subulate, 4–7 mm. long: ligules

7–12 mm. long: pappus-scales prolonged into slender awns.—(YELLOW-DICK. BITTERWEED. SPANISH-DAISY.)—Fields, roadsides, and waste-places, various provinces, Fla. to Tex., Mo., and S Va.; adventive NE to Pa. and Mass.—Sum.–fall.



2. **H. quadridentatum** Labill. Plant 3–10 dm. tall, loosely branched: blades of the lower leaves 8–15 cm. long, pinnatifid: involucral bracts linear to linear-subulate, becoming 4–6 mm. long: ligules 3–5 mm. long: pappus-scales orbicular-oval.—Low grounds, Coastal Plain, Fla. to Tex. and S. C.—Spr.–fall.

3. **H. latifolium** Mill. Plant 2–9 dm. tall: leaf-blades elliptic or slightly broadest above the middle or below it, 3–12 cm. long, rather prominently toothed: involucral bracts linear-lanceolate or narrower, 5–7 mm. long: ligules 10–20 mm. long: disk yellow; corollas about 3 mm. long. [*H. autumnale* L. in part]—Swamps and low grounds, various provinces, Fla. to Tex., Minn., Que., and Conn.—Sum.–fall.

4. **H. parviflorum** Nutt. Plant 2–8 dm. tall, much branched: leaf-blades elliptic to elliptic-lanceolate, 3–12 cm. long, shallowly toothed: involucral bracts linear-subulate or narrower, 6–9 mm. long: ligules 6–10 mm. long: disk yellow; corollas about 2.5 mm. long.—Low grounds, Coastal Plain and adj. provinces, Fla. to Tex., Ark., Tenn., and Ga.—Sum.–fall.

5. **H. nudiflorum** Nutt. Plant 2–10 dm. tall, corymbosely branched above: leaf-blades oblanceolate to elliptic or linear, 2.5–12 cm. long, those of the lower leaves often toothed: involucral bracts narrowly linear to linear-subulate, 5–7 mm. long: ligules 10–15 mm. long.—Low grounds, prairies, and flatwoods, various provinces, Fla. to Tex., Mo., and Md.; adv. NE to Conn.—Spr.–fall.

6. **H. polyphyllum** Small. Plant 3–8 dm. tall: leaf-blades elliptic to linear-lanceolate, 2–10 cm. long, undulate or remotely toothed: involucral bracts narrowly linear to linear-subulate, 5–8 mm. long: ligules 6–12 mm. long: disk purplish: corollas 2 mm. long.—Fields, meadows, and thickets, Appalachian provinces, Ga. and Tenn.—Sum.–fall.

7. **H. fimbriatum** (Michx.) A. Gray. Plant 4–8 dm. tall: leaf-blades linear-spatulate to broadly linear, 4–12 cm. long, entire: involucral bracts linear-subulate, 7–10 mm. long, reflexed: ligules 1.5–2 cm. long: disk corollas 5 mm. long: achene 1 mm. long.—Low pinelands, Coastal Plain, Fla. to Tex.—Sum.–fall.

8. **H. Curtisii** A. Gray. Plant 5–9 dm. tall: leaf-blades oblanceolate to linear, 4–10 cm. long, undulate: involucral bracts lanceolate to lance-subulate, 5–8 mm. long; ligules 1.5–2 cm. long: disk corollas 4.5–5 mm. long: achene 1.5 mm. long.—Low pinelands and marshes, Coastal Plain, N. C.—Spr.–sum.

9. **H. Helenium** (Nutt.) Small. Plant 3–7 dm. tall: leaf-blades linear or nearly so, 5–15 cm. long, undulate or coarsely few-toothed: involucral bracts linear or linear-lanceolate, 5–9 mm. long: ligules 9–17 mm. long: disk corollas 4.5 mm. long: achene 1–1.5 mm. long. [*H. incisum* (T. & G.) Wood]—Marshes, low pinelands, and about ponds, Coastal Plain, Fla. to La. and S. C.—Spr.–fall.

10. **H. vernale** Walt. Plant 3–7 dm. tall: leaf-blades spatulate to linear, 6–15 cm. long, toothed or incised-pinnatifid: involucral bracts lance-subulate, 5–6 mm. long, spreading: ligules 1 cm. long: disk corollas 4–4.5 mm. long:

achene 1.5–2 mm. long. [*H. pinnatifidum* (Schw.) Rydb.]—Low pinelands and swamps, Coastal Plain, Fla. to Miss. and N. C.—Spr.–sum.

11. H. brevifolium (Nutt.) A. Gray. Plant 3–8 dm. tall: leaf-blades spatulate to linear, 2–8 cm. long, entire, or undulate: involucral bracts linear-lanceolate to linear, 8–10 mm. long: ligules 1–1.5 cm. long: disk-flowers 4 mm. long: achene 1.5 mm. long.—Wet pinelands, Coastal Plain and adj. provinces, Fla. to Miss. and N. C.—Spr.–sum.

96. GAILLARDIA Foug. Annual, biennial, or perennial, often diffuse herbs. Leaves alternate: blades entire, toothed, or pinnatifid. Heads erect, radiate and showy, or sometimes discoid. Involucre broad or flat: bracts ultimately spreading or reflexed. Ray-flowers several, the corollas with prominently lobed yellow, orange, red, or purple ligules, or wanting. Disk-corollas with a short tube, a longer throat, and deltoid, triangular-lanceolate or caudate-acuminate lobes. Achene 5-ribbed. Pappus of 6–12 awned, 1-nerved scales.—About 20 species, all except one North American.—BLANKET-FLOWERS. FIRE-WHEELS. BANDANA-DAISIES.

Fimbrillae of the receptacle obsolete or very small tooth-like projections: lobes of the disk-corollas caudate-acuminate from a broad base. I. LANCEOLATAE.
Fimbrillae of the receptacle subulate or setiform, longer than the achenes: lobes of the disk-corollas short-acuminate. II. PULCHELLAE.

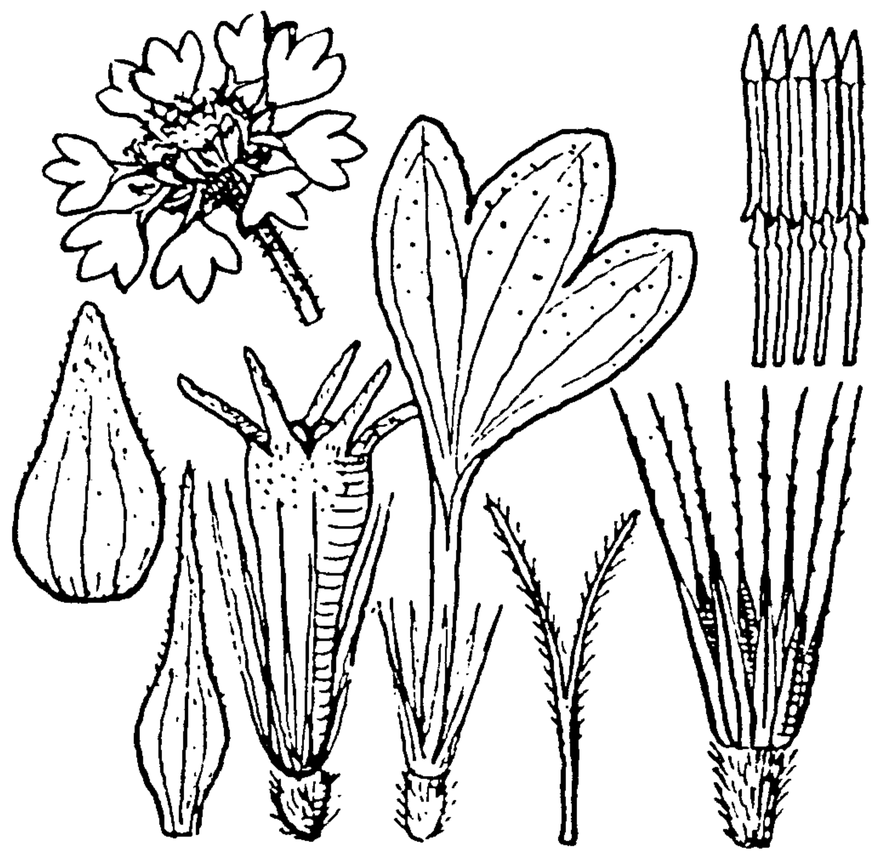
I. LANCEOLATAE

Disk light-yellow. 1. *G. chrysantha.*
Disk purplish or purplish-brown. 2. *G. lanceolata.*

II. PULCHELLAE

Plant herbaceous: leaf-blades thin. 3. *G. Drummondii.*
Plant partly woody: leaf-blades fleshy. 4. *G. picta.*

1. G. chrysantha Small. Plant annual or biennial, finely pubescent, 3–6 dm. tall, usually with few elongate more or less spreading branches: leaf-blades spatulate or elliptic-spatulate on the lower part of the stem to linear or elliptic-linear above, 2–8 cm. long, undulate or remotely sinuate-toothed: heads long-peduncled: involucral bracts 7–11 mm. long, the outer triangular or lanceolate-triangular, the inner lanceolate: ligules of the ray-flowers yellow, 1–1.5 cm. long, 3-cleft, the middle lobe the narrowest: disk light-yellow, 1.5–2 cm. broad: achene about 2 mm. long.—Pinelands and sandy prairies, Coastal Plain, Ala. to Tex. and Ark.—Spr.–fall.



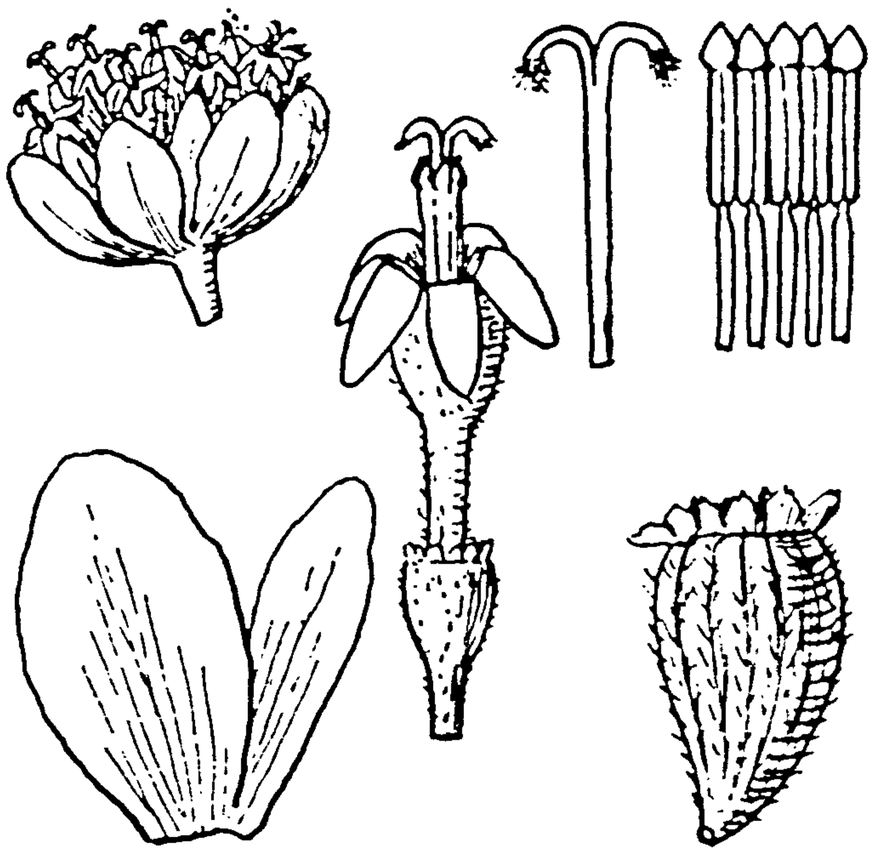
2. G. lanceolata Michx. Plant annual or sometimes biennial, cinereous-pubescent, 3–7 dm. tall, loosely branched, the branches long and spreading: leaf-blades spatulate to elliptic or linear, 1.5–8 cm. long, acute, entire or remotely serrate, sessile, at least above the base of the stem: heads long-peduncled: involucral bracts oblong to lanceolate, 8–12 mm. long, acute or acuminate: ligules of the ray-flowers yellow, 1.5–2 cm. long, 3-cleft: disk purplish or purplish-brown, 1.5–2 cm. broad: receptacle naked or nearly so: achene 1.5–2 mm. long.—Pinelands, dry woods, rocky banks, and prairies, various provinces, Fla. to Tex., Kans., and S. C.—Spr.–sum.

3. G. Drummondii (Hook.) DC. Plant annual, 6 dm. tall or less, the branches puberulent and somewhat villous: leaf-blades spatulate to oblanceolate and undulate to pinnatifid on the lower part of the stem, lanceolate to linear-

lanceolate above, entire, undulate, or distantly toothed, sessile: heads slender-peduncled: involucral bracts 12–20 mm. long, or rarely shorter, linear-lanceolate, usually narrowly so, long-attenuate, hirsute and ciliate; ligules of the ray-flowers 15–22 mm. long, usually purple, except the yellow tips: achene 2.5 mm. long or nearly so, strigose.—Dry soil, prairies, open woods, and cult. grounds, Coastal Plain, S Fla. and Tex.—(*Mex.*)—Spr.–fall, or all year S.

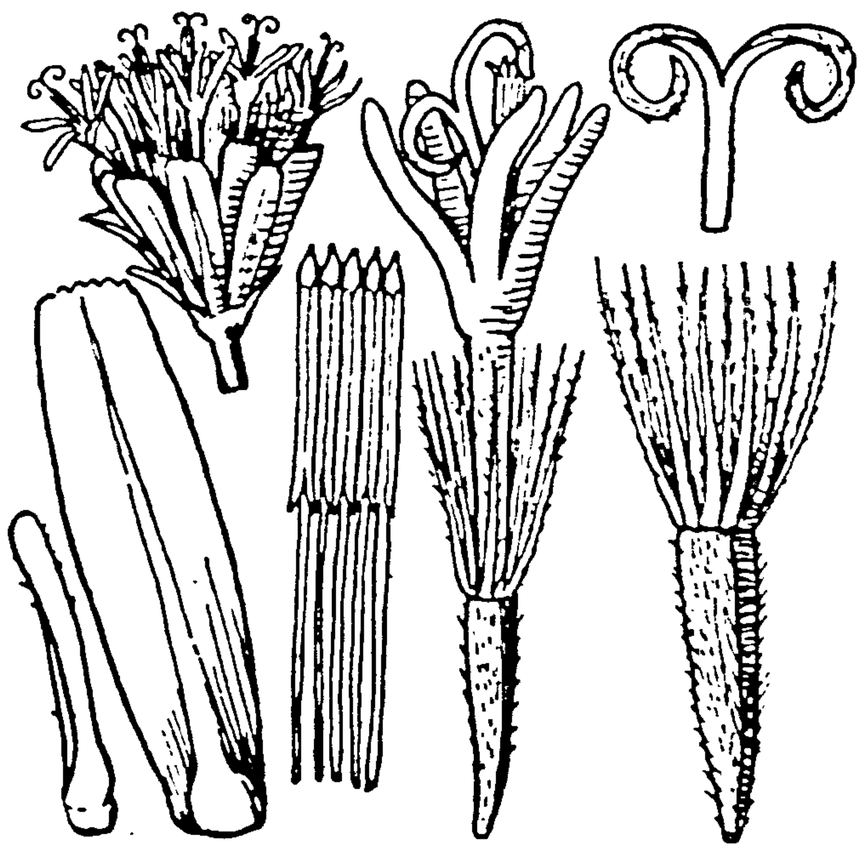
4. **G. picta** Sweet. Plant perennial, but flowering the first year, becoming woody below, 3 dm. tall or less, the branches puberulent and densely long-hairy: leaf-blades spatulate and pinnatifid on the lower part of the stem, linear to lanceolate and mostly entire on the upper part and sessile: heads long-peduncled: involucral bracts narrowly lanceolate, mostly 9–15 mm. long, acuminate, copiously pubescent and ciliate: ligules of the ray-flowers 15–24 mm. long, purple or sometimes yellow-tipped: achene about 2 mm. long, strigose.—Coastal sands, Fla. to Tex. and S. C.—Spr.–fall.

97. **HYMENOPAPPUS** L'Her. Biennial or perennial, erect herbs. Leaves alternate: blades pinnatifid or dissected, or rarely entire. Heads discoid, corymbose. Involucral bracts petaloid. Disk-corollas white or pink, becoming purplish-red the second day, pubescent, with a campanulate or urceolate throat and spreading or recurved lobes. Anther-appendages deltoid-ovate. Achene broadened upward, pubescent all over. Pappus of several scales shorter than the achene, or obsolete.—About 7 species, North American.



1. **H scabiosaeus** L'Her. Stem 3–7 dm. tall, glabrate or thinly tomentose: leaf-segments rather coarse, elliptic to linear, entire or with ovate to elliptic teeth: bracts of the involucre narrowly elliptic to oval, varying to somewhat obovate: achene 3.5–4 mm. long, or sometimes smaller: pappus-scales obovate, about 0.5 mm. long.—Dry sandy soil, various provinces, Fla. to Tex., Kans., and S. C.—Sum.

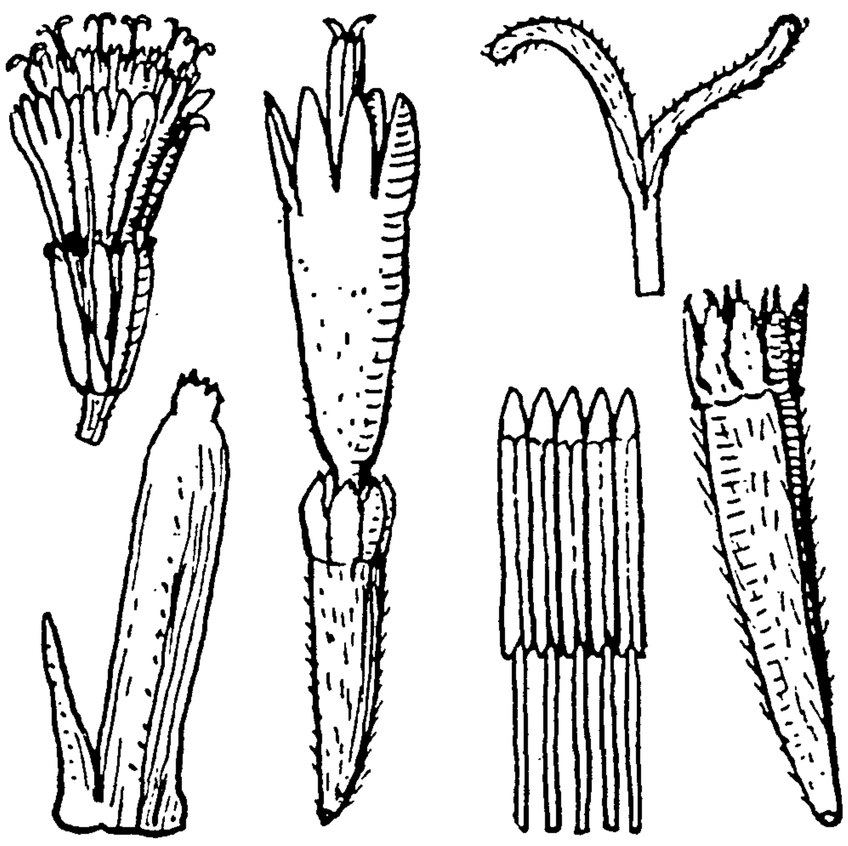
98. **POLYPTERIS** Nutt. Perennial, tall, branching, rigid herbs. Leaves alternate, or opposite on the lower part of the stem: blades entire, thick. Heads corymbose, scattered, discoid. Involucre turbinate: bracts rather numerous and broad, scarious above the base, mainly in 2 series. Receptacle naked. Ray-flowers wanting. Disk-corollas white or pink, with a campanulate throat and a long slender tube. Anthers longer than the filaments. Achene 4-angled, rather stoutly enlarged upward, pubescent. Pappus of several slender pubescent awn-like scales.—One species.



1. **P. integrifolia** Nutt. Plant 1.5 mm. tall or less, corymbose above: leaf-blades lanceolate or linear-lanceolate to linear, 3–7 cm. long obtuse or acutish: involucre corolloid; bracts elliptic or spatulate, 10–14 mm. long, obtuse: corollas 9–14 mm. long; lobes linear-

lanceolate: achene narrowly obpyramidal, 4–5 mm. long.—Dry pinelands, Coastal Plain, Fla. and Ga.—Sum.–fall or all year S.

99. **PALAFOXIA** Lag. Annual or perennial, sometimes partly woody plants. Leaves alternate or opposite: blades narrow, entire. Heads corymbose. Involucre campanulate to ellipsoid: bracts narrow, herbaceous. Disk-corollas with a cylindric throat much longer than the tube. Achene 4-angled, slenderly enlarged upward, pubescent. Pappus of 4–8 short broad scales.—About 6 species, North American.



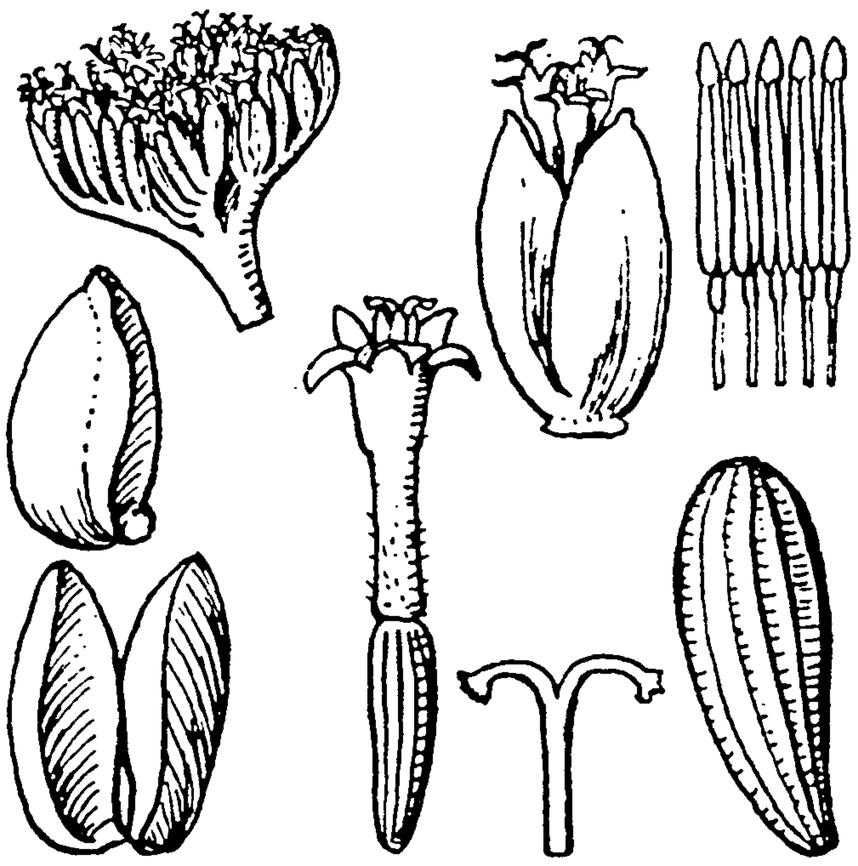
1. P. Feayi A. Gray. Slender shrubby plant 6–35 dm. tall minutely pubescent: leaves evergreen; blades elliptic to elliptic-lanceolate, 2–7 cm. long: involucre 7–8 mm. long; bracts obtuse: corollas white, 7–8 mm. long: achene clavate, 5–6 mm. long.—Pinelands and scrub, pen. Fla.—All year S.

100. FLAVERIA Juss. Annual, glabrous or pubescent, erect but often bushy-branched, somewhat succulent herbs. Leaves opposite: blades entire or toothed, sessile, sometimes connate. Heads individually inconspicuous. Involucre narrow, prismatic: bracts few, 1–8, mostly nearly equal. Ray-flowers mostly solitary and ligule yellow, or wanting. Disk-flowers 1–15. Achene narrow, 8–10-ribbed. Pappus wanting, or rarely of 2–4 scales.—About 10 species, all except 1 American.—Spr.–fall or all year S.

Receptacle naked: involucre of more than 2 bracts: heads 2–20-flowered: disk-corollas with a funnelform throat.
- Involucre of 3 bracts or rarely of 4. — 1. *F. bidentis.*
- Involucre of 5–7 bracts.
  - Heads 2–8-flowered.
    - Stem with long internodes below and usually simple at the base: leaves herbaceous: plant annual. — 2. *F. latifolia.*
    - Stem with short internodes below and usually branched at the base: leaves fleshy: plant perennial (?). — 3. *F. linearis.*
  - Heads 10–15-flowered. — 4. *F. floridana.*

Receptacle setose: involucre of 1, 2, or 3 bracts: head usually 1-flowered: disk-corollas with a campanulate throat. — 5. *F. trinervia.*

1. F. bidentis (L.) Kuntze. Stem 10 dm. tall or less, angled, glabrous or sparingly villous on the angles and the nodes: leaf-blades lanceolate-elliptic, linear-lanceolate, or linear-elliptic, 3–8 cm. long, serrate, 3-ribbed, glabrous, slightly connate: inflorescence with scorpioid branches: heads 2–9-flowered: bracts of the involucre 3, with 1 or 2 additional scale-like ones at the base, oval to ovate, concave 3–4 mm. long, obtuse: ligule about 1 mm. long, narrow: disk-flowers 1–8, the corolla 2–3 mm. long: achene 1.5 mm. long. [*F. chilensis* Gmel.]—Waste-places and roadsides, Coastal Plain, Fla. to Ala. and Ga.—(*Mex., S. A.*)



2. F. latifolia (J. R. Johnston) Rydb. Stem 10 dm. tall or less, striate, glabrate: leaf-blades linear-lanceolate to linear, 2.5–10

cm. long, entire or serrulate, connate: corymb open: heads in small clusters: bracts of the involucre 5, narrowly elliptic, 3.5–4.5 mm. long: ligule 2.5–3 mm. long: disk-flowers 2–5, the corolla 2.5 mm. long: achene about 1.5 mm. long.—Low pinelands, wet prairies, and mangrove swamps, pen. Fla. and the Keys.

3. F. linearis Lag. Stem 2–9 dm. long, sometimes decumbent, corymbose above, striate, glabrous: leaf-blades narrowly linear, often narrowly so, 3–10 cm. long, narrowed above the connate bases, entire: corymbs irregular: heads numerous: bracts of the involucre mostly 5, 3.5–4 mm. long, elliptic, or lanceolate: ray-flowers usually solitary; ligule elliptic to oval, 2–3.5 mm. long: disk-flowers usually 5–10, the corollas 2.5–3.5 mm. long: achene about 2 mm. long. [*F. pinetorum* Blake.]—Coastal sands, hammocks, marshes, and low pinelands, pen. Fla. and the Keys.—(*W. I., Mex.*)

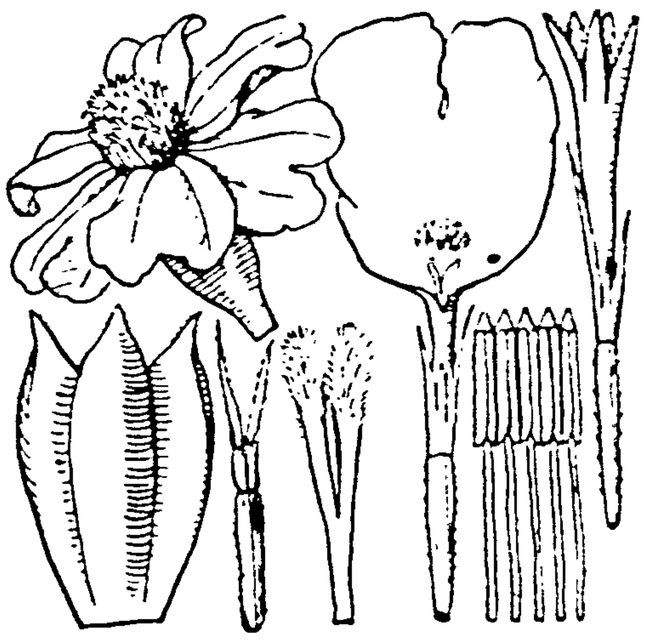
4. F. floridana J. R. Johnston. Stem 10 dm. tall or less, striate, glabrous: leaf-blades linear-lanceolate to linear, 2.5–8 cm. long, entire or rarely denticulate, slightly connate: heads 10–13-flowered, in compact clusters which are often subtended by a whorl of leaves: bracts of the involucre about 4 mm. long: ligule oval, about 2 mm. long: disk-corollas 2.5 mm. long: achene about 1.5 mm. long.—Sandy shores, pen. Fla.

5. F. trinervia (Spreng.) C. Mohr. Stem 2–12 dm. tall, widely branched, glabrate: leaf-blades linear-elliptic to lanceolate or broadly linear, 3–10 cm. long, acute or somewhat acuminate, serrate, 3-ribbed, narrowed to the sessile but connate bases: heads usually 1-flowered, in axillary or involucrate clusters: bracts 1–3, or sometimes accompanied by a few accessory ones: corolla of the pistillate flowers 1.5 mm. long, the ligule oblique: corolla of the perfect flower 2 mm. long: achene clavate, about 2 mm. long.—Waste-places and cult. grounds, various provinces, Ala. to Ariz.—(*W. I., Mex., C. A., S. A.*)

101. TAGETES L. Annual or rarely perennial, strong-scented, erect, caulescent herbs. Leaves mostly opposite: blades pinnately divided. Heads erect. Involucre narrow: bracts partly united. Ray-flowers several, the corollas with elongate tubes and broad colored, often variegated, ligules. Disk-corollas elongate, the slender tube and narrow throat about equal in length. Achene elongate, somewhat 4-angled. Pappus of unequal narrow scales.—About 20 species, of warm and tropical America.—Marigolds.

Heads solitary at the ends of the branches: involucre campanulate: ray-flowers 5–8; ligules obovate, 1 cm. long or more. 1. *T. erecta.*
Heads in compact corymbose cymes: involucre fusiform: ray-flowers usually 3; ligules suborbicular, usually 5 mm. long or less. 2. *T. minuta.*

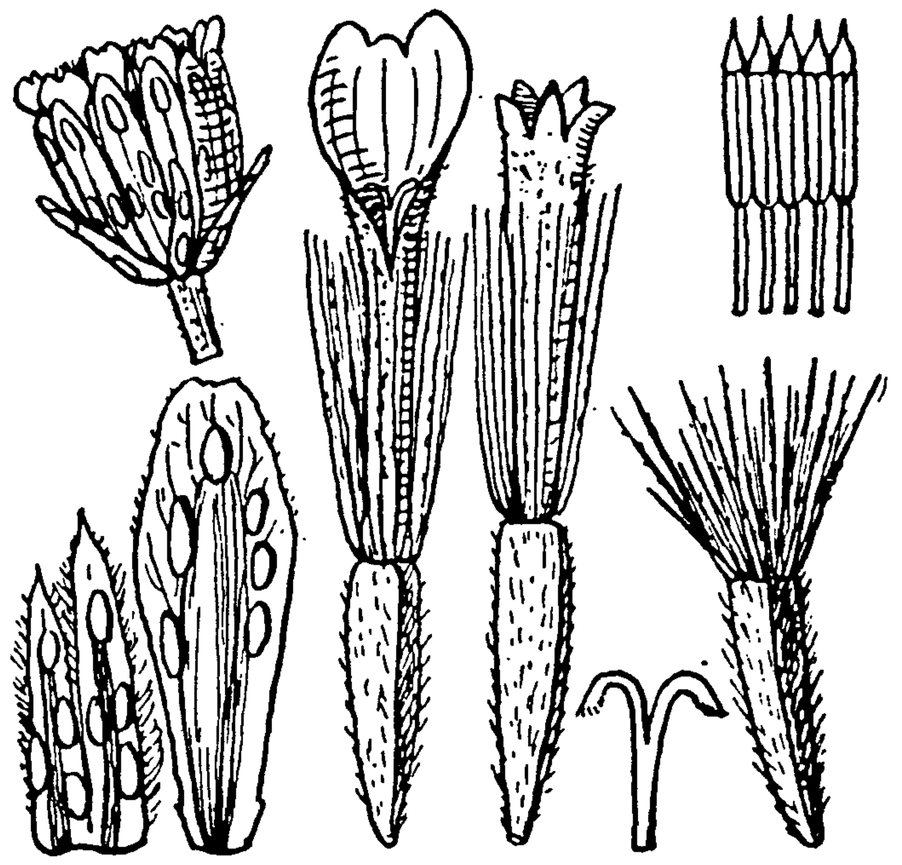
1. T. erecta L. Plant mostly 2–15 dm. tall, the branches spreading or ultimately more or less decumbent: leaf-divisions linear-lanceolate, elliptic, mostly 1–2 cm. long, sharply and rather coarsely serrate: peduncles elongate, markedly clavate: involucre 15–18 mm. long; lobes ovate, short-acuminate: ligules obovate, orange or pale-yellow, 1–2 cm. long: disk-corollas 11–16 mm. long; lobes lanceolate: achene nearly linear, 7–9 mm. long, about as long as the longer pappus-scale.—(African Marigold.)—Roadsides, fields, and waste-places, Fla. Nat. of Mex.—(*W. I., C. A., S. A., O. W.*)—All year.



2. T. minuta L. Plant 3–10 dm. tall, the branches erect or nearly so: leaf-divisions linear to linear-lanceolate, finely but sharply serrate: peduncles short, slender: involucre about 1 cm. long; lobes deltoid, obtuse or merely acutish: ligules yellowish, suborbicular,

usually less than 5 mm. long: disk-corollas 3–4 mm. long; lobes ovate: achene 5–6 mm. long, much longer than the longer pappus-scale.—Sandy waste-places, Coastal Plain, N. C. Nat. of Chile.—Sum.–fall.

102. BOEBERA Willd. Annual or perennial, glandular-dotted, strong-scented herbs. Leaves alternate or opposite: blades commonly parted or dissected. Heads inconspicuous, usually corymbose. Involucre turbinate or campanulate: bracts broad, thin-margined. Receptacle flat or nearly so. Ray-flowers yellow, few, the corollas with minute ligules. Disk yellow. Achene 3–5-angled. Pappus of 10 or more partly united narrow scales.—About 3 species, North American.



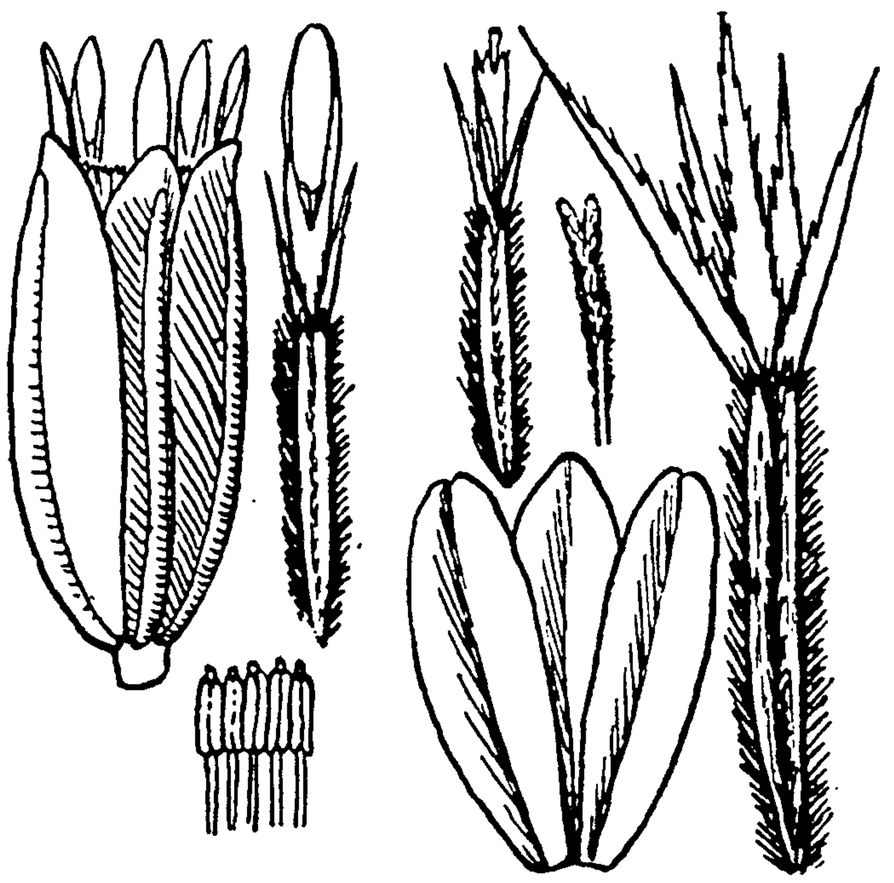
1. B. papposa (Vent.) Rydb. Plant annual, pubescent, 1–4 dm. tall: leaves opposite; blades 1–3 cm. long, pinnately 1- or 2-parted: involucre 6–8 mm. high; bracts scarious-margined: ligules of the ray-flowers inconspicuous: achene 3.5–4 mm. long, pubescent.—Waste-places and roadsides, Tenn. to La., Ariz., Minn., and Ohio.—(*Mex.*)—Adv. E.—Sum.–fall.

Thymophylla tenuiloba (DC.) Small, a native of Tex. and adj. Mex., is adventive at Miami, Fla. It has finely cut leaf-blades and yellow heads.

103. PECTIS L. Slender or wiry glandular-dotted herbs, the stems usually pubescent in lines. Leaves opposite: blades narrow, usually ciliate near the base. Heads clustered or solitary. Involucre narrow, few-several-flowered: bracts gland-bearing. Ray-flowers few: corollas with yellow ligules. Styles pubescent. Stigmas of the disk-flowers very short.—About 75 species, American.

Heads sessile or nearly so, mostly in clusters.
  Leaves with scattered glands; blades oblanceolate to linear-spatulate. 1. *P. prostrata*
  Leaves with 2 rows of glands beneath; blades narrowly linear. 2. *P. linearifolia.*
Heads distinctly peduncled, solitary in the branch-forks and at the ends of the branches. 3. *P. leptocephala.*

1. P. prostrata Cav. Stem usually branched at the base, the branches procumbent or prostrate, 0.5–2 dm. long: leaf-blades oblanceolate to linear-spatulate, 1–3 cm. long, entire, with 5–9 pairs of bristles: heads sessile or nearly so, more or less clustered: involucre 5–7 mm. long; bracts 5, elliptic to linear-elliptic, concave and keeled: ray-flowers 5: disk-flowers 4–15, with corollas 2–2.5 mm. long: achene 3–4 mm. long or rarely smaller: pappus-scales of the ray 2, narrowly lanceolate, accompanied by 1–3 bristles; of the disk 5, unequal.—Waste-places and cult. grounds, various provinces, Fla. to Ariz.—(*W. I., Mex., C. A., S. A.*)



2. P. linearifolia Urban. Stem 1–4 dm. tall, erect or diffusely branched, puberulent in lines: leaf-blades linear or nearly so, over

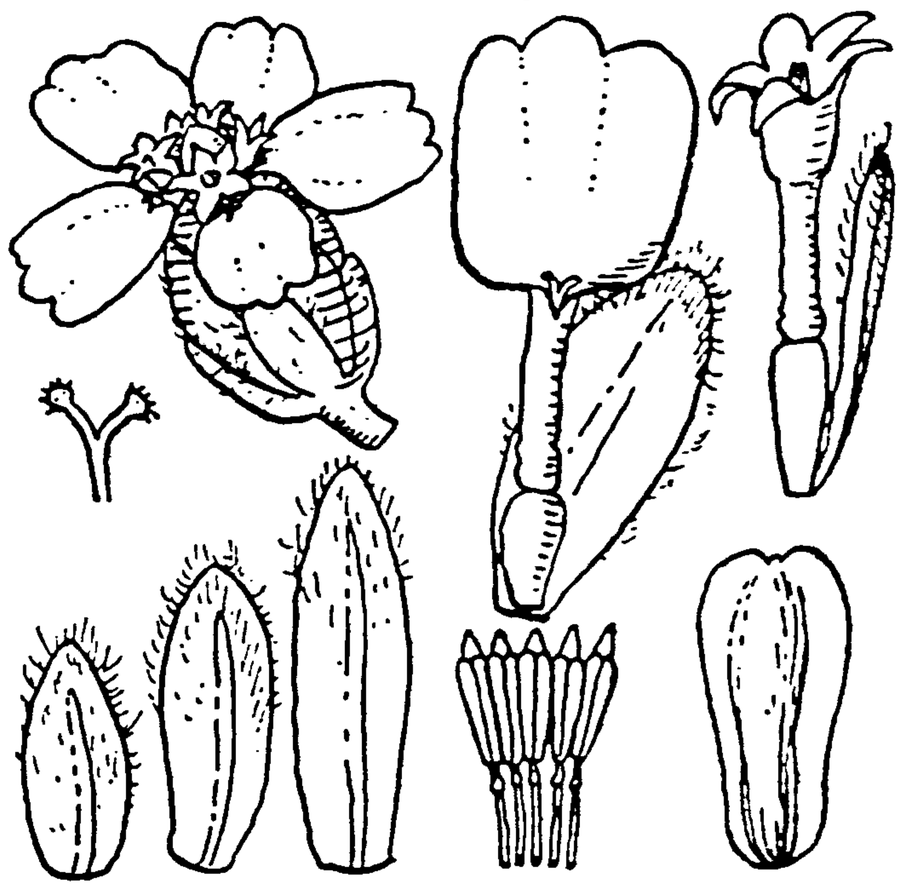
1 mm. wide, acute, entire, 3–6 pairs of bristles near the base: heads sessile or nearly so, few in clusters: involucre prismatic, 4–5 mm. high; bracts 4–6, linear or linear-lanceolate: ray-flowers 2–3; ligules 2–2.5 mm. long: disk-flowers 6 or 7, with corollas about 2.5 mm. long: achene 3 mm. long or nearly so: pappus-scales of the ray 2, narrowly lanceolate and aristate-attenuate, of the disk 5. [*P. ciliaris* Fernald, not L.]—Sandy woods and cult. grounds, pen. Fla.—(*W. I.*).

3. **P. leptocephala** (Cass.) Urban. Stem more or less diffusely branched, slender, 1–4 dm. long, the branches prostrate, forming mats, finely pubescent in lines: leaf-blades narrowly linear, commonly 1–3 cm. long, mostly less than 1 mm. wide, acute, entire, with 2–4 pairs of bristles below the middle: heads solitary on filiform peduncles, 1–2.5 cm. long: involucre narrow, 4–5 mm. high; bracts 5, linear or nearly so: ray-flowers 5; ligules 2–2.5 mm. long: disk-flowers 4–7, with corollas 2–2.5 mm. long: achene slender, 2.5–3 mm. long: pappus-bristles of the ray 2, with an incised lanceolate base and a slender awn, of the disk 5, or rarely 4. [*P. linifolia* Less. *P. Lessingii* Fernald.]—Pinelands and sand-dunes, S pen. Fla. and the Keys.—(*W. I.*).

104. ACHILLEA (Vaill.) L. Perennial, usually copiously pale-pubescent, herbs. Leaves alternate: blades coarsely toothed to thrice-pinnatifid. Heads several or numerous, rather small, in corymbs or corymbiform panicles. Involucre hemispheric, campanulate, or obovoid: bracts imbricate in 3 or 4 series, the outer the smaller. Receptacle conic or convex, chaffy, the chaff membranous, broad. Ray-flowers 5–12, pistillate, fruit-producing: corollas with short and broad, white, pink or purple, or rarely yellow ligules. Disk-flowers 15–75, perfect, fruit-producing: corollas yellowish-white or straw-colored, the tube equaling or longer than the throat. Achene ellipsoid or obovoid, callous-margined. Pappus wanting.—About 75 species, in the Northern Hemisphere, mostly in the Old World.—Spr.–fall.—MILFOILS. YARROWS.

Ultimate leaf-segments linear or nearly so: ligules of the ray white. 1. *A. occidentalis.*
Ultimate leaf-segments ovate or lanceolate.
  Ligules of the ray purplish: leaf-blades conspicuously punctate, the ultimate segments strongly callous-thickened toward the apex. 2. *A. asplenifolia.*
  Ligules of the ray white or rarely pink: leaf-blades not conspicuously punctate, the ultimate segments not callous-thickened toward the apex. 3. *A. Millefolium.*

1. **A. occidentalis** Raf. Stem 3–10 dm. tall, silky-villous, mostly simple: leaves sparingly villous; rachis merely margined; ultimate segments linear or nearly so: bracts of the involucre elliptic, often broadly so, to elliptic-lanceolate, the outer obtuse, the inner acute, all erose-ciliate at the apex: ligules 2 mm. wide: disk-corollas 2–2.5 mm. long: achene narrowly cuneate, nearly 2 mm. long.—Open woods, clearings, roadsides, and waste-places, various provinces, Fla. to Ark., Colo., Minn., and Mass.

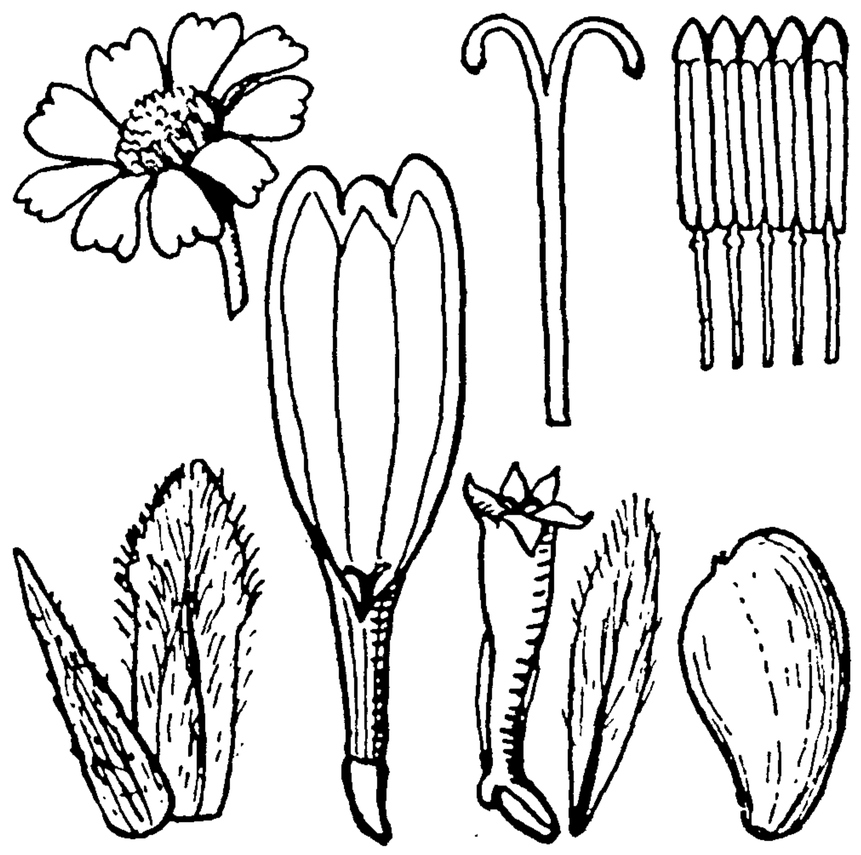


2. **A. asplenifolia** Vent. Stem 2.5–6 dm. tall, nearly glabrous or sparingly silky-villous, sometimes branched above: leaves glabrous above, sparingly villous beneath; rachis winged; ultimate segments lanceolate: bracts of the involucre ovate to ellip-

tic, sometimes narrowly so, all obtuse, ciliate at the apex: ligules nearly 2 mm. wide: disk-corollas about 2 mm. long: achene ellipsoid, less than 2 mm. long.—(YAR.)—Roadsides, fields, and woods, various provinces N of Coastal Plain, N. C. to S. Dak. and N. S. Nat. of Eu.

3. **A. Millefolium** L. Stem 2–7 dm. tall, sparingly villous, sometimes branched above: leaves sparingly villous; rachis winged; ultimate segments ovate or ovate-lanceolate: bracts of the involucre ovate to elliptic, all obtuse, ciliate at the apex: ligules about 2 mm. wide: disk-corollas fully 2 mm. long: achene ellipsoid or slightly broadened upward, fully 2 mm. long.—Dry hillsides, woods, pastures, and roadsides, various provinces, Fla. to Miss., Ill., Yukon, and N. S.—(*W. I., O. W.*)—Often a weed.

105. **ORMENIS** Cass. Annual, diffusely branched herbs. Leaves alternate: blades pinnatifid, the segments rather broad. Heads solitary at the ends of the branches. Involucre saucer-shaped: bracts in 2 or 3 series, rather broad. Receptacle conic, chaffy, the chaff cartilaginous, boat-shaped, surrounding the achenes. Ray-flowers perfect, fruit-producing; corollas with yellow ligules, or white and yellow at the base. Disk-flowers numerous, perfect, fruit-producing, the tube produced into an appendage at the base. Achene ellipsoid or obovoid, prominently 3-ribbed on the inner side. Pappus wanting.—One species.



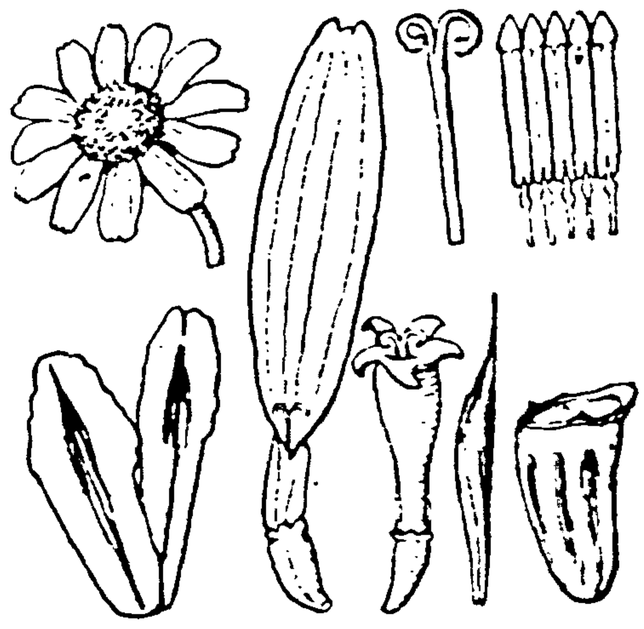
1. **O. mixta** (L.) Dum. Stem 1–4 dm. tall, usually branched at the base, the branches spreading, villous: leaf-blades cuneate or spatulate to linear in outline, 1–3 cm. long, the rachis broad, the segments triangular to lanceolate on the lower part of the blade, often broadened upward toward the apex: peduncles slightly thickened under the head: bracts of the involucre ovate to elliptic and linear, 3–4 mm. long, villous: ligules cuneate, 5–8 mm. long, yellow at the base: achene obovoid, fully 1 mm. long.—Waste-places and cult. grounds, various provinces, Fla. to B. C. and N. J. Nat. of Medit. Reg.—Spr.–fall.

106. **ANTHEMIS** L. Annual or perennial, branched, leafy herbs. Leaves alternate: blades pinnatifid or bipinnatifid, the segments rather narrow. Heads solitary at the ends of the branches. Involucre saucer-shaped: bracts in about 3 series, usually thin. Receptacle conic to hemispheric, chaffy, the chaff membranous, with a midrib. Ray-flowers pistillate, fruit-producing: corollas with white ligules. Disk-flowers numerous, perfect, fruit-producing: corolla yellow, the tube equalling or longer than the throat, the lobes ovate. Achene subcylindric or somewhat obovoid, with filiform ribs. Pappus wanting or a minute crown.—About 80 species, Eurasian and African.

Receptacle with cuspidate-acuminate chaff: achene equally 10-nerved. 1. *A. arvensis.*
Receptacle with obtuse chaff: achene 3-nerved on the inner side. 2. *A. nobilis.*

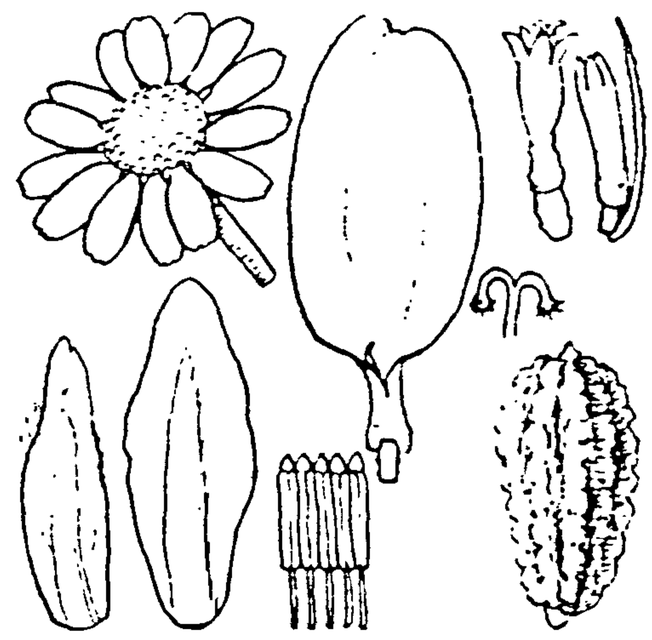
1. **A. arvensis** L. Annual or sometimes biennial, not strong-scented: stem 1–5 dm. tall, finely pubescent: leaf-blades 2–5 cm. long, pinnatifid or bipin-

natified, the segments linear-lanceolate to subulate: bracts of the involucre pubescent, the outer lanceolate, acute, the inner elliptic, obtuse: ligules 7–12 mm. long: achene subcylindric, 1.5–2 mm. mm. long: pappus a minute border. — Waste-places, roadsides, and fields, various provinces, Fla. to Ore., B. C., and Que. Nat. of O. W.—Spr.–fall.



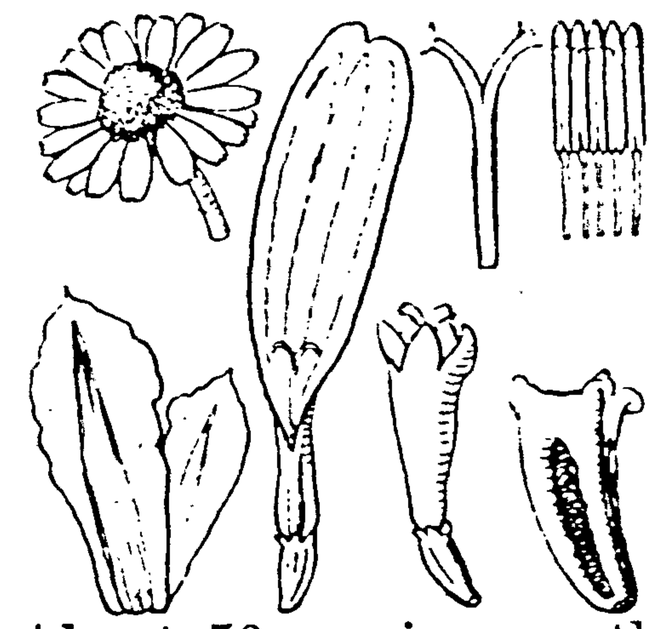
2. **A. nobilis** L. Perennial, aromatic: stem 1–3.5 dm. tall, pubescent, sometimes decumbent: leaf-blades 1–4 cm. long, pinnatifid or bipinnatifid, the segments linear to subulate: bracts of the involucre pubescent, the outer ovate-lanceolate, obtuse, the inner elliptic, rounded at the apex: ligules 6–10 mm. long: achene somewhat pyriform, 1–1.5 mm. long: pappus wanting. —Waste-places and about gardens, various provinces, N. C. to Tenn. and R. I. Nat. of Eu.—Sum.–fall.

107. **MARUTA** Cass. Annual, branching, usually very leafy herbs. Leaves alternate: blades pinnatifid, the segments narrow. Heads solitary at the ends of the branches. Involucre saucer-shaped: bracts in 2 series, rather broad. Receptacle conic, chaffy toward the apex, the chaff subulate, rather persistent. Ray-flowers 10–15, neutral: corollas with white ligules. Disk-flowers perfect, fruit-producing: corollas greenish-yellow, the tube longer than the throat, the lobes ovate. Achene nearly cylindric, 10-ribbed, glandular-tubercled. Pappus wanting.—About 12 species, natives of the Old World.



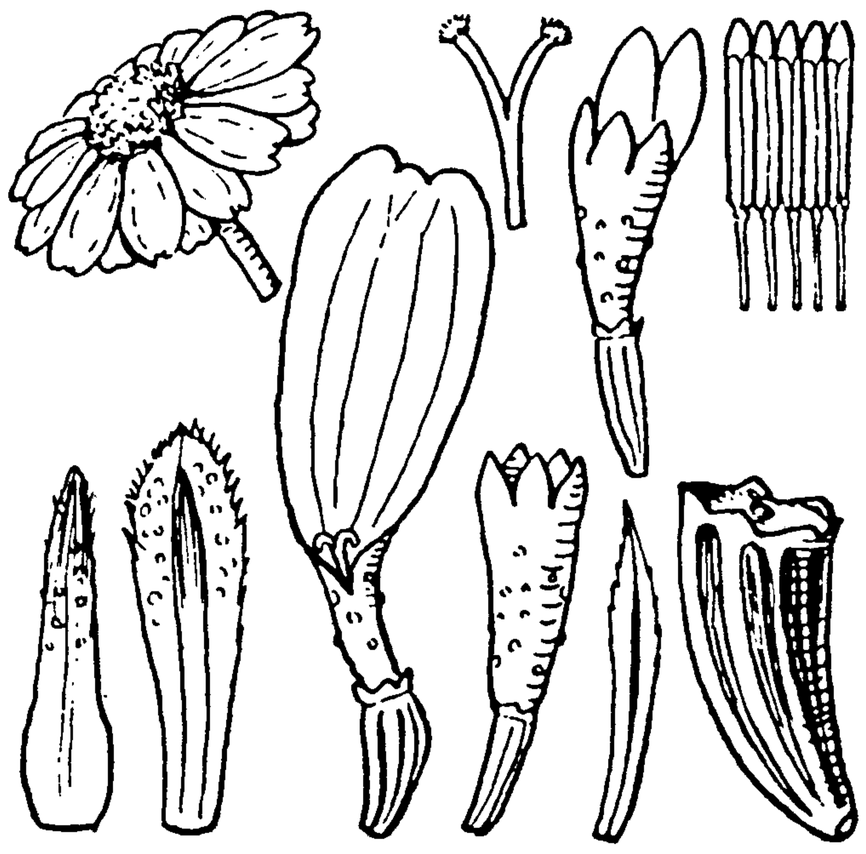
1. **M. Cotula** (L.) DC. Plant strong-scented: leaf-blades thrice pinnately dissected, the segments very slender: disk-flowers near the center of the receptacle with chaff; corollas mostly 2.5 mm. long: achene tuberculate-roughened: pappus wanting. [*Anthemis Cotula* L.]—(MAY-WEED. DOG'S-CAMOMILE. DOG-DAISY. DOG-FENNEL.)—Fields, roadsides, cult. grounds, and waste-places, various provinces, Fla. to Calif., Alas., and Newf. Nat. of O. W.—Sum.–fall.

108. **CHAMOMILLA** [Hall.] Gilib. Annual herbs, resembling *Anthemis* and *Maruta*. Leaves alternate: blades once to thrice pinnatifid, the segments narrow. Heads solitary or corymbose. Involucre saucer-shaped to hemispheric: bracts somewhat imbricate in 2–4 series, scarious-margined. Receptacle conic, hemispheric, or subglobose, naked. Ray-flowers, if present, pistillate, fruit-producing: corollas with white ligules. Disk-flowers numerous, perfect, fruit-producing: corollas yellow, the tube equaling or slightly longer than the throat, the lobes lanceolate to ovate. Achene asymmetric, the back nerveless, the face 3–5-ribbed. Pappus a crown or a mere border.—About 50 species, mostly natives of the Old World.



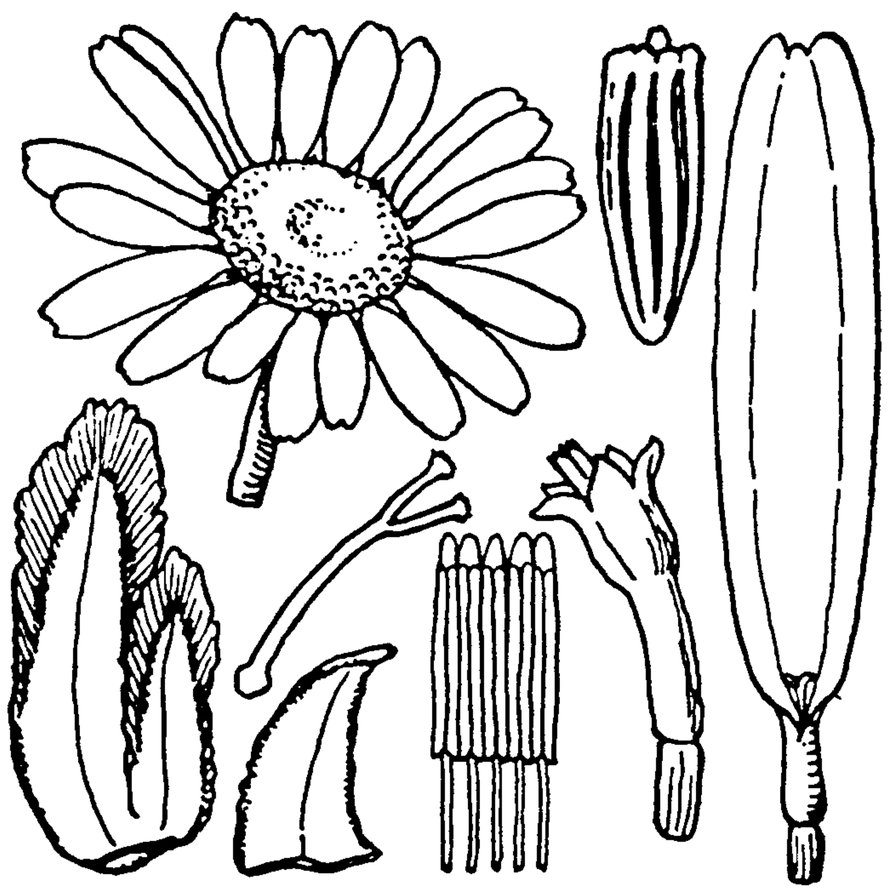
1. **C. maritima** (L.) Rydb. Stem and branches 1–3 dm. tall, often decumbent: leaf-blades 2–4 cm. long; blades bipinnatifid, the segments spreading, fleshy: involucre 10–12 mm. wide; bracts elliptic, obtuse, brown-margined: ray-flowers 15–20; ligules white, 8–11 mm. long: achene cuneate, 2–2.5 mm. long, rugose on the back and between the corky ribs: pappus-crown toothed.—Ballast and waste-places, Coastal Plain and adj. provinces, Ala. to Pa. and Mass. Nat. of Eu.—Spr.–fall.

109. **MATRICARIA** [Tourn.] L. Annual or perennial, branching herbs, but sometimes partly woody. Leaves alternate: blades lobed, dissected, or pinnately divided. Heads corymbose. Involucre saucer-shaped to hemispheric: bracts somewhat imbricate in 2–4 series, narrow. Receptacle convex, naked. Ray-flowers usually present, several, pistillate, fruit-producing: corollas with narrow or broad ligules, white in our species. Disk-flowers numerous, perfect, fruit-producing: corollas often yellow, the tube and throat slightly differentiated, the lobes deltoid. Achene subcylindric, 5–10-angled or 5–10-ribbed. Pappus in both ray and disk a lobed crown.—About 100 species, widely distributed.



1. **M. Parthenium** L. Stem 2–7 dm. tall, striate: leaf-blades broad, those of the lower ones at least, twice pinnately parted, the divisions incised: involucre 7–10 mm. wide; outer bracts linear-lanceolate, acute; inner bracts linear-elliptic, 2.5–3 mm. long, acute or obtuse: ligules white, 3–8 mm. long: disk cream-colored: achene 1.5 mm. long, 8–10-ribbed: pappus a toothed crown. [*Chrysanthemum Parthenium* (L.) Bernh.]—(Feverfew.)—Roadsides, fence-rows, and waste-places, various provinces, Ga. to Ohio and N. B.; also Calif. to Wash. Nat. of Eu.—(*W. I., Mex., C. A.*)—Sum.–fall.

110. **LEUCANTHEMUM** [Tourn.] Mill. Perennial herbs with root-stocks. Leaves alternate: blades toothed or entire, or sometimes pinnatifid. Heads solitary at the ends of the stem and branches. Involucre saucer-shaped: bracts somewhat imbricate in 2–4 series, narrow. Receptacle flat or convex, naked. Ray-flowers usually present, 10–25, pistillate and fruit-producing: corollas with white ligules. Disk-flowers numerous, perfect, fruit-producing: corollas yellow, the tube usually shorter than the throat, the lobes lanceolate. Filaments adnate to the tube. Achene cylindric or nearly so, 10-ribbed or 10-angled. Pappus wanting or obsolete, or in the ray a mere crown.—About 20 species, natives of the northern hemisphere.

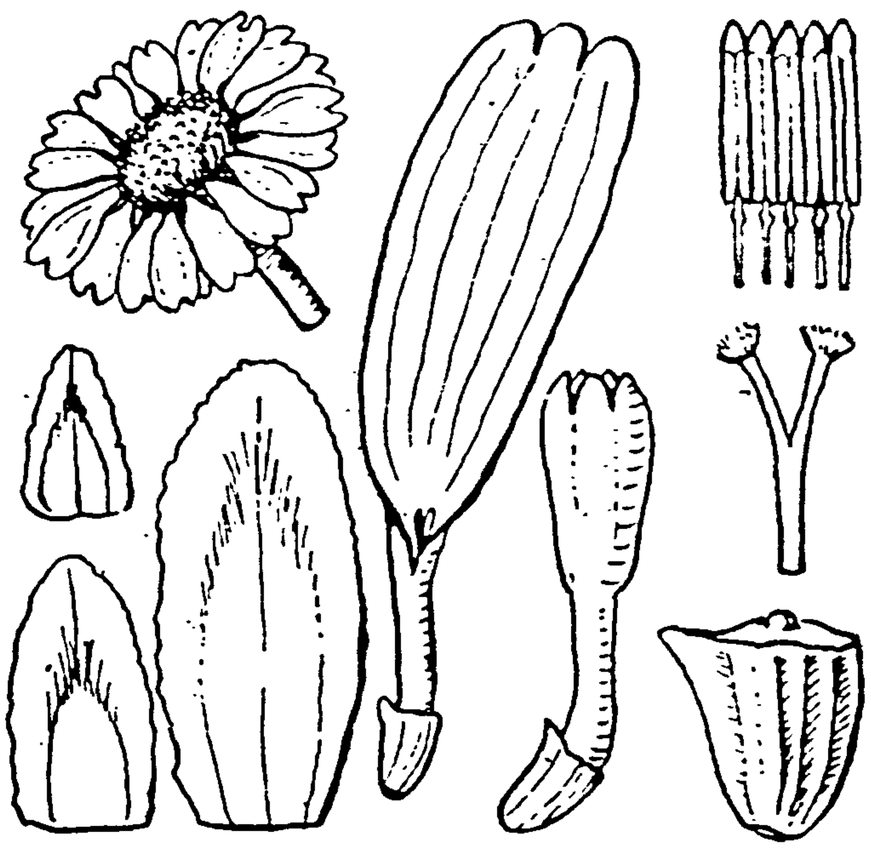


1. L. Leucanthemum (L.) Rydb. Plant 2–9 dm. tall, glabrous or nearly so: leaf-blades spatulate to linear, 2–15 cm. long, serrate or pinnatifid: involucre 12–18 mm. wide; outer bracts linear-lanceolate, acute: inner bracts elliptic, 5.5–6.5 mm. long, obtuse: ray-flowers numerous; ligules white or pink, 1–2.5 cm. long: disk yellow: achene cylindric, about 1.5 mm. long: pappus obsolete. [*Chrysanthemum Leucanthemum* L.]—(WHITE-DAISY. OX-EYE DAISY. WHITE-WEED.)—Fields, roadsides, woods, and waste-places, nearly throughout U. S. and Can. Nat. of O. W.—(*W. I.*)—Sum.–fall.—Widely distributed in the Southern States during the Civil War. In the mountains, when abundant, the plants, especially the ripe heads, are much eaten by sheep.

111. CHRYSANTHEMUM L. Annual herbs, suggesting coarse-leaved *Maruta* or *Cotula*. Leaves alternate: blades toothed to pinnatifid. Heads solitary at the ends of the branches. Involucre hemispheric or nearly so: bracts thin, imbricate in about 3 series, broad. Receptacle convex, naked. Ray-flowers 10–20, pistillate, fruit-producing: corollas with yellow ligules. Disk-flowers numerous, perfect, fruit-producing: corollas yellow, the tube and throat about equal in length, the lobes ovate. Achenes various, those of the ray short and obpyramidal, with 2 or 3 wing-angles, those of the disk prismatic or cylindric, 8–10-ribbed. Pappus wanting.—About 15 species, natives of the Old World.

Leaf-blades dissected, bipinnatifid: achenes of the ray 3-angled, the median angle with the broader wing-margin. 1. *C. coronarium*.
Leaf-blades toothed or merely pinnately lobed: achenes of the ray with 2 lateral wings. 2. *C. segetum*.

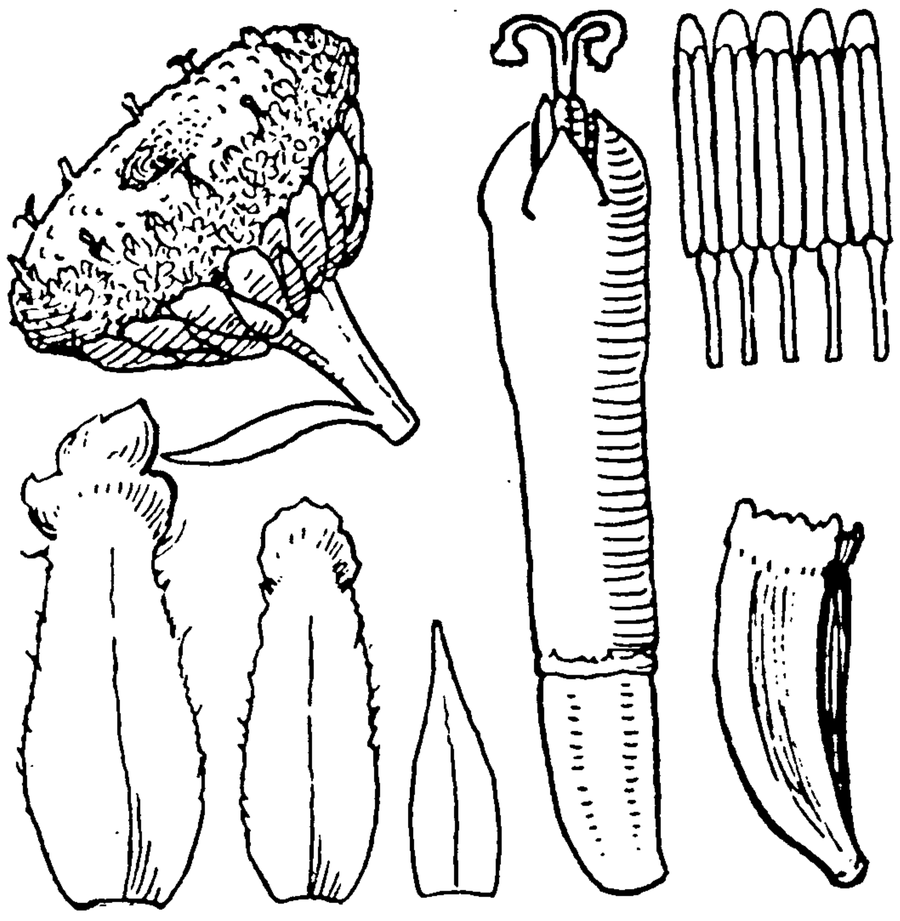
1. C. coronarium L. Stem 3–6 dm. tall, glabrous: blades of the cauline leaves obovate outline 3–6 cm. long, mostly bipinnatifid, sessile and auricled, the ultimate segments linear-lanceolate: heads on peduncles mostly over 5 cm. long: involucre 1 cm. high or less; bracts ovate to elliptic, with broad light-brown margins: ray-flowers 15–20, the ligules 1–1.5 cm. long: disk-corollas about 5 mm. long: achenes of the ray 3-angled, the middle angle winged, those of the disk 4-angled, the inner angle produced into a spur.—Waste-places and roadsides, various provinces, Ala. to Ont. Nat. of Medit. Reg.—(*W. I.*)—Spr.–fall.



2. C. segetum L. Stem 2–5 dm. tall, glabrous: blades of the cauline leaves spatulate to elliptic or lanceolate, pinnately lobed, toothed, or entire, the segments oblanceolate to cuneate: heads on peduncles mostly less than 5 cm. long: involucre about 1 cm. high; bracts elliptic, often broadly so, with broad brown margins: ray-flowers 12–15, the ligules 1–2 cm. long: disk-corollas about 5 mm. long: achenes of the ray with two lateral wings, those of the disk cylindric, 10-ribbed.—(CORN-MARIGOLD. CORN-CHRYSANTHEMUM.)—Waste-places, fields, and cult. grounds, various provinces, Fla. to Ala., N. Y., and N. B.; also Calif. and Ore. Nat. of O. W.—Sum.–fall.

112. TANACETUM [Tourn.] L. Perennial rather coarse erect herbs with rootstocks or rarely annuals. Leaves alternate: blades once to thrice

pinnatifid. Heads corymbose. Involucre hemispheric to saucer-shaped: bracts in 2 or 3 series, usually narrow, often partly similar. Receptacle convex, naked. Ray-flowers 5–20, pistillate, fruit-producing: corollas with erect or spreading, inconspicuous, yellow ligules. Disk-flowers numerous, perfect, fruit-producing: corollas with the tube and throat only slightly differentiated. Achenes subcylindric, those of the ray mostly 3-angled, those of the disk 5-angled. Pappus a crown-like border.—About 30 species, widely distributed in the Northern Hemisphere.



1. **T. vulgare** L. Plants perennial, 3–10 dm. tall, acrid-aromatic: leaf-blades 5–20 cm. long, with the ultimate segments sharply toothed: involucre 6–8 mm. wide, the inner bracts 4–5 mm. long: ray-flowers scarcely exceeding the disk and so inconspicuous as to make the heads appear discoid; corollas yellow: achene about 2 mm. long.—(TANSY.)—Fields, roadsides, and about gardens, various provinces, Ga. to Miss., Calif., Wash., and N. S. Nat. of O. W.—Sum.

113. **ARTEMISIA** L. Annual or perennial, often copiously branched herbs, or shrubs. Leaves alternate: blades dissected, lobed, or toothed, or entire. Heads relatively small, mostly in panicles, usually nodding before maturity, apparently discoid, the marginal flowers without ligules or wanting. Involucre campanulate to hemispheric: bracts in 2–4 series, the inner longer and thinner than the outer. Receptacle convex or conic, naked or hairy. Flowers yellowish or greenish. Marginal flowers (functionally ray-flowers) pistillate, fruit-producing: corollas various, sometimes oblique, or wanting. Disk-flowers few, perfect, often fruit-producing: corollas campanulate, funnelform, or trumpet-shaped. Achene ellipsoid, terete. Pappus wanting.—About 250 species, in the Northern Hemisphere and South America.—WORMWOODS.

Disk-flowers not producing fruits: stigmas united or very short and erect: receptacle naked.	I. DRACUNCULOIDES.
Disk-flowers fruit-producing, their stigmas elongate and recurved.	
Receptacle hairy.	II. FRIGIDAE.
Receptacle naked.	
Annual or biennial herbs.	III. ANNUAE.
Perennial plants.	
Leaf-blades with broad lobes.	IV. VULGARES.
Leaf-blades bipinnatifid, the segments very narnarrow or filiform.	V. PONTICAE.

I. DRACUNCULOIDES

Plant biennial: heads mostly erect.	1. *A. caudata.*
Plant perennial: heads mostly nodding.	2. *A. campestris.*

II. FRIGIDAE

Woody perennial: leaf-blades with linear to ovate obtuse teeth.	3. *A. Absinthium.*

III. ANNUAE

Heads in dense axillary spikes, not nodding.	4. *A. biennis.*
Heads in lax racemes or panicles, nodding.	5. *A. annua.*

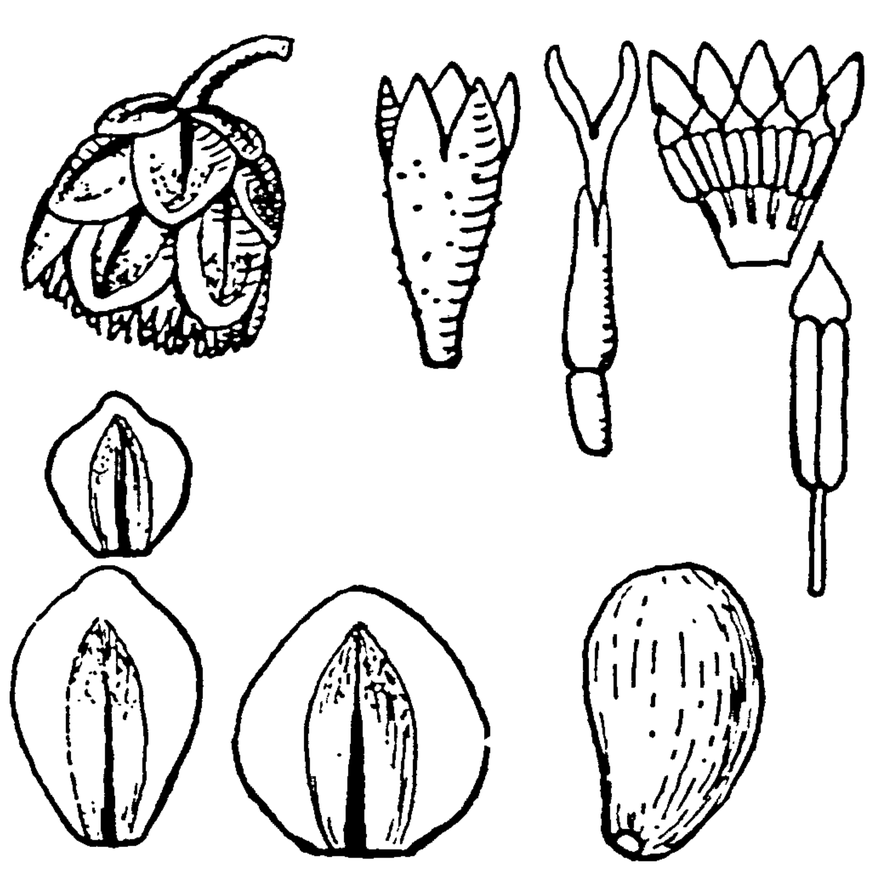
IV. VULGARES

Perennial with broad-lobed leaf-blades: heads in simple or compound spikes. 6. *A. vulgaris.*

V. PONTICAE

Perennial with narrow lobed leaf-blades: heads in simple or compound racemes. 7. *A. Abrotanum.*

1. **A. caudata** Michx. Stem, glabrous, at least at maturity, 5–18 dm. tall, often with ascending branches at the base: leaves numerous; blades once to thrice pinnately divided, the segments linear-filiform to nearly filiform: heads very numerous in elongate panicles: involucre with the disk-flowers perfect but not producing fruit, 3–4 mm. high; bracts ovate to oval or broadly elliptic: ray-flowers 6–8: corollas 1.5 mm. long: achene about 1 mm. long.—Sandy soil, various provinces, Fla. to Tex., Wyo., and N. B.—Sum.–fall.



2. **A. campestris** L. Stem, glabrous, 3–6 dm. tall, usually branched, striate: leaves clustered at the base of the stem; blades mostly once or twice pinnately divided, the segments linear-filiform: heads numerous, in open panicles: involucre with the disk-flowers perfect, but not producing fruits, 2–2.5 mm. high; bracts ovate to oval: ray-flowers 6–10: corollas 1 mm. long: achene fully 0.5 mm. long.—Sandy woods and dry banks, various provinces, S. C. to Conn. Nat. of Eu.—Sum.–fall.

3. **A. Absinthium** L. Stem, more or less woody, 4–12 dm. tall, finely cinereous-pubescent, much-branched: leaf-blades once, twice, or thrice pinnately divided, the segments linear, lanceolate, or ovate: heads numerous in leafy panicles, nodding: involucre 3–3.5 mm. high, with the central flowers fruit-producing; bracts lanceolate to ovate: ray-flowers about 10: corollas 1.5 mm. long: achene fully 1 mm. long.—(WORMWOOD.)—Fields, roadsides, and banks, various provinces, N. C. to Utah, B. C., Ont., and Newf. Nat. of Eu.—Sum.–fall.

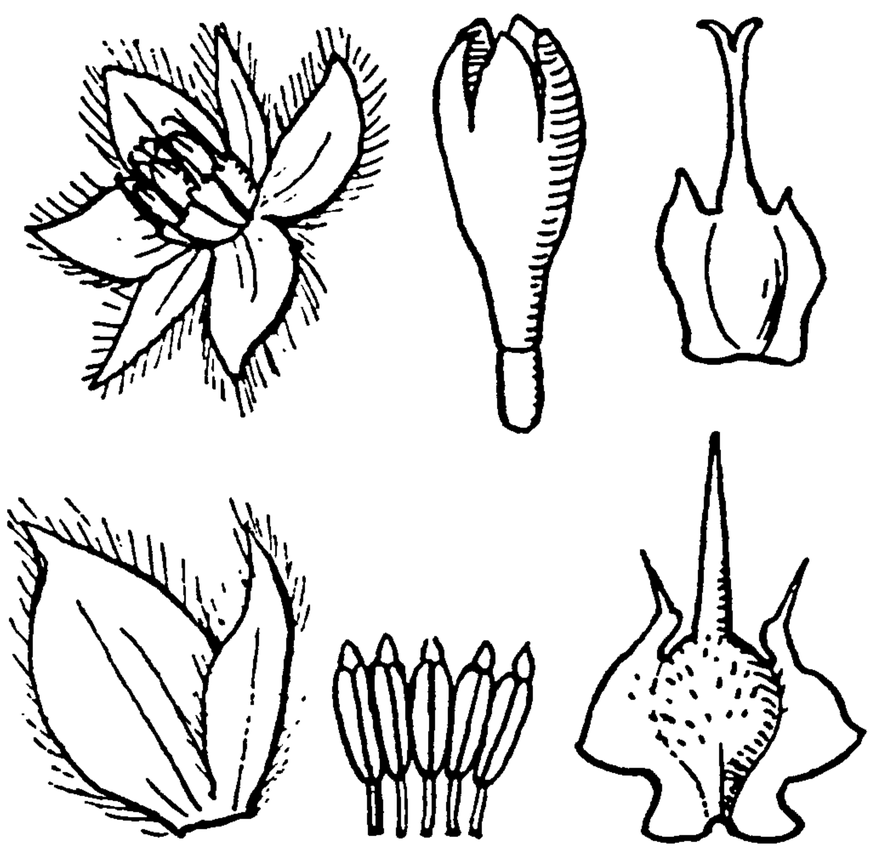
4. **A. biennis** Willd. Plant glabrous, inodorous, insipid, 2–11 dm. tall, the stem nearly simple or sparingly branched: leaves numerous; blades once or twice pinnately divided, the segments lanceolate or linear, incised-pinnatifid or pinnatifid: panicle-branches ending in spikes: heads not drooping, crowded in axillary clusters: involucre 2–3 mm. high, with the central flowers perfect and fruit-producing; bracts elliptic to elliptic-lanceolate: ray-flowers 10–15; disk-flowers 10–15; corollas yellow, about 1 mm. long: achene about 1 mm. long.—Gravelly banks and rocky soil, various provinces N of Coastal Plain, Tenn. to Mo., B. C., N. S., and Pa.; naturalized eastward.—(*O. W.*)—Sum.–fall.

5. **A. annua** L. Plant, glabrous, very aromatic, 4–10 dm. tall, the stem much-branched: leaf-blades once, twice, or thrice pinnately divided, the segments elliptic or incised, or pinnatifid: panicle-branches ending in loose racemes: heads subglobose, scattered, nodding: involucre about 1.5 mm. high, with the central flowers perfect and fruit-producing; bracts mostly elliptic, the outer narrower than the inner: ray-flowers 5 or 6; corollas greenish-yellow, less than 1 mm. long: disk-flowers 5 or 6; corollas yellow, 1 mm. long: achene 1 mm. long.—Fields, roadsides, and waste-places, various provinces, Tenn. to Ark., Ont., N. B., and Va.; also Calif. Nat. of O. W.—Sum.

6. A. vulgaris L. Herbaceous, lanate-tomentose, 3–12 dm. tall, the stems paniculately branched: leaf-blades various, white-woolly beneath, twice pinnatifid or pinnately parted, the segments lanceolate or linear: heads first nodding, soon erect, in a leafy panicle: involucre 4–5 mm. high, with the central flowers fruit-producing; bracts ovate to elliptic or elliptic-lanceolate: ray-flowers 6–12; corollas 2 mm. long: disk-flowers 5–15; corollas 2.5 mm. long: achene 1.5 mm. long or more.—(MUGWORT. WHITE-SAGE.)—Roadsides, stream-banks, cult. grounds, and waste-places, various provinces, Ga. to Ala., B. C., Ont., and Newf. Nat. of Eu.—(*W. I.*)—Sum.–fall.

7. A. Abrotanum L. Shrub 1 m. tall or less, puberulent or glabrous, the stem much-branched, the branches erect or ascending: leaf-blades twice pinnately divided, the segments linear-filiform, revolute: heads numerous, nodding, in leafy panicles: involucre about 3 mm. high; bracts linear-lanceolate to elliptic, arachnoid-canescent: ray-flowers about 10; corollas 1.5 mm. long: disk-flowers 15–20; corollas nearly 2 mm. long: achene about 1 mm. long.—(SOUTHERNWOOD.)—Waste-places and roadsides, various provinces, N. C. to Colo. and N. B. Nat. of Eu.—Sum.–fall.

114. SOLIVA R. & P. Annual, caulescent, diminutive herbs. Leaves alternate: blades pinnately twice divided, the ultimate segments deeply lobed. Heads sessile on the stem or on the branches, green, discoid, the flowers mostly pistillate and apetalous, the few perfect ones with 2–6-lobed corollas. Involucre hemispheric: bracts broad in 2 series. Anthers broad, mostly rounded at the base. Achene much flattened, winged, the wings, often broadly pandurate, smooth, usually prolonged into a short spine on either side of the larger terminal spine. Pappus none.—About 3 species, South American.

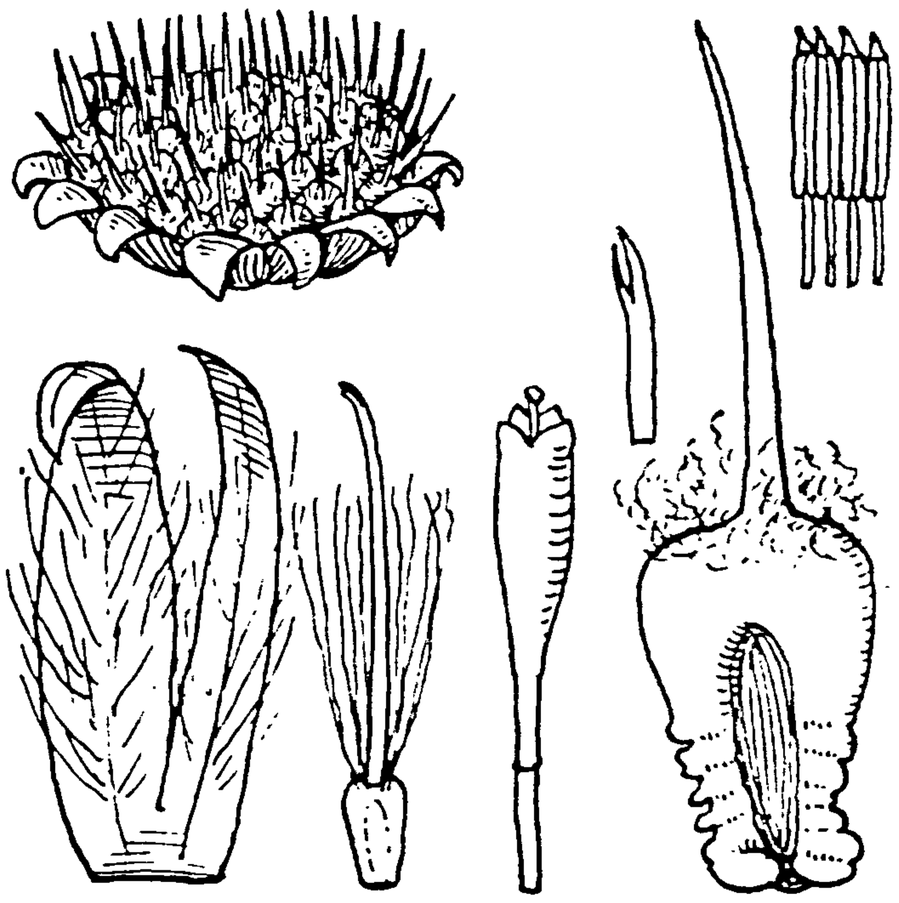


1. S. sessilis R. & P. Plant depressed, the stem and branches, at least, villous: leaves 2–5 cm. long, the lobes acute or acuminate, ciliate: involucre sessile in the somewhat dilated leaf-bases; bracts ovate, about 4 mm. long, acute or sharp acuminate: achene-body about 2 mm. long, the broad wings ciliolate, the terminal spine about as long as the achene-body.—Lawns and banks, N Fla. to La. Nat. of S. Am.—Spr.–fall.

115. GYMNOSTYLES A. Juss. Annual, caulescent, diminutive, often matted stoloniferous herbs. Leaves alternate: blades once or twice pinnately divided, the ultimate segments entire or toothed. Heads sessile at the base of the plant, green, discoid, the flowers as in *Soliva*. Involucre hemispheric, becoming flattish: bracts narrow, in 1 or 2 series. Anthers narrow, somewhat sagittate at the base. Achene somewhat flattened, with callous corrugated margins and a terminal spine. Pappus none.—About 3 species, South American.

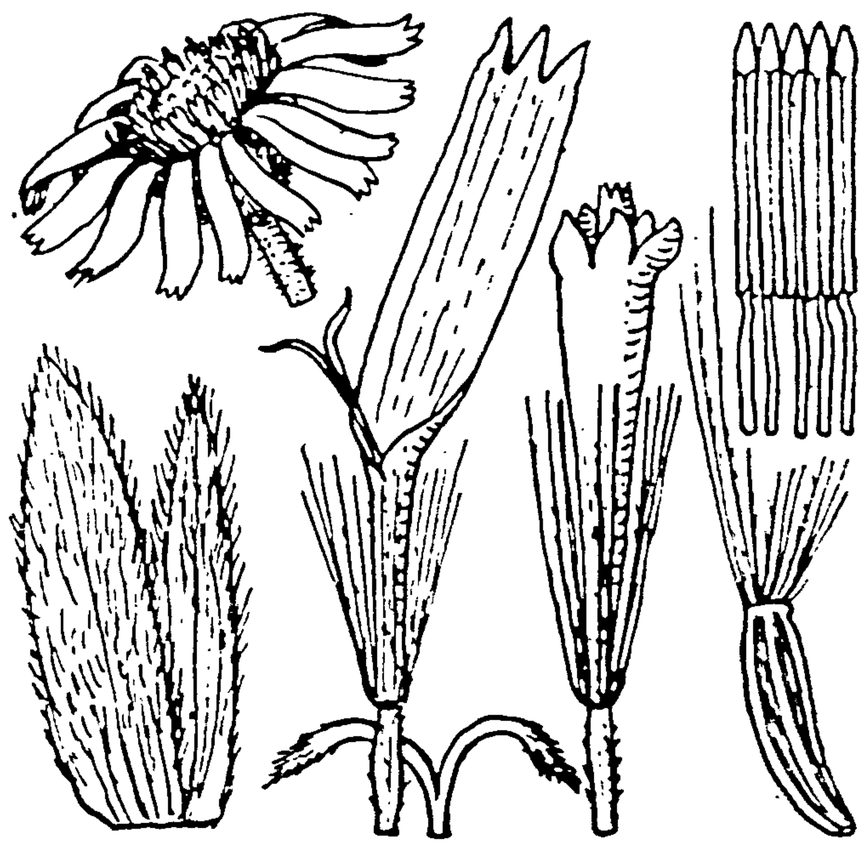
Leaf-blades 2-pinnate: achene-callous corrugated up to the base of the rounded top: heads much depressed, 8–10 mm. wide. 1. *G. anthemifolia.*
Leaf-blades 1-pinnate: achene-callous corrugated up to the truncate or notched top: heads subglobose, 3–6 mm. wide. 2. *G. nasturtiifolia.*

1. G. anthemifolia A. Juss. Plant somewhat depressed, light-green, the branches often creeping: leaves erect or nearly so, 4–14 cm. long, the lobes acute or acuminate, long-hairy: bracts of the involucre elliptic-lanceolate, 4.5–5.5 mm. long, usually somewhat acuminate: achene-body ellipsoid-cuneate, about 2 mm. long, the margins bluntly corrugated.—In dense tufts, bayou-banks, roadsides, ditch-banks, paths, fields, yards and waste grounds, Coastal Plain, N Fla. to Tex. Nat. of S. Am.—Spr.



2. G. nasturtiifolia A. Juss. Plant much depressed, dark-green, the branches creeping: leaves prostrate or spreading, 1.5 cm. long or less, the lobes obtuse or acutish, short-hairy: bracts of the involucre lanceolate to linear-spatulate, 2.5–3 mm. long, acute or acuminate: achene-body cuneate, 1.5–2 mm. long, the margin sharply corrugated. [*Soliva nasturtiifolia* (A. Juss.) D. C.]—In patches or carpets, low, moist, or damp, partly shaded places, Coastal Plain, Fla. to La. and N. C. Nat. of S. Am.—Early spr.

116. ARNICA L. Perennial simple-stemmed or sparingly branched herbs. Leaves typically opposite: blades entire or toothed. Heads solitary or several. Involucre mostly turbinate or campanulate, or broader in age: bracts nearly equal, narrow. Ray-flowers with yellow ligules. Corollas of the disk-flowers tubular, the lobes very short. Achene ribbed. Pappus a single series of slender bristles.—About 45 species, in the Northern Hemisphere.



1. A. acaulis (Walt.) B. S. P. Plant 2–10 dm. tall, hirsute: leaves mainly basal and spreading on the ground; blades elliptic to oval or ovate, 5–12 cm. long, shallowly toothed or nearly entire: bracts of the involucre 9.5–11 mm. long, acute: ligules 1.5–2.5 cm. long: achene 4 mm. long. [*A. nudicaulis* Nutt.]—(LEOPARD'S-BANE.)—Pinelands and low open woods, in acid soil, Coastal Plain and adj. provinces, Fla. to Pa.—Sum.—Rather rare.

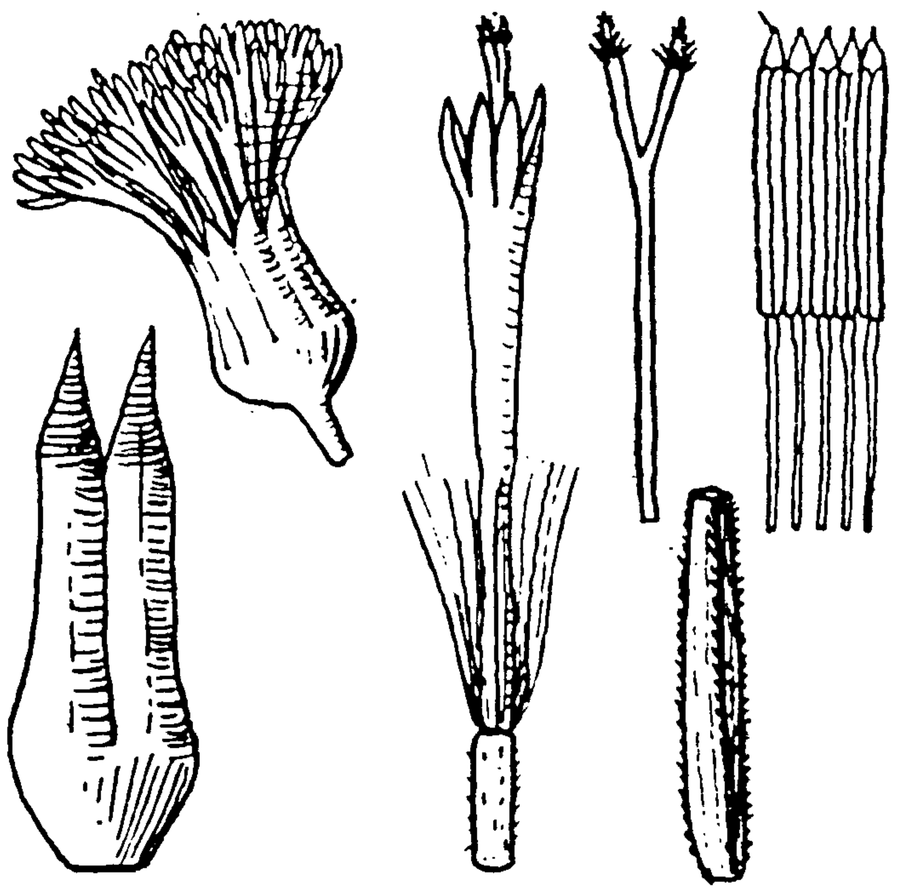
117. EMILIA Cass.[1] Annual or perennial, tender herbs. Leaves alternate, but often mostly basal: blades entire toothed, or lyrate-pinnatifid. Heads solitary or in lax corymbs. Involucre swollen at the base: bracts in one series and without accessory ones at the base. Ray-flowers wanting. Disk-corollas golden, purple, or red, with a cylindric throat and a slender tube, the lobes lanceolate. Filaments slender. Achene 5–ribbed.—About 5 species, natives of the Old World Tropics.

Corollas scarlet or orange: heads stout: involucre campanulate, usually over 1 cm. long. 1. *E. coccinea.*

Corollas lilac or pale-purplish: heads slender: involucre cylindric-campanulate, usually less than 1 cm. long. 2. *E. sonchifolia.*

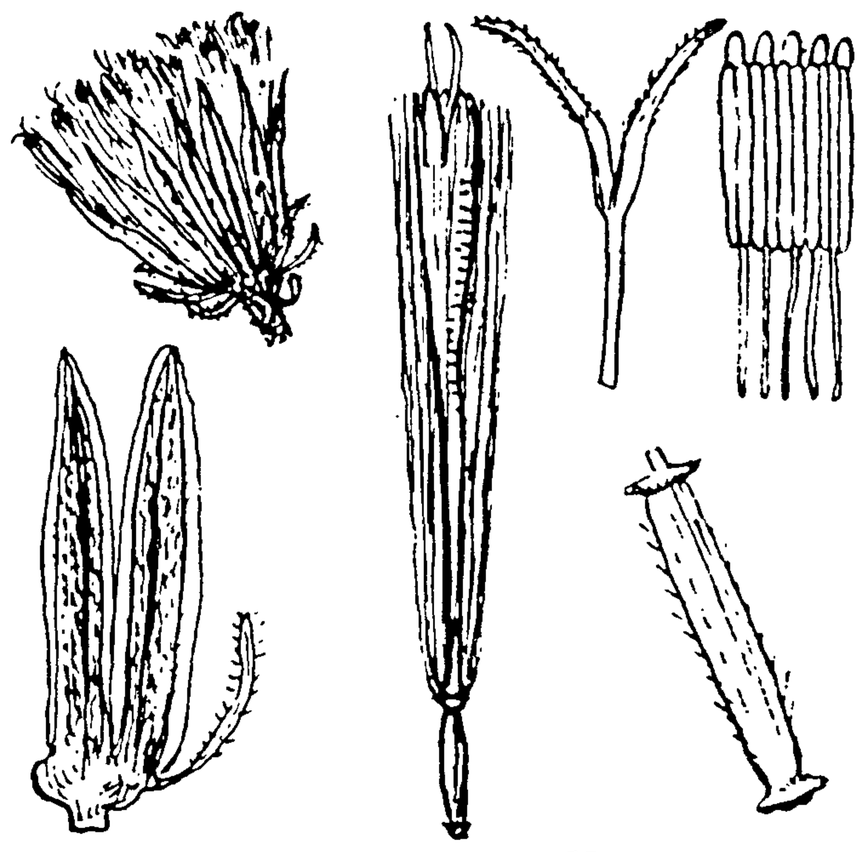
[1] Revised by Edward Johnston Alexander.

1. E. coccinea (Sims) Sweet. Plant moderately slender, mostly 1–8 dm. tall: leaf-blades rather succulent, those of the lower leaves spatulate, those of the upper leaves lanceolate to linear, auricled at the base, all sinuate-dentate: heads long-peduncled: involucral bracts linear, 10–12 mm. long: corollas 9–11 mm. long: achene 4 mm. long. [*E. sonchifolia* (Fl. SE. U. S.)]—Cult. grounds, waste-places, fields, and roadsides, pen. Fla. and Florida Keys. Nat. of O. W. trop.—(*W. I., Mex., C. A., S. A.*)—All year.



2. E. sonchifolia (L.) DC. Plant very slender, 1–5 dm. tall: leaf-blades spatulate in outline below, above lanceolate to elliptic, all auricled at the base, the lower narrowed to a wing-like petiole between the blade and the auricled base, all sinuate-dentate, or somewhat pinnatifid: heads long-peduncled: involucral bracts linear, 8–10 mm. long: corollas 7–8 mm. long: achene 3 mm. long.—Cult. grounds, waste-places, fields, and roadsides, pen. Fla. and Florida Keys. Nat. of O. W. trop.—(*W. I., Mex., C. A., S. A.*)

118. GYNURA Cass. Annual or perennial, rather coarse herbs or subshrubs. Leaves alternate; blades entire, toothed, pinnatifid or pinnately parted. Heads solitary to many. Involucre campanulate or cylindric, with several subtending bractlets: bracts flat. Heads discoid. Corollas yellow or orange to red, with a long, narrow funnel-form throat, and triangular or ovate lobes. Anthers entire or minutely sagittate at the base. Style-branches slender with long, subulate, pubescent appendages. Achene terete, 5–10-ribbed. Pappus copious, white.—About 20 species, natives of Asia, Africa, East Indies, and Australia.



1. G. aurantiaca (Blume) DC. Plant up to 1 m. tall, the stem densely velvety with long purple hairs, often widely branched: leaf-blades simple, with flaring teeth; the lower petioles expanding into an auriculate base; upper leaves sessile by an auriculate base: bracts subtending the involucre narrowly linear to filiform; involucre 10–15 mm. high: corollas yellow-orange: achene pubescent.—(VELVET-PLANT.)—Pinelands, roadsides and waste-places, S pen. Fla. Nat. of E. I. (*W. I.*)—Spr.

119. MESADENIA Raf. Perennial, somewhat leafy herbs. Leaves alternate: blades undulate, toothed, or somewhat lobed. Heads in corymb-like clusters but centrifugal. Involucre cylindric to cylindric-ovoid: bracts sometimes winged or keeled. Flowers white or pinkish; disk-corollas with linear or linear-lanceolate lobes longer than the campanulate throat. Filaments filiform. Achene ribbed, glabrous. [*Cacalia* L. in part]—About 30 species, North American.—Sum. or Spr.–fall S.—INDIAN-PLANTAINS.

Bracts of the involucre wingless.
  Leaf-blades pedately or digitately veined, those of the lower leaves wider than long. I. RENIFORMES.

Leaf-blades parallel-veined or subpinnately veined: stem terete. — II. LANCEOLATAE.
Bracts of the involucre winged along the midrib. — III. TUBEROSAE.

I. RENIFORMES

Leaves green on both sides or glaucous beneath; blades pedately veined.
Leaves green: stem furrowed. — 1. *M. reniformis.*
Leaves glaucous beneath: stem terete. — 2. *M. atriplicifolia.*
Leaves glaucous on both sides: blades digitately veined. — 3. *M. maxima.*

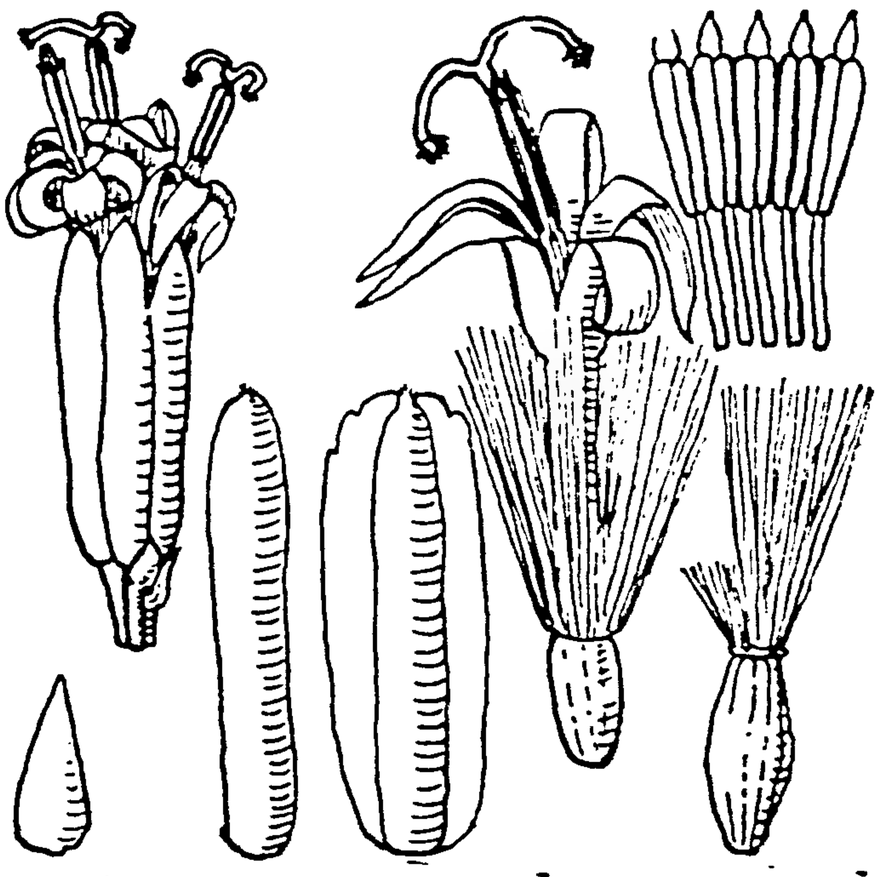
II. LANCEOLATAE

Leaf-blades ovate, commonly broadly so. — 4. *M. Elliottii.*
Leaf-blades linear to lanceolate. — 5. *M. lanceolata.*

III. TUBEROSAE

Stem terete, merely striate: blades of the upper stem-leaves hastate. — 6. *M. diversifolia.*
Stem channeled or angled: blades of the upper stem-leaves not hastate.
Lower leaves with 7–9-veined entire or crenate blades.
Leaf-blades entire or nearly so. — 7. *M. tuberosa.*
Leaf-blades crenate. — 8. *M. floridana.*
Lower leaves with 3–5-veined sinuate-dentate blades. — 9. *M. sulcata.*

1. M. reniformis (Muhl.) Raf. Stem 9–30 dm. tall: blades of the cauline leaves reniform, 10–60 cm. wide: involucral bracts 8–11 mm. long: achene about 5 mm. long. [*C. reniformis* Muhl.]—(GREAT INDIAN-PLANTAIN.)—Rich banks, woods, and thickets, various provinces, rarely Coastal Plain, Ga. to Ala., Tenn., Minn., and N. J.



2. M. atriplicifolia (L.) Raf. Stem 9–20 dm. tall: blades of the cauline leaves ovate to triangular, or narrower above, angulate-lobed or sharply and coarsely toothed: involucral bracts 8–11 mm. long: achene 4–4.5 mm. long. [*C. atriplicifolia* L.]—(PALE INDIAN-PLANTAIN.) — Woods, various provinces, Fla. to Kans., Minn., and N. J.

3. M. maxima Harper. Stem about 15 dm. tall: blades of the cauline leaves broadly ovate or narrower above, coarsely sinuate-toothed involucral bracts 9–11 mm. long: achene not seen.—Dry pinelands, Sumter Co., near inner edge of Coastal Plain of Ga.

4. M. Elliottii Harper. Stem 8–12 dm. tall: blades of the cauline leaves ovate to oval, entire or repand-undulate: involucral bracts 8–10 mm. long: achene 6–6.5 mm. long. [*Cacalia ovata* (Chapm. Fl.) *M. ovata* (Fl. SE. U. S.)]—Swamps, low pinelands, and damp woods, Coastal Plain, Fla. to La. and Ga.—Late sum.

5. M. lanceolata (Nutt.) Raf. Stem 8–15 dm. tall: blades of the cauline leaves linear, narrowly lanceolate, or linear-elliptic, entire or repand-denticulate: glaucous (or merely yellowish-green in *M. lanceolata virescens*): involucral bracts 8–10 mm. long: achene about 5 mm. long. [*C. lanceolata* Nutt.]—Everglades and wet pinelands, Coastal Plain, Fla. to La. and N. C.

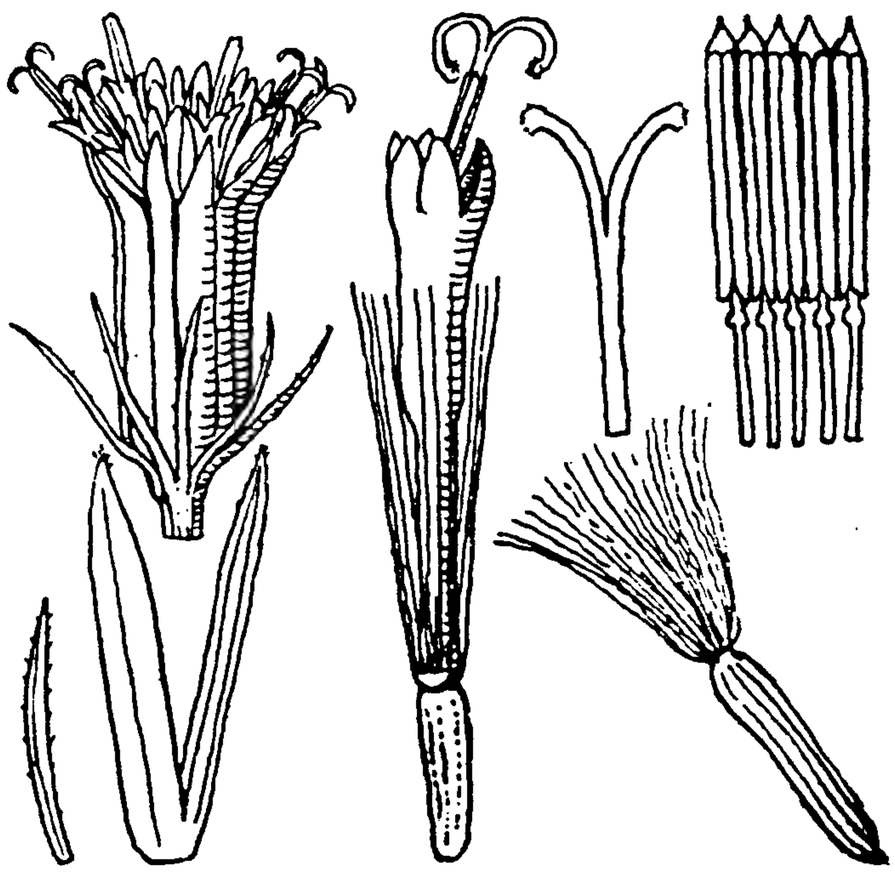
6. M. diversifolia (T. & G.) Greene. Similar to *M. atriplicifolia* in habit, but not glaucous: stem angled, bracts keeled: corolla-lobes but little longer than the throat. [*C. diversifolia* T. & G. *M. difformis* Small.]—Swamps, Coastal Plain, W Fla. and SW Ga.

7. **M. tuberosa** (Nutt.) Britton. Stem 6–12 dm. tall: blades of the cauline leaves ovate, oval, elliptic-lanceolate, or narrowly elliptic, 5–20 cm. long: bracts of the involucre 8–10 mm. long: achene 4.5–5 mm. long. [*C. tuberosa* Nutt.]—Prairies, various provinces, Ala. to La., Minn., and Ont.

8. **M. floridana** (A. Gray) Greene. Stem 7–12 dm. tall: leaf-blades ovate, oval, or elliptic, crenate: involucral bracts 10–12 mm. long: corolla-lobes slightly longer than the throat: achene about 5 mm. long.—Dry pinelands, E Fla.—Spr.–sum.

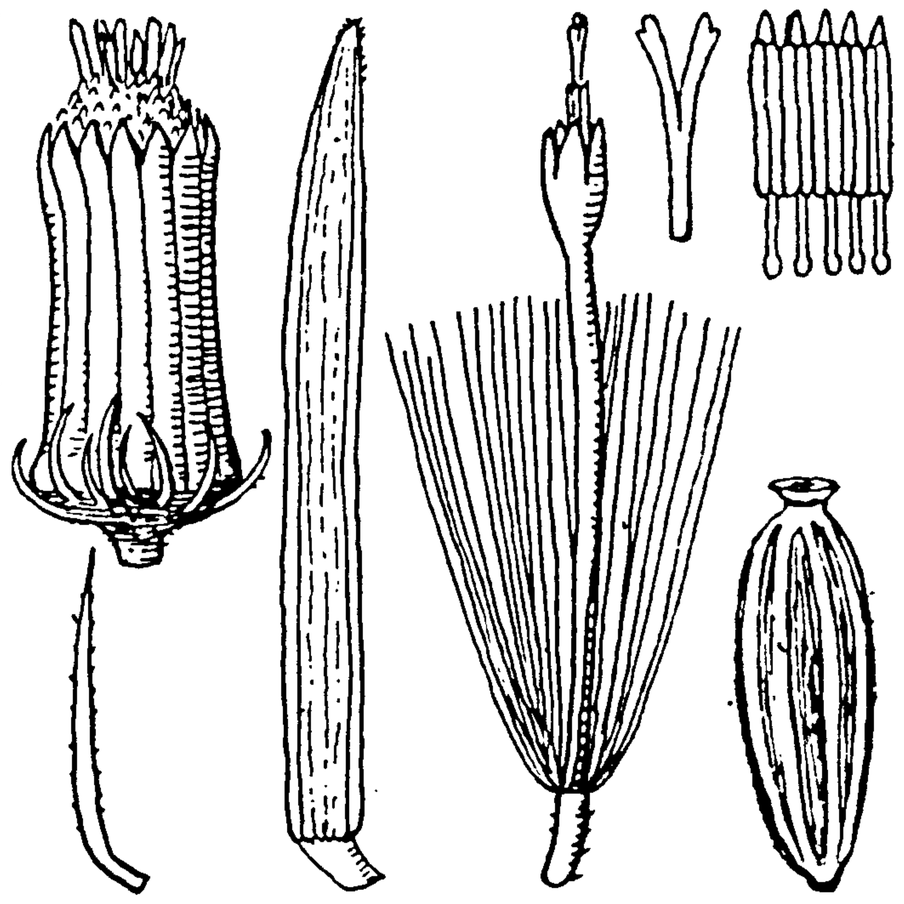
9. **M. sulcata** (Fernald) Small. Stem 9–15 dm. tall: leaf-blades ovate to elliptic-ovate, narrowly elliptic, or elliptic-lanceolate: involucral bracts 8–10 mm. long: corolla-lobes twice as long as the throat: achene 5.5–6 mm. long.—Bogs or wet woods, Coastal Plain, N Fla. to Ala. and Ga.—Sum.–fall.

120. **SYNOSMA** Raf. Perennial, copiously leafy herbs. Leaves alternate: blades triangular to hastate, toothed. Heads corymbose. Involucre nearly cylindric: bracts narrow. Flowers white or pinkish: disk-corollas with lanceolate lobes shorter than the funnelform throat. Filaments enlarged below the anthers. Achene ribbed, glabrous.—One species.



1. **S. suaveolens** (L.) Britton. Plant 6–15 dm. tall: leaves numerous; blades hastate, 8–20 cm. long, serrate or dentate-serrate: larger bracts of the involucre 10–11 mm. long: corollas 11–12 mm. long: achene slender, 7–9 mm. long. [*Cacalia suaveolens* L.]—Rich woods, thickets, and shaded banks, various provinces, Fla. to Tenn., Minn., and Mass.—Sum.–fall.

121. **ERECHTITES** Raf. Annual herbs. Leaves alternate: blades toothed or pinnatifid. Heads corymbose or paniculate. Involucre narrow and somewhat swollen at the base: bracts narrow, flat. Disk-corollas with triangular-lanceolate or deltoid lobes shorter than the narrow throat. Filaments longer than the anthers. Achene ribbed. Pappus of many white bristles.—About 12 species, American and Australian.



1. **E. hieracifolia** (L.) Raf. Plant 2–20 dm. tall, watery: leaf-blades spatulate-elliptic to lanceolate, 5–20 cm. long, coarsely toothed, incised, or pinnatifid: involucre 12–15 mm. long; bracts narrowly linear: corollas 8–9 mm. long, white: achene about 1.5 mm. long.—(Fireweed. Pilewort.)—Fields, woods, roadsides, and waste-places, various provinces, Fla. to La., Sask., and Newf.—Sum. or all year S.—A rather tender, but also somewhat coarse herb varying greatly in habit and with almost endless leaf-forms.

122. **SENECIO** [Tourn.] L. Annual or perennial herbs. Leaves alternate: blades entire, toothed, pinnatifid, or pinnately parted. Heads solitary or many. Involucre campanulate to cylindric: bracts flat. Ligules of the ray yellow, when present, in our species. Disk-corollas yellow with a funnelform throat and triangular or ovate lobes. Filaments often enlarged below the anthers. Achene 5–10-ribbed, pubescent or papillose.—About 1,500 species, widely distributed.—Spr.—SQUAW-WEEDS. RAGWORTS. RAGWEEDS. GROUNDSELS.

Plant annual or perhaps biennial: pubescence, if present, arachnoid.
  Ray-flowers present: achene pubescent on the angles. I. LOBATI.
  Ray-flowers wanting: achene pubescent all over. II. VULGARES.
Plant perennial: foliage, if pubescent, woolly or floccose.
  Heads large, the involucres over 1 cm. high: ray-flowers none. III. NUDICAULES.
  Heads small, the involucres less than 1 cm. high: ray-flowers normally present.
    Blades of the basal leaves toothed or partly and slightly lyrate-pinnatifid. IV. AUREI.
    Blades of the basal leaves pinnately parted and twice or thrice pinnatifid or dissected. V. MILLEFOLIA.

I. LOBATI

Plant with pinnately parted leaf-blades: involucre 4–5 mm. high; bracts light-green. 1. *S. glabellus.*

II. VULGARES

Plant with pinnatifid leaf-blades: involucre 6–8 mm. high; bracts, as well as the small bracts at their bases, dark-green or black. 2. *S. vulgaris.*

III. NUDICAULES

Stem usually bearing 3–5 pedunculate somewhat racemose heads: heads very many-flowered. 3. *S. Rugelia.*

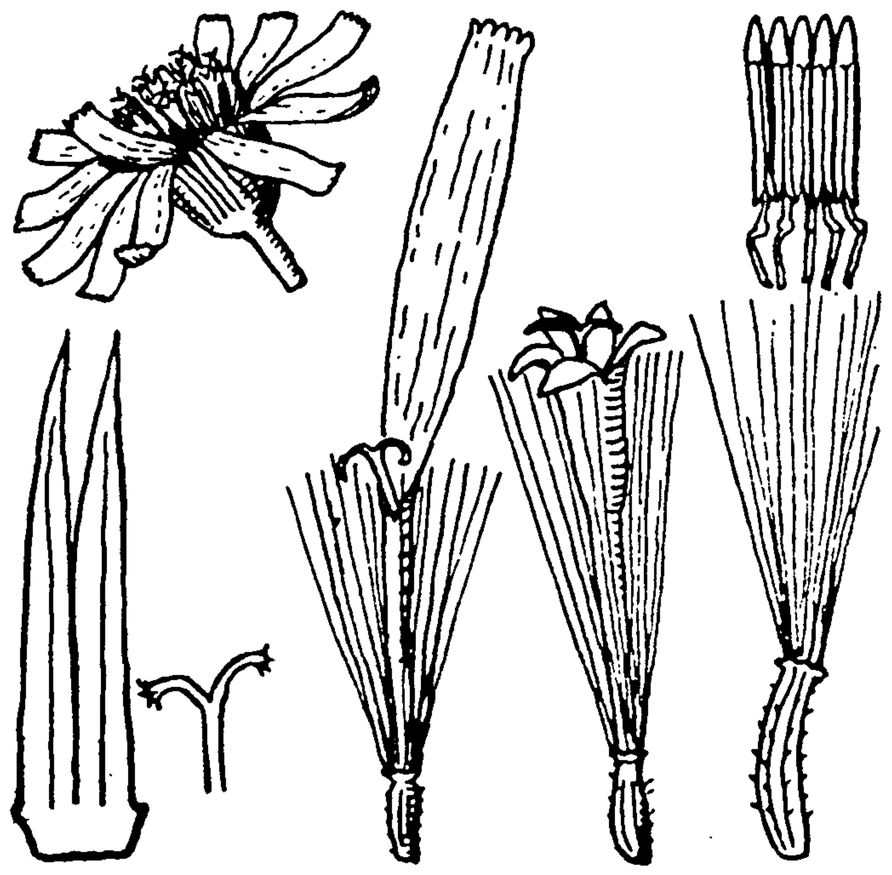
IV. AURIE

Blades of the basal leaves cordate or truncate at the base.
  Blades of the basal leaves predominantly lanceolate or elliptic-lanceolate, sharply serrate. 4. *S. Robbinsii.*
  Blades of the basal leaves predominately orbicular or ovate, crenate.
    Involucres over 5 mm. high. 5. *S. aureus.*
    Involucres less than 5 mm. high. 6. *S. gracilis.*
Blades of the basal leaves gradually narrowed or cuneate at the base.
  Blades of the basal leaves scarcely longer than broad. 7. *S. rotundus.*
  Blades of the basal leaves manifestly or markedly longer than broad.
    Blades of the basal leaves wholly, or predominately, narrowly or broadly spatulate: achene glabrous. 8. *S. obovatus.*
    Blades of the basal leaves wholly, or predominately elliptic, oval, or lanceolate: achene pubescent.
      Foliage more or less copiously arachnoid; often densely so, the base of the stem and petioles of the basal leaves usually copiously silky-tomentose.
        Involucre 4–6 mm. high: blades of the basal leaves elliptic or oval, varying to broadest above or below the middle, or oblanceolate to lanceolate.
          Blades of the basal leaves elliptic to oval, varying to ovate or obovate: involucre 5–6 mm. long. 9. *S. pauperculus.*
          Blades of the basal leaves narrowly lanceolate to oblanceolate: involucre 4–5 mm. long. 10. *S. Smallii.*
        Involucre 6–7 mm. high: blades of the basal leaves triangular-ovate to broadly lanceolate, triangular-lanceolate, or ovate. 11. *S. tomentosus.*
      Foliage nearly glabrous, the base of the stem, petioles, and inflorescence inconspicuously arachnoid. 12. *S. alabamensis.*

V. MILLEFOLIA

Primary leaf-divisions 1–2-pinnatifid. 13. *S. Memmingeri.*
Primary leaf-divisions dissected, the ultimate divisions mainly linear. 14. *S. Millefolium.*

1. S. glabellus Poir. Plant annual, glabrous, the stem, 1–9 dm. tall: leaf-blades 3–20 cm. long, the lateral lobes cuneate to suborbicular, coarsely toothed, the terminal lobe rather large: involucre 4–6 mm. long; bracts narrowly linear to linear-lanceolate: ligules 4–8 mm. long: achene 1.5–2 mm. long, pubescent on the ribs. [*S. lobatus* Pers.]—Wet soil and river bottoms, various provinces, Fla. to Tex., Mo., Ill., and N. C.—(*Mex.*)—Spr.–fall.—The form with few-lobed broad terminal leaf-segments has been described as *S. mississippianus*.—Sometimes called BUTTER-WEED.



2. S. vulgaris L. Plant annual, sparingly pubescent, the stem 5 dm. tall or less, hollow, corymbosely branched: leaf-blades mostly 1 dm. long or less; the lobes and rachis toothed, the terminal lobe relatively small: involucre 6–8 mm. long; bracts narrow, acuminate: ligules wanting: achene about 2.5 mm. long, minutely pubescent all over.—(COMMON-GROUNDSEL.)—Cult. grounds and waste-places, various provinces, rarely Coastal Plain, N. C. to Tex., S. Dak., Ont., and Newf.; also Pacific Coast. Nat. of Eu.—Spr.–fall.—*Senecio viscosus* L., coarser than *S. vulgaris* and strong-scented, with wholly green involucral bracts and inconspicuous ray-flowers, has been reported from N. C. It is a native of Eu.

3. S. Rugelia A. Gray. Plant 2–5 dm. tall: leaf-blades ovate to elliptic-oval, 8–15 cm. long, denticulate or dentate: bracts of the involucre linear-lanceolate, 12–13 mm. long: disk-corollas 7–8 mm. long: achene about 6 mm. long.—High mt. slopes, Blue Ridge, N. C. and Tenn.—Sum.

4. S. Robbinsii Oakes. Plant 3–10 dm. tall: blades of the basal leaves 3–8 cm. long, acute: involucre 6–8 mm. long; bracts narrowly linear: ligules 4–5 mm. long: achene pubescent.—Mt. meadows, Roan Mt. in the Blue Ridge of N. C. and Tenn., and more N provinces, N. Y. to Que. and N. B.—Sum.

5. S. aureus L. Plant 3–7 dm. tall: blades of the basal leaves 2–12 cm. long, rounded at the apex: involucre 6–7 mm. long; bracts linear, fully 1 mm. wide: ligules narrow, 5.5–7.5 mm. long: achene glabrous.—Low grounds, swamps, and wet woods, various provinces, Fla. to Tex., Ont., and Newf.—Spr.–sum.

6. S. gracilis Pursh. Plant similar to that of *S. aureus* in habit, but smaller and more slender: involucre 3.5–4.5 mm. long; bracts narrowly linear, scarcely 1 mm. wide: ligules broad, 3.5–5 mm. long.—Wet grounds, various provinces, Ga. to Pa.—Spr.

7. S. rotundus (Britton) Small. Plant 3–6 dm. tall: blades of the basal leaves suborbicular to orbicular-ovate, coarsely crenate-serrate: involucre 4–5 mm. long; bracts linear-subulate to linear-lanceolate: ligules 8–10 mm. long.—Low grounds or wet rocks, various provinces, La. to Tex., Mo., and Ohio.—Spr.

8. S. obovatus Muhl. Plant 1–5 dm. tall: blades of the basal leaves spatulate to obovate, coarsely toothed or some of them lyrate-pinnatifid: involucre 4–5 mm. long: bracts narrowly linear or subulate-linear: ligules 5–7 mm. long.—Thickets and dry hillsides, various provinces, W Fla. to Tex., Vt., and Me.—Spr.–sum.

9. S. pauperculus Michx. Plant 2–6 dm. tall: blades of the basal leaves elliptic to oval, varying ovate or obovate, serrate, incised-serrate or partly

pinnatifid: heads typically few, not crowded: involucre 5–6 mm. long; bracts glabrous or nearly so: ligules of the ray mostly 7–9 mm. long: achene 2.5–3 mm. long.—Stony woods, dry pastures, hillsides, and meadows, various provinces, Ga. to Tex., B. C., Ont., and Newf.—Spr.–sum.—*Senecio Earlei* Small seems to be a more robust and broader leaved form of this species in the southern part of its range.

10. S. Smallii Britton. Plant 3–6 dm. tall: blades of the basal leaves narrowly lanceolate to oblanceolate, serrate, incised-serrate, or incised or pinnatifid near the base: heads typically numerous and often crowded: involucre 4–5 mm. long; bracts glabrous or nearly so: ligules of the ray mostly 4–5 mm. long: achenes 1.5–2 mm. long.—Sandy fields, ditches, pinewoods, and dry woods, various provinces, Fla. to Miss., Tenn., and Pa.—Spr.

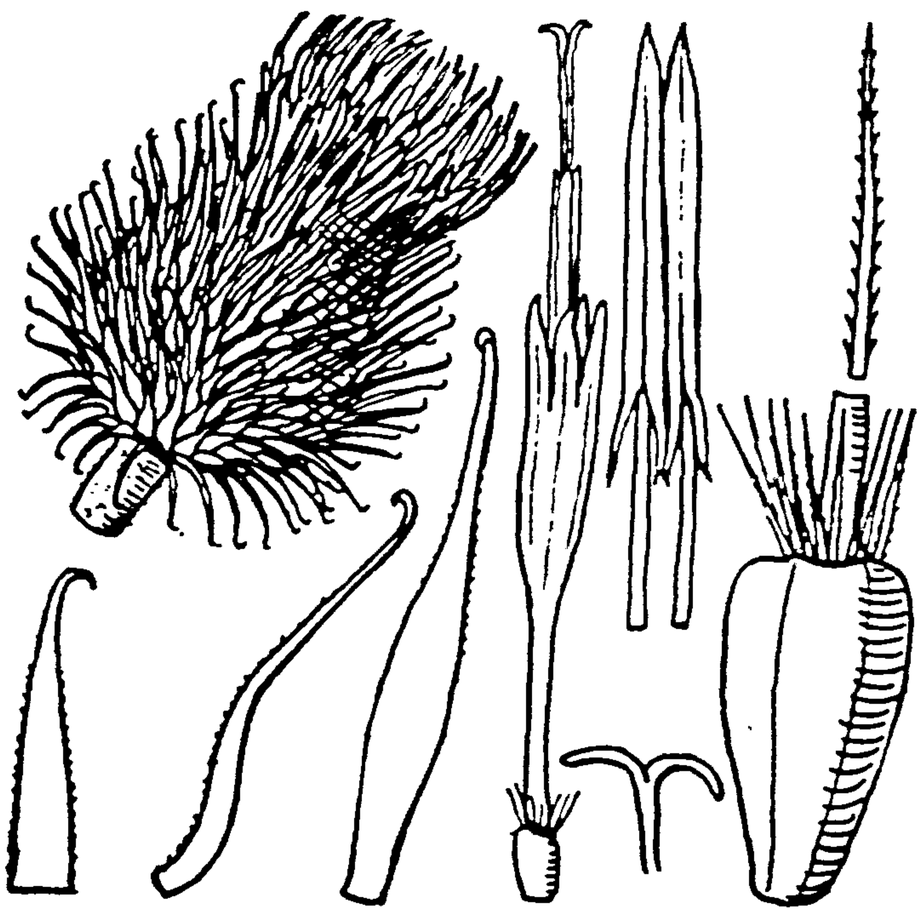
11. S. tomentosus Michx. Plant 2–7 dm. tall, the foliage typically and persistently floccose-tomentose: blades of the basal leaves triangular-ovate to broadly lanceolate, triangular-lanceolate, or ovate, crenate or crenate-serrate, abruptly narrowed or truncate at the base: heads few, at least relatively so, ultimately not crowded: involucre 6–7 mm. long; bracts densely white-pubescent when young: ligules of the ray 5–8 mm. long: achene 2–2.5 mm. long.—Sandy fields, banks, roadsides, and prairies, Coastal Plain and adj. provinces, Fla. to Tex., Ark., and N. J.—Spr.

12. S. alabamensis Britton. Plant similar to *S. tomentosus* in habit, but nearly glabrous up to the inflorescence where the peduncles are arachnoid: blades of the basal leaves ovate, triangular-ovate, or ovate-lanceolate, crenate, dentate, or nearly entire, often inequilateral at the abruptly narrowed or truncate base; heads rather few, not crowded, except when young: involucre 6–7 mm. long: bracts slightly arachnoid or nearly glabrous: ligules 5–8 mm. long: achene about 2.5 mm. long.—Moist pine woods, Coastal Plain, Ala.—Spr.

13. S. Memmingeri Britton. Plant 3–6 dm. tall: blades of the basal leaves bipinnatifid: involucre 5–6 mm. long; bracts linear: ligules 5–6 mm. long.—Cliffs and dry soil, Blue Ridge to Appalachian Plateau, Ala. to N. C.—Spr.–sum.

14. S. Millefolium T. & G. Plant 3–7 dm. tall: blades of the basal leaves bipinnately dissected into narrowly linear segments: involucre 5–6 mm. long; bracts linear and usually lanceolate at the tip: ligules 2–4 mm. long: disk-corollas 4 mm. long.—Cliffs, Blue Ridge, S. C. and N. C.—Sum.

123. ARCTIUM L. Biennial, coarse herbs. Leaves alternate: blades often ample, mainly entire or repand. Heads solitary in the axils or clustered; not conspicuous. Involucre with many narrow bracts, each hooked at the tip. Filaments glabrous. Pappus of short, rigid or scale-like bristles.—About 6 species, Eurasian.



1. A. minus Schk. Plant 4–16 dm. tall, often widely branched: leaf-blades ovate, those of the lower cauline leaves 2–4.5 dm. long, all undulate or shallowly toothed: inner bracts of the involucre mostly 7–8 mm. long: corollas purple, pink, or white: achene cuneate to elliptic-obovate, 5–6 mm. long or rarely smaller. — (BURDOCK. BEGGAR'S-BUTTONS. CLOTBUR.) — Waste-places, cult. grounds, and roadsides throughout U. S. and S Can. Nat. of Eu.—Sum.–fall.

124. CIRSIUM [Tourn.] Hill. Annual, biennial or perennial, large or coarse herbs. Leaves alternate: blades toothed, lobed, or pinnatifid, usually spiny. Heads erect, often showy. Involucre with the outer bracts, at least, spine-tipped or spiny margined. Flowers violet, purple, lilac, or yellowish, or rarely white. Filaments mostly pubescent. Pappus of elongate capillary, plumose bristles in several series.—More than 200 species, widely distributed in the Northern Hemisphere.—Sum.–fall or all year S.—THISTLES. BULL-THISTLES.

Heads not involucrate, but sometimes approximate to 1 or few bract-like leaves.
  Bracts of the involucre not spine-tipped.
    Heads solitary or few, large, the involucre over 2 cm. in diameter. — I. MUTICA.
    Heads numerous, small, the involucre less than 2 cm. in diameter. — II. ARVENSIA.
  Bracts of the involucre, at least the outer spine-tipped.
    Spines of the involucral bracts appressed or erect. — III. REPANDA.
    Spines of the involucral bracts spreading.
      Inner bracts of the involucre narrow, with soft flattened tips. — IV. ALTISSIMA.
      Inner bracts of the involucre, as well as outer spine-tipped. — V. LANCEOLATA.
Heads involucrate, surrounded by a whorl of spinescent bracts. — VI. HORRIDULA.

I. MUTICA

Rather tall plant with woolly involucral bracts and deeply pinnatifid leaf-blades. — 1. *C. muticum.*

II. ARVENSIA

Very spiny erect or diffuse plant with clusters of numerous small, lilac-colored, heads of flowers. — 2. *C. arvense.*

III. REPANDA

Body of the involucre 2 cm. thick or less.
  Leaf-margins densely spiny: glutinous line of the involucral bracts narrow. — 3. *C. repandum.*
  Leaf-margins not densely spiny: glutinous line of the involucral bracts broad. — 4. *C. LeContei.*
Body of the involucre 3 cm. thick or more. — 5. *C. odoratum.*

IV. ALTISSIMA

Involucre less than 1.5 cm. thick.
  Leaf-blades densely lanate-tomentose beneath.
    Leaf-blades merely spiny toothed: spines of the involucral bracts slender, over 2 mm. long. — 6. *C. virginianum.*
    Leaf-blades pinnatifid or sinuate- pinnatifid: spines of the involucral bracts stout, less than 2 mm. long. — 7. *C. revolutum.*
  Leaf-blades thinly lanate-tomentose beneath.
    Leaf-blades with weak, rather few, marginal spines: spines of the involucral bracts over 2 mm. long. — 8. *C. flaccidum.*
    Leaf-blades with long and stout, very numerous marginal spines: spines of the involucral bracts less than 2 mm. long. — 9. *C. Nuttallii.*
Involucre over 1.5 cm. thick.
  Leaf-blades, except those near the heads, merely toothed. — 10. *C. altissimum.*
  Leaf-blades 1–2-pinnatifid. — 11. *C. discolor.*

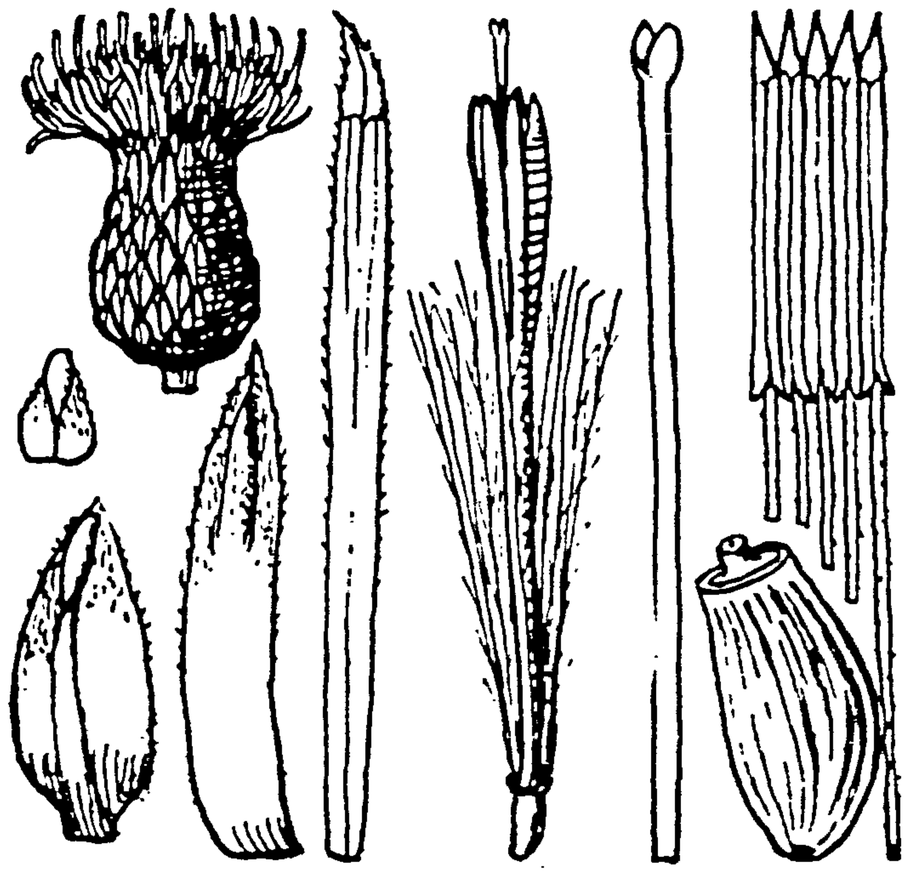
V. LANCEOLATA

Very spiny plant with decurrent leaves: heads of flowers brilliant-violet. — 12. *C. lanceolatum.*

VI. HORRIDULA

Involucral bracts all serrulate-ciliate.
  Basal leaves with narrow spine-margined blades: anthers twice as long as the filaments. — 13. *C. vittatum.*
  Basal leaves with broad pinnatifid blades: anthers about as long as the filaments. — 14. *C. Smallii.*
Involucral bracts puberulent or pubescent, but not ciliate. — 15. *C. horridulum.*

1. C. muticum Michx. Stem 8–25 dm. tall, angled, lanuginous or glabrate: leaf-blades elliptic to elliptic-ovate, 1–2-pinnatifid, mainly 17–40 cm. long,



rather weakly spine-armed: outer bracts of the involucre obtuse or cuspidate, the inner ones narrowly linear, short-acuminate, 27–29 mm. long: corollas lilac, mostly 28–30 mm. long.—(SWAMP-THISTLE.)—Swamps, meadows, fields, and roadsides, various provinces, Fla. to Tex., Sask., and Newf.—Sum.–fall.

2. **C. arvense** (L.) Scop. Stems 2–10 dm. tall, glabrous or nearly so: leaf-blades spatulate, elliptic, or lanceolate in outline, pinnatifid, 4–16 cm. long, rigidly spine-armed, pubescent beneath or sometimes nearly glabrous: outer bracts of the involucre acute, the inner ones narrowly linear, short-acuminate, 9–12 mm. long: corollas lilac to rosy-purple or white, mostly 12–15 mm. long.—(CANADA-THISTLE.)—Fields, pastures, waste-places, and roadsides, various provinces, N. C. to Kans., B. C., and Newf.—Sum.—Nat. of Eu.—Plants are imperfectly dioecious.

3. **C. repandum** Michx. Stem 1.5–5 dm. tall, webby-lanate: leaf-blades spatulate to narrowly elliptic or broadly linear, pinnately many-lobed and copiously spiny: outer bracts of the involucre long-acuminate, the inner ones with curled tips: corollas rosy-purple.—Pinelands and sand-hills, Coastal Plain, Fla. to N. C.—Sum.

4. **C. LeContei** T. & G. Stem 6–11 dm. tall, floccose-woolly: leaf-blades oblanceolate to lanceolate, pinnatifid and relatively sparingly spiny: outer bracts of the involucre short-acuminate, the inner ones with erect tips: corollas rosy-purple.—Low pinelands, Coastal Plain, Fla. to La. and N. C.—Sum.–fall.

5. **C. odoratum** (Muhl.) Petrak. Stem 3–10 dm. tall, tomentulose: leaf-blades oblanceolate, 1 or 2-pinnatifid: outer bracts of the involucre lanceolate, slender-tipped, the inner bracts 25–35 mm. long: corollas rosy-purple, 40–50 mm. long.—(PASTURE-THISTLE.)—Pastures, fields, and low grounds, various provinces N of Coastal Plain, N. C. to Pa. and Me.—Sum.–fall.

6. **C. virginianum** (L.) Michx. Stem 5–11 dm. tall, arachnoid: leaf-blades linear to linear-elliptic, or spatulate at the base of the stem, spiny-toothed: outer bracts of the involucre with slender tips nearly as long as the body, the inner bracts 12–14 mm. long: corollas lilac to rosy-purple, 16–19 mm. long.—Woods and thickets, Fla. to Miss., Ky., and Va.—Spr.–sum.

7. **C. revolutum** Small. Stem 5–20 dm. tall, floccose: leaves rigid; blades thick, revolute, rigidly spine-armed, densely white-woolly or tomentose beneath: outer bracts of the involucre short-tipped, the inner bracts 12–20 mm. long, narrowly linear: corollas lilac to rosy-purple, 20–25 mm. long.—Low pinelands, Coastal Plain, Fla. to N. C.—Sum.–fall.

8. **C. flaccidum** Small. Stem 7–16 dm. tall, floccose: leaves pliable; blades thin, flat, weakly spine-armed, thinly gray tomentose-woolly beneath: outer bracts of the involucre with slender tips nearly as long as the body, the inner bracts long-tipped, 12–16 mm. long: corollas lilac to rosy-purple, 19–21 mm. long.—Woods and banks, Coastal Plain and adj. provinces, Ga. to Tex. and Mo.—Late spr.–sum.

9. C. Nuttallii (DC.) A. Gray. Stem 9–40 dm. tall, early glabrate: blades of the basal and the lower cauline leaves elliptic to elliptic-spatulate, 2-pinnatifid: outer bracts of the involucre short-tipped, the inner bracts abruptly short-tipped, 15–20 mm. long: corollas lilac to rosy-purple, 20–25 mm. long.—Dry soil, Coastal Plain, Fla. to Miss. and S. C.—Spr.–fall or all year S.

10. C. altissimum (L.) Spreng. Stem 9–30 dm. tall, downy: blades of the basal or lower cauline leaves elliptic, or broadest above or below the middle, densely white-tomentose beneath: outer bracts of the involucre with tips about ½ as long as the body, the inner bracts 28–30 mm. long: corollas purple to lilac, 37–40 mm. long.—(ROADSIDE-THISTLE.)—Thickets and fields, various provinces, Fla. to Tex., Minn., and Mass.—Sum.–fall.

11. C. discolor (Muhl.) Spreng. Similar to *C. altissimum* in habit, but seldom over 20 dm. tall: leaf-blades mainly elliptic-lanceolate to ovate-lanceolate, densely white-tomentose beneath: outer bracts of the involucre with tips about as long as the body, the inner bracts 25–28 mm. long: corollas, lilac to purple, 28–30 mm. long.—(FIELD-THISTLE.)—Thickets and roadsides, various provinces, rarely Coastal Plain, Ga. to Miss., Mo., Ont., and N. B.—Sum.–fall.

12. C. lanceolatum (L.) Hill. Stem 8–15 dm. tall, pubescent: leaves crowded; blades lanceolate, 1 or 2 pinnatifid, grayish-woolly beneath: outer bracts of the involucre gradually narrowed into slender tips, the inner bracts very narrowly linear and attenuate: corollas, brilliant violet, 32–35 mm. long. —(COMMON-THISTLE. BULL-THISTLE.)—Fields, pastures, and roadsides, various provinces, Ga. to Nebr., Calif., Ore., Minn., and Newf.; mostly a weed. Nat. of Eu.—Sum.–fall.

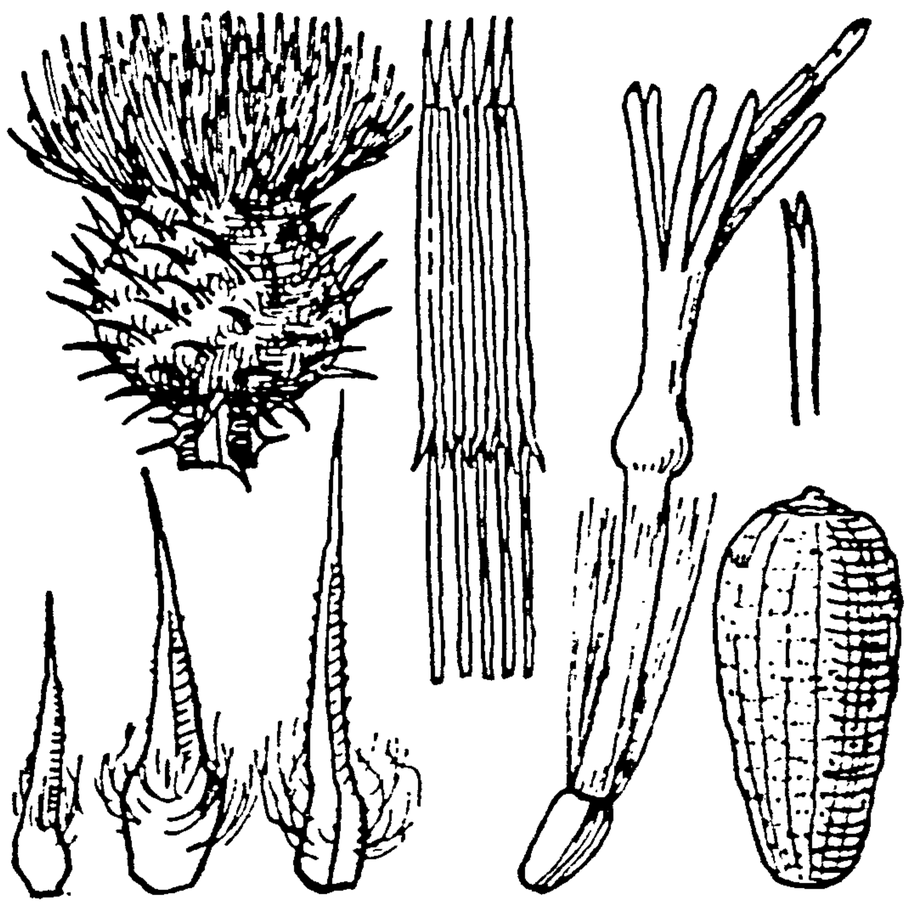
13. C. vittatum Small. Stem 2–7 dm. tall, thinly pubescent: leaf-margins undulate or sinuate, with mostly ascending spines: inner bracts of the involucre 30–35 mm. long: corollas yellow or cream, about 30 mm. long: anthers much longer than the filaments.—Everglades and low pinelands, Everglade Keys, Fla.—Spr.–sum.

14. C. Smallii Britton. Stem 4–9 dm. tall, thinly pubescent: leaf-segments with the terminal spines directed forward: inner bracts of the involucre 25–30 mm. long: corollas yellow or cream, 30–40 mm. long: anthers about as long as the filaments. [*C. pinetorum* Small not Greenm.]—Pinelands and sand-dunes, Coastal Plain, Fla. to S. C.—(*W. I.*)—Wint.–late spr.

15. C. horridulum Michx. Stem 3–40 dm. tall, woolly: leaf-segments with spreading spines: inner bracts of the involucre 40–45 mm. long: corollas 40–43 mm. long, yellow, (or purple in *C. horridulum Elliottii*): anthers mostly shorter than the filaments. [*Carduus spinosissimus* Walt.]—(YELLOW-THISTLE.)—Low grounds, swamps, and pastures, Coastal Plain and adj. provinces, Fla. to Tex. and Me.—Spr.–sum.—Often a weed.

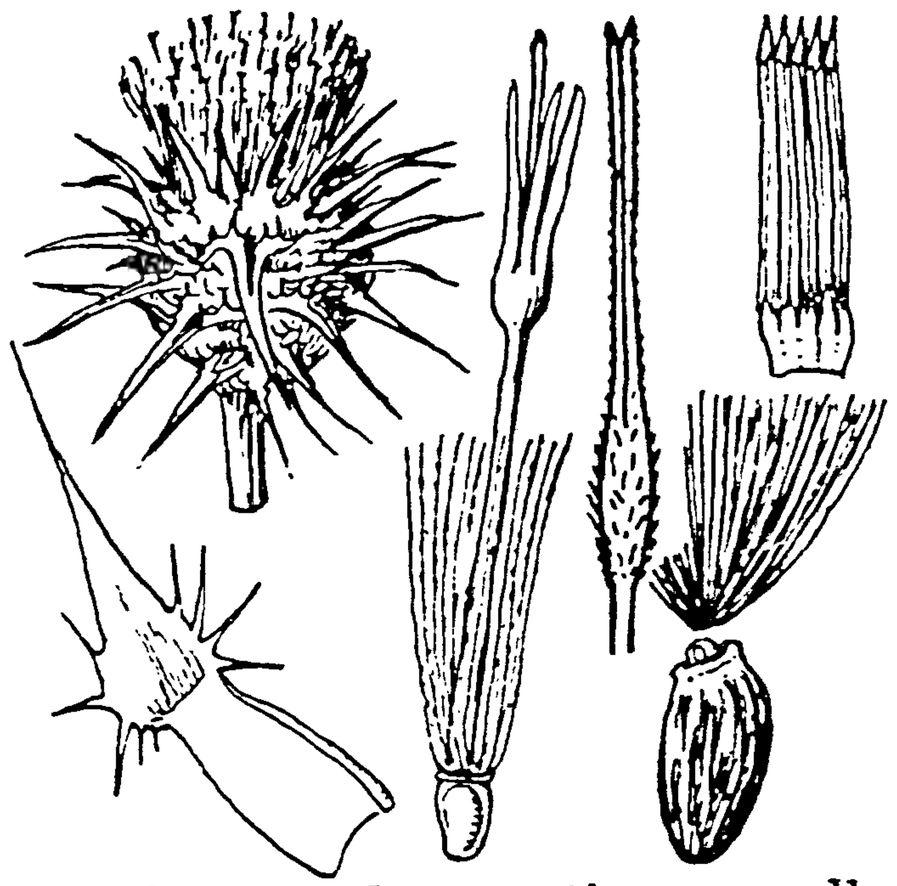
125. ONOPORDUM [Vaill.] L. Annual or biennial, caulescent, coarse herbs, the stems and branches winged. Leaves alternate: blades sinuate or pinnatifid, prickle-armed, decurrent. Heads erect, many-flowered. Involucre ovoid, globular, or depressed: bracts numerous, narrow, spine-tipped. Receptacle honeycombed. Flowers numerous, all alike, perfect, tubular. Corollas elongate, with a slender tube and a shorter campanulate throat: lobes linear or

nearly so. Anthers sagittate at the base, with subulate appendages. Achene stout, broadened upward. Pappus of many capillary-attenuate scabrous or barbellate bristles which are united at the base and deciduous all together.—About 12 species, natives of the Old World.



1. O. Acanthium L. Stem 2 m. tall or less, lanate, the wings spiny margined: leaf-blades oblanceolate, elliptic, lanceolate, or ovate, mostly 1–3 dm. long, lanate, copiously spine-armed: involucre 3–4 cm. in diameter; bracts numerous, linear-subulate, firm, the inner 2–3 cm. long, the outer shorter and reflexed: corollas purple or purplish: achene narrowly obovoid, 4–5 mm. long, transversely wrinkled and ribbed.—(COTTON-THISTLE. SCOTCH-THISTLE.)—Roadsides, waste-places, and fields, various provinces, Ala. to Ont. and N. S. Nat. of Eurasia.—Sum.

126. **MARIANA** [Vaill.] Hill. Annual or biennial, tall, thistle-like herbs, the stem not winged. Leaves alternate: blades sinuate-lobed or pinnatifid, prickle-armed, not decurrent. Heads erect, many-flowered, not radiate. Involucre depressed-globose: bracts conspicuous, spiny-ciliate, with broad bases and firm spreading or reflexed spine-armed tips. Receptacle flattish, densely bristly. Flowers all alike, perfect, tubular. Corollas elongate, with a very slender tube and a short campanulate throat: lobes linear. Anthers slightly sagittate at the base, with lanceolate appendages. Achene stout. Pappus of numerous capillary-attenuate barbellate bristles which are united at the base and deciduous all together from the ring-like top of the achene.—One species.



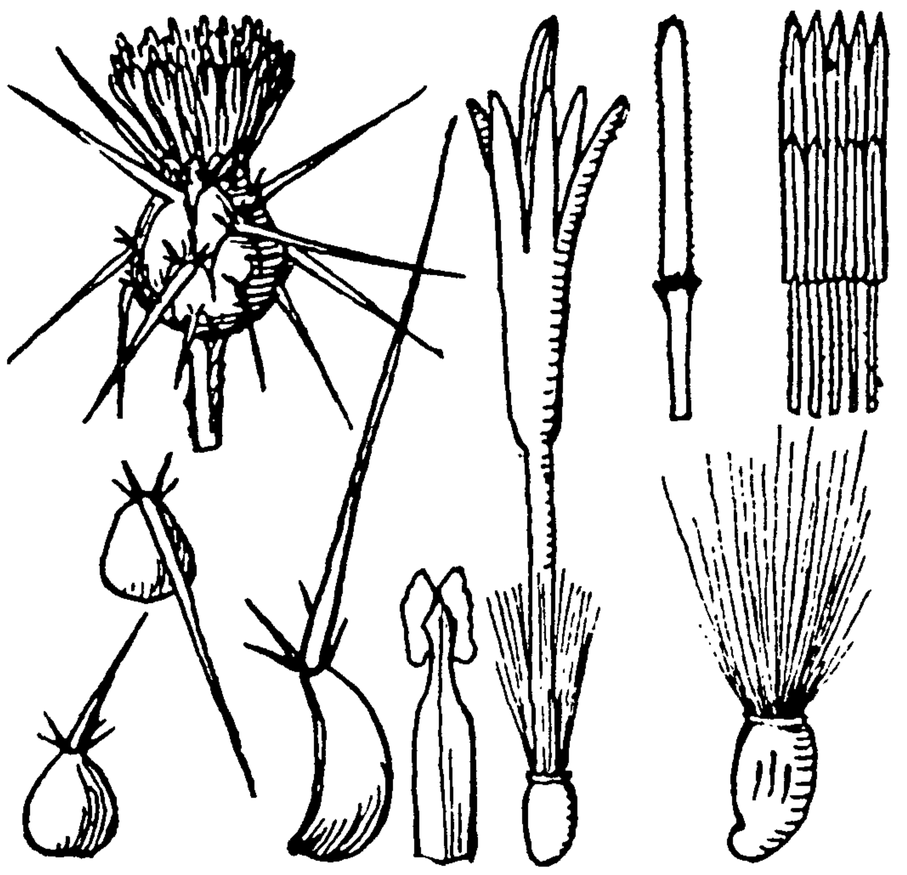
1. M. Mariana (L.) Hill. Stem 1.5 m. tall or less, sparingly branched: leaf-blades pinnately lobed and spinescent on and near the margins, those of the basal leaves with stout petiole-like bases, those of the cauline auriculate-clasping, mostly 1–4 dm. long: involucre mostly 4–6 cm. in diameter; bracts with suborbicular, ovate, or elliptic bodies and equally as long or longer tips: corollas purple or purplish, mostly 2.5–3 cm. long: achene more or less oblique, ellipsoid-obovoid, 5.5–6.5 mm. long, glabrous, with a blunt protuberance within the ring-like top.—(MILK-THISTLE.)—Roadsides and waste-places, locally in various provinces, Ala. to Ont.; also on Pacific Coast. Nat. of Eu.—Spr.–sum.

127. **CENTAUREA** L. Annual (ours), or perennial herbs. Leaves alternate: blades entire, toothed, or pinnatifid. Heads relatively small. Involucre with irregularly toothed or fimbrillate outer bracts, the intermediate ones, at least, often armed with spines. Anthers sagittate at the base, with appendages at least ½ as long as the sacs. Achenes flattened or 4-angled. Pappus

of scales or bristles in several series, or obsolete.—About 350 species, mostly natives of the Old World.—Sum.—STAR-THISTLES.

Corollas yellow: stem and branches winged.
  Stem woolly: spines of the involucre yellowish. 1. *C. solstitialis.*
  Stem: spines of the involucre purplish. 2. *C. melitensis.*
Corollas purple: stem and branches wingless. 3. *C. Calcitrapa.*

1. C. solstitialis L. Stem 3–6 dm. tall, woolly: blades of the stem-leaves elliptic-lanceolate or linear, entire or merely toothed: involucres ovoid or subglobose, about 1.5 cm. long; bracts various, the intermediate ones with long, slender, yellow spines: corollas yellow.—(BARNABY'S-THISTLE.)—Waste-places, fields, and roadsides, various provinces, Fla. to Calif., Ia., Ont., and Mass. Nat. of Eu.

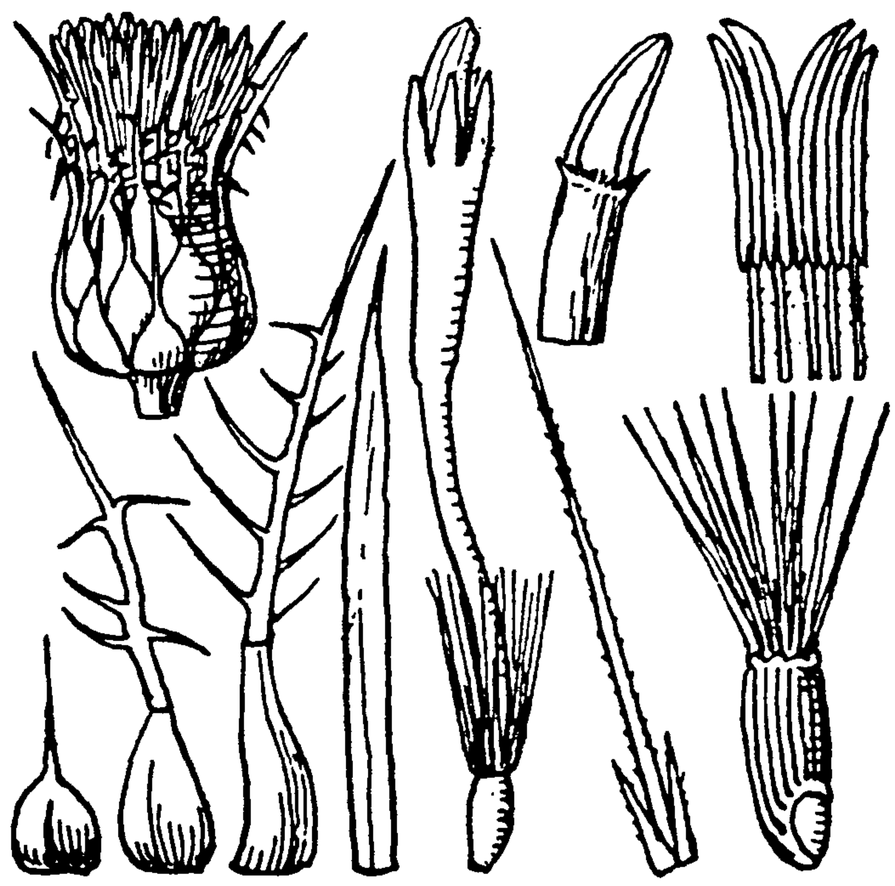


2. C. melitensis L. Stem 1 m. tall or less, arachnoid, usually sparingly branched: leaf-blades various, those of the basal leaves spatulate, toothed or pinnatifid, those of the stem-leaves oblanceolate, elliptic or linear, narrowly decurrent on the stem: heads sessile or short-peduncled: involucre ovoid, the outer and middle bracts with slender apical prickles: corollas yellow.—Various provinces, Ga. to Ala., N. Mex., Calif., Mo., and Mass. Nat. of Eu.

3. C. Calcitrapa L. Stem 3–4 dm. tall: blades of the stem-leaves 1–2-pinnatifid: corollas purple.—Waste-places, various provinces, Ala. to N. C. and Mass.; also on Pacific Coast. Nat. of Eu.

Centaurea Cyanus L. An annual, native of Europe, with white-floccose foliage, narrow entire leaves, white, pink, blue, or purple heads, and spineless involucral bracts, has escaped from cultivation in the eastern United States. It is known as CORN-FLOWER, BLUEBOTTLE, BACHELOR'S-BUTTON, or RAGGED-ROBIN.

128. CNICUS L. Annual, caulescent, widely branched herbs. Leaves alternate: blades sinuate-pinnatifid and spiny-margined or merely spiny-pinnatifid, veiny. Heads erect, many-flowered, sessile. Involucre ovoid, leafy-involucrate: bracts narrow, rigid, some of them pectinate-spiny near the tip, appressed. Receptacle with capillary bristles. Flowers various, the marginal ones sterile, the central fruit-producing. Corollas elongate, with a slender tube and a shorter cylindric-campanulate throat: lobes narrow, unequal. Anthers minutely tailed at the base, with lanceolate appendages. Achene stout, oblique, many striate-ribbed, with a scalloped crown. Pappus double, the outer row of long slender-subulate bristles, the inner of short-subulate bristles.—One species.



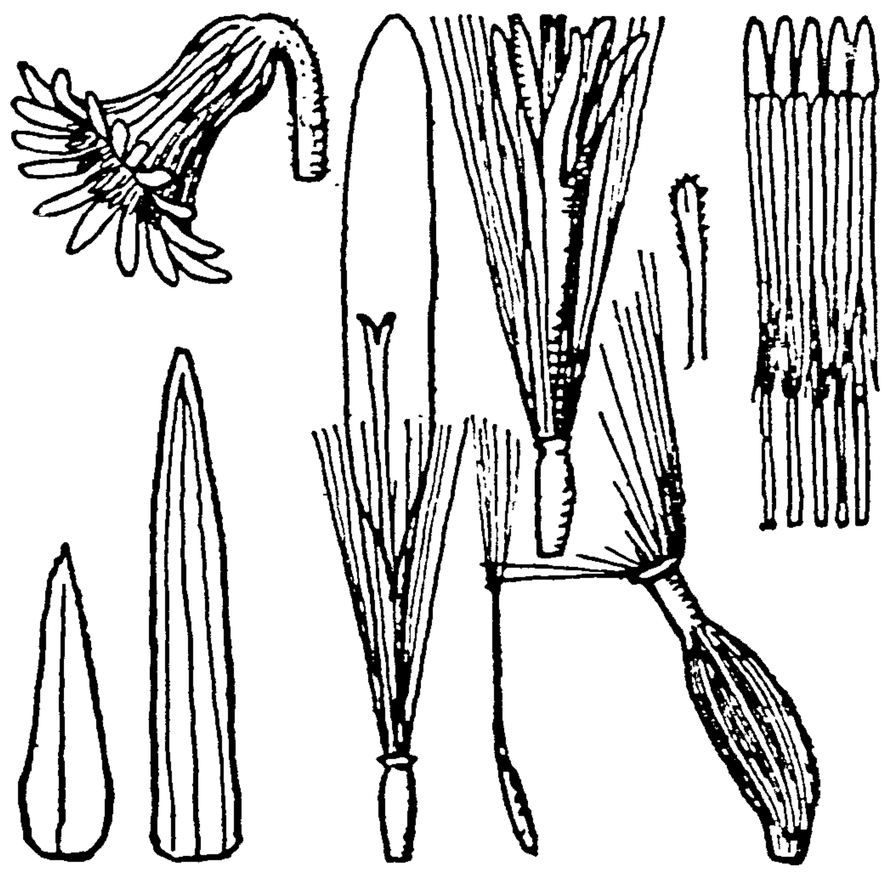
1. C. benedictus L. Stem usually less than 1 m. tall, finely hirsute or villous: leaf-blades mostly 5–15 cm. long, coarsely reticulate, the upper ones somewhat clasping: involucre 1.5–2 cm. in diameter; larger bracts

lanceolate, with pectinate spinescent tips: corollas mainly yellow: achene nearly cylindric, 7–9 mm. long, with many prominent ribs, thus fluted; teeth of the crown deltoid: longer pappus-bristles exceeding the achene.—(BLESSED-THISTLE.)—Waste-places, roadsides, and fields, various provinces, Ga. to Ala. and N. S. Nat. of Eu.—Spr.–sum.

129. CHAPTALIA Vent. Perennial, scapose, small herbs, woolly throughout. Leaves alternate, all basal: blades undulate to lyrate-pinnatifid. Heads nodding, at least when young, solitary. Involucre mostly narrow: bracts herbaceous, ultimately reflexed. Flowers white, sometimes purple-stained without. Marginal corollas ligulate. Anthers long-tailed at the base: appendages lanceolate. Achene mostly beaked or narrowed at the apex.—About 25 species, natives of warm-temperate and tropical America.—SUN-BONNETS.

Involucre becoming 1–1.5 cm. long: achene narrowed into a short neck; only the pistillate perfect. 1. *C. tomentosa.*
Involucre becoming 2 cm. long: achene with a beak fully as long as the body; all perfect. 2. *C. dentata.*

1. C. tomentosa Vent. Leaves in rosettes; blades elliptic to oblanceolate, 4–10 cm. long, apiculate, entire or remotely denticulate, green and glabrous above, densely white tomentose beneath: scapes 1–3 dm. tall, sometimes tufted, simple: involucral bracts subulate to linear, the inner becoming 10–15 mm. long: ligules of the ray-flowers purple without, white or ivory within, 7–10 mm. long: achene of the pistillate flowers perfect, glabrous, 3 mm. long, each constricted into a short neck. [*Thyrsanthema semifloscularе* (Walt.) Kuntze.]—Moist pinelands, Coastal Plain, Fla. to Tex. and N. C.



2. C. dentata (L.) Cass. Leaves spreading; blades spatulate to oblanceolate, 3–11 cm. long or more, undulate or denticulate, evergreen, floccose above or glabrous in age, lanate-tomentulose beneath: scape slender, 1–3 dm. tall, floccose: involucre lanate, the inner bracts becoming 18–21 mm. long, narrowly linear: inner corollas 7–8 mm. long: achene slender, the body 3.5–4.5 mm. long, the beak as long or longer than the body. [*Thyrsanthema dentata* (L.) Kuntze.]—Pinelands, Everglade Keys, Fla.—(*W. I.*)—Spr.

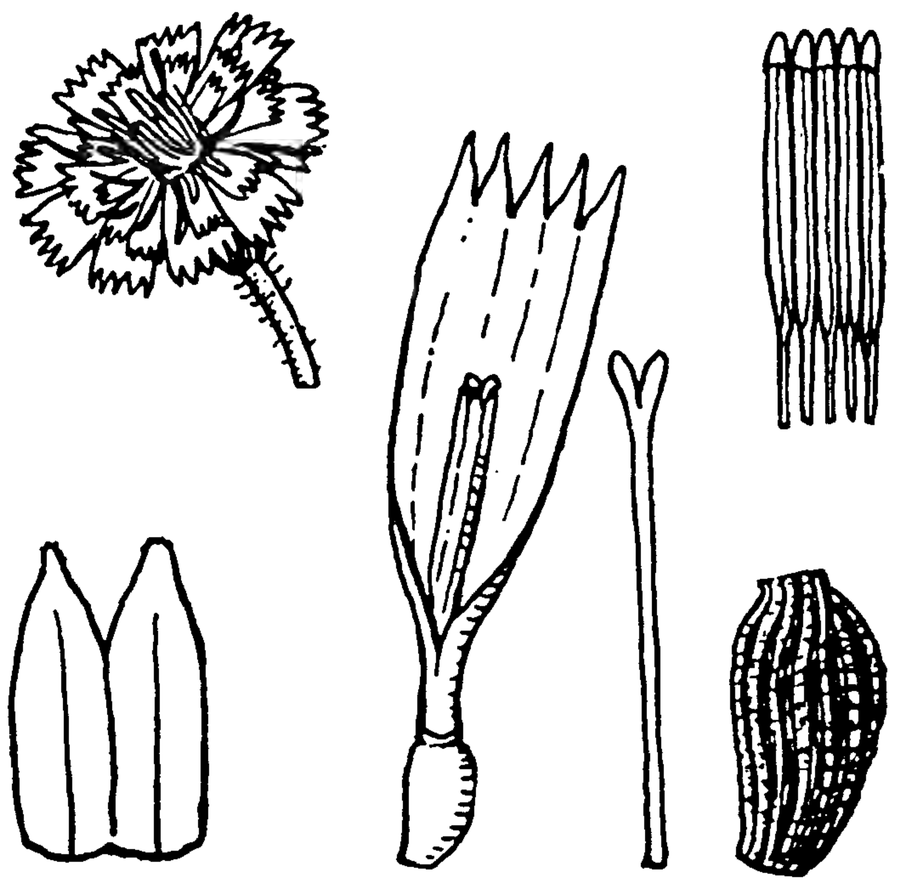
FAMILY 3. CICHORIACEAE — CHICORY FAMILY

Annual, biennial, or perennial herbs, or partially woody plants. Leaves alternate: blades entire, toothed, or parted. Flowers perfect, all alike, borne in heads. Corolla ligulate, the 1-sided limb mostly 5-lobed at the apex. Stigmas unappendaged. Achene smooth, papillose, muriculate, or spiny.—About 70 genera and 1,500 species, of wide geographic distribution.

Pappus wanting or obsolete. 1. SERINEA.
Pappus present.
  Pappus of plumose bristles.
    Receptacle not chaffy: plant caulescent. 2. TRAGOPOGON.
    Receptacle chaffy: plant scapose. 3. HYPOCHAERIS.

Pappus not plumose.
  Pappus consisting, at least in part, of scales which sometimes are united into a crown.
    Involucre single: pappus of both scales and bristles: corolla yellow.
      Pappus of 5 broad scales and 5–10 bristles: plant annual. 4. KRIGIA.
      Pappus of 10–15 minute narrow scales and 10–15 bristles or more: plant perennial. 5. CYNTHIA.
    Involucre double: pappus crown-like, of numerous scales in 2 or more series: corolla blue. 6. CICHORIUM.
  Pappus consisting of capillary bristles, not plumose.
    Achene not flattened, cylindric or prismatic.
      Achene not beaked.
        Corolla rose or purplish.
          Achene tapering to the apex: plant with rush-like stems and narrow leaf-blades. 7. LYGODESMIA.
          Achene tapering to the base: plant with cane-like stems and broad leaf-blades. 8. NABALUS.
        Corolla yellow, cream-colored, or white.
          Ligules cream-colored. 8. NABALUS.
          Ligules yellow.
            Pappus tawny, or white in *H. argyraeum*: leaf-blades not pinnatifid. 9. HIERACIUM.
            Pappus white: leaf-blades pinnatifid. 10. CREPIS.
      Achene beaked at the apex, the beak long and slender or short and stout.
        Achenes, at least the marginal ones slender beaked.
          Achene smooth, merely nerved or ribbed.
            Bracts of the outer involucre appressed: pappus white: achene attached by a narrowed base. 10. CREPIS.
            Bracts of the outer involucre lax: pappus sordid: achene attached by a disk-like base. 11. SITILIAS.
          Achene tuberculate and spinulose. 12. LEONTODON.
        Achenes with short stout beaks. 13. BRACHYRHAMPHUS.
    Achene flattened.
      Achene narrowed at the apex or beaked.
        Achene thin, prolonged into a slender, often filiform beak. 14. LACTUCA.
        Achene thickish, narrowed at the apex, but not beaked. 15. MULGEDIUM.
      Achene truncate at the apex. 16. SONCHUS.

1. **SERINEA** Raf. Annual, pale, tender, caulescent herbs. Leaves often numerous: blades narrow, entire, repand, or lyrate-pinnatifid. Heads long-peduncled, small (1–1.5 cm. broad). Involucre campanulate: bracts rather broad, ribbed, erect at maturity. Corollas yellow. Achene obovoid, 8–10-ribbed. Pappus wanting or obsolete.—Three species, North American.

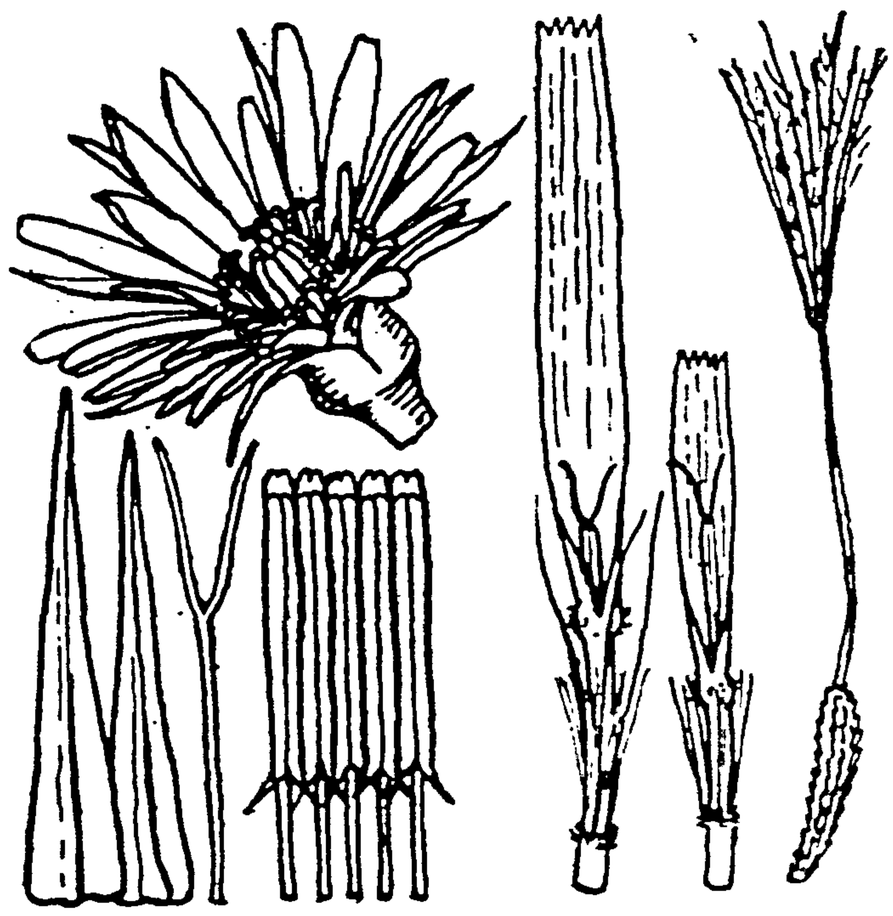


1. S. oppositifolia (Raf.) Kuntze. Stem 5–30 cm. tall, slender, sometimes sparingly glandular-pubescent: leaf-blades spatulate to linear, 2–12 cm. long, very irregular, those of the lower leaves often toothed or pinnatifid and with petiole-like bases, those of the upper entire and sessile: bracts of the involucre ovate to lanceolate, becoming 4–5 mm. long: achene 1.5 mm. long, prominently ribbed.—Moist soil, fields, and waste-places, various provinces, Fla. to Tex., Kans., and S. C.—Spr.

2. **TRAGOPOGON** [Tourn.] L. Biennial or perennial erect caulescent, rather coarse herbs. Leaf-blades narrow, long-attenuate, often sheathing at the base. Heads erect. Involucres relatively narrow: bracts elongate, often surpassing the disk. Achene terete or 5-angled, the inner at least slender-beaked.—About 35 species, natives of the Old World.

Bracts of the involucre surpassing the ligules: corollas purple. 1. *T. porrifolius.*
Bracts of the involucre as long as the ligules or shorter: corollas yellow. 2. *T. pratensis.*

1. T. porrifolius L. Stem 4–15 dm. tall: leaf-blades clasping or sheathing at the base: peduncles gradually enlarged upward: bracts of the involucre linear-lanceolate, 30–60 mm. long: achene slender-fusiform, 3.5–4 cm. long, the beak longer than the body.—(SALSIFY. OYSTER-PLANT.)—Fence-rows and roadsides, various provinces, Ga. to Calif. and Ont. Nat. of Eu.—Sum.

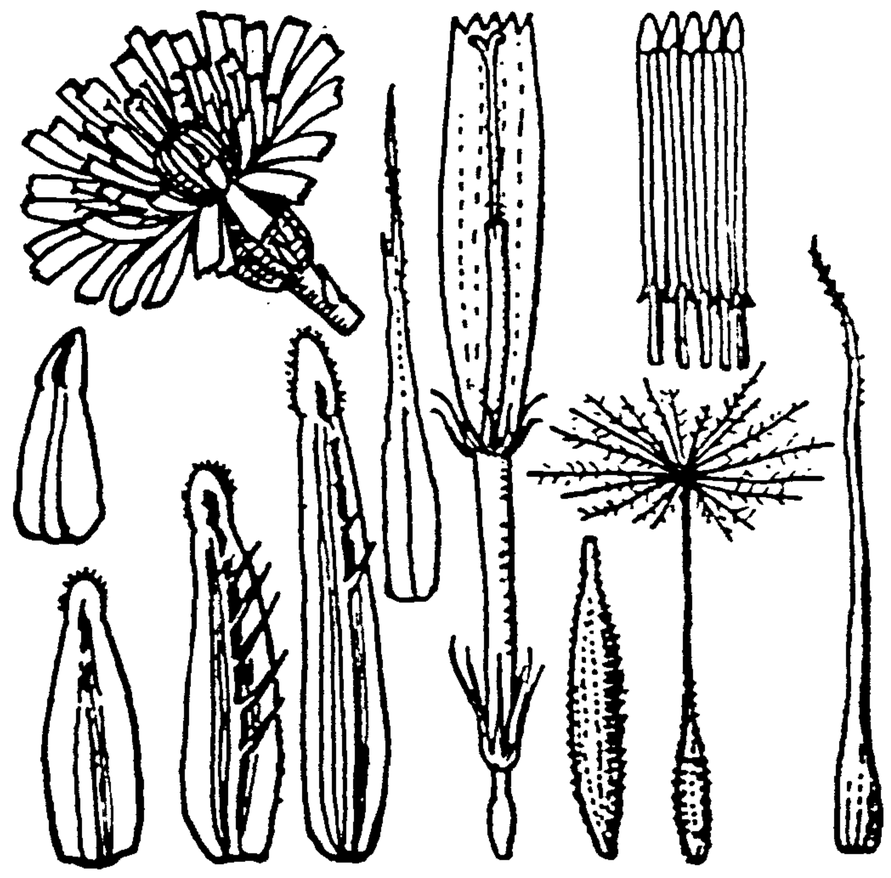


2. T. pratensis L. Similar to *T. porrifolius* in habit: peduncle abruptly thickened under the head: bracts of the involucre lanceolate, 25–35 mm. long: achene stout-fusiform, 1.5–2 cm. long, the beak shorter than the body.—(GOAT'S-BEARD.)—Fields and waste-places, various provinces, Ga. to Ont. Nat. of Eu.

3. **HYPOCHAERIS** L. Perennial or rarely annual, scapose herbs, the scapes often minutely scaly. Leaf-blades entire, toothed, or pinnatifid. Heads showy, erect, long-peduncled. Involucres cylindric to campanulate: bracts in several unequal series, the outer ones very small, the inner ones with dorsal crests near the apex. Corollas yellow. Stigmas slender, filiform or short. Achenes, the inner ones, at least, slender-beaked. Pappus single, the bristles plumose.—About 50 species, Eurasian and South American.—CAT'S-EARS.

Achenes uniform, all beaked: corollas much exceeding the involucre. 1. *H. radicata.*
Achenes of 2 kinds, the outer beakless, the inner beaked: corollas slightly exceeding the involucre. 2. *H. glabra.*

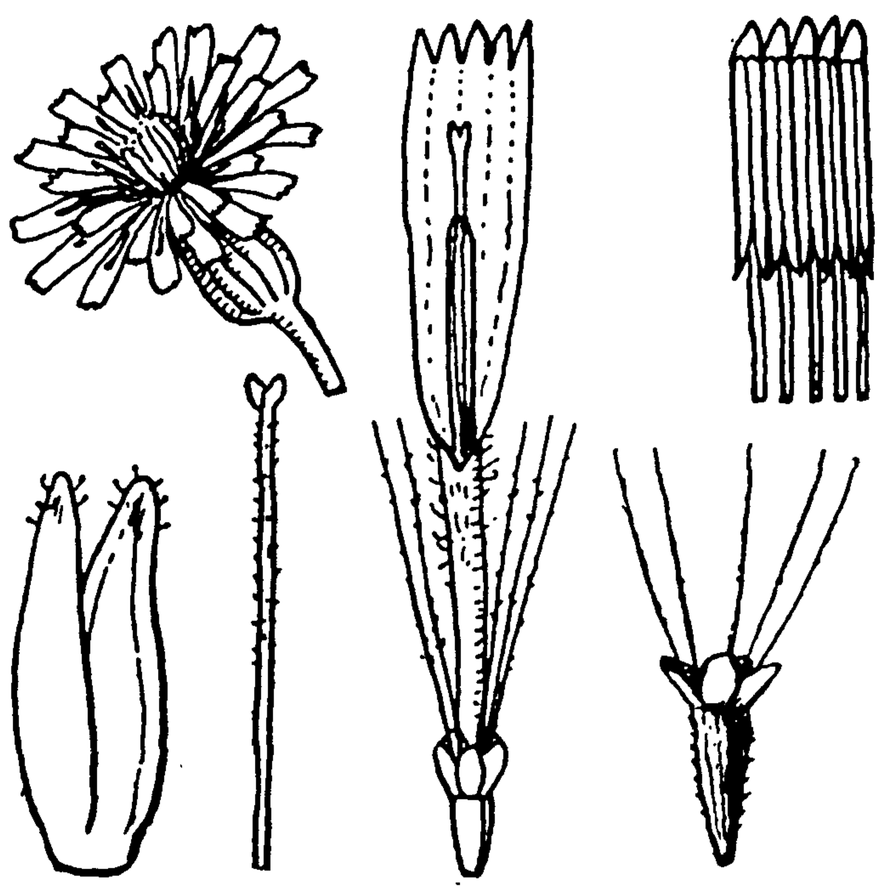
1. H. radicata L. Plant perennial, 2–6 dm. tall: leaves mostly 4–17 cm. long, hirsute; blades spatulate in outline, coarsely toothed or pinnatifid: heads 2.5–4 cm. wide: corollas with very narrow ligules: achenes fusiform, the bodies 3–3.5 mm. long, spinulose, those of the inner ones at least shorter than the filiform beaks.—Waste-places, fields, and wet pastures, various provinces, S. C. to Tex., Ont., and N. J.; Colo., and Pacif. St.—Nat. of Eu.—Spr.–sum.



2. H. glabra L. Plant annual, 2–5 dm. tall: leaves mostly 6–14 cm. long, glabrous or nearly so; blades spatulate to linear-spatulate in outline, pinnatifid or pinnately toothed: heads smaller than in *H. radicata:* corollas with narrow but relatively short ligules: achenes various, the inner fusiform

with bodies 3–4 mm. long and slender beaks, the outer about 3 mm. long, beakless.—Roadsides, lawns, and grassy places, various provinces, N Fla. to Ohio and Me. Nat. of Eu.—Spr.–fall.

4. **KRIGIA** Schreb. Annual herbs. Leaves mainly basal: blades narrow, toothed or pinnatifid. Heads slender-peduncled. Involucre narrow: bracts narrow, reflexed at maturity. Corollas light-yellow. Achene oblong or broadened upward. Pappus of 5 scales about ½ as long as the achene and also of 5 or 10 barbellate bristles.—One species.



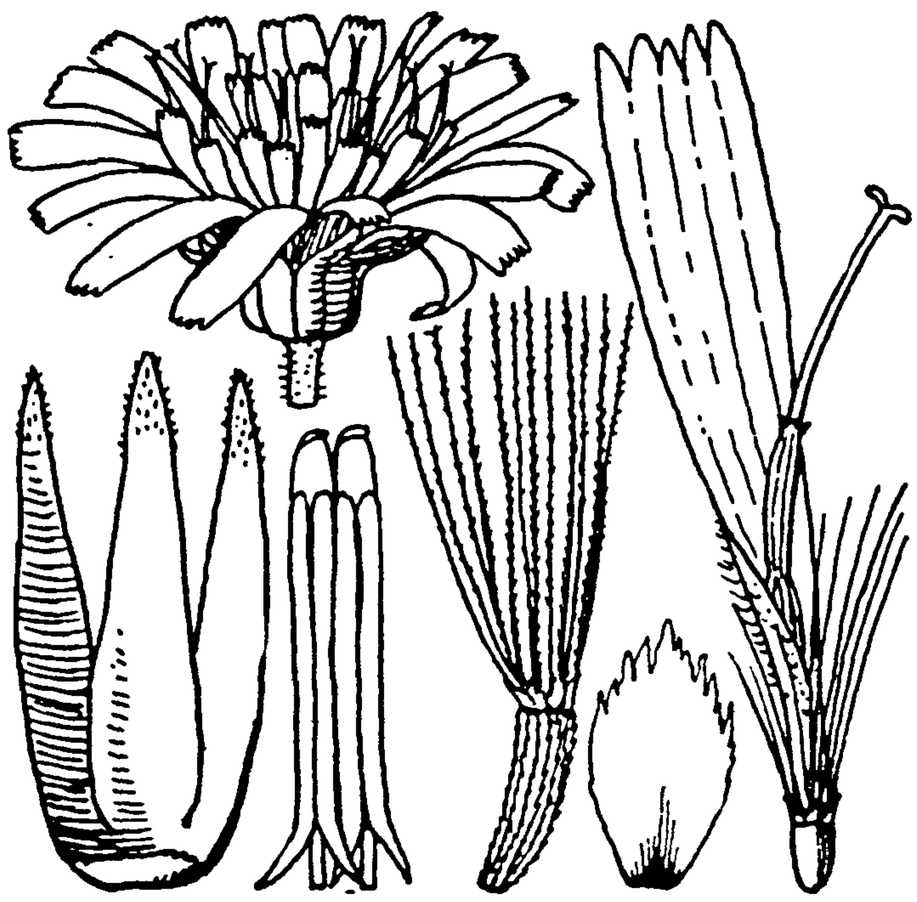
1. **K. virginica** (L.) Willd. Plant 0.3–4 dm. tall: leaf-blades spatulate to nearly linear, 2–12 cm. long: involucres mostly less than 7 mm. long: corollas 6–7 mm. long: achenes fully 1.5 mm. long, finely ribbed. [*Adopogon carolinianus* (Walt.) Britton.] —(DWARF-DANDELION.)—Open sandy places, and woods, various provinces, Fla. to Tex., Ont., and Me.—Spr.

5. **CYNTHIA** D. Don. Perennial herbs. Leaves mainly basal: blades narrow or broad, entire, repand, or pinnatifid. Heads long-peduncled. Involucre stout: bracts narrow, reflexed at maturity. Corollas bright-yellow. Achene not broadened upward. Pappus of 10–15 minute scales and as many or more numerous barbellate bristles.—Four species, North American.

Plant caulescent, the roots not tuber-bearing: pappus-scales not attenuate: heads 2–many.
- Pappus-scales very short: stem erect, sparingly leafy: leaves with dilated blades. — 1. *C. virginica.*
- Pappus-scales about ¼ the length of the achene: stem decumbent or reclining, very leafy: leaves with narrow blades. — 2. *C. montana.*

Plant acaulescent, the roots tuber-bearing: pappus-scales attenuate: heads solitary. — 3. *C. Dandelion.*

1. **C. virginica** (L.) D. Don. Stem 1–7 dm. tall: leaf-blades spatulate, elliptic, or oval, not elongate, entire or repand or slightly lyrate-pinnatifid: involucres mostly over 8 mm. long: corollas 10–12 mm. long: achene 2 mm. long, coarsely ribbed.—Moist banks and meadows, various provinces, rarely Coastal Plain, Ga. to Kans., Man., and Mass.—Spr.–fall.

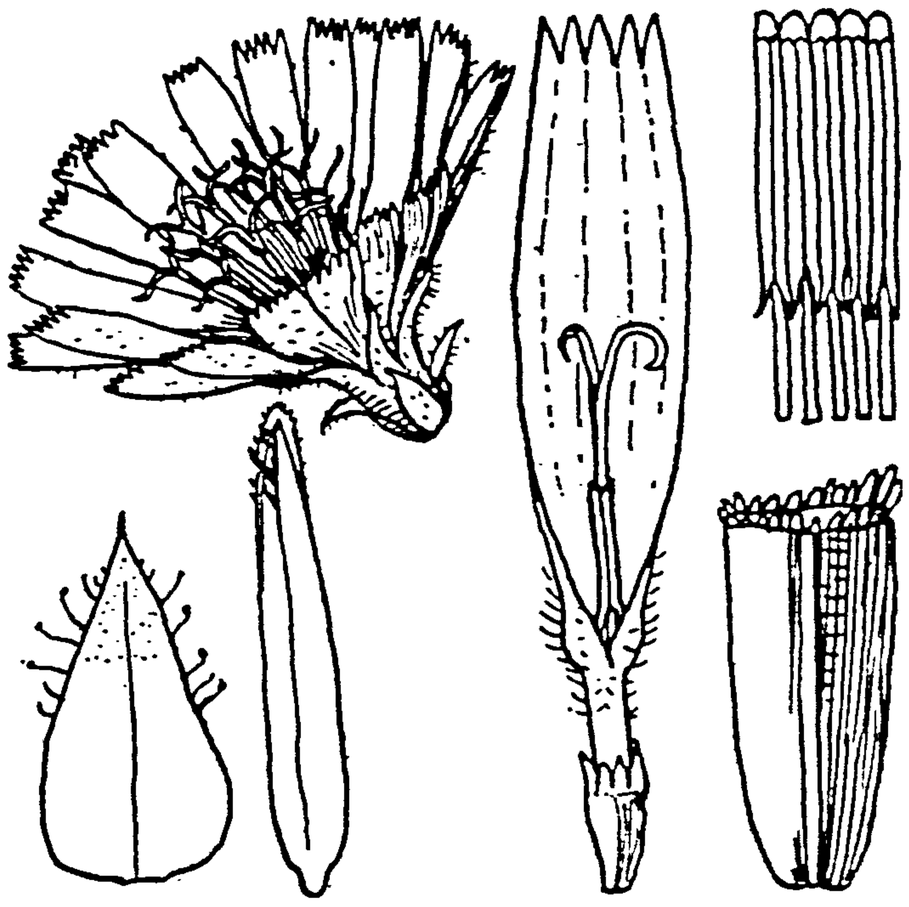


2. **C. montana** (Michx.) Standley. Stem 1–4 dm. tall, branched, diffuse at maturity: leaf-blades linear to linear-spatulate, elongate, entire or irregularly pinnatifid: peduncles usually solitary: achene slightly broadest above the middle, 2.5–3 mm. long, ⅓ as long as the pappus-bristles: pappus-scales about ¼ as long as the achene.—Cliffs and rocky slopes, in rather acid soil, Blue Ridge, Ga. to Tenn. and N. C.—Sum.–fall.

3. **C. Dandelion** (L.) DC. Scape 0.5–5 dm. tall, simple: leaf-blades spatulate to linear-oblong or linear, 5–15 cm. long, entire, repand, or irregularly

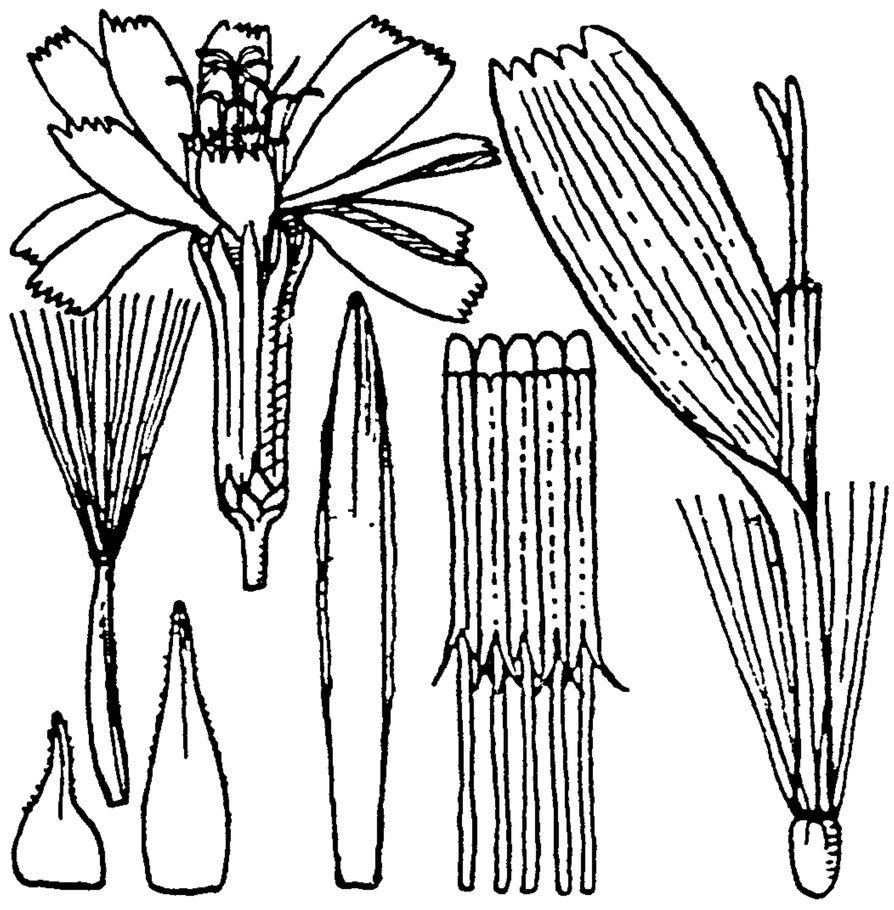
pinnatifid: head solitary: achene slightly broadest above the middle, nearly 2.5 mm. long, about ⅓ as long as the pappus-bristles: pappus-scales ¼–⅕ as long as the achene.—Moist or dry soil, often in woods, various provinces, Fla. to Tex., Kans., and N. J.—Spr.–sum.

6. **CICHORIUM** [Tourn.] L. Perennial rigid herbs. Leaf-blades toothed or pinnatifid, or crisped. Heads sessile or nearly so. Involucre firm or rigid: outer bracts spreading, the inner erect. Achene 5-ribbed or 5-angled. Pappus of 2 or 3 rows of scales.—About 8 species, in the Old World.—CHICORIES. SUCCORIES.



1. **C. Intybus** L. Tap-root elongate, tough. Stem 3–15 dm. tall, rigidly wide-branched: blades of the stem-leaves oblong to lanceolate, pinnatifid, toothed, or entire: involucres 10–12 mm. long; bracts lanceolate to linear, the outer glandular-ciliate: corollas sky-blue or white: ligules 10–20 mm. long: achene 2–2.5 mm. long.—(COMMON-CHICORY. BLUE-SAILORS.)—Fields, fence-rows, and roadsides, various provinces, Fla. to Tex., Calif., Wash., Ont., and N. S. Nat. of Eu.—(*W. I.*)—Sum.–fall.

7. **LYGODESMIA** D. Don. Annual or perennial caulescent herbs or partly woody plants, the stems rush-like. Leaf-blades narrow, entire or remotely pinnate-toothed, or scale-like. Heads erect. Involucre cylindric. Achene not flattened.—About 6 species, North American.



1. **L. aphylla** (Nutt.) DC. Stem erect or ascending, 3–8 dm. tall, solitary or tufted by the branching base, rush-like, naked or nearly so, sometimes forking above: leaves wanting or represented by narrow scales, or a few elongate linear blades at base of stem: involucres cylindric, about 2 cm. long; bracts various, the outer small, 1–3 mm. long, the inner linear or nearly so: ligules rose-colored or rarely white, 1.5–2 cm. long, toothed at the apex: achene narrow, 10–13 mm. long, nearly as long as the white pappus.—(FLOWERING-STRAWS. ROSE-RUSH.)—Dry pinelands and scrub, Coastal Plain, Fla. and Ga.—Spr.–fall.

8. **NABALUS** Cass. Perennial caulescent herbs. Leaf-blades toothed, lobed, pinnatifid, or divided. Heads nodding. Involucre cylindric or nearly so: main bracts nearly equal in length. Achene ellipsoid to columnar.—About 25 species, American and Asiatic.—Sum.–fall.—RATTLESNAKE-ROOTS. WHITE-LETTUCES. LION'S-FOOT. GALL-OF-THE-EARTH.

Heads 8–18-flowered, in thyrsoid or virgate racemiform panicles.
- Achene minutely, sometimes obscurely striate and also sometimes 3- or 4-ribbed: involucre glabrous or nearly so. I. ALBI.

Achene 5–15-nerved and sometimes angled by 4 or 5 of the stronger nerves: involucre copiously pubescent. II. RACEMOSI.
Heads 20–35-flowered, in corymb-like panicles. III. CREPIDINEI.

I. ALBI

Heads 5–7-flowered: involucre slender, less than 3 mm. thick; bracts light-green: pappus stramineous. 1. *N. altissimus.*
Heads 8–16-flowered: involucre stout, over 3 mm. thick, deep-green, glaucous, or purple.
Pappus deep cinnamon-colored. 2. *N. albus.*
Pappus stramineous or light-brown.
Leaf-blades merely toothed or somewhat incised.
Larger bracts of the outer involucre lanceolate: lower leaf-blades elliptic to oval, not cordate. 3. *N. integrifolius.*
Larger bracts of the outer involucre ovate: lower leaf-blades hastate, cordate. 4. *N. roanensis.*
Leaf-blades, at least some of them, pinnatifid, lobed, or divided.
Inflorescence paniculate.
Panicle broadened upward: bracts of the involucre, at least the longer ones, glabrous.
Larger bracts of the outer involucre lanceolate: pappus exceeding the inner involucral bracts. 5. *N. serpentarius.*
Larger bracts of the outer involucre ovate to triangular-ovate: pappus and inner involucral bracts about equal. 6. *N. trifoliatus.*
Panicle cylindric: bracts of the involucre sparingly hairy. 7. *N. cylindricus.*
Inflorescence racemiform. 8. *N. virgatus.*

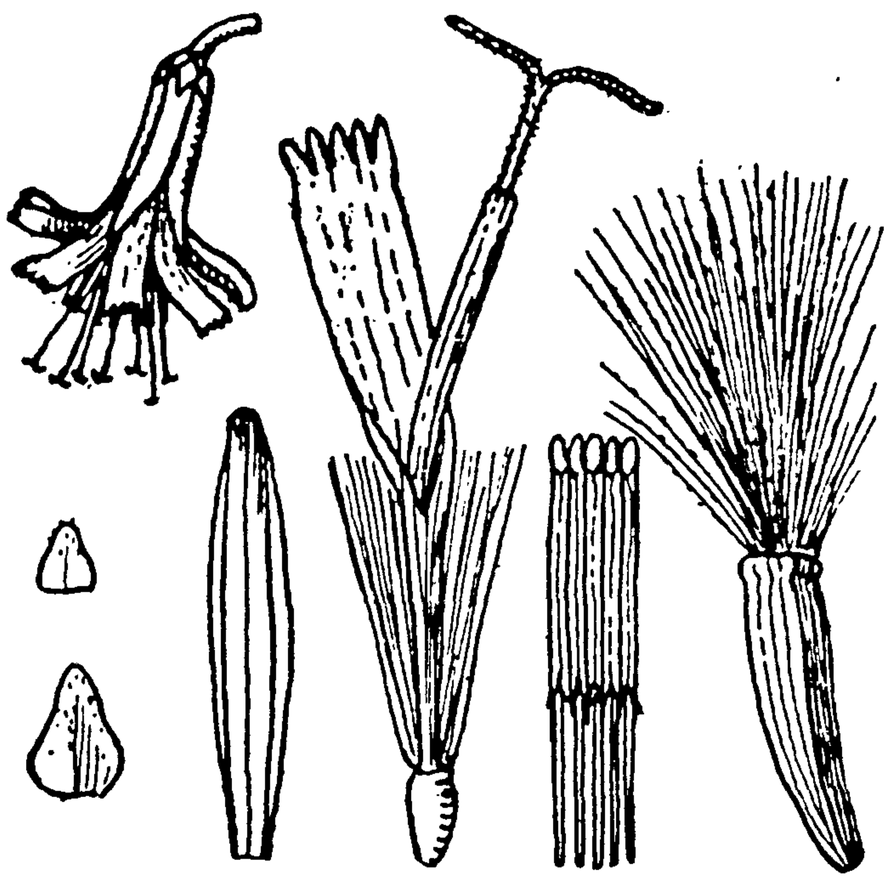
II. RACEMOSI

Leaf-blades entire or rather finely toothed: branches of the inflorescence very short and close together. 9. *N. asper.*

III. CREPIDINEI

Leaf-blades finely or coarsely toothed or incised: branches of the inflorescence elongate and distant. 10. *N. crepidineus.*

1. N. altissimus (L.) Hook. Stem 9–21 dm. tall, glabrous, glaucous: leaf-blades denticulate, or lobed or divided and with denticulate or lobed divisions: involucres less than 3 m. thick, the outer bracts of the involucre deltoid to ovate, 1–2 mm. long, the inner ones 9–10 mm. long, light-green, glabrous: ligules greenish or yellowish.—Woods and low thickets, various provinces, rarely Coastal Plain, Ga. to Miss., Tenn., Man., and Newf.



2. N. albus (L.) Hook. Stem 3–16 dm. tall, glabrous, glaucous: leaf-blades, or the divisions, coarsely toothed: outer bracts of the involucre ovate, 2–3 mm. long, the inner ones 10–12 mm. long, dark-green, glabrous: ligules dull-white or cream-colored.—Rich banks, woods, and thickets, various provinces, rarely Coastal Plain, Ga. to Tenn., Sask., and Me.

3. N. integrifolius Cass. Stem 4–18 dm. tall, glabrous, at least in age; leaf-blades oblong, varying to broadest above or below the middle, finely or coarsely dentate, those of the lower leaves cuneate to subcordate at the base: outer bracts of the involucre lanceolate, hirsute on the back: pappus dirty-brown.—Woods, various provinces N of Coastal Plain, Ga. to N. Y.

4. N. roanensis Chickering. Stem 3–5 dm. tall, pubescent: leaf-blades ovate to hastate, denticulate, the basal lobes directed backwards or sidewards:

inner bracts of the involucre 8–9 mm. long, sparingly hirsute on the back with long hairs: pappus dingy straw-colored.—Mt. peaks, Blue Ridge, N. C. and Tenn.

5. **N. serpentarius** (Pursh) Hook. Stem 3–12 dm. tall, glabrous: larger leaf-blades pinnately lobed: inner bracts of the involucre 9–11 mm. long, often ciliate at the tip: pappus straw-colored.—(LION'S-FOOT.)—Fields, woods, and thickets, various provinces, Fla. to Miss., Ont., and Mass.

6. **N. trifoliatus** Cass. Stem 8–26 dm. tall, glabrous: larger leaf-blades pedately lobed: inner bracts of the involucre 9–11 mm. long, wholly glabrous: pappus light-brown.—(GALL-OF-THE-EARTH.)—Woods and thickets, various provinces, rarely Coastal Plain, N. C., and Tenn.

7. **N. cylindricus** Small. Stem 3–9 dm. tall, glabrous: larger leaf-blades pinnately 3–5-lobed: inner bracts of the involucre 9–10 mm. long, with scattered hairs on the back: pappus pale-brown.—Mt. slopes, Blue Ridge to Appalachian Plateau, N. C. to Tenn. and Ky.

8. **N. virgatus** (Michx.) DC. Stem 6–12 dm. tall, glabrous: leaf-blades spatulate to lanceolate in outline, pinnatifid, the lobes sometimes toothed: outer bracts of the involucre ciliate, the inner ones 9–10 mm. long, glabrous: ligules white or pink: pappus straw-colored.—Pinelands, Coastal Plain, Fla. to Miss. and N. J.

9. **N. asper** (Michx.) T. & G. Stem 9–20 dm. tall, pubescent: leaf-blades obovate, oblong or lanceolate, undulate to coarsely toothed: bracts of the involucre hirsute, the inner ligules cream-colored: pappus sordid-brown or pale straw-colored.—Dry soil, various provinces, La. to Tenn., S. Dak., and Ohio.

10. **N. crepidineus** (Michx.) DC. Stem 9–21 dm. tall, finely pubescent at least when young: leaf-blades ovate to ovate-hastate, finely or coarsely toothed: bracts of the involucre strigose-hirsute, the inner 9–10 mm. long: ligules cream-colored: pappus dirty-brown.—Rich soil and thickets, various provinces N of Coastal Plain, Tenn. to Kans., Minn., and N. Y.

9. **HIERACIUM** L. Perrennial caulescent or scapose herbs. Leaf-blades entire or toothed. Heads erect, paniculate or corymbose. Involucres usually narrow: main bracts unequal in length, often in 2 or 3 series, with a calyculum. Corolla yellow, rarely white or orange. Achenes fusiform or columnar, ribbed. Pappus of 1 or 2 series of sordid or brownish fragile bristles, or rarely white.—About 300 species, natives of the north temperate zone and South America.—HAWKWEEDS.

Flowering stem leafy.	I. PANICULATA.
Flowering stem leafless.	II. VENOSA.

I. PANICULATA

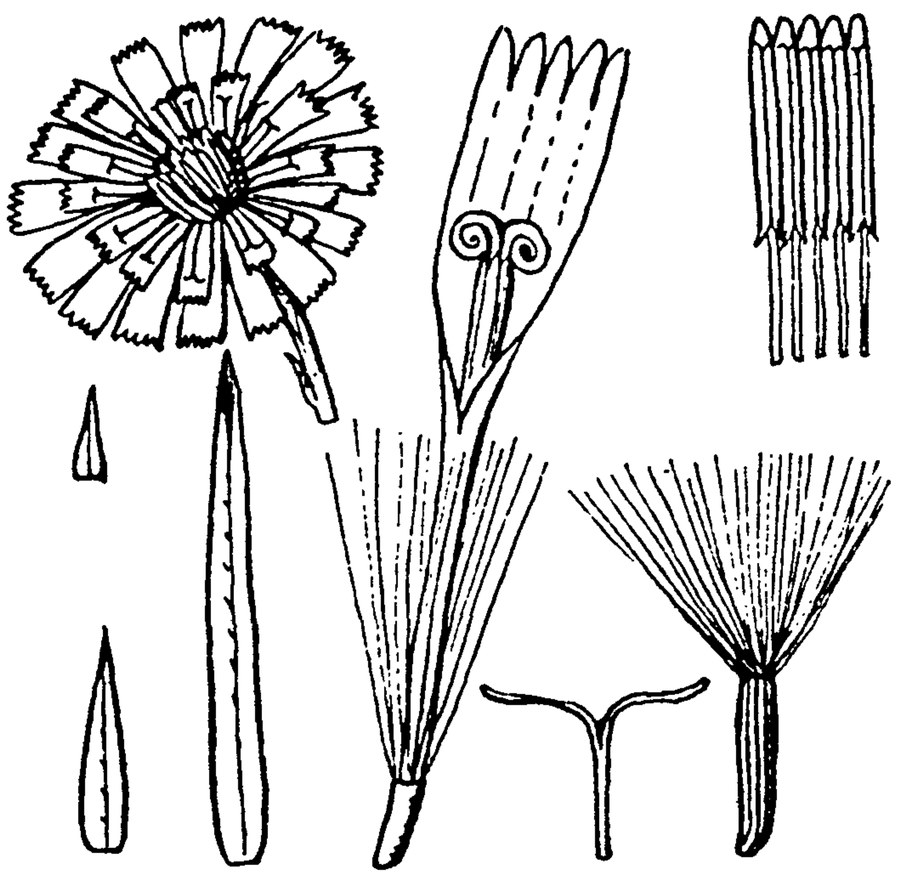
Achene columnar.	
Inflorescence more or less elongate, not flat-topped.	
Panicle lax: heads few- (10–20) flowered.	1. *H. paniculatum.*
Panicle stiff: heads many- (40–50) flowered.	2. *H. scabrum.*
Inflorescence corymbiform.	
Heads many- (20–40) flowered: peduncles densely pubescent.	3. *H. marianum.*
Heads few- (10–15) flowered: peduncles glaucous.	4. *H. Scribneri.*
Achene fusiform.	
Inflorescence elongate, paniculate.	5. *H. Gronovii.*
Inflorescence corymbiform.	
Pappus brown.	6. *H. megacephalon.*
Pappus white.	7. *H. argyraeum.*

II. VENOSA

Inflorescence-branches glabrous or sparingly pubescent: bracts of the involucre glabrous or with scattered fine short glandular hairs. 8. *H. venosum.*

Inflorescence-branches tomentulose and hispid: bracts of the involucre tomentulose and also with long black glandular hairs. 9. *H. Greenii.*

1. **H. paniculatum** L. Plant pale-green or glaucescent, 3–12 dm. tall, the stem sometimes villous at the base: blades of the cauline leaves elliptic-spatulate to elliptic or elliptic-lanceolate, mostly 3–13 cm. long, sinuate-toothed, glabrous, acute or acuminate, sessile: peduncles very slender, nearly filiform, usually glabrous: inner bracts of the involucre 5–6 mm. long, glabrous or obscurely pubescent: achene about 2.5 mm. long.—Banks, woods, and thickets, various provinces, Ga. to Ala., Mich., and N. S.—Sum.



2. **H. scabrum** Michx. Plant bright-green, 3–14 dm. tall, the stem pubescent throughout: blades of the cauline leaves spatulate to elliptic, oval, or ovate, 3–16 cm. long, entire or repand-denticulate, pubescent, obtuse or acutish, the upper ones sessile: peduncles rather stout, copiously glandular-pubescent: inner bracts of the involucre 7–9 mm. long, glandular-pubescent: achene 2–2.5 mm. long.—Clearings, dry woods, pastures, and roadsides, various provinces, Ga. to Miss., Kans., Minn., and N. S.—Sum.–fall.

3. **H. marianum** Willd. Plant bright-green, 3–8 dm. tall, the stem glabrous or softly hirsute near the base: basal leaves often persistent; blades spatulate to obovate, mostly 10–15 cm. long, with more or less shaggy-pubescent petiole-like bases: cauline leaves few; blades obovate, oblanceolate, or elliptic, entire or repand-denticulate, obtuse or abruptly pointed, sessile: peduncles usually finely white-tomentulose and also glandular-pubescent: inner bracts of the involucre 7–9 mm. long, sparingly glandular-pubescent: achene 2.5–3 mm. long, or rarely longer.—Woods, clearings, and banks, various provinces, Fla. to Miss., Ohio, and N. H.—Spr.

4. **H. Scribneri** Small. Plant glaucous, 3–8 dm. tall, the stem glabrous or hirsutulous at the more or less purple-tinged base: basal leaves often persistent; blades spatulate to elliptic, 5–15 cm. long, with shaggy-pubescent petiole-like bases: cauline leaves few; blades oblanceolate, elliptic, lanceolate, or linear-lanceolate, undulate or repand-denticulate, acuminate or acute, sessile: peduncles glabrous or sparingly glandular-pubescent: inner bracts of the involucre 7–9 mm. long, glabrous or sparingly glandular pubescent: achene 2–2.5 mm. long or rarely larger.—Rocky slopes, wooded hillsides, and bluffs, Blue Ridge to Interior Low Plateaus, Ga. to Ala. and Ind.—Sum.

5. **H. Gronovii** L. Plant 2–12 dm. tall, very variable in habit, bright-green, the stem pubescent on the lower part or near the base: basal leaves sometimes persistent; blades obovate to spatulate, 3–16 cm. long, sparingly shaggy-pubescent at the edges or sometimes only sparingly pubescent: cauline leaves few to many; blades spatulate, obovate, elliptic, or ovate, mostly sessile or clasping: peduncles glandular-pubescent: inner bracts of the involucre 6–7 mm.

long, glandular-pubescent: achene 3–3.5 mm. long.—Dry woods, barren hillsides, and pinelands, various provinces, Fla. to Tex., Ont., and Mass.—Sum.–fall.—The plant with broad based sessile leaf-blades extending nearly to the base of the stem, from Florida, has been described as *H. floridanum*.

6. **H. megacephalon** Nash. Plant 2–7 dm. tall, the stem hirsute, sometimes sparingly so, throughout: basal leaves persistent; blades spatulate to obovate, 4–17 cm. long, more or less shaggy-pubescent: cauline leaves few; blades spatulate, obovate, elliptic, or lanceolate: peduncles finely pubescent and glandular: inner bracts of the involucre 9–11 mm. long, glandular-pubescent: achene 4.5–5.5 mm. long.—Pinelands, pen. Fla. and Coastal Plain of Ga.—All year.

7. **H. argyraeum** Small. Plant 1.5–5 dm. tall, the stem more or less hirsute and glandular above: basal leaves persistent; blades spatulate, obovate, or elliptic, 2–13 cm. long, more or less shaggy-pubescent: cauline leaves few; blades spatulate, obovate, elliptic, or lanceolate: peduncles closely glandular pubescent and finely tomentulose: inner bracts of the involucre 8–10 mm. long, glandular-pubescent, sometimes copiously so: achene 4–4.5 mm. long.—Hammocks and open pinelands, Fla.—All year.

8. **H. venosum** L. Plant 2–6.5 dm. tall, the stem (scape) usually glabrous and purple-tinged: basal leaves persistent; blades obovate to spatulate, 3–15 cm. long, undulate or repand-denticulate usually pale-green and purple-veined, sometimes purple beneath, glabrous or pubescent near the base: peduncles glabrous or sparingly glandular-pubescent: inner bracts of the involucre 6–7 mm. long: achene 2.5–3 mm. long.—(RATTLESNAKE-WEED. POOR-ROBIN'S PLANTAIN.)—Dry woods, shaded banks, and plains, often in acid soil, various provinces, Ga. to Nebr., Mass., and Me.—Sum.

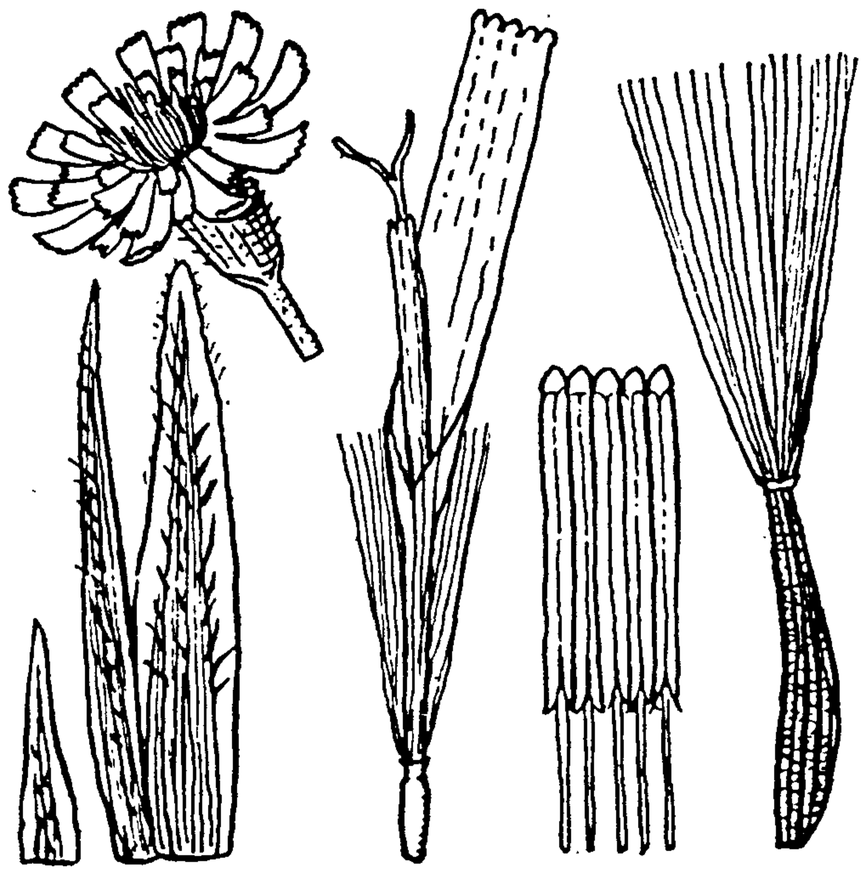
9. **H. Greenii** Porter & Britton. Plant 3–9 dm. tall, the stem (scape) glabrous or finely pubescent, often only in lines: basal leaves persistent; blades spatulate to elliptic-spatulate, 5–20 cm. long, undulate, somewhat shaggy-pubescent, especially near the margins and at the base, bright green: peduncles finely white tomentulose and glandular-pubescent: inner bracts of the involucre 8–11 mm. long: achenes 3–3.5 mm. long.—Dry woods and open slopes, Blue Ridge and more N provinces, Ga. to Ala., Ohio, and Pa.—Spr.

10. **CREPIS** L. Annual or biennial herbs, resembling *Hieracium*, with glabrous or sparingly pubescent foliage. Leaves alternate: blades mostly repand or pinnatifid. Heads few–many-flowered, paniculate or corymbose. Involucres narrow: bracts usually in a single row or in several rows. Corollas yellow. Achene narrow. Pappus of white soft hairs.—About 200 species, natives of the Northern Hemisphere.

Involucre 6–8 mm. high: achenes fusiform, beakless.
  Leaf-blades runcinate-pinnatifid: involucre 6–8 mm. high: achene 2.5–3 mm. long. 1. *C. tectorum.*
  Leaf-blades lyrate-pinnatifid: involucre 3.5–4.5 mm. high: achene 1.5–2 mm. long. 2. *C. japonica.*
Involucre 9–12 mm. high: achene slender-fusiform, beaked, the marginal ones filiform-beaked. 3. *C. foetida.*

1. **C. tectorum** L. Plant usually branched at the base, 2–4 dm. tall, sparingly pubescent: leaf-blades elliptic, lanceolate, or linear-lanceolate in outline,

runcinate-pinnatifid, usually sagittate-auriculate at the base: involucres 6–8 mm. high; bracts hirsute-hispid, acute: achene fusiform, 2.5–3 mm. long, ribbed.—(HAWKSBEARD.)—Roadsides and fields, various provinces, N. C. to Nebr. and Ont. Nat. of Eu. —Fall.



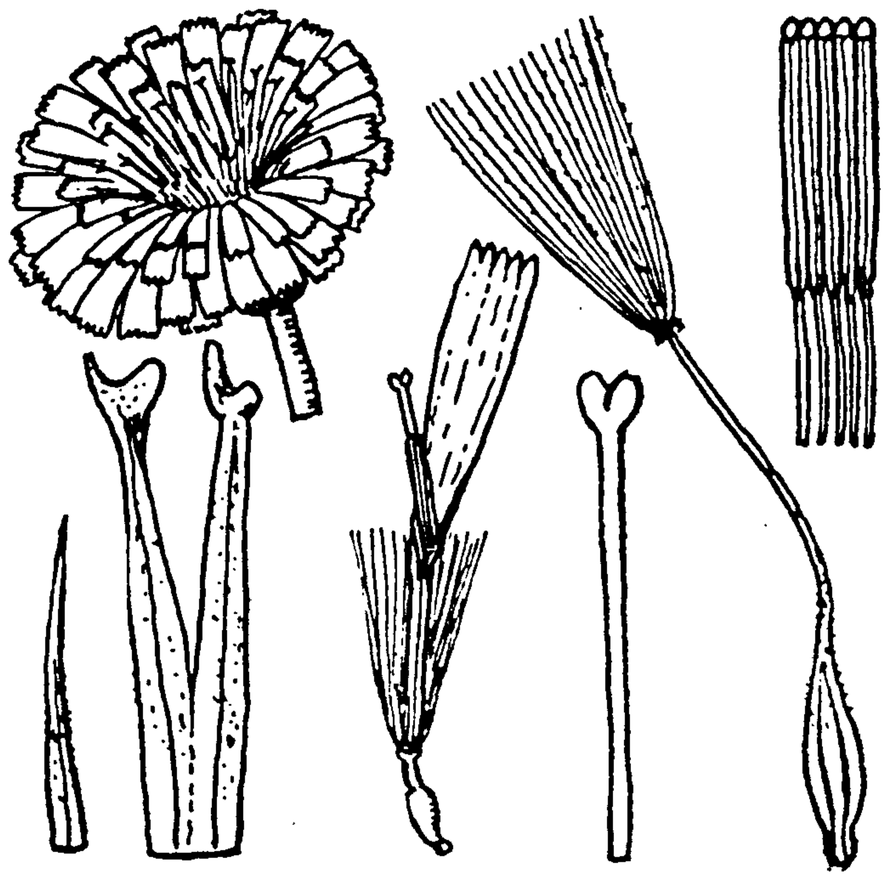
2. **C. japonica** (L.) Benth. Plant 1–6 dm. tall: stem simple below or branched at the base, finely pubescent near the base, glabrous or nearly so above and in the very slenderly branched inflorescence: leaves mainly or wholly basal; blades lyrately pinnatifid, mostly 5–15 cm. long, petioled: involucres 3.5–4.5 mm. high; bracts acuminate, glabrous: achene fusiform, 1.5–2 mm. long, ribbed.—Roadsides, waste-places, and meadows, S La. Nat. of Japan.—(*W. I.*)—All year.

3. **C. foetida** L. Plant 3–5 dm. tall, simple below or branched at the base, pubescent: leaf-blades mostly oblanceolate in outline, runcinate-pinnatifid or some of them coarsely sinuate-toothed, those of the stem with dilated fringed-toothed bases: involucres 9–12 mm. high; bracts acuminate, loosely hirsute: achenes various, and inner ones short-beaked, the marginal ones with filiform beaks as long as the body.—Roadsides, fields, and dunes, coastwise islands of NE Fla. and Ga.—Nat. of Eu.—Spr.–fall.

11. SITILIAS Raf. Biennial or perennial caulescent or scapose herbs. Leaf-blades irregularly toothed, pinnatifid, or sometimes entire. Heads erect. Involucre ovoid to campanulate: bracts in 2 unequal series, inner ones abruptly keeled near the apex. Corollas yellow or whitish. Achene with an ellipsoid body. Pappus double, the outer very short.—Six species, North American.—Spr.–fall.—FALSE-DANDELIONS.

Bracts of the outer involucres fully 1/3 to over 1/2 as long as the inner: heads fully 2.5 cm. long at maturity. 1. *S. caroliniana.*
Bracts of the outer involucres less than 1/3 as long as the inner: heads 2 cm. long at maturity or shorter. 2. *S. multicaulis.*

1. **S. caroliniana** (Walt.) Raf. Stems erect, 1–1.5 dm. tall, usually branched: leaves various; blades more or less deeply pinnatifid, sometimes merely denticulate or nearly entire, these conspicuously elongate: involucre 12–26 mm. long; inner bracts narrowly linear; outer bracts narrower, fully ⅓ to over ½ as long as the inner: ligules yellow: achene-body about 5 mm. long, ribbed, somewhat rufous. [*Pyrrhopappus carolinianus* (Walt.) DC.]—Dry soil, roadsides, waste-places and pinelands, various provinces, Fla. to Tex., Kans., and Del.—Spr.–fall.—A variety with pale cream-colored ligules, tipped with rose, and streaked rose on the under side, occurs in N Fla. A similar or the same one occurs in Ala. This may prove, upon further investigation to be a distinct species.



2. **S. multicaulis** (DC.) Greene. Stems solitary or tufted, ascending or spreading, 1–4 dm. long, more or less branched: leaves mainly basal, 5–15 cm. long:

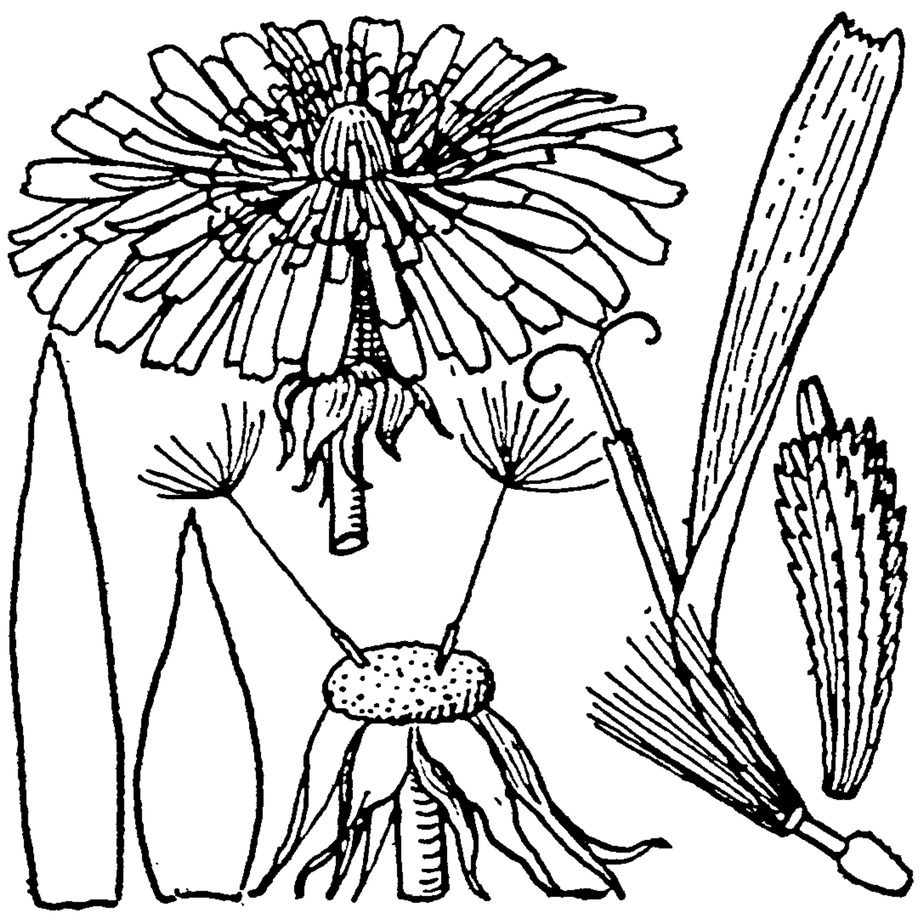
blades pinnate or irregularly pinnatifid, the segments entire or toothed; upper leaves narrower, deeply pinnatifid or merely toothed; involucres 1–1.5 cm. long; inner bracts narrowly linear, acute; outer bracts linear-subulate, ¼ to nearly ⅓ as long as the inner bracts: ligules bright-yellow, 1.5–2 cm. long: achene-body 3.5–4 mm. long, reddish, transversely wrinkled.—Dry soil, hillsides, prairies, woods, and ditch-banks, various provinces, N Fla. to Tex. and Ariz.—(*Mex.*)—Spr. and sum.

12. **LEONTODON** L. Perennial low caulescent herbs. Leaf-blades sinuate-toothed or runcinate-pinnatifid, or rarely entire. Heads solitary. Involucre thick, scaly. Achene not much flattened. Pappus persistent. [*Taraxacum* Ludwig.]—About 30 species, in the Northern Hemisphere and South America.—Spr.–fall.—DANDELIONS. BLOW-BALLS.

Inner involucral bracts unappendaged: achene brown or olive-green.
1. *L. Taraxacum.*

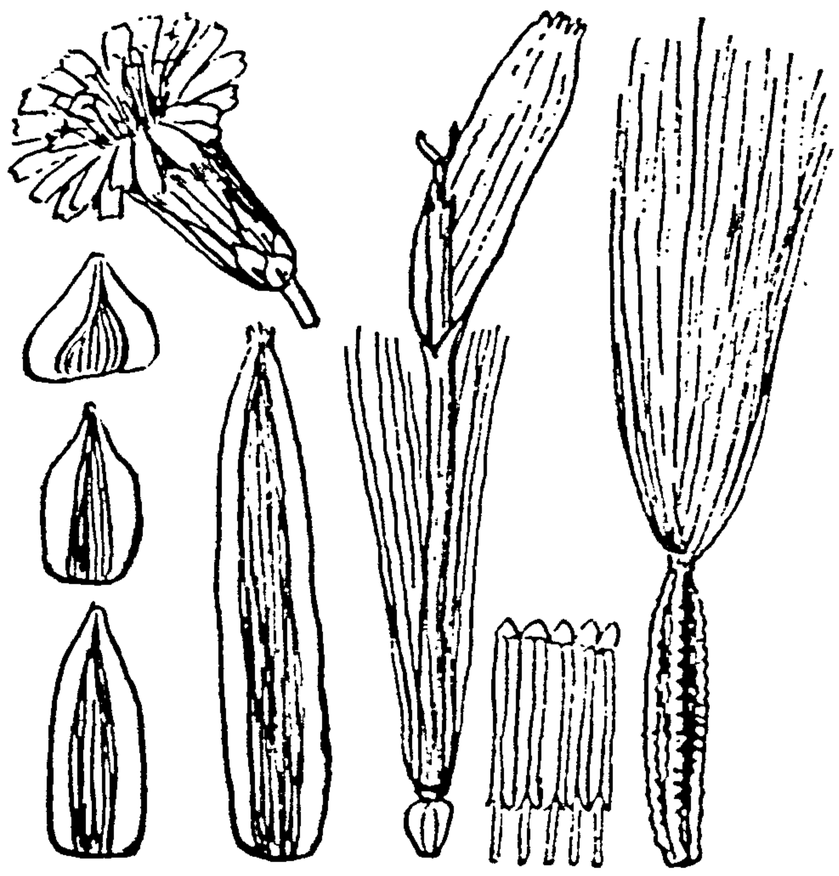
Inner involucral bracts appendaged at the tip: achene red or red-brown.
2. *L. erythrospermum.*

1. L. Taraxacum L. Leaf-blades sinuate or coarsely pinnatifid, often lyrate, the lobes broad: heads 3–5 cm. wide, the ligules orange-yellow: involucral bracts green, the outer ones long, reflexed: achene-body bluntly spinulose near the top: pappus white. [*Taraxacum Taraxacum* (L.) Karst.]—Fields, open grounds, waste-places, and woods, throughout U. S. and S. Can.



2. L. erythrospermum (Andrz.) Eichw. Leaf-blades pinnatifid or pinnately divided, runcinate, the lobes narrow: heads 2–3 cm. wide, the ligules light-yellow: involucral bracts glaucous, the outer ones short, ascending or spreading: achene-body sharply spinulose near the apex: pappus dirty-white.—Fields, lawns, and waste-places, various provinces N of Coastal Plain, N. C. to Tenn., Alb., and Me. Nat. of Eu.

13. **BRACHYRHAMPHUS** DC. Annual, coarse herbs with branching stems. Leaves mainly basal or on the lower part of the stem. Leaf-blades sagittate-clasping, mostly pinnatifid or lyrate-pinnatifid. Heads erect. Involucre ovoid-conic. Achene subterete, ribbed, the ribs muriculate.—The following and perhaps a few other species, tropical.



1. B. intybaceus (Jacq.) DC. Stem 3–15 dm. tall, glabrous: leaf-blades bright-green, those of the lower leaves 1–3 dm. long, the edges or lobes spiny-toothed: heads solitary at the nodes, on slender scaly stalks: bracts of the involucre conspicuously scarious-margined, the outer ovate, the inner linear-lanceolate: corollas yellow or ochroleucous: achene somewhat fusiform, about 4 mm.

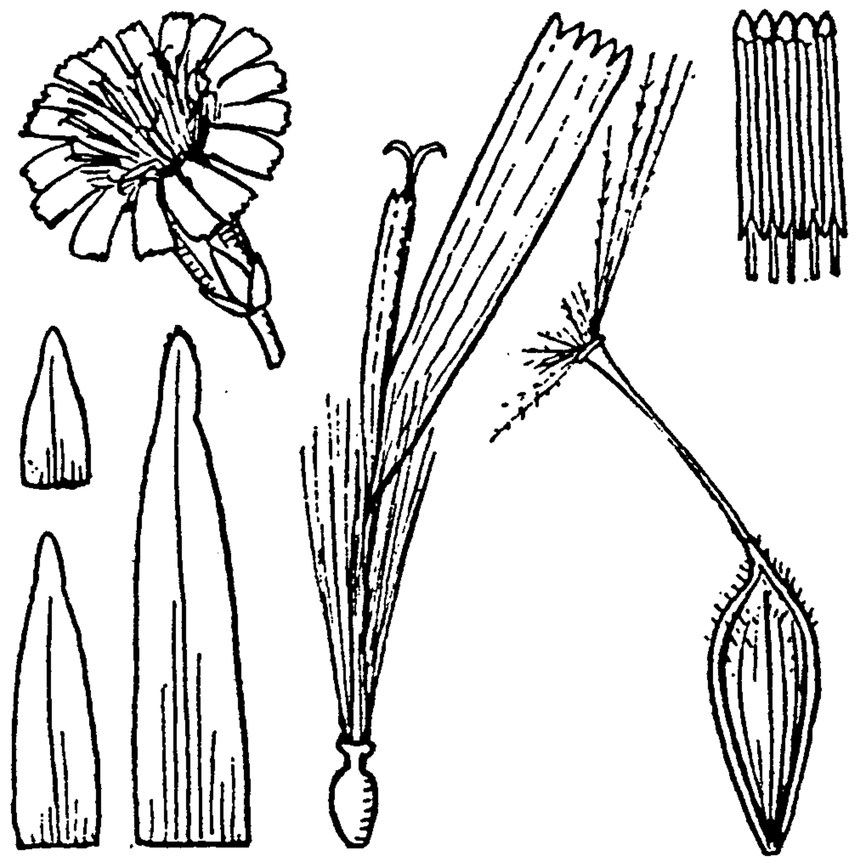
long: pappus bright-white.—(WILD-LETTUCE.)—Roadsides, cult. grounds, and waste-places, S Fla. Nat. of Trop. Am.—(*W. I., Mex., C. A., S. A.*)—All year.

14. **LACTUCA** L. Annual, biennial, or perennial herbs, the stems stout. Leaf-blades mostly relatively broad, entire, toothed, or pinnatifid, sometimes spiny-margined. Heads erect. Involucres cylindric to ovoid. Achene flattened, slender-beaked.—About 75 species, in the Northern Hemisphere.—Sum.–fall.—LETTUCES. WOOD-LETTUCES. WILD-LETTUCES.

Leaf-blades spiny-toothed and often spiny along the midrib beneath: corollas yellow.	
Involucres 6–12-flowered.	
Leaf-blades sinuately spiny-denticulate.	1. *L. virosa.*
Leaf-blades deeply pinnatifid.	2. *L. Scariola.*
Involucres 12–20-flowered.	
Involucres over 1.5 cm. high: beak fully as long as the body of the achene.	3. *L. ludoviciana.*
Involucres less than 1.5 cm. high: beak shorter than the body of the achene.	4. *L. sagittifolia.*
Leaf-blades without spines on the margins or midribs.	
Leaf-blades entire or merely toothed.	4. *L. sagittifolia.*
Leaf-blades, at least some of them, pinnatifid.	
Leaves glabrous.	5. *L. canadensis.*
Leaves hirsute, at least their midribs.	
Lower leaf-blades all pinnatifid: beak of achene fully as long as the body.	6. *L. hirsuta.*
Lower leaf-blades usually both entire and pinnatifid: beak of achene much shorter than the body.	7. *L. graminifolia.*

1. **L. virosa** L. Stem hirsute below, 6–20 dm. tall: leaf-blades oblanceolate to oblong, merely denticulate, glaucous: inner bracts of the involucre 12–15 mm. long, narrowly linear: outer corollas 11–12 mm. long: achene-body gradually narrowed at the apex.—Fields, waste-places, and roadsides, various provinces, Ga. to Tenn., Kans., and N. Y. Nat. of Eu.

2. **L. Scariola** L. Stem nearly or quite glabrous, 4–15 cm. tall: leaf-blades oblong to lanceolate in outline, pinnatifid, bright-green: inner bracts of the involucre 8–10 mm. long, linear-oblong: outer corollas 8–9 mm. long: achene-body abruptly narrowed at the apex.—(PRICKLY-LETTUCE.)—Waste-places, fields, and roadsides, various provinces, Ga. to Miss., Mo., and Vt. Nat. of Eu.



3. **L. ludoviciana** (Nutt.) DC. Stem 4–15 dm. tall, glabrous: leaves horizontal: blades 5–20 cm. long, sinuate-lobed or pinnatifid: involucres 16–20 mm. long, the inner bracts linear-lanceolate: ligules yellow: achene-body 4–4.5 mm. long.—Dry soil, often on wooded banks, various provinces, Tenn. to Tex., N. Dak., Minn., and Ark.

4. **L. sagittifolia** Ell. Stem 9–30 dm. tall, glabrous: blades of the stem-leaves 8–30 cm. long, irregularly dentate: involucres 10–20 mm. long, the inner bracts narrowly linear or nearly so: ligules yellow or reddish: achene-body 2.5–3 mm. long, longer than the beak.—Rich soil, open woods, and shaded banks, various provinces, Ga. to Nebr., and Pa.

5. **L. canadensis** L. Stem 9–30 dm. tall, glabrous or nearly so: blades of the stem-leaves 10–30 cm. long, sinuate-pinnatifid: involucres 10–12 mm. long,

the inner ones linear-lanceolate: ligules yellow: achene-body 3–4 mm. long, about as long as the beak.—(WILD-LETTUCE. HORSE-WEED.)—Rich soil, fence-rows, thickets, and open woods, various provinces, Ga. to La., Colo., B. C., Ont., and N. S.—(*W. I.*)

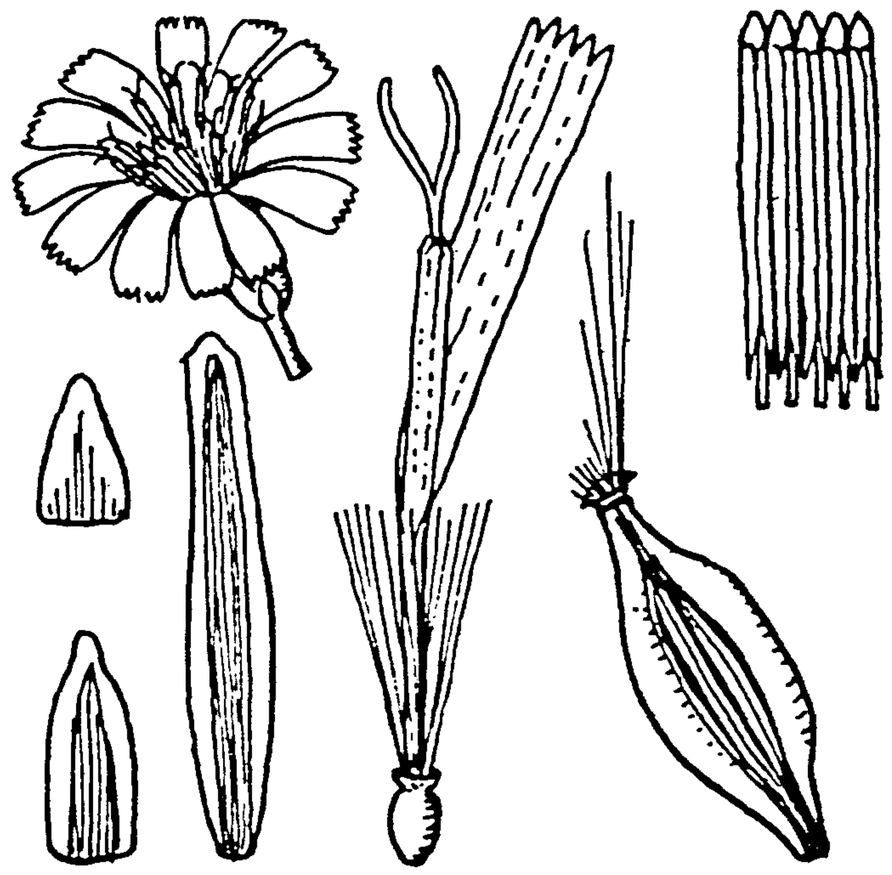
6. **L. hirsuta** Muhl. Stem 6–12 dm. tall, sometimes hirsute: blades of the stem-leaves 9–20 cm. long, sinuate-pinnatifid, not elongate: involucres 12–15 mm. long, the inner bracts linear: ligules purplish yellow to white: achene-body about 4 mm. long, much shorter than the beak.—Dry soil, various provinces, Ala. to Tex., Ont., and Que.

7. **L. graminifolia** Michx. Stem 6–15 dm. tall, glabrous: blades of the stem-leaves 10–40 cm. long, entire or with few spreading or deflexed lobes, conspicuously elongate: involucres 12–15 mm. long, the inner ones linear-lanceolate: ligules purple-blue, or rarely white or yellowish: achene-body 4–4.5 mm. long. —Fields and woods, Coastal Plain and adj. provinces, Fla. to Tex. and S. C.

15. **MULGEDIUM** Cass. Herbs resembling *Lactuca* in habit. Achene thick, beakless. About 25 species, Eurasian and North American.—Sum.–fall. —LETTUCES. BLUE-LETTUCES.

Pappus bright-white: blades of the stem-leaves neither auriculate nor clasping.
  Leaf-blades toothed: achene-body not narrowed into a neck. 1. *M. villosum.*
  Leaf-blades pinnatifid: achene-body narrowed into a slender neck. 2. *M. floridanum.*
Pappus brown: blades of the stem-leaves auriculate and clasping. 3. *M. spicatum.*

1. **M. villosum** (Jacq.) Small. Stem 9–20 dm. tall: blades of the stem-leaves irregularly dentate, 8–20 cm. long: inner bracts of the involucre linear-lanceolate: ligules blue: achene 4.5–5.5 mm. long.—Borders of woods, open woods, and thickets, various provinces, Fla. to La., Nebr., and N. Y.



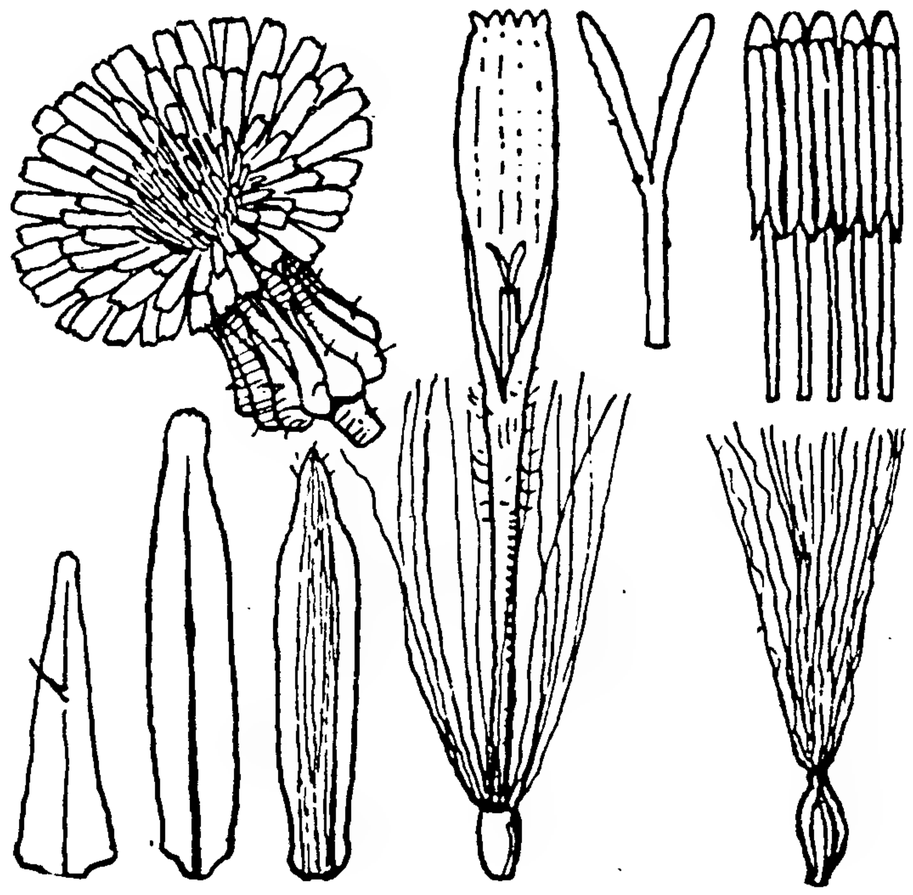
2. **M. floridanum** (L.) DC. Stem 10–30 dm. tall: blades of the stem-leaves lyrate-pinnatifid, 2–45 cm. long: inner bracts of the involucre linear: ligules blue: achene 6–7 mm. long.—Rich soil, thickets, and banks, various provinces, Fla. to Tex., Nebr., and N. Y.—(*W. I.*)

3. **M. spicatum** (Lam.) Small. Stem 9–35 dm. tall: blades of the stem-leaves lobed or pinnatifid (merely denticulate in *M. spicatum integrifolium*): ligules white, yellowish, or bluish: achene 4–5 mm. long. —Low grounds, thickets, and open woods, various provinces, rarely Coastal Plain, N. C. to Colo., Man., and Newf.

16. **SONCHUS** [Tourn.] L. Annual or perennial, tall caulescent herbs. Leaf-blades entire, toothed, or pinnatifid, sometimes spiny margined. Heads erect. Involucres ovoid or subglobose. Achene flattened. Pappus deciduous. —About 45 species, natives of the Old World.—Spr.–fall.—SOW-THISTLES.

Leaf-auricles rounded: achenes smooth and 3-ribbed. 1. *S. asper.*
Leaf-auricles acute: achenes transverse-wrinkled and striate. 2. *S. oleraceus.*

1. **S. asper** (L.) All. Stem 2–15 dm. tall: leaf-blades with rigid-tipped teeth: achene 2–2.5 mm. long, margined, ribbed and smooth.—Waste-places, fields, and roadsides, throughout U. S. and S Can. Nat. of Eu.—(*W. I., Mex., C. A., S. A.*)



2. **S. oleraceus** L. Stem 1–18 dm. tall: leaf-blades more divided than in *S. asper*, with soft-tipped teeth: achene 2.5–3 mm. long, scarcely margined, striate and transverse-wrinkled.—Cult. grounds, waste-places, and fields, various provinces, U. S. and S Can. Nat. of Eu.—(*W. I., Mex., C. A., S. A.*)

Scolymus maculatus L., an annual, spine-armed herb, with pinnately lobed leaves, each lobe terminating in a long spine, the stem with broad spine-margined wings, the involucre not spiny, bracts thin, herbaceous, flowers yellow; achene inclosed by the chaff, has been found on ballast on the seacoast of N. C. Nat. of Eu.

APPENDIX

This appendix contains descriptions of additional plants found within the region covered by this work during the several years the book has been in press, and corrections.

Page 300, after *O. puberula,* insert:

1a. **O. nitida** (Britton) Mackenzie. Plant similar to *O. puberula* in habit, but usually smaller; leaf-blades narrowly elliptic to elliptic-lanceolate, 2–4 cm. long, thinnish, green and shining on both sides; sepals and petals 1.5–2 cm. long: capsule oval-elliptic to oval-orbicular, 1.5–1.8 cm. long.—Low pinelands, Coastal Plain, N. C. to N. J.—Differs from *O. puberula* in the smooth or nearly smooth stem-angles, the uniformly green and shining leaf-blades, the smaller flowers and the smaller and relatively broader capsules.

Page 375, at bottom of page add:

Petals very much shorter than the sepals: sepals with elongate involute tips: flower (and capsule) long-stalked: lip over twice as long as wide.	1. *I. verticillata*
Petals as long as the sepals or slightly shorter: sepals without involute tips: flower (and capsule) short-stalked: lip less than twice as long as wide.	2. *I. affinis*

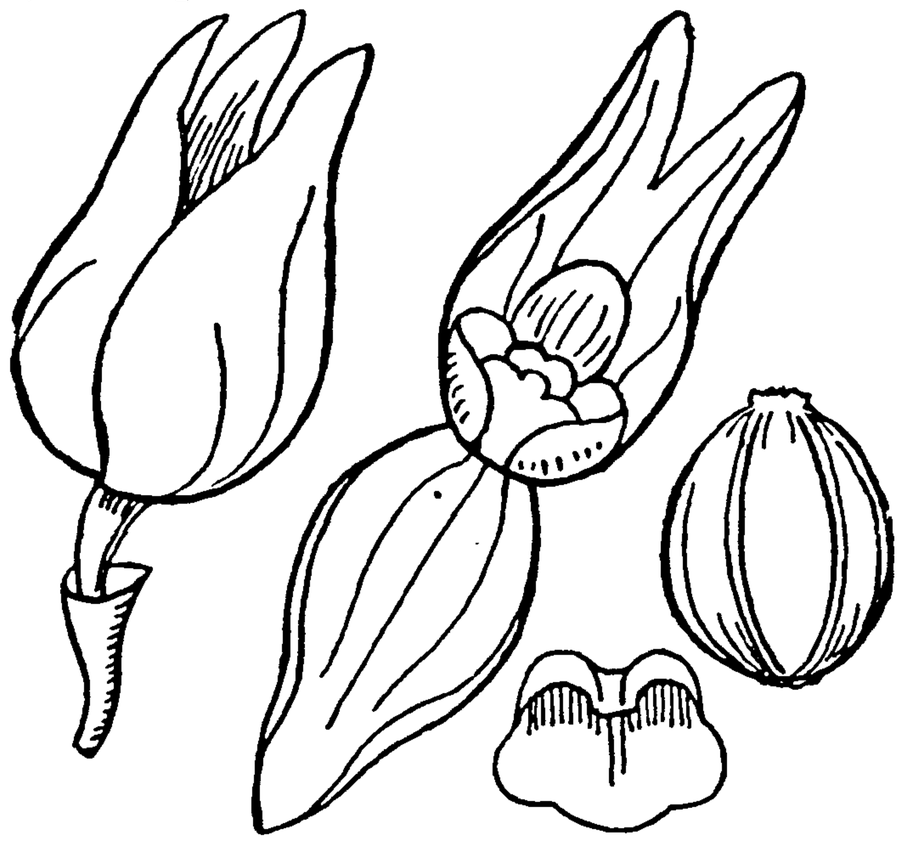
Page 376, after *Isotria verticillata* add:

2. **I. affinis** (Austin) Rydb. Plant similar to *I. verticillata* in habit: scapes 1–2.5 dm. tall: blades of the whorled bracts oval to elliptic, 2.5–5 cm. long: flowers short-stalked: lateral sepals greenish-yellow, narrowly spatulate, 1–2 cm. long, without long tips: petals broadly spatulate or obovate, as long as the sepals or somewhat shorter: lip white with green crest, obovate-cuneate, 11–13 mm. long, less than twice as long as wide when spread out, with scattered hairs at the end of the median ridges, the apical lobe flabellate; capsule 2–3 cm. long, stout-stalked. [*Pogonia affinis* Aust.]—Woods, various provinces, N. C. to Pa., Vt., and Me.—Spr.—Discovered in N. C. in the summer of 1933.

Page 389, after *Pleurothallis gelida,* insert:

36a. **LEPANTHES** Sw. Epiphytic dwarf caulescent herbs. Stems clustered, slender, simple, covered with tubular or funnelform sheaths, the uppermost one of which bears a leaf-blade. Leaves solitary on a stem: blade broad, margined, coriaceous, sessile, minutely 3-toothed at the apex. Racemes axillary, solitary or sometimes clustered, slender-peduncled. Flowers few or several, minute, usually approximate, 2-ranked. Sepals spreading or erect, broad, nearly equal, the lateral more or less united. Petals minute, with the short claw adnate to the base of the column, the limb usually wider than long. Lip often slightly longer than the petals, adnate at the base or above the base to the column, entire or lobed, with the two lobes erect, parallel to the column, with the edges thickened and embracing the column. Column short. Anther terminal. Pollinia pyriform. Capsule, oval, ovoid, ellipsoid, or obovoid.—About 50 species, in continental and insular tropical America.—Differs from *Pleurothallis* in having the claws of the petals and the lip adnate to the column.—The description and drawing made partly from Jamaican specimens.

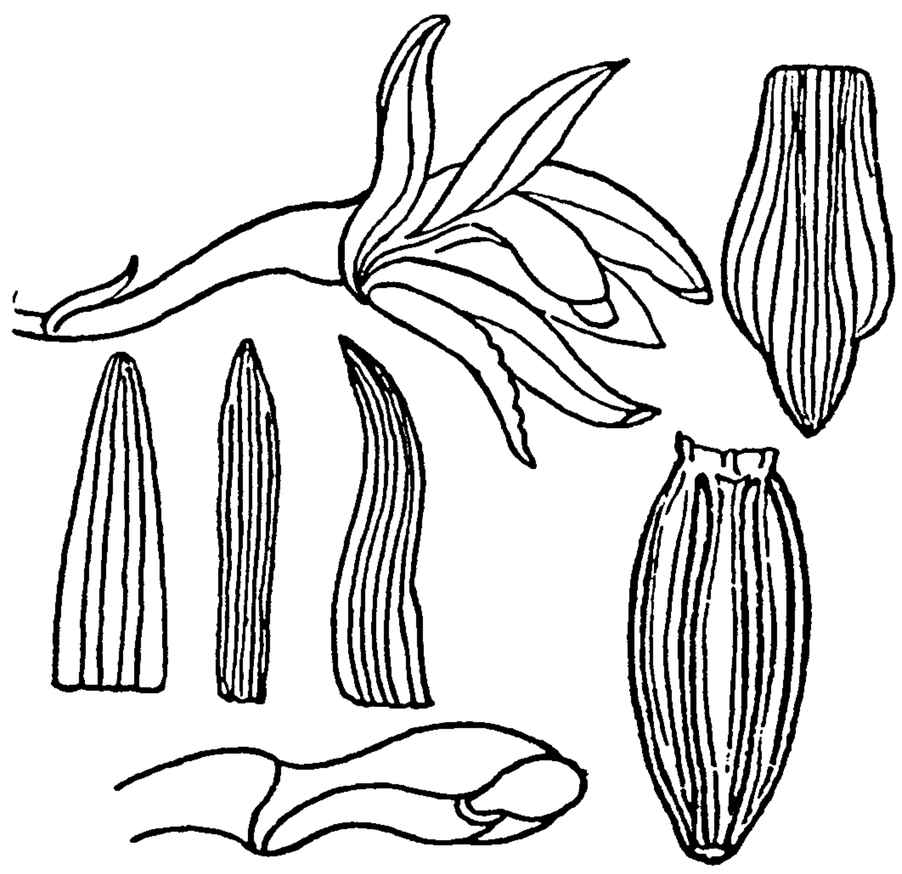
1. **L. Harrisii** Fawcett and Rendle. Stems 3–4.5 cm. tall, simple, several usually together. Leaf-sheaths contiguous, funnelform, oblique, brown-hirtellous on the ridges and on the mouth: leaf-blade elliptic or oval, 1–2 cm. long, acute or acutish, shining. Raceme overtopping the leaf, compact: bracts glabrous, acute: perianth minute, dark crimson-purple: sepals about 2 mm. long, the median one narrowly oval, the 2 lateral ½ united, lanceolate, 1-veined: petals elliptic, 0.5–0.7 mm. long, rounded at the apex: lip orbicular-ovate, entire, little over 1 mm. long, 3-veined: column about 0.5 mm. long: capsule ellipsoid or oval, 3–4 mm. long, 6-ribbed.—On trees, Big Cypress Swamp, Fla.—(*W. I.*)—Wint.



Page 396, after *Macradenia lutescens*, insert:

49a. **MAXILLARIA** R. & P. Epiphytic herbs with more or less clustered flowering branches, the pseudobulbs sometimes poorly developed, each bearing one leaf. Leaves coriaceous, 2-ranked, erect. Scapes (peduncles) arising at the bases of the pseudobulbs or in the axils of the leaves, solitary, with sheathing bracts, 1-flowered. Flowers large or medium. Sepals narrow, nearly equal, distinct, the lateral adnate to the column-foot, forming a more or less prominent chin. Petals narrower than the sepals, usually somewhat broadened upward. Lip concave, erect at the apex of the column-foot, the claw very short, or wanting, the lateral lobes shallow, erect, the terminal lobe ovate or elliptic-ovate, spreading. Column with a short foot, often slightly incurved, semiterete, not winged. Anther terminal. Pollinia 4, unappendaged. Capsule ovoid, ellipsoid, or obovoid, erect, ribbed, beakless.—About 240 species, in continental and insular tropical America.—Differs from *Macradenia* in having 4 pollinia, instead of 2, the solitary axillary flower at the base of the plant, and the slightly lobed lip.

1. **M. sessilis** (Sw.) Fawcett and Rendle. Stem very short, the branches usually clustered or approximate: pseudobulbs inconspicuous, elongate, flattened, each with a leaf at the apex. Leaves basal (except the one on the apex of the pseudobulb) erect, 2-ranked, the outer ones scale-like; inner one 1–3 dm. long, with blades conduplicate and sheating at the thickened base, linear, oblique at the apex: flowers few, clustered in two's or three's, from the axils of each leaf, the peduncle very short: pedicels about as long as the peduncle, with one sheathing bract: perianth mainly pale-yellow: sepals coriaceous, lanceolate, about 1.5 cm. long; petals linear-spatulate, about as long as the sepals, slightly curved: lip elliptic-lanceolate, 1–1.5 cm. long, with a strong midrib, acute: capsule ellipsoid, 2–3 cm. long, with 6 ribs and furrows.—On trees, Big Cypress Swamp, Fla.—(*W. I., Mex., C. A., S. A.*)—Spr.–sum.



Page 430, after *Quercus coccinea,* insert:

35a. Q. Nuttallii E. J. Palmer. Tree becoming 22 m. tall, with a narrow pyramidal crown, the bark gray or slate-colored and smooth or dark brownish-gray and slightly fissured on old trunks: leaf-blades obovate or elliptic in outline, 8–16 cm. long, glabrous, except tufted vein-axils beneath, pinnately 5–7-lobed, the lobes as long as the body or shorter, all bristle-tipped, the terminal one acuminate: acorns sessile or very short-stalked; cup hemispheric above the stout stipe or deep-turbinate, 2–2.5 cm. wide; nut ovoid or cylindric-ovoid, 20–28 mm. long, ⅓ to ½ included in the cup.—Alluvial lowlands, mostly Coastal Plain, Miss. to E. Tex., to Ark. and Mo. (?)

Page 608, after *Spiraea alba,* insert:

2a. S. prunifolia S. & Z. Shrub, with slender arching branches and finely pubescent twigs: leaf-blades elliptic or oval, varying to ovate, 1–2.5 cm. long, obtuse or acute, more or less pubescent and sometimes veiny, serrulate, very short-petioled: hypanthium broadly turbinate, less than 1 mm. high: petals white, about 3 mm. long: follicles oblong, 3–3.5 mm. long. (BRIDAL-WREATH)—Roadsides and about abandoned gardens, various provinces, N. C. to Mass. Nat. of Asia.—Spr.—Differs from *S. alba* in the elliptic, oval or ovate leaf-blades, and the inflorescence which has sessile clusters scattered along the old wood of the slender branchlets.

Page 608, after *Spiraea corymbosa,* add:

6a. S. japonica L. f. Shrub 1–2 m. tall with finely pubescent twigs: leaf-blades oblong, elliptic, or oblong-lanceolate, 3–12 cm. long, acuminate, coarsely serrate, finely pubescent at least when young, cuneate at the base: corymbs many-flowered, round-topped: hypanthium broadly campanulate: petals pink or rose-colored, suborbicular, 1.5–2 mm. long, or rarely longer: follicles erect, about 3 mm. long, glabrous.—Woods, hillsides, and roadsides, various provinces, Ga. to Pa., and Conn. Nat. of e Asia.—Sum.—Differs from *S. corymbosa* in the acuminate leaf-blades and the pink or rose-colored corolla.

Page 816, in place of the description of *Ilex Amelanchier* as it now stands, insert:

14. I. Amelanchier M. A. Curtis. Shrub or small tree with more or less persistent pubescent foliage: leaf-blades elliptic to elliptic-lanceolate, 4–8 cm. long, acute or short-acuminate, inconspicuously serrate, finely reticulate above, thinly pubescent beneath, acute or rounded at the base: calyx 2–2.5 mm. broad: corolla 6–7 mm. broad: drupe globose, 7–10 mm. in diameter, red.—Swamps and shaded stream-banks, Coastal Plain, Ga. and S. C.—Spr.—This more complete description is to replace that on page 816, where the word petioles is omitted before "6–10 mm." long and to give measurements of the flowers which have only recently been collected.

Pages 1166 and 1167, under *Conradina* in place of **C. montana** Small, read **C. verticillata** Jennison, in both key and description.

LIST OF GENERA AND SPECIES PUBLISHED IN THIS MANUAL*

Sagittaria ornithorhyncha Small. Type, Fayetteville, N. C., Biltmore Herbarium, No. 5236 b, in herb. N. Y. B. G.

Philotria densa (Planch.) Small. *Egeria densa* Planch.

Cyperus Winkeleri Britton & Small. Type, Humbuggus Prairie, Dade Co., Fla., Small & Mosier, No. 5625, in herb. N. Y. B. G.

Cyperus Deeringianus Britton & Small. Type, Arch Creek Prairie, Dade Co., Fla., Small, Mosier, and Small, No. 6789, in herb. N. Y. B. G.

Cyperus multiflorus (Chapm.) Small. *Cyperus echinatus multiflorus* Chapm.

Eleocharis carolina Small. Type, South Carolina, M. A. Curtis, in herb. C. U.

Eleocharis Curtisii Small. Type, Wilmington, N. C., M. A. Curtis, in herb. C. U.

Rynchospora Rappiana Small. Type, between DeLand and New Smyrna, Fla., Rapp, Oct. 10, 1926, in herb. N. Y. B. G.

Rynchospora leptocarpa (Chapm.) Small. *Rynchospora glomerata leptocarpa* Chapm.

Rynchospora Harperi Small. Type, 3 m. sw. of Hawkinsville, Ga., Harper, No. 1377, in herb. N. Y. B. G.

Rynchospora pinetorum Britton & Small. Type, w. of Punta Gorda, Fla., Small, No. 10,912, in herb. N. Y. B. G.

Rynchospora Edisoniana Britton. Type, Everglades, w. of Miami, Fla., Small. No. 8835, in herb. N. Y. B. G.

Rynchospora saxicola Small. Type, Little Stone Mountain, Ga., Harper, No. 2308, in herb. N. Y. B. G.

Scleria Brittonii Core. *Scleria pauciflora glabra* Chapm.

Carex purpurifera Mackenzie. Type, Morley, Tenn., John Bright, May 18, 1923, in herb. N. Y. B. G.

Commelina Gigas Small. Type, e. shore of Lake Okeechobee, Fla., Small, No. 8247, in herb. N. Y. B. G.

Tillandsia simulata Small. Type, along Manatee River, Fla., Garber, June, 1878, in herb. C. U.

Tillandsia myriophylla Small. Type, s. of Brooksville, Fla., Small & Alexander, May 13, 1931, in herb. N. Y. B. G.

Xeniatrum umbellulatum (Michx.) Small. *Dracaena umbellulatum* Michx.

Tortipes Small (tortus, *twisting*, and pes, *foot*, referring to the twisted flower-stalk.)

Tortipes amplexifolius (L.) Small. *Uvularia amplexifolia* L.

Atamosco candida (Lindl.) Small. *Amaryllis candida* Lindl.

Hymenocallis keyensis Small. *Hymenocallis caribaea* Chapm., not Herb.

Hymenocallis Collieri Small. Type, Marco Island, Fla., Small, May, 1920, in herb. N. Y. B. G.

Hymenocallis Kimballiae Small. Type, Apalachicola, Fla., Kimball, May, 1921, in herb. N. Y. B. G.

Hymenocallis tridentata Small. Type, Vero, Fla., Small, Dec., 1920, in herb. N. Y. B. G.

Hymenocallis bidentata Small. Type, St. Bernard, Ala., Bede Knapke, Oct., 1920, in herb. N. Y. B. G.

Hymenocallis laciniata Small. Type, near Carbur, Fla., Small, May 6, 1925, in herb. N. Y. B. G.

* In this list C. U. = Columbia University and N. Y. B. G. = New York Botanical Garden.

Habenella odontopetala (Reichenb. f.) Small. *Habenaria odontopetala* Reichenb. f.
Spathiger stroboliferus (Reichenb. f.) Small. *Epidendrum stroboliferum* Reichenb. f.
Amphiglottis conopsea (Ait.) Small. *Epidendrum conopseum* Ait.
Micropiper leptostachyon (Nutt.) Small. *Piper leptostachyon* Nutt.
Micropiper humile (Vahl) Small. *Piperomia humilis* Vahl.
Rhynchophorum Small. *Peperomia*, subgenus *Rhynchophorum* Miq.
Rhynchophorum obtusifolium (L.) Small. *Piper obtusifolium* L.
Rhynchophorum floridanum Small. *Piperomia floridana* Small.
Rhynchophorum spathulifolium Small. *Piperomia spathulifolium* Small.
Hicoria austrina Small. Type, Shell-midden, 5 m. s. of Daytona, Fla., Small, Britton, & DeWinkeler, No. 9191, in herb. N. Y. B. G.
Salix Chapmanii Small. Type, Middle Fla., Chapman, in herb. C. U.
Parietaria nummularia Small. Type, Sanford, Fla., Rapp, Apr. 11, 1929, in herb. N. Y. B. G.
Ramium niveum (L.) Small. *Urtica nivea* L.
Acetosella Acetosella (L.) Small. *Rumex Acetosella* L.
Delopyrum filiforme Small. Type, near Douglas, Fla., Harper, No. 2010, in herb. N. Y. B. G.
Delopyrum articulatum (L.) Small. *Polygonum articulatum* L.
Persicaria mississippiensis (Sanford) Small. *Polygonum mississippiense* Sanford.
Persicaria paludicola Small. Type, Everglades, Camp Jackson to Camp Longview, Fla., Small, Carter, and Small, No. 3494, in herb. N. Y. B. G.
Gastronychia Small. (Gaster, *belly*, and *anychia*, referring to the swollen base of the flower.)
Gastronychia herniarioides (Michx.) Small. *Anychia herniarioides* Michx.
Odontonychia interior Small. Type, along the Suwanee River, e. of Old Town, Fla., Small, Small, & DeWinkeler, No. 11465, in herb. N. Y. B. G.
Torrubia globosa Small. Type, Miami Beach, Fla., Small, Small, & DeWinkeler, No. 11539, in herb. N. Y. B. G.
Claytonia media (DC.) Small. *Claytonia virginica media* DC.
Sabularia uniflora (Walt.) Small. *Stellaria uniflora* Walt.
Sabularia groenlandica (Retz.) Small. *Stellaria groenlandica* Retz.
Sabularia brevifolia (Nutt.) Small. *Arenaria brevifolia* Nutt.
Sabularia glabra (Michx.) Small. *Arenaria glabra* Michx.
Sabularia caroliniana (Walt.) Small. *Arenaria caroliniana* Walt.
Clematis mierantha Small. Type, Devil's Punch Bowl, w. of Brooksville, Fla., Small, No. 11337; for fr. Choocochatte hammock, s. of Brooksville, Fla., Small, No. 10602, in herb. N. Y. B. G.
Viorna subreticulata Harbison. Type, Garden City, Ala., Biltmore herb., No. 15011, in herb. N. Y. B. G.
Viorna Beadlei Small. Type, Currahee Mt., Ga., Small, Sept. 1–3, 1894, in herb. N. Y. B. G.
Pityothamnus Small. (πίτυς, *pine*, and θάμνος, *shrub*, referring to the habitat of these plants.)
Pityothamnus reticulatus (Chapm.) Small. *Asimina reticulata* Chapm.
Pityothamnus incanus (Bartr.) Small. *Anona incana* Bartr.
Pityothamnus angustifolius (A. Gray) Small. *Asimina angustifolia* A. Gray.
Pityothamnus pygmaeus (Bartr.) Small. *Anona pygmaea* Bartr.
Pityothamnus tetramerus Small. *Asimina tetramera* Small.
Pityothamnus obovatus (Willd.) Small. *Anona obovata* Willd.
Neocleome Small. (νέος, *new*, and *Cleome*.)
Neocleome spinosa (L.) Small. *Cleome spinosa* L.
Neocleome serrata (Jacq.) Small. *Cleome serrata* Jacq.
Sedum vigilimontis Small. Type, Lookout Mountain, near Rising Fawn, Ga., Curtiss, No. 6798, in herb. N. Y. B. G.

Vachellia peninsularis Small. Type, Long (Pine) Key, Everglades, Fla., for fls., Small & Wilson, No. 1778; for fr., Small & Carter, No. 2975, in herb. N. Y. B. G.

Vachellia densiflora Alexander. Type, along Bayou La Fourche near Cut-off, La., for fls., Small & Alexander, Apr. 16, 1931; for fr., Small, Aug., 1931, both in herb. in N. Y. B. G.

Vachellia insularis Small. Type, Big Pine Key, Fla., for fls., Small & Mosier, No. 6018; for fr., Small, Carter, & Small, No. 3549, in herb. N. Y. B. G.

Adipera corymbosa (Lam.) Small. *Cassia corymbosa* Lam.

Chamaesenna didymobotrya (Forsk.) Small. *Cassia didymobotrya* Forsk.

Crotalaria Linaria Small. Type, Big Pine Key, Fla., Small & Mosier, No. 6034, in herb. N. Y. B. G.

Galactia prostrata Small. Type, for fls., Redlands district, Dade Co., Fla., Small, No. 8633; for fr., near Silver Palm, Dade Co., Fla., Small, Mosier & Small, No. 6453, in herb. N. Y. B. G.

Stylosanthes calcicola Small. Type, Rose-Costello hammock, Dade Co., Fla., Small, Mosier, & Small, No. 6539, in herb. N. Y. B. G.

Asemeia leiodes (Blake) Small. *Polygala grandiflora leiodes* Blake.

Asemeia grandiflora (Walt.) Small. *Polygala grandiflora* Walt.

Asemeia cumulicola Small. *Polygala cumulicola* Small.

Asemeia miamensis Small. *Polygala miamensis* Small.

Polygala aboriginum Small. Type, dunes s. of Coronado, Fla., Small, Mosier, and Matthaus, May 24, 1926, in herb. N. Y. B. G.

Pilostaxis arenicola Small. *Polygala arenicola* Small.

Pilostaxis lutea (L.) Small. *Polygala lutea* L.

Pilostaxis Rugelii (Shuttl.) Small. *Polygala Rugelii* Shuttl.

Pilostaxis ramosa (Ell.) Small. *Polygala ramosa* Ell.

Pilostaxis cymosa (Walt.) Small. *Polygala cymosa* Walt.

Pilostaxis Baldwinii (Nutt.) Small. *Polygala Baldwinii* Nutt.

Pilostaxis Carteri Small. *Polygala Carteri*, Small.

Chamaesyce cumulicola Small. Type, Caxambas Island, Fla., Small. No. 10490, in herb. N. Y. B. G.

Chamaesyce Moseri Small. Type, near Brogdon hammock, Dade Co., Fla., Small & Mosier, No. 6347, in herb. N. Y. B. G.

Chamaesyce Mathewsii Small. Type, dunes opposite Miami, Fla., Small, No. 4556.

Galarrhoeus floridanus (Chapm.) Small. *Euphorbia floridana* Chapm.

Galarrhoeus inundatus (Torr.) Small. *Euphorbia inundata* Torr.

Galarrhoeus telephioides (Chapm.) Small. *Euphorbia telephoides* Chapm.

Galarrhoeus Darlingtonii (A. Gray) Small. *Euphorbia Darlingtonii* A. Gray.

Galarrhoeus austrinus Small. *Tithymalus austrinus* Small.

Galarrhoeus trichotomus (H.B.K.) Small. *Euphorbia trichotoma* H.B.K.

Saccharodendron nigrum (Michx. f.) Small. *Acer nigrum* Michx. f.

Argentacer Small. (argentum, *silver*, and *acer*, *i.e.*, silver-maple.)

Argentacer saccharinum (L.) Small. *Acer saccharinum* L.

Rufacer Small. (rufus, *red*, and *acer*, *i.e.*, red-maple.)

Rufacer rubrum (L.) Small. *Acer rubrum* L.

Rufacer carolinianum (Walt.) Small. *Acer carolinianum* Walt.

Cardiospermum keyense Small. Type, Key Largo, Fla., Small, Mosier, & DeWinkeler, No. 10952, in herb. N. Y. B. G.

Ascyrum Edisonianum Small. Type, twenty-one m. e. of Arcadia, Fla., Hand, No. 118, in herb. N. Y. B. G.

Lechea prismatica Small. Type, scrub, e. of Sebring, Fla., Small, No. 9787, in herb. N. Y. B. G.

Lechea exserta Small. Type, w. of Halendale, Fla., Small, DeWinkeler, & Small, No. 11089, in herb. N. Y. B. G.

Lechea myriophylla Small. Type, scrub, e. of Sebring, Fla., Small & DeWinkeler, Dec. 13, 1920, in herb. N. Y. B. G.

Viola rugosa Small. Type, Telogia, Fla., Small, Apr., 1927, in herb. N. Y. B. G.
Opuntia atrocapensis Small. Type, dunes, Cape Sable (E. Cape), Small, Nov. 25, 1916, in herb. N. Y. B. G.
Opuntia polycarpa Small. Type, Caxambas Island, Fla., Small, May 11, 1922, in herb. N. Y. B. G.
Opuntia nitens Small. Type, hammock, 5 m. s. of Daytona, Fla., Small, Small, & DeWinkeler, Aug. 23, 1922, in herb. N. Y. B. G.
Opuntia cumulicola Small. Type, beach, opp. Lemon City, Fla., Small, Small, & Carter, No. 970, in herb. N. Y. B. G.
Opuntia tenuiflora Small. Type, Lignum Vitae Key, Fla. Small, Mar. 30, 1916, in herb. N. Y. B. G.
Opuntia turbinata Small. Type, St. Scorge Island, Fla., Small, Aug. 22, 1922, in herb. N. Y. B. G.
Opuntia magnifica Small. Type, s. end of Amelia Island, Fla., Small, Small, and DeWinkeler, Aug. 21, 1922, in herb. N. Y. B. G.
Brasiliopuntia brasiliensis (Willd.) Small. *Cactus brasiliensis* Willd.
Eugenia anthera Small. Type, for fls., near Roseland, Fla., Charles A. Mosier, Aug., 1928; for fr., near Roseland, Fla., Small, Dec. 27, 1927, in herb. N. Y. B. G.
Mosiera Small. (In honor of Charles A. Mosier.)
Mosiera longipes (Berg) Small. *Eugenia longipes* Berg.
Mosiera bahamensis (Kiearsk.) Small. *Eugenia bahamensis* Kiearsk.
Isnardia media Small, Alexander. Type, between Homestead and Cross Key, Fla., Small & Carter, No. 2626, in herb. N. Y. B. G.
Ludwigia spathulifolia Small. Type, Everglades, NW. of Perrine, Fla., Small & Carter, No. 2990, in herb. N. Y. B. G.
Jussiaea neglecta Small. Type, along Escambia River, near Pensacola, Fla., Small, Aug., 1930, in herb. N. Y. B. G.
Proserpinaca amblygona (Fernald) Small. *Proserpinaca palustris amblygona* Fernald.
Eryngium cuneifolium Small. Type, about Lake Nancesowee, Fla., Small & Mosier, Dec., 1927, in herb. N. Y. B. G.
Sium floridanum Small. Type, Swamps of the Chipola River, Fla., Chapman, in herb. C. U.
Zizia latifolia Small. Type, near Bristol, Fla., Curtiss, Aug. 28, in herb. N. Y. B. G.
Decachaea tomentosa Small. *Gaylussacia tomentosa* Small.
Decachaena nana (A. Gray) Small. *Gaylussacia frondosa nana* A. Gray.
Decachaena baccata (Wang.) Small. *Andromeda baccata* Wang.
Decachaena ursina (M. A. Curtis) Small. *Vaccinium ursinum* M. A. Curtis.
Lasiococcus Small. (λάσιος, *hairy*, and κοκκος, *berry*, referring to the hairy fruit.)
Lasiococcus dumosus (Andr.) Small. *Vaccinium dumosum* Andr.
Lasiococcus Mosieri Small. *Gaylussacia Mosieri* Small.
Lasiococcus orocola Small. Type, near Flat Rock, N. C., Biltmore Herbarium, No. 470b, in herb. N. Y. B. G.
Buxella Small. (Diminutive of Buxus.)
Buxella brachycera (Michx.) Small. *Vaccinium brachycerum* Michx.
Polycodium macilentum Small. Type, Vaughns Mill, Ala., Earle, No. 1632, in herb. N. Y. B. G.
Polycodium leptosepalum Small. Type, French Camp, Miss., Ida M. Clute, No. 59, in herb. N. Y. B. G.
Cyanococcus Myrsinites (Lam.) Small. *Vaccinium Myrsinites* Lam.
Cyanococcus fuscatus (Ait.) Small. *Vaccinium fuscatum* Ait.
Cyanococcus tenellus (Ait.) Small. *Vaccinium tenellum* Ait.
Cyanococcus Elliottii (Chapm.) Small. *Vaccinium Elliottii* Chapm.
Cyanococcus amoenus (Ait.) Small. *Vaccinium amoenum* Ait.
Cyanococcus virgatus (Ait.) Small. *Vaccinium virgatum* Ait.

Cyanococcus atrococcus (A. Gray) Small. *Vaccinium corymbosum atrococcum* A. Gray.
Cyanococcus simulatus Small. *Vaccinium simulatum* Small.
Cyanococcus Cuthbertii Small. Type, Augusta, Ga., Cuthbert, No. 259, in herb. N. Y. B. G.
Cyanococcus holophyllus Small. Type, for fls., Sandhills, e. of Sebring, Fla., Small, DeWinkeler, & Mosier, No. 11347; for fr., Lake Jackson, Fla., Small, Mosier, & DeWinkeler, No. 10861, in herb. N. Y. B. G.
Cyanococcus Margarettae (Ashe) Small. *Vaccinium Margarettae* Ashe.
Cyanococcus pallidus (Ait.) Small. *Vaccinium pallidum* Ait.
Cyanococcus liparus Small. Type, Bull Pasture Mtn., Va., Rydberg, No. 9007.
Cyanococcus tallapusae Coville. Type, for fls., near Tallapoosa, Ga., George E. Murrill, Nat. Herb. No. 1,582,192; for fr. one m. east of Tallapoosa, Ga., G. A. Schulze, No. 691.
Cyanococcus subcordatus Small. Type, Knoxville, Tenn., Ruth, No. 445, in herb. N. Y. B. G.
Cyanococcus hirsutus (Buckl.) Small. *Vaccinium hirsutum* Buckl.
Herpothamnus Small. (ἕρπης, *spreads*, and θάμνος, *shrub*, referring to the trailing stems.)
Herpothamnus crassifolius (Andr.) Small. *Vaccinium crassifolium* Andr.
Bumelia lacuum Small. Type, for fls., dunes, n. of Kuhlman, Fla., Small, & DeWinkeler, No. 9965; for fr., between Avon Park and Sebring, Fla., Small, Small and DeWinkeler, No. 10666 in herb. N. Y. B. G.
Amarolea Small. (Amarus, *bitter*, and olea, *olive*, referring to the bitter olive-like fruit.)
Amarolea megacarpa Small. Type, for fls. and fr., near Lake Annie, Fla., Small & Matthaus, No. 11612, in herb. N. Y. B. G.
Lapithea capitata (Raf.) Small. *Pleienta capitata* Raf.
Acerates delticola Small. Type New Orleans, La., Ingalls in 1834, in herb. C. U.
Biventraria Small. (Bis, *two*, and venter, *belly*, referring to the inflated hoods of the flower.)
Biventraria variegata (L.) Small. *Asclepias variegata* L.
Oxypteryx Curtissii (A. Gray) Small. *Asclepias Curtissii* A. Gray.
Asclepiodella Small. (Diminutive of *Asclepias*.)
Asclepiodella Feayi (Chapm.) Small. *Asclepiodora Feayi* Chapm.
Cyclodon Small. (Κύκλος, *circle*, and ὀδούς, *tooth*, referring to the toothed crown of the flower.)
Cyclodon alabamense (Vail) Small. *Vincetoxicum alabamense* Vail.
Odontostephana Alexander. (ὀδούς, *tooth*, and στέφανος, *crown*, referring to the toothed crown of the flower.)
Odontostephana decipiens Alexander. *Vincetoxicum carolinense* Authors, not *Cynanchum carolinense* Jacq.
Odontostephana carolinensis (Jacq.) Alexander. *Cynanchum carolinense* Jacq.
Odontostephana obliqua (Jacq.) Alexander. *Cynanchum obliquum* Jacq.
Odontostephana Shortii (A. Gray) Alexander. *Gonolobus obliquus Shortii* A. Gray.
Odontostephana Baldwiniana (Sweet) Alexander. *Gonolobus Baldwinianum* Sweet.
Odontostephana flavidula (Chapm.) Alexander. *Gonolobus flavidulus* Chapm.
Odontostephana floridana (Vail) Alexander. *Vincetoxicum floridanum* Vail.
Edisonia Small. (In honor of Thomas Alva Edison.)
Edisonia pubiflora (Deene.) Small. *Chthamalia pubiflora* Deene.
Evolvulus macilentus Small. Type, Big Pine Key, Ga. Small, No. 3798, in herb. N. Y. B. G.
Strophocaulos Small. (στροφή, *twist*, and καυλός, *stem*, referring to the twining stems.)
Strophocaulos arvensis (L.) Small. *Convolvulus arvensis* L.

Decemium appendiculatum (Michx.) Small. *Hydrophyllum appendiculatum* Michx.
Solanum perplexum Small. Type, near Thomasville, Ga., Small, May 28–June 6, 1895, in herb. C. U.
Myriopus Small. (μυρίος, *many*, and πούς, *foot*, referring to the many-flowered cymes.)
Myriopus volubilus (L.) Small. *Tournefortia volubilis* L.
Myriopus poliochrus (Spreng.) Small. *Tournefortia poliochrus* Spreng.
Stylodon carolinensis (Walt.) Small. *Verbena carolinensis* Walt.
Glandularia maritima Small. *Verbena maritima* Small.
Glandularia Lambertii (Sims) Small. *Verbena Lambertii* Sims.
Glandularia canadensis (L.) Small. *Verbena canadensis* L.
Glandularia Drummondii (Lindl.) Small. *Verbena Drummondii* Lindl.
Glandularia tampensis (Nash) Small. *Verbena tampensis* Nash.
Glandularia tenuisecta (Briq.) Small. *Verbena tenuisecta* Briq.
Glandularia peruviana (L.) Small. *Erinus peruvianus* L.
Scutellaria Cuthbertii Alexander. Type, Augusta, Ga., Cuthbert, May 26, 1900, in herb. N. Y. B. G.
Scutellaria alabamensis Alexander. Type, Attalla, Ala., Eggert, June 30, 1897, in herb. N. Y. B. G.
Dracocephalum leptophyllum Small. *Physostegia leptophyllum* Small.
Dracocephalum veroniciformis Small. *Physostegia veroniciformis* Small.
Koellia pauciflora Small. Type, Albany, Ga., Small, July 9–12, 1895, in herb. C. U.
Tragiola Small & Pennell (Anagram of *Gratiola*.)
Tragiola pilosa (Michx.) Small & Pennell. *Gratiola pilosa* Michx.
Tragiola pilosa epilis (Pennell) Small & Pennell. *Gratiola pilosa epilis* Pennell.
Penstemon Brittonorum Pennell. Type, White Rock Mountain, Va., Britton, Britton, & Vail, June 22, 1892, in herb. N. Y. B. G.
Penstemon brevisepalus Pennell. Type, Crossville, Tenn., F. W. Pennell, No. 11311, May 30–31, 1923, in herb. Acad. Nat. Sci. Phila.
Buchnera breviflora Pennell. Type, Robinson Island, Fla., S. M. Tracy, No. 7605, May 22, 1901, in herb. N. Y. B. G.
Calpidisca Standleyae Barnhart. Type, near Ft. Myers, Fla., J. P. Standley, No. 406, in herb. N. Y. B. G.
Rotantha Small. (Rota, *wheel*, and anthus, *flower*, referring to the rotate corolla.)
Rotantha floridana (S. Wats.) Small. *Campanula floridana* S. Wats.
Rotantha Robinsiae Small. *Campanula Robinsiae* Small.
Kuhnia Mosieri Small. Type, Ross-Costello hammock, Dade Co., Fla., Small, Mosier, & Small, No. 6544, in herb. N. Y. B. G.
Laciniaria Shortii Alexander. Type, Ohio, Short, 1842, in herb. C. U.
Laciniaria Tracyi Alexander. Type, Gateswood, Ala., Tracy, No. 8558, in herb. N. Y. B. G.
Laciniaria Ruthii Alexander. Type, Hiawassee Valley, e. Tenn., Ruth, No. 34, in herb. C. U.
Chrysopsis subulata Small. Type, between Avon Park and Sebring, Fla., Small, No. 11495.
Chrysopsis arenicola Alexander. Type, Hartsville, S. C., Coker, Oct. 9, 1909, in herb. N. Y. B. G.
Chrysopsis lanuginosa Small. Type, Lynn Haven, Fla., A. H. Van Cleve, Dec. 3, 1920, in herb. N. Y. B. G.
Chrysopsis floridana Small. Type, Bradenton, Fla., Tracy, No. 7344.
Pityopsis flexuosa (Nash) Small. *Chrysopsis flexuosa* Nash.
Pityopsis Tracyi Small. *Chrysopsis Tracyi* Small.
Pityopsis microcephala Small. *Chrysopsis microcephala* Small.
Pityopsis Ruthii Small. *Chrysopsis Ruthii* Small.
Pityopsis aspera Small. *Chrysopsis aspera* Small.
Pityopsis oligantha (Chapm.) Small. *Chrysopsis oligantha* Chapm.

Solidago Milleriana Mackenzie. *Solidago petiolaris* Authors, not Ait.
Solidago Harperi Mackenzie. Type, near Grier's Cave, Randolph Co., Ga., Harper, No. 1778, in herb. N. Y. B. G.
Solidago notabilis Mackenzie. *Solidago amplexicaulis* T. & G., not Martens.
Solidago tarda Mackenzie. Type, Winterville, Ga., J. H. Miller, Oct. 20, 1926, in herb. N. Y. B. G.
Solidago Edisoniana Mackenzie. Type, hammocks, near Ft. Mead, Fla.
Solidago mirabilis Small. Type, Turnbull hammock, near Titusville, Fla., Small.
Oligoneuron Jacksonianum (Kuntze) Small. *Solidago corymbosa* Ell.
Aster georgianus Alexander. Type, Augusta, Ga., Cuthbert, No. 275, in herb. N. Y. B. G.
Aster fontinalis Alexander. Type, prairie, s. of Deep Lake, Fla., Small & Buswell, Dec. 7, 1925, in herb. N. Y. B. G.
Aster Walteri Alexander. *Aster squarrosus* Walter, not All.
Aster Smallii Alexander. Type, between Hendersonville and Salola Mountain, N. C., Small & Huger, October 2–3, 1901, in herb. N. Y. B. G.
Aster pinifolius Alexander. Type, Coconut Grove, Fla., Small, No. 7958, in herb. N. Y. B. G.
Aster gracilipes (Wiegand) Alexander. *Aster dumosus gracilipes* Wiegand.
Aster brachypholis Small. Type, Aspalaga Bluff, Liberty Co., Fla., Small, DeWinkeler, & Mosier, No. 11027, in herb. N. Y. B. G.
Aster pedionomus Alexander. Type, Cheatham Co., Tenn., Eggert, Aug. 19, 1897, in herb. N. Y. B. G.
Aster Gattingeri Alexander. Type, Tullahoma, Tenn., Gattinger, Aug. 19, in herb. C. U.
Aster hemisphaericus Alexander. Type, Will's Point, Tex., Reverchon, No. 4363, in herb. N. Y. B. G.
Aster verutifolius Alexander. Type, Ocean Springs, Miss., Earle, Sept. 11, 1899, in herb. N. Y. B. G.
Pluchea tenuifolia Small. Type, 5½ miles n. of Bowling Green on road to Ft. Mead, Fla., Hand, No. 360, in herb. N. Y. B. G.
Smallanthus Mackenzie. (In honor of John Kunkel Small.) Type, *Polymnia Uvedalia* L.
Smallanthus Uvedalia (L.) Mackenzie. *Polymnia Uvedalia* L.
Silphium lapsuum Small. Type, Augusta, Ga., Cuthbert, July 17, 1898, in herb. N. Y. B. G.
Silphium orae Small. Type, Wilmington, N. C., Curtis, in herb. C. U.
Silphium confertiflorum Small. Type, Cocoa, Ala., Schuchert, Oct. 13, 1896, in herb. N. Y. B. G.
Silphium nodum Small. Type, Charleston Neck, Charleston, S. C., Gibbes & Branch in 1855, in herb. N. Y. B. G.
Chrysogonum australe Alexander. Type, Marianna, Fla., Harper, May 16, 1925, in herb. N. Y. B. G.
Echinacea tennesseensis (Beadle) Small. *Brauneria tennesseensis* Beadle.
Pterophyton helianthoides (Michx.) Alexander. *Verbesina helianthoides* Michx.
Pterophyton heterophyllum (Chapm.) Alexander. *Actinomeris heterophylla* Chapm.
Pterophyton pauciflorum (Nutt.) Alexander. *Actinomeris pauciflora* Nutt.
Pterophyton aristatum (Ell.) Alexander. *Verbesina aristata* Ell.
Ridan paniculatum (Walt.) Small. *Anthanasia paniculata* Walt.

TABLES OF THE ORDERS AND FAMILIES

	Gen.	Sp.
CYCADALES.		
1. Cycadaceae,	1	4
PINALES.		
2. Pinaceae,	5	18
3. Juniperaceae,	6	9
4. Taxaceae,	2	2
PANDANALES.		
5. Typhaceae,	1	2
6. Sparganiaceae,	1	2
NAIADALES.		
7. Zannichelliaceae,	3	17
8. Zosteraceae,	1	1
9. Cymodoceaceae,	2	2
10. Naiadaceae,	1	5
ALISMALES.		
11. Scheuchzeriaceae,	1	1
12. Alismaceae,	5	28
HYDROCHARITALES.		
13. Elodeaceae,	3	7
14. Hydrocharitaceae,	2	2
POALES.		
15. Poaceae,	100	476
16. Cyperaceae,	22	375
ARECALES.		
17. Arecaceae,	10	15
ARALES.		
18. Araceae,	7	11
19. Lemnaceae,	4	10
XYRIDALES.		
20. Mayacaceae,	1	2
21. Xyridaceae,	1	20
ERIOCAULALES.		
22. Eriocaulaceae,	3	13
COMMELINALES.		
23. Commelinaceae,	7	25
24. Pontederiaceae,	4	7
25. Bromeliaceae,	6	18
LILIALES.		
26. Melanthiaceae,	16	23
27. Juncaceae,	2	35
28. Nartheciaceae,	1	2
29. Alliaceae,	3	10
30. Liliaceae,	7	16
31. Convallariaceae,	13	19
32. Aloaceae,	1	1
33. Dracaenaceae,	2	9
34. Trilliaceae,	2	20
35. Roxburghiaceae,	1	1
36. Smilacaceae,	2	18
AMARYLLIDALES.		
37. Leucojaceae,	7	35
38. Tamaceae,	1	5
39. Ixiaceae,	7	119
40. Haemodoraceae,	2	2
SCITAMINALES.		
41. Musaceae,	1	2
42. Cannaceae,	1	2
43. Alpiniaceae,	1	1
44. Marantaceae,	2	3
ORCHIDALES.		
45. Burmanniaceae,	2	3
46. Orchidaceae,	55	112
PIPERALES.		
47. Saururaceae,	1	1
48. Piperaceae,	2	5
CASUARINALES.		
49. Casuarinaceae,	1	1
JUGLANDALES.		
50. Juglandaceae,	2	16
LEITNERIALES.		
51. Leitneriaceae,	1	1
MYRICALES.		
52. Myricaceae,	3	6
SALICALES.		
53. Salicaceae,	2	23
FAGALES.		
54. Corylaceae,	3	4
55. Betulaceae,	2	6
56. Fagaceae,	3	50
URTICALES.		
57. Urticaceae,	7	16
58. Cannabinaceae,	2	2
59. Artocarpaceae,	4	9
60. Ulmaceae,	5	15
POLYGONALES.		
61. Polygonaceae,	18	67
CHENOPODIALES.		
62. Chenopodiaceae,	11	25
63. Scleranthaceae,	1	1
64. Basellaceae,	1	1
65. Amaranthaceae,	9	34
66. Corrigiolaceae,	8	16
67. Phytolaccaceae,	4	5
68. Petiveriaceae,	1	1
69. Batidaceae,	1	1
70. Allioniaceae,	4	6
71. Pisoniaceae,	2	6
72. Tetragoniaceae,	6	8
73. Portulacaceae,	3	13
74. Alsinaceae,	11	31
75. Caryophyllaceae,	6	17
RANALES.		
76. Ceratophyllaceae,	1	3
77. Ranunculaceae,	24	92
78. Annonaceae,	4	14
79. Magnoliaceae,	5	13
80. Menispermaceae,	4	4
81. Cabombaceae,	2	2

	Gen.	Sp.
82. Nelumbonaceae,	1	1
83. Nymphaeaceae,	2	13
84. Podophyllaceae,	4	4
85. Berberidaceae,	1	1
PAPAVERALES.		
86. Papaveraceae,	5	8
87. Fumariaceae,	4	10
88. Brassicaceae,	31	94
89. Capparidaceae,	5	8
90. Moringaceae,	1	1
SARRACENIALES.		
91. Droseraceae,	1	5
92. Dionaeaceae,	1	1
93. Sarraceniaceae,	1	8
ROSALES.		
94. Podostemaceae,	1	2
95. Sedaceae,	7	13
96. Penthoraceae,	1	1
97. Parnassiaceae,	1	3
98. Saxifragaceae,	9	27
99. Hydrangeaceae,	3	12
100. Iteaceae,	1	1
101. Rosaceae,	25	93
102. Hamamelidaceae,	2	5
103. Altingiaceae,	1	1
104. Grossulariaceae,	2	6
105. Platanaceae,	1	1
106. Calycanthaceae,	1	4
107. Malaceae,	7	53
108. Amygdalaceae,	6	25
109. Mimosaceae,	11	24
110. Cassiaceae,	14	30
111. Krameriaceae,	1	1
112. Fabaceae,	74	304
GERANIALES.		
113. Geraniaceae,	2	8
114. Oxalidaceae,	4	19
115. Linaceae,	2	12
116. Tropaeolaceae,	1	1
117. Balsaminaceae,	1	3
118. Limnanthaceae,	1	1
119. Zygophyllaceae,	3	5
120. Malpighiaceae,	1	1
121. Rutaceae,	8	20
122. Surianaceae,	1	1
123. Simarubaceae,	4	4
124. Burseraceae,	1	1
125. Meliaceae,	2	2
POLYGALALES.		
126. Polygalaceae,	5	37
EUPHORBIALES.		
127. Euphorbiaceae,	30	127
128. Callitrichaceae,	1	6
SAPINDALES.		
129. Buxaceae,	1	1
130. Empetraceae,	1	1
131. Spondiaceae,	6	16
132. Cyrillaceae,	2	4
133. Aquifoliaceae,	1	19
134. Celastraceae,	7	10
135. Hippocrateaceae,	1	1
136. Dodonaeaceae,	1	3
137. Staphyleaceae,	1	1
138. Aesculaceae,	1	4
139. Aceraceae,	5	11
140. Sapindaceae,	6	9
RHAMNALES.		
141. Frangulaceae,	9	18
142. Vitaceae,	5	23
MALVALES.		
143. Tiliaceae,	3	19
144. Malvaceae,	20	63
145. Buettneriaceae,	6	7
HYPERICALES.		
146. Canellaceae,	1	1
147. Clusiaceae,	1	2
148. Elatinaceae,	1	1
149. Tamaricaceae,	1	1
150. Hypericaceae,	6	45
151. Theaceae,	4	4
152. Turneraceae,	2	5
153. Cistaceae,	3	26
154. Violaceae,	2	42
PASSIFLORALES.		
155. Papayaceae,	1	1
156. Passifloraceae,	1	7
OPUNTIALES.		
157. Loasaceae,	1	1
158. Opuntiaceae,	10	44
BEGONALES.		
159. Begoniaceae,	1	1
PROTEALES.		
160. Proteaceae,	1	1
THYMELEALES.		
161. Daphnaceae,	1	1
162. Elaeagnaceae,	1	2
163. Lauraceae,	8	12
164. Cassythaceae,	1	1
MYRTALES.		
165. Melastomaceae,	2	15
166. Lythraceae,	7	16
167. Punisaceae,	1	1
168. Terminaliaceae,	4	4
169. Myrtaceae,	6	13
170. Rhizophoraceae,	1	1
171. Epilobiaceae,	14	66
172. Gunneraceae,	2	8
AMMIALES.		
173. Nyssaceae,	3	14
174. Hederaceae,	3	7
175. Ammiaceae,	41	92
ERICALES.		
176. Clethraceae,	1	3
177. Monotropaceae,	3	7
178. Pyrolaceae,	2	4
179. Ericaceae,	22	50

	Gen.	Sp.
180. Vacciniaceae,	10	41
181. Diapensiaceae,	1	2
182. Galacaceae,	2	2
PRIMULALES.		
183. Armeriaceae,	2	6
184. Primulaceae,	9	22
185. Theophrastaceae,	1	1
186. Ardisiaceae,	2	2
EBENALES.		
187. Ebenaceae,	1	2
188. Sapotaceae,	7	15
189. Symplocaceae,	1	1
190. Styracaceae,	2	6
OLEALES.		
191. Oleaceae,	7	26
GENTIANALES.		
192. Spigeliaceae,	6	11
193. Gentianaceae,	11	37
194. Menyanthaceae,	1	2
ASCLEPIADALES.		
195. Apocynaceae,	12	21
196. Asclepiadaceae,	20	53
POLEMONIALES.		
197. Dichondraceae,	1	1
198. Convolvulaceae,	15	52
199. Cuscutaceae,	1	14
200. Hydroleaceae,	7	19
201. Polemoniaceae,	3	17
202. Solanaceae,	12	67
203. Borraginaceae,	11	23
204. Ehretiaceae,	3	5
205. Heliotropiaceae,	8	14
206. Verbenaceae,	14	41
207. Avicenniaceae,	1	1
208. Phrymaceae,	1	1
209. Lamiaceae,	41	159
210. Rhinanthaceae,	39	122
211. Acanthaceae,	10	25
212. Pinguiculaceae,	9	22
213. Orobanchaceae,	4	4
214. Bignoniaceae,	6	7
215. Pedaliaceae,	2	2
216. Martyniaceae,	1	1
PLANTAGINALES.		
217. Plantaginaceae,	1	9
SANTALALES.		
218. Loranthaceae,	1	3
219. Santalaceae,	4	4
220. Olacaceae,	2	2
RUBIALES.		
221. Rubiaceae,	25	70
222. Caprifoliaceae,	9	35
VALERIANALES.		
223. Valerianaceae,	2	7
224. Morinaceae,	1	1
ARISTOLOCHIALES.		
225. Asaraceae,	3	17
CAMPANULALES.		
226. Cucurbitaceae,	11	18
227. Campanulaceae,	5	8
228. Lobeliaceae,	1	22
229. Brunoniaceae,	1	1
230. Calyceraceae,	1	1
CARDUALES.		
231. Ambrosiaceae,	5	22
232. Carduaceae,	129	698
233. Cichoriaceae,	16	50

Orders	Families	Genera	Species
58	233	1518	5557

INDEX[1]

Aaron's-beard cactus, 911
Aaron's-rod, 674
Abama, 287
Abelmoschus, 857
Abies, 3, 8
Abildgaardia, 155
Abrus, 742
Abizzia, 653
Abutilon, 847
Acacia, 653, 654
Acaciella, 654
Acalypha, 785, 786, 787
ACANTHACEAE, 1225
Acanthocereus, 914, 915, *915*
Acanthospermum, 1407, 1408
Acanthoxanthium, 1301
ACANTHUS FAMILY, 1225
Acer, 823, *824*, *825*
ACERACEAE, 823
Acerates, 1066, 1067
Acetosella, 445, 446
Ache, 982
Achillea, 1466, 1467
Achroanthes, *386*
Achyranthes, *475*, 476
Acicarpha, 1296
Acmispon, 687
Acnida, 474, 475
Acoeloraphe, *242*
Aconites, 515
Aconitum, 515, 516
Acorus, 244
Actaea, 513
Actinomeris, *444*, *445*
Actinospermum, 1455
Acuan, 655, 656
Adam-and-Eve, 388
Adam's-needle, 303
Adam's-pitcher, 581
Adder's-tongue, 292
Adelia, *1040*, *1041*
Adenoropium, 791
Adenoplea, 1047
Adicea, 433
Adipera, 660
Adlumia, 549
Adonis, 523
Adonis-flower, 523
Adopogon, *1489*
Adzuk-bean, 724
Aegopodium, 974
Aeschynomene, 727, 728, 729
AESCULACEAE, 822
Aesculus, 822, 823
Aethusa, 982
African bowstring-hemp, 301
African-marigold, 1464
Afzelia, 1213
Agalinis, 1216
  aphylla, 1220
  decemloba, 1220
  divaricata, 1221
  erecta, 1220
  fasciculata, 1219
  filicaulis, 1221
  filifolia, 1219
  Gattingeri, 1221
  georgiana, 1219
  Harperi, 1218
  keyensis, 1220
  laxa, 1219
  linifolia, 1221
  maritima, 1219
  oligophylla, 1220
  pinetorum, 1218
  Plukenetii, 1220
  pulchella, 1219
  purpurea, 1218
  setacea, 1219
  stenophylla, 1219
  tenella, 1220
  tenuifolia, 1221
  virgata, 1218
Agastache, 1153
Agati, 703
Agave, 319, 320
Agdestis, 485
Ageratum, 1319
Agrimonia, 615
  Bicknellii, 616
  Eupatoria, *615*, *616*
  Eupatoria mollis, *616*
  gryposepala, 616
  hirsuta, *616*
  incisa, 616
  microcarpa, 616
  mollis, *616*
  parviflora, 615
  platycarpa, 616
  pubescens, 616
  pumila, *616*
  rostellata, 616
  striata, 615
Agrimony, 615
Agropyron, 136
Agrostemma, 508
Agrostis, 104
  alba, 105
  altissima, *106*
  arachnoides, *106*
  borealis, 105
  canina, 105
  Elliottiana, 105
  hiemalis, 105
  novae-angliae, *106*
  perennans, 105
  rubra, *105*
  scabra, *105*
  Scribneriana, *106*
  vulgaris, *105*
Ague-tree, 923
Ague-weed, 1052
Ailanthus, 763
Air-plants, 269, 272
Aira, 107, 108
Albizzia, 653
Alchemilla, *614*
Aldenella, 575
Alder
  Black, 814
  Green, 419
  Hazel, 419
  Mountain, 419
  Red, 419
  Russet, 419
  Speckled, 419
  Tag, 419
Alders, 418
Aletris, 315, 316
Alfalfa, 682
Alfileria, 745
Alicia, 730
Alisma, 21
ALISMACEAE, 20
ALISMALES, 20
Alkali-grasses, 128
Allamanda, 1063, 1064
  Pink, 1066
Allegheny-barberry, 545
Allegheny Mountain-spurge, 806
Allegheny-vine, 549
ALLIACEAE, 288
Alligator-apple, 533
Alligator-bonnet, 543
Alligator-buttons, 540
Alligator-lily, 324
Alligator-pear, 921
Alligator-tree, 601
Allionia, 488
ALLIONIACEAE, 487
Allium, 288, 289
Almond
  Indian, 933
  West Indian, 933
Alnus, 418, 419
ALOACEAE, 301
ALOE FAMILY, 301
Aloe, 302, 316
Alopecurus, 100
ALPINIACEAE, 360
Alsatian-clover, 685
Alsike-clover, 685
ALSINACEAE, 496
Alsine, 497
  aquatica, 497
  Baldwinii, 498
  brevifolia, *499*
  fontinalis, 498
  glabra, *499*
  groenlandica, *499*
  longifolia, 498
  media, 497
  Michauxii, *499*
  patula, *499*
  pubera, 498
  squarrosa, *499*
  tennesseensis, 498
Alsinopsis, *498*
Alternanthera, *476*, *477*
ALTINGIACEAE, 601
Alum-roots, 592
Alvaradoa, 763, 764
Alysicarpus, 736
Alyssum, *565*
Amaranth, 473
AMARANTHACEAE, 470
AMARANTH FAMILY, 470
Amaranthus, 471
  albus, *473*
  blitoides, 473
  chlorostachys, *473*
  crassipes, 472
  crispus, 473
  cruentus, 472
  deflexus, 473
  gracilis, 473
  graecizans, 473
  hybridus, 473

[1] In the cases of genera with less than ten species the latter have not been indexed.

muricatus, 473
polygonoides, 472
pumilus, 473
retroflexus, 473
spinosus, 473
Amarolea, 1043
AMARYLLIDALES, 314
AMARYLLIS FAMILY, 315
Amaryllis, 320
Ambaree, 856
Amblogyna, 472
Ambrina, 466
Ambrosia, 1299, 1300
AMBROSIACEAE, 1297
Amelanchier, 635, 637
Amerbell, 292
American-arborvitae, 9
American aspen, 411
American-cowslips, 1027
American dog-violet, 893
American-elm, 441
American-hazelnut, 417
American-holly, 816
American-ipecac, 610
American-ivies, 840
American-ivy, 840
American-mistletoes, 1248
American-pennyroyal, 1165
American-white hellebore, 277
American-wisteria, 699
American-wolfsbane, 699
Amerimnon, 711
Amianthium, 278, 279
Ammannia, 928
Ammi, 977
AMMIACEAE, 960
AMMIALES, 955
Ammocallis, 1060
Ammophila, 106
Ammopursus, 1335
Amoracia, 558
Amorpha, 688
Bushii, 690
canescens, 689
caroliniana, 689
crenulata, 690
croceolanata, 691
Curtissii, 690
cynostachya, 689
densiflora, 689
Dewinkeleri, 689
floridana, 690
fruticosa, 691
glabra, 689
glabra, 689
herbacea, 690
montana, 689
nitens, 689
Schwerini, 689
tennesseensis, 690
virgata, 690
Ampelopsis, 839
Ampelothamnus, 1003
Amphiachyris, 1337
Amphianthus, 1193
Amphicarpa, 720
Amphicarpon, 88
Amphiglottis, 390, 391
Amphistelma, 1074
Amsinckia, 1123
Amsonia, 1059
AMYGDALACEAE, 644
Amygdalus, 646
Amyris, 759
Anacampseros, 586
Anacheilium, 392
Anagallis, 1025, 1026
Anamomis, 936
Ananas, 272, 273
Anantherix, 1073
Anaphalis, 1402
Andira, 712
Anastrophus, 54
Androcera, 1112
Andromedia, 1005
Andropogon, 42
arctatus, 46
argyraeus, 46
Bakeri, 46
brachystachys, 46
Cabanisii, 46
campyloracheus, 46
capillipes, 45
corymbosus, 45
Elliottii, 46
feensis, 45
floridanus, 46
furcatus, 45
glaucopsis, 45
glomeratus, 45
gracilior, 46
gracilis, 45
halepensis, 47
hirtiflorus, 45
littoralis, 44
longiberbis, 45
macrourus, 45
maritimus, 44
mississippiensis, 46
Mohrii, 46
oligostachyus, 45
perangustatus, 45
provincialis, 45
scoparius, 44
Scribnerianus, 46
semiberbis, 44
stolonifera, 44
subtenuis, 46
tener, 44
tennesseensis, 45
tenuispatheus, 45
ternarius, 46
tetrastachys, 45
Tracyi, 45
vaginatus, 45
virginicus, 45
virginicus, 46
Aneilema, 263
Anemone, 516, 517
Anemonella, 518
Anethum, 983
Angelica, 984, 985
Angelicas, 984
Angelico, 972, 985
Angelon, 1206
Angelonia, 1206
Angle-pods, 1076
Anise-root, 968
Anise-trees, 533
Anisostichus, 1240
Annona, 532, 533
ANNONACEAE, 529
Annual garden-phlox, 1104
Antennaria, 1400, 1401
Anthaenantia, 49
Anthemis, 1467
Anthopogon, 1051
Anthoxanthum, 93
Anticlea, 279
Anthriscus, 968
Ant's-wood, 1033
Anychia, 481
Anychiastrum, 480, 481
Aphanes, 614
Aphanostephus, 1362
Aphyllon, 2139
Apios, 723
Apium, 976, 979, 982
Aplectrum, 387, 388
APOCYNACEAE, 1057
Apocynum, 1061
Apples, 633
APPLE FAMILY, 632
Apple-haw, 641
Apple-lotus, 543
Apple-of-Peru, 1106
Apricot-vine, 896
Apteria, 363
AQUIFOLIACEAE, 813
Aquilegia, 514
Arabian-jessamine, 1044
Arabidopsis, 561
Arabis, 570
Burkii, 572
canadensis, 572
dentata, 572
georgiana, 571
hirsuta, 571
laevigata, 572
laevigata Burkii, 572
ludoviciana, 571
lyrata, 572
ovata, 571
patens, 571
virginicus, 571
ARACEAE, 234
Arachis, 728
ARALES, 243
Aralia, 960
Aranella, 1233
Arborvitaes, 9, 10
Arctium, 1480
Ardisia, 1029
ARDISIACEAE, 1028
ARECACEAE, 236
Arenaria, 499, 500
Arethusa, 377
Argemone, 548
Argentacer, 825
Argyreia, 1091
Arisaema, 246, 247, 247
Aristida, 94
Chapmaniana, 98
condensata, 97
Curtissii, 95
dichotoma, 95
gracilis, 95
gyrans, 96
intermedia, 96
lanata, 96
lanosa, 96
longespica, 95
Mohrii, 97
oligantha, 95
palustris, 96
patula, 96
purpurascens, 97
ramosissima, 95
simpliciflora, 96
spiciformis, 96
stricta, 96
tenuispica, 97
ternipes, 95
tuberculosa, 95
virgata, 96
Aristolochia, 1281, 1282
ARISTOLOCHIALES, 1279
Arkwood, 789
ARMERIACEAE, 1020
Arnica, 1474
Aronia, 634, 635
Arrhenatherum, 111
Arrow-arums, 245

Arrow-grass, 20
ARROW-GRASS FAMILY, 20
Arrow-heads, 22
Arrowleaf, 25
Arrow-leaved violet, 890
Arrow-lotus, 541
Arrowroot, 361
ARROWROOT FAMILY, 361
Arrow-vine, 458
Arrow-wood, 818
Arrow-woods, 1270, 1271
Arsenococcus, 1005
Artemisia, 1471
Arthraxon, 46
Artichoke, 1440
Artillery-plant, 434
ARTOCARPACEAE, 437
ARUM FAMILY, 243
Aruncus, 608, 609
Arundinaria, 138, *139*
Arundo, 119, 120
ASARACEAE, 1279
Asarum, *1280*, 1281
ASCLEPIADACEAE, 1064
ASCLEPIADALES, 1057
Asclepias, 1067
aceratoides, 1071
aceratoides, 1073
amplexicaulis, 1070
arenicola, 1073
cinerea, 1072
curassavica, 1070
Curtissii, 1073
decumbens, 1069
exaltata, 1070
galioides, 1071
humistrata, 1070
incarnata, 1070
lanceolata, 1069
laurifolia, 1069
linearis, 1071
Michauxii, 1072
obovata, 1071
obtusifolia, 1070
perennis, 1071
pulchra, 1070
purpurascens, 1070
quadrifolia, 1071
Rolfsii, 1069
rubra, 1069
syriaca, 1070
tomentosa, 1071
tuberosa, 1069
variegata, 1072
verticillata, 1071
viridula, 1071
Asclepiodella, 1073
Asclepiodora, 1073, *1073*
Ascyrum, 867, 868
Asemeia, 766, 767
Ash,
Blue, 1039
Green, 1040
Pop, 1039
Pumpkin, 1040
Red, 1040
Swamp, 1039
Water, 1039
White, 1040
Ash-leaved maple, 826
Ashes, 1038
Ashy-hydrangea, 597
Asiatic-arborvitae, 10
Asimina, 529
angustifolia, 531
cuneata, 530
grandiflora, 531
obovata, 531
parviflora, 529
pygmaea, 531
reticulata, 530
Rugelii, 532
secundiflora, 531
speciosa, 531
triloba, 529
Asparagus, 295, 296
Asphalthium, 691
Asprella, 138
Aspris, 108
Aster, 1364
acuminatus, 1391
adnatus, 1382
agrostifolius, 1387
amygdalinus, 1394
asperifolius, 1376
asperulus, 1376
attenuatus, 1380
azureus, 1375
Baldwinii, 1378
Boykinii, 1371
Bracei, 1392
brachypholis, 1389
Camptosorus, 1373
carolinianus, 1379
castaneus, 1371
Chapmanii, 1393
chlorolepis, 1371
claviger, 1377
commixtus, 1373
concinnus, 1380
concolor, 1384
conduplicatus, 1379
continuus, 1381
cordifolius, 1374
coridifolius, 1389
corrigiatus, 1376
Curtissii, 1385
diffusus, 1390
divaricatus, 1370
dumosus, 1388
dumosus gracilipes, 1389
Elliottii, 1379
elodes, 1384
ericoides, 1389
ericoides, 1387
ericoides platyphyllus, 1388
ericoides pilosus, 1388
ericoides villosus, 1388
eryngiifolius, 1392
excavatus, 1371
exilis, 1393
falcidens, 1381
Faxonii, 1388
flexilis, 1372
fontinalis, 1382
Gattingeri, 1391
georgianus, 1381
gracilentus, 1381
gracilescens, 1377
gracilipes, 1389
gracilis, 1385
grandiflorus, 1383
hemisphericus, 1391
hirsuticaulis, 1390
inconspicuus, 1393
infirmus, 1394
juniperinus, 1388
laevis, 1379
Lamarckianus, 1386
lateriflorus, 1390
linariifolius, 1395
linguiformis, 1378
loriformis, 1378
Lowrieanus, 1374
macrophyllus, 1372
missouriensis, 1386
mirabilis, 1373
Mohrii, 1378
multiflorus, 1389
multiformis, 1372
novae-angliae, 1383
novi-belgii, 1383
oblongifolius, 1383
paludosus, 1391
paniculatus, 1386
patens, 1382
patens gracilis, 1382
patens tenuicaulis, 1382
pedionomus, 1391
phlogifolius, 1382
pilosus, 1387
pinifolius, 1387
plumarius, 1374
plumosus, 1384
poaceus, 1375
prenanthoides, 1379
Priceae, 1388
Proteus, 1376
ptarmicoides, 1390
puniceus, 1378
purpuratus, 1380
racemosus, 1389
ramosissimus, 1387
reticulatus, 1394
riciniatus, 1372
sagittifolius, 1374
salicifolius, 1386
sericeus, 1384
Shortii, 1373
Simmondsii, 1386
simulatus, 1384
Smallii, 1385
spatelliformis, 1386
spectabilis, 1385
spinosus, 1393
spinulosus, 1392
squarrosus, 1383
stilettiformis, 1370
subulatus, 1393
Sulznerae, 1386
surculosus, 1385
sylvestris, 1376
tenebrosus, 1370
tenuicaulis, 1382
tenuifolius, 1393
Tradescanti, 1387
triangularis, 1377
trigonicus, 1375
truellius, 1376
turbinellus, 1381
umbellatus, 1394
undulatus, 1375
undulatus loriformis, 1378
undulatus triangularis, 1377
ursinus, 1380
verutifolius, 1392
vimineus, 1390
virgatus, 1380
Walteri, 1382
Astilbe, 596, 709, 710
Astragalus, 709, 710
Astranthium, 1361, 1362
Atamosco, 320
Atamosco-lilies, 320
Athanasia, 1445
Atheropogon, 116
Atlantic prickly-pear, 905
Atragene, 528
Atriplex, 467, 468
Aureolaria, 1213, 1214, 1215

Australian corkwood-tree, 703
Australian-pine, 402
Autumn-elaeagnus, 920
Avena, 110, 111
Avens, 617
Avicennia, 1145
AVICENNIACEAE, 1144
Avocado, 921
Axonopus, 53, 54
Ayenia, 863
Azalea, 993
  alabamensis, 996
  atlantica, 996
  arborescens, 996
  austrina, 995
  calendulacea, 994
  candida, 995
  canescens, 995
  canescens, 995
  lutea, 994
  nudiflora, 995
  prinophylla, 995
  prunifolia, 997
  serrulata, 996
  speciosa, 994
  Vaseyi, 998
  viscosa, 996
Azalea,
  Early, 995
  Flame, 994
  Smooth, 996
  Swamp, 996
  Yellow, 994
Azaleas, 993

Baby-dewflower, 265
Baby-pepper, 484
Baccharis, 1397, 1398
Bachelor's-button, 477, 733, 1485
Bahaman wild-coffee, 1261
Bald-cypress, 9
Bald-rush, 175
Bald-rushes, 174
Balduina, 1455
Baldwina, 1455
Ball-moss, 269
Balloon-vines, 827
Balm-of-Gilead, 412
Balsam-apple, 865, 1285
  Wild, 1285
Balsam-bell, 296
Balsam-fir, 8
Balsam torchwood, 759
BALSAM-TREE FAMILY, 865
BALSAMINACEAE, 753
Bamboo, 313
Bamboo-vine, 314
Banana, 359
BANANA FAMILY, 359
Bandana-daisies, 1461
Bandana-of-the-Everglades, 360
Bantam-buttons, 257
Baptisia, 674
  alba, 677
  albescens, 677
  australis, 678
  bracteata, 677
  calycosa, 676
  calycosa villosa, 676
  elliptica, 676
  Gibbesii, 676
  hirsuta, 676
  lanceolata, 676
  Le Contei, 676
  leucantha, 678
  megacarpa, 677
  microphylla, 675
  perfoliata, 675
  Serenae, 677
  simplicifolia, 675
  tinctoria, 676
  villosa, 677
Barbadoes-aloe, 302
Barbados-gooseberry, 898
Barbara's-buttons, 1455
Barbarea, 561
Barbed-wire cactus, 915
Barberry, 545
BARBERRY FAMILY, 545
Barley-grasses, 136
Barnaby's-thistle, 1485
Barnyard-grass, 83
Barren oak, 430
Barren-strawberries, 616
Bartonia, 1055
BASELLACEAE, 469
Bashful wake-robin, 309
Basil, 1181
Basils, 1168, 1171
Basil-thyme, 1169
Basil-weed, 1169
Basiphyllaea, 393
Basket-oak, 425
Basket-willow, 415
Basswoods, 842
Bastard-elm, 442
Bastard jute, 856
Bastard pennyroyal, 1148
Bastard toad-flax, 1249
Bastard white-oak, 426
BATIDACEAE, 486
Batis, 486
Batodendron, 1010
Batrachium, 519
Batschia, 1125, 1126
Bay-bean, 727
Bayberry, 409
BAYBERRY FAMILY, 408
Bay-cedar, 762
BAY-CEDAR FAMILY, 761
Bay leaved caper-tree, 577
Bay lobelia, 1295
Bays, 535
Bay-star vine, 534
Bazina, 1195
Beach-grass, 70, 106, 128
Beach-heather, 880
Beach-heathers, 880
Beach-orach, 468
Beach-sap, 575
Beach-stars, 187
Beach-tea, 783
Beachwort, 486
Beadlea, 382
Beak-rushes, 175
Beaked hazelnut, 417
Beaked-violet, 893
Beans, 723
Bean-vine, 724
Bear-berry, 815, 1017
Bear-foot, 1406
Bear-grass, 303
Bear-grasses, 302
Bear-gum, 957
Bear-huckleberry, 1008
Bear-oak, 431
Beard grasses, 43, 103, 116
Beard-tongues, 1202
Beauty-berries, 1143
Beaver-tree, 536
Beaver-wood, 442
Bedstraws, 1266
Bee-balm, 1164, 1166
Bee blossoms, 662
Beech, 420
  Red, 420
  Ridge, 420
  White, 420
Beech drops, 1239
Beechnut-tree, 420
Beefsteak-plant, 1180
Beef-trees, 489
Beefwood, 402
BEEFWOOD FAMILY, 402
Beet, 463
Beetle-weed, 1020
Befaria, 992
Beggar's buttons, 1480
Beggar's-lice, 1123
Beggar-ticks, 1450
Begonia, 917, 918
BEGONIACEAE, 917
BEGONIA FAMILY, 917
BEGONIALES, 917
Begonias, 918
Belamcanda, 327
BELL FLOWER FAMILY, 1288
Bellflowers, 1289
Bellis, 1361
Bell-rue, 528
Bell-trees, 1036
Bellworts, 299
Benjamin bush, 929
Benne, 1243
BENNE FAMILY, 1242
Bent-grasses, 105
Benzoin, 924
BERBERIDACEAE, 545
Berberis, 545
Berchemia, 831
Bergamot-lime, 760
Berlandiera, 1415, *1416*
Bermuda grass, 112
Besom, 681
Beta, 463
Betula, 417, 418, *418*
BETULACEAE, 417
Bicuculla, 549, 550
Bidens, 1450
  aristosa, 1453
  bipinnata, 1451
  cernua, 1452
  chrysanthemoides, 1453
  comosa, 1451
  connata, 1452
  coronata, 1453
  coronata, 1454
  discoidea, 1452
  frondosa, 1452
  involucrata, 1453
  laevis, 1453
  leucantha, 1451
  mitis, 1453
  Nashii, 1453
  pilosa, 1451
  trichosperma, 1453
  vulgata, 1452
Big bachelors button, 774
Big-bloom, 536
Bignonia, 1240, *1240*
BIGNONIACEAE, 1239
Big shag bark, 406
Big shell bark, 406
Bilderdykia, 458, 459
Billion dollar grass, 83
Bilsted, 601
Biltia, 998, 999
Bindweeds, 1089, 1091
Biota, 10
Biovularia, 1237
BIRCH FAMILY, 417

Birches, 417
Bird-cherry, 649
Bird-knotgrass, 453
Bird-on-the-wing, 767
Bird-pepper, 1117
Bird's-eye, 523
Bird's-foot trefoil, 687
Bird's-foot violet, 886
Birth-roots, 305
BIRTHWORT FAMILY, 1279
Birthworts, 1281
Biscayne-palm, 241
Bishop's-cap, 591
Bishop's-weeds, 977
Bitter-aloe, 302
Bitter-bloom, 1051
Bitter-bush, 763
Bitter-cress, 561
Bitter-cresses, 567
Bitter-dock, 448
Bitter-pecan, 405
Bittersweet, 1113
Bittersweet-orange, 761
Bitter-waternut, 405
Bitter-weed, 1300, 1460
Bitter-willow, 415
Bitter-wood, 762
Biventraria, 1072
Bivonea, 790
Black-alder, 814
Black-bead, 653
Black-bean, 726
Blackberries, 619
Blackberry-lily, 327
Black-bindweed, 459
Black-birch, 418
Black-cap, 620
Black-calabash, 1242
Black-chokeberry, 635
Black-cohosh, 513
Black-cottonwood, 412
Black-eyed susan, 1226, 1427
Black-grama, 117
Black grass-rush, 284
Black-gum, 956–957
Black-haw, 1034, 1272
Black hazel, 416
Black-hickory, 406, 407
Black-huckleberry, 1008
Black-ironwood, 830
Black-jack, 430
Black-laurel, 877
Black-linn, 534
Black-locust, 700
Black-mangrove, 1145
BLACK-MANGROVE FAMILY, 1144
Black-maple, 825
Black-medic, 382
Black-mulberry, 437
Black-mustard, 563
Black-oak, 430
Black oat-grass, 98
Black-olive, 933
Black-pine, 5
Black-raspberry, 620
Black-root, 1209, 1400
Black-rush, 170, 283
Black scrub-oak, 431
Black-sloe, 648
Black-snakeroot, 513
Black-snakeroots, 965
Black-sumac, 810
Black-titi, 812
Black-walnut, 403
Black-willow, 413
Bladder-campion, 507
Bladder-ketmia, 858
Bladdernut, 821
BLADDERNUT FAMILY, 821
Bladder-pod, 703
Bladder-pods, 555
BLADDERWORT FAMILY, 1231
Bladderworts, 1235
Blanket-flowers, 1461
Blaspheme-vine, 314
Blazing-star, 897
Blazing-stars, 1331
Blechnum, 1229
Bleeding-heart, 550, 818
Blephariglottis, 369, 370
Blephilia, 1165
Blessed-thistle, 1486
Bletia, 394
Blind-eye headache-poppy, 548
Blister-cresses, 562
Blister-pine, 8
Blisterwort, 522
Blolly, 490
Blonde-lilian, 292
Blood-red princes'-feather, 473
Blood-root, 546
Bloodwort, 448
BLOODWORT FAMILY, 358
Bloody-dock, 448
Blow-balls, 1496
Blue-anemone, 516
Blue-ash, 1039
Blue-bead lily, 296
Blue-beech, 416
Blue-bells, 1123
Blue-bell valerian, 1100
Bluberries, 1012
Blue-bottle, 1485
Blue-bottles, 294
Blue-cohosh, 545
Blue-curls, 1148, 1155
Blue-devil, 1128
Blue-dogbanes, 1059
Blue-eyed grasses, 327
Blue-eyed Mary, 1207
Blue-flags, 266, 331
Blue ginseng, 545
Blue-grape, 837
Blue-grass, 261
Blue-grasses, 129
Bluehearts, 1222
Blue-jack, 428
Blue-jasmine, 527
Blue-joint, 138
Blue joint-grass, 106
Blue-leaf sundrops, 950
Blue-lettuces, 1498
Blue marsh-violet, 889
Blue-palmetto, 243
Blue-pea, 722
Blue-phlox, 1103
Blue-sailors, 1490
Blue-ridge St. John's wort, 873
Blue-stars, 1059
Blue-stem, 45, 240
Blue-tangle, 1007
Blue-toadflax, 1208
Bluets, 1254
Blue-verbena, 1136
Blue water-lily, 543
Blueweed, 1128
Blue wild-indigo, 678
Boat-lily, 262
Boebera, 1465
Boehmeria, 435, 436
Boerhaavia, 488
Bog-asphodel Family, 287
Bogbean Family, 1056
Bog-bugles, 580
Bog-buttons, 256
Bog-cresses, 567
Bog-hemp, 435
Bog-mat, 249
Bog-moss, 250
Bog-mosses, 251
Bog-myrtle, 409
Bog-rush, 286
Bog-stars, 590
Bog-torches, 245, 373
Bog white-violet, 891
Bog-willow, 414
Bois-plant, 1241
Bolboxalis, 746
Boltonia, 1362, 1363
Bonamia, 1080
Bonaveria, 687
Bonchea, 1141
Boneset, 1326
Bonnets, 540
Borage Family, 1121
BORAGINACEAE, 1121
Borreria, 1264, 1265
Borrichia, 1430
Botrydium, 465
Bottlebrush-buckeye, 822
Bottlebrush-grass, 138
Bottlebrush-sedge, 233
Bottle-bush, 938
Bottle-gourd, 1286
Bottle-tree, 864
Bottom-hickory, 406
Bouncing-bet, 505
Bourreria, 1129, *1130*
Boussingaultia, 470
Bouteloua, 116, 117
Bowlesia, 966
Bowman's-root, 609, 1209
Bow-wood, 438
Box-alder, 826
Box-Family, 806
Box-huckleberry, 1010
Box-thorn, 1118
Boxwood, 820
Boykinia, 595
Brachiaria, 53
Brachychaeta, 1361
Brachyelytrum, 99
Brachygyne, 1213
Brachyrhamphus, 1496
Bradburya, 721
Bradleia, 699
Bramble-rose, 629
Brambles, 619
Bramia, 1189
Branching-foxtails, 114
Brasenia, 539
Brasiliopuntia, 911
Brassia, 396
Brassica, 562, 563
BRASSICACEAE, 551
Brauneria, 1421
Brazilian blady-grass, 39
Brazilian morning-glory, 1085
Breweria, 1080, 1081
Breynia, 779
Brickellia, 1328
Brides-feathers, 608
Brier-berry, 621
Brintonia, 1342
Bristly-buttercup, 522, 523
Bristly-foxtail grasses, 84
Bristly-greenbrier, 312
Bristly-sarsaparilla, 960

Brittle-willow, 413
Briza, *128*
Broad-dock, 448
Broad-leaf phlox, 1105
Brome-grasses, 134
BROMELIACEAE, 268
Bromus, 134
  ciliatus, 135
  ciliatus laeviglumis, *135*
  commutatus, 135
  erectus, 135
  inermis, 135
  japonicus, 135
  laeviglumis, 135
  purgans, 135
  racemosus commutatus, *135*
  secalinus, 135
  sterilis, 135
  tectorum, 135
  unioloides, 134
Bronze willow-herb, 946
Brook-feather, 511
Brooklime, 1212
Brook-parnassia, 590
Brook-saxifrage, 595
Brook-weed, 1027
Brooms, 681
Broom-brush, 873
Broom-corn, 47
Broom-corn millet, 69
Broom-grasses, 43
Broom-hickory, 407
Broomrape, 1238, 1239
BROOMRAPE FAMILY, 1238
Broom-sedge, 44, 45
Broom-wood, 862
Broussonetia, *438*
Brown-hickory, 407
Brown-beth, 307
Brown Indian-hemp, 856
Brown-rush, 283
Brunella, 1155
Bruneria, 248
Brunetta, 388
Brunnichia, 460
BRUNONIACEAE, 1295
Bryophyllum, 589
Bubby-blossoms, 631
Bubby-shrubs, 631
Bucaneer-palm, 238
Buchnera, 1222, 1223
Bucida, 933
Buckberries, 1010
Buckberry, 1008
BUCKEYE FAMILY, 822
Buckeyes, 822
Buckleya, 1249
Buckthorn, 832, 1034
  Sandhill, 1035
  Tough, 1034
BUCKTHORN FAMILY, 830
Buckthorns, 832, 1033
Buck-vine, 460
Buckwheat, 458
Buckwheat-brush, 813
Buckwheat-vine, 460
Buddleia, *1047*
BUETTNERIACEAE, 861
Buffalo-bur, 1112
Buffalo-clover, 685
Buffalo-nut, 1250
Buffalo-ryes, 137
Bugbane, 513
Bugle-weeds, 1175
Bugloss, 1127
Bullace-grape, 838
Bull-bay, 535
Bullbrier, 513
Bull-grass, 102
Bullnut, 406
Bull's-eyes, 511
Bull-thistle, 1483
Bull-thistles, 1481
Bulrushes, 167
Bumelia, 1033, 1034
BUNCH-FLOWER FAMILY, 273
Bunch-flowers, 280
Bunch-grasses, 43
Bunch-moss, 269
Bupleurum, 979
Bur-clover, 382
Burdock, 1480
Bur-gherkin, 1286
Bur-grasses, 86
Bur-heads, 21
Bur-marigolds, 1450
Bur-seed, 1123
Burweed, 842
Bur-weeds, 1302
BURMANNIA FAMILY, 362
Burmannia, 362
BURMANNIACEAE, 362
Burnet, 614
Burning bush, 818
Bur-nuts, 754
Bur-oak, 425
BUR REED FAMILY, 14
Bur-reeds, 14
Bursa, 554
Bursera, *764*
BURSERACEAE, 764
Bush-clovers, 737
Bush-honeysuckle, 1276
Bush-pea, 674
Bush-vetch, 742
Bushy St. John's-wort, 873
Bustic, 1033
Butneria, *631*
Butter-and-eggs, 1208
Butterbough, 829
Buttercup-oxalis, 746
Buttercups, 519
Butter-dock, 448
Butterfly-banner, 550
Butterfly-lily, 361
Butterfly-orchid, 394
Butterfly-peas, 721, 722
Butterfly-weed, 1069
Butternut, 403
Butter-rose, 522
Butter-weed, 1397
Butterworts, 1232
Button alders, 601
Buttonball, 604
Buttonbush, 1258
Button-hazels, 435
Button-hemp, 435
Button-rods, 257
Button-rosy, 771
Button-snakeroot, 963
Button-snakeroots, 1331
Buttonweeds, 1263, 1264
Buttonwood, 604, 933
  White, 934
BUXACEAE, 806
Byrsonima, 756

Cabbage-palm, 240
Cabbage-palmetto, 240
Cabbage-tree, 240
Cabbage-trees, 239
Cabomba, 539
CABOMBACEAE, 538
Cacalia, *1475*, *1476*, *1477*
CACTUS FAMILY, 897
Caesalpinia, 667
Cailleia, 658
Cajan, 715
Catopsis, 272
Catharanthus, 1060
Caulophyllum, 545
Cakile, 574
Calabash, 1286
Calabash-tree, 1242
Calamagrostis, 106, *107*
Calamovilfa, 107
Calamus, 244
Callicarpa, 1143
Calico-bush, 999
Calicowood, 1036
California privet, 1042
Callirrhoe, 851, 852
Callistemon, 938
CALLITRICHACEAE, 804
Callitriche, 804, *505*
Calonyction, 1087
Calophanes, *1227*
Calpidisca, 1234
Calopogon, *376*
Caltha, 511
CALTROP FAMILY, 754
Caltrops, 754, 755
CALYCANTHACEAE, 631
Calycanthus, 631
CALYCERACEAE, 1296
CALYCERA FAMILY, 1296
Calycocarpum, 537
Calyptocarpus, 1445
Calyptranthes, 937, 938
Camassia, *292*
Camelina, 556
CAMELLIA FAMILY, 875
CAMPANULACEAE, 1288
Campanula, 1289, 1290
CAMPANULALES, 1282
Campanulastrum, 1290
Campe, 561
Camphora, 921
Camphor-plant, 1342
Camphor-tree, 921
Campions, 505, 508
Campulosus, 114
Campylocentrum, 398
Canada blue grass, 130
Canada hemlock, 7
Canada nettle, 432
Canada pea, 740
Canada-thistle, 1482
Canary-grass, 93
Canary-grasses, 92
Canavali, 726, 727
Cancer-root, 1239
Cancer-roots, 1238
Candleberry, 409
Can-dock, 540
Candyweed, 774
Candyweeds, 766, 768
Canella, 865
CANELLACEAE, 864
Canes, 138
Canker-root, 512, 1209
Canker-roots, 1021
Canna, 360
CANNA FAMILY, 359
CANNABINACEAE, 436
Cannabis, 436
CANNACEAE, 359
Cantaloupe, 1286
CAPER FAMILY, 575
Caper-spurge, 801
Caper-trees, 577
Caperonia, 785

Cape-weed, 1140
Capnoides, 550, 551
CAPPARIDACEAE, 575
Capparis, 577
Capraria, 1186
CAPRIFOLIACEAE, 1269
Capriola, 112
Capsella, 554
Capsicum, 1117
Carara, 553
Cardamine, 567
arenicola, 569
bulbosa, 568
Clematitis, 568
curvisiliqua, 568
debilis, 569
flagellifera, 569
hirsuta, 569
Hugeri, 569
parviflora, 569
pennsylvanica, 569
rhomboidea, 568
rotundifolia, 568
Cardinal-flower, 1293
Cardinal-spear, 716
Cardiospermum, 827, 828
CARDUACEAE, 1303
CARDUALES, 1297
Carduus, 1483
Careless, 474
Carex, 191
abscondita, 216
aestivalis, 221
alata, 209
albolutescens, 209
Albursina, 217
allegheniensis, 222
amphibola, 220
anceps, 217
angustior, 208
annectens, 204
Asa-Grayi, 235
atlantica, 207
austro-caroliniana, 215
Baileyi, 233
Baltzellii, 213
Barrattii, 226
biltmoreana, 215
blanda, 218
brevior, 209
bromoides, 206
brunnescens, 206
bullata, 232
Bushii, 225
Buxbaumii, 226
caroliniana, 225
cephalophora, 203
Chapmanii, 215
Chapmanii, 212
cherokeensis, 223
Collinsii, 231
communis, 211
comosa, 233
complanata, 224
conoides, 220
convoluta, 203
costellata, 224
Crawei, 219
crebriflora, 217
crinita, 229
crus-corvi, 206
dasycarpa, 212
Davisii, 221
debilis, 223
decomposita, 205
digitalis, 216
digitalis glauca, 216
eburnea, 214
Elliottii, 232
festucacea, 209
festucacea, 209
flaccosperma, 220
flexuosa, 223
floridana, 212
folliculata, 232
folliculata australis, 232
Frankii, 234
Fraseri, 236
fusca, 226
fusiformis, 215
gigantea, 235
glaucescens, 227
glaucodea, 220
gracilescens, 218
gracillima, 221
granularis, 219
grisea, 220
gynandra, 229
Harperi, 210
heterosperma, 217
hirsuta, 224
hirsutella, 224
hirta, 230
Howei, 207
hystricina, 233
impressa, 230
incomperta, 207
interior, 207
intumescens, 234
Jamesii, 210
Joorii, 227
juncea, 222
laevi-vaginata, 205
lanuginosa, 230
laxiculmis, 216
laxiculmis-floridana, 216
laxiflora, 217
laxiflora, 218
Leavenworthii, 203
leptalea, 210
leptonervia, 217
littoralis, 226
Longii, 209
louisianica, 235
lucorum, 211
lupulina, 235
lurida, 232
macrokolea, 227
magnifolia, 216
Meadii, 214
mesochorea, 204
microdonta, 219
misera, 221
Mitchelliana, 229
Mohrii, 207
Mirabilis, 209
Muhlenbergii, 203
Muhlenbergii enervis, 203
nigro-marginata, 212
normalis, 209
oblita, 222
oligocarpa, 218
oxylepis, 221
pennsylvanica, 211
physorhyncha, 212
picta, 213
plana, 203
plantaginea, 215
platyphylla, 216
polymorpha, 230
polytrichoides, 210
prasina, 221
ptychocarpa, 216
purpurifera, 216
radiata, 203
reniformis, 209
retroflexa, 202
riparia, 231
rosaeoides, 207
rosea, 203
Ruthii, 208
scabrata, 225
Schweinitzii, 233
scoparia, 208
seorsa, 207
setacea-ambigua, 204
Shortiana, 226
Smalliana, 231
Smithii, 225
squarrosa, 234
stenolepis, 234
stipata, 205
stipata uberior, 205
straminea, 209
striata, 230
striatula, 217
stricta, 228
strictior, 228
styloflexa, 217
Swanii, 224
tenuis, 223
tetanica, 215
texensis, 203
torta, 228
triangularis, 204
tribuloides, 208
triceps, 224
turgescens, 230
typhina, 234
typhinoides, 234
uberior, 205
validior, 212
varia, 211
varia australis, 212
venusta, 222
verrucosa, 227
virescens, 224
vulpinoidea, 204
Walteriana, 230
Willdenovii, 210
Caribbean-pine, 4
Carica, 894, 895
Carnation, 504
Carolina-allspice, 631
Carolina beech-drops, 989
Carolina-hemlock, 7
Carolina-maple, 826
Carolina-moonseed, 537
Carolina-pink, 1046
Carolina-poplar, 412
Carolina-poppy, 548
Carolina-rose, 630
Carpenter-weed, 1155
Carpet-weed, 491
CARPET-WEED FAMILY, 490
Carphephorus, 1329, 1330
Carpinus, 416
Carrion-flowers, 309
CARROT FAMILY, 960
Carrots, 966
Carteria, 393
Carya, 404
CAROPHYLLACEAE, 504
Cassada, 1003
Cassasia, 1257
Cassava, 791
Cassena, 816
Cassia, 662, 663, 664
CASSIACEAE, 658
Cassie, 654
CASSYTHA FAMILY, 924
Cassytha, 924, 925
CASSYTHACEAE, 924
Castalia, 542, 543

Castanea, 420
alabamensis, 421
alnifolia, 421
alnifolia floridana, 421
arkansana, 421
Ashei, 421
dentata, 420
floridana, 421
Margaretta, 421
nana, 421
ozarkensis, 421
pumila, 420
Castilleja, 1223
Castor-bean, 792
Castor-oil plant, 792
Casuarina, 402
CASUARINACEAE, 402
CASUARINALES, 402
Catalonia-jessamine, 1044
Catalpa, 1241
Catalpas, 1241
Catawbas, 1241
Cat-bells, 674
Catbrier, 313
Catchflys, 505
Cat-clover, 687
Catesbaea, 1257
Cat-grape, 837
Cat-gut, 706
Cathartolinum, 750
arenicola, 752
Carteri, 752
Curtissii, 751
floridanum, 751
Harperi, 752
intercursum, 751
macrosepalum, 751
medium, 751
striatum, 751
sulcatum, 752
virginianum, 751
Cat-mint, 1154
Catnip, 1154
Cat-o-nine-tails, 13
Cat's-claw, 653
Cat's-ears, 1488
Cat-tails, 13
CAT-TAIL FAMILY, 13
Cat tail flag, 170
Cayaponia, 1287
Cayenne-pepper, 1117
Cayenne-peppers, 1117
Ceanothus, 832
Cebatha, 537
Cedars, 11
Cedar-elm, 440
Cedar-mosses, 509
Cedar-pine, 5
Cedronella, 1154
Celandine, 547
Celandine-poppy, 547
CELASTRACEAE, 817
Celastrus, 818
Celeri, 978
Celery, 978
Celery-leaved buttercup, 521
Celestial-lilies, 326
Celestials, 326
Celosia, 471
Celtis, 441
Cenchropsis, 87
Cenchrus, 86, 87
Centaurea, 1484, 1485
Centaurium, 1048
Centaury, 1048
Centella, 971
Centrosema, 721
Centrostachys, 475
Centunculus, 1026
Century-plant, 320
Century-plants, 319
Cephalanthus, 1258
Cephalocereus, 916, 917
Cephaloxys, 284
Ceranthera, 1170
Cerastium, 500, 501, 502
Cerastiums, 500
Ceratiola, 807
CERATOPHYLLACEAE, 509
Ceratophyllum, 509
Ceratoschoenus, 178
Ceratotheca, 1243
Cerbera, 1058
Cercis, 659
Cerefolium, 968
Cerothamnus, 409
Cestrum, 1118
Chaerophyllum, 969
Chaetochloa, 84
ambigua, 85
barbata, 85
caudata, 86
corrugata, 85
geniculata, 85
glauca, 84
hispida, 85
imberbis, 85
italica, 85
lutescens, 84
macrosperma, 85
magna, 85
occidentalis, 85
purpurascens, 85
rariflora, 85
versicolor, 85
verticillata, 84
viridis, 85
Chaff seed, 1223
Chaff-weed, 1026
Chair-maker's rush, 170
Chalk-maple, 825
Chamaecrista, 662
aspera, 664
bellula, 663
brachiata, 663
Chamaecrista, 664
Deeringiana, 663
depressa, 664
fasciculata, 663
grammica, 663
keyensis, 663
littoralis, 664
mississippiensis, 664
Mohrii, 664
multipinnata, 664
multipinnata Nashii, 664
procumbens, 664
robusta, 663
rotundifolia, 665
Tracyi, 664
Chamaecyparis, 10
Chamaedaphne, 1000
Chamaelirium, 276
Chamaenerion, 945
Chamaesenna, 662
Chamaesyce, 792
adenoptera, 797
adhaerens, 795
adicioides, 796
Blodgettii, 794
brachypoda, 794
buxifolia, 795
Chiogenes, 794
conferta, 797
cordifolia, 794
cumulicola, 794
deltoidea, 795
Garberi, 795
gemella, 797
hirta, 797
humistrata, 796
hypericifolia, 796
hyssopifolia, 796
Ingallsii, 794
keyensis, 796
maculata, 796
Mathewsii, 797
Mosieri, 795
Nashii, 794
pilulifera, 797
pilulifera procumbens, 797
pinetorum, 796
polygonifolia, 794
Porteriana, 795
prostrata, 796
scoparia, 795
serpens, 794
Serpyllum, 795
Tracyi, 796
Chamomilla, 1468
Chapmannia, 730
Chapman's-oak, 427
Chaparral-shrubs, 443
Chaptalia, 1486
Charlock, 563
Charlocks, 564
Chaste-tree, 1144
Cheat, 135
Cheats, 134
Checkerberry, 1006
Cheeses, 851
Cheirinia, 562
Chelidonium, 547
Chelone, 1199, 1200, *1201*
CHENOPODIACEAE, 462
CHENOPODIALES, 461
Chenopodium, 464, 465, *466*
Cherokee-beans, 716
Cherokee-rose, 628
Cherries, 647
Cherry, 1029
Cherry-birch, 418
Cherry-laurels, 651
Cherry-tomato, 1116
Chervil, 969
Chervils, 969
Chess, 135
Chesses, 134
Chestnut-oak, 426
Chew-stick, 835
Chickasaw-plum, 649
Chicken-corn, 47
Chicken-grape, 836
CHICKWEED FAMILY, 496
Chickweeds, 497
Chimaphila, 990
China-bean, 726
China-berry, 765
Chinabrier, 313
China parasol-tree, 864
China-tree, 765
Chinese-arborvitae, 10
Chinese-rose, 857
Chinese tallow-tree, 789
Chinese-wisteria, 699
Chinquapin, 421
Chinquapin-oak, 425
Chinquapins, 420
Chiococca, 1259, 1260
Chiogenes, 1018
Chionanthus, 1041, 1042
Chlaenobolus, 1400
Chloris, 114, *115*

CHOCOLATE FAMILY, 861
Chokeberries, 634
Choke-cherries, 650
Choke-cherry, 650
Chondrophora, 1342
Christmas-berry, 819, 1118
Christmas-flower, 512
Christmas-rose, 512
Christ's-tears, 38
Chrosperma, 278
Chrysanthemum, *1469*, 1470
Chrysobalanus, 645, *646*
Chrysogonum, 1415
Chrysoma, 1344
Chrysophyllum, 1031
Chrysopsis, 1338
  arenicola, 1339
  argentea, 1341
  aspera, 1341
  decumbens, 1340
  flexuosa, 1341
  floridana, 1339
  gigantea, 1338
  gossypina, 1340
  graminifolia, 1341
  hyssopifolia, 1339
  lanuginosa, 1339
  latisquama, 1339
  mariana, 1339
  microcephala, 1341
  Nuttallii, 1340
  oligantha, 1341
  pilosa, 1340
  pinifolia, 1341
  Ruthii, 1341
  scabrella, 1339
  subulata, 1338
  Tracyi, 1341
  trichophylla, 1338
Chrysosplenium, 591
Chthamalia, 1078
Chufa, 149
Churl-hemp, 433
Churl's-cresses, 554
Chytraculia, 937
Cicca, 779
CICHORIACEAE, 1486
Cichorium, 1490
Cicuta, 975
Cienfuegosia, 860
Cigar-trees, 1241
Cimcifuga, 513
Cinna, 104
Cinnamon-bark, 865
Cinnamon-oak, 428
Cinquefoil, 610
Circaea, 953
Cirsium, 1481
  altissimum, 1483
  arvense, 1482
  discolor, 1483
  flaccidum, 1482
  horridulum, 1483
  lanceolatum, 1483
  Le-Contei, 1482
  muticum, 1481
  Nuttallii, 1483
  odoratum, 1482
  pinetorum, 1483
  repandum, 1482
  revolutum, 1482
  Smallii, 1483
  virginianum, 1482
  vittatum, 1483
Cissampelos, 538
Cissus, 838, 539
CISTACEAE, 878
Citharexylum, 1142
Citron, 761
Citrullus, 1285
Citrus, 760, *761*
Cladium, 187
Cladrastis, 673
Clambering-monkshood, 515
Clammy-locust, 702
Clammy-weed, 576
Clamshell-orchid, 392
Clary, 1163
Claytonia, 494
Clear-weed, 433
Cleavers, 1266
Cleistes, 375
Clematis, 525, *526, 527*
Clematis, 526
Cleome, 576, *577*
Clerodendron, 1143
Clethra, 987
CLETHRACEAE, 987
Cliff-barberry, 545
Cliff-green, 818
Cliff-harlequin, 549
Cliff-orpine, 586
Cliff-stonecrop, 587
Cliftonia, 812
Climbing-bittersweet, 818
Climbing-buckwheat, 459
Climbing-fumitory, 549
Climbing-hempvine, 1328
Climbing-hempweeds, 1328
Climbing-hydrangea, 599
Clinopodium, 1168, 1169
Clintonia, 296
Clitoria, 721
Clitoria, 722
Clotbur, 1480
Clotburs, 1302
Clovers, 684
Clubrushes, 167
Clusia, 865
CLUSIACEAE, 865
Clustered-dock, 448
Clustered poppy-mallow, 852
Cnicus, 1485
Cnidoscolus, 790
Coastal water-cress, 568
Coccinea, 1287
Coccolobis, 461
Coccothrinax, 241
Cocculus, 537
Cochranea, 1134
Cockleburs, 1302
Cocks-combs, 471
Cock-spur, 489
Cock-spurs, 86
Coco-grass, 149
Coco-palm, 237
Cocoa-plum, 645
Coconut, 237
Cocos, 237
Coeloglossum, 368
Coelostylis, 1045
Coffee-senna, 661
Coffee-weed, 660, 661
Coffee-weeds, 661
Cohosh-bugbane, 513
Coix, 38
Coleosanthus, 1328
Coleus, 1182
Colic-roots, 315
Collinsia, 1207
Collinsonia, 1179
Colocasia, 248
Colt's-foot, 1020
Colubrina, 833
Columbines, 514
Comandra, 1249
Comfortroots, 1
Comfrey, 1127
Commelina, 263
  angustifolia, 265
  caroliniana, 264
  communis, 264
  crispa, 265
  elegans, 265
  erecta, 265
  Gigas, 264
  hamipila, 265
  hirtella, 265
  longicaulis, 265
  Nashii, 265
  nudiflora, 265
  saxicola, 265
  Swingleana, 265
  virginica, 265
  virginica, 265
COMMELINACEAE, 258
COMMELINALES, 258
Common-alumroot, 593
Common-banana, 359
Common-chicory, 1490
Common-chickweed, 497
Common-cotton, 861
Common-elder, 1270
Common-elm, 441
Common-fig, 439
Common-flax, 750
Common-groundsel, 1479
Common-lilac, 1038
Common-locust, 700
Common-milkweed, 1070
Common-millet, 85
Common morning-glory, 1083
Common-nightshade, 1114
Common-peach, 646
Common-reed, 120
Common-smartweed, 457
Common-thistle, 1483
Common-vetch, 741
Compass-plant, 1410
Compties, 1
Comptonia, 410
Cone-flowers, 1421
Cone-plants, 1
Confederate-violet, 888
Congo-pea, 715
Congo-root, 693
Conioselinum, 984
Conium, 974
Conobea, 1197
Conocarpus, 933
Conoclinium, 1327, *1328*
Conopholis, 1238
Conradina, 1166
Conringa, 560
Consolea, 912
Conti-Chatu, 311
Conti-Hateka, 1
Contis, 1
Convallaria, 301
CONVALLARIACEAE, 294
CONVOLVULACEAE, 1080
Convolvulus, 1089, 1090
Coolweed, 433
Coolworts, 594
Coon-tails, 509
Coonties, 1
Cooper's-reeds, 13
Copel-tree, 763
Coppery St. John's-wort, 870
Coptis, 512
Coral-beads, 537

Coral-beans, 716
Coralberry, 513, 1273
Coral-greenbrier, 313
Coral-honeysuckle, 1274
Corallorrhiza, 388, *389*
Coral-orchids, 388
Coral-plant, 1206
Coral-roots, 388
Coral-sumac, 808
Coral-vine, 460
Corchorus, 841
Corculum, 460
Cord-grasses, 113
Cordia, 1128, 1129
Cordyline, 301
Coreopsis, 1446
angustifolia, 1449
auriculata, 1448
cardaminefolia, 1449
crassifolia, 1447
delphinifolia, 1448
Drummondii, 1449
falcata, 1450
gladiata, 1450
grandiflora, 1448
helianthoides, 1450
integrifolia, 1450
lanceolata, 1447
latifolia, 1449
Leavenworthii, 1449
Lewtonii, 1449
longifolia, 1450
major, 1448
nudata, 1450
nuecensis, 1448
pubescens, 1448
pulchra, 1448
rosea, 1449
saxicola, 1448
senifolia, 1448
stenophylla, 1449
tinctoria, 1449
tripteris, 1448
verticillata, 1448
Coriander, 972
Coriandrum, 972
Cork-elm, 441
Corkwood, 408
CORKWOOD FAMILY, 407
Corky-stemmed passion-flower, 896
Corn, 38
Corn-campion, 508
Corn-chrysanthemum, 1470
Corn-cockle, 508
Corn-flower, 1485
Corn-gromwell, 1125
Corn-marigold, 1470
Corn-mustards, 561
Corn-rose, 508
Corn-salads, 1277
Corn-snakeroot, 964
Corn-spurrey, 502
Cornel,
Pagoda, 958
Rough-leaf, 958
Silky, 958
Umbrella, 958
Cornels, 957
Cornstalk-pondweed, 17
Cornus, 957, *958*
Corpse-plant, 988
CORRIGIOLACEAE, 479
Corydalis, 550
CORYLACEAE, 415
Corylus, 416, *417*
Corymbis, 385
Cosmiza, 1233
Cosmos, 1454
Cotinus, 808
Cotoneaster, 644
Cottongrasses, 167
Cotton-gum, 957
Cotton-rose, 857, 1404
Cottonrushes, 167
Cottons, 861
Cotton-thistle, 1484
Cottonweed, 479
Cotton-weeds, 946
Cottonwood, 412
Cottonwoods, 410
Couple-caps, 785
Cow-bane, 986
Cow-bells, 299, 507
Cow-cress, 554
Cow-herb, 505
Cowhorn-orchids, 394
Cow-itch, 1241
Cow-licks, 1036
Cow-lilies, 540
Cow-oak, 425
Cow-parsnip, 985
Cow-pea, 726
Cow-wheat, 1225
Cowitch-vine, 599, 717
Cowslip, 511
Cow-sorrel, 446
Cow-vetch, 740
Crab-apples, 633
Crab-grass, 51, 117
Crab-grasses, 50
Crab's-eye, 743
Crabwood, 790
Cracca, 704
ambigua, 707
angustifolia, 707
angustissima, 708
Carpenteri, 706
Chapmanii, 706
chrysophylla, 706
cinerea, 708
corallicola, 707
Curtissii, 707
flexuosa, 707
gracillima, 707
hispidula, 707
intermedia, 706
latidens, 706
Mohrii, 706
onobrychoides, 707
purpurea, 708
Rugelii, 706
spicata, 706
virginica, 705
Crack-willow, 413
Crag-hemlock, 7
Crag-jangles, 592
Cranberry, 1018
Mountain, 1017
Cranefly-orchid, 387
Cranesbills, 744
Cranichis, 379
Crantzia, 972
Crape-moss, 268
Crape-myrtle, 930
Crataegus, 637
aestivalis, 641
albicans, 643
apiifolia, 644
arborescens, 642
berberifolia, 640
brachyacantha, 642
Calpodendron, 641
Chapmani, 641
chrysocarpa, 642
collina, 641
cordata, 644
Crus-galli, 640
cuneiformis, 641
flava, 642
floridana, 643
Harbisonii, 642
intricata, 642
lacrimata, 644
luculenta, 641
macrosperma, 643
maloides, 641
Margaretta, 641
Marshallii, 644
mendosa, 642
Michauxii, 643
Mohrii, 640
mollis, 643
monogyna, 643
pausiaca, 641
phaenopyrum, 644
populifolia, 642
pruinosa, 643
punctata, 640
rotundifolia, 642
rufula, 641
signata, 640
spathulata, 643
succulenta, 641
tomentosa, 641
triflora, 642
uniflora, 644
viridis, 642
yadkinensis, 644
Cream-violet, 893
Cream wild-indigo, 677
Creeping-blueberry, 1017
Creeping-buttercup, 522
Creeping-cucumbers, 1284
Creeping-oxalis, 748
Creeping-phlox, 1104
Creeping St. John's-wort, 871
Creeping-snowberry, 1018
Creeping-thyme, 1171
Creeping water-plantains, 21
Creeping wintergreen, 1006
Crepis, 1494, 1495
Crescentia, 1241, 1242
Crested dwarf-iris, 331
Crested-ettercap, 375
Crimson-clover, 685
Crinkle-root, 567
Crinkle-roots, 566
Crinum, 321
Crocanthemum, 878
Crookea, 868
Croomia, 309
Cross-vine, 1240
Cross-weed, 563
Crosswort, 1021
Crotalaria, 678
incana, 680
Linaria, 679
maritima, 679
pumila, 680
Purshii, 679
retusa, 679
Retzii, 679
rotundifolia, 679
sagittalis, 679
spectabilis, 679
striata, 680
Croton, 780
alabamensis, 781
arenicola, 782
argyranthemus, 781
Berlandieri, 782

capitatus, 783
Elliottii, 783
Engelmannii, 783
Fergusonii, 782
floridanus, 782
glandulosus, 782
linearis, 782
maritimus, 783
miquelensis, 782
monanthogynus, 783
punctatus, 783
texensis, 783
Crotonopsis, 784
CROW-BERRY FAMILY, 807
Crowfoot, 117
CROWFOOT FAMILY, 510
Crowfoot-grass, 118
Crowfoots, 519
Crowfoot-violet, 886
Crow-garlic, 289
Crow-needles, 968
Crow-poison, 278, 279
Crownbeards, 1443
Crown-of-thorns, 666
Crunch-weed, 564
Cryptophila, 989
Cryptostegia, 1065
Cuban-palm, 242
Cubelium, 894
Cucumber-tree, 534
Cucumber-trees, 534
Cucumis, 1286
Cucurbita, 1286
CUCURBITACEAE, 1283
Cudjoe-wood, 1028
Cudweeds, 1402
Cullen, 691
Culver's-physic, 1209
Cunila, 1175
Cupania, 829
Cup-plant, 1410
Cup-seed, 537
Cupularia, 1406
Curl-flowers, 527
Curled-dock, 447
Curled-mustard, 563
Curly-clematis, 527
Curly-hair, 303
Curly-heads, 528
Currants, 602
Cursed-crowfoot, 521
Curve-leaf yucca, 303
Cuscuta, 1092
americana, 1094
arvensis, 1093
Cephalanthi, 1093
compacta, 1093
Coryli, 1093
decora pulcherrima, 1094
exaltata, 1094
glandulosa, 1093
glomerata, 1093
Gronovii, 1094
Harperi, 1094
indecora, 1094
inflexa, 1093
obtusiflora glandulosa, 1093
paradoxa, 1093
pentagona, 1093
Polygonorum, 1093
rostrata, 1094
umbellata, 1094
CUSCUTACEAE, 1092
Cushat-lily, 305
Custard-apple, 533, 895
CUSTARD-APPLE FAMILY, 529
Custard-apples, 529–532
Cuthbertia, 259
Cyanococcus, 1013
amoenus, 1014
atrococcus, 1014
corymbosus, 1015
Cuthbertii, 1015
Elliottii, 1014
fuscatus, 1013
hirsutus, 1016
holophyllus, 1015
liparus, 1016
Margarettae, 1015
Myrsinites, 1013
pallidus, 1016
simulatus, 1015
subcordatus, 1016
tallapusae, 1016
tenellus, 1014
vacillans, 1015
virgatus, 1014
CYCADACEAE, 1
CYCADALES, 1
Cyclocloma, 463
Cyclodon, 1075
Cyclopogon, 382, 583
Cyclospermum, 976
Cymodocea, 18
CYMODOCEACEAE, 18
Cymophyllus, 235
Cynanchum, 1077
Cynoctonum, 1046
Cynodon, 112
Cynoglossum, 1122
Cynosciadium, 971
Cynoxylon, 958
Cynthia, 1489
Cyperus, 141
alternifolius, 148
articulatus, 149
Blodgettii, 153
brunneus, 153
Careyi, 147
cayennensis, 152
compressus, 147
cuspidatus, 147
cylindricus, 151
cylindrostachys, 151
Deeringianus, 151
densus, 146
dentatus, 148
dentatus multiradiatus, 149
diandrus, 145
dipsaciformis, 151
dissitiflorus, 153
distans, 148
echinatus, 152
elegans, 147
Engelmannii, 154
erythrorhizos, 149
esculentus, 149
ferax, 154
filicinus, 146
filiculmis, 153
flavescens, 145
flavicomus, 146
floridanus, 150
fuligineus, 153
Gatesii, 146
globulosus, 152
Halei, 149
Haspan, 148
hermaphroditus, 153
hystricinus, 151
inflexus, 147
Iria, 147
laevigatus, 146
lancastriensis, 151
Le Contei, 148
ligularis, 152
litoreus, 150
longispicatus, 154
lutescens, 149
Martindalei, 150
microdontus, 146
multiflorus, 153
Nashii, 152
Nuttallii, 146
ochraceus, 147
odoratus, 146
Ottonis, 154
ovularis, 152
paniculatus, 146
phymatoides, 149
Plankii, 152
Pollardi, 151
polystachys, 146
praelongatus, 150
pseudovegetus, 148
pumilis, 146
refractus, 150
retrofractus, 150
retrorsus, 151
rivularis, 145
rotundus, 149
speciosus, 154
squarrosus, 147
stenolepis, 150
strigosus, 150
subulosus, 146
surinamensis, 148
tetragonus, 153
Torreyi, 151
virens, 147
Winklerii, 152
Cypress-grass, 145
Cypress-spurge, 802
Cypresses, 10
Cypripedium, 367, 367
Cypselea, 491
Cyrilla, 811, 812
CYRILLACEAE, 811
Cyrtopodium, 394, 395
Cytisus, 681

Dactylis, 129
Dactyloctenium, 117, 118
Dahoon, 816
Daisy, 1362
Daisy-fleabane, 1396
Daisy-pink, 505
Dalbergia, 711
Dalea, 694
Dalibarda, 618
Dallis-grass, 60
Dame's-rocket, 560
Dame's-violet, 560
Dandelions, 1496
Dangleberry, 1007
Danthonia, 111, 112
DAPHNACEAE, 919
Darling-plum, 831
Darnels, 136
Dasheen, 248
Dasiphora, 613
Dasistoma, 1212
Dasystephana, 1052, 1053, 1054, 1055
Dasystoma, 1214, 1215
Datelet, 238
Date-palm, 239
Date-plums, 1030
Datura, 1118
Daubentonia, 704
Daucus, 966, 967
Day-flowers, 263

Day-jessamine, 1118
Day-lilies, 294
Dead-man's bryonys, 309
Dead-nettle, 1158
Dead-nettles, 1157
Decachaena, 1007, 1008
Decemium, 1096
Deciduous-holly, 815
Decodon, 929
Decumaria, 599
Deerberries, 1010
Deer-hair, 169
Deerhair-bulrush, 169
Deeringothamnus, 531
Deer-pea, 741
Deer's-tongue, 1336
Deer-wood, 416
Delonix, 666
Delopyrum, 450, 451
Delphinum, 514, 515
Delta-palmetto, 240
Dendrium, 993
Dendrophylax, 398
Dendropogon, 268
Dentaria, 566, 567
Dentoceras, 450
Deptford pink, 504
Deringa, 969, 970
Deschampsia, 107, 108
Desmanthus, 655, 656
Desmodium, 731
acuminatum, 732
canadense, 735
canescens, 734
cuspidatum, 734
Dillenii, 734
floridanum, 734
glabellum, 733
humifusum, 733
incanum, 735
laevigatum, 735
lineatum, 733
marylandicum, 735
nudiflorum, 732
paniculatum, 734
paniculatum angustifolium, 734
paniculatum pubens, 734
pauciflorum, 732
rigidum, 735
rotundifolium, 733
strictum, 733
tenifolium, 733
tortuosum, 735
triflorum, 736
viridiflorum, 735
Desmothamnus, 1003
Devil-woods, 1043
Devil's-bits, 276
Devil's-boats, 581
Devil's-claws, 489
Devil's darning-needles, 97
Devil's-pincushions, 899
Devil's-plague, 967
Devil's-potato, 1063
Devil's-shoestring, 740
Devil's-shoestrings, 706
Devil's-tongues, 899
Devil's-walkingstick, 960
Dewdrops, 619
Dew-flowers, 263
Dew-threads, 579
Diamorpha, 588
Dianthera, 1230
Dianthus, 504
Diapedium, 1229, 1230
DIAPENSIACEAE, 1018
Diaphoranthema, 269
Diarina, 126
Diarrhena, 127
Dicentra, 549, 550
Dicerandra, 1169, 1170
Dichondra, 1079
DICHONDRA FAMILY, 1079
DICHONDRACEAE, 1079
Dichromena, 173, 174
Dichrophyllum, 797
Dicliptera, 1230
Didiplis, 928
Diervilla, 1276
Digitaria, 50
Dildoe, 915
Dilepyrum, 99
Dill, 983
Dillweed, 983
Dilly, 1032
Dimorphostachys, 57
Dioclea, 717
Diodella, 1264
Diodia, 1263, 1264
Dionaea, 580
Dioscorea, 324, 325
Diospyros, 1030
Dipholis, 1033
Diplachne, 118, 119
Diplotaxis, 563
Diphylleia, 544
Dipsacus, 1278
Dirca, 919
Dishcloth-gourd, 1285
Disporum, 298
Distichlis, 128
Ditaxis, 784
Ditch-crowfoot, 521
Ditch-grass, 15
Ditch-stonecrop, 589
DITCH-STONECROP FAMILY, 589
Ditremexa, 660, 661
Dittany, 1175
Docks, 446
Doctor-gum, 808
DODDER FAMILY, 1092
Dodders, 1092
Dodecatheon, 1026, 1027
Dodoneae, 821
DODONAEACEAE, 820
Doellingeria, 1394
Dog-apples, 530
DOGBANE FAMILY, 1057
Dogbanes, 1061
Dogberry, 604
Dog-brier, 629
Dog-daisy, 1468
Dog-fennel, 1323, 1468
Dog-grass, 117
Dog-hobble, 1001
Dog-mint, 1169
Dog-rose, 629
Dog's-camomile, 1468
Dog's-mercuries, 785
Dog-tongue, 445
Dog-tongues, 266
Dog-tooth violets, 292
DOGWOOD FAMILY, 956
Dolicholus, 712
cinereus, 714
erectus, 715
intermedius, 715
Leutonii, 714
Michauxii, 714
minimus, 913
mollissimus, 715
parvifolius, 713
simplicifolius, 715
Swartzii, 913
tomentosus, 714
Dolichos, 726
Dollar-leaf, 733
Dollar-weed, 715
Doll's-daisy, 1363
Doll's eyes, 513
Dolly Varden, 706
Dondia, 469
Doorweeds, 452
Dotted-smartweed, 457
Double-leaf orchids, 378
Dove's foot, 744
Downward-plum, 1033
Downy-chinquapin, 421
Downy-grape, 837
Downy-haw, 643
Downy-phlox, 1103
Downy-poplar, 412
Downy-violet, 892
Draba, 565, 566
DRACAENACEAE, 302
Dracocephalum, 1156
Dracopis, 1427, 1428
Dragon's-teeth, 716
Drooping-sedge, 221
Drooping-willow, 414
Dropseeds, 100
Dropworts, 985
Drosera, 579
DROSERACEAE, 578
Drum-heads, 772
Drymaria, 503
Drymocallis, 613
Drypetes, 780
Duck-acorn, 540
Duchesnea, 611
Duck-oak, 428
Duck-potato, 25
DUCKWEED FAMILY, 248
Duck-weed, 250, 496
Duck-weeds, 249
Dulichium, 141
Dummy-date, 238
Duranta, 1142
Durra, 47
Durasnilla, 911
Dusty-clover, 739
Dutch-beech, 411
Dutch-clover, 686
Dutch-flax, 556
Dutchman's-breeches, 549
Dutchman's-pipe, 1282
Dwarf-amaranth, 474
Dwarf banana, 359
Dwarf-barleys, 136
Dwarf-candleberry, 409
Dwarf-cherry, 650
Dwarf chinquapin oak, 426
Dwarf-dandelion, 1489
Dwarf-ginseng, 959
Dwarf gray-willow, 415
Dwarf-huckleberries, 1008
Dwarf-huckleberry, 1009
Dwarf-irises, 330
Dwarf-larkspur, 515
Dwarf live-oak, 426
Dwarf-nettle, 433
Dwarf-palmetto, 240
Dwarf-pawpaw, 530
Dwarf-poinciana, 666
Dwarf rock-cress, 572
Dwarf St. John's-wort, 780
Dwarf-saxifrages, 595
Dwarf-sennas, 662
Dwarf-spirea, 608
Dwarf-sumac, 810
Dwarf-sundew, 579
Dwarf-thorn, 644

Dwarf wax-myrtle, 409
Dwarf witch-alder, 601
Dwarfed-bulrush, 169
Dye-flowers, 1146
Dye-root, 358
Dyschoriste, 1227, 1228

Eardrop, 460
Eardrops, 550
Ear-leaf, 536
Early-azalea, 995
Early-crowfoot, 522
Early meadow-rue, 524
Early wood-buttercup, 522
Early winter-cress, 561
Early yellow-violet, 892
Earth-almond, 149
Earth-smoke, 551
Easter-lily, 320, 321
Eatonia, 109, 110
EBENACEAE, 1030
EBENALES, 1030
EBONY FAMILY, 1030
Edisonia, 1078
Ecastophyllum, 710, *711*
Echinacea, 1420, 1421, *1426*
Echinochloa, 82, 83
Echinocystis, 1288
Echinodorus, 21, *21*, 22
Echinospermum, 1123
Echites, 1062, *1062, 1063*
Echium, 1128
Eclipta, 1419
Eel-grass, 18
Eel-grasses, 27
EEL-GRASS FAMILY, 18
Egg-fruit, 1032
Egg-plant, 1114
Eglantine, 628
Egyptian-bean, 726
EHRETIACEAE, 1128
EHRETIA FAMILY, 1128
ELAEAGNACEAE, 919
Elaeagnus, 919, 920
Elaphrium, 764
ELATINACEAE, 866
Elatine, 866
Elder,
  Common, 1270
  Gulf, 1270
  Red-berried, 1270
  Southern, 1270
Elders, 1269
Elecampane, 1405
Eleocharis, 159
  acicularis, 163
  acuminata, 166
  albida, 165
  arenicola, 166
  atropurpurea, 162
  Baldwinii, 165
  bicolor, 163
  Brittonii, 164
  calva, 163
  capillacea, 162
  capitata, 166
  caribaea, 162
  carolina, 165
  cellulosa, 161
  chaetaria, 164
  Curtisii, 165
  elongata, 162
  Engelmannii, 163
  equisetoides, 161
  flaccida, 162
  glaucescens, 163
  macrostachya, 163
  melanocarpa, 165
  microcarpa, 164
  mutata, 161
  nodulosa, 163
  obtusa, 163
  ochreata, 162
  olivacea, 162
  praticola, 162
  prolifera, 165
  quadrangulata, 161
  retroflexa, 164
  Robbinsii, 161
  rostellata, 166
  simplex, 164
  tenuis, 166
  Torreyana, 164
  tortilis, 164
  tricostata, 165
  tuberculosa, 164
  uncialis, 163
  vivipara, 164
Elephant-foots, 1316
Elephantopus, 1316, 1317
Elephant's-ears, 918
Eleusine, 117, *118*
Elf-feather, 297
Elf-orpines, 588
Elfin-spur, 387
Elk-wood, 536
Elk-woods, 534
Elliottia, 992
Emelista, 660
Emex, 448, 449
Emilia, 1474, 1475, *1475*
EMPETRACEAE, 807
Enallagma, 1242
Enchanter's-nightshade, 953
Encyclia, 391
Endorima, 1454, 1455
English-ivy, 959
English-plantain, 1246
English rye-grass, 136
English-violet, 892
Enslenia, 1074
Ephiphegus, 1239
Epibaterium, 537
Epicion, 1075
Epicladium, 392
Epidendrum, 390, *391, 392*
Epigaea, 1005
EPILOBIACEAE, 939
Epilobium, 946
Eragrostis, 122
  acuta, 124
  amabilis, 125
  bahiensis, 125
  campestris refracta, 124
  capillaris, 125
  cilianensis, 125
  ciliaris, 125
  conferta, 125
  Elliottii, 124
  Eragrostis, 126
  floridana, 124
  Frankii, 125
  glomerata, 125
  hirsuta, 124
  hypnoides, 125
  limbata, 126
  lugens, 124
  lugens, 124
  major, 125
  megastachya, 125
  minor, 126
  oxylepis, 124
  pectinacea, 126
  pilosa, 125
  plumosa, 125
  Purshii, 126
  refracta, 124
  secundiflora, 124
  simplex, 125
  spectabilis, 124
  tephrosanthos, 126
  trichocolea, 124
  unioloides, 125
Erechtites, 1477
Erianthus, 40, *40*, 41
ERICACEAE, 991
ERICALES, 986
Erigenia, 973, 974
Erigeron, 1395
  annuus, 1396
  bellidifolius, 1396
  canadensis, 1397
  divaricatus, 1397
  linifolius, 1397
  nudicaulis, 1936
  philadelphicus, 1396
  pulchellus, 1396
  quercifolius, 1396
  ramosus, 1396
  strigosus, 1396
  strigosus Beyrichii, 1396
  vernus, 1395
ERIOCAULACEAE, 255
ERIOCAULALES, 255
Eriocaulon, 257, 258
Eriochloa, 52, 53, *53*
Eriogonum, 445, *445*
Erioneuron, 121
Eriophorum, 167
Erithalis, 1259
Ernodea, 1262, 1263
Erodium, 745, 746
Eruca, 564, *564*
Erysimum, 559
Erysimum, 562
Eryngium, 963
  aquaticum, 963
  aromaticum, 964
  Baldwinii, 964
  cuneifolium, 964
  divaricatum, 964
  floridanum, 964
  integrifolium, 965
  Ludovicianum, 965
  Mettaueri, 965
  praealtum, 964
  prostratum, 964
  Ravenelii, 965
  synchaetum, 964
  virgatum, 965
  virginianum, 964
Eryngos, 963
Erythraea, 1048
Erythrina, 715
Erythronium, 292
Ettercap, 375
Eubotrys, 1000, 1001
Euchlaena, 37
Eugenia, 935, *937*
Eulophus, 975
Euonymus, 817, 818
Eupatorium, 1320
  album, 1324
  altissimum, 1325
  anomalum, 1324
  aromaticum, 1326
  capillifolium, 1323
  Chapmanii, 1326
  coelestinum, 1328
  compositifolium, 1323
  conyzoides, 1320
  cuneatum, 1326
  cuneifolium, 1325

Eugenei, 1323
heteroclinum, 1320
hyssopifolium, 1324
incarnatum, 1326
ivaefolium, 1320
jucundum, 1326
latidens, 1327
lecheaefolium, 1324
leptophyllum, 1323
leucolepis, 1324
maculatum, 1327
mikanioides, 1324
Mohri, 1324
pectinatum, 1323
perfoliatum, 1326
petaloideum, 1324
pinnatifidum, 1323
pubescens, 1325
purpureum, 1327
recurvans, 1325
roanensis, 1326
rotundifolium, 1325
scabridum, 1325
semiserratum, 1325
serotinum, 1324
sessilifolium, 1326
Torreyanum, 1324
tortifolium, 1325
trifoliatum, 1327
urticaefolium, 1326
verbenaefolium, 1325
villosum, 1327
Euphorbia, *796*, 803
EUPHORBIACEAE, 775
EUPHORBIALES, 774
Euphorbias, 792, 800, 802
European-verbena, 1137
Eustachys, 114, 115
Eustoma, 1048
Euthamia, 1360
Euxolus, 473, 474
EVENING PRIMROSE FAMILY, 939
Evening Primrose,
Seaside, 947
Weedy, 946
Evening primroses, 946
Evening trumpet-flower, 1045
Everglade cocoa-plum, 645
Evergreen-millet, 47
Evergreen-winterberry, 814
Everlasting-peas, 741
Everlastings, 1401, 1402
Eve's-cups, 580
Evolvulus, 1082, *1082*
Exogonium, 1088
Exostema, 1256
Exothea, 829
Eye-bane, 796
Eyebright, 1295
Eye-roots, 511

FABACEAE, 669
Facelis, 1403, 1404
FAGACEAE, 419
FAGALES, 415
Fagara, 757
Fagopyrum, 458
Fagus, 419, *420*
Fairy-bells, 298
Fairy-candles, 298
Fairy-creepers, 549
Fairy-cup, 591
Fairy-flowers, 990
Fairy-fringe, 370
Fairy-lilies, 320
Fairy-wand, 276
Falcata, 720
False-acacia, 700
False-aloes, 318
False-banana, 529
False beech-drops, 988
False-bonesets, 1329
False-boxwood, 819
False-buckwheat, 459
False-bugbane, 518
False-dandelions, 1495
False-dogwood, 828
False-dragon heads, 1156
False-flaxes, 556
False-foxgloves, 1214, 1216
False-garlics, 289
False goat's-beard, 596
False-goldenrod, 1361
False-heather, 880
False-hellebores, 276
False-indigo, 674
False-ipecac, 609
False-mallow, 850
False-mallows, 848
False-mermaid, 754
False-mermaid Family, 753
False-mitreworts, 594
False-moneywort, 736
False-nettles, 435
False-oats, 109
False-pennyroyal, 1149
False-pimpernel, 1026
False-pimpernels, 1194
False purple-foxgloves, 1216
False rue-anemone, 512
False-sisal, 519
False-willow, 1398
Fanwort, 539
Farkleberry, 1010
Fat-porks, 865
Featherbells, 277
Feather-columbine, 525
Feather-fleeces, 277
Featherfoil, 1023
Feather-geranium, 466
Feather-grasses, 97, 118
Feather,
Parrot's, 955
Water, 955
Feather-shank, 278
Feather-trees, 596
Female-fluellin, 1209
Fen-roses, 859
Fenn-rue, 525
Fennel, 983, 1323
Fern-bush, 410
Fernleafs, 1224
Fescues, 132
Fescue-grasses, 132
Festuca, 132
capillata, 133
duriuscula, 133
elatior, 133
Myuros, 133
nutans, 133
obtusa, 133
octoflora, 133
ovina, 133
parviflora, 133
rubra, 133
sciuréa, 133
Shortii, 133
tenella, 133
Fetid-buckeye, 823
Fetid-currant, 602
Feterita, 47
Fetter-bush, 1003
Fetter-bushes, 1000, 1001
Fever-bush, 814
Feverfew, 1469
Fever-grasses, 327
Fever-tree, 1253
Feverworts, 1273
Ficus, 439
Fiddle-dock, 448
Fiddler's-spurge, 803
Fiddler's-trumpet, 582
Fiddlewood, 1142
Field-balm, 1169
Field-bindweeds, 1091
Field-cress, 554, 555
Field-garlic, 289
Field-larkspur, 515
Field-pansy, 893
Field-pennycress, 555
Field-sorrel, 446
Field-thistle, 1483
Fig, 439
Common, 439
Golden, 439
Strangler, 439
Wild, 439
Figwort, 1206
FIGWORT FAMILY, 1182
Filaginopsis, 1404
Filago, 1404
Filberts, 416
Filipendula, 610
Filmy-angelica, 985
Fimbristylis, 155
anomala, 157
autumnalis, 157
Baldwiniana, 157
castanea, 157
castanea puberula, 156
diphylla, 157
Drummondii, 157
Frankii, 157
geminata, 157
Harperi, 156
laxa, 157
miliacea, 158
perpusilla, 157
puberula, 156
spadicea, 156
Vahlii, 157
Finger-grasses, 50, 114
Finger-rot, 790
Firecracker-plant, 822
Fire-leaf, 245
Fire-pink, 507
Firethorn, 644
Fire-weed, 945, 1477
Fire-wheels, 1461
Firmiana, 863, 864
Fish-blankets, 509
Fishweeds, 16
Fissipes, 367
Five-leaf orchid, 376
Five-finger, 611
Five-fingers, 610
Flags, 331
Flag-pawpaw, 531
Flag-root, 244
Flame-azalea, 994
Flame-tree, 666
Flaveria, 1463, *1463*, 1464, *1464*
FLAX FAMILY, 749
Flaxes, 750
Fleabanes, 1395
Flix-weed, 563
Flix-weeds, 572
Floating-hearts, 1056
Floerkea, 573
Florida-arrowroots, 1
Florida-bean, 717

Florida-beggarweed, 735
Florida-elm, 441
Florida-gooseberry, 603
Florida-mahogany, 922
Florida-moss, 268
Florida-phlox, 1103
Florida-privet, 1041
Florida thatch-palm, 241
Florida-trema, 443
Florida-yew, 12
Flote-grass, 131
Flower-fence, 666
Flower-of-an-hour, 858
Flowering-ashes, 1041
Flowering-dogwood, 958
Flowering-moss, 1019
Flowering-raspberry, 619
Flowering-spurge, 799
Flowering-straws, 1490
Flowering-wintergreen, 767
Fluellins, 1209
Fly-catcher, 992
Fly-catchers, 582
Fly-honeysuckle, 1274
Fly-poison, 278
Flytrap, 580, 581
Foam-flowers, 594
Foeniculum, 982, 983
Fog-fruits, 1139
Fool's-parsley, 982
Forefather's-cup, 581
Forestiera, 1040, 1041
Forget-me-nots, 1124
Forked-leaf, 430
Forsteronia, 1063
Fothergilla, 601
Fountain-plant, 1206
Four-o'clock, 487
FOUR-O'CLOCK FAMILY, 487
Fox-grape, 838
Foxtail-grasses, 84, 100
Foxtail-pine, 5
Fragaria, 612
Fragrant-sumac, 811
FRANGULACEAE, 830
Franklin-tree, 876
Franklinia, 876
Franseria, 1300
Frasera, 1054
Fraxinus, 1038, 1039, 1040
French-mulberry, 1143
Frenchweed, 555
Fringe-orchids, 369
Fringe-trees, 1041
Fringed-bleeding heart, 550
Fringed-gentian, 1051
Fringed-polygala, 767
Froelichia, 478
Frog-arrow, 374
Frog-bonnets, 580
Frog-buttons, 249
Frog-fruits, 1139
Frog's-bit, 29
FROG'S-BIT FAMILY, 29
Frog-spear, 373
Frog-spike, 374
Frogweeds, 519
Frost-grape, 836, 837
Frost-weed, 880, 1443
Fuirena, 172, 173, *173*
Fumaria, 551
FUMARIACEAE, 549
Fumeroot, 551
Fumeweed, 551
Fumewort, 551
Fumitory, 551
Funastrum, 1066
Gaillardia, 1461, 1462
GALACACEAE, 1019
Galactia, 718
brachypoda, 718
brevipes, 719
cubensis, 719
Elliottii, 720
erecta, 718
fasciculata, 719
filiformis, 719
floridana, 718
glabella, 719
mollis, 719
parvifolia, 719
pilosa, 719
pinetorum, 719
prostrata, 719
regularis, 719
sessiliflora, 718
spiciformis, 719
striata, 719
volubilis, 719
Galarhoeus, 800
arkansanus, 802
austrinus, 801
commutatus, 801
Cyparissias, 802
Darlingtonii, 801
floridanus, 801
Helioscopia, 802
inundatus, 801
Lathyrus, 801
obtusatus, 802
Peplus, 801
platyphylla, 802
telephioides, 801
trichotomus, 802
Galax, 1020
Galaxy, 1020
GALAXY FAMILY, 1019
Galenia, 492
Galeopsis, 1157
Galeorchis, 368
Galingales, 142
Galinsoga, 1457, 1458, *1458*
Gallberry, 814
Gall-of-the-earth, 1490, 1492
Galium, 1266
Aparine, 1267
arkansanum, 1268
asprellum, 1268
bermudense, 1268
circaezans, 1267
Claytonii, 1268
filifolium, 1268
hispidulum, 1268
lanceolatum, 1267
latifolium, 1268
parisiense, 1267
pilosum, 1267
tinctorium, 1268
triflorum, 1267
uniflorum, 1268
virgatum, 1267
Galypola, 767, 768
Gama-grasses, 37
Gander-grasses, 454
Gander-vine, 525
Garberia, 1336
Garden-balsam, 753
Garden-burnet, 614
Garden-phlox,
Annual, 1104
Perennial, 1105
Garden-poppy, 548
Garden-rocket, 564
Garlics, 288
Garter-pink, 507
Gastronychia, 480
Gaultheria, 1005, 1006
Gaura, 951, 952, 953
Gayoides, 848, *848*
Gaylussacia, 1007, 1008, 1009, 1010
Gay-wings, 767
Geiger-tree, 1128
Gelsemium, 1045
Gemmingia, 327
Genipa, 1257
GENTIAN FAMILY, 1047
Gentian,
Fringed, 1051
Soapwort, 1053
Stiff, 1052
Gentiana, 1051, 1052, 1053, 1054
GENTIANACEAE, 1047
GENTIANALES, 1044
Gentianella, 1052
Gentians, 1052
Geobalanus, 645, 646
Geoprumnon, 708
Georgia-hackberry, 442
Georgia-oak, 429
Georgia-pine, 4
GERANIALES, 743
GERANIACEAE, 744
Geranium, 744, 745
GERANIUM FAMILY, 744
Gerardia, 1229
Gerardia, 1216
decemloba, 1220
divaricata, 1221
filicaulis, 1221
filifolia, 1219
flava, 1215
Gattingeri, 1221
Holmiana, 1219
linifolia, 1221
maritima, 1219
microphylla, 1220
parvifolia, 1221
Plukenetii, 1220
purpurea, 1218
tenuifolia, 1221
virginica, 1215
Gerardias, 1216
German-knotgrass, 470
Germanders, 1147
Geum, 617, 618
Giant-alumroot, 593
Giant-arrowleaf, 26
Giant-cane, 139
Giant-hyssops, 1153
Giant-reed, 120
Gibbesia, 483
Gifola, 1404
Gilia, 1100, *1100*
Gillenia, 609
Gill-over-the-ground, 1154
GINGER FAMILY, 360
Ginger-lily, 361
Ginseng, 959
Ginster, 681
Gipsy-weed, 1211
Glabraria, 923
Gladiolus, 357
Glandularia, 1138, 1139
Glassworts, 468
Glaucous-willow, 414
Glecoma, 1154
Gleditsia, 665
Globe-amaranth, 477
Globe-amorette, 296

Globe-flower, 625
Globifera, 1195
Glorybowers, 1143
Glottidium, 703
Glyceria, 131, 132
Glycine, 723
Glycosmis, 759
Gnaphalium, 1402, 1403, *1403*
Gnomes'-gold, 818
Goat's-beard, 608, 1488
Goat's-rue, 706
Goat's-weed, 1187
Gold-crest, 358
Gold-cups, 519
Gold-heather, 880
Gold-moss, 587
Gold-thread, 512
Gold-weed, 522
Golden-alexanders, 982
Golden-asters, 1338
Golden-canna, 360
Golden-club, 245
Golden-dewdrop, 1143
Golden-dock, 448
Golden-fig, 439
Golden fringe-orchid, 369
Golden-fumeroot, 551
Golden-hardhack, 613
Golden-parsnip, 981
Goldenrods, 1344
Golden Saint John's wort, 872
Golden-saxifrage, 591
Golden-seal, 511
Golden-shower, 660
Golden-slipper, 367
Golden-trumpets, 582
Golden-eyed saxifrage, 595
Gomphrena, 477, *477*
Goniostachyum, 1140
Gonolobus, 1074, *1076, 1077, 1078*
Gonopyrum, 450
Goober-nut, 729
GOODENIA FAMILY, 1295
Goodyera, 384
Gooseberries, 602, 1010
Gooseberry-gourd, 1286
Gooseberry-tree, 779
GOOSEFOOT FAMILY, 462
Goosefoots, 464
Goose-grass, 1267
Gopher-apples, 646
Gopherberries, 1008
Gopher-weed, 674
Gordonia, 876, 877
Gossypium, 860, 861
Gouania, 834, 835, *835*
Gourd, 1286
GOURD FAMILY, 1283
Gourds, 1286
Goutweed, 975
Grace-garlics, 289
Gramma-grasses, 116
Grandsir-graybeards, 1041
Granite-gooseberry, 603
GRAPE FAMILY, 835
Grape-hyacinths, 294
Grapes, 835
Grape-tree, 461
GRASS FAMILY, 30
Grasses-of-Parnassus, 590
GRASS-OF-PARNASSUS FAMILY, 589
Grass-pinks, 376
Grass-wrack, 18
Gratiola, 1190
aurea, 1191
brevifolia, 1192
Drummondii, 1192
floridana, 1191
georgiana, 1192
macrantha, 1191
neglecta, 1191
pilosa, 1193
ramosa, 1192
repens, 1188
sphaerocarpa, 1191
subulata, 1193
virginiana, 1191
virginiana, 1191
viscidula, 1192
viscosa, 1192
Gray-beard, 597
Gray-birch, 418
Gray-nicker, 667
Gray-oak, 429
Great-aspen, 411
Great-bulrush, 170
Great-chickweed, 498
Great Indian-plantian, 1476
Great-laurel, 997
Great-lobelia, 1293
Great-leaf magnolia, 536
Great-mullen, 1199
Great-ragweed, 1300
Greek-valerian, 1100
Green-adderling, 376
Green-alder, 419
Green-amaranth, 473
Green-arum, 246
Green-ash, 1040
Greenbrier, 313
Greenbriers, 311
Green-bulrush, 171
Green-dragon, 247
Green-eyes, 1415
Green-fly orchid, 391
Green-foxtail, 85
Green-fringed orchid, 370
Green-hellebore, 512
Green-milkweeds, 1066
Green rein-orchid, 374
Green-violet, 894
Green-vivian, 545
Grevillea, 918
Grindelia, 1337
Gromwells, 1125
Ground-cherries, 1107
Ground-ivy, 1154
Groundsels, 1478
Groundsel-tree, 1398
Grossularia, 602, 603
GROSSULARIACEAE, 602
Ground-honeysuckle, 687
Ground-lemon, 544
Groundnut, 723, 959
Ground-oaks, 646
Guaiacum, 755
Guava, 937
Guettarda, 1258, 1259
Guiana-plum, 780
Guilandina, 667
Guinea-grass, 70
Guinea-hen weed, 486
Gulf-elder, 1270
Gulf-willow, 413
Gum,
Bear, 957
Black, 956, 957
Cotton, 957
Elastic, 1034
Sour, 956
Tupelo, 957
Water, 956
Gumbo, 858
Gumbo-limbo, 764
Gum-elemi, 764
Gum-plants, 1337
GUNNERACEAE, 953
Guzmannia, 272
Gyminda, 819
Gymnadenia, 374, 375
Gymnadeniopsis, 373, 374
Gymnanthes, 790
Gymnocladus, 665
Gymnolomia, 1422
Gymnopogon, 115, 116
Gymnostyles, 1473, 1474
Gynandropsis, 576
Gynura, 1475
Gypsy-spikes, 371
Gypsy-witch, 378
Gyrostachys, 380
Gyrotheca, 358

Habenaria, 371, 372, *372*
Habenella, 372, 373
Hackberries, 442
Hackelochloa, 42
HAEMODORACEAE, 358
Hagbrier, 512
Hair-grass, 99, 105
Hair-grasses, 98, 107, 108
Hair-sedge, 158
Hairy-alumroot, 593
Hairy-angelica, 985
Hairy-phlox, 1104
Hairy-pipewort, 256
Hairy-sumac, 810
Hairy-vetch, 740
Halberd-leaved rose-mallow, 856
Halesia, 1036
Halodule, 19
Halophila, 26
HAMAMELIDACEAE, 600
Hamamelis, 600
Hamelia, 1258
Hammerwort, 434
Hammock-maple, 824
Handsome-Harry, 927
Hangman's-hemp, 436
Harbinger-of-spring, 974
Hardhack, 608
Hard-maple, 824
Hare's-ear, 979
Hare-tail, 167
Harperella, 978, 979
Harrisella, 398
Harrisia, 915, 916
Hartmannia, 951
Hartwrightia, 1318
Harvest-lice, 615
Hat-pins, 257
Haw,
Black, 1272
Possum, 1272
Southern-black, 1272
Swamp, 1272
Hawk's-beard, 1495
Hawkweed, 1492
Haws, 637
Hay-bells, 299
Hazel-alder, 419
Hazelnuts, 416
Heal-all, 1206
Healing-herb, 1127
Heals-alls, 1155
Heart-leaf, 297
Heartleaf-pondweeds, 17
Heart-leafs, 1279
Heart-leaved willow, 414

Heart-pea, 827
Heart-seeds, 827
Heart-weed, 456
HEATH-FAMILY, 991
He-balsam, 7
Hedeoma, 1165, *1166*
Hedera, 959
HEDERACEAE, 959
Hedge-buckwheat, 459
Hedge-hyssops, 1190
Hedge-mustard, 559
Hedge-nettles, 1159
Hedge-parsley, 967
Hedge-pink, 505
Hedge-rose, 628
Hedge-thorn, 644
Hedgehog-grass, 87
He-huckleberry, 812
Helanthium, 21
Helenium, 1459
autumnale, 1460
brevifolium, 1461
Curtisii, 1460
fimbriatum, 1460
Helenium, 1460
incisum, 1460
latifolium, 1460
nudiflorum, 1460
parviflorum, 1460
pinnatifidum, 1461
polyphyllum, 1460
quadridentatum, 1460
tenuifolium, 1459
vernale, 1460
Helianthella, 1442
Helianthemum, 878, 879, 880
Helianthus, 1431
agrestis, 1435
alienus, 1438
angustifolius, 1434
annuus, 1435
argophyllus, 1436
atrorubens, 1434
carnosus, 1436
Curtissii, 1435
cucumerifolius, 1435
debilis, 1435
decapetalus, 1439
divaricatus, 1440
doronicoides, 1441
Dowellianus, 1439
Eggertii, 1437
floridanus, 1435
giganteus, 1438
glaucus, 1438
grosse-serratus, 1437
heterophyllus, 1434
hirsutus, 1441
laetiflorus, 1441
laevigatus, 1438
longifolius, 1436
Maximiliani, 1438
microcephalus, 1439
mollis, 1439
montanus, 1438
occidentalis, 1439
petiolaris, 1435
radula, 1436
reindutus, 1440
resinosus, 1441
rigidus, 1434
saxicola, 1440
scaberrimus, 1434
Schweinitzii, 1437
simulans, 1436
stenophyllus, 1437
strumosus, 1440
subrhomboideus, 1434
tomentosus, 1437
tuberosus, 1440
undulatus, 1435
validus, 1441
verticillatus, 1436
vestitus, 1435
Heliopsis, 1417, 1418, *1418*
HELIOTROPE FAMILY, 1130
Heliotropes, 1132
HELIOTROPIACEAE, 1130
Heliotropium, 1132, *1133, 1134*
Hellebore, 277
Helleborus, 512
Hellfetter, 312
Helmet-flowers, 1149
Helonias, 276, *279*
Hemerocallis, 294
Hemianthus, 1196
Hemicarpha, 141
Hemlock-parsley, 984
Hemlocks, 7
Hemp, 436
Hemp-nettle, 1157
Hemp-rush, 284
Henbit, 1158
Henderson-wood, 816
Hen-pepper, 554
Hepatica, 516
Hepatics, 516
Heracleum, 985
Herba-impia, 1404
Herbertia, 357
Herb-mercury, 785
Herb-sophia, 573
Hercules-club, 758, 960
Heron-bill, 745
Herpestis, *1187*, 1188, 1189
Herpothamnus, 1017
Hesperis, 560
Heteranthera, 266, *226*
Heteropogon, 48, *48*
Heterotheca, 1341, 1342, *1342*
Heuchera, 592
aceroides, 594
americana, 593
calycosa, 593
Curtisii, 593
hirsuticaulis, 594
hispida, 594
lancipetala, 593
longiflora, 594
macrorhiza, 593
parviflora, 592
puberula, 592
pubescens, 593
Rugelii, 592
scabra, 594
villosa, 593
Hexalectris, 388, *388*
Hexastylis, 1279, 1280
Hibiscus, 854
aculeatus, 856
cannabinus, 856
coccineus, 857
furcellatus, 855
grandiflorus, 856
incanus, 856
lasiocarpus, 856
militaris, 856
Moscheutos, 856
mutabilis, 856
oculiroseus, 856
pilosus, 855
Rosa-Sinensis, 857
Sabdariffa, 857
semilobatus, 857
spiralis, 855
syriacus, 857
Trionum, 858
tubiflorus, 855
Hickories, 404
Hicoria, 404
alba, 405
aquatica, 405
austrina, 406
carolinae septentrionalis, 406
carolinae-septentrionalis australis, 406
cordiformis, 405
floridana, 407
glabra, 407
laciniosa, 406
microcarpa, 406
minima, 405
myristicaeformis, 405
ovata, 406
pallida, 407
Pecan, 405
texana, 405
Hieracium, 1492, 1493, 1494
Hierochloa, 93
Highbush-blackberry, 622
High-ground willow-oak, 428
High-mallow, 851
High-water shrub, 1298
Hinsack, 654
Hippastrum, 321
Hippocratea, 820, *820*
HIPPOCRATEACEAE, 820
HIPPOCRATEA FAMILY, 820
Hippomane, 790
Hoarhound, 1153
Hoary-peas, 704
Hoary-verbena, 1136
Hobble-bush, 1271
Holcophacos, 709
Holcus, 46, 47
Hold-backs, 667
Hollies, 813
Holly, 816
HOLLY FAMILY, 816
Holy-grass, 93
Hooded pitcher-plants, 583
Hooked-buttercup, 52
Hoopwood, 815
Holosteum, 500
Homalocenchrus, 89, 90
Hog-apples, 637
Hog-cabbage palm, 238
Hog-millet, 69
Hog-peanuts, 721
Hog-plum, 648, 649
Hog-rush, 284
Hogwort, 783
Honesty-weed, 676
Honewort, 970
Honey-cups, 662
Honey-grasses, 126
Honey-locust, 665
Honeysuckle, 995, 1274
Bush, 1276
Coral, 1274
Fly, 1274
Japanese, 1274
Mountain, 1275
Trumpet, 1274
Wild, 993
HONEYSUCKLE FAMILY, 1269
Honeysuckles, 1275

Hop, 436
Hop-clover, 686
Hop-hornbeam, 416
Hop-medic, 382
Hop-tree, 758
Hordeum, 136, 137
Hormidium, 392, 393
Hornbeam, 416, 441
Horned-pondweed, 15
Horned-rush, 178, 179
Hornweeds, 509
HORNWORT FAMILY, 509
Hornworts, 509
Horse-balm, 1179
Horse-balms, 1179
Horse-bean, 727
Horsebrier, 313
Horsebriers, 311
Horse-cane, 1300
Horse-chestnut, 822
Horse-gentians, 1273
Horse-gold, 522
Horse-mint, 1164
Horse-mints, 1163, 1171
Horse-nettle, 1114
Horseradish, 558
Horseradish-tree, 578
HORSERADISH-TREE FAMILY, 578
Horse-sorrel, 446
Horse-sugar, 1035
Horsetail-tree, 402
Horse-weed, 1397, 1498
Hosackia, 637
Hottonia, 1023
Hot-weed, 1300
Hound's-tongue, 1122, 1336
Houstonia, 1253
  angustifolia, 1256
  caerulea, 1254
  canadensis, 1255
  ciliolata, 1255
  filifolia, 1256
  lanceolata, 1255
  longifolia, 1255
  minima, 1255
  minor, 1255
  montana, 1255
  procumbens, 1255
  pulvinata, 1256
  purpurea, 1255
  pusilla, 1254
  rotundifolia, 1255
  serpyllifolia, 1254
  tenuifolia, 1255
Huckleberries, 1007, 1012
Huckleberry,
  Bear, 1008
  Black, 1008
  Box, 1010
  Dwarf, 1009
  Jerusalem, 1010
  Tree, 1010
  Winter, 1010
HUCKLEBERRY FAMILY, 1006
Hudsonia, 880, 881
Hugeria, 1017
Hulver, 815
Humulus, 436
Hungarian-grass, 85
Hungary-root, 960
Huntsman's-cup, 581
Huntsman's-horn, 852
Hyacinth-bean, 726
Hydatica, 596
Hydrangea, 597
HYDRANGEA FAMILY, 596
HYDRANGEACEAE, 596
Hydrangeas, 597
Hydrastis, 511
HYDROCHARITACEAE, 29
HYDROCHARITALES, 26
Hydrochloa, 90
Hydrocotyle, 970, *971*
Hydrolea, 1098, 1099
HYDROLEACEAE, 1095
Hydrophyllum, 1095, *1096*
Hydrotrida, 1188
Hygrophila, 1227
Hylocereus, 914
Hymenocallis, 321
  bidentata, 323
  caribaea, 322
  Collieri, 322
  coronaria, 323
  crassifolia, 323
  humilis, 324
  keyensis, 322
  Kimballiae, 323
  laciniata, 323
  occidentalis, 323
  Palmeri, 324
  rotatum, 324
  tridentata, 323
Hymenopappus, 1462
Hymenoxys, 1458
Hypelate, 829
HYPERICACEAE, 866
HYPERICALES, 864
Hypericum, 868
  acutifolium, 870
  adpressum, 871
  ambiguum, 871
  apocynifolium, 871
  aspalathoides, 872
  aureum, 872
  Buckleyi, 873
  canadense, 870
  cistifolium, 871
  densiflorum, 873
  denticulatum, 870
  dolabriforme, 871
  fasciculatum, 872
  galioides, 872
  galoides pallidum, 871
  glomeratum, 871
  graveolens, 873
  gymnanthum, 870
  lobocarpum, 873
  maculatum, 873
  microsepalum, 868
  Mitchellianum, 873
  mutilum, 870
  myrtifolium, 872
  nudiflorum, 871
  opacum, 871
  perforatum, 873
  pilosum, 871
  prolificum, 873
  pseudomaculatum, 873
  punctatum, 872
  setosum, 870
  sphaerocarpum, 871
  splendens, 872
  subpetiolatum, 872
  turgidum, 871
  virgatum, 870
Hypochaeris, 1488
Hypopitys, 988, 989
Hypoxis, 316
  Curtissii, 317
  decumbens, 317
  erecta, 317
  grandis, 317
  hirsuta, 317
  juncea, 318
  leptocarpa, 317
  micrantha, 317
  rigida, 317
  sessilis, 317
  Wrightii, 318
Hyptis, 1180, 1181
Hyssop, 1170
Hyssopus, 1170
Hystrix, 138

Ibidium, 380
  Beckii, 381
  cernuum, 382
  floridanum, 381
  gracile, 381
  laciniatum, 381
  longilabre, 381
  ochroleucum, 382
  odoratum, 382
  ovale, 382
  plantagineum, 382
  praecox, 381
  tortile, 381
  trilobum, 382
  vernale, 381
  xyridifolium, 381
Icacorea, 1029
Ichthyomethia, 711
Ilex, 813, 1501
  ambigua, 815
  Amelanchier, 816
  arenicola, 816
  Beadlei, 816
  Buswellii, 815
  Cassine, 816
  Cassine, 816
  caroliniana, 815
  coriacea, 814
  cumulicola, 816
  Curtissii, 815
  Cuthbertii, 815
  Dahoon, 816
  decidua, 815
  decidua Curtissii, 815
  glabra, 814
  Krugiana, 814
  laevigata, 815
  longipes, 815
  lucida, 814
  monticola, 815
  myrtifolia, 816
  opaca, 816
  verticillata, 814
  vomitoria, 816
Illicium, 533, 534, 876
Ilysanthes, 1194, 1195, *1195*
Impatiens, 753
Imperata, 39
India-rubber plant, 439
Indian-almond, 933
Indian-beans, 1241
Indian-cherry, 832
Indian-chickweed, 491
Indian-cigars, 1241
Indian-clover, 684
Indian-corn, 38
Indian cucumber-root, 305
Indian-currant, 1273
Indian-dye, 511
Indian-elm, 441
Indian-grasses, 47
Indian-hemp, 847
Indian-hemps, 1061
Indian-licorice, 743
Indian-mallow, 848, 850

Indian-mallows, 847
Indian-mustard, 563
Indian paint-brush, 1224
Indian-physic, 536
Indian-physics, 609
Indian-pink, 1046
INDIAN-PIPE FAMILY, 987
Indian-pipes, 988
Indian-pitcher, 581
Indian-plantains, 1475
Indian-poke, 277
Indian-reeds, 47
Indian-rice, 92
Indian-shots, 360
Indian-strawberry, 612
Indian-tobacco, 1295, 1443
Indian turnips, 246
Indigo, 698
Indigo bush, 691
Indigofera, 697, 698
Indigo-plants, 697
Indigo-squill, 292
Inkberries, 485
Inkberry, 814
Inkwood, 829
Innocence, 1207, 1254
Inula, 1405
Iodanthus, 559
Ionactis, 1395
Ionopsis, 396
Ionoxalis, 747
Ipecac-spurge, 798
Ipomoea, 1084
acetosaefolia, 1085
angustifolia, 1085
antillana, 1091
Bona-Nox, 1087
Batatas, 1086
cairica, 1086
coccinea, 1088
commutata, 1086
dissecta, 1803
fastigiata, 1086
fistulosa, 1087
heptaphylla, 1086
jalapa, 1085
lacunosa, 1086
littoralis, 1085
macrorhiza, 1085
pandurata, 1086
Pes-Caprae, 1085
polyanthes, 1086
Quamoclit, 1088
sagittata, 1085
setosa, 1085
sidaefolia, 1091
sinuata, 1083
speciosa, 1085
stolonifera, 1085
tenuissima, 1085
texana, 1087
tiliacea, 1086
trichocarpa, 1086
trifida, 1086
trifida Torreyana, 1086
triloba, 1086
umbellata, 1086
Iresine, 477, 478
Ironweeds, 1312
Iris, 331
acleantha, 338
alabamensis, 354
albilineata, 349
Albispiritus, 351
amnicola, 348
atrocyanea, 341
atroenantha, 348
auralata, 349
aurilinea, 353
bifurcata, 345
brevipes, 355
callilopha, 350
callirhodea, 347
carolina, 356
caroliniana, 356
cerasioides, 343
chlorolopha, 338
chrysaeola, 350
chrysolopha, 350
chrysophoenicia, 350
citricristata, 353
citriviola, 345
cristata, 331
crocinubia, 341
cuprea, 337
cyanantha, 344
cyanochrysea, 348
De Winkeleri, 347
ecristata, 337
elephantina, 352
fluviatilis, 353
foliosa, 355
fourchiana, 344
fulva, 337
fulvaurea, 340
fumiflora, 340
fumifulva, 340
fuscaurea, 340
fuscirosea, 342
fuscisanguinea, 349
fuscivenosa, 341
gentilliana, 345
georgiana, 356
giganticaerulea, 352
hexagona, 354
ianthina, 339
iochroma, 348
iocyanea, 344
iodantha, 345
ioleuca, 344
iophaea, 338
Kimballiae, 351
lancipetala, 346
lilacinaurea, 343
ludoviciana, 339
Marplei, 346
mississippiensis, 355
miraculosa, 341
moricolor, 340
oenantha, 344
oolopha, 350
pallidirosea, 347
paludicola, 352
parvicaerulea, 354
parvirosea, 346
phoenicis, 349
prismatica, 355
Pseudacorus, 357
pseudocristata, 346
purpurissata, 340
pyrrholopha, 339
regalis, 343
regifulva, 338
rhodantha, 346
rhodochrysea, 347
rivularis, 354
rosiflora, 338
rosilutea, 342
rosipurpurea, 343
rubea, 338
rubicunda, 342
rubrolilacina, 345
salmonicolor, 339
savannarum, 351
schizolopha, 351
Shrevei, 356
subfulva, 337
Thomasii, 348
tripetala, 356
tyriana, 342
venulosa, 352
verna, 330
versicolor, 356
vinicolor, 342
violilutea, 350
violipurpurea, 342
violivenosa, 339
virginica, 356
virginica, 355
viridis, 345
viridivinea, 341
Wherryana, 353
IRIS FAMILY, 325
Irises, 331
Irisettes, 327
Iron-oak, 424, 430
Ironwood, 416, 813, 829, 936, 1034
Ironwoods, 811
Isanthes, 1149
Isnardia, 940, 941
Isolepis, 159
Isopappus, 1343
Isopyrum, 512
Isotria, 375, 500
ITACEAE, 600
Itadori, 460
Italian-clematis, 526
Italian-clover, 685
Italian-jessamine, 1044
Italian rye-grass, 136
Itea, 600
Iva, 1297, 1298, 1299

Jack-in-the-pulpit, 246
Jacksonbrier, 313
Jacquemontia, 1089, *1089*
Jacquinia, 1028
Jagged-chickweed, 500
Jamaica caper-tree, 577
Jamaica-dogwood, 712
Jamaica-sorrel, 857
Jamestown-weed, 1119
Japanese barnyard-millet, 83
Japanese-cherry, 920
Japanese-clover, 738
Japanese-honeysuckle, 1274
Japanese-knotweed, 460
Japanese-rose, 625, 627
Japanese varnish-tree, 864
Japanese-wisteria, 699
Jasminum, 1043, 1044
Jasper-green, 584
Jatropha, 791, *791*
Jeffersonia, 544
Jersey-pine, 6
Jerusalem-artichoke, 1440
Jerusalem-cherries, 1107
Jerusalem-cherry, 1115
Jerusalem-corn, 47
Jerusalem-huckleberry, 1010
Jerusalem-oak, 466
Jerusalem-thorn, 666
Jessamine,
Arabian, 1044
Catalonia, 1044
Italian, 1044
Nassau, 1044
Royal, 1044
Spanish, 1044
Yellow, 1045

Jew-bush, 804
Jewel-weed, 753
JEWEL-WEED FAMILY, 753
Jew's-mallow, 841
Jimson-weed, 1119
Job's-tears, 38
Joe Pye-weed, 1327
Joe-wood, 1028
JOE-WOOD FAMILY, 1028
Johnny-jump-up, 886
Johnson-grass, 47
Joint-grass, 57
Jointweeds, 449, 450
Jove's-fruit, 924
Judas-tree, 659
JUGLANDACEAE, 403
JUGLANDALES, 403
Juglans, 403
Jujube-tree, 831
Julibrissin, 653
Jump-seed, 454
JUNCACEAE, 281
Juncoides, 286, 287
Juncus, 281
abortivus, 285
acuminatus, 286
acuminatus debilis, *286*
aristulatus, 285
brachycarpus, 285
bufonius, 283
canadensis, 286
debilis, 286
dichotomus, 284
diffusissimus, 286
Dudleyi, 284
effusus, 283
Elliottii, 286
filipendulus, 284
georgianus, 284
Gerardi, 284
gymnocarpus, 283
interior, 284
marginatus, 285
megacephalus, 285
polycephalus, 285
repens, 284
robustus, 286
Roemerianus, 283
scirpoides, 285
secundus, 284
setaceus, 284
tenuis, 284
Torreyi, 285
trifidus, 284
trigonocarpus, 286
validus, 285
June-bean, 727
Juneberries, 636
June-grass, 130
June-grasses, 110
Jungle-rice, 83
Juniper, 1010
JUNIPERACEAE, 8
JUNIPER FAMILY, 8
Junipers, 10
Juniperus, 8, 10, 11
Jussiaea, 944, 945
Justicia, 1231
Jutes, 841

Kalanchoe, 588
Kallstroemia, 755
Kalmia, 999, 1000
Kalmiella, 1000
Kaoliang, 47
Karri-tree, 1186
Kentucky blue-grass, 130
Kentucky coffee-tree, 665
Kentucky-wisteria, 699
Kerria, 625
Key-grass, 119
Kickxia, 1208, 1209
Kidney-bean, 724
Kidney-leaf buttercup, 521
King-cup, 511
King-nut, 406
Kinnikinnik, 958
Kirtle-pink, 368
Kitten-breeches, 550
Knawel, 470
KNAWEL FAMILY, 470
Kneiffia, 948
arenicola, 949
brevistipata, 949
fruticosa, 949
fruticosa, *950*
glauca, 950
hybrida, 950
latifolia, 950
linearis, *949*
linifolia, *959*
longipedicellata, *949*
perennis, 950
pratensis, 949
pumila, *950*
riparia, 949
semiglandulosa, 949
subglobosa, 949
tetragona, 950
Knight's-spur, 515
Knot-leaved rush, 286
Knotted-spikerush, 161
Knotweeds, 452
Koeleria, 110
Koellia, 1171
albescens, 1173
aristata, 1173
Beadlei, 1174
clinopodioides, 1173
curvipes, 1174
dubia, 1174
flexuosa, 1172
Hugeri, 1173
hyssopifolia, 1173
incana, 1174
leptodon, 1173
montana, 1173
multiflora, 1174
mutica, 1173
nuda, 1172
pauciflora, 1174
pilosa, 1173
pycnanthemoides, 1174
verticillata, 1173
virginica, 1172
Koniga, 565
Korycarpus, *127*
Kosteletzkya, 859, 860
Krameria, 688
KRAMERIACEAE, 668
Kraunhia, 699
Krigia, 1489
Krugiodendron, 830
Krug's-holly, 814
Kudzu-vine, 720
Kuhnia, 1329
Kuhnistera, 696, 697
Kyllinga, 154, 155

Lace-grass, 125
Lachnanthes, 358
Lachnocaulon, 255, 256, 257
Laciniaria, 1331
aspera, 1334
Boykinii, 1333
carinata, *1333*
Chapmanii, 1333
chlorolepis, 1333
Deamii, *1333*
elegans, 1332
flabellata, 1332
Garberi, 1333
Garberi, *1333*
gracilis, 1334
gracilis, *1334*
graminifolia, 1334
Helleri, 1334
laxa, 1334
macilenta, *1333*
microcephala, 1334
Nashii, *1333*
Ohlingeri, *1336*
pauciflora, 1333
pilosa, 1334
polyphylla, *1334*
pycnostachya, 1333
regimontis, 1333
Ruthii, 1335
scariosa, 1335
secunda, 1333
Shortii, 1335
Smallii, 1334
spicata, 1334
squarrosa, 1332
squarrulosa, *1335*
tenuifolia, 1333
Tracyi, 1335
vittata, *1334*
Lactuca, 1497, 1498
Ladies'-slippers, 367
Ladies'-streamer, 930
Ladies'-tresses, 380
Lady-lupine, 681
Lady-rue, 524
Lady's-comb, 968
Lady's-ettercap, 375
Lady's-leek, 288
Lady's-sorrel, 748
Lady's-thumb, 456
Lady's-tobaccos, 1401
Lagenaria, *1286*
Lagerstroemia, 930
Laguncularia, 934
Lake-cress, 558
Lambkill, 1000
Lamb's-lettuces, 1277
Lamb's-quarters, 465
LAMIACEAE, 1145
Lamium, 1157, 1158
Lanceleaf-violet, 891
Lancewood, 922
Land-cress, 562
Languas, 360
Lantana, 1141, 1142
Lapithea, 1051, *1051*
Lappula, 1122, 1123
Large-buckeye, 822
Large-cane, 139
Large-gallberry, 814
Lark-heel, 515
Larkspur, 514
Large-toothed aspen, 411
Lash-horn, 8
Lasiacis, 81
Lasiococcus, 1008, 1009
Late-blackberry, 621
Lathyrus, 741, 742
Lattice-leaves, 384
LAURACEAE, 920
Laurel, 535
LAUREL FAMILY, 980
Laurels, 999
Laurel,

Mountain, 999
Sheep, 1000
Wild, 1035
Laurel-oak, 428
Laurel-tree, 922
Laurocerasus, 651, *651*
Lavauxia, 951
Lead-plants, 688
Lead-tree, 655
LEADWORT FAMILY, 1020
Leadworts, 1022
Leaf-cups, 1407
Leafless-vanilla, 374
Leafy-vanilla, 374
Leatherbark, 919
Leather-flowers, 526
Leather-leaf, 1000
Leatherwood, 812, 919
Leavenworthia, 569, 570, *570*
Lebbek, 653
Lechea, 881
cernua, 883
Deckertii, 884
divaricata, 883
exserta, 883
Leggettii, 883
maritima, 883
minor, 882
myriophylla, 884
patula, 882
prismatica, 882
racemulosa, 883
tenuifolia, 882
Torreyii, 883
villosa, 882
Lecticula, 1235
Leersia, 89, 90, *90*
Leiphaimos, 1056
Leiophyllum, 993
Leitneria, 407, 408
LEITNERIACEAE, 407
LEITNERIALES, 407
Lemna, 249, 250, *250*
LEMNACEAE, 248
Lemon, 761
Lemon-balm, 1166
Lemon-vine, 898
Lentil-tare, 740
Leonotis, 1159
Leontodon, 1496, *1496*
Leonurus, 1158, 1159
Leopard-lily, 291
Leopard-oak, 429
Leopard's-bane, 1474
Lepadena, 797
Lepanthes, 399, 1500
Lepidium, 554, 555
Leptamnium, 1239
Leptandra, 1209
Leptilon, 1396, 1397
Leptochloa, 118, 119, *119*
Leptoglottis, 656, 657
Leptoloma, 52
Leptorchis, 386
Lepuropebalon, 591
Lespedeza, 737
angustifolia, 739
bicolor, 739
capitata, 739
frutescens, 738
hirta, 739
longifolia, 739
neglecta, 739
Nuttalli, 738
procumbens, 738
repens, 738
simulata, 738
striata, 737
Stuvii, 738
texana, 738
violacea, 738
virginica, 739
Lesquerella, 555, 556
Lesser-spearwort, 521
Lettuce,
Prickly, 1497
Wild, 1498
Lettuces, 1497, 1498
Lettuce-saxifrage, 596
Leucaena, 655
Leucanthemum, 1469, 1470
LEUCOJACEAE, 315
Leucopterum, 713
Leucospora, 1196, 1197
Leucothoe, 1001, *1001*, 1002
Leverwood, 416
Liatris, 1333
Licorice-vine, 743
Life-plant, 589
Lignum-vitae, 755
Ligusticum, 972
Ligustrum, 1042
Lilac, 1038
Lilaeopsis, 972, 973
LILIACEAE, 290
LILIALES, 273
Lilians, 292
Lilies, 291, 362
Lilium, 290, 291
LILY FAMILY, 290
Lily-leaf sedge, 236
Lily-of-the-valley, 301
LILY-OF-THE-VALLEY FAMILY, 294
Lily-royal, 291
Lillette, 292
Lima-bean, 724
Lime, 761
Lime-berry, 760
LIMNANTHACEAE, 753
Limnanthemum, *1056*, *1057*
Limnobium, 29
Limnodea, 104
Limodorum, 376, 377, *377*
Limonium, 1021, *1021*
LINACEAE, 749
Linaria, 1207, 1208, *1208*
LINDEN FAMILY, 840
Lindens, 842
Lindera, *924*
Linn, 750
Linum, 750, *752*
Lion's-ears, 1159
Lion's-foot, 1490, 1492
Liparis, 386, 387
Lipocarpha, 140
Lippia lanceolata, *1140*
Liquidambar, 601
Liriodendron, 536
Listera, *378*
Lithococca, 1133
Lithophila, *478*
Lithospermum, 1125, *1126*
Litrisa, 1330
Little-blue-stem, 44
Little-shag-bark, 406
Little-staggerweed, 550
Live-leaf, 589
Live-oak, 426, 427
Liver-leaf, 516
LIZARD'S-TAIL FAMILY, 399
Lizard's-tail, 400
LOASACEAE, 897
LOASA FAMILY, 897
Lobelia, 1291
amoena, 1293
Boykinii, 1295
bracteata, 1294
brevifolia, 1293
Canbyi, 1295
cardinalis, 1292
Cliffortiana, 1295, *1295*
elongata, 1293
Feayana, 1295
flaccidifolia, 1294
floridana, 1294
Gattingeri, 1294
glandulifera, 1293
glandulosa, 1294
homophylla, 1295
inflata, 1295
leptostachys, 1295
Nuttallii, 1295
paludosa, 1294
puberula, 1293
siphilitica, 1293
spicata, 1294
xalapensis, *1295*
LOBELIACEAE, 1291
LOBELIA FAMILY, 1291
Loblolly-bay, 877
Loblolly-magnolia, 535
Loblolly-pine, 5
Locusts, 699
Locust-berry, 756
Locust-tree, 700
LOGANIA FAMILY, 1044
Lolium, 135, 136, *136*
Lombardy-poplar, 411
Lonicera, *1274*, 1275, 1276
Long-leaf pine, 4
Long-moss, 268
Long-pod poppy, 548
Long-root, 499
Long-spur orchids, 371
Long-spurred violet, 893
Long-straw pine, 4
LOOSESTRIFE FAMILY, 928
Loosestrife,
Whorled, 1024
Winged, 930
Loosestrifes, 930, 1023, 1024
Lophanthus, *1153*
Lophila, 358
Lophotocarpus, 22
Lopseed, 1145
LOPSEED FAMILY, 1145
LORANTHACEAE, 1247
Lost camellia, 876
Lotus, 686, 687
Lotus, 540
LOTUS FAMILY, 539
Louseworts, 1224
Lovage, 972
Love-apple, 1116
Love-grasses, 122
Love-vine, 925
Love-vines, 1092
Low-bindweed, 1090
Low hop-clover, 686
Low-Juneberry, 636
Low-mallow, 851
Low-maple, 823
Low-rose, 630
Low spear-grass, 130
Lucerne, 382
Luck-bean, 665
Lucuma, 1032
Ludwigia, 941
alata, 943
alternifolia, 942
capitata, *943*

Curtissii, 943
glandulosa, 943
hirtella, 942
lanceolata, 943
linearis, 944
linifolia, 943
maritima, 942
microcarpa, 942
pilosa, 943
polycarpa, 943
Simpsonii, 943
simulata, 943
spathulifolia, 943
sphaerocarpa, 943
suffruticosa, 943
virgata, 942
Ludwigiantha, 941
Luffa, 1285
Lungwort, 1123
Lupines, 680
Lupinus, 680, 681
Luziola, 91, *91*
Lychnis, 508
Lycium, 1117, 1118
Lycopersicon, 1116
Lycopsis, 1127
Lycopus, 1175, 1176, *1176*
Lygodesmia, 1490
Lyme-grasses, 137
Lyonia-vine, 537
Lyonia, 1074
Lyre-leaved sage, 1163
Lysias, 368
Lysiloma, 653, *653*
Lysimachia, 1023, 1024
LYTHRACEAE, 928
Lythrum, 930, 931, *931*

Macartney-rose, 628
Macbridea, 1155
Maclura, 438
Macradenia, 395
Macranthera, 1212, *1212*
Macuillamia, 1187
MADDER FAMILY, 1251
Mad-dog skullcap, 1150
Madeira-redwood, 765
Madeira-vine, 470
MADEIRA-VINE FAMILY, 469
MAGNOLIA FAMILY, 533
MAGNOLIACEAE, 533
Magnolia, 535
acuminata, 534
Ashei, 536, 876
cordata, 534
foetida, 535
Fraseri, 536
glauca, 535
grandiflora, 535
macrophylla, 536
pyramidata, 536
tripetala, 536
Umbrella, 536
virginiana, 535
Magueys, 319
Mahoe, 859
Mahogany, 765
Mahogany-birch, 418
MAHOGANY FAMILY, 764
Maiden-bush, 777
Maiden-cane, 81
Maid-Marian, 925
Maid-of-the-mist, 524
Maize, 38
Malaceae, 632
Malache, 853, 854
Malachodendron, 876
Malachra, 852
Malapoena, 923
Malaxis, 386, *386*
Mallotonia, 1130
MALLOW FAMILY, 846
Mallows, 851
MALPIGHIA FAMILY, 755
MALPIGHIACEAE, 755
Malus, 633, *633*, 634
Malva, 851
MALVACEAE, 846
MALVALES, 840
Malvastrum, 848, 849, *849*
Malvaviscus, 854
Manatee-grass, 18
MANATEE-GRASS FAMILY, 18
Manchineel, 790
Mandrake, 544
Manfreda, 318
Mangifera, 808
Mango, 808
Mangrove, 939
Black, 1145
Red, 939
White, 934
MANGROVE FAMILY, 938
Manihot, 791
Manisuris, 41, *41*
Manna-grasses, 131
Man-of-the-earth, 1086
Many-flowered spearwort, 521
MAPLE FAMILY, 823
Maples, 823, 824, 825
Mappia, 1175
Maranta, 361
MARANTACEAE, 361
Marbled-alumroot, 593
Mariana, 1484
Marigolds, 1464
Marilaunidium, 1098
Marine-ivy, 839
Mariscus, 186, 187
Marlberry, 1029
Marrubium, 1153
Marshallia, 1455
angustifolia, 1456
angustifolia cyananthera, 1456
graminifolia, 1456
grandiflora, 1457
laciniarioides, 1456
Mohrii, 1457
obovata, 1457
obovata platyphylla, 1457
ramosa, 1457
trinervia, 1456
Williamsonii, 1456
Marsh-bellflower, 1289
Marsh-clematis, 527
Marsh-cress, 557
Marsh-cresses, 557
Marsh-elder, 1298
Marsh-fleabanes, 1398
Marsh-grasses, 113
Marsh-mallow, 856
Marsh-marigold, 511
Marsh-parsley, 976
Marsh-pennyworts, 970
Marsh-pine, 5
Marsh-purslanes, 940
Marsh-rosemarys, 1021
Marsh St. John's-worts, 875
Marsh spike-grass, 128
Martiusia, 722
Martynia, 1244
MARTYNIACEAE, 1243
Maruta, 1468
Marvel-of-peru, 487
Mastic, 1032
Mat-buttercup, 522
Matricaria, 1469
Matrimony-vine, 1118
Matrimony-vines, 1117
Mat-rush, 170
Maxillaria, 1500
Mayaca, 251
MAYACACEAE, 250
May-apple, 544
MAY-APPLE FAMILY, 543
May-cherries, 635
Mayflower, 1005
May-haw, 641
May-pop, 896
Maytenus, 818, 819
Mayweed, 1468
Mazzard, 650
Meadow-barley, 137
Meadow-beauties, 925
Meadow-beauty, 927
MEADOW-BEAUTY FAMILY, 925
Meadow-buttercup, 522
Meadow-foxtail, 100
Meadow-gold, 522
Meadow-grasses, 122, 131
Meadow-hyacinth, 292
Meadow-leek, 289
Meadow-parsnips, 980, 981
Meadow-phlox, 1105
Meadow-queen, 608
Meadow-rues, 523
Meadow-spirea, 608
Meadow-stars, 610
Meadow-sundrops, 949
Meadow-sweet, 608
Meadow-sweets, 610
Meadow-violet, 889
Mecardonia, 1189, 1190
Medeola, 305
Medias, 1027
Medicago, 682, *682*
Meehania, 1154
Meg-many-feet, 522
Meibomia, 731
acuminata, 732
arenicola, 733
arenicola polymorpha, 733
bracteosa, 734
cana, 735
canadensis, 735
canescens, 733
Chapmanii, 734
ciliaris, 735
Dillenii, 734
glabella, 733
grandiflora, 734
laevigata, 735
longifolia, 734
marylandica, 735
Michauxii, 733
nudiflora, 732
ochroleuca, 733
paniculata, 734
paniculata Chapmanii, 734
pauciflora, 732
polymorpha, 733
pubens, 734
purpurea, 735
rhombifolia, 734
rigida, 735
sessilifolia, 733
stricta, 733
supina, 735

tenuifolia, 733
triflora, 736
viridiflora, 735
Melaleuca, 938
Melampyrum, 1225, *1225*
Melanthera, 1419, 1420, *1420*
MELANTHRACEAE, 273
Melanthium, 280
MELASTOMACEAE, 925
Melia, 764, 765
MELIACEAE, 764
Melic-grasses, 126
Melica, 126
Melilots, 683
Melilotus, 683
Melissa, 1166
Melochia, 862, *862*
Melon, 1286
Melonettes, 1284
Melon-tree, 895
Melothria, 1284
MENISPERMACEAE, 537
Menispermum, 538
Mentha, 1177, 1178, *1178*
Mentzelia, 897
MENYANTHACEAE, 1056
Menziesia, 999
Mercurialis, 785
Mermaid-weed, 954
Mermaid-weeds, 954
Merry-hearts, 279
Mertensia, 1123
Mesadenia, 1475, 1476, *1476*
Mesadenus, 383
Mesosphaerum, 1180
Mesquite-grasses, 116
Metastelma, 1075
Metopium, 808
Mexican-poppy, 548
Mexican-tea, 466
MEZEREON FAMILY, 919
Micheliella, 1178
Micrampelis, 1288
Micranthemum, 1196
Micranthes, 595, 596
Micromeria, 1168
Micropiper, 400
Micropteryx, 716
Micropyxis, 1026
Microstylis, 386
Midas'-ears, 245
Midics, 382
Mikania, 1328
Mild water-pepper, 457
Milfoils, 1466
Milk-peas, 718
Milk-purslane, 797
Milk-thistle, 1484
Milk-tree, 789
Milkweed, Common, 1070
Poke, 1070
Purple, 1070
Swamp, 1070
MILKWEED FAMILY, 1064
Milkweeds, 1067
MILKWORT FAMILY, 765
Miller's-maid, 316
Milo, 47
MIMOSA FAMILY, 652
MIMOSACEAE, 652
Mimosa, 657
Mimulus, 1197, 1198
Mimusops, 1035, *1035*
Minnie-bush, 999
Minnow-fole, 250
Mint,
Dog, 1169
Morse, 1164
Spear, 1178
Stone, 1175
Water, 1178
MINT FAMILY, 1145
Mints, 1177
Mirabilis, 487
Misanteca, 923, 924
Miscanthus, 39
Missouri-gooseberry, 603
Mist-flower, 1328
Mistletoe-cactus, 913
MISTLETOE FAMILY, 1247
Mistletoes, 1248
Mitchella, 1261
Mitella, 591
Miterworts, 1046
Mitreworts, 591
Moccasin-flowers, 367
Mock-apple, 1288
Mock bishops-weeds, 978
Mockernut, 406
Mock-orange, 438, 541, 598, 651, 1034
Mock-pennyroyal, 1165
Mock-strawberries, 612
Modiola, 848, *848*
Mohrodendron, 1036
Mole-plant, 801
Mollugo, 491
Moluchia, 862
Momisia, 443, *443*
Momordica, 1284, 1285
Monanthochloe, 119
Monarda, 1163, 1164
Monkey-apples, 865
Monkey-flowers, 1157, 1159
Monkshoods, 515
Monniera, 1187, 1189
MONOTROPACEAE, 987
Monotropa, 988
Monotropsis, 989
Moon-flowers, 1087
MOONSEED FAMILY, 537
Moonseed, 538
Moon-set, 369
Moon-vines, 1087
Moosewood, 824, 919, 1271
Mosiera, 936, 937
Moss-locust, 702
Mossy-cup oak, 425
Mossy-stonecrop, 587
Morella, 904
Morello-cherry, 650
MORINACEAE, 1278
Morinda, 1262
Moringa, 578
MORINGACEAE, 578
Morning-glories, 1083, 1084
Morning-glory, 1083
MORNING-GLORY FAMILY, 1080
Morning-honeysuckle, 952
Morongia, 656, 657
Morus, 437
Mosquito-plant, 1181
Moss-phlox, 1102
Motherworts, 1158
Moth-mullen, 1198
Mottled-spurge, 804
Moxie-plum, 1018
Mountain-alder, 419, 824
Mountain-anemone, 517
Mountain-ash, 632
Mountain-asphodel, 275, 287
Mountain-bugbane, 513
Mountain-camellia, 876
Mountain-cinquefoil, 613
Mountain-clematis, 528
Mountain-coconut, 1250
Mountain-cranberry, 1017
Mountain-currant, 602
Mountain-fetterbush, 1002
Mountain-fringe, 549
Mountain-gooseberry, 603
Mountain-holly, 815
Mountain-honeysuckle, 1275
Mountain-hydrangea, 597
Mountain-indigo, 689, 690
Mountain-juniper, 11
Mountain-laurel, 999
Mountain lettuce, 596
Mountain-lover, 818
Mountain-magnolia, 534
Mountain-maple, 823
Mountain meadow-rue, 524
Mountain meadow-sweet, 608
Mountain-mints, 1171
Mountain-oread, 536
Mountain-phlox, 1104
Mountain-pine, 6
Mountain-pink, 1102
Mountain-ramp, 288
Mountain-rose, 460
Mountain rose-bay, 998
Mountain St. John's-wort, 873
Mountain-sandwort, 499
Mountain-saxifrage, 596
Mountain-stonecrop, 587
Mountain-stuartia, 876
Mountain-sumac, 810
Mountain thimble-weed, 517
Mountain water-cress, 568
Mountain-winterberry, 815
Mouse-ear, 501, 1161
Mouse-ear chickweeds, 500
Mouse-ear cress, 561
Mouse-tail, 518
Mucuna, 717, *717*
Mud-babies, 21
Mud-plantains, 266
Mud-purslane, 866
Mud-marys, 248
Mud-midgets, 249
Mugwort, 1473
Muhlenbergia, 98
caespitosa, 99
capillaris, 99
diffusa, 99
erecta, 99
expansa, 99
foliosa, 99
glomerata, 99
mexicana, 98
racemosa, 99
Reverchoni, 99
Schreberi, 99
sobolifera, 98
sylvatica, 99
tenuiflora, 98
trichopodes, 99
umbrosa, 99
Willdenovii, 98
MULBERRY FAMILY, 437
Mulefoot-lily, 541
Mulgedium, 1498
Mullen,
Foxglove, 1213
Great, 1199
Moth, 1198
White, 1199
Woolly, 1199

Mullens, 1198
Muricauda, 247
Musa, 359
MUSACEAE, 359
Muscadine, 838
Muscadinia, 838
Muscaria, 294
Muskmelon, 1286
Musk-rose, 627
Musquash-root, 975
Mustards, 562
MUSTARD FAMILY, 551
Myosotis, 1124
Myosurus, 518
Myrica, 408
MYRICACEAE, 408
MYRTICALES, 408
Myriophyllum, 954, 955
Myriopus, 1131
Myrsine, 1029
MYRSINE FAMILY, 1028
MYRTACEAE, 934
MYRTALES, 925
MYRTLE FAMILY, 934
Myrtle-of-the-River, 938
Myrtles, 1059
Myrtle-spurge, 801

Nabalus, 1490
albus, 1491
altissimus, 1491
asper, 1492
crepidineus, 1492
cylindricus, 1492
integrifolius, 1491
roanensis, 1491
serpentarius, 1492
trifoliatus, 1492
virgatus, 1492
NAIADACEAE, 19
NAIADALES, 14
NAIAD FAMILY, 19
Naias, 19, 20, *20*
Nailwort, 479
Nailworts, 479
Nakedwood, 834
Nakedwoods, 936
Nama, 1098, *1098*, 1099
Nannyberry, 1272
Nap-at-noon, 293
Narrow-dock, 447
Narrowleaf-sundew, 579
NARTHECIACEAE, 287
Nash's-viburnum, 1272
Nassau-jessamine, 1044
Nasturtium, 752
Nasturtium, 557
NASTURTIUM FAMILY, 752
Natal-grass, 84
Navelworts, 970
Nazia, 48
Necklace-pod, 673
Necklace-poplar, 412
Necklace-weeds, 513
Neckweed, 1211
Nectandra, 922
Needle-grasses, 94
Needle-palm, 243
Negundo, 826
Nelumbo, 539
NELUMBONACEAE, 539
Nemastylis, 326, *327*
Nemexia, 309, 310, 311, *311*
Nemophila, 1096
Neobeckia, 558
Neocleome, 577
Neopieris, 1004
Nepeta, 1154, *1154*
Neptunia, 657, 658
Nerium, 1060
Nestronia, 1249
NETTLE FAMILY, 431
Nettle-leaved goosefoot, 464
Nettle-patch, 432
Nettles, 432
Nettle-trees, 442
Neubeckia, 330, 331
Never-wet, 245
Neviusia, 625
New-Jersey tea, 833
New-Zealand spinach, 493
Neyraudia, 120
Nicandra, 1106
Nickers, 667
Nicotiana, 1119, 1120
Nigger-coffee, 661
Nigger-coffees, 661
Nigger-head, 1428
Nigger-teats, 1427
Night-blooming cereus, 914
Night-blooming jessamine, 1118
Nightcaps, 517
Night-flowering catchfly, 507
Nightshades, 1112
Nimble-kate, 1288
Nimble-will, 99
Nimble-wills, 458
Ninebarks, 606
Nintooa, 1274
Nodding-caps, 378
Nodding-ettercap, 378
Nodding-mandarin, 299
Nodding-nixie, 363
Nolina, 304
Nondo, 972
None-such, 382
Norta, 559, 560
Northern-bayberry, 409
Northern-hemlock, 7
Northern prickly-ash, 758
No-sting, 433
Notholcus, 107
Nothoscordum, 289, 290
Nuphar, 541
Nut-grass, 149
Nutmeg-hickory, 405
Nut-rushes, 188
Nyachia, 481
Nyctelea, 1096
NYMPHAEACEAE, 540
Nympheae, 540
advena, 541
bombycina, 542
chartaceae, 541
flava, 543
fluviatilis, 541
macrophylla, 542
odorata, 543
orbiculata, 542
sagittifolia, 541
ulvaceae, 541
Nymphoides, 1056, 1057
Nyssa, 956, 957
NYSSACEAE, 956

Oakesiella, 299, 300, 1500
Oak-leaf hydrangea, 597
Oaks, 421
Oat, 111
Obedient-plants, 1156
Obione, 468, *468*
Obolaria, 1055, 1056
Oceanoros, 278
Ocimum, 1181
Oconee-bells, 1019
Ocotea, 922
October-flower, 449
Odontonychia, 482, 483
Odontostephana, 1076, 1077
Odorless wax-myrtle, 409
Oenothera, 946, *948*, *949*, *950*
Ogeche-lime, 957
Ogeechee-plum, 957
Ohio-buckeye, 823
Oil-nut, 403, 1250
Oil-seed, 556
Okeechobee-gourd, 1287
Okenia, 487
Okra, 858
OLACACEAE, 1250
Oldenlandia, 1253
Old-field clover, 685
Oldfield pine, 5
Old-hook, 489
Old-maid, 1060
Old-man's-beard, 597
Old-man's-beards, 525, 1041
OLEACEAE, 1037
OLEALES, 1037
Oleander, 1060
OLEASTER FAMILY, 919
Oligoneuron, 1360, 1361
Olive,
Black, 933
Wild, 1032, 1041
OLIVE FAMILY, 1037
Olyra, 88
Onagra, 946
Oncidium, 396, 397, *397*
One-berry, 442
One-flower coltsfoot, 1019
ONION FAMILY, 288
Onions, 288
Onopordum, 1483
Onosmodium, 1126, 1127, *1127*
Operculina, 1082, 1083
Ophrys, 378
Opium-poppy, 548
Oplismenus, 82
Opopanax, 654
Opossum-wood, 1036
Opulaster, 606, 607
Opuntia, 899
abjecta, 902
ammophila, 907
atrocapensis, 905
austrina, 906
Bentonii, 909
brasiliensis, 912
cantabrigiensis, 910
cumulicola, 907
Dillenii, 908
Drummondii, 902
eburnispina, 903
Ficus-Indica, 910
frustulenta, 903
impedita, 903
keyensis, 907
lata, 905
leucotricha, 910
Lindheimeri, 908
macrarthra, 904
magnifica, 910
nitens, 906
ochrocentra, 904
Opuntia, 904
Pes-Corvi, 903
pisciformis, 903
Pollardi, 905
polycarpa, 906

stricta, 909
tenuiflora, 908
Tracyi, 902
tunoidea, 909
turbinata, 910
turgida, 905
zebrina, 910
OPUNTIACEAE, 897
OPUNTIALES, 896
Orach, 467
Oraches, 467
Orange-bell lily, 291
Orange-cup lily, 291
Orange-grass, 874
Orange-plum, 370
Orange rein-orchid, 374
Orange root, 511
Orbexilum, 692, 693
Orchard-grass, 129
ORCHIDACEAE, 363
ORCHIDALES, 362
ORCHID FAMILY, 363
Orchis, 368
Oredoxa, 238
Origanum, 1170
Ormenis, 1467
Orobanche, 1238
OROBANCHACEAE, 1238
Orontium, 245
Ornithogalum, 293
ORPINE FAMILY, 585
Ortachne, 95
Orzya, 89
Osage-orange, 438
Osiers, 412
Osmanthus, 1043
Osmia, 1319, 1320
Osmorrhiza, 968
Ostrya, 416
Oswego-tea, 1164
Otaheite-gooseberry, 779
Otophylla, 1222
Overcup-oak, 425
OXALIDACEAE, 745
Oxalis, 746, *746*
Ox-eye daisy, 1470
Ox-eyes, 1417
Oxybaphus, 488
Oxycoccus, 1017, 1018
Oxydendrum, 1002
Oxypolis, 985, 986
Oxypteryx, 1072
Oxytria, 293
Oyster-plant, 262, 1488

Pachysandra, 806
Pachystima, 818
Padus, 650, *650*, 651, *651*
Paederia, 1261
Paepalanthus, 257
Pagoda-bells, 298
Pagoda-cornel, 958
Painted-cup, 1224
Painted-lady, 308
Painted-leaf, 803
Painted-trillium, 308
Paint-root, 358
Palafoxia, 1463
Pale-corydalis, 551
Pale-dock, 447
Pale-hickory, 407
Pale Indian-plantain, 1476
Pale meadow-beauty, 925
Pale-persicaria, 456
Pale-spikerush, 162
Pale touch-me-not, 753
Palma-Christi, 792
Palmettos, 239
Palmetto-with-a-stem, 240
PALM FAMILY, 236
Palm-polly, 398
Panax, 959
PANDANALES, 13
Panic-grasses, 60
Panicularia, 131
acutiflora, 131
americana, 132
elongata, 132
fluitans, 131
grandis, 132
melicaria, 132
nervata, 132
obtusa, 131
pallida, 132
septentrionalis, 131
striata, 132
Panicum, 60
aciculare, 73
aculeatum, 79
Addisonii, 77
adspersum, 69
agrostoides, 71
albemarlense, 76
albomarginatum, 77
amaroides, 70
amarulum, 70
amarum, 70
amarum, 70
anceps, 71
angustifolium, 72
annulum, 73
arenicola, 73
arenicoloides, 73
Ashei, 80
atlanticum, 76
auburne, 75
autumnale, 52
Baldwinii, 78
barbinode, 68
barbulatum, 74
barbulatum, 73
bartowense, 69
Bergii, 70
Bicknellii, 73
Boscii, 80
breve, 78
caerulescens, 74
capillare, 69
chamaelonche, 78
Chapmani, 68
chrysopsidifolium, 72
ciliatum, 72
ciliiferum, 76
ciliosum, 75
clandestinum, 80
Clutei, 74
cognatum, 52
colonum, 83
columbianum, 77
Combsii, 71
Commonsianum, 77
commutatum, 80
concinium, 78
condensum, 71
consanguineum, 72
Crus-galli, 83
cryptanthum, 80
curtifolium, 77
curtivaginum, 74
Cuthbertii, 78
depauperatum, 71
dichotomum, 74
dictotomiflorum, 69
digitarioides, 81
divaricatum, 81
Earlei, 77
ensifolium, 78
epilifolium, 80
equilaterale, 80
erectifolium, 77
fasciculatum, 69
filiculme, 76
filiforme, 52
flavovirens, 78
flexile, 69
fuscum, 69
fusiforme, 72
Gattingeri, 70
geminatum, 68
gibbum, 82
glabrifolium, 78
glabrissimum, 78
glabrum, 51
Gouini, 70
gracilicaule, 78
gymnocarpon, 81
halophilum, 70
hemitomon, 81
hians, 71
Huachucae, 76
Joorii, 80
lancearium, 79
lanuginosum, 75, *76*
latifolium, 80, *81*
laxiflorum, 72, *72*
leucophaeum, 50
Lindheimeri, 75
linearifolium, 72
longifolium, 71
longiligulatum, 75
lucidum, 74
macrocarpon, 80
malacon, 76
malacophyllum, 79
manatense, 80
mattamuskeetense, 74
maximum, 70
meridionale, 76
microcarpon, 73
miliaceum, 69
molle, 68
mutabile, 80
Nashianum, 79
nemopanthum, 73
neuranthum, 73
nitidum, 73, *75*
nudicaule, 73
octonodum, 75
oligosanthes, 79
ovale, 76, *80*
ovium, 73
paludivagum, 68
parvispiculum, 75
paspaloides, 68
patentifolium, 78
patulum, 79
paucipilum, 75
philadelphicum, 70
polyanthes, 77
polycaulon, 72
portoricense, 78
proliferum, 69
prostratum, 69
pseudanceps, 71
pseudopubescens, 76
pubescens, 79
pyriforme, 72
Ravenelii, 79
repens, 70
reptans, 69
rhizomatum, 71
roanokense, 74
rostratum, 71
sanguinale, 51

scabriusculum, 79
scoparium, 79
Scribnerianum, 79
serotinum, 51
sphaerocarpon, 77
sphagnicola, 74
spretum, 75
stenodes, 70
stipitatum, 71
strictifolium, 77
strigosum, 72
tenerum, 70
tennesseense, 75
tenue, 77
texanum, 69
Thurowii, 75
trifolium, 78
tsugetorum, 77
unciphyllum, 76
vernale, 78
verrucosum, 71
villosissimum, 76
virgatum, 70
virgatum breviramosum, 70
Webberianum, 78
wilmingtonense, 76
Wrightianum, 75
xalapense, 72
xanthospermum, 76
yadkinense, 74
Pansy-violet, 886
Papaver, 547, 548
PAPAVERACEAE, 546
PAPAVERALES, 546
Papaw, 895
Papaya, 895
PAPAYACEAE, 894
PAPAYA FAMILY, 894
Paper-mulberry, 438
Pappoose-root, 545
Papyrius, 438
Paradise-tree, 762
Pardelle, 327
Parietaria, 434
Pariti, 858, 859
Parkinsonia, 665, 666
Parnassia, 590
PARNASSIACEAE, 589
Paronychia, 479, 480
Parosela, 694, *694*
Parrot pitcher-plant, 581
Parrot's-feather, 955
Parsley, 982
  Marsh, 976
  Water, 976
Parsley-haw, 644
Parsley-leaved thorn, 644
Parsley-piert, 614
Parsnip, Golden, 981
Parson-in-the-pillory, 245
Parson-in-the-pulpit, 247
Parsonsia, 931, 932
Parthenium, 1416
Parthenocissus, 840
Partridge-berry, 1261
Partridge-pea, 663
Partridge-peas, 662
Pascalia, 1429, 1430
Paspalum, 54
  altissimum, 59
  amplum, 59
  angustifolium, 59
  australe, 59
  bifidum, 59
  blepharophyllum, 58
  Blodgettii, 57
  Boscianum, 60
  caespitosum, 58
  Chapmanii, 58
  ciliatifolium, 58
  circulare, 59
  conjugatum, 57
  Curtisianum, 59
  dasyphyllum, 58
  debile, 58
  difforme, 59
  dilatatum, 60
  dissectum, 57
  distichum, 57
  Eggertii, 58
  elatum, 58
  epile, 58
  floridanum, 59
  fluitans, 57
  furcatum, 54
  geminum, 60
  giganteum, 59
  glaberrimum, 59
  gracillimum, 57
  Hallii, 60
  Kearneyi, 59
  kentuckyense, 58
  laeve, 59
  laeviglumis, 60
  Langei, 57
  latifolium, 58
  laxum, 58
  lentiferum, 59
  lividum, 59
  longepedunculatum, 58
  longicilium, 59
  longipilum, 59
  membranaceum, 57
  monostachyum, 58
  mucronatum, 57
  Muhlenbergii, 58
  platycaule, 54
  plenipilum, 59
  plicatulum, 60
  praecox, 59
  praelongum, 59
  propinquum, 58
  pubescens, 58
  pubiflorum, 60
  purpurascens, 60
  racemulosum, 59
  reimarioides, 57
  repens, 57
  rigidifolium, 58
  scrobiculatum, 60
  setaceum, 58
  solitarium, 58
  supinum, 58
  tardum, 59
  Urvillei, 60
  vaginatum, 57
  Vaseyanum, 60
  villosissimum, 58
  Walterianum, 57
Passiflora, 895, 896, *896*
PASSIFLORACEAE, 895
PASSIFLORALES, 894
Passion-flower, 895
PASSION-FLOWER FAMILY, 895
Passion-vines, 895
Pastinaca, 984
Pasture-gooseberry, 604
Pasture rose, 630
Pasture-thistle, 1482
Paulownia, 1186
Paurotis, 242
Pavonia, 853, *853*, 854
Pawpaw-apple, 529
Pawpaws, 529, 530, 532
Peach-leaved dock, 447
Peaches, 646
Peacock-flower, 666
PEA FAMILY, 669
Peanut, 729
Pear, 632
Pearl-harlequin, 550
Pearl-millet, 86
Pearl-twists, 380
Pearlwort, 497
Pearly-everlasting, 1402
Peat-weed, 929
Pea-vines, 739
Pecan, 405
Pectis, 1465, 1466, *1466*
PEDALIACEAE, 1242
Pedicellaria, 576
Pedicularis, 1224
Pedilanthus, 804
Pediomelum, 693, 694
Peiranisia, 661
Pelexia, 384
Pellitories, 434
Pellitory, 434
Peltandra, 245, 246, *246*
Pencil-cactus, 913
Pencil flowers, 729
Penicillaris, 86
Peniophyllum, 950
Pennisetum, 86
Pennyroyal, 1165, 1167
Pennywort, 1056
Pennyworts,
  Marsh, 970
  Water, 970
Penstemon, 1201
  alluviorum, 1203
  australis, 1204
  brevisepalus, 1204
  Brittonorum, 1204
  calycosus, 1204
  canescens, 1204
  Digitalis, 1203
  dissectus, 1203
  hirsutus, 1205
  lacrigatus, *1204*
  multiflorus, 1205
  pallidus, 1204
  pauciflorus, 1204
  Pentstemon, 1203
  pubescens, *1205*
  Smallii, 1204
  tenuiflorus, 1205
  tubiflorus, 1205
PENTHORACEAE, 589
Penthorum, 589
Pentodon, 1256
Pepo, 1286
Peperomia, 400, 401, 402
Peperomias, 400
Pepper-and-salt, 974
Pepperbushes, 987
Pepper-cresses, 554
PEPPER FAMILY, 400
Pepper grasses, 554
Pepperidge, 956
Peppermint, 1178
Pepper root, 567
Pepper vine, 839
Pepper-wood, 758
Pepperworts, 566
Peramium, 384, *384*
Perennial garden-phlox, 1105
Perennial rye-grass, 136
Pereskia, 898, *898*
Perilla, 1179
Periploca, 1065

Periwinkle, 1060
Periwinkles, 1059
Perizoma, 1116
Perpetual-begonia, 918
Persea, 921, *922*
Persicaria, 454
acre, *457*
Careyi, 456
densiflorum, *456*
emersa, *455*
hirsuta, 457
Hydropiper, 457
hydropiperoides, 457
incarnatum, *456*
lapathifolia, 456
longistyla, 456
mississippiensis, 456, *456*
Muhlenbergii, 455
Opelousana, 45
orientalis, 457
paludicola, 457
pennsylvanica, 456
Persicaria, 456
portoricensis, 455
punctata, 457
setacea, 457
Persimmons, 1030
Perularia, 371
Petalostemon, 695
albidus, 695
candidus, 696
carneus, 696
decumbens, *696*
Feayi, 696
foliosus, 696
Gattingeri, 696
gracilis, 695
purpureus, 696
roseum, *696*
Petiveria, 486
Petiveriaceae, 485
Petiveria Family, 485
Petty-spurge, 802
Petunia, 1120, 1121
Phaca, 710
Phacelia, 1097
Bicknellii, 1098
bipinnatifida, 1097
Boykinii, 1098
brevistyla, 1097
dubia, 1097
fimbriata, 1098
hirsuta, 1097
parviflora, *1097*
Purshii, 1098
Phaethusa, 1443
laciniata, 1443
occidentalis, 1443
virginica, 1443
Phalaris, 92, 93, *93*
Phanopyrum, 81
Pharbitis, 1083, 1084
Pharus, 92
Phaseolus, 723
adenanthus, 725
angularis, 724
diversifolius, *725*
helvolus, *725*
lunatus, 724
perennis, *724*
polystachyus, 724
pauciflorus, *725*
sinuatus, 723
smilacifolius, 724
vulgaris, 724
Pheasant-flowers, 723
Pheasant's-eye, 523
Phenianthus, 1274
Philadelphus, 598, 599
Philibertella, 1066
Philibertia, 1066
Philotria, 28, *28*
Philoxerus, 478
Phleum, 100
Phlox, 1101
amoena, 1103
amplifolia, 1105
bifida, 1103
carolina, 1104
divaricata, 1103
Drummondii, 1104
floridana, 1103
glaberrima, 1104
Hentzii, *1102*
maculata, 1105
nivalis, 1102
ovata, 1104
paniculata, 1105
pilosa, 1103
reptans, *1104*
stolonifera, 1104
subulata, 1102
Phlox,
Annual Garden, 1104
Blue, 1103
Broad-leaf, 1105
Creeping, 1104
Downy, 1103
Florida, 1103
Hairy, 1104
Meadow, 1105
Mountain, 1104
Perennial Garden, 1105
Sand, 1103
Smooth, 1105
Thick-leaf, 1104
Phlox Family, 1099
Phoebanthus, 1441, 1442
Phoenix, 238, 239
Phoradendron, 1247, 1248
Phragmites, 120, *120*
Phryma, *1135*, 1145
Phrymaceae, 1145
Phyla, 1139, 1140
Phyllanthus, 777, 778, *778*, 779
Physalis, 1107
ambigua, 1111
angulata, 1109
angustifolia, 1112
arenicola, 1110
barbadensis, 1109
Carpenteri, 1109
ciliosa, 1110
Elliottii, 1112
floridana, 1108
fuscomaculata, 1111
heterophylla, 1111
intermedia, 1110
Lagascae, *1109*
lanceolata, 1109
lanceolata, *1110*
missouriensis, 1109
mollis, 1111
monticola, 1110
nyctaginea, 1111
pruinosa, 1108
pubescens, 1108
rigida, 1110
sinuata, 1111
subglabrata, 1109
turbinata, 1109
virginiana, 1110
viscosa, 1111
Physalodes, 1106
Physocarpus, *606*
Physostegia, *1156*
Physurus, 385
Phytolacca, 484, 485, *485*
Phytolaccaceae, 483
Piaropus, 267, 268
Picea, 6, 7, 7
Pickerel-weed Family, 265
Pickerel-weeds, 266
Picramnia, 763
Pieris, 1002, *1082*
Pigeon-berries, 485
Pigeon-cherry, 649
Pigeon-grape, 837
Pigeon-grass, 84
Pigeon-grasses, 84
Pigeon-pea, 715
Pigeon-plum, 461
Pigeon-wings, 722
Pignut, 405, 407
Pig-potato, 986
Pigweed, 465, 473
Pigweeds, 464, 472
Pilea, 433, 434
Pilewort, 473, 1477
Pilostaxis, 773, 774
Pimpernel, 1026
False, 1026
Water, 1027
Pinaceae, 2, 3
Pinales, 2
Pin-cherry, 649
Pinckneya, 876, 1252
Pinders, 729
Pine-apple, 273
Pine Family, 3
Pineapple Family, 268
Pine-hyacinth, 528
Pineland-ginseng, 1418
Pine-lily, 291
Pine-needles, 745
Pines, 3
Pine-saps, 988
Pineweed, 874
Pinguicula, 1232, *1232*
Pinguiculaceae, 1231
Pink, 504
Carolina, 1046
Indian, 1046
Pink-allamanda, 1066
Pink corydalis, 551
Pink Family, 504
Pink fringe-orchid, 371
Pink lady-slipper, 367
Pink marsh-spurrey, 502
Pink meadow-spirea, 608
Pink-root, 1046
West Indian, 1046
Pink shell-azalea, 999
Pink-sundew, 579
Pink-vine, 460
Pinkweed, 456
Pin-oak, 426, 428, 429
Pinus, 3
australis, 3
australis, *4*, *5*
caribaea, 3
clausa, 4, 5
echinata, 4, 5
Elliottii, *5*
glabra, 4, 5
heterophylla, 4, 5
inops, *6*
mitis, *5*
palustris, 3
palustris, *4*
pungens, 4, 6
rigida, 4, 6

serotina, 4, 5
Strobus, 6
Taeda, 3, 5
virginiana, 4, 5
Pinweeds, 881
Pinxter-flower, 995
Piper, 400
PIPERACEAE, 400
PIPERALES, 399
Pipevine, 1282
Pipewort, 225
Pipeworts, 257
Pipsissewas, 990
Piriqueta, 877, 878
Piscidia, 712
Pisonia, 489, *490*
PISONIACEAE, 489
PISONIA FAMILY, 489
Pistia, 247
Pitcheria, 712
Pitcher-plant, 581
PITCHER-PLANT FAMILY, 580
Pitcher-plants, 580
Pitch-pine, 4, 6
Pithecolobium, 652
Pityopsis, 1340, 1341
Pityothamnus, 530, 531
Pixie-parasol, 544
PLANE-TREE FAMILY, 604
Plane-trees, 604
Planera, 441
PLANTAGINACEAE, 1244
PLANTAGINALES, 1244
Plantago, 1244, 1245, 1246, 1247
PLANTAIN FAMILY, 1244
Plantain-leaf sedge, 216
Plantains, 1244
PLATANACEAE, 604
Platanthera, 369, 370, 371
Platanus, 604
Platter-leaf, 461
Platypus, 395, *395*
Pleea, 275
Pleienta, 1051
Pleiotaenia, 983
Pleurisy-root, 1069
Pleuropterus, 459
Pleurothallis, 389, 399
Pluchea, 1398
adnata, 1340
bifrons, 1399
camphorata, 1399
foetida, 1399
foetida, 1399
imbricata, 1399
longifolia, 1399
odorata, 1399
petiolata, 1399
purpurascens, 1399
Quitoc, 1399
tenuifolia, 1399
PLUM FAMILY, 644
Plum-grape, 838
Plums, 647
Plumbago, 1021, 1022
Plume-grasses, 40
Plume-locusts, 688
Plume-of-Navarre, 369
Plume-royal, 370
Poa, 129
alsodes, 130
annua, 130
arachnifera, 130
autumnalis, 130
brachyphylla, 130
brevifolia, 130
Chapmaniana, 130
compressa, 130
cristata, 130
cuspidata, 130
flexuosa, 130
glabrescens, 130
pratensis, 130
sylvestris, 130
trivialis, 130
Wolfii, 131
POACEAE, 30
POALES, 29, 30
PODOPHYLLACEAE, 543
Podophyllum, 544
PODOSTEMACEAE, 584
Podostemon, 584
Podostigma, 1066
Pogonia, 375, *375, 376*
Poinciana, 666
Poinsettia, 802, 803, *803*
Poison-arum, 246
Poisonberry, 513
Poison-darnel, 136
Poison-dogwood, 809
Poison-elder, 809
Poison-hemlock, 974
Poison-ivy, 809
Poison-oak, 809
Poison-sumac, 809
Poisonwood, 808
Poke-milkweed, 1070
Pokes, 485
POKEWEED FAMILY, 483
Polanisia, *575,* 576
Pole-bean, 724
Polecat-geranium, 1142
Polecat-tree, 832
POLEMONIACEAE, 1099
POLEMONIALES, 1078
Polemonium, 1100
Polycarpon, 503
Polycodium, 1010, 1011, 1012, *1012*
Polygala, 767, 768
aboriginum, 770
ambigua, 772
arenicola, 774
Baldwinii, 774
Boykinii, 772
brevifolia, 771
Carteri, 774
Chapmanii, 770
corallicola, 776
cruciata, 771
cruciata ramosior, 771
cumulicola, 767
Curtissii, 770
cymosa, 774
flagellaris, 772
grandiflora, 776
grandiflora leiodes, 766
Harperi, 771
Hookeri, 771
Hugeri, 771
incarnata, 768
Krugii, 767
leptocaulis, 770
leptostachys, 772
Lewtonii, 770
lutea, 774
mariana, 771
miamiensis, 767
nana, 773
Nuttallii, 770
paludosa, 770
polygama, 769
praetervisa, 772
Pretzii, 772
paucifolia, 767
ramosa, 774
ramosior, 771
Reynoldsiae, 774
Rugelii, 774
sanguinea, 771
Senega, 769
setacea, 770
verticillata, 772
viridescens, 771
POLYGALALES, 765
POLYGALACEAE, 765
Polygalas, 766, 768, 773
POLYGONACEAE, 443
POLYGONALES, 443
Polygonatum, 300
Polygonella, 449, *449,* 450, *450*
Polygonum, 452, 453, *453*
Polymnia, 1406, 1407
Polymniastrum, 1406
Polyodon, 116
Polypogon, 103, *103*
Polypremum, 1047
Polypteris, 1462
Polyrrhiza, 398
Polystachya, 393, *393*
Polytaenia, 983
Pomegranate, 932
POMEGRANATE FAMILY, 932
Poncirus, 760
Pond-apple, 533
Pond-bush, 923
Pond-cypress, 9
Pond-lilies, 542
Pond-pine, 5
Pond-spice, 923
Pond-rush, 187
PONDWEED FAMILY, 15
Pondweeds, 16
Pontederia, 266
PONTEDERIACEAE, 265
Ponthieva, 379, 380, *380*
Pool-mosses, 251
Poor-man's patches, 897
Poor-man's pepper, 555
Poor-man's weather-glass, 1026
Poor-robin's plantain, 1494
Pop-ash, 1039
Popinack, 654
Poplar-leaved haw, 642
Poplars, 410
Poppies, 547
POPPY FAMILY, 546
Poppy-mallows, 852
Populus, 410, 411, *411,* 412, *412*
Porcupine-grasses, 97
Porteranthus, 609
Portio-tree, 860
Portulaca, 495, 496
PORTULACACEAE, 493
Portulacas, 495
Possum-grape, 838
Possum-haw, 815, 1272
Possum-oak, 428
Possumwoods, 1030
Post-oak, 424
Potamogeton, 15
americanus, 17
amplifolius, 17
angustifolius, 17
australis, 26
Curtissii, 17
diversifolius, 18
epihydrus, 17
floridanus, 16

fluitans, 17
foliosus, 17
heterophyllus, 17
hybridus, 18
lonchites, 17
lucens, 17
montevidensis, 26
natans, 16
Nuttallii, 17
pauciflorus, 17
pectinatus, 18
pennsylvanicus, 17
perfoliatus, 17
pulcher, 16
pusillus, 17
POTATO FAMILY, 1105
Potato-tree, 1115
Potentilla, 610, 611, *611, 613*
Poterium, 614
Potherb-mustard, 563
Poverty-grass, 166
Poverty-grasses, 94
Poverty-pine, 6
Poverty-weed, 1405
Powdery-thalia, 361
Prairie-fires, 1224
Prairie-indigo, 678
Prairie-meadow-sweet, 610
Prairie-orchid, 370
Prairie-rose, 627
Prairie-tea, 783
Prairie-willow, 415
Prescottia, 379
Prester-John, 247
Prickle-grass, 49
Prickle-weed, 656
Prickly-apples, 915
Prickly-ash, 758, 960
Prickly-bur, 420
Prickly-elder, 960
Prickly-fescue, 134
Prickly-gooseberry, 604
Prickly-lettuce, 1497
Prickly-pears, 899
Prickly-poppies, 548
Prickly-sida, 850
Pride-of-india, 765
Pride-of-the-peak, 371
Prim, 1042
PRIMROSE FAMILY, 1022
Primroses, 951
PRIMULACEAE, 1022
PRIMULALES, 1020
Prince's-feather, 457
Prince's-pine, 990
Prince's-plume, 457
Princess-tree, 1186
Princewood, 1256
Priva, 1140, *1140*
Privet, 1042
Proboscis-flower, 1244
Procession-flower, 768
Prosartes, 298, 299
Proserpinaca, 953, 954
PROTEA FAMILY, 918
PROTEACEAE, 918
PROTEALES, 918
Prunella, 1155
Prunus, 646
americana, 648
angustifolia, 649
Avium, 650
caroliniana, 651
Cerasus, 650
Chicasa, 649
cuneata, 649
geniculata, 649
hortulana, 649
hortulana Mineri, 649
injucunda, 648
maritima, 649
Mexicana, 648
mitis, 648
Munsoniana, 649
pennsylvanica, 649
sphaerocarpa, 651
umbellata, 648
Pseudophoenix, 238
Psidium, 937
Psilocarya, 174, 175
Psilorhegma, 662
Psoralea
americana, 691
bituminosa, 692
canescens, 694
gracilis, 693
Lupinellus, 693
macrophylla Rowlee, 692
Onobrychis, 692
pedunculata, 693
simplex, 693
subacaulis, 694
virgata, 692
Psychotria, 1260, 1261
Ptelea, 758
Pterocaulon, 1400
Pterophyton, 1443, 1444
Ptilimnium, 977, 978
Pueraria, 720
Pull-and-hold-back, 489
Pumpkin-ash, 1040
Pumpkins, 1286
Puncture-weed, 754
Punica, 932
PUNICACEAE, 932
Punk-tree, 938
Purple-anise, 534
Purple-bonnet, 539
Purple-chokeberry, 635
Purple-clover, 686
Purple-fringe orchid, 370
Purple-hooded orchis, 368
Purple-laurel, 998
Purple meadow-parsnip, 980
Purple-milkweed, 1070
Purple-orpine, 586
Purple-osier, 415
Purple-rocket, 559
Purple-sesban, 704
Purple-slipper, 367
Purple-tassels, 696
Purple-trumpet, 582
Purple-virgin-bower, 528
Purple wen-dock, 539
Purple-willow, 415
Puck's-orpine, 587
Purslane, 496
Marsh, 940
Water, 940
PURSLANE FAMILY, 493
Pussley, 496
Putty-root, 388
Pycnanthemum, 1171
Pycnothymus, 1167
Pygmy-pipes, 989
Pyrola, 990
PYROLACEAE, 989
Pyrrhopappus, 1495
Pyrularia, 1250
Pyrus, 632, *632*, 635
Pyxidanthera, 1019
Pyxie, 1019
PYXIE FAMILY, 1018
Quack-grass, 136
Quaking-aspen, 411
Quamasia, 292
Quamoclit, 1087, 1088
QUASSIA FAMILY, 762
Queen-Anne's-lace, 967
Queens-delight, 988
Queen-of-the-night, 914
Queen-of-the-prairie, 610
Queens-root, 788
Queens-roots, 788
Queens-slipper, 367
Quercitron, 130
Quercus, 421, 1501
acuminata, 425
alba, 424
Andromeda, 427
aquatica, 428
arkansana, 430
austrina, 426
bicolor, 425
borealis, 429
Boyntonii, 424
caput-rivuli, 430
Catesbaei, 430
Chapmanii, 427
cinerea, 428
coccinea, 429
coccinea-tinctorea, 430
digitata, 430
Durandii, 426
falcata, 430
geminata, 426
georgiana, 429
hybrida, 428
ilicifolia, 431
imbricaria, 428
laevis, 430
laurifolia, 428
lyrata, 425
macrocarpa, 425
Margaretta, 424
marilandica, 430
maxima, 429
Michauxii, 425
microcarya, 427
minima, 426
minor, 424
montana, 425
Muhlenbergii, 425
myrtifolia, 427
nana, 431
nigra, 428
nigra, 430
obtusa, 428
Pagoda, 431
pagodaefolia, 431
palustris, 429
Phellos, 428
Phellos arenaria, 427
Phellos laurifolia, 428
platanoides, 425
prinoides, 426
Prinus, 425
Prinus, 426
pumila, 427
Rolfsii, 427
rubra, 430
rubra, 429
Schneckii, 429
Shumardii, 429
sinuata, 426
stellata, 424
stellata parviflora, 427
succulenta, 427
tinctoria, 430
triloba, 430

velutina, 430
virens, 426
virens dentata, 426
virens maritima, 426
virginiana, 426
virginiana dentata, 426
virginiana minima, 426

Rabbit-bells, 679
Rabbit-foot clover, 685
Rabbit's-pea, 706
Rabbit-tobacco, 1403, 1405
Radicula, 556, 557
Radish, 565
Ragged-orchid, 370
Ragged-robin, 1485
Ragweed, 1416
RAGWEED FAMILY, 1297
Ragweeds, 1299, 1301, 1478
Ragworts, 1478
Railroad-vine, 1085
Raimannia, 946, 947
Rakestraws, 458
Rain-lilies, 320
Ramie, 436
Ramium, 435
Ramp, 289
Ramp-scallions, 289
Ram's-horn, 1244
RANALES, 508
Randia, 1257
RANUNCULACEAE, 510
Ranunculus, ~~519~~
abortivus, 521
acris, 522
allegheniensis, 521
ambigens, 521
apricus, 522
aquatilis, 519
bulbosus, 522
delphinifolius, 520
fascicularis, 522
hispidus, 523
Lindheimeri, 520
micranthus, 521
mississippiensis, 521
muricatus, 523
oblongifolius, 521
obtusiusculus, 521
palmatus, 522
parviflorus, 523
parvulus, 523
pennsylvanicus, 522
pusillus, 521
recurvatus, 522
repens, 522
sceleratus, 521
septentrionalis, 522
septentrionalis marilandicus, 523
septentrionalis nitidus, 622
tener, 520
trachyspermus, 520
Rapanea, 1029
Raphanus, 564, 565
Raspberries, 619
Raspberry-rose, 619
Ratibida, 1428
Rat-stripper, 818
Rattan-vine, 831
Rattle-bags, 507
Rattle-box, 704, 1036
Rattle-boxes, 678
Rattle-bush, 704
Rattlesnake-master, 318, 964
Rattlesnake-masters, 1331
Rattlesnake-plantains, 384
Rattlesnake-roots, 1490
Rattlesnake-weed, 1494
Rattle-top, 513
Rattle-vetch, 709
Rattle-weed, 676
Rayless-goldenrods, 1342
Red-alder, 419
Red-ash, 1040
Red-baneberry, 513
Red-bay, 877, 922
Redbeech, 420
Red-bells, 514
Red-berried elder, 1270
Red-birch, 418
Red bird-flowers, 804
Red-buckeye, 822
Red-bud, 659
Red-cardinal, 716
Red-careless, 455
Red-cedar, 11
Red-chokeberry, 635
Red-clover, 686
Red-elm, 441
Red-gum, 601
Red-grape, 837
Red-harlequin, 550
Red-haw, 644
Red-hickory, 406
Red-ironwood, 831
Red-locust, 702
Red-maple, 826
Red-moonseed, 537
Red-mulberry, 438
Red-oak, 429, 430
Red-pepper, 1117
Red-plum, 648
Red-puccoon, 456
Red-raspberry, 621
Red-root, 358, 617, 833
Red-roots, 833
Red-shank, 833
Red spider-lily, 321
Red-spruce, 7
Red-stopper, 935
Red-sumac, 810
Red-titus, 811
Red-top, 105
Red-veined dock, 448
Reed, 138
Reed-bend grasses, 106
Reed canary-grass, 93
Reed-grasses, 104, 107
Reed-maces, 13
Reef-thatches, 241
Reimaria, 54
Reimarochloa, 54
Rein-orchids, 373
Remirea, 187
Rescue-grass, 135
Reynosia, 831
Rhabdadenia, 1062
Rhacoma, 819
RHAMNALES, 830
Rhamnidium, 830
Rhamnus, 832
Rhaphis, 48
Rhapidophyllum, 243
RHATANY FAMILY, 668
Rheumatism-root, 544
Rhexia, 925
Alifanus, 927
aristosa, 927
ciliosa, 926
cubensis, 926
delicatula, 927
filiformis, 927
floridana, 926
glabella, 927
lanceolata, 927
lutea, 926
mariana, 926
Nashii, 927
parviflora, 927
serrulata, 926
stricta, 927
virginica, 927
RHINANTHACEAE, 1182
Rhipsalis, 913
Rhizophora, 939
RHIZOPHORACEAE, 938
Rhode Island-bent, 105
Rhodiola, 585
Rhododendron, 997, 998, 998
Rhoeo, 262
Rhombolytrum, 121
Rhus, 809
Ashei, 810
caroliniana, 810
Copallinum, 810
glabra, 810
hirta, 810
leucantha, 811
Michauxii, 810
obtusifolia, 810
pumila, 810
radicans, 809
Toxicodendron, 809
typhina, 810
venenata, 809
Vernix, 809
Rhynchophorum, 401
Rhynchosia, 713
caribaea, 713
cinerea, 714
erecta, 715
galactioides, 712
intermedia, 715
Lewtonii, 714
menispermoidea, 714
Michauxii, 714
minima, 713
mollissima, 715
parvifolius, 713
reniformis, 714, 715
reticulata, 714
simplicifolia, 715
tomentosa, 714
Rhytidomene, 693
Ribes, 602, 603, 603, 604, 604
Rib-grass, 1246
Rice, 89
Richardia, 1262
Richardsonia, 1262
Richweed, 433, 1179
Ricinus, 791
Ridan, 1444, 1445
Ridge-beech, 420
Riedlea, 862
Ripple-grass, 1246
River-bank willow, 414
River-birch, 418
River-cypress, 9
River-leek, 585
River-plum, 648
River-poplar, 412
River-raft, 267
Riverside-grape, 837
River-weed, 584
RIVER-WEED FAMILY, 584
Rivina, 484
Road-grass, 165
Roadside-thistle, 1483
Roan-lily, 291

Robinia, 699
Boyntonii, 701
Elliottii, 701
fertilis, 702
grandiflora, 701
Hartwigii, 702
hispida, 702
hispida Elliottii, 701
Kelseyi, 701
longiloba, 701
nana, 701
pallida, 701
pedunculata, 702
Pseudo-Acacia, 700
speciosa, 701
viscosa, 702
Robin's-plantain, 1396
Rock-bells, 514
Rock-catchfly, 506
Rock-clematis, 528
Rock-cress, 587
Rock-cresses, 570
Rock-elm, 441
Rock-fumeroot, 551
Rock-geranium, 593
Rock-geraniums, 592
Rock-honeysuckle, 514
Rock-larkspur, 515
Rock-maple, 824
Rock-orpine, 587
Rock-pine, 4
Rock-poppy, 547
Rock-portulaca, 494
ROCK-ROSE FAMILY, 878
Rock-roses, 878
Rock-sandwort, 499
Rock-sanicle, 593
Rocket, 560
Rocket-larkspur, 515
Rockets, 561
Roke-harlequin, 551
Roke-ladies, 550
Rolfs'-oak, 427
Roman-wormwood, 1300
Roripa, *558*, 559
Rosa, 626
bracteata, 628
canina, 629
carolina, 630
carolina, *629*
cherokeensis, *628*
floridana, 629
humilis, *630*
laevigata, 628
lancifolia, 631
Lyonii, 630
micrantha, 628
moschata, 627
multiflora, 627
obtusiuscula, 630
palustris, 629
rubifolia, 627
rubiginosa, 628
serrulata, 630
setigera, 627
tomentosa, 628
virginiana, 629
ROSACEAE, 604
Rosa-de-Montana, 460
ROSALES, 583
Rosary-pea, 743
Rose-acacia, 702
Rose-bay, 997
Rose-bays, 997
Rose-bells, 298
Rose crested-orchid, 375
Rose-elfs, 494
ROSE FAMILY, 604
Rose-leek, 289
Roselings, 259
Roselle, 857
Rose-lip, 377
Rose-mallows, 854
Rose-mandarin, 298
Rosemary, 807
Rosemary-willow, 414
Rose-of-Sharon, 857
Rose-orchid, 375
Rose-pink, 1051
Rose-robin, 702
Roseroot, 586
Roseroots, 586
Rose-rush, 1490
Roses, 626
Rose-wings, 376
Rosin-plants, 1408
Rosin-weeds, 1408, 1410
Rosy-twisted-stalk, 298
Rosy wake-robin, 309
Rotala, 929
Rotantha, 1289
Rottboellia, *41*
Roubieva, 463
Rouge-plant, 484
Rough-bedstraw, 1268
Rough-cinquefoil, 611
Rough-leaf cornel, 958
Rough-stalked meadow-grass, 130
Rough-strongback, 1129
Rough velvet-seed, 1259
Round-leaf orchid, 369
Roundleaf-sundew, 579
ROXBURGHIACEAE, 309
ROXBURGHIA FAMILY, 309
Royal-jessamine, 1044
Royal-oread, 536
Royal-palm, 238
Royal-poinciana, 666
Roystonea, 238
Rubber-plant, 439
Rubber-vine, 1062, 1063, 1066
Rubacer, 619
RUBIACEAE, 1251
RUBIALES, 1251
Rubus, 619
argutus, 622
Baileyanus, 623
betulifolius, 622
canadensis, 622
canadensis, *624*
carolinianus, 621
carpinifolius, *624*
continentalis, 624
cuneifolius, 621
Enslenii, 623
flagellaris, 623
floridus, 622
hispidus, 624
invisus, 623
Linkianus, 621
lucidus, 624
Millspaughii, *622*
nigrobaccus, 621
occidentalis, 620
odoratus, *619*
persistens, *624*
phoenicolasius, 621
procumbens, *624*
rhodophyllus, 623
rubrisetus, 624
strigosus, *621*
subuniflorus, *624*
trivalis, 624
villosus, *621*
Rudbeckia, 1422
acuminata, 1425
alismaefolia, 1424
amplectens, 1427
Beadlei, 1426
bicolor, 1427
Brittonii, 1427
bupleuroides, *1426*
Chapmanii, 1425
divergens, 1427
florida, 1427
foliosa, 1425
fulgida, 1425
glabra, 1425
graminifolia, 1426
grandiflora, 1424
Heliopsidis, 1424
heterophylla, 1424
hirta, 1427
laciniata, 1424
longipes, 1427
maxima, 1424
Mohrii, 1426
mollis, 1424
monticola, 1427
missouriensis, 1426
nitida, 1424
palustris, 1425
pinnatiloba, 1426
rupestris, 1426
sericea, 1427
spathulata, 1425
speciosa, 1425
subtomentosa, 1424
Sullivantii, 1425
tenax, 1426
triloba, 1426
triloba pinnatiloba, *1426*
triloba rupestris, *1426*
truncata, 1426
umbrosa, 1425
Rue, 757
Rue-anemone, 518
RUE FAMILY, 756
Ruellia, 1228, 1229
Rufacer, 825, 826
Rum-cherry, 651
Rumex, 446
Acetosella, *446*
altissimus, 447
Berlandieri, 447
conglomeratus, 448
crispus, 447
cuneifolius, 448
fascicularis, 447
floridanus, 447
hastatulus, 447
Langloisii, *447*
obtusifolius, 448
persicarioides, 448
pulcher, 448
sanguineus, 448
verticillatus, 448
Running-clover, 685
Running crab-grass, 88
Running-Euonymus, 818
Running-oak, 427
Running strawberry-bush, 818
Ruppia, 15
Rush, 283
Featherling, 275
Grasses, 100
RUSH FAMILY, 281
Rushes, 281
Rushfoils, 784
Russelia, 1206
Russet-alder, 651

Russet-orchid, 370
Ruta, 756
Ruta Baga, 563
RUTACEAE, 756
Rye-grasses, 136
Rynchospora, 175
alba, 180
alba macra, 180
axillaris, 181
Baldwinii, 182
brachychaeta, 183
caduca, 185
capitellata, 180
Careyana, 179
cephalantha, 181
Chapmanii, 179
ciliaris, 183
ciliata, 183
compressa, 184
corniculata, 178
corniculata macrostachya, 179
Curtisii, 181
cymosa, 184
decurrens, 185
distans, 182
divergens, 179
dodecandra, 183
Earlei, 184
Edisoniana, 184
fascicularis, 182
filifolia, 181
fusca, 181
fuscoides, 181
globularis, 184
glomerata, 180
glomerata, 180
glomerata leptocarpa, 131
glomerata paniculata, 181
gracilenta, 182
Grayi, 193
Harperi, 182
Harveyi, 183
inexpansa, 186
intermedia, 180
intermixta, 179
inundata, 178
leptocarpa, 181
leptorhyncha, 182
macra, 180
macrostachya, 179
microcarpa, 185
microcephala, 181
miliacea, 186
mixta, 186
oligantha, 180
pallida, 179
patula, 185
perplexa, 184
pinetorum, 183
Plankii, 183
plumosa, 180
prolifera, 186
punctata, 185
pusilla, 179
Rappiana, 179
rariflora, 183
saxicola, 185
schoenoides, 185
semiplumosa, 180
Smallii, 182
solitaria, 182
stenophylla, 186
stipitata, 186
Torreyana, 184
Tracyi, 178
Wrightiana, 183
Rytilix, 42
Sabal, 239, 240, *240*
Sabbatia, 1049
angularis, 1050
angustifolia, 1050
Boykinii, 1051
brachiata, 1050
calycina, 1050
campanulata, 1050
decandra, 1051
difformis, 1049
dodecandra, 1050
Elliottii, 1050
foliosa, 1051
grandiflora, 1050
Harperi, 1050
lanceolata, 1049
macrophylla, 1049
paniculata, 1050
recurvans, 1049
Sabina, 11, *11*
Sabulina, 498, *498*
Saccharodendron, 824, 825
Saccharum, 39
Sacrolepis, 81, 82, *82*
Sachia, 1400
Saffron-plume, 1033
Sage, 1142
Sage-grasses, 43
Sages, 1161
Sage-willow, 415
Sageretia, 832
Sagina, 496, 497
Sagittaria, 22
angustifolia, 25
Chapmanii, 25
cycloptera, 24
falcata, 25
filiformis, 24
graminea, 24
isoetiformis, 24
lancifolia, 25
latifolia, 25
longirostra, 26
lorata, 24
macrocarpa, 25
Mohrii, 24
natans, 24
natans pusilla, 24
ornithorhyncha, 25
platyphylla, 24
pubescens, 25
rigida, 25
stagnorum, 24
subulata, 24
teres, 24
variabilis, 25
viscosa, 26
SAGO-PALM FAMILY, 1
Sagotia, 736
St. Agnes'-feather, 279
St. Andrew's-cross, 867
St. Andrew's-crosses, 867
St. Augustine-grass, 88
St. Elmo's-feather, 278
St. John's-weed, 873
ST. JOHN'S-WORT FAMILY, 866
St. John's-worts, 868
St. Mary's-grass, 255
St. Peter's-cabbage, 595
St. Peter's-worts, 867
SALICACEAE, 410
SALICALES, 410
Salicornia, 468, *468*
Salix, 412
alba, 414
amphibia, 413
babylonica, 414
Chapmanii, 414
cordata, 414
discolor, 414
floridana, 413
fragilis, 413
humilis, 415
interior, 414
longifolia, 414
longipes, 413
marginata, 413
missouriensis, 414
nigra, 413
petiolaris, 414
purpurea, 415
sericea, 414
tristis, 415
Sally-bloom, 945
Salomonia, 300
Salpingostylis, 326
Salsify, 1488
Salsola, 469
Salt-bushes, 467
Salt-grass, 114
Salt grasses, 118, 128
Salt joint-grass, 57
Salt-marsh-grass, 114
Salt-marsh mallow, 859
Salt-marsh bulrush, 171
Salt-marsh umbrella-grass, 173
Salt-reed grass, 113
Saltwort, 469, 486
Salvia, 1161
azurea, 1162
Blodgettii, 1163
Chapmanii, 1162
coccinea, 1162
lyrata, 1163
occidentalis, 1163
privoides, 1162
Sclerea, 1163
serotina, 1162
urticifolia, 1162
verbenacea, 1163
Sambucus, 1269, 1270, *1270*
Samodia, 1028
Samolus, 1027, *1028*
Sampson's-snakeroot, 693
Samphires, 468
SANDAL-WOOD FAMILY, 1248
Sandbar-willow, 414
Sand-beans, 725
Sand-blackberry 621
Sand-blackjack, 430
Sand-burs, 86, 668
Sand-grape, 863
Sand-grass, 122
Sand-grasses, 43, 107, 121, 122
Sandhill-buckthorn, 1035
Sandhill-lupine, 681
Sand-jack, 428
Sand-myrtles, 993
Sand-phlox, 1103
Sand-pine, 5
Sand-plum, 649
Sand-rocket, 563
Sand-rockets, 563
Sand-spur, 86
Sand-spurrey, 502
Sand-vetch, 74
Sand-weed, 872
Sandworts, 498, 499
Sandywinks, 499
Sang, 959
Sanguinaria, 546
Sanguisorba, 614
Sanicles, 965

Sanicula, 965, 966
Sanidophyllum, 874
Sansevieria, 301
SANTALACEAE, 1248
SANTALALES, 1247
SAPINDACEAE, 827
SAPINDALES, 805
Sapindus, 828
Sapium, 789, *789*
Sapodilla, 1032
SAPODILLA FAMILY, 1031
Saponaria, 505
Sapota, 1031, 1032
SAPOTACEAE, 1031
Sargent's-palm, 238
Sarothra, 874
Sarracenia, 580, 581, 582, *583*
SARRACENIACEAE, 580
SARRACENIALES, 578
Sarsaparilla, 313
  Bristly, 960
  Wild, 960
Sarsaparillas, 90
Sassafras, 923
Sassafrax, 923
Satin-curls, 525
Satinleaf, 1031
Satin-wood, 757
Satyr-orchid, 368
SAURURACEAE, 399
Saururus, 399
Savia, 11
Savia, 777
Savastana, 93
Saw-brier, 312
Saw-cabbage palm, 242
Saw-grass, 187
Saw-palmetto, 242
Saxifraga, 595, 596
SAXIFRAGACEAE, 590
SAXIFRAGE FAMILY, 590
Saxifrages, 595
Scaevola, 1296
Scaly-bark hickory, 426
Scandix, 967
Scare-weed, 674
Scarlet-buckeye, 822
Scarlet-firethorn, 644
Scarlet-haw, 643
Scarlet-maple, 826
Scarlet-oak, 429
Scarlet-sumac, 810
Schaefferia, 820
SCHEUCHZERIACEAE, 20
Schizandra, 534
Schizachyrium, 43
  acuminatum, 44
  gracile, 46
  littorale, 44
  maritimum, 44
  oligostachyum, 45
  scoparium, 44
  semiberbe, 44
  stoloniferum, 44
  tenerum, 44
  triaristatum, 44
  villosissimum, 44
Schmaltzia, 811, *811*
Schobera, 1133
Schoenocaulon, 277, 278, *278*
Schoenolirion, 293, 294
Schoenus, 188
Schoepfia, 1250, *1250*
Schrankia, 656, 657
Schwalbea, 1223
Scirpus, 167
  americanus, 170
  atrovirens, 171
  caespitosus, 169
  californicus, 170
  carinatus, 169
  Clintonii, 169
  cubensis, 171
  cylindricus, 170
  cyperinus, 171
  debilis, 169
  divaricatus, 171
  Eriophorum, 171
  etuberculatus, 170
  fontinalis, 171
  georgianus, 171
  Hallii, 169
  lacustris, 170
  lineatus, 171
  nanus, 169
  Olneyi, 170
  polyphyllus, 171
  robustus, 170
  subterminalis, 169
  sylvaticus, 171
  validus, 170
SCITAMINALES, 358
Scleria, 188
  Baldwinii, 191
  Baldwinii costata, 191
  Brittonii, 190
  ciliata, 190
  costata, 191
  Curtissii, 190
  Elliottii, 190
  glabra, 190
  gracilis, 190
  hemitaphra, 190
  hirtella, 191
  lithosperma, 191
  oligantha, 189
  pauciflora, 190
  reticularis, 189
  setacea, 190
  Torreyana, 190
  trichopoda, 190
  triglomerata, 189
  verticillata, 191
Scokes, 485
Scolymus, 1498
Scoparia, 1187
Scorpion-grasses, 1124
Scotch-broom, 681
Scotch-thistle, 1484
Scrambled-eggs, 550
Scratch-grass, 458
Scrophularia, 1205
Scrub-cabbage, 240
Scrub chestnut-oak, 426
Scrub-hickory, 407
Scrub live-oak, 426
Scrub-oak, 426, 427, 430
Scrub-palmetto, 240
Scrub-pine, 6
Scrub-plum, 649
Scrub prickly-pear, 907
Scuppernong, 838
Scuppernongs, 838
Scurvy-grasses, 561
Scutch-grass, 112
Scutellaria, 1149
  alabamensis, 1151
  Altamaha, 1152
  ambigua, 1151
  arenicola, 1152
  arguta, 1151
  campestris, 1151
  canescens, 1151
  cordifolia, 1151
  cubensis, 1151
  Cuthbertii, 1151
  epilobifolia, 1150
  floridana, 1152
  galericulata, 1150
  glabriuscula, 1152
  havanensis, 1150
  incana, 1151
  integrifolia, 1152
  lateriflora, 1150
  longiflora, 1151
  Mellichampii, 1152
  montana, 1152
  multiglandulosa, 1152
  nervosa, 1152
  Ocmulgee, 1151
  ovalifolia, 1152
  ovata, 1151
  parvula, 1151
  parvula, 1151
  pilosa, 1152
  saxatilis, 1151
  serrata, 1152
  versicolor, 1151
  villosa, 1151
Sea-ash, 758
Sea-bean, 717
Sea-blite, 469
Sea club-rush, 171
Sea-grape, 461
Sea-grass, 15
Sea-grasses, 26
Sea-hollyhock, 856
Sea-island cotton, 861
Sea-lavender, 1130
Sea-lavenders, 1021
Sea-mat, 106
Sea-oat, 128
Sea ox-eyes, 1430
Sea-purslanes, 492
Sea-rockets, 574
Sea-sand reed, 106
Seaside evening-primrose, 947
Seaside-heliotrope, 1132
Seaside-mahoe, 860
Seaside-spurge, 794
Seed-pod plants, 13
Sedum, 586, *586,* 587
Selenicereus, 913, 914
Self-heals, 1155
Self-perpetuating pea, 724
Senebiera, 553
Seneca-snakeroot, 759
Senecio, 1478
  alabamensis, 1480
  aureus, 1479
  glabellus, 1479
  gracilis, 1479
  lobatus, 1479
  Memmingeri, 1480
  Millefolium, 1480
  obovatus, 1479
  pauperculus, 1479
  Robbinsii, 1479
  rotundus, 1479
  Rugelia, 1479
  Smallii, 1480
  tomentosus, 1480
  vulgaris, 1479
Seneciodes, 1316
SENNA FAMILY, 1658
Sensitive-briars, 656
Sensitive-joint vetches, 727
Sensitive-peas, 662
Sensitive-plant, 662
Sensitive-plants, 656
September-elm, 441

Septilia, 1189
Serenoa, 242, *242*
Sericocarpus, 1363, *1363*, 1364, *1364*
Serinea, 1486, 1487
Service-berries, 635
Sesamum, 1243
Sesban, 702, 703
Sesbania, 703, 704
Sesuvium, 492
Setaria, 84, 85
Setiscapella, 1234
Seutera, 1074
Sevenbark, 597
Sevenbarks, 597
Seven-year apple, 1257
Seville-orange, 761
Seymeria, 1213
Shadbush, 636
Shadow-witch, 589
Shadow-witches, 379
Shag-bark, 406
Shag-bark hickory, 406
Shallu, 47
Shamrock, 686
Sharp-lobe liverleaf, 516
Sheathed-galingale, 141
She-balsam, 8
Sheepberry, 1272
Sheep's-fescue, 133
Sheep-laurel, 1000
Sheep-sorrel, 446
Shell-flowers, 460
Shepherd's-cress, 587
Shepherd's-needle, 1451
Shepherd's-purse, 554
Shepherd's weather-glass, 1026
Sherardia, 1269
Sherwoodia, 1019
Shin-leafs, 990
Shingle-oak, 429
Shining-sumac, 810
Shittimwood, 1034
Shoe-black plant, 857
Shoe-buttons, 257
Shoo-fly 676
Shooting-stars 1027
Shore-bay, 922
Short-leaf pine, 5
Shortia, 1019
Shortia, 1019
Shovel-weed, 554
Showy-hydrangea, 597
Showy-orchid, 368
Shrub, 631
Shrub-verbenas, 1141
Shrub yellow-root, 511
Shrubby-althaea, 857
Shrubby-bittersweet, 818
Shrubby-cinquefoil, 613
Shrubby St. John's-wort, 873
Shrubby-trefoils, 758
Shy-leaves, 727
Sibbaldiopsis, 613
Sickle-pod, 572, 660
Sicyos, 1288
Sida, 849
  carpinifolia, 850
  ciliaris, 850
  cordifolia, 850
  Elliottii, 851
  hermaphrodita, 850
  leptophylla, 851
  Napaea, 850
  procumbens, 850
  rhombifolia, 850
  rubromarginata, 851
  spinosa, 850
  supina, 850
Sideranthus, 1343
Sideroxylon, 1032, 1032
Sidesaddle-plant, 581
Sieversia, 618
Silene, 505
  alba, 506
  anglica, 507
  antirrhina, 507
  Baldwinii, 507
  caroliniana, 506
  dichotoma, 507
  latifolia, 507
  noctiflora, 507
  ovata, 506
  pennsylvanica, 506
  regia, 507
  rotundifolia, 507
  stellata, 506
  virginica, 507
  Wherryi, 506
Silk-bay, 922
Silk-oak, 918
Silk-tree, 653
Silk-vine, 1065
Silkweeds, 1067
Silky-camellia, 876
Silky-cornel, 958
Silky-willow, 414
Silphium, 1408
  asperrimum, 1414
  Asteriscus, 1413
  brachiatum, 1414
  compositum, 1410
  confertifolium, 1412
  dentatum, 1412
  Elliottii, 1412
  Gatesii, 1414
  glabrum, 1412
  gracile, 1413
  incisum, 1413
  integrifolium, 1414
  laciniatum, 1410
  lapsuum, 1411
  Mohrii, 1415
  nodum, 1413
  orae, 1411
  ovatifolium, 1411
  perfoliatum, 1410
  pinnatifidum, 1412
  reniforme, 1410
  rumicifolium, 1411
  scaberrimum, 1414
  Simpsonii, 1413
  terebinthinaceum, 1411
  trifoliatum, 1412
  venosum, 1411
Silverbell-tree, 1036
Silver-berries, 920
Silver-chickweed, 479
Silver-fir, 8
Silver-head, 479
Silver-leaf, 536, 597
Silver-leaf croton, 783
Silver-leaved poplar, 411
Silverling, 480, 1398
Silver-maple, 825
Silver-palm, 241
Silver-plume, 39
Silver-poplar, 411
Silver-slipper, 367
Silver-willow, 415
Silver-wort, 479
Simarouba, 762
SIMAROUBACEAE, 762
Simmons, 1030
Sinapis, 563, *563*, 564
Siphonanthus, 1144
Siphonychia, 482, *483*
Sisal, 319
Sisal-hemp, 319
Sisymbrium, 558, 559, *559*, *560*, *561*
Sisyrinchium, 327
  albidum, 328
  anceps, 329
  angustifolium, 328
  atlanticum, 329
  Brownei, 330
  capillare, 328
  carolinianum, 329
  fibrosum, 329
  floridanum, 329
  fuscatum, 329
  graminoides, 329
  incrustatum, 329
  minus, 330
  mucronatum, 328
  rosulatum, 330
  rufipes, 329
  scabrellum, 328
  xerophyllum, 329
Sitilias, 1495
Sium, 975, 976
Six week's grass, 130
Skullcaps, 1149
Skunk-cabbage, 245
Skunk-currant, 602
Skunk-daisy, 1442
Skunk-grasses, 122
Skunk meadow-rue, 525
Skunk-weed, 784
Sky-blue lupine, 681
Slash-pine, 4, 5
Slender-fumeroot, 551
Sleeping-plant, 663
Sleepy-catchfly, 507
Slippery-elm, 441
Sloe, 648, 1272
Slough-grass, 113
Smallanthus, 1406
Small-cane, 81, 138
Small-fruited cocoa-plum, 645
Small-fruited pawpaw, 530
Small-pignut, 406
Small post-oak, 424
Small-nettle, 433
Small-viburnum, 1272
Smartweeds, 454
Smilacaceae, 309
Smilacina, 297
Smilax, 311
  auriculata, 313
  Beyrichii, 313
  Bona-Nox, 312
  cinnamomifolia, 313
  glauca, 312
  havanensis, 314
  hispida, 312
  lanceolata, 313
  lata, 313
  laurifolia, 314
  leptanthera, 311
  megacarpa, 314
  Pseudo-China, 313
  pumila, 314
  rotundifolia, 313
  Smallii, 313
  tamnoides, 313
  Walteri, 313
SMILAX FAMILY, 309
Smoke-tree, 808
Smokeweed, 1327

Smoking-beans, 1241
Smooth-alder, 418
Smooth-azalea, 996
Smooth-fruited poppy, 548
Smooth-hydrangea, 597
Smooth-phlox, 1105
Smooth-strongback, 1129
Smooth-sumac, 810
Smooth-winterberry, 815
Smut-grass, 102
Snailseed, 537
Snakeberry, 513, 612
Snake-cactus, 913
Snake-heads, 1199
Snakeroot, 965, 1282
Snakeweeds, 716
Snapweeds, 753
Snap-willow, 414
Snappy-hazel, 600
Sneezeweeds, 1459
Snowberries, 1259
Snowberry, 1273
Snowboys, 517
Snowbush, 780
Snowdrop-tree, 1036
Snow-on-the-mountain, 797
Snow-wreath, 625
Snowy-campion, 506
Snowy-orchid, 370
Soapberry, 828
SOAPBERRY FAMILY, 827
Soapwort, 505
Soapwort-gentian, 1053
Soda-apple, 1114
Soft-maple, 825
Soft-rush, 283
SOLANACEAE, 1105
Solanum, 1112
  aculeatissimum, 1114
  alatum, 1114
  bahamense, 1115
  Blodgettii, 1115
  carolinense, 1114
  Dulcamara, 1113
  elaeagnifolium, 1115
  floridanum, 1115
  glaucum, 1115
  gracile, 1114
  jamaicense, 1116
  Melongena, 1114
  nigrum, 1114
  perplexum, 1115
  Pseudo-capsicum, 1115
  rostratum, 1112
  sisymbriifolium, 1114
  torvum, 1115
  verbascifolium, 1115
Soldier's-cap, 550
Soldier-wood, 834
Solidago, 1344
  alleghaniensis, 1351
  altissima, 1358
  altissima, 1360
  amplexicaulis, 1353
  angustifolia, 1356
  arguta, 1353
  arguta caroliniana, 1353
  aspericaulis, 1357
  asterifolia, 1356
  austrina, 1354
  bicolor, 1351
  Boottii, 1353
  brachyphylla, 1353
  Buckleyi, 1351
  caesia, 1356
  canadensis, 1359
  canadensis, 1360
  celtidifolia, 1358
  Chapmanii, 1352
  Chrysopsis, 1356
  conferta, 1352
  corymbosa, 1361
  Curtissii, 1357
  dispersa, 1358
  Earlei, 1358
  Edisoniana, 1358
  Elliottii, 1358
  erecta, 1351
  fistulosa, 1357
  flaccidifolia, 1356
  flavovirens, 1354
  flexicaulis, 1356
  Gattingeri, 1355
  gigantea, 1359
  glaberrima, 1359
  glomerata, 1350
  gracillima, 1356
  Harperi, 1352
  Harrisii, 1354
  hirsutissima, 1360
  hispida, 1351
  juncea, 1353
  lancifolia, 1357
  latissimifolia, 1356
  Leavenworthii, 1359
  Maxonii, 1351
  mexicana, 1354
  Milleriana, 1350
  mirabilis, 1359
  missouriensis, 1359
  monticola, 1351
  Nashii, 1360
  neglecta, 1354
  nemoralis, 1355
  notabilis, 1353
  odora, 1352
  pallescens, 1353
  patula, 1354
  petiolaris, 1350
  petiolata, 1356
  pinetorum, 1355
  plumosa, 1352
  Porteri, 1351
  pubens, 1357
  puberula, 1351
  pulchra, 1356
  pulverulenta, 1351
  radula, 1355
  rigida, 1354
  rigida, 1361
  rigidiuscula, 1352
  roanensis, 1351
  rugosa, 1358
  rupestris, 1359
  salicina, 1354
  serotina, 1359
  speciosa, 1352
  spithamaea, 1352
  squarrosa, 1350
  stricta, 1356
  strigosa, 1353
  suaveolens, 1352
  tarda, 1355
  tortifolia, 1357
  ulmifolia, 1352
  uniligulata, 1354
  Vaseyi, 1353, 1354
  verna, 1355
  virgata, 1356
  yadkinensis, 1353
Soliva, 1473, *1474*
Solomon's-feathers, 297
Solomon's-plumes, 297
Solomon's-seals, 300
Sonchus, 1498
Sophia, 572, 573
Sophronanthe, 1193, *1193*
Sophora, 672, 673
Sorbus, 632
Sorghastrum, 47, *47*, 48
Sorghum halepense, 47, *48*
Sorgo, 47
Sorrel,
  Cow, 446
  Field, 446
  House, 446
  Sheep, 446
Sorrel-tree, 1002
Sorrel-vine, 839
Sour-cherry, 650
Sour-dock, 446
Sour-gum, 956
Sour-grass, 446
Sour-grasses, 747
Sourwood, 1002
Southern black-haw, 1272
Southern-dewberry, 624
Southern-elder, 1270
Southern fox-grape, 838
Southern-magnolia, 535
Southern-pine, 4
Southern red-cedar, 11
Southern red-maple, 826
Southern-spruce, 7
Southern-sumac, 811
Southernwood, 1473
Southern yellow-birch, 418
Sow-thistles, 1498
Spangle-grasses, 127
Spanish-bayonet, 303
Spanish-dagger, 304
Spanish-daisy, 1460
Spanish-jessamine, 1044
Spanish-larkspur, 1100
Spanish-moss, 268
Spanish-needles, 1451
Spanish-oak, 268
Spanish-stopper, 935
SPARGANIACEAE, 14
Sparganium, 14, *14*
Sparkleberry, 1010
Spartina, 112
  alterniflora, 113
  Bakeri, 113
  cynosuroides, 113
  cynosuroides, 113
  glabra, 113
  juncea, 114
  junciformis, 113
  Michauxiana, 113
  patens, 114
  polystachya, 113
  spartinae, 113
  stricta, 113
Spathiger, 390
Spathyema, 245
Spatter-docks, 540
Spatularia, 596
Spear-grasses, 97, 129
Spear-mint, 1178
Speckled-alder, 419
Speckled wood-lily, 296
Specularia, 1290
Speedwells, 1210
Spergula, 502
Spergularia, 502
Spermacoce, 1265, *1265*, 1266
Spermolepis, 973
Sphenoclea, 1290, 1291
Sphenopholis, 109, 110
Spice-birch, 418
Spice-bush, 409, 924
Spice-bushes, 924

Spice-wood, 938
Spice-woods, 924
Spider-flowers, 576, 577
Spider-lilies, 322
Spider-orchid, 396
Spider-rose, 576
Spiderlings, 488
Spiderwort, 258
Spiderworts, Blue, 260
Spigelia, 1046
SPIGELIACEAE, 1044
Spike-grasses, 127, 128
Spike-rushes, 159
Spiked-cresses, 570
Spiked-indigo, 677
Spikenard, 960
Spikenards, 960
Spilanthes, 1420, *1420*
Spinach, 466
Spinacia, 466
Spinage, 466
Spindle-tree, 818
Spineless-blackberry, 622
Spiny-pods, 1076
Spiraea, 607, 608, 609, *610*
Spiral-orchids, 380
Spiranthes, 380, 381, 382, 384
Spireas, 607
Spirodela, 250
Splatter-docks, 540
SPONDIACEAE, 807
Spoon-leaf yucca, 303
Spoon-wood, 999
Sporobolus, 100
  angustus, 102
  argutus, 102
  asper, 102
  Berteroanus, 102
  canovirens, 102
  clandestinus, 102
  compositus, 102
  compressus, 102
  cryptandrus, 103
  Curtissii, 103
  domingensis, 102
  cjuncidus, 103
  floridanus, 103
  gracilis, 103
  indicus, 102
  juncea, 103
  littoralis, 102
  longifolius, 102
  macrus, 102
  neglectus, 101
  teretifolius, 103
  Torreyanus, 102
  vaginaeflorus, 101
  vaginaeflorus minor, 101
  virginicus, 102
Spotted-cowbane, 975
Spotted-medic, 382
Spotted-oak, 428
Spotted St. John's-wort, 873
Spotted-snapweed, 753
Spotted-wintergreen, 990
Sprangle, 118
Spray-aster, 1387
Spread-eagle orchid, 397
Spreading-pigweed, 473
Spring-beauties, 494
Spring-cleavers, 1267
Spring-cress, 568
Spring meadow-rue, 524
Spruce-pine, 5, 7
Spruces, 6
SPURGE FAMILY, 775
Spurge-nettle, 790
Spurges, 792, 802
Spurred-snapdragons, 1207
Spurrey, 502
Spurt-grass, 171
Squaw-huckleberries, 1010
Squaw-root, 1238
Squaw-weeds, 1478
Squirrel-corn, 550
Squirrel-cups, 516
Squirrel-tails, 276
Stachydeoma, 1166
Stachys, 1159
  agraria, 1160
  ambigua, 1160
  aspera, 1161
  Clingmanii, 1161
  cordata, 1161
  floridana, 1161
  hyssopifolia, 1160
  italica, 1161
  latidens, 1160
  lythroides, 1160
  Nuttallii, 1160
  salvioides, 1161
  tenuifolia, 1161
Stachytarpheta, 1141
Staff-tree, 818
STAFF-TREE FAMILY, 817
Stag-brush, 1272
Stagger-bush, 1004
Stagger-grasses, 320
Staggerweed, 515, 550
Staghorn-sumac, 810
Standing-cypress, 1100
Staphylea, 821
STAPHYLEACEAE, 821
Star-anise, 534
Star-anises, 533
Star-chickweed, 498
Star-cucumber, 1288
Star-grasses, 315, 316
Star-lance, 513
Star-leaved gum, 601
Star-lotus, 543
Star-of-Bethlehem, 293
Star-rush, 174
Star-thistles, 1485
Starry-campion, 506
Starry-cerastium, 502
Star-violet, 619
STARWORT FAMILY, 486
Starworts, 497
Statice, 1021
Stave-oak, 424
Steeple-bush, 608
Steinchisma, 71
Steironema, 1024, 1025, *1025*
Stellaria, 497, 498, 499
Stemmodontia, 1429
Stenandrium, 1229
Stenanthium, 277
Stenophragma, 561
Stenophyllus, 158, 159, *159*
Stenorrhynchus, 383
Stenotaphrum, 87, 88, *88*
Sterculia, 864
Stick-leaf, 897
Stick-tight, 1452, 1453
Stick-tights, 731
Stick-weed, 1123
Sticky-heads, 1337
Stiff-arrowhead, 25
Stiff-gentian, 1052
Stillingia, 788, 789
Stinging-nettle, 433
Stink-bush, 534
Stinkweed, 466
Stinking-cedar, 12
Stinking-goosefoot, 464
Stinking-willie, 307
Stipa, 97
Stipulicida, 503, 504
Stitchwort, 498
Stitchworts, 497
Stizolobium, 716, 717
Stokesia, 1317, 1318, *1318*
Stomoisia, 1233, 1234
Stone-clover, 685
Stone-mint, 1175
Stone Mountain-oak, 429
Stone-root, 1179
Stone-roots, 1178
Stopper,
  Red, 935
  Spanish, 935
  Spanish, 935
  White, 935
Stoppers, 935, 936
Storaxes, 1037
Storksbill, 745
Stramonium, 1119
Strangle-weeds, 1092
Strangler-fig, 439
Straw-bill, 299
Strawberries, 612
Strawberry-bush, 817, *818*
Strawberry-fool, 616
Strawberry-shrub, 631
STRAWBERRY-SHRUB FAMILY, 631
Straw-flowers, 299
Streptachne, 95
Streptopus, 297, 298, *298*
Stretch-berry, 313
String-bean, 724
String-lily, 321
Striped-dogwood, 824
Striped garlic, 289
Striped-maple, 824
Striped wake-robin, 308
Strobus, 6
Strongback, 1130
Strophocaulos, 1090, 1091
Strophostyles, 725
Strumpfia, 1260
Stuartia, 875, *876*
Stursshum, 559
Stylipus, 618
Stylisma, 1081
Stylodon, 1135
Stylophorum, 547
Stylosanthes, 729, 730, *730*
Styptic-weed, 661
STYRACACEAE, 1036
Styrax, 1037
Suaeda, 469
Sugar-apple, 533
Sugar-berries, 442
Sugar-cane, 39
Sugar-grape, 836
Sugar-maple, 824
Sugar-pear, 636
Sugar-tree, 824
SUMAC FAMILY, 807
Sumacs, 809
Summer-cohosh, 513
Summer-grape, 837
Summer-haw, 642
Summer meadow-rue, 525
Summer-snowflakes, 293
Summersweets, 987
Summer-violet, 893
Sunflowers, 1431
Sun-plant, 495

Sun-roses, 878
SUNDEW FAMILY, 578
Sundews, 579
Sundial-lupine, 680
Sundrops, 948, 949
Sun-lotus, 543
Sunnybell, 293
Supple-jack, 831
Suriana, 762
SURIANACEAE, 761
Svida, 957, 958, *958*
Swallow-wort, 547
Swamp-ash, 1039
Swamp-azalea, 996
Swamp-bay, 536, 922
Swamp beggar-ticks, 1452
Swamp-buttercup, 522
Swamp-cabbage, 245
Swamp-candleberry, 409
Swamp-candles, 1024
Swamp chestnut-oak, 425
Swamp-cottonwood, 412
Swamp-dewberry, 624
Swamp-dock, 448
Swamp-haw, 1272
Swamp-hickory, 405
Swamp-lily, 321
Swamp-loosestrife, 929
Swamp-lousewort, 1224
Swamp-maple, 826
Swamp-milkweed, 1070
Swamp-oat-grasses, 109
Swamp-pine, 5
Swamp-pink, 276
Swamp post-oak, 425
Swamp-potatoes, 22
Swamp red-bay, 922
Swamp-rose, 629
Swamp rose-mallow, 856
Swamp rose-orchid, 377
Swamp spanish-oak, 429
431
Swamp-sumac, 809
Swamp-thistle, 1482
Swamp white-oak, 425
Swamp-willow, 413
Swamp-wood, 919
Swaying-rush, 169
Sweating-weed, 856
Sweat-root, 1100
Swedish-clover, 685
Sweet-acacia, 654
Sweet alyssum, 565
Sweet-bay, 536, 922
Sweet-bean, 665
Sweet-beth, 308
Sweet-birch, 418
Sweet-brier, 628
Sweet-buckeye, 822
Sweet-bush, 410
Sweet-cherry, 650
Sweet-cicelies, 968
Sweet-clovers, 683
Sweet-elm, 441
Sweet-fern, 410
Sweet-flag, 244
Sweet-gale, 409
Sweet-goldenrod, 1352
Sweet-grass, 131
Sweet-gum 601
SWEET-GUM FAMILY, 601
Sweet-jarvil, 968
Sweetleaf, 1035
SWEETLEAF FAMILY, 1035
Sweet-orange, 761
Sweet-pepperbush, 987
Sweet pine-saps, 989
Sweet pitcher-plant, 582
Sweet-potato, 1086
Sweet-robin, 700
Sweet-rocket, 560
Sweet-rushes, 142
Sweet-scabious, 1396
Sweet-scented bedstraw,
1268
Sweet-scented sumac, 811
Sweet-shrubs, 631
Sweet-sap, 533
Sweet-spires, 600
Sweet-sumacs, 811
Sweet-trillium, 308
Sweet vernal-grass, 93
Sweet-viburnum, 1272
Sweet-violet, 892
Sweet white-violet, 891
Sweet winter-grape, 837
Swietenia, 765
Swine-cresses, 553
Switch-bud hickory, 407
Switch-cane, 138
Switch-ivy, 1001
Sword-bush, 777
Sword-grass, 170
Sycamore, 604
SYMPLOCACEAE, 1035
Symphoricarpos, 1273,
1273
Symphytum, 1127
Symplocarpus, 245
Symplocos, 1035
Synandra, 1156, 1157, *1157*
Syndesmon, 517, 518
Synedrella, 1145
Syngonanthus, 257
Synosma, 1477
Syntherisma, 50
Bakeri, 52
barbatum, 51
digitatum, 50
filiforme, 52
fimbriatum, 51
floridanum, 51
gracillimum, 51
humifusum, 51
Ischaemum, 51
leucocoma, 52
marginatum, 51
paniceum, 52
pauciflorum, 51
sanguinale, 51
serotinum, 51
setosum, 51
Simpsoni, 51
villosum, 52
Syringa, 1038
Syringas, 598

Table-mountain pine, 6
Table-rock pine, 6
Taenidia, 981
Tag-alder, 419
Tagetes, 1464
Talinum, 493, 494
Talisia, 828
Tallahassee-vine, 460
Tall-buttercup, 522
Tall-larkspur, 515
Tall meadow-rue, 525
Tall nut-rush, 189
Tall oat-grass, 111
Tallow-wood, 1251
Tall red-top, 121
Tall white-violet, 893
Tall wild-nettle, 433
TAMACEAE, 324
Tamala, 921, 922
Tamarack, 7
TAMARICACEAE, 866
Tamarind, 668
Tamarindus, 668
Tamarisk, 866
TAMARISK FAMILY, 866
Tamarix, 866
Tanbark-oak, 426
Tanacetum, 1470
Tan-bay, 877
Tansy, 1470
Tansy-mustards, 572
TAPE-GRASS FAMILY, 26
Tape-grasses, 27
Taraxacum, 1496
Tare, 740
Tares, 739
Tar-flower, 992
Tar-weeds, 785
Taro, 248
Tassel cotton-grass, 167
Tassel-pondweed, 15
Tassel-rue, 518
Tassel-white, 600
Tawny cotton-grass, 167
Tawny day-lily, 294
TAXACEAE, 2, 3, 11
Taxodium, 8, 9, *9*
Taxus, 12
Teaberry, 1006
Tear-grass, 38
Tearthumbs, 458
Teasel, 1278
Wild, 1278
TEASEL FAMILY, 1278
Tecoma, 1240, *1241*
Telanthera, 476, *477*
Tennessee-indigo, 690
Tephrosia, 704
Terminalia, 933
TERMINALIACEAE, 932
Terrell-grass, 137
Tetragonia, 493
TETRAGONIACEAE, 490
Tetragonotheca, 1418
Tetrazygia, 927
Tetrorum, 587
Teucrium, 1147, 1148
Texas-star, 1059
Thalassia, 29
Thalesia, 1239
Thalia, 361, *361, 362*
Thalictrum, 523
caulophylloides, 524
clavatum, 524
coriaceum, 524
debile, 524
dioicum, 524
macrostylum, 525
mirabile, 524
perelegans, 525
polygamum, 525
purpurascens, 525
revolutum, 525
Thaspium, 979, 980
Thatch-leaf, 762
Thatch-palms, 241
THEACEAE, 875
THEOPHRASTACEAE, 1028
Thermopsis, 673, 674
Therophon, 595
Thespesia, 860
Thevetia, 1058
Thicket-shadblow, 636
Thick-leaf phlox, 1104
Thick shell-bark, 406
Thimble-berry, 619, 620
Thimble-flower, 1427

Thimble-weed, 517
Thistle,
Barnaby's, 1485
Blessed, 1486
Bull, 1483
Canada, 1482
Common, 1483
Cotton, 1484
Field, 1483
Milk, 1484
Pasture, 1483
Roadside, 1483
Scotch, 1484
Swamp, 1482
Yellow, 1483
THISTLE FAMILY, 1303
Thistles, 1481
Thlapsi, 555
Thorn-apple, 548, 1119
Thorn-apples, 548
Thorn-plum, 648
Thorny-amaranth, 473
Thorough-wax, 979
Thoroughwort, 1326
Thread-foot, 584
Three-birds, 378
Three-leaf stonecrop, 587
Three-seeded mercuries, 785
Three-square bulrush, 170
Three-thorn acacia, 665
Thrinax, 241, *241*
Thuja, 8, 9, *10*
Thunbergia, 1226
Thunderwood, 809
Thurberia, 104
Thyella, 1088
Thyme, 1171
THYMELEALES, 919
Thyme-leaved sandwort, 500
Thymophylla, 1465
Thymus, 1171
Thyrsanthema, 1486
Thysanella, 451
Tiarella, 594
Tiaridium, 1133
Ticanto, 667
Tick-clovers, 731
Tick-trefoils, 731
Tickweed, 1443, 1446
Tiedemannia, 985
Tilia, 842
alabamensis, 846
americana, 843
apposita, 843
australis, 846
carolina, 843
cinerea, 844
crenoserrata, 846
eburnea, 844
floridana, 845
fulva, 845
georgiana, 844
glabra, 845
heterophylla, 844
lasioclada, 845
lata, 843
leucocarpa, 845
littoralis, 845
Michauxii, 844
monticola, 844
neglecta, 843
nuda, 845
porracea, 843
pubescens, 843
tenera, 844
truncata, 844
venulosa, 845
TILIACEAE, 840
Tillaea, 585
Tillaeastrum, 585
Tillandsia, 269
aloifolia, 271
angustifolia, 270
Balbisiana, 271
Bartramii, 270
bracteata, 271
bulbosa, 271
caespitosa, 270
circinata, 271
fasciculata, 271
Houzeavi, 271
hystricina, 271
juncea, 270
juncea, 271
myriophylla, 270
polystachya, 271
recurvata, 269
simulata, 270
tenuifolia, 270
utriculata,271
utriculata, 271
Valenzuelana, 271
Timothy, 100
Tiniaria, 458
Tinker's-weed, 1273
Tipularia, 387, *387*
Tissa, 502
Tisswood, 922, 1036
Tithonia, 1431
Tithymalopsis, 799
apocynifolia, 799
corollata, 799
Curtissii, 799
discoidalis, 799
eriogonoides, 799
exerta, 799
gracilis, 799
Ipecacuanhae, 798
mercurialina, 799
olivacea, 799
paniculata, 800
polyphylla, 798
zinniiflora, 799
Tithymalus, 804
Tithymalus, 800
Titi, 812, 1002
TITI FAMILY, 811
Titis, 811
Tium, 710, *710*
Toadflax,
Blue, 1208
Yellow, 1208
Toadflaxes, 1207
Toad-shade, 307
Tobaccos, 1119
Tofieldia, 274, *275*
Tomanthera, 1221
Tomato, 1116
Toothache-grasses, 114
Toothache-tree, 758, 960
Tooth-cups, 929
Toothworts, 566
Torchwood, 759
TORCHWOOD FAMILY, 764
Torilis, 967
Torresia, 93
Torreya, 12
Torrubia, 489, 490
Tortipes, 298
Touch-me-nots, 753
Tough-buckthorn, 1034
Tournefortia, *1130*, 1131
Tovara, 454
Toxicodendron, 809
Toxicoscordion, 279
Toxylon, 438
Tracaulon, 458
Trachelospermum, 1063
Tracyanthus, 279
Tradescantella, 260
Tradescantia, 260
brevicaulis, 261
comata, 262
fluminensis, 262
foliosa, 261
hirsuticaulis, 261
incarnata, 261
longifolia, 262
montana, 262
pilosa, 262
reflexa, 261
rosea, 259
roscolens, 262
virginiana, 261
Tragia, 787, *787*, 788
Tragiola, 1192
Tragopogon, 1488
Trailing-arbutus, 1005
Trailing-beans, 725
Trailing-phlox, 1102
Trailing-wolfsbane, 516
Tramp's-spurge, 799
Tramp's-trouble, 313
Trautvetteria, 518, *518*
Treacle-mustards, 562
Tread softly, 790
Tree-cacti, 916
Tree-of-heaven, 763
Trefoils, 684
Trema, 442, 443
Trema,
Florida, 443
West Indian, 443
Trembling-poplar, 411
Trepocarpus, 977
Triadenum, 875
Triadica, 789
Trianosperma, 1287
Triantha, 275
Trianthema, 491, *492*
Trianthera, 116
Tribulus, 754
Trichachne, 50
Tricholaena, 83, 84
Trichostema, 1148
Trichostigma, 484
Triclisperma, 767
Tridax, 1458
Tridens, 121
Trifoliate-orange, 760
Trifolium, 684
agrarium, 686
arvense, 685
carolinianum, 686
dubium, 686
hybridum, 685
incarnatum, 685
lappaceum, 685
pratense, 686
procumbens, 686
reflexum, 685
repens, 686
saxicola, 686
stoloniferum, 685
Triglochin, 20, *20*
Trigonella, 683
Trilisa, 1336
TRILLIACEAE, 304
Trillium, 305
album, 307
Catesbaei, 308
cernuum, 308
declinatum, 308
decumbens, 307

discolor, 307
erectum, 307
erythrocarpum, 308
grandiflorum, 308
Hugeri, 307
lanceolatum, 306
ludovicianum, 306
pusillum, 308
rectistamineum, 307
recurvatum, 306
Rugelii, 307
sessile, 307
simile, 308
stamineum, 307
stylosum, 309
Underwoodii, 307
undulatum, 308
Vaseyi, 308
viride, 307
Triodia, 120, 121, *121*
Trionum, 858
Triorchos, 394, 395
Triosteum, 1272, 1273
Triphasia, 760
Triphora, 377
Triplasis, 121, 122, *122*
Tripsacum, 37
Trisetum, 108, 109, *109, 110*
Triumfetta, 841, 842
TROPAEOLACEAE, 752
Tropaeolum, 752
Tropida, 385
Trout-lilies, 292
Trumpet, 1241
Trumpet-creeper, 1241
TRUMPET-CREEPER FAMILY, 1239
Trumpet-flower, 1058, 1240
Trumpet-honeysuckle, 1274
Trumpet-leaf, 582
Trumpets, 580, 582
Tsuga, 7
Tubiflora, 1226, 1227
Tule, 170
Tulipastrum, 534
Tulip-tree, 536
Tumble-mustard, 560
Tumble-weed, 473
Tumble-weeds, 472
Tumion, 12
Tunas, 899
Tupelo-gum, 954
Turbina, 1091
Turkey-beard, 275
Turkey-berry, 1116
Turkey-corn, 550
Turkey-oak, 428, 430
Turk's-cap lily, 292
Turk's-turban, 1144
TURNERACEAE, 877
Turnera, 878
TURNERA FAMILY, 877
Turnip, 563
Turnip-buttercup, 522
Turnip-geranium, 466
Turtle-grass, 29
Turtle-heads, 1199
Twayblades, 378, 386
Twin-berry, 1261
Twin-leaf, 544
Twin live-oak, 426
Twisted-stalk, 298
Two-leaved Solomon's-seal, 297
Typha, 13, *13*
TYPHACEAE, 13, 14

ULMACEAE, 440
Ulmus, 440, 441
Umbrella-cornel, 958
Umbrella-grasses, 172
Umbrella-leaf, 544
Umbrella-magnolia, 536
Umbrella-plant, 148
Umbrella-plants, 445
Umbrella-sedge, 148
Umbrella-tree, 536
Umbrella-wort, 488
Umbrella-worts, 488
Undines, 590
Unicorn-plant, 1244
UNICORN-PLANT FAMILY, 1243
Unicorn-root, 276
Unifolium, 297
Uniola, 127, 128, *128*
Upland-cotton, 861
Upland poison-sumac, 810
Upland willow-oak, 428
Urechites, 1061, 1062
Urena, 853
Urtica, 432, 433
URTICACEAE, 431
URTICALES, 431
Urticastrum, 432
Utricularia, 1235
biflora, 1236
cornuta, 1233
fibrosa, 1235
floridana, 1236
foliosa, 1236
gibba, 1236
inflata, 1237
juncea, 1233
macrorhiza, 1236
macrorhyncha, 1236
oligosperma, 1236
olivacea, 1237
pumila, 1236
purpurea, 1238
radiata, 1237
resupinata, 1235
simplex, 1234
subulata, 1234
vulgaris americana, 1236
Uvularia, 299, *300*

Vaccaria, 505
VACCINIACEAE, 1006
Vaccinium, 1009, 1012, 1013, 1014, 1017
Vachellia, 654, 655
Vagnera, 297
VALERIAN FAMILY, 1276
Valeriana, 1277
VALERIANACEAE, 1276
VALERIANALES, 1276
Valerianella, 1277, 1278, *1278*
Valerianoides, 1141
Validallium, 289
Vallesia, 1058
Vallisneria, 27
Valota, 49, 50
Vanilla, 374, *374*
Vanilla-grass, 93
Vanilla-orchids, 37
Vanilla-plant, 1336
Vanilla-vine, 374
Varebells, 276
Vare-goldies, 251
VARNISH-LEAF FAMILY, 820
Varnish-leaves, 821
Varronia, 1129
Vase-vine, 528
Vase-vines, 526
Vasey-grass, 60
Vegetable-porcupine, 243
Vegetable-sponge, 1285
Velvet-bean, 717
Velvet-bur, 1140
Velvet-grass, 107
Velvet-leaf, 847
Velvet-plant, 1199, 1475
Velvet-seed, 1259
Velvet-sumac, 810
Venus'-comb, 968
Venus'-flytrap, 580
VENUS'-FLY-TRAP FAMILY, 580
Venus'-slipper, 367
Venus's looking-glasses, 1290
Veratrum, 276, 277
Verbascum, 1198
Verbena, 1135
angustifolia, 1136
Aubletia, 1139
bonariensis, 1137
bracteosa, 1137
brasiliensis, 1137
canadensis, 1139
caroliniana, 1135
chamaedrifolia, 1139
Drummondii, 1139
Halei, 1137
hastata, 1136
littoralis, 1136
officinalis, 1137
rigida, 1138
riparia, 1137
scabra, 1137
stricta, 1136
tampensis, 1139
Vervains, 1135
Vesiculina, 1237
Vetches, 739
Vetchling, 741
Vetchlings, 741
Viburnum, 1270
acerifolium, 1271
alnifolium, 1271
bracteatum, 1271
cassinoides, 1272
densiflorum, 1271
dentatum, 1271
lantanoides, 1271
Lentago, 1272
Nashii, 1272
nudum, 1272
obovatum, 1272
prunifolium, 1272
pubescens, 1271
Rafinesquianum, 1271
rufidulum, 1272
rufotomentosum, 1272
semitomentosum, 1271
Viburnum,
Nash's, 1272
Small, 1272
Sweet, 1272
Vicia, 739
acutifolia, 741
angustifolia, 741
caroliniana, 740
Cracca, 740
floridana, 741
hirsuta, 740
Hugeri, 740
ludoviciana, 741
micrantha, 741
sativa, 741
tetrasperma, 740
texana, 741
Vicoa, 1405
Vigna, 725, 726, *726*
Viguiera, 1421

Veronica 1209

Vinca, 1059, *1060*
Vincetoxicum, 1076, *1076*, 1077, *1077*, 1078, *1078*
Viola, 884
affinis, 889
arvensis, 894
blanda, 890
blanda, 891
canadensis, 893
carolina, 890
chalcosperma, 889
conspersa, 893
cucullata, 889
denticulosa, 891
Egglestonii, 887
emarginata, 890
eriocarpa, 892
esculenta, 887
fimbriatula, 890
floridana, 888
hastata, 892
hirsutula, 889
incognita, 890
lanceolata, 891
Langloisii, 889
Le Conteana, 891
Lovelliana, 887
multicaulis, 893
odorata, 892
pallens, 891
palmata, 887
papilionacea, 888
pedata, 886
Priceana, 888
primulifolia, 891
pubescens, 892
Rafinesquii, 893
rosacea, 888
rostrata, 893
rotundifolia, 891
rugosa, 891
sagittata, 890
scabriuscula, 892
septemloba, 890
sororia, 888
striata, 893
tenuipes, 892
Thompsonae, 892
triloba, 887
tripartita, 892
villosa, 890
vincialis, 890
vittata, 891
Walteri, 893
VIOLACEAE, 884
VIOLET FAMILY, 884
Violet-iris, 330
Violets, 884
Violet wood-sorrel, 747
Viorna, 526
Addisonii, 528
Baldwinii, 528
Beadlei, 527
crispa, 527
flaccida, 528
Gattingeri, 527
glaucophylla, 528
obliqua, 527
ochroleuca, 528
Pitcheri, 527
reticulata, 527
Simsii, 527
subreticulata, 527
Viorna, 528
Vipers-bugloss, 1128
Virgilia, 673
Virginia-cowslip, 1123
Virginia-creeper, 840
Virginia-creepers, 840
Virginia-mallow, 850
Virginia-Stuartia, 876
Virginia-snakeroot, 1282
Virginia wake-robin, 246
Virginia-willow, 600
VIRGINIA-WILLOW FAMILY, 600
Virgins-bowers, 525
Viticella, 526
VITACEAE, 835
Vitex, 1144
Vitis, 835
aestivalis, 837
Baileyana, 836
bicolor, 837
cinerea, 837
cordifolia, 836
coriacea, 838
Labrusca, 838
Linsecomii, 837
palmata, 837
peltata, 838
rufotomentosa, 837
rupestris, 836
Simpsonii, 838
vulpina, 839
Voyria, 1056

Waahoo, 818
Wahoo, 441
Wafer-ash, 758
Wait-a-bit-vines, 667
WAKE-ROBIN FAMILY, 304
Wake-robins, 305
Waldsteinia, 616, 617, *617*
Water-locust, 665
Water-maple, 826
Water-melon, 1285
WATER-MILFOIL FAMILY, 953
Water-milfoils, 954
Water-millet, 91
Water-mint, 1178
Water-nut, 540
Water-nymphs, 542
Water-oak, 428
Water-oleander, 929
Water-parsley, 976
Water-pennyworts, 970
Water-pepper, 457
Water-pimpernel, 1027
Water-plantain, 21
WATER-PLANTAIN FAMILY, 20
Water-plantain spearwort, 521
Water-poplar, 411
Water-purslane, 928
Water-purslanes, 940
Water-shield, 539
WATER-SHIELD FAMILY, 538
Water Spanish-oak, 429
Water star-grass, 266
WATER-STARWORT FAMILY, 804
Water-starworts, 804
Water-target, 539
Water-tupelo, 957
Waterweeds, 28
Water white-oak, 425
Water-willow, 1230
Water-wort, 866
WATER-WORT FAMILY, 866
Wauhoos, 534
Waxberry, 409
Wax-mallow, 854
Wax-myrtle, 409
Waxwork, 818
Weak-leaf yucca, 303
Weather-glass,
Poor-man's, 1026
Shepherd's, 1026
Weather-vine, 743
Websteria, 166
Wedelia, 1429
Weedy evening-primrose, 946
Weeping-lantana, 1142
Weeping-willow, 414
Welk-holly, 815
Wen-dock, 539
West Indian-almond, 933
West Indian-birch, 764
West Indian-cherry, 651
West Indian-Gherkin, 1286
West Indian-gooseberry, 898
West Indian-mahogany, 765
West Indian pink-root, 1046
West Indian trema, 443
Wheat-grasses, 136
Whippoorwill-flower, 307
WHITE-ALDER FAMILY, 987
Wall-cress, 561
Wallia, 403
Wall-pepper, 588
Wall-rocket, 563
Wall-speedwell, 1211
WALNUT FAMILY, 403
Walnuts, 403
Walter's-pine, 5
Waltheria, 863
Wampee, 267
Wampees, 266
Wandering-jew, 262, 263
Wand-flower, 1020
Wapato, 25
Warea, 573, 574
Wart-cresses, 553
Wartweed, 802
Warty-spurge, 802
Washingtonia, 968
Washington-thorn, 644
Watches, 582
Water-ash, 826, 1039
Water-beech, 416
Water-birch, 418
Water-bitternut, 405
Water-bonnets, 247
Water-buttercup, 520
Water-carpet, 591
Water-celeries, 27
Water-chickweed, 497, 805
Water-chinquapin, 540
Water-cress, 559
Water-cresses, 557
Water-crowfoots, 519
Water-dock, 245
Water-dropwort, 986
Water-elm, 441
Water-feather, 955
Water-grass, 68, 159
Water-gum, 957
Water-hemlocks, 975
Water-hemp, 474
Water-hickory, 405
Water-hoarhounds, 1175
Water-hyacinth, 267
Water-hyacinths, 267
Water-leaf, 474
Water-leaf Family, 1095
Water-leafs, 1095
Water-lettuce, 247
Water-lilies, 542
WATER-LILY FAMILY, 540

White-alders, 987
White-arum, 246
White-ash, 1040
White bachelor's-button, 774
White-baneberry, 513
White-bay, 536
White beak-rush, 180
White-beech, 420
Whiteberry, 513
White-blow, 566
White bread-plant, 1
White butterfly-orchid, 398
White-buttonwood, 934
White-camas, 279
White-campion, 508
White-cedar, 9, 10
White-clover, 686
White-daisy, 1362, 1470
White-elm, 441
White-featherling, 274
White fringe-orchid, 369
White-grass, 90
White-heart hickory, 406
White-hearts, 550
White-hickory, 405, 406
White horse-nettle, 1115
White-holly, 816
White-ironwood, 829
White-lettuces, 1490
White-mandarin, 298
White-mangrove, 934
WHITE-MANGROVE FAMILY, 932
White-maple, 825
White-melilots, 683
White-mulberry, 437
White-mullen, 1199
White-mustard, 564
White-oak, 424, 426
White-pine, 5, 6
White-poplar, 411
White prairie-clover, 696
White rein-orchid, 373
White-root, 1
White-sage, 1473
White-sanicle, 1326
White-snakeroot, 1326
White-stopper, 935
White-sunnybell, 294
White sweet-clover, 683
White-tassels, 696
White-thunbergia, 1226
White-titis, 811
White-topped asters, 1394
White-top rush, 174
White-tops, 173
White-verbena, 1137
White wake-robin, 308
White-walnut, 403
White water-crowfoot, 519
White-weed, 1470
White-wicky, 1000
White wild-indigo, 678
White-willow, 414
Whitewood, 536, 780, 1250
Whitlow-grass, 566
Whitlow-grasses, 565
WITLOW-WORT FAMILY, 479
Whitlow-worts, 479, 565
Whorled-loosestrife, 1024
Wicky, 1000
Wide-leaf spring beauty, 494
Widow's-cross, 587
Widow's-frill, 506
Wild-allamanda, 1062
Wild bachelor's-button, 774
Wild balsam-apple, 1285, 1288
Wild-bamboo, 81, 313
Wild-banyan, 439
Wild-basil, 1169, 1181
Wild-bean, 724
Wild-beans, 725
Wild-bergamot, 1164
Wild black-cherry, 651
Wild-buckwheat, 445
Wild-buckwheats, 445
Wild-carrot, 967
Wild century-plant, 320
Wild-cherries, 650
Wild-chervil, 969
Wild-china, 828
Wild-cinnamon, 865
WILD-CINNAMON FAMILY, 864
Wild-coffee, 834, 1261, 1273
Wild-comfrey, 1122
Wild-cotton, 861
Wild-cranesbill, 744
Wild-dilly, 1035
Wild-elder, 960
Wild-fig, 439
Wild four-o-clock, 488
Wild-fumeroot, 550
Wild-geraniums, 744
Wild-gingers, 1281
Wild-gladioles, 331
Wild-goldenglow, 1453
Wild goose-plum, 649
Wild-grape, 837
Wild-hoarhound, 1327
Wild-honeysuckles, 993
Wild-hyacinth, 292
Wild-indigos, 674
Wild-laurel, 1035
Wild-leeks, 289
Wild-lettuce, 1497, 1498
Wild-lettuces, 1497
Wild-lime, 757
Wild-liquorice, 1267
Wild-liveforever, 586
Wild-marjoram, 1171
Wild-monkshood, 515
Wild-mustard, 564
Wild-oat-grasses, 109, 111
Wild-olive, 1032, 1041
Wild-olives, 1043
Wild-olive tree, 1036
Wild-onion, 288, 289
Wild-pansy, 894
Wild-parsnip, 984
Wild-pea, 679
Wild-peppers, 400
Wild-pines, 269
Wild-pink, 506
Wild-plum, 648
Wild-potato, 1088
Wild-potato vine, 1086
Wild pussy-willow, 415
Wild-raisin, 1272
Wild red-cherry, 649
Wild red-raspberry, 621
Wild-rice, 92
Wild-rose, 630
Wild-rue, 518
Wild-ryes, 1137
Wild-sagos, 1
Wild-sapodilla, 1035
Wild-sarsaparilla, 312, 534, 960
Wild-senna, 661
Wild sensitive-plant, 664
Wild-snapdragon, 1208
Wild-spikenards, 297
Wild-tamarind, 653
Wild-teasel, 1278
Wild-tobacco, 1295
Wild-wallflower, 562
Wild white-violet, 891
Wild yam-roots, 324
Wild yellow-lily, 291
Wild yellow-plum, 648
WILLOW FAMILY, 410
Willow-herb, 929, 945
Willow-herbs, 946
Willow-oak, 428
Willows, 412
Willow-weed, 945
Willugbaeya, 1328
Wineberry, 621
Wineleaf-cinquefoil, 613
Wind-flower, 518
Wind-flowers, 516
Wind-grasses, 108
Wind-waif, 517
Winged-elm, 441
Winged-loosestrife, 930
Winged-pigweed, 463
Winterberry, 814, 1006
Winter-bloom, 600
Winter-cresses, 561
Winter-grape, 837
Wintergreen, 1006
WINTERGREEN FAMILY, 989
Wintergreens, 990
Wire-grass, 96, 117
Wire-grasses, 94
Wire-grass rush, 284
Wireweeds, 450
Wisteria, 699
Wisterias, 699
Witch-alders, 601
Witch-grass, 52, 69
Witch-grasses, 60
Witch-hazel, 600
WITCH-HAZEL FAMILY, 600
Witch-hobble, 1271
Witchlings, 498
Withe-rod, 1272
Withys, 412
Woe-vine, 925
Wolffia, 248
Wolffiella, 249
Wolfsbanes, 515
Woman's tongue tree, 653
Wood-anemone, 517
Wood-betony, 1224
Woodbine, 840, 1274
Woodbines, 840, 1275
Wood-featherling, 275
Wood-grass, 47
Wood-grasses, 82
Wood-lettuces, 1497
Wood-lily, 291
Wood-nettle, 432
Wood-oread, 536
Wood-poppy, 547
Wood-rushes, 286
Wood-sages, 1147
Wood-shamrock, 746
Wood-sorrel, 746
WOOD-SORREL FAMILY, 745
Wood-strawberry, 612
Wood-trillium, 307
Wood-vamp, 599
Wood-vetch, 740
Wood-violet, 888
Woody-glasswort, 468
Woody wire-weed, 450
Wool-crape, 268
Wool-grass, 171
Woolly beard-grasses, 40

Woolly-croton, 783
Woolly-mullen, 1199
Worm-grass, 1046
Wormseed, 466
Wormseed-mustard, 562
Worm-weed, 576
Wormwood, 1472
Wormwoods, 1471

Xanthium, 1301, *1302*
Xanthorrhiza, 511, *511*
Xanthosoma, 246
Xanthoxalis, 747
  Brittoniae, 748
  Bushii, 748
  colorea, 749
  corniculata, 748
  cymosa, 749
  filipes, 748
  grandis, 749
  hirsuticaulis, 749
  Langloisii, 748
  macrantha, 749
  Priceae, 749
  recurva, 749
  rufa, 748
  stricta, 748
Xeniatrum, 296
Xerophyllum, 275
Ximenesia, 1442
Ximenia, 1250, 1251
XIMENIA FAMILY, 1250
Xolisma, 1004
Xylophylla, 777, *777*
Xylosteon, 1274
XYRIDACEAE, 251
XYRIDALES, 250
Xyris, 251
  ambigua, 253
  arenicola, *255*
  Baldwiniana, 255
  brevifolia, 253
  caroliniana, 253
  communis, 253
  difformis, 254
  elata, 254
  Elliotti, 254
  fimbriata, 254
  flabelliformis, 253
  flexuosa, 255
  flexuosa, *253*
  iridifolia, 254
  neglecta, 253
  pallescens, 255
  platylepis, 254
  scabrifolia, 254
  serotina, 254
  Smalliana, 254
  stricta, 253
  torta, 253
  torta, *253*

YAM FAMILY, 324
Yam-vines, 324
Yar, 1467
Yard-grass, 117
Yarrows, 1466
Yaupon, 816
Yeatesia, 1230
Yellow-ash, 673
Yellow-asphodel, 287
Yellow-azalea, 994
Yellow bachelor's-button, 774
Yellow-barked oak, 430
Yellow bell-lily, 291
Yellow-buckeye, 822
Yellow-clover, 686
Yellow-cress, 558
Yellow-daisy, 1427
Yellow-dick, 1460
Yellow-dock, 447
Yellow-elder, 1240
Yellow-eyed grasses, 251
Yellow false-mallows, 849
Yellow-flaxes, 750
Yellow-foxgloves, 1214
Yellow-foxtails, 84
Yellow fringe-orchid, 370
Yellow-fumeroot, 551
Yellow-harlequin, 551
Yellow-jessamine, 1045
Yellow-linn, 534
Yellow-mandarin, 299
Yellow-melilot, 683
Yellow morning-glory, 1083
Yellow-nicker, 667
Yellow nut-grass, 149
Yellow-oak, 425
Yellow-oleander, 1058
Yellow-opopanax, 654
Yellow passion-flower, 896
Yellow-pimpernel, 981
Yellow-pine, 4, 5
Yellow pond-lilies, 540
Yellow-poplar, 536
Yellow-poppy, 547
Yellow rocket, 561
Yellow-root, 511
Yellow-seed, 555
Yellow-strawberry, 612
Yellow-thistle, 548, 1483
Yellow-toadflax, 1208
Yellow trumpet-flower, 1240
Yellow-trumpets, 582
Yellow-violet, 892
Yellow water-cress, 557
Yellow water-lily, 543
Yellow wild-indigo, 676
Yellow wood, 673, 757, 820, 832, 1035
Yellow wood-lily, 296
Yellow wood-sorrels, 747
Yew, 12
YEW FAMILY, 11
Yew-pine, 7
Yonkapin, 540
Yucca, 302, 303, 304
YUCCA FAMILY, 302
Yuccas, 302

Zamia, 1, 2, *2*
Zannichellia, 15
ZANNICHELLIACEAE, 15
Zanthoxylum, 757, 758
Zea, 38
Zebrina, 263
Zenobia, 1002
Zephyranthes, *320*
Zephyr-lilies, 320
Zinnia, 1417, *1417*
Zizania, 91, *91*, 92
Zizaniopsis, 91
Zizia, 981, 982
Zizyphus, 831
Zornia, 729, *729*
Zostera, 18
ZOSTERACEAE, 18
Zosterella, 266
Zygadenus, 280, *280*
ZYGOPHYLLACEAE, 754